LINDA CROCKETT LINGLE Mayor



DAVID W. BLANE Director

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COUNTY OF MAUI PLANNING DEPARTMENT 250 S. HIGH STREET WAILUKU, MAUI, HAWAII 96793

July 25, 1997

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GFC, OF DAMAGE CONTRACTORS

Mr. Gary Gill, Director Office of Environmental Quality Control 235 South Beretania Street Suite 702 Honolulu, Hawaii 96813

Dear Mr. Gill:

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Subject:

Final Environmental Assessment (EA) And Finding of No Significant Impact for the Kulamalu Project, a Development of 53.67 Acres of Property in Pukalani, Maui, Hawaii TMK 2-3-008:por. 5, por. 38, por. 39, Island of Maui, Hawaii

The Planning Department has reviewed the comments received during the 30-day public comment period which began on May 23, 1997. The Planning Department has determined that this project will not have a significant environmental effect and has issued a negative declaration. Please publish this notice in the August 8, 1997 Office of Environmental Quality Control (OEQC) Bulletin.

We have enclosed a completed OEQC Bulletin Publication Form and four copies of the Final EA. Please contact Don Schneider, Staff Plannner, at 243-7735 if you have any questions.

Very truly yours,

a M. Nugen

YDAVID W. BLANE **Planning Director**

DWB:DAS Enclosures cc: Clayton Yoshida, AICP, Planning Program Administrator Project File General File Milton Arakawa Don Fujimoto Don Schneider, Staff Planner

1997-08-08-MA-FEA-Kulamalu Project

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Final Environmental Assessment

Kulamalu Project

Prepared for:

Kulamalu Limited Partnership

July 1997

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Final Environmental Assessment

Kulamalu Project

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Prepared for:

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Kulamalu Limited Partnership

July 1997



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<u>Preface</u>

The applicant, Kulamalu Limited Partnership, proposes to construct the Kulamalu Project, located in Pukalani, Maui, Hawaii (TMK 2-3-8:por. 5, por. 38, por. 39). Pursuant to Chapter 343, Hawaii Revised Statutes, and Chapter 200 of Title 11, Hawaii Administrative Rules, this Environmental Assessment documents the project's technical characteristics, environmental impacts and alternatives, and advances findings and conclusions relative to the significance of the project.

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Chapter

Project Overview

I. PROJECT OVERVIEW

A. PROPERTY LOCATION AND EXISTING USE

The applicant, Kulamalu Limited Partnership, proposes to develop the Kulamalu Project on approximately 53.67 acres of property in Pukalani, Maui, Hawaii (TMK 2-3-8:por. 5, por. 38, por. 39). See Figure 1.

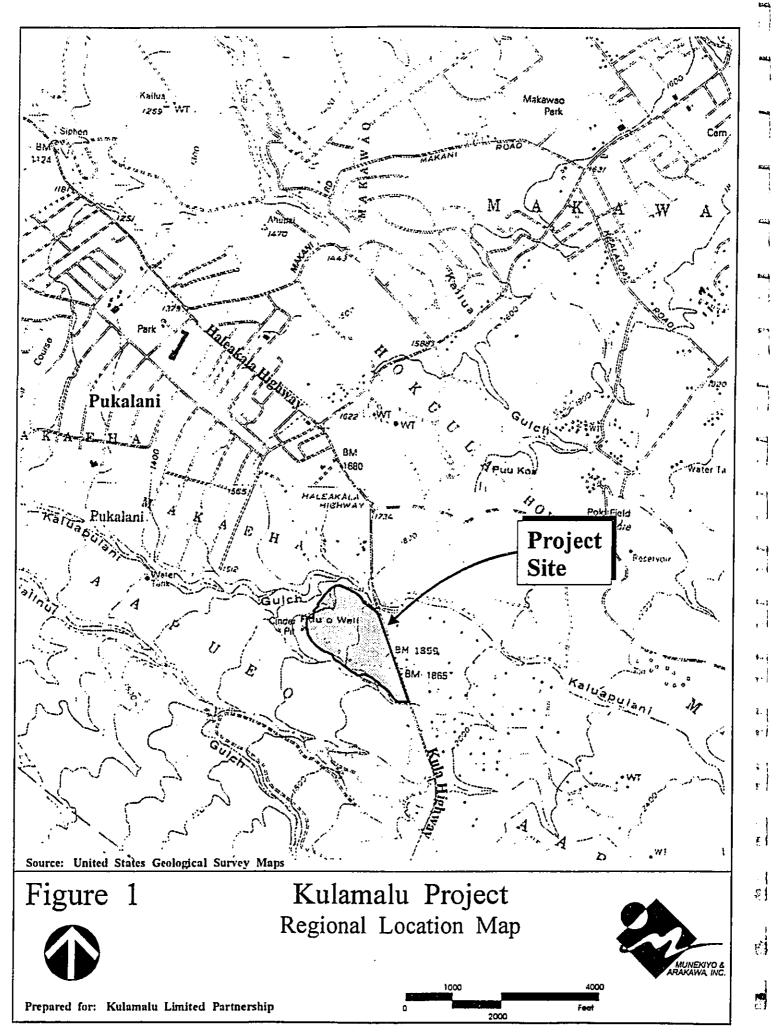
The subject property is bounded by Kula Highway, Kaluapulani Gulch, and an unnamed tributary to Kaluapulani Gulch. The subject property is being used as pasture. Vegetation includes grasses and low-growing shrubs such as guinea grass, lantana, sensitive plant, prickly pear, and koa-haole.

Most of the subject property is owned by Kulamalu Limited Partnership (TMK 2-3-8:5, 38). A portion is owned by Kamehameha Schools/Bishop Estate (TMK 2-3-8:39).

B. PROPOSED ACTION

The applicant is proposing a mix of business, multi-family residential, single-family residential, park, and public/quasi-public uses within the upper Pukalani area. See Figure 2 and Figure 3. The components for the Kulamalu Project are as follows:

- 1. Approximately 4.88 acres overlooking Kaluapulani Gulch is proposed as a multi-family elderly housing complex. Approximately 50 units are proposed in this area.
- 2. To the west of the multi-family use, a 5.03 acre area is set aside for a learning center pertaining to hula, Hawaiian chants and songs, history and genealogy.
- 3. Commercial areas abut one side of a through roadway extending to Kula Highway. The proposed business area encompasses 19.41 acres. A neighborhood commercial center, complying with

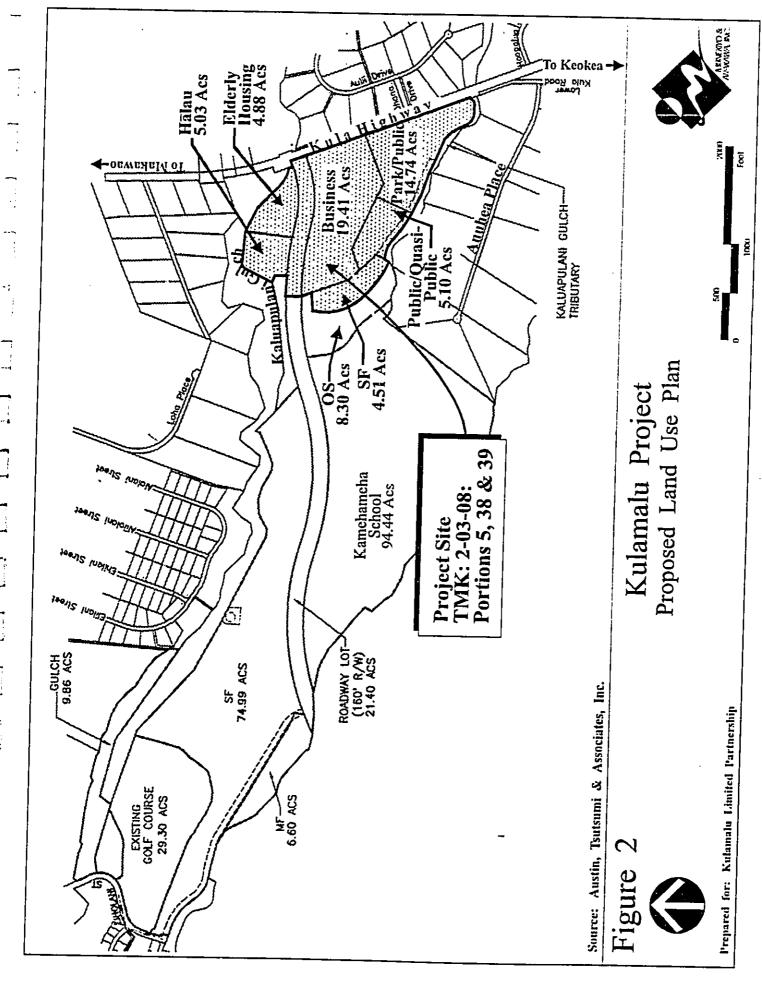


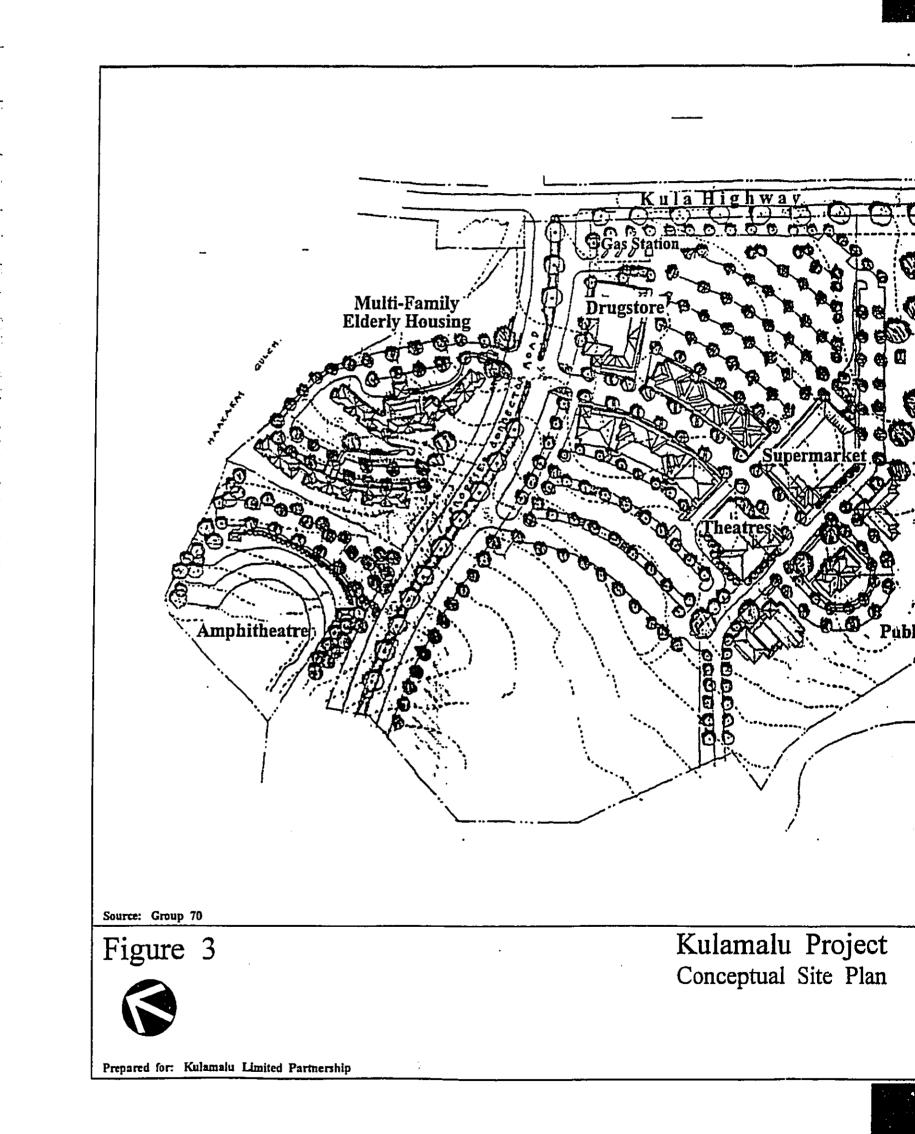
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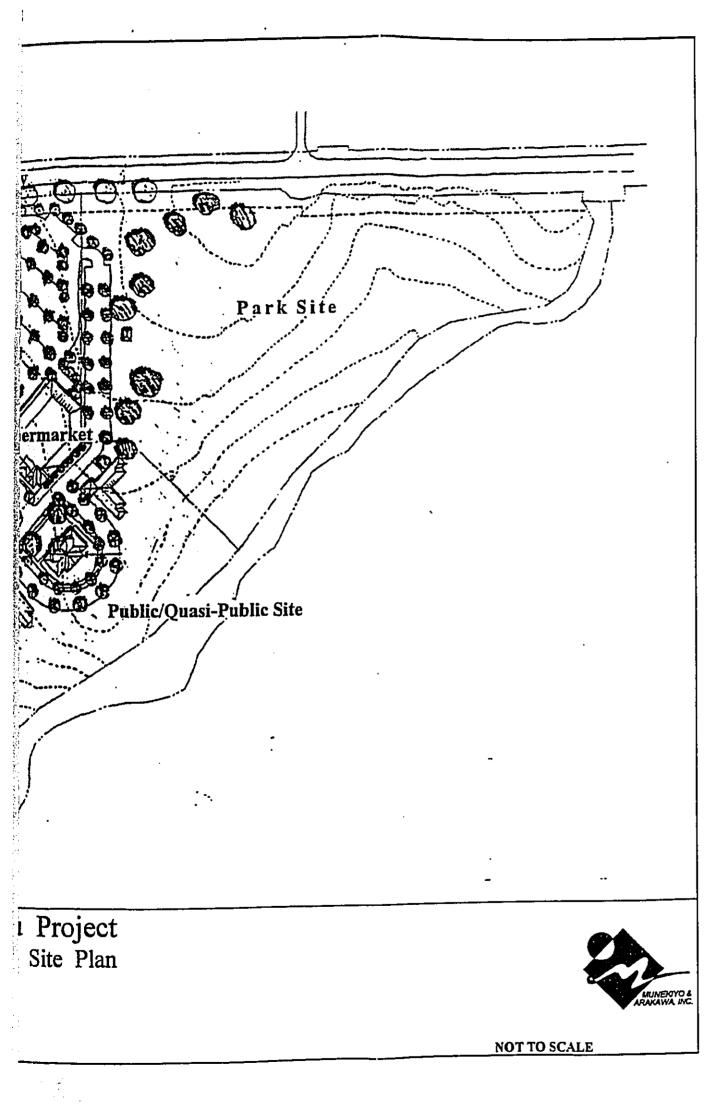
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Business Country Town design guidelines, is proposed to consist of establishments such as the following:

- a. A drug store of approximately 25,000 square feet;
- b. A supermarket of approximately 15,000 square feet;
- c. A theater of approximately 20,000 square feet;

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(.....)

- d. Other commercial areas totalling approximately 75,000 square feet which could include restaurants, gas station, other personal services such as hair styling or dry cleaning, and entertainment such as video, records, or electronic/computer games; and
- e. Medical/dental offices and other office uses may also be supported by the development.
- 4. A park of approximately 14.74 acres would abut Kula Highway. This is intended to be a neighborhood park containing facilities for active recreation.
- 5. To the west of the park is an approximately 5.10 acre public/quasipublic area. Possible uses for this public/quasi-public area include a church, day care center, and/or other public uses.
- 6. Approximately 4.51 acres of single-family residential areas are located to the west of the business area. This involves a reconfiguration of existing single-family residential areas. No `additional acreages of single-family residential are proposed to be added.

A full-size site plan and site section of the project is shown in Appendix A.

Chapter II Description of th

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Description of the Physical Environment

II. DESCRIPTION OF THE PHYSICAL ENVIRONMENT

A. <u>PHYSICAL_SETTING</u>

1. <u>Climate</u>

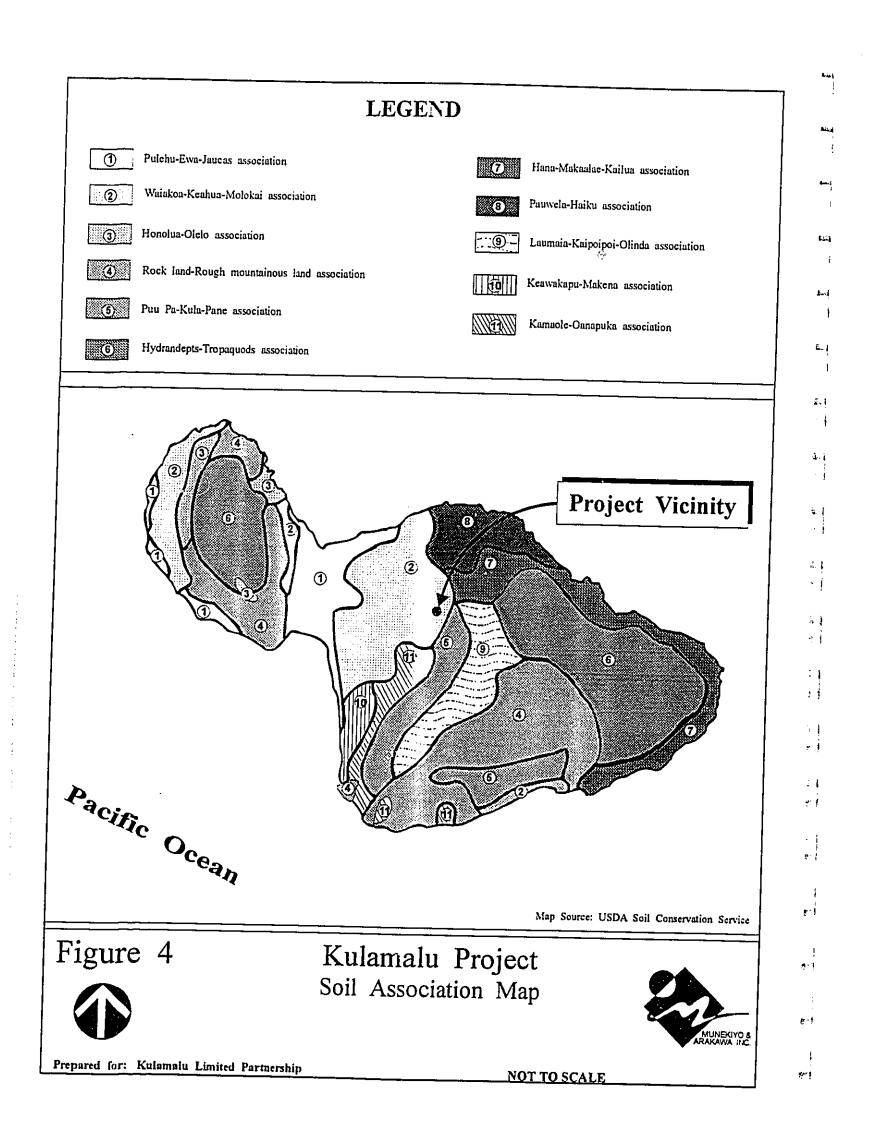
The Pukalani area is generally cool and equable the entire year. Average annual rainfall ranges between 40 and 50 inches per year, with most rainfall occurring between October and April. The temperature ranges between the high 50's and the high 80's.

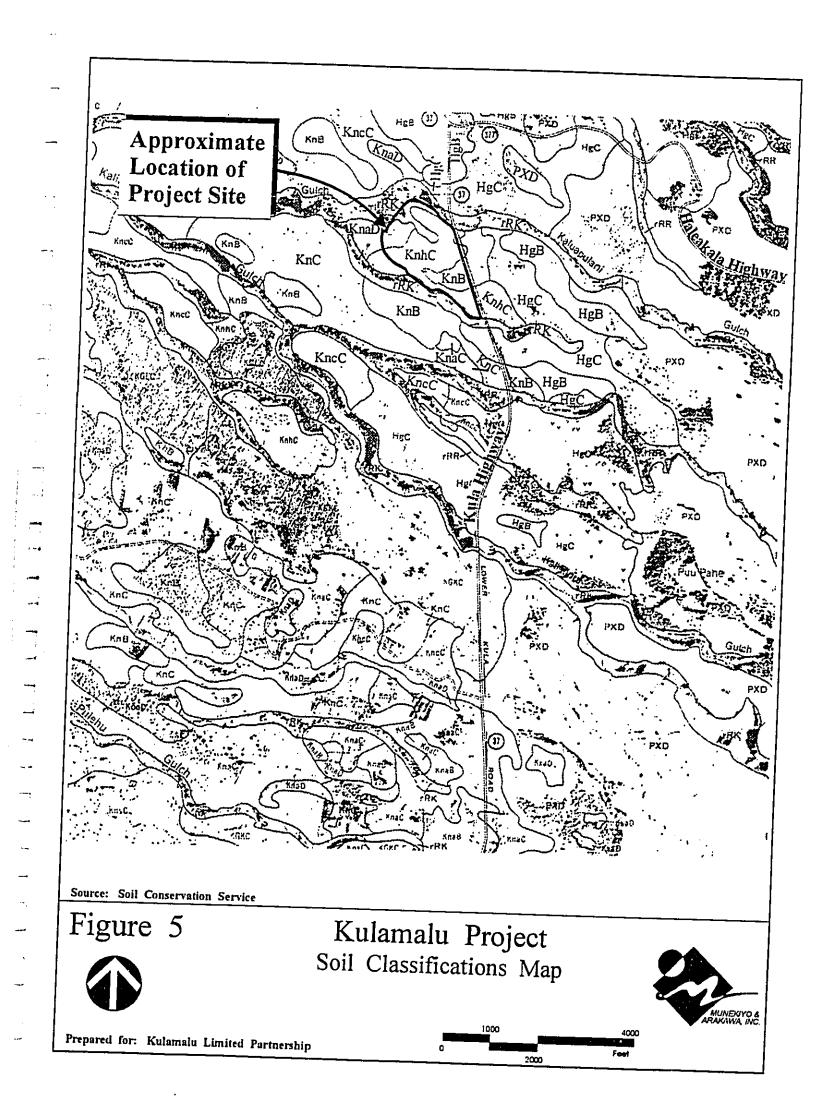
Like most areas of the Islands, the prevailing wind throughout the year is the northeasterly tradewind. These are generally more persistent in summer than in winter. Between about October and April, there may be increased frequency of the southerly winds of Kona storms. In the absence of the trades and nearby storms, winds may become light and variable. Then the diurnal heating and cooling of the land gives rise to onshore sea breezes during the day and offshore land breezes at night (Department of Geography, 1983).

2. <u>Topography and Soil Characteristics</u>

The moderately sloping project site ranges in elevation from 1,750 to 1,860 feet above sea level.

Underlying the site and surrounding lands are soils belonging to the Waiakoa-Keahua-Molokai association. See Figure 4. This soil association consists of moderately steep, well-drained soils that have a moderately fine textured subsoil located on low uplands. The soils specific to the subject site are Keahua silty clay loam, 3 to 7 percent slopes (KnB), Keahua cobbly silty clay loam, 15 to 25 percent slopes (KnaD), Keahua cobbly silty clay, 7 to 15 percent slopes (KnhC), and Rock land (rRK). See Figure 5.





A representative profile of Keahua silty clay loam, 3 to 7 percent slopes (KnB) soils consist of a surface layer of dark-reddish brown silty clay loam about 10 inches thick. The subsoil, about 50 inches thick, is dark reddish-brown silty clay loam and very dark gray loam that has a subangular blocky structure. The substratum is mostly soft, weathered basic igneous rock. The soil is slightly acid in the surface layer and slightly acid to neutral in the subsoil. Permeability is moderate. Runoff is slow, and the erosion hazard is slight. Keahua cobbly silty clay loam, 15 to 25 percent slopes (KnaD) soils are characterized by medium runoff and moderate erosion hazard. Keahua cobbly silty clay, 7 to 15 percent slopes (KnhC) soils are characterized by slow to medium runoff and slight to moderate erosion hazard. Rock land (rRK) is made up of areas where exposed rock covers 25 to 90 percent of the surface. The rock outcrops and very shallow soils are the main characteristics. The rock outcrops are mainly basalt and andesite.

Lands underlying the project site are designated "B" and "E" by the University of Hawaii Land Study Bureau. See Figure 6. This classification system rates lands on a scale of "A" to "E", reflecting land productivity characteristics. Lands designated "A" are considered to be of highest productivity, with "E" lands ranked lowest.

3. Flood Hazard

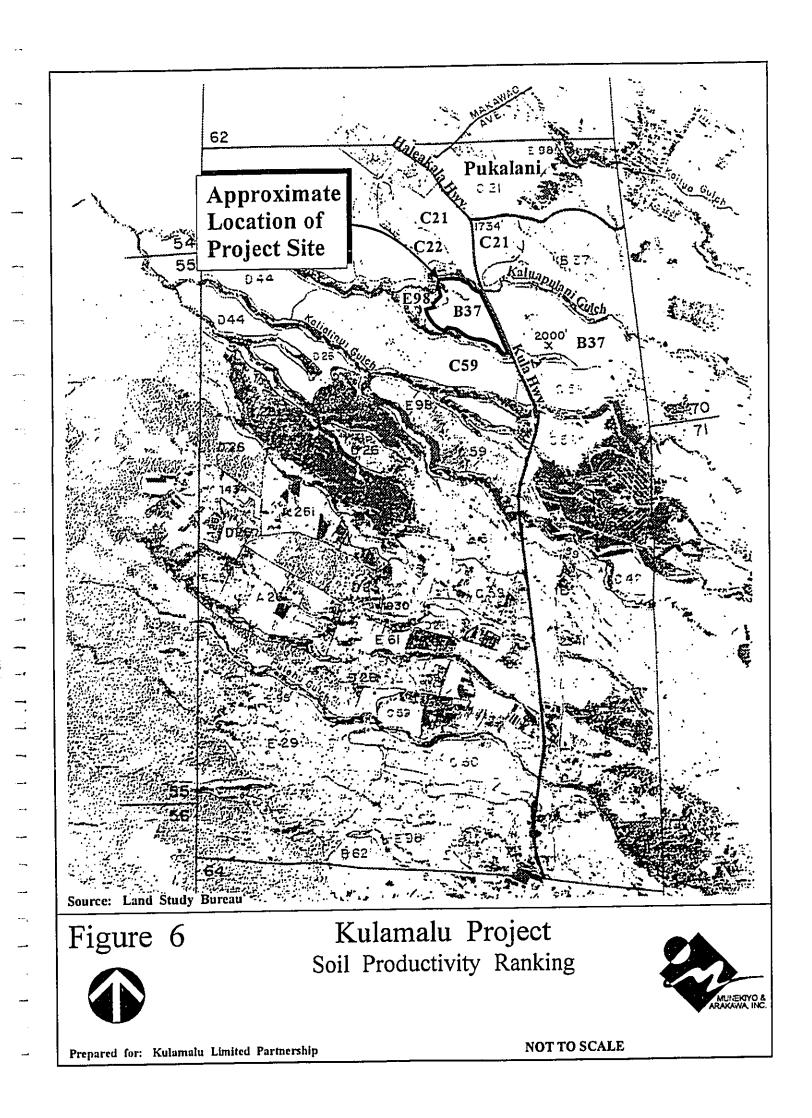
The proposed project is designated by the Flood Insurance Rate Map as Zone C, an area of minimal flooding. See Figure 7.

4. Flora and Fauna

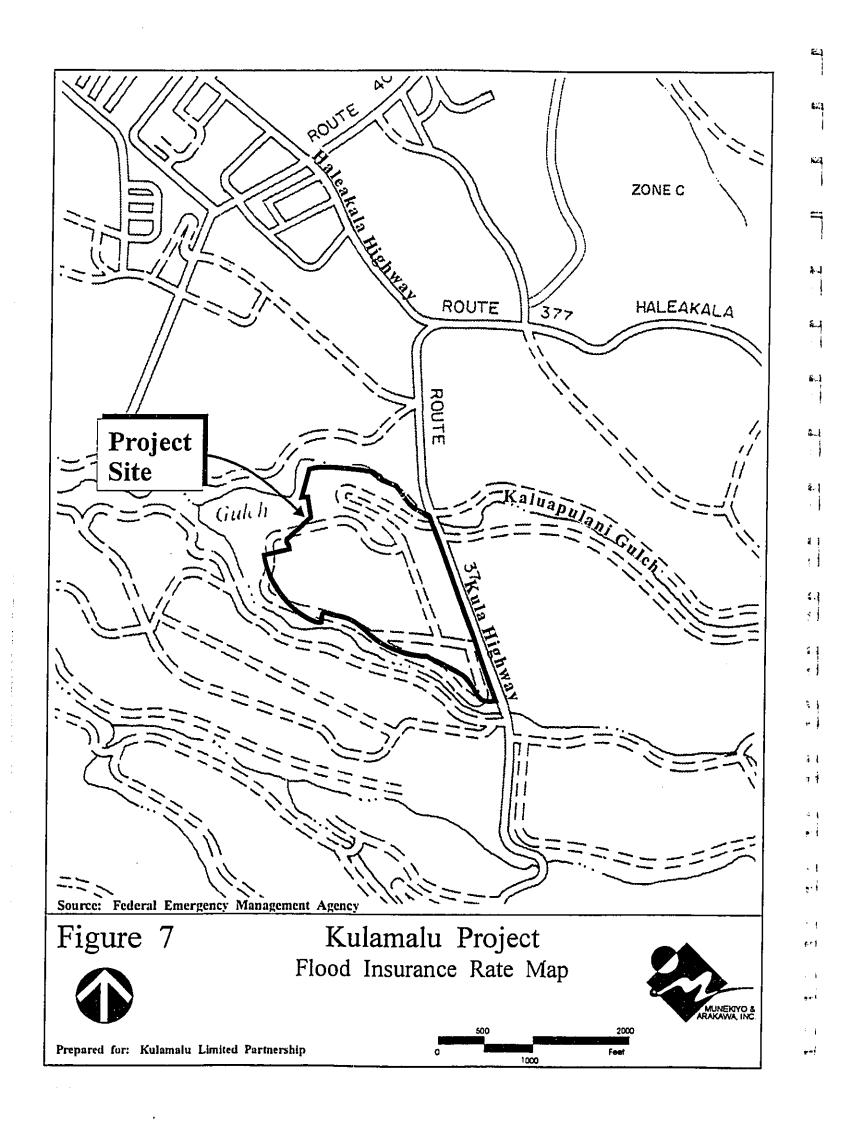
The project site is presently being utilized as pasture lands covered

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with various grasses and low-lying shrubs. Vegetation includes guinea grass (Panicum maximum), lantana (Lantana camara L.), sensitive plant (Mimosa pudica), prickly pear (Opuntia ficus-indica), agave (Agave sisalana), koa-haole (Leucaena leucocephala). The fringes of the former pineapple fields exhibit a few tree specimens, including koa-haole, silver oak (Grevillea robusta), eucalyptus, and Christmas berry (Schinus terebinthifolius).

The rural nature of the region finds a number of fauna such as mongoose, chickens, rats, dogs, and cats. Avifauna in the region typically include mynas, doves, sparrows, and cardinals.

5. <u>Archaeological Resources</u>

An archaeological inventory survey for mauka or eastern portion of the subject property was conducted by Paul H. Rosendahl, Ph.D., Inc. See Appendix B-1.

A single previously unrecorded site, SIHP No. 50-50-10-4181 (PHRI temporary Site 1700-1) containing four component features, was identified. Features A and B of this site are alignments forming terraces in a small swale between former pineapple fields. Features C and D are land-clearing piles of rock, associated with pineapple cultivation.

Site No. 4181 measures approximately 100 meters in length and from 20 meters to 35 meters in width.

Test units at the site have indicated clearly modern artifacts. No evidence of prehistoric activity was found. The swale at Features A and B may have been the result of agricultural irrigation while Features C and D appear to have been the result of clearing of the adjacent fields.

An archaeological reconnaissance survey was conducted for a 250 acre area which included the makai or western portion of the project site. See Appendix B-2. Two (2) sites containing two (2) component features were identified. Site No. 1707-1 is a petroglyph of what appears to be a canoe with a "crab claw" sail. It measures approximately .32 meter by .28 meter with the bow facing south. This appears to be a prehistoric petroglyph. It appears to be unaltered with no portable remains observed. The site is located to the south of the quarry.

Site No. 1707-2 is a boundary wall on the north side of Kalialinui Gulch. The wall measures 184 meters long by .5 meter wide. The wall height ranges from .8 to 1.4 meters high. The wall appears to be historic in age.

6. <u>Air Quality and Noise</u>

There are no point sources of airborne emissions in the immediate vicinity of the project site. The air quality of the Pukalani and Kula regions are considered good, with existing airborne pollutants attributed primarily to automobile exhaust from the region's roadways.

Surrounding noise levels in the region are characteristic of its rural atmosphere and are considered relatively low. Background noise levels are attributed to natural (e.g., wind) conditions and traffic from the Kula Highway.

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7. <u>Visual Resources</u>

Situated on the lower slopes of Haleakala, Maui's central isthmus and the West Maui Mountains are visible from the project site. Mount Haleakala is also visible to the east.

B. <u>COMMUNITY SETTING</u>

1. Land Use History

Most of the project area was originally part of a 160-acre parcel deeded to Aui as Grant 1167. A small triangular wedge on the northwest side of the project site was a portion of Grant 1829, Apana 1 to Keawe. The property is currently in use as cattle pasture.

There are no known outstanding citations regarding violations of statutes, ordinances, or rules pertaining to the subject property.

2. <u>Land Use and Community Character</u>

The Makawao-Pukalani-Kula region is a sprawling agricultural, rural and suburban region on the western slope of Haleakala. Pineapple cultivation, smaller independent farming and cattle ranching are the predominant agricultural activities within the region. The towns of Makawao and Pukalani reflect its agricultural roots with the latter being the more recently developed of the two. Kula's residential settlements reflect a lower density over a larger area with smaller commercial clusters in Pulehu, Waiakoa, and Keokea. The region also serves a residential suburban function for people working within other regions of the island.

The project is located on Kula Highway approximately 2,000 feet to the south of the "Five Trees" intersection (Kula Highway -

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Haleakala Highway intersection).

To the north of the subject property, there is an electric substation, church and several residential dwellings. The new King Kekaulike High School is located to the northeast of the project site across Kula Highway. Portions of Pukalani Town are located approximately 2,000 feet to the northwest. Lands to the west are currently utilized for cattle pasture. Lands to the south and east of the property are in low density residential and agricultural use.

3. <u>Population</u>

The population of Maui has exhibited relatively strong growth over the past decade with the 1990 population estimated at 100,504, a 41.8% increase over the 1980 population of 70,847. Growth in the County is expected to continue, with resident population projections to the years 2000 and 2010, estimated to be 124,562 and 145,872, respectively (Community Resources, Inc., 1994).

The estimated 1990 population of the Makawao-Pukalani-Kula Community Plan region is 18,923. A projection of the region's population shows an increase to 21,760 by the year 2000. By the year 2010, population is anticipated to increase to 23,830 (Community Resources, Inc., 1994).

4. <u>Economy</u>

Agriculture and tourism are vital components of Maui's economy. The cultivation of pineapple and sugar cane and the tourist industry provides for much of the Island's economic stability.

The Makawao-Pukalani-Kula region provides the backdrop for

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ranching of cattle and other farm animals by various individuals. There are a number of farms in the Kula region growing products such as cabbages, onions, tomatoes, corn, carnation and protea. Pineapple is also cultivated on fields surrounding the area. Sugar cane cultivation takes place on lower elevation lands extending to the central isthmus.

C. <u>PUBLIC SERVICES</u>

1. Police and Fire Protection

The County of Maui's Police Department is headquartered at its Wailuku Station. The Department consists of several patrol, investigative, and administrative divisions. The Department's Upcountry Patrol covers the Makawao-Pukalani-Kula region. The nearest police substation is located at the Eddie Tam Gymnasium in Makawao, approximately 2.5 miles away.

Presently, fire prevention, suppression and protection for the region is offered by the County's Department of Fire Control Makawao and Kula Stations. The Makawao Station, is located on Makawao Avenue, approximately one (1) mile from the project site. The Kula Station is located adjacent to Kula Elementary School, approximately 4.2 miles away.

2. <u>Medical Facilities</u>

Maui Memorial Hospital, the only major medical facility on the Island, services the Makawao region. Acute, general and emergency care services are provided by the 185-bed facility which is located in Wailuku. Medical/dental offices are located in Pukalani and Makawao to serve the Upcountry region's residents.

3. <u>Solid Waste</u>

With the closure of the Makawao Landfill, all solid wastes generated in the Upcountry region are transported to the Central Maui Landfill in Puunene. Outside of Hana, the Central Maui Landfill is the only disposal site on the Island of Maui. For the year 1994, solid waste arrived at the Central Maui Landfill at an estimated rate of approximately 400 tons per day. The Makawao-Pukalani-Kula and Paia-Haiku regions accounted for approximately 16% of the volume entering the landfill (R.W. Beck, December 1994).

4. <u>Schools</u>

The State of Hawaii, Department of Education, operates five (5) public schools in Upcountry Maui. They are (with September 1996 student enrollment in parenthesis): Makawao Elementary School (685), Kalama Intermediate School (1,344), Pukalani Elementary School (567), Kula Elementary School (574), and King Kekaulike High School (733). It is noted that King Kekaulike High School opened in September 1995 with only a freshman class. Older public high school students from the Upcountry region presently attend Maui High School in Kahului (telephone conversation with Department of Education employee, Trudy Yip-Onaga, March 1997).

Kamehameha Schools recently opened its temporary facilities within the Pukalani Terrace area serving approximately 80 students in grades K-3. In September 1997, the facility is expected to serve approximately 100 students in grades K-4. In September 1998, approximately 120 students in grades K-5 are expected to be enrolled.

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The region is also served by privately operated Haleakala School (grades K-8) and Seabury Hall (grades 6-12).

5. <u>Recreational Facilities</u>

Upcountry Maui is served by numerous recreational facilities offering diverse opportunities for the region's residents. These facilities include the County's Eddie Tam Park/Gym, Pukalani Recreation Center, Keokea Park, Rice Park, Kula Gym, and the Kula Ball Park.

D. INFRASTRUCTURE

1. <u>Roadways</u>

The existing circulation system serving the area, including number of travel lanes, street classifications, and traffic control devices, are described below:

- Hana Highway: Hana Highway is a major State highway which links Kahului and Hana. Hana Highway is a four-lane, divided highway with channelization at major intersections between Kahului and the Haleakala Highway intersection. North of the Haleakala Highway intersection, Hana Highway serves as a two-lane highway to Hana.
 - <u>Haleakala Highway:</u> Haleakala Highway is a major arterial between Hana Highway and the Haleakala National Park and passes through the town of Pukalani. The section of Haleakala Highway between Hana Highway and the Pukalani Bypass Road is striped for two (2) lanes in the east-bound (mauka) direction and one (1) lane in the westbound (makai) direction. During the morning peak period of traffic, Haleakala Highway is coned to provide a contra-flow lane from Pukalani Bypass Road to Hana Highway with two (2) lanes in the west-bound direction and one (1) lane in the east-bound direction. East of the Pukalani Bypass Road, Haleakala Highway continues as a two-lane road through Pukalani Town to the Haleakala National Park.

Pukalani Bypass Road: In the vicinity of Pukalani town,

the Pukalani Bypass Road, a limited access roadway, serves as an alternative route to Haleakala Highway with its western terminus at the intersection with Haleakala Highway and the eastern terminus at the intersection of Kula Highway and Haleakala Highway (Five Trees). The Pukalani Bypass Road is a three-lane Highway, between the Haleakala Highway intersection (west terminus) and Makawao Avenue, providing two (2) lanes in the east-bound direction and one (1) lane in the west-bound direction. South of Makawao Avenue, the Pukalani Bypass Road reduces to a two-lane highway with one (1) travel lane in each direction.

- <u>Makawao Avenue:</u> Within the study area, Makawao Avenue is a two-lane County collector road serving Pukalani town and Makawao town. Makawao Avenue originates within Pukalani, at its intersection with Haleakala Highway, and extends northeasterly through Makawao town. At the intersection with Baldwin Avenue, Makawao Avenue continues as Kaupakulua Road and eventually connects with Hana Highway in the vicinity of Ulumalu. Baldwin Avenue extends in a northwesterly direction and connects with Hana Highway in Paia town.
- Kula Highway: Kula Highway is a two-lane arterial highway serving the Upcountry area from its intersection with Haleakala Highway and the Pukalani Bypass Road (Five Trees) to the Kula area. Kula Highway is a north-south arterial serving mainly residential/agricultural uses.
- **Pukalani Street:** Pukalani Street is a local two-lane collector roadway serving residential and commercial areas in Pukalani town and connects to Haleakala Highway in a T-intersection.
- **Iolani Street:** Iolani Street serves as a two-lane collector roadway within the residential area of Pukalani town.
 - **Ohana Street:** Ohana Street, a two-lane roadway, provides access to a local residential area and connects to Kula Highway. An existing gated private driveway to the Kulamalu site is situated directly across the Ohana Street intersection on Kula Highway.

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2. <u>Water</u>

The Makawao-Haiku system is supplied by surface water runoff collected on the windward slopes of Haleakala. This water is collected and conveyed by the Wailoa irrigation ditch and tunnel system, owned and maintained by the East Maui Irrigation Company (EMI), with a capacity of 190 million gallons per day (mgd). The County of Maui, Department of Water Supply (DWS) has an agreement with EMI to draw up to 12 mgd at Kamole Weir forebay.

This water is then treated by the Kamole Weir Water Treatment Plant (WTP), owned and operated by DWS. Kamole Weir WTP is located northeast of Haliimaile near the intersection of Baldwin Avenue and Haliimaile Road. It has a 300,000 gallon concrete treated water storage tank at a floor elevation of 1,114 feet above mean sea level (msl), and can treat up to 8 mgd in compliance with EPA Safe Drinking Water standards.

Water from the Kamole Weir WTP is transmitted by pumping to Makawao through a 24-inch diameter force main along Baldwin Avenue and Olinda Road. Storage is provided by the 0.3 and 2.0 million gallon Pookela tanks at floor elevations of 1,808 and 1,830 feet msl, respectively.

Water is then pumped via an 18-inch force main to the 0.5 mg Maluhia Tank at 2,051 feet msl.

There is a 12-inch main running along Olinda Road, Hanamu Road and Haleakala Highway from the Maluhia Tank to the new King Kekaulike High School.



There are no water mains within the Kula Highway right-of-way fronting the project site. See Appendix E.

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3. <u>Wastewater</u>

There are no County wastewater treatment facilities serving the Kula-Pukalani area. The project will connect with a private wastewater treatment plant which serves existing Pukalani Terrace residents. The plant currently provides treated wastewater to the Pukalani Terrace Country Club golf course for irrigation purposes.

4. <u>Drainage</u>

Onsite runoff sheetflows across the project site in an east to northwesterly direction and eventually enters the abutting Kaluapulani Gulch. There are no improved drainage systems within the project site.

5. <u>Electrical, Telephone, and CATV</u>

The distribution system for electrical, telephone, and CATV facilities are on Kula Highway which abut the project site.

Chapter III

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Potential Impacts and Mitigation Measures

III. POTENTIAL IMPACTS AND MITIGATION MEASURES

A. IMPACTS TO THE PHYSICAL ENVIRONMENT

1. <u>Flora_and Fauna</u>

The property is currently utilized as cattle pasture. There are no known rare, endangered or threatened species of flora and fauna within the project site. The removal of existing vegetation is not considered an adverse impact to this component of the environment.

Similarly, there are no known rare, endangered or threatened species of avifauna and wildlife in the project site. Construction of improvements within the property is not anticipated to adversely impact the area's fauna and avifauna population.

2. <u>Archaeological Resources</u>

During the archaeological inventory survey conducted for the mauka portion of the subject property, one previously undiscovered archaeological site (50-50-10-4181) was found. The site consists of two terrace alignments (Features A and B) and two land-clearing piles (Features C and D).

Site No. 50-50-10-4181 was assessed under Criterion D of the National Register Criteria for Evaluation. Based on the recordation, testing, and reporting, the site has been assessed as no longer significant, based on the recent age of the features and the lack of information content important to history. Refer to Appendix B-1.

The archaeological reconnaissance survey found two (2) new sites. Refer to Appendix B-2. These consist of a prehistoric petroglyph (Site No. 1707-1) and a historic wall (Site No. 1707-2). Both sites

are tentatively assessed under Criteria D. However, Site No. 1707-1 is also assessed as being culturally significant. Both sites are recommended for inventory survey.

It should be noted that both sites found in the reconnaissance survey are located outside of the project site.

Should any human remains or significant cultural materials be found during construction, the State Historic Preservation Division will be notified and appropriate mitigation measures taken.

An addendum to the archaeological inventory survey was also done. With the original inventory survey, the entire project site has been analyzed at the inventory level. See Appendix B-3.

3. <u>Air Quality and Noise</u>

Air quality impacts attributed to the project will include dust generated by short-term construction-related activities. Site work such as clearing, grubbing and grading, and utilities and roadway construction for example, will generate air-borne particulates. Dust control measures, such as regular watering and sprinkling, will be implemented to minimize wind-blown emissions.

Ambient noise conditions will also be temporarily impacted by construction activities. Heavy construction equipment, such as bulldozers, front-end loaders, and materials-carrying trucks and trailers, would be the dominant source of noise during the construction period. All construction activities are anticipated to be limited to daylight working hours and will comply with the provisions of Hawaii Administrative Rules, Chapter 11-46, "Community Noise Control".

The proposed project is anticipated to contain public/quasi-public and commercial uses, multi-family housing, a halau, and park. The * i

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proposed uses are not anticipated to generate significant emissions. Project-related traffic will generate automotive emissions but is not expected to adversely impact local and regional air quality conditions.

For the long-term, the project is not anticipated to significantly impact ambient noise conditions in the vicinity.

4. Scenic and Open Space Resources

The project will be fully landscaped to create a site visually integrated with its surroundings. The proposed project is anticipated to be low-rise in keeping with the existing built environment. It is not anticipated to adversely affect scenic corridors.

5. Use of Chemicals and Fertilizers

Use of herbicides on the project site will generally be limited to the initial plant establishment period. Pesticides are anticipated to be used only as a treatment and not as a preventive measure. As a treatment, application usage will be minimal. In addition, plant selection for the project will be based on hardiness, drought tolerance, pest resistance as well as aesthetic concerns.

Nitrogen/Phosphorus/Potash mixed fertilizers are anticipated to be applied to lawn areas, groundcover, and flowering shrubs. With proper irrigation management practices, leaching of fertilizers should be negligible.

No adverse effects on surface, underground and marine water resources are anticipated.

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B. IMPACTS TO COMMUNITY SETTING

1. <u>Surrounding Uses</u>

The proposed project is not anticipated to have an adverse impact upon surrounding uses. The project will involve commercial, public/quasi-public, multi-family and single-family housing and park uses within an approximately 53.67 acre area. Adjacent to the project site are a high school which is expected to reach full enrollment in September 1998, a church, and low density residential use. To the west of the project site are a private school site and a planned expansion of the Pukalani Terrace residential community. The project will service the Upcountry region and is considered compatible with existing and planned uses.

2. <u>Population and Local Economy</u>

On a short-term basis, the project will support construction and construction-related employment. Over the long-term, the project will provide added commercial services within the Makawao, Pukalani and Kula regions.

According to the market study done for the proposed project, there are several competitive advantages for commercial retail development on the subject site. See Appendix C. These include:

- 1. A relatively large land area;
- 2. Extensive frontage along Kula Highway;
- 3. Generally level topography;

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- 4. Close proximity to residential growth area of Pukalani; and
- 5. No new competing large retail and ancillary office facilities planned in the area. See Appendix C.

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Upcountry Maui is under-serviced in terms of neighborhood shopping facilities. Because of the limited retail facilities in the Upcountry region, goods and services for day-to-day living needs that could be purchased in the area, are largely purchased in Kahului.

The Kulamalu commercial project site represents 77 percent of the undeveloped commercial land in Upcountry Maui. Alternative commercial sites suitable for large scale retail development are not available in the area. As a result, retail development at Kulamalu could have a significant competitive advantage to capture a significant share of the projected retail demand. The demand for retail facilities in Upcountry Maui would continue to exceed the available supply, even after the completion of the Kulamalu project.

Based on the characteristics of the target markets and retail trends in the area, the shopping facility could be anchored by a full-service supermarket and drug/variety store. Other tenants could include:

- 1. Entertainment, such as video, records or electronic/computer games;
- 2. Theaters;
- 3. Restaurants, including fast food;
- 4. Medical and dental offices; and
- 5. Other personal services, such as hair styling or dry cleaning.

In addition, the center could probably support a gas station to service both residents and visitors.

3. <u>Agriculture</u>

The project site is currently utilized for cattle grazing. There are approximately 71,807 acres of property designated as Agricultural within the Makawao-Pukalani-Kula Community Plan region. The use of approximately 53.67 acres already designated Urban will not have a significant effect on agricultural endeavors on the island and could even support agricultural endeavors through possible inclusion of a farmer's market.

4. Police, Fire and Medical Services

The proposed project is not anticipated to affect service capabilities of police, fire, and emergency medical operations. The project will not extend existing service area limits for emergency services. Environmental design features which may assist in crime prevention will be considered in the final design of the project.

5. <u>Recreational and Educational Services</u>

The 14.74 acre neighborhood park will enhance active recreation pursuits in the Upcountry area. An added amenity is the 5.03 acre Hawaiian cultural learning center for the pursuit of hula, oli, mele, history and genealogy. The proposed day care facility should also complement existing educational facilities within the region. The project should provide additional recreational and educational benefits within the Upcountry area.

It is noted that the proposed reduction in land area for the park from 15.01 acres to 14.74 acres is due to additional right-of-way set aside for the proposed through roadway which links with Kula Highway. Land use allocations for Park, Public/Quasi-Public, Business/Commercial, and Multi-Family Residential were all

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reduced slightly in order to accommodate the increase in right-ofway.

Within the project site, there are no known traditional beach and mountain access trails.

6. <u>Solid Waste</u>

A solid waste management plan will be developed in coordination with the Solid Waste Division of the County Department of Public Works and Waste Management for the disposal of clearing and grubbing material from the site during construction.

Once completed, it is anticipated that the public/quasi-public, commercial, multi-family, learning center and day care facility portions of the project will be served by a private collection company. The park and single-family residential area will be served by the County of Maui. Solid waste generated by the project will be disposed at the County's Central Maui Landfill.

C. IMPACTS TO INFRASTRUCTURE

1. <u>Roadways</u>

A traffic study was conducted for the 53.67 acre Kulamalu Project as part of the Kulamalu Conceptual Planning Area, in Pukalani, Maui. See Appendix D. The subject property includes the development of commercial uses, elderly dwelling units, a park, amphitheater, and public/quasi-public uses. The Kulamalu Project is adjacent to a larger 251.04 acre area; the total 304.71 acres is herein designated as the Kulamalu Conceptual Planning Area. Additional uses in the 251.04 acre area include single-family residential units and a private school which are currently

permissible under the existing zoning of this property. Although the extent and timing of the 251.04 acre area is uncertain and predicated by market conditions, this report addresses the traffic impacts of the 53.67 acres for the Kulamalu Project as a part of the Kulamalu Conceptual Planning Area.

In order to assess the traffic impacts of the Kulamalu Conceptual Planning Area in context with other growth expected to occur in the region, two (2) future year traffic assignments were developed for Year 2010 when the conceptual planning area is expected to be completed. First, future base conditions were established by estimating future traffic volumes without the Kulamalu-generated traffic. For the second future traffic assignment, the forecasted traffic volumes generated by the Kulamalu Conceptual Planning Area were added to future base traffic volumes. Traffic impacts are identified through the comparison of the analyzed results of these two (2) future Year 2010 traffic assignments.

The base roadway improvements, described below, are required to accommodate the projected de facto growth of traffic (without the Kulamalu-generated traffic) at an acceptable level of operation (LOS D or better). These improvements are consistent with the recommendations of the <u>Maui Long-Range Land Transportation</u> <u>Plan</u> (Draft Final Report, February 1996).

a. <u>Haleakala Highway:</u> Widen to four (4) travel lanes, two (2) in each direction, between Hana Highway and the makai (west) terminus of the Pukalani Bypass Road. This project is currently funded for preparation of the plans, specifications and construction cost estimate and is being processed to meet the environmental regulatory requirements.

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- b. <u>Pukalani Bypass Road:</u> Widen this roadway to four (4) travel lanes to provide two (2) mauka-bound lanes and two (2) makai-bound lanes.
- c. <u>Intersection of Pukalani Bypass Road (West Terminus)</u> <u>and Haleakala Highway:</u> Widen, reconfigure and signalize the intersection to provide two (2) makai-bound lanes on the Pukalani Bypass Road approach, double left-turn lanes on the Haleakala Highway north-bound approach and two (2) through lanes with a separate right-turn lane on the Haleakala Highway mauka-bound approach.

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- d. <u>Intersection of Pukalani Bypass Road/Makani Road:</u> Widen, reconfigure and signalize this intersection to provide two (2) mauka-bound lanes, two (2) makai-bound lanes on the Pukalani Bypass Road approaches, and separate turn lanes on the Makani Road approaches.
- e. <u>Intersection of Pukalani Bypass Road and Makawao</u> <u>Avenue:</u> Widen and reconfigure to allow the widening of Pukalani Bypass Road to two (2) mauka-bound and two (2) makai-bound lanes.
- f. <u>Optimization of Traffic Signal Operations</u>: Adjust traffic signal timing as traffic volumes increase to better accommodate the increased traffic flows and to reduce delays at signalized intersections. Also, the existing traffic signals at the intersections of Haleakala Highway/Pukalani Bypass Road/Kula Highway (Five Trees) and Pukalani Bypass Road/Makawao Avenue should be interconnected with the traffic signals at the Pukalani Bypass Road/Makani Road intersection to maintain traffic progression through Pukalani town.
- g. <u>Alternate Upcountry Access Roads</u>: Provide alternate access routes to the Upcountry area to alleviate the traffic congestion at the intersection of Hana Highway and Haleakala Highway. The introduction of new routes could be accomplished through the construction of new roadways, such as the proposed Upcountry-Kihei Road, or through the

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upgrade/realignment of existing rural, winding roadways, such as Omaopio Road and Pulehu Road. While gradeseparated ramps may be constructed at the intersection of Hana Highway and Haleakala Highway, the provision of new/upgraded Upcountry routes would reduce travel times to other areas and redistribute regional traffic volumes from Haleakala Highway and Hana Highway. 1111

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Project-related roadway improvements which are recommended for implementation by the developer are at the proposed intersection of Kula Highway and the Kulamalu development primary access road:

Intersection of Kula Highway and Project Road: Provide a separate left-turn storage lane on northbound Kula Highway and a deceleration right-turn lane on southbound Kula Highway. Provide separate left-turn lane and right-turn lane on the project road approach to Kula Highway. Install a traffic signal system when traffic volumes meet the Traffic Signal Warrants of the "Manual on Uniform Traffic Control Devices".

2. <u>Water</u>

The Kulamalu project, by agreement with DWS, will install a well at Huluhulunui Gulch near Kaupakulua. The well improvements will include the drilling of the well, installation of the well pump, reservoir and associated water lines to connect to the existing system. See Appendix E.

With regard to storage, an offsite storage reservoir of approximately 1.0 million gallons is proposed on Maui Land & Pineapple Company land at elevation 1,975 feet mean sea level (msl) above King Kekaulike High School. This storage is sized for use by Maui Land & Pineapple Company, The Malama Group, King Kekaulike High School, and the service area between the 1,860 foot to 1,600 foot elevations of the Kulamalu project, which includes the project area. The reservoir size is based on the requirements set forth by the "Water System Standards, Volume I, 1985, Department of Water Supply". The Department of Water Supply has the option of increasing the reservoir size and to participate in the funding for the upsize costs.

Improvements not within the 53.67 acre project area include a storage reservoir of approximately 350,000 gallons, proposed at elevation 1,690 feet msl on the project site to service area 1,690 feet to 1,320 feet. This reservoir is also sized by maximum daily demand plus fire flow. The existing 850,000 gallon reservoir at elevation 1,416 feet msl will service the area below 1,320 feet msl.

The offsite storage reservoir at elevation 1,975 feet msl will be fed via a 12-inch inflow main connecting to the existing 12-inch Kekaulike High School main at Haleakala Highway. The outflow main will be a 12-inch main installed along Haleakala Highway to Five Trees, then up along Kula Highway to the project site.

The onsite mains along the backbone road within the project between reservoirs will be sized at 12 inches.

3. <u>Wastewater</u>

Wastewater generated from the project site is anticipated to flow through onsite gravity lines and enter the existing gravity system within the Pukalani Terrace, Unit II Subdivision, located to the west of the project site. The wastewater will then be conveyed to the privately owned and operated wastewater treatment plant. The plant will be able to accommodate the project's flows. Refer to Appendix E.

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4. <u>Drainage</u>

Runoff generated onsite is anticipated to be collected by underground drainage systems and will be conveyed to the abutting Kaluapulani Gulch. The onsite drainage system will be sized by using a 50-year recurrence interval based on a one-hour storm. Detention facilities will also be incorporated within the proposed drainage system to release stormwater into Kaluapulani Gulch at predevelopment rates. Also, offsite runoff will be allowed to flow through Kaluapulani Gulch unimpeded. Refer to Appendix E. (z.)

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The development of the Kulamalu project is not anticipated to cause adverse effects to adjacent or downstream properties.

5. <u>Electrical and Telephone</u>

Electrical and telephone trunk lines will be extended underground through the proposed 160-foot road right-of-way from Kula Highway. The distribution system for these facilities will also be placed underground in accordance with the provisions of the Maui County Code.

Chapter IV

Relationship to Land Use Plans. Policies and Controls

IV. RELATIONSHIP TO LAND USE PLANS, POLICIES AND CONTROLS

A. <u>STATE LAND USE DISTRICTS</u>

Chapter 205, Hawaii Revised Statutes, relating to the Land Use Commission, establishes the four (4) major land use districts in which all lands in the State are placed. These districts are designated "Urban", "Rural", "Agricultural", and "Conservation". The project site is within the Urban District. See Figure 8.

Public/quasi-public and commercial uses, cultural learning center, day care facility, multi-family elderly housing, single-family residential housing and park uses are allowable within the State Urban District.

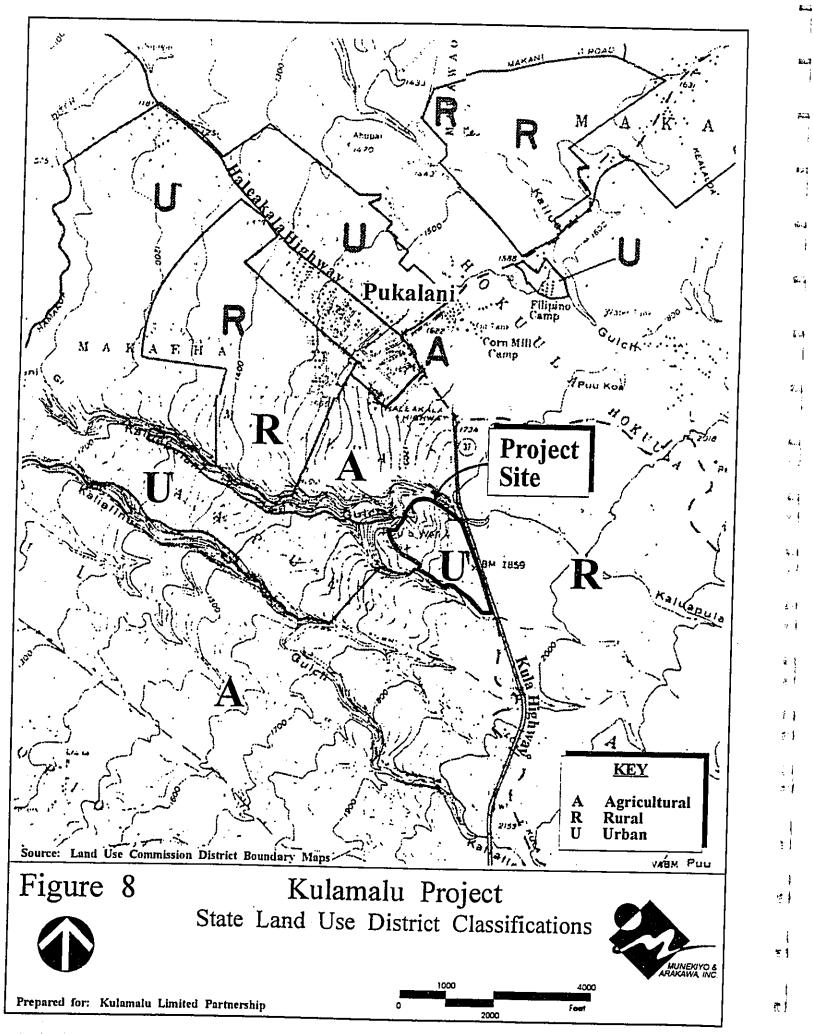
B. MAUI COUNTY GENERAL PLAN

The Maui County General Plan (1990 Update) sets forth broad objectives and policies to help the long-range development of the County. As stated in the Maui County Charter, "The purpose of the General Plan is to recognize and state the major problems and opportunities concerning the needs and development of the County and the social, economic, and environmental effects of such development and set forth the desired sequence, patterns and characteristics of future development."

The proposed action is in keeping with the following General Plan objectives and policies:

Objective:

To preserve for present and future generations existing geographic, cultural and traditional community lifestyles by limiting and managing growth through environmentally sensitive and effective use of land in accordance with the individual character of the various communities and



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regions of the County.

Policy:

Provide and maintain a range of land use districts sufficient to meet the social, physical, environmental and economic needs of the community.

Objective:

To provide high-quality recreational facilities to meet the present and future needs of our residents of all ages and physical ability.

Policy:

Develop facilities that will meet the different recreational needs of the various communities.

C. <u>MAKAWAO-PUKALANI-KULA COMMUNITY PLAN</u>

The subject parcel is located in the Makawao-Pukalani-Kula Community Plan region which is one of nine Community Plan regions established in the County of Maui. Planning for each region is guided by the respective Community Plans, which are designed to implement the Maui County General Plan. Each Community Plan contains recommendations and standards which guide the sequencing, patterns and characteristics of future development in the region.

The Ten Year Update of the Makawao-Pukalani-Kula Community Plan has recently been completed. This process establishes a comprehensive review of community plan provisions by the Makawao-Pukalani-Kula Citizen Advisory Committee, the County Planning Director, the Maui Planning Commission and the Maui County Council. The revisions took effect on July 23, 1996.

Land use guidelines are set forth by the Makawao-Pukalani-Kula

Community Plan Land Use Map. The project site is designated Open Space, Park, Public/Quasi-Public, Business/Commercial, Multi-Family Residential, and Single-Family Residential. See Figure 9.

An implementing action of the Makawao-Pukalani-Kula Community Plan notes the following:

Require that the development and dedication (pursuant to parks and playgrounds assessment requirements) of the 15.01 acre park and the development of the 5.11 acre public/quasi-public area and 5-acre multi-family/elderly housing in the vicinity of the proposed Kulamalu development along Kula Highway be developed concurrently with the development of the 20-acre commercial site. The commercial site shall be Country-Town Business at the time of zoning.

Since the adoption of the Makawao-Pukalani-Kula Community Plan, there have been relatively minor revisions and fine tuning of the Kulamalu land use plan. Although community plan amendments are being proposed, it is noted that the acreages are generally the same but locations of the land uses have been slightly revised. The existing and proposed land use allocations are shown in Table 1.

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COMPARISON OF EXISTING AND PROPOSED COMMUNITY PLAN LAND USE ALLOCATIONS			
Land Use Allocation	Existing Acreage	Proposed Acreage	
Park	15.01	14.74	
Public/Quasi-Public	5.11	5.10	
Multi-Family Residential	5	4.88	
Business/Commercial	20	19.41	
Park (Amphitheater)	5	0	
Public/Quasi-Public (Halau)	0	5.03	
Single-Family Residential	4.51	4.51	
TOTAL	54.63	53.67	

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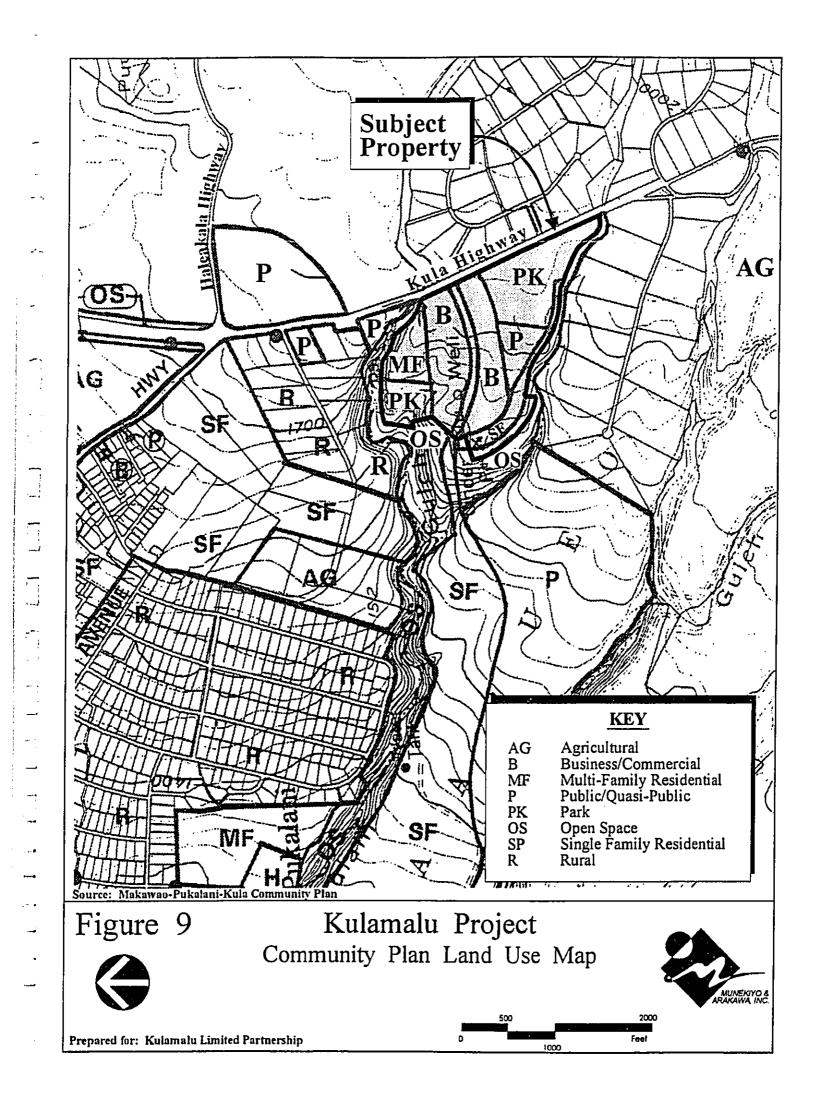
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The most significant revision concerns the amphitheater site. During the deliberation on the community plan, it was felt that the Park designation may be the most appropriate for an amphitheater to be used primarily by hula halau. However, this site is proposed to be a halau which involves not only the teaching of hula, but also Hawaiian chants, songs, history, genealogy, and customs. Thus, the use of the site is more appropriately classified as an educational facility or school which falls within the Public-Quasi-Public designation. It is noted that minor reductions in acreages between the existing and proposed allocations are due to additional right-of-way set aside for the proposed through roadway which links with Kula Highway.

In order to implement the revised land use plan, areas requiring community plan amendment are delineated in Figure 10 and listed in Table 2.

PROPOSED COMMUNITY PLAN AMENDMENTS		
Area	Proposed Revision	Acreage
A	Single Family Residential to Park	0.79
B Single Family Residential to Public/Quasi-Public		0.75
С	Public/Quasi-Public to Park	1.14
D	Public/Quasi-Public to Business/Commercial	0.42
E Park to Business/Commercial		1.35
F Business/Commercial to Public/Quasi-Public		1.77
G Open Space to Single Family Residential		1.54
н	Single Family Residential to Business/Commercial	2.85
1	Open Space to Business/Commercial	0.10
J	Park to Public/Quasi-Public	5.03
	Total	15.74

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Table 2

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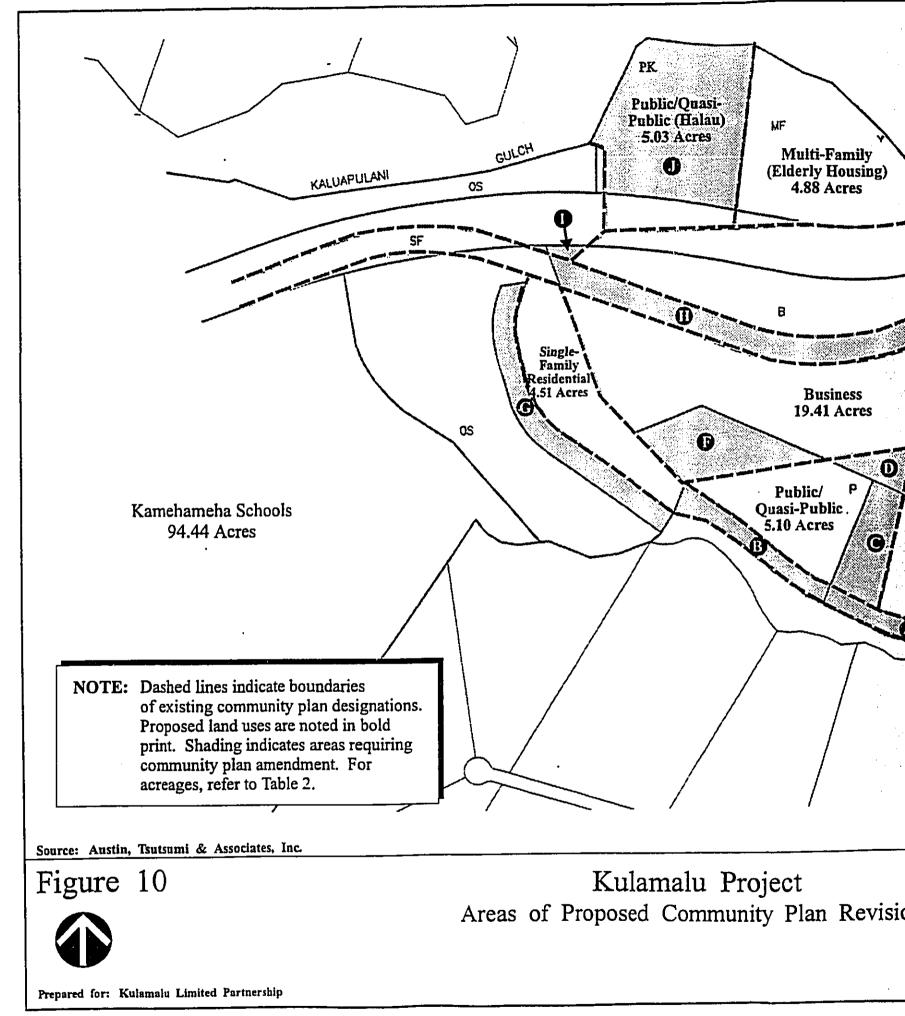
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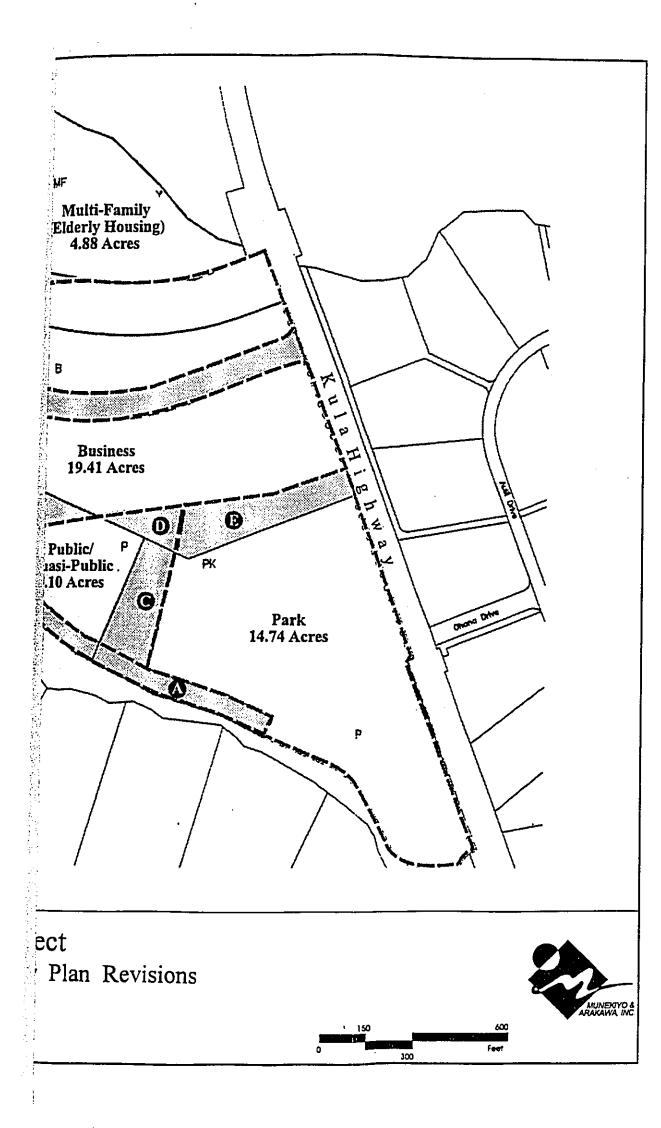
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D. <u>ZONING</u>

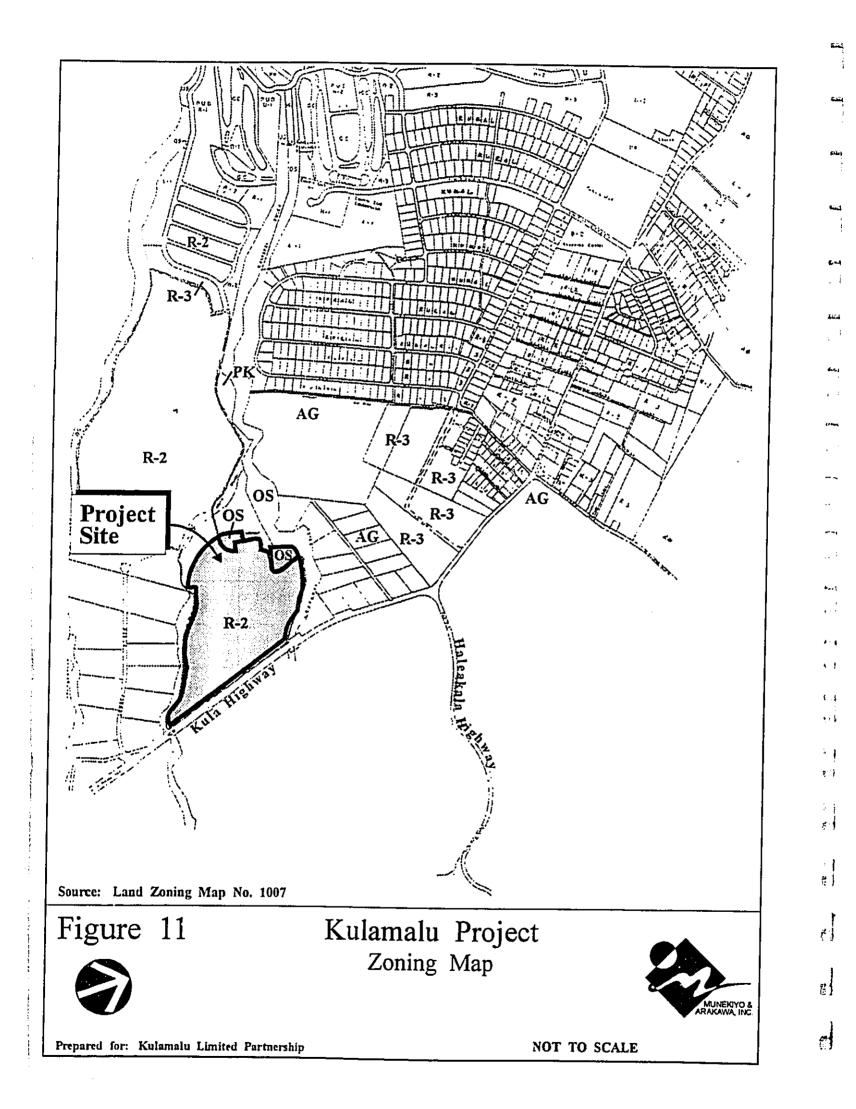
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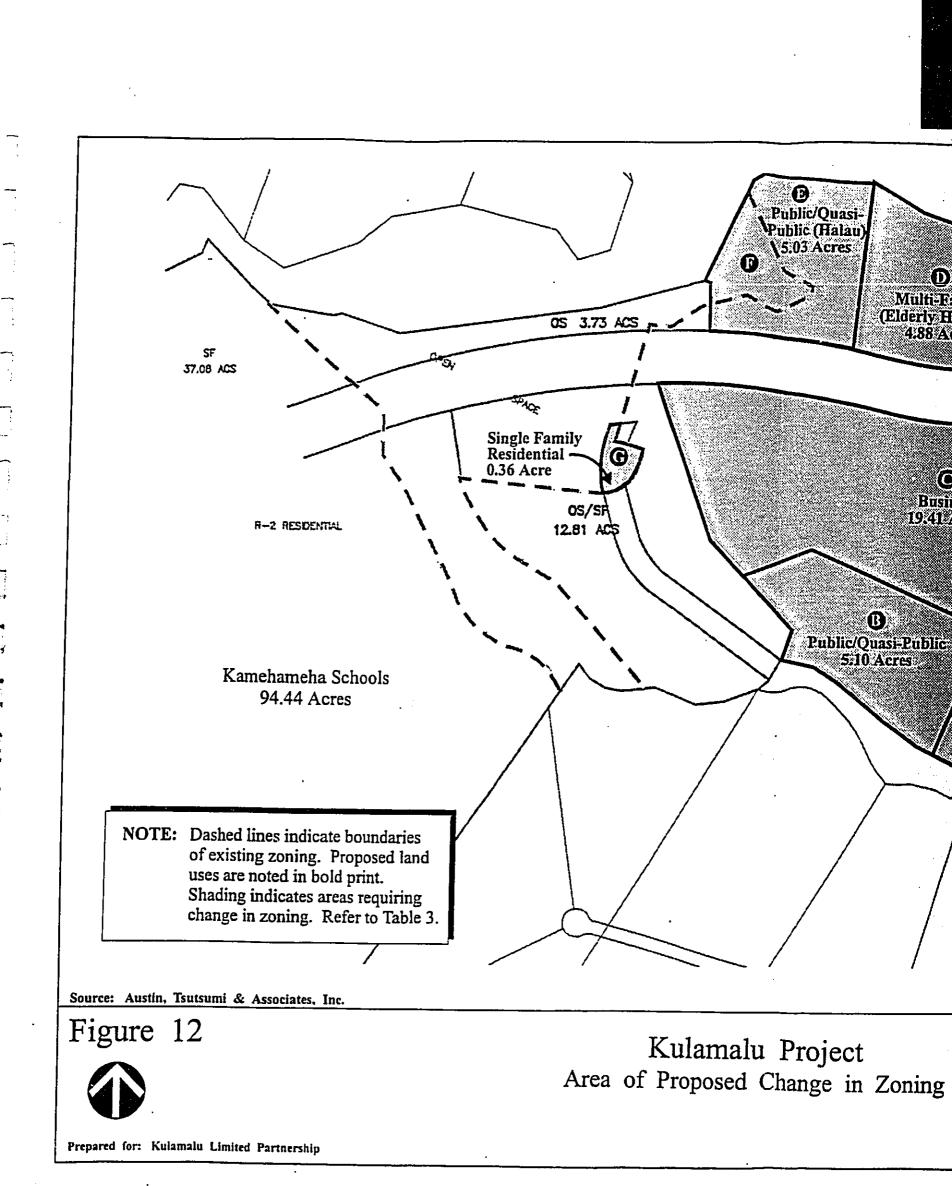
With the exception of a 1.23 acre area and a 0.36 acre area of the project site near Kaluapulani Gulch both of which are zoned Open Space, the remainder of the site is zoned R-2 Residential District. See Figure 11.

Areas requiring change in zoning are delineated in Figure 12 and listed in Table 3.

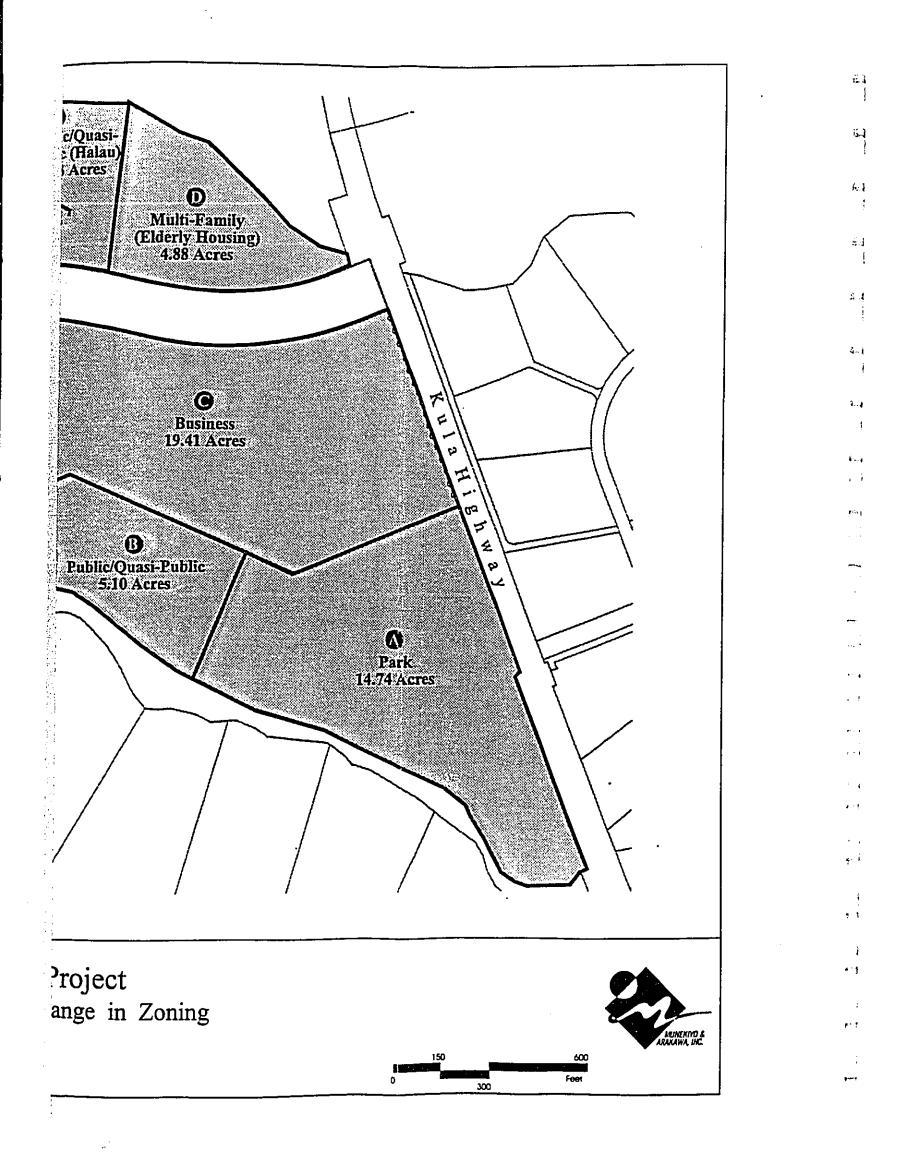
PROPOSED CHANGES IN ZONING		
Area	Proposed Revision	Acreage
"A" Park	R-2 Residential District to PK-1 Neighborhood Park District	14.74
"B" Public/Quasi-Public	R-2 Residential District to P-1 Public/Quasi-Public	5.10
"C" Business/Commercial	R-2 Residential District to B-CT Country Town Business District	19.41
"D" Multi-Family Residential	R-2 Residential District to A-1 Apartment District	4.88
"E" Public/Quasi-Public (Halau)	R-2 Residential District to P-1 Public/Quasi-Public	3.80
"F" Public/Quasi-Public (Halau)	OS Open Space to P-1 Public/Quasi-Public	1.23
"G" Single-Family Residential	OS Open Space to R-2 Residential District	0.36
Total Acreage 49.52		

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Chapter V

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Summary of Adverse Environmental Effects Which Cannot Be Avoided

V. SUMMARY OF ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

The proposed development will result in unavoidable construction-related impacts as described in Chapter III, Potential Impacts and Mitigation Measures.

Potential effects include noise generated impacts occurring from site preparation and construction activities. In addition, there may be temporary air quality impacts associated with dust generated from construction activities, and exhaust emissions discharged by construction equipment.

The proposed project is not anticipated to create any significant, long-term adverse environmental effects.

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Chapter VI

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Alternatives Analysis

VI. ALTERNATIVES ANALYSIS

Alternatives were considered for the subject property.

A. <u>ALTERNATIVE A</u>

Alternative A represents the proposed action. This alternative creates a mix of commercial, multi-family residential, park, public, and single-family residential uses. The commercial center creates business opportunities for a region in which demand for commercial services exceeds supply. Elderly multi-family residential uses are also created. The development also includes a variety of spaces for a neighborhood park, public uses, such as a church and day care center, and a halau for the teaching of Hawaiian culture and dance.

B. <u>ALTERNATIVE B</u>

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Alternative B represents construction of a project in accordance with the existing zoning. Approximately 52.08 acres of the project site are presently zoned R-2 Residential District. The zoning would allow a single family residential development with a minimum lot size of 7,500 square feet. Assuming a density of 5 units per acre, approximately 260 single family residences could be built within the subject property.

On lots of 7,500 square feet or more, the Maui County Code also allows accessory dwellings. Thus, as much as 520 primary and accessory dwellings could be built on a portion of the subject property under existing zoning.

The remainder of the property (approximately 1.59 acres) is zoned Open Space. Although there is an Open Space zoning category noted on the County's zoning maps, there are no corresponding Open Space zoning provisions in the Maui County Code. Thus, only passive uses of property, such as landscaping or natural drainage, are permitted. No uses or structures are allowed in the Open Space zone.

Chapter VII

Irreversible and Irretrievable Commitments of Resources

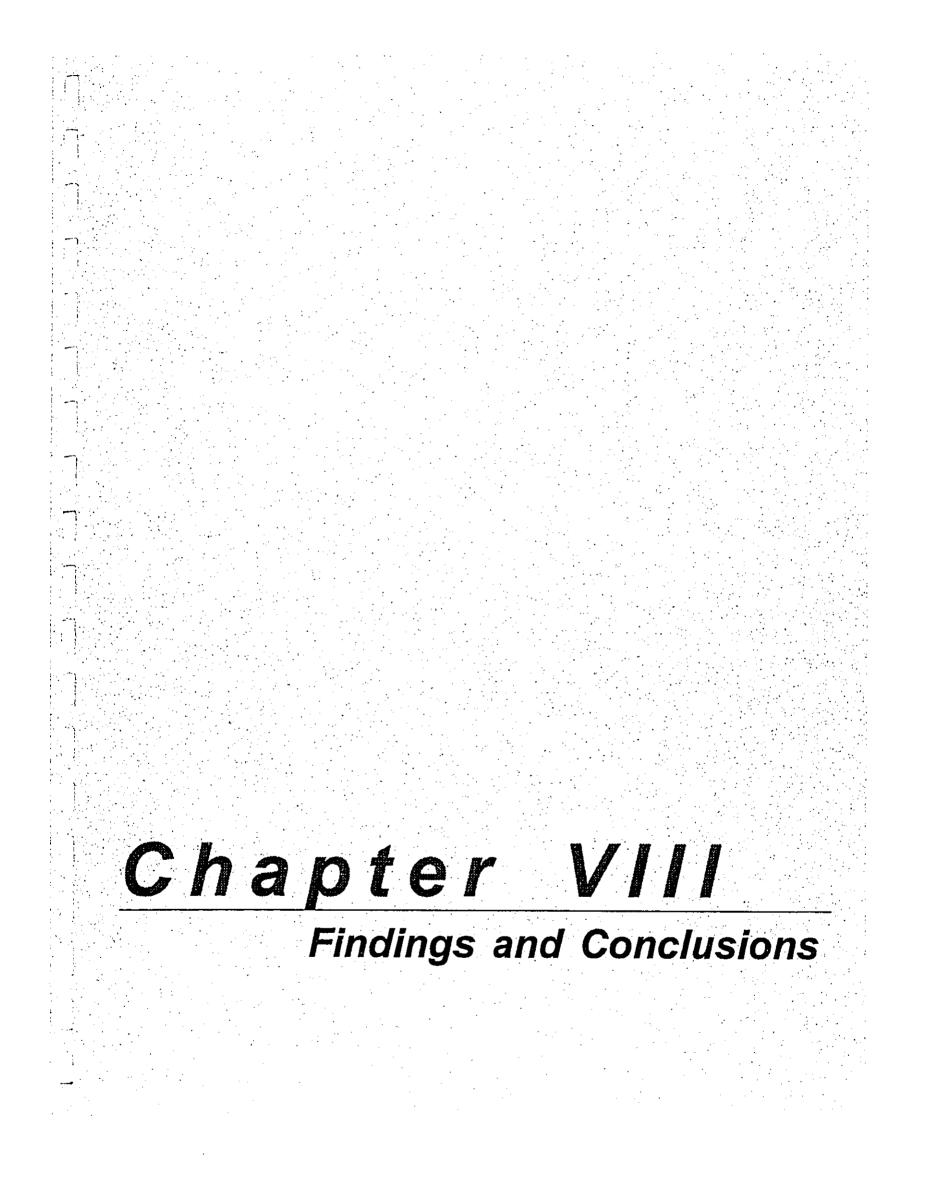
VII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The proposed development would involve a commitment of fuel, labor, funding and material resources. No other significant irreversible and irretrievable commitments of resources have been identified in connection with the proposed action.

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VIII. FINDINGS AND CONCLUSIONS

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The "Significance Criteria", Section 12 of Hawaii Administrative Rules Title 11, Chapter 200, "Environmental Impact Statement Rules", were reviewed and analyzed to determine whether the proposed project will have significant impacts to the environment. The following analysis is provided:

1. <u>No Irrevocable Commitment to Loss or Destruction of any Natural or</u> <u>Cultural Resource Would Occur as a Result of the Proposed Project</u>

The proposed project will not result in any adverse environmental impacts. There are no known, rare, endangered or threatened species of flora, fauna or avifauna located on the subject property.

Additionally, archaeological inventory and reconnaissance surveys for the subject property were conducted and revealed one archaeological site (50-50-10-4181). The site has been assessed and recorded and is no longer considered significant.

Should any cultural remains be identified during the development of the proposed project, however, work will stop in the immediate vicinity and State Historic Preservation Division will be consulted to establish an appropriate mitigation strategy.

2. <u>The Proposed Action Would Not Curtail the Range of Beneficial Uses</u> of the Environment

The proposed project will involve the commitment of lands in the Urban District which may preclude other land options within the project area. This commitment of land resources would not have a significant effect on the range of beneficial uses of the environment.



<u>The Proposed Action Does Not Conflict With the State's Long-Term</u> <u>Environmental Policies or Goals as Expressed in Chapter 344,</u> <u>Hawaii Revised Statutes</u>

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The State Environmental Policy and Guidelines are set forth in Chapter 344, Hawaii Revised Statutes. The proposed action is in consonance with the following guidelines:

Environmental Policy:

Creating opportunities for the residents of Hawaii to improve their quality of life through diverse economic activities which are stable and in balance with the physical and social environment.

<u>Guideline:</u>

3.

Community Life and Housing:

- (1) Develop communities which provide a sense of identity and social satisfaction in harmony with the environment and provide internal opportunities for shopping, employment, education, and recreation; and
- (2) Recognize community appearance as major economic and aesthetic assets of the counties and State; encourage green belts, plantings, and landscape plans and designs in urban areas; and preserve and promote ocean-to-mountain vistas.

4. <u>The Economic or Social Welfare of the Community or State Would</u> <u>Not Be Substantially Affected</u>

The proposed project will be a direct economic benefit to the Upcountry area and should have no effect upon social welfare parameters.

5. <u>The Proposed Action Does Not Affect Public Health</u>

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No impacts to the public's health and welfare are anticipated as a result of the proposed project.

6. <u>No Substantial Secondary Impacts, Such as Population Changes or</u> <u>Effects on Public Facilities Are Anticipated</u>

The construction of the proposed project will not affect the Island's population base or place new demands on the Island's public services.

7. No Substantial Degradation of Environmental Quality is Anticipated

As the proposed project is implemented, appropriate environmental mitigation measures will be used to ensure that adverse environmental effects are minimized. If any, such effects are anticipated to be limited to temporary construction-related activities. Thus, no substantial degradation of environmental quality resulting from the proposed project is anticipated.

8. <u>The Proposed Action Does Not Involve a Commitment to Larger</u> <u>Actions, Nor Would Cumulative Impacts Result in Considerable</u> <u>Effects On The Environment</u>

All land areas proposed for the development of the proposed project involve urban lands. The proposed project is not anticipated to create any significant long-term adverse environmental effects.

9. <u>No Rare, Threatened or Endangered Species or Their Habitats Would</u> <u>Be Adversely Affected By the Proposed Action</u>

There are no known significant habitats or rare, endangered or threatened species of flora and fauna at the project sites. The removal of the existing flora and the displacement of fauna or avifauna from the area due to

construction activities are not considered a negative impact upon these environmental features.

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10. <u>Air Quality, Water Quality or Ambient Noise Levels Would Not Be</u> <u>Detrimentally Affected By The Proposed Project</u>

Appropriate environmental mitigation measures will be used during construction to ensure that adverse environmental effects on air quality and noise are minimized. The project will be fully landscaped to create a site visually integrated with its surroundings. Low-rise building improvements are also proposed to keep with the existing built environment.

In the long-term, the proposed project is not anticipated to have a significant impact on air quality, water quality or noise parameters.

11. <u>The Proposed Project Would Not Affect Environmentally Sensitive</u> <u>Areas, Such as Flood Plains, Tsunami Zones, Erosion-prone Areas,</u> <u>Geologically Hazardous Lands, Estuaries, Fresh Waters or Coastal</u> <u>Waters</u>

The subject property is not located within and would not affect environmentally sensitive areas. The subject property is not subject to flooding or tsunami inundation and the underlying soils are not erosionprone. There are no geologically hazardous lands, estuaries, or coastal waters within or adjacent to the subject property.

Based on the foregoing findings, it is concluded that the proposed project will not result in any significant impacts.

Chapter IX

Agencies Contacted in the Preparation of the Environmental Assessment and Responses Received

IX. AGENCIES CONTACTED IN THE PREPARATION OF THE ENVIRONMENTAL ASSESSMENT AND RESPONSES RECEIVED

The following agencies were contacted during the preparation of the Environmental Assessment:

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- 1. Planning Department County of Maui 250 South High Street Wailuku, Hawaii 96793
- Department of Public Works and Waste Management County of Maui
 200 South High Street
 Wailuku, Hawaii 96793
- Department of Water Supply County of Maui
 200 South High Street
 Wailuku, Hawaii 96793
- State Historic Preservation Division
 State of Hawaii
 Department of Land and Natural Resources
 P.O. Box 621
 Honolulu, Hawaii 96809

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Chapter X

Comments Received During the Public Comment Period and Applicable Responses L. Douglas MacCluor 360 Hoopalua Road Pukalani, Hawaii 96768

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С. Арті 7, 1997

David Blane County of Maui Planning Dept. 250 S. High St. Wailuku, HI 96793

Dear Planners:

I object to the application for rezoning of tax key 2-3-8-por. 5, por. 38, por. 39, to change from agriculture to park, public/quasi-public, business/ commercial, multi-family residential, single-family residential, and open space. This proposal is not in the best interest for the upcountry public.

In January 1977, the state designated this land as "Prime Agriculture Land of Importance to the State of Hawaii". Have we forgotten how valuable open space and agricultural land is to Maui? When this is all depleted, what will the tourist come to see and keep the industry alive? In the last 20 years, we have watched developers take our best of farm land and "plant" houses.

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In the proposed subdivision area, traffic is already badly congested due to the new high school. Concurrently, the upcountry highway from Kiliei is also projecte to end here. The nearby community residents request that you not allow this rezoning to occur. Thank you for your consideration into this matter.

Sincerely,

DOUG MACCLUER LDM/jr

Enclosures

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		Pukalani, Hawaii 96768		
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	April 7, 1997		NELEIV	÷
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	Planning Commission			ť
•	County of Maul Planning Dept.			
	250 S. High St.			ı
	Wailuku, HI 96793			
	Dear Chairman:			
	Lobiect to the application	for rezoning of tax key 2.3.	0 0	4.4 -)
•	por. 39, to change from ag	riculture to park, public/qu	asi-public, business/	1.11 1
	commercial, multi-family r	esidential, single-family res	idential, and onen space.	. 1
	inis proposal is not in the	best interest for the upcou	ntry public.	i 1
	In January 1977, the state	designated this land as "Pr	ime Agriculture Land	i i c
	of Importance to the State	of Hawail". Have we forge is to Maui? When this is a	otten how valuable open	3 P
	the tourist come to see and	keep the industry alive? In	n the last 20 years, we	15 I
	have watched developers to	ike our best of farm land ar	id "plant" houses.	J 🛊
	In the proposed subdivision	n area, traffic is already ba	div congrested due to the	<i>∉</i> #
	new high school. Concurre	ently, the upcountry highwa	y from Kihei is also projected	
	to end here. The nearby co	mmunity residents reques	t that you not allow this	
	rezoning to occur. Thank y	ou for your consideration i	alo lais mutter.	ie ≹ ⊒it
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KULAMALU Limited Partnership

July 21, 1997

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Mr. L. Douglas MacCluer 360 Hoopalua Road Pukalani, Hawaii 96768

SUBJECT: Kulamalu Project

Dear Mr. MacCluer:

We have received a copy of your April 7, 1997 letter to the County of Maui Planning Department and the Maui Planning Commission. As the applicant for the land use changes, we would like to take this opportunity to provide a response to your comments.

With regard to the issue of prime agricultural land, we would like to note that this property has been earmarked for urban development since the early 1970's when it was zoned for single family residential use. While open space and agriculture are valuable assets on an island wide basis, we also believe that a neighborhood commercial center in this location serves the retailing needs of the Upcountry region. Our intent is to mitigate impacts resulting from the development of our project, including traffic impacts.

Our intent is to build a project which will complement the rural nature of the region. If you have any questions, please feel free to call me. Thank you for your interest in the project.

Very truly yours,

KULAMALU LIMITED PARTNERSHIP UM 0 By Don S. Fujimoto

Its Vice President

DF:to

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cc: Don Schneider, Planning Department Milton Arakawa, Munekiyo & Arakawa, Inc.

P. O. Box 1417 * Walluku, Hawaii 96793 * 808/244-1500 * 808/242-2777

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May 13, 1997

Director of Planning County of Maui Planning Department County Building 200 South High Street Wailuku, Maui, HI 96793

RE: APPLICATION FOR PROPOSED CHANGE IN ZONING TAX MAP KEY: 2-3-8-POR. 5, POR. 38, POR. 39

Dear Sir:

We respectfully wish to oppose the proposed change in zoning for the project referred to on the attached notice (by Kulamalu Limited Partnership) for the reasons listed below, and would appreciate being informed in advance about any and all hearings, meetings, etc. involving the proposed project.

1. The supply of water to the Upcountry area is hardly enough to meet the needs of current residents and businesses. Water restrictions have become commonplace in our area, and the welfare of everyone here would be further compromised by making even greater demands on an already overburdened water supply. Where will the extra water come from? There should be no new development until current supply and demand can be constantly met.

2. Check the real estate listings in the Sunday Maui News and other publications and you will find numerous homes and ohanas for rent and sale in the Pukalani/Kula/Makawao area, as well as new housing developments in the Pukalani area STILL for sale despite a long period of advertising. This clearly indicates that there is already more than sufficient housing in the area as it is. We can also find no established need or desire for multi-family residential. Our area is what can be called a "bedroom community", with the majority of residents living in the area but working elsewhere (read: Downcountry). If the idea is meant as a cost-saving device for families, they would be better served to find housing closer to their place of work, as the cost of gasoline and maintaining a car to make the run down and uphill each work day is not

3. As to a commercial center, the number of businesses we have seen go under in the Upcountry area in the past few years, despite a "captive audience" of sorts, should be an accurate barometer in forecasting that a commercial center is not needed and most probably will not survive. The idea of building such a center may sound grand to some, perhaps, but who will come regularly enough to keep the businesses alive after the initial glow has worn off the project? If residents aren't patronizing established firms, what proof is there that more of the same is needed? This seems like overkill, especially in the Upcountry area.

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4. In respect to items 2 and 3, the impact of added traffic and pollution in the area must be considered, and this applies not only to the cars of possible new residents, but delivery trucks coming and going as well. As you know, Kula Highway is one lane in each direction, and heavily traveled as it is. The high school will bring about more traffic in itself with its continued growth, and one must also consider the safety of students entering and exiting the school from Kula Highway.

5. The Upcountry area, in general opinion, is a community geared to a more rural attitude. Residents choose to live here for that reason. If we want to do business, we can go to Kahului or Wailuku. Maui has areas of the island for every need, and Upcountry was meant to be quiet and pastoral. Land development is a business - not a charity gesture - and the idea is to make money. To corrupt the virgin landscape in the name of profit is not in the best interest of the Upcountry residents you serve. The term "The greatest good for the greatest number" applies here, and the greatest number are Upcountry residents who do not wish to see our bastion of peace and solitude paved over and built up.

6. As a final note, what studies have proven that an additional load on Upcountry services (utilities, police, fire, other infrastructure, etc.) can be tolerated successfully if such a project were to go ahead? It seems that areas such as Kahului, Kihei or especially Wailuku, which could dearly use revitalization, would be better-equipped to handle such a development.

We could go on, but we believe our main reasons for opposition have been noted by now. If you wish to contact us, please feel free to do so at the address listed below or leave a message on our answering machine and we will certainly get back with you. Thank you for your consideration in this very important matter.

Very truly yours,

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Mr. and Mrs. Alvin K. Barnhart 14 Aulii Place Pukalani, Maui, HI 96768 573-1696

cc:

- Mayor Linda C. Lingle
- County Council
- Maui News
- Haleakala Times
- Local Homeowner Associations

KULAMALU Limited Partnership

July 21, 1997

Mr. and Mrs. Alvin Barnhart 14 Aulii Place Pukalani, Hawaii 96768

SUBJECT: Kulamalu Project

Dear Mr. and Mrs. Barnhart:

We have received a copy of your letter to the County of Maui Planning Department which was received on May 21, 1997. We would like to take this opportunity to provide a response to the issues raised in your letter.

With regard to water, we would like to note that the project will be developing its own source, transmission, and storage improvements, in consultation with the Department of Water Supply. A new well is proposed to be drilled in Kaupakalua to supply water for the project. An off site and on site reservoir are also proposed to provide for adequate storage capacity for the project. Also, appropriate transmission mains and lines are included as part of the project improvements. Thus, construction of the project should have no adverse effect upon the existing water system and in fact will improve the existing system by adding these facilities.

With regard to residential use, it should be noted that this portion of the project is intended for the elderly multi-family residential market. Since there are not very many elderly multi-family projects in the Upcountry area, we believe that there will be sufficient demand for this type of product.

We would like to note that the commercial portion of the project is intended as a neighborhood commercial center. Our studies have shown that Upcountry Maui is under serviced in terms of neighborhood shopping facilities and that demand for retail facilities will exceed the available supply even if the project is included within the analysis.

With regard to traffic, it is noted that there are a number of improvements already recommended by the Maui Long Range Land Transportation Plan (Draft Final Report, February 1996). Project-related improvements include intersection improvements at Kula Highway and the main project roadway leading to the project.

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Mr. and Mrs. Barnhart July 16, 1997 Page Two

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Our goal is to construct a neighborhood shopping center which is geared to the needs of the Upcountry community. Our intent is to mitigate any infrastructural or public servicerelated impacts resulting from the project and complement the rural nature of the region.

Thank you for your interest in the project. If you have any questions, please feel free to call me.

Very truly yours,

KULAMALU LIMITED PARTNERSHIP Om By Don S. Fujimoto

Its Vice President

DF:to cc: Don Schneider, Planning Department Milton Arakawa, Munekiyo & Arakawa, Inc.

P. O. Box 1417 • Walluku, Hawaii 96793 • 808/244-1500 • 808/242-2777

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United States Department of Agriculture

Natural Resources Conservation Service

210 Imi Kala St. Suita 209 Wailuku, HI 96793-2100 Our People...Our Islands...In Harmo'Ry MAY 28 Pl2:39

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Mr. David Blane, Planning Director County of Maui Planning Department 250 S. High Street Wailuku, Hawaii 96793

Dear Mr. Blane,

Subject: Kulamalu Project; TMK: 2-3-08: por. 38, 39 I.D. CPA97002, CIZ970005, EA970005

It is recommended that the project effects look at drainage very carefully. The adjacent Kaluapulani Gulch joins Kalialinui Gulch below the Pukalani area and meanders through HC&S sugarcane fields outleting at Kanaha Beach Park. The gulch crosses five major irrigation delivery ditches controlled by HC&S which may be affected by higher runoff. Thus, the proposed detention facilities are very critical.

Thank you for the opportunity to comment.

Sincerely, Jean A. Jufuwara Neal S. Fujiwara District Conservationist

The Natural Resources Conservation Service works hand-in-hand with the American people to conserve natural resources on private taxet BENJAMIN J. CAYETANO GOVERNOR

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GARY GILL DIRECTOR

STATE OF HAWAII OFFICE OF ENVIRONMENTAL QUALITY CONTROL

> 235 SOUTH BERETANIA STREET SUITE 702 HONOLULU, HAWAII 95813 TELEPHONE (808) 5864185 FACSIMILE (808) 5864186

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May 28, 1997

David Blane, Director Maui Planning Department 250 South High Street Wailuku, HI 96793

Attn: Don Schneider

Dear Mr. Blane:

Subject: Draft Environmental Assessment (EA) for Kulamalu Project, Pukalani

We have the following comments to offer:

1. Segmentation:

Kulamalu Master Plan is referenced in the document. The EIS law prohibits segmentation of projects and requires that full disclosure of impacts be made on projects in their entirety. Please provide a full analysis and discussion of this and all geograhically-related projects, and indicate whether other project segments are anticipated under this Master Plan.

2. Water resources:

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a) Given the chronic water shortages that have plagued Maui in recent years, how will Maui DWS meet water demand for this project and the rest of the Kulamalu master-planned developments? What cumulative impacts will be caused by the continued demand for potable water?

b) In the final EA please include a full discussion of construction and operational impacts to any surface or ground water sources. Please also indicate any related mitigation measures.

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	y 28, 1997 je 2	
3.		
Э.	Population impacts: The project proposes 50 elderly housing units and 4.5 acres of single family residences, as well as a 19-acre commercial area. What are the anticipated increases in resident and transient populations and their associated impacts for this and for the Master Plan area?	
4.	Community notification:	
	Notify the nearest neighbors or neighboring landowners and any interested community groups. Include documentation of your contacts in the final EA.	
5.	Agency contacts; permits:	
	In the final EA include a list of agencies contacted along with copies of any correspondence. Also list all required permits and their status.	
6.	Visual outcomes:	
	Provide renderings in the final EA of the final appearance of the facilities in this complex;	
	Provide photos of mauka and makai viewplanes of the site superimposed with a rendering of the final appearance of the complex.	
7.	Timing:	
	What are the anticipated start and end dates of construction?	
lf you	have any questions, call Nancy Heinrich at 586-4185.	3
Since	rely,	
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GAHY		
Direct	or	
):	Milton Arakawa Kulamalu Limited Partnership	
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KULAMALU Limited Partnership

July 21, 1997

Mr. Gary Gill, Director Office of Environmental Quality Control 235 South Beretania Street, Suite 702 Honolulu, Hawaii 96813

SUBJECT: Draft Environmental Assessment for Kulamalu Project Pukalani, Hawaii

Dear Mr. Gill:

We have received a copy of your May 28, 1997 letter to the County of Maui Planning Department relating to the subject project. We would like to provide a response to your comments.

With regard to segmentation issues, we would like to note that the term "master plan" is raised in the EA within the context of the traffic study. The term is misleading and will be revised in the Final EA. The traffic study analyzes the larger 304.71 acre area. The larger area includes the 53.67 acre area which is the subject of the EA. It is noted that the portion of the larger area designated for private school use is owned by a separate development entity. Thus, the extent and timing of development is beyond the control of Kulamalu Limited Partnership. Portions of the larger area are zoned Open Space. These are primarily gulch areas. Other portions have been zoned for single family residential use since 1971. Since there is consistency on State land use, community plan and zoning for single family residential use, development could proceed on this portion without further discretionary approvals. Although traffic impacts of implementing the residential zoning have been assumed as part of the traffic study, the question as to whether this portion of the property is proposed to be developed for single family residential use is uncertain at this juncture. Also, the extent and timing of developing this portion is uncertain. Thus, the lands outside of the 53.67 acre area have been included within the traffic study for contextual purposes although it should be considered outside of the scope of the EA.

With regard to water, it is noted that the 53.67 acre project will be developing its own source as well as transmission and storage improvements. A well construction permit for a new well at Huluhulunui has been granted by the Commission on Water Resource Management (CWRM) on June 2, 1997. Our intent is to move forward with pump tests and

Mr. Gary Gill, Director July 21, 1997 Page Two

subsequent application for pump installation permit from the CWRM. Possible construction and operational impacts of withdrawing water from the Huluhulunui well should be addressed as part of the CWRM application process.

With regard to population impacts, it should be emphasized that approximately 52.08 acres of the project site is presently zoned R-2 Residential District. Compared to what can be built under the existing zoning, the proposed land use changes would lead to a significant reduction in population. Under the existing zoning, approximately 240 single family residences containing 720 people could be built. Under the proposed project, there could be 75 elderly persons living at the multi-family residential portion of the project and 21 single family homes containing 63 people. It is anticipated that people living in the Upcountry area would utilize the commercial area within the project. Thus, the commercial area should not cause an increase in population within the Upcountry region.

With regard to community notification and agency contacts, all landowners of record within 500 feet of the project's tax map parcels were notified that a change in zoning application was being filed. In addition, we had a community informational meeting on July 10, 1997. The public review period of the EA overlaps with the agency review period of the community plan amendment and change in zoning application filed with the County of Maui. (The EA is included in these applications).

We will include a full-size site plan and a site section in the Final EA in order to address issues relating to visual appearance and viewplanes.

Construction on the commercial portion of the project is anticipated to begin in early 1998 with completion by the end of 1998. The park and public/quasi-public areas are intended to be completed at the same time as the commercial portion. The multi-family residential use and the halau should be started and completed in 1999.

If you have any questions, please feel free to call me.

Very truly yours, U LIMITED PH KULAMA Bv

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Don S. Fujimoto Its Vice President

DF:to Attachment

P. O. Box 1417 • Walluku, Hawaii 96793 • 808/244-1500 • 808/242-2777

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	-	BENJAMIN J. CAYETANO GOVERNOR LAWRENCE MIIKE DIRECTOR OF HEALTH
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	'	STATE OF HAWAII
		MAUI DISTRICT HEALTH OFFICE
•		54 HIGH STREET WAILUKU, MAUL, HAWAII 86793
t		Mr. David W. Blane
	1.1	Director Planning Department
		County of Maui 250 South High Street Wailuku, Hawaii 96793
1. A. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.		Dear Mr. Blane:
a dan an an Asaan in a da		Subject: Kulamalu Project CPA97002, CIZ970005, EA97005 TMK: (2) 2-3-008: por. 5, por. 38, por. 39
	(Thank you for the opportunity to review and comment on the application. We have the following comments to offer:
andra dh' an chuire dh' Granda Ban Burg t		Activities associated with the construction phase of the project must comply with the provisions of Hawaii Administrative Rules, Chapter 11-46, "Community Noise Control".
1	ل_	Should you have any questions, please call me at 984-8230.
Ş.		Sincerely,
-	~	to.
		HERBERT S. MATSUBAYASHI
1	,	District Environmental Health Program Chief
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Maul Electric Company, Ltd. • 210 West Kamehameha Avenue • PO Box 398 • Kahulul, Maui, Hl 96733-6898 • (808) 871-8

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June 2, 19	97	
Mr. David I Planning D	irector	
County of I Maui Plann	ing Department	
250 So. Hig Wailuku, Hi	gh Street 1 96793	
Dear Mr. Bl	ane:	
Subject:	Kulamalu Project CPA 97002, CIZ970005, EA970005 (TMK: 2-3-008: 005, Pukalani, Maui)	
		•
Thank you f	or allowing us to comment on the subject project	
In reviewing	or allowing us to comment on the subject project. the information transmitted and our records, Maui Electric Company (MECO) at this objections to the proposed project.	
In reviewing time has no MECO enco		
In reviewing time has no MECO enco may plan for	the information transmitted and our records, Maui Electric Company (MECO) at this objections to the proposed project. Surages that the project's consultant meet with us as soon as practical so that we the project's electrical requirements.	
In reviewing time has no MECO enco may plan for	the information transmitted and our records, Maui Electric Company (MECO) at this objections to the proposed project.	
In reviewing time has no MECO enco may plan for If you have a Sincerely,	the information transmitted and our records, Maui Electric Company (MECO) at this objections to the proposed project. Purages that the project's consultant meet with us as soon as practical so that we the project's electrical requirements. The project's electrical requirements.	
In reviewing time has no MECO enco may plan for If you have a Sincerely,	the information transmitted and our records, Maui Electric Company (MECO) at this objections to the proposed project. Surages that the project's consultant meet with us as soon as practical so that we the project's electrical requirements.	
In reviewing time has no MECO enco may plan for If you have a Sincerely,	the information transmitted and our records, Maui Electric Company (MECO) at this objections to the proposed project. Purages that the project's consultant meet with us as soon as practical so that we the project's electrical requirements. Any questions or concerns, please call Fred Oshiro at 872-3202.	
In reviewing time has no MECO enco may plan for If you have a Sincerely,	the information transmitted and our records, Maui Electric Company (MECO) at this objections to the proposed project. Purages that the project's consultant meet with us as soon as practical so that we the project's electrical requirements. Any questions or concerns, please call Fred Oshiro at 872-3202.	
In reviewing time has no MECO enco may plan for If you have a Sincerely, <i>Literary</i> Edward Rein Manager, En	the information transmitted and our records, Maui Electric Company (MECO) at this objections to the proposed project. Purages that the project's consultant meet with us as soon as practical so that we the project's electrical requirements. Any questions or concerns, please call Fred Oshiro at 872-3202.	

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BENJAMIN J. CAYETAND GOVERNOR		HERMAN M. AIZAWA, Ph.D. SUPERINTENDENT
	STATE OF HAWAN UN -6 P2:00 DEPARTMENT OF EDUCATION P 0. BOX 2360 () HONOLULU HAWAII 96804	
OFFICE OF THE SUPERINTENDENT	June	3, 1997

Mr. David W. Blane Planning Director County of Maui 250 South High Street Wailuku, Hawaii 96793

Dear Mr. Blane:

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Subject: Kulamalu Project, CPA97002, CIZ970005

The Department of Education (DOE) has determined that the proposed 50-unit elderly housing component and the development of approximately 23 single-family units will not have a significant impact upon school facilities in the area.

We request, however, that as a condition of zoning approval the applicant be required to satisfy the DOE's fair-share requirements if the elderly housing complex is instead developed for non-elderly persons.

Thank you for the opportunity to comment. If you have any questions, please call Mr. Sanford Beppu at 733-4862.

Sincerely,

Herman M. Aizawa, Ph.Q. Superintendent

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A. Suga, OBS CC: R. Murakami, MDO

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY FMPI OYER

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BENJAMIN J, CAYETANO GOVERNOR JOR GENERAL EDWARD V. RICHARDSON DIRECTOR OF CML DEFENSE		
ROY C. PRICE, SR. VICE DIRECTOR OF CML DEFENSE	STATE OF HAWAII	PHONE (608) 733-43(2-3 FAX (808) 733-42(
	DEPARTMENT OF DEFENSE OFFICE OF THE DIRECTOR OF CIVIL DEFENSE 3949 DIAMOND HEAD ROAD HONOLULU, HAWAII 95816-4495	ſæ:1
	June 5, 1997	ñ. i
		<u>5.</u>]
TO: Planning Dep County of Ma 250 South Hig Wailuku, Haw	ui gh Street	ÈI
FROM: Mr. Roy C. Pri		6 <u>.</u>
SUBJECT: APPLICATIO ZONING, KUI	N FOR COMMUNITY PLAN AMENDMENT AND CHANGE IN LAMALU LIMITED PARTNERSHIP	1 · † e~1
park, public/guasi-public, b	ity to comment on the Application for Community Plan Amendmen funekiyo & Arakawa, Inc., for Kulamalu Limited Partnership for usiness/commercial, multi-family residential, and single-family aui, Hawaii; TMK: 2-3-8:5, 38 and 2-3-8:39.	nt E
State Civil Defense (SCD) h location does not have any s 115 db omni-directional sola	has no negative comments to this zoning change, although this siren coverage. SCD therefore requests that the developer provide a ar powered siren into what appears to be the parking lot for the is annotated in red on the "conceptual site plan" with approximate	
If you have any further ques	tions, please call Mr. Norman Ogasawara of my staff at 733-4300.	· · · · · · · · · · · · · · · · · · ·
Enc.		2 T 14
c: Maui Civil Defense Agen	cy	
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KULAMALU

July 18, 1997

Mr. Roy C. Price, Sr. Vice Director of Civil Defense State of Hawaii Department of Defense Office of the Director of Civil Defense 3949 Diamond Head Road Honolulu, Hawaii 96816-4495

Subject: Kulamalu Project

Dear Mr. Price:

We have received a copy of your June 5, 1997 transmittal to the County of Maui Planning Department relating to the subject project.

We understand the public safety benefits of placing a 115 db omni-directional solar powered siren within the commercial portion of the project site and are willing to cooperate in the process of finding an acceptable site.

If you have any questions, please feel free to call me. Thank you for your interest in the project.

Very truly yours,

KULAMALU LIMITED PARTNERSHIP By

• . . ·

Don S. Fujimoto Its Vice President

c: Don Schneider, Planning Department Milton Arakawa, Munekiyo & Arakawa, Inc.

DF:to cc: Don Schneide Milton Arakaw dowing/kulamak/defense ar

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P. O. Box 1417 . Walluku, Hawai 98793 . 808/244-1500 . 808/242-2777



LINDA CROCKETT LINGLE

MAYOR

OUR REFERENCE

YOUR REFERENCE

POLICE DEPARTMENT



HOWARD H, TAGOMORI CHIEF OF POLICE

THOMAS PHILLIPS DEPUTY CHIEF OF POLICE 50

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COUNTY OF MAUL 97 JUN 17 FI2:13

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55 MAHALANI STREET WAILUKU, HAWAII 96793. . AREA CODE (608) 244-6400 FAX NO. (808) 244-6411

June 13, 1997

MEMORANDUM

то	:	DIRECTOR, PLANNING DEPARTMENT
FROM	:	HOWARD H. TAGOMORI, CHIEF OF POLICE
SUBJECT	:	LD. No.: TMK: Project Name: Applicant:
		No recommendation or special condition is necessary or

No recommendation or special condition is necessary or desired.

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Refer to attachment(s).

Assistant Chief Charles Hall

for: HOWARD H. TAGOMORI Chief of Police HOWARD TAGOMORI, CHIEF OF POLICE ALL OF

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SUBJECT

KULAMALA PROJECT APPLICATION FOR COMMUNITY PLAN AMMENDMENT AND CHANGE IN ZONING - COMMENTS AND RECOMMENDATIONS

GREGORY PARESA, LIEUTENANT, BRAVO WATCH

On 05/22/97, I received this assignment from Captain Gerald MATSUNAGA of the Wailuku Patrol Division.

This zoning request change encompasses 53.67 acres of the upper portion of the overall Kulamala Project Development. This area is roughly the size of the presently developed Kula 200 residential subdivision; that is, those homes having entry/exit onto Kula Hwy from Ohana Street. And, according to Appendix C of the Preliminary Wastewater Calculations, it is anticipated that this area comprising of: businesses, elderly housing, single family housing, a public park and other quasi-public areas should support a population of approximately 6,000 people.

It appears from the information provided in the Kulamalu Limited Partnership's booklet that every aspect of a Development of this size has been researched and taken into account, including, police service.

It is therefore suggested in an effort to further enhance police service and a sense of safety by those who will be populating this Development, that the Developer impliment techniques of Crime Prevention Through Enviornmental Design as taught at the University of Louisville's National Crime Prevention Institute.

#### Examples such as:

- utilizing concrete pilings or low hedge throughout the business area parking lot to affort a more controlled and safe flow of traffic.
- strategicly placing large planters infront of display windows or glass doorways to discourage the "smash and grab" using a vehicle.
- using the bougainvillaea or natal plum as an ornamental hedge, etc.
- placing lights at strategic locations through the Development, as well as using the right kind of light source.
- the placing of "speed humps" to deter speeding or imped escape thereby discouraging potential crime.

These are but a few examples that thru Enviornmental Design, the Developer can assist in crime prevention and foster a sense of safety among the people in the area.

It is further suggested that upon the completion of the structions, be it home or office, that the Crime Prevention specialist from Maui Police Department be contacted to do an onsite Crime Prevention Survey for the Developer.

Respectfully submitted.

topund Concret Spri 7281 Con Spri 7281 6/9/97

Gregory Paresa 3719 Ligutenant Bravo Watch 06/08/97

BENJAMIN J. CAYETANO GOVERNOR STATE OF HAWAII

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KALI WATSON CHAIRMAN HAWAIIAN HOMES COMMISSION

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STATE OF HAWAII DEPARTMENT OF HAWAIIAN HOME LANDS P.O. BOX 1879 HONOLULU, HAWAII 96105

June 18, 1997

Mr. David W. Blane County of Maui, Planning Department 250 South High Street Wailuku, Hawaii 96793

Dear Mr. Blane:

Subject: Kulamalu Project

The Department of Hawaiian Home Lands has reviewed the environmental assessment for the Kulamalu Project.

As part of our review we have noted that Kulamalu's projected water use is 122,620 gpd and that an agreement has been made to install a 1 to 1.5 mgd well and 1,000,000 gallon reservoir. The proposed infrastructure is intended to improve the quantity and reliability of the Lower Kula System.

Hawaiian Home Lands at Keokea and Waiohuli rely upon the Lower Kula System for water. We support improvements to the system and as long as the project does not adversely impact water sources that serve Hawaiian Home Lands, we have no objection.

If you have any questions regarding our comments, please contact Daniel Ornellas of our Planning Office at 583-3836.

Aloha,

KALI WATSON, Chairman Hawaiian Homes Commission

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BOARD OF WATER SUPPLY COUNTY OF MAUL P.O. BOX 1108 WAILUKU, MAUL, HAWAII 98783-7109 97 JUL 20 22:29

:

June 19, 1997

4140

Mr. David Blane, Director County of Maui Planning Department 250 South High Street Wailuku, Maui, Hawaii 96793

Re: I.D.: CPA 970002; CIZ 970005; EA 970005 TMK: 2-3-08: por 5, por 38, por 39 Project Name: Kulamalu Project

#### Dear Mr. Blane,

Thank you for the opportunity to review this application. The Board of Water Supply has the following comments.

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The project area totals 53.67 acres comprised of single-family, multi-family, open space, public, and commercial uses. Using per-acre State standards, the project may use about 240,000 gallons per day. The applicant should be advised that, per their March 21, 1956 agreement with BWS, they will need to submit a letter (schedule "G" of the agreement) notifying BWS of their intent to exercise a portion of the storage, transmission, and source credits allocated under the agreement.

#### Source and System

The applicant should be advised that the proposed subdivision is in the Upcountry area affected by the "Shortage of Water Source Capacity Affecting Upcountry Areas" by the Director of Water Supply, dated March 16, 1993. However, the applicant has entered into an agreement with the Board of Water Supply to provide sufficient water for the project such that service to existing users will not be adversely effected by the development.

Domestic, fire, and irrigation calculations will be reviewed in detail during the development process. Actual fire demand for structures is determined by fire flow calculations performed by a certified engineer.

#### Water Quality

This project overlies the Makawao Aquifer System. In order to protect the aquifer, BWS recommends that the applicant utilize Best Management Practices (BMPs) designed to minimize infiltration from all construction operations. We have attached sample BMPs for principle operations for reference. Additional information is available from the State Department of Health.

"R. M/ ... All Things Find Sila"

#### Conservation

To further conserve water resources, the applicant should refer to the attached documents and consider these measures:

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Eliminate Single-Pass Cooling: Single-pass, water-cooled systems should be eliminated per Maui County Code Subsection 14.21.20. These units pass water once-through for cooling, and then dispose of the water into the drain. Although prohibited by code, single-pass water cooling is still manufactured into some models of air conditioners, freezers, and commercial refrigerators.

<u>Utilize Low-Flow Fixtures and Devices</u>: Maui County Code Subsection 16.20.675 requires the use of low flow water fixtures and devices in faucets, showerheads, urinals, water closets and hose bibs. Water conserving washing machines, ice-makers and other units are also available, and can help cut back on water bills.

<u>Maintain Fixtures to Prevent Leaks</u>: A simple, regular program of repair and maintenance can prevent the loss of hundreds or even thousands of gallons a day. Refer to the attached handout, "The Costly Drip". The applicant should establish a regular maintenance program.

<u>Use Climate-adapted Plants:</u> The project site is located in "Maui County Planting Plan" -Plant Zone 3. Please refer to the "Maui County Planting Plan", and to the attached documents, "XERISCAPE: Water Conservation Through Creative Landscaping" and "Some of Maui's Native and Polynesian Plants." We encourage the applicants to review the attached documents, refer to the Planting Plan, and consider using climate-adapted and salt-tolerant native plants. Native plants adapted to the area, conserve water and further protect the watershed from degradation due to invasive alien species.

<u>Prevent Over-Watering By Automated Systems:</u> Provide rain-sensors on all automated irrigation controllers. Check and reset controllers at least once a month to reflect the monthly changes in evapotranspiration rates at the site. As an alternative, provide the more automated, soil-moisture sensors on controllers.

Look for Opportunities to Conserve Water Around the Home: A few examples: When clearing driveways, etc. of debris, use a broom instead of a hose. When washing cars, use a hand-operated spray nozzle instead of an open hose. Periodically check for leaks in faucets and toilet tanks.

If you need more information, please contact our Water Resources and Planning Division anytime at (808) 243-7199.

Sincerely,

fr. David Craddick Director

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C WYDOCU-IWILL'SYPLANNING RESPON-IKULAMALU WPD

#### attachments:

"The Costly Drip" "Some of Maui's Native and Polynesian Plants" Ordinance 2108 - An ordinance amending Chapter 16.20 of the Maui County Code, pertaining to the plumbing code" "XERISCAPE - Water Conservation through Creative Landscaping"

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"A Checklist for Water Conservation Ideas for Cooling" "A Checklist for Water Conservation Ideas for Commercial Buildings"

"A Checklist for Water Conservation Ideas for Schools and Public Buildings"

"A Checklist for Water Conservation Ideas for Restaurants"

Sclected BMPs from "Guidance Specifying Management Measures For Sources of Nonpoint Pollution In Coastal Waters." U.S. EPA, "Fire Flow" - Hawaii Insurance Bureau, 1991

"Guide for Determination of Required Fire Flow" - Insurance Service Office, 1974

|                                       |                               | DEPARTMENT OF<br>PARKS AND RECREATION<br>COUNTY OF MAUI                                                                                                                                                                                                     |                              |                                     |                                             | Mayor<br>HENRY OLIVA<br>Director<br>ALLEN SHISHIDO      | المُعَمَّدُ<br>المُعَمَّدِ<br>المُعَمَّدِ |
|---------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------------------------------|---------------------------------------------|---------------------------------------------------------|-------------------------------------------|
| _                                     | A CONTRACTOR                  | 1580-C KAAHUMANU AVENUE WAILUKU, HAWAII 96793                                                                                                                                                                                                               | <b>*</b> 97                  | JUN 25                              | P3:12                                       | Deputy Director<br>(808) 243-7230<br>FAX (808) 243-7934 | ũ.,                                       |
|                                       |                               | TO: David W. Blane, Planning Director                                                                                                                                                                                                                       | Bî r<br>Cu                   | RLCEIV                              |                                             |                                                         | ба.<br>Д                                  |
|                                       |                               | TE: June 19, 1997                                                                                                                                                                                                                                           |                              |                                     |                                             |                                                         | Ц                                         |
|                                       |                               | ECT: Kulamalu Project<br>CPA97002, CIZ 970005, EA970005<br>TMK: 2-3-008:por.5, por.38, por.39                                                                                                                                                               |                              |                                     |                                             |                                                         | \$<br>;;                                  |
| · · · · · · · · · · · · · · · · · · · | and play<br>Plan. T           | re reviewed the subject application and note that<br>yground assessment requirement outlined in the M<br>he Community Plan requires a 15.01 acre park,<br>rk instead. A justification for the change in land                                                | lakawad<br>but the           | o-Pukalar<br>applicar               | ni-Kula Co<br>nt proposes                   | mmunity                                                 | 13 <del>1</del><br>3.8                    |
|                                       | Waste N<br>on topo<br>Thank y | Dicant shall arrange a meeting with my office an<br>Management to make an official presentation of the<br>ography, metes and bounds, easements, and ex<br>you for the opportunity to comment. Should you<br>43-7626 or Patrick T. Matsui, Chief-Planning an | he park<br>cisting<br>have a | parcel in<br>onsite/of<br>ny questi | cluding inf<br>fsite infras<br>ions, please | ormation<br>structure.<br>e contact                     | (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)   |
|                                       | HO:PT                         | M:GU                                                                                                                                                                                                                                                        |                              |                                     |                                             |                                                         |                                           |
| *                                     |                               | Charles Jencks, Director-Public Works & Waste                                                                                                                                                                                                               | _                            | -                                   |                                             |                                                         | Ċ                                         |
|                                       | (                             | Patrick T. Matsui, Chief- Parks Planning & Dev<br>Gerald Unabia, Parks Project Manager<br>Files                                                                                                                                                             | elopme                       | nt                                  |                                             |                                                         | 1                                         |
| :                                     | dblane.m10                    |                                                                                                                                                                                                                                                             |                              |                                     |                                             |                                                         | .*                                        |
|                                       |                               |                                                                                                                                                                                                                                                             |                              |                                     |                                             |                                                         | eş.                                       |
|                                       |                               |                                                                                                                                                                                                                                                             |                              |                                     |                                             |                                                         | F                                         |
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# KULAMALU

July 18, 1997

Mr. Henry Oliva Director Department of Parks and Recreation 1580-C Kaahumanu Avenue Wailuku, Hawaii 96793

# SUBJECT: Kulamalu Project

Dear Mr. Oliva:

We have received a copy of your June 19, 1997 memorandum to David Blane regarding the subject project. We would like to provide a response to the comments.

The proposed reduction in land area for the park from 15.01 acres to 14.74 acres is due to additional right-of-way set aside for the proposed through roadway which links with Kula Highway. Land use allocations for Park, Public/Quasi-Public, Business/Commercial, and Multi-Family Residential were all reduced slightly in order to accommodate the increase in right-of-way.

With regard to topography, metes and bounds, easements, and existing onsite and offsite infrastructure for the park parcel, this information will be formulated as part of the subdivision process. We intend to work closely with you in ensuring that your concerns are addressed.

P. O. Box 1417 . WALLIKU, HAWAII 96793 . 808/244-1500 . 808/242-2777

If you have any questions, please feel free to call me.

Very truly yours,

KULAMALU LIMITED PARTNERSHIP By\_ Don S. Fujimoto Its Vice President

DF:to

cc: Don Schneider, Planning Department Milton Arakawa, Munekiyo & Arakawa, Inc.

| DEPARTMENT OF BUSINE<br>ECONOMIC DEVELOPME                                                                                                                                                                                                                                                  | -                                                                                                           |                                          | BF                                        | NJAMIN J. CAYETA<br>GOVERNOR<br>SEIJI F. NAYA<br>DIRECT<br>ADLEY J. MOSSM.<br>DEPUTY DIRECT<br>RICK EGGED<br>R. OFFICE OF PLANNING |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| OFFICE OF PLANNING<br>235 South Beretania Street, 6th Flr., Honolulu<br>Mailing Address: P.O. Box 2359, Honolulu, Ha                                                                                                                                                                        |                                                                                                             | JUN 30                                   |                                           | (808) 587-28<br>(808) 587-2824<br>£.1                                                                                              |
| Ref. No. P-6756                                                                                                                                                                                                                                                                             | ι                                                                                                           | NEULT                                    | :                                         | 1                                                                                                                                  |
| June                                                                                                                                                                                                                                                                                        | 20, 1997                                                                                                    |                                          |                                           | قعم<br>ن                                                                                                                           |
| Mr. David W. Blane<br>Planning Director                                                                                                                                                                                                                                                     |                                                                                                             |                                          |                                           | <b>Q</b>                                                                                                                           |
| Planning Department<br>County of Maui<br>250 South High Street<br>Wailuku, Hawaii 96793                                                                                                                                                                                                     |                                                                                                             |                                          |                                           | ۵-۱۰۰<br>۱<br>۱۰۰۰                                                                                                                 |
| Attention: Mr. Don A. Schneider                                                                                                                                                                                                                                                             |                                                                                                             |                                          |                                           | · .                                                                                                                                |
| Subject: Kulamalu Project, CPA97000<br>TMK: 2-3-08: por. 5, por. 38<br>Pukalani, Maui                                                                                                                                                                                                       | 2, CIZ970005, EA9700<br>3, and por. 39                                                                      | 05                                       |                                           | -                                                                                                                                  |
| We have reviewed the proposal by Kult<br>multi-family residential, single-family residential<br>zoning designation is Open Space and R-2 Res<br>Public/Quasi-Public, Business/Commercial, Mi<br>and Open Space. It is our understanding that a<br>Kamehameha Schools/Bishop Estate (TMK: 2- | al, park and public/quas<br>idential. The Communit<br>ilti-Family Residential,<br>portion of the subject pr | i-public us<br>ty Plan des<br>Single Fan | es. The exist ignation is Panily Resident | ing 🦾                                                                                                                              |
| Since the 53.67-acre project site is with<br>comments at this time.                                                                                                                                                                                                                         | in the Urban Land Use I                                                                                     | District, we                             | e have no                                 | \$ }                                                                                                                               |
| Thank you for allowing us the opportune questions, please contact Lorene Maki at 587-2                                                                                                                                                                                                      | nity to review this propo<br>888.                                                                           | sai. If you                              | have any                                  | <b>1</b> (                                                                                                                         |
|                                                                                                                                                                                                                                                                                             | Sincerely,<br>Rick Eggen<br>Director<br>Office of Planning                                                  |                                          |                                           | <b>ग</b> ा  <br>•<br>•<br>•<br>•<br>•<br>•<br>•<br>•                                                                               |
| cc: Ms. Esther Ueda, LUC                                                                                                                                                                                                                                                                    |                                                                                                             |                                          |                                           | 7                                                                                                                                  |
|                                                                                                                                                                                                                                                                                             |                                                                                                             |                                          |                                           | ₹.}<br>}                                                                                                                           |
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# '97 UN 27 P3:18 STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES

P.O. BOX 621 HONOLULU, HAŴAII 96809

LD-NAV Ref.: CPA97002.RCM

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JN 26 1997

The Honorable David W. Blane Planning Director County of Maui Planning Department 250 S. High Street Wailuku, Hawaii 96793

Dear Mr. Blane:

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SUBJECT: Review : Application for Community Plan Amendment Change in Zoning I. D. Nos.: CPA97002, CIZ970005 and EA970005 Project : Kalamalu Project Applicant : Kalamalu Limited Partnership Location : Pukalani, Island of Maui, Hawaii TMK : 2nd/ 2-3-08: Portion of 5 and 38

Thank you for the opportunity to review and comment on the subject Application for Community Plan Amendment and Change in Zoning pertaining to the Kalamalu project.

Our Commission on Water Resource Management has the following comments to offer on the proposed project:

- 1. We recommend coordination with the county government to incorporate this project into the county's Water Use and Development Plan; and
- 2. A Well Construction Permit (approved June 2, 1997), and a Pump Installation Permit (to be based on pump test results), from CWRM would be required before ground water is developed as a source of supply for the project.

Our Engineering Branch has confirmed that the proposed project site is located in Zone C (unshaded). This is an area of minimal flooding.

The Department of Land and Natural Resources has no other comments to offer on the proposed project at this time. Should you have any questions, please contact Nick Vaccaro of the Land Divisions' Support Services Branch at 1-808-587-0438.

HAWAII: Earth's best!

Aloha,

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MICHAEL D. WILSON

c: Maui Land Board Member At Large Land Board Member Maui District Land Office AQUACULTURE DEVELOPMENT PROGRAM AQUATIC REBOURCES BOATING AND OCEAN RECREATION CONSERVATION AND ENVIRONMENTAL AFFAIRS CONSERVATION AND RESOURCES ENFORCEMENT CONVEYANCES FORESTRY AND WILLIFE HISTORIC PRESERVATION LAND MANAGEMENT STATE PARKS WATER AND LAND DEVELOPMENT WATER RESOURCE MANAGEMENT

# KULAMALU

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July 16, 1997

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Mr. Michael D. Wilson, Director<br>State of Hawaii                                                                                                                                                                                                  |              |
| Department of Land and Natural Resources<br>P.O. Box 621<br>Honolulu, Hawaii 96809                                                                                                                                                                  | &.†<br>:     |
| Subject: Kulamalu Project<br>Pukalani, Maui, Hawaii                                                                                                                                                                                                 | \$ A<br>     |
| Dear Mr. Wilson:                                                                                                                                                                                                                                    | <u>e</u> 1   |
| We have received a copy of your June 26, 1997 letter to the County of Maui Planning<br>Department relating to the subject project. We would like to provide a response to your<br>comments.                                                         | 8            |
| In accordance with the comments of the Commission on Water Resources Management                                                                                                                                                                     | 2.1)<br>11 1 |
| (CWRM), we are coordinating with the County of Maui Department of Water Supply to incorporate the project into their Water Use and Development Plan.                                                                                                |              |
| The CWRM has also approved a Well Construction Permit for our proposed well at Huluhulunui. We intend to initiate well drilling and construction shortly. Thereafter, a pump installation permit application is expected to be filed with the CWRM. |              |
| If you have any question, please feel free to call me.                                                                                                                                                                                              |              |
| Very truly yours,                                                                                                                                                                                                                                   |              |
| KULAMALU LIMITED PARTNERSHIP                                                                                                                                                                                                                        |              |
| By<br>Don S. Fujimoto<br>Its Vice President                                                                                                                                                                                                         | A.           |
| DF:to<br>cc: Don Schneider, Planning Department                                                                                                                                                                                                     | 4            |
| w. YalleYnerwepipTyscIYLLformebuitneysLig87betllon, wpd                                                                                                                                                                                             | 1<br>2 }     |
| P. O. Box 1417 • Walliku, Hawali 98793 • 808/244-1500 • 808/242-2777                                                                                                                                                                                | <b>a</b> 1   |

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ſ RALPH NAGAMINE, L.S., P.E. LINDA CROCKETT LINGLE Land Use and Codes Administration Mayor EASSIE MILLER, P.E. CHARLES JENCKS Wastewater Reclamation Division Director A9:45 LLOYD P.C.W. LEE, P.E. DAVID C. GOODE JU. Engineering Division **Deputy Director** BRIAN HASHIRO, P.E. AARON SHINMOTO, P.E. **Highways Division** COUNTY OF MAUL Chief Staff Engineer DEPARTMENT OF PUBLIC WORKS Se . Solid Waste Division Aurol AND WASTE MANAGEMENT 200 SOUTH HIGH STREET WAILUKU, MAUI, HAWAII 96793 June 30,1997 DAVID W. BLANE, DIRECTOR OF PLANNING MEMO TØ: LES JENCKS, DIRECTOR OF PUBLIC WORKS AND WASTE FROM: MANAGEMENT COMMUNITY PLAN AMENDMENT, CHANGE IN ZONING AND SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT KULAMALU PROJECT TMK (2) 2-3-008:005, 038 & 039 CPA-97/002, CIZ-97/005, EA-97/005 We reviewed the subject application and have the following comments. A road lot shall be provided for the proposed collector road to provide for 1.

- 1. A road lot shall be provided for the proposed collector road to provide for future 100-foot wide right-of-way if designated as a "Parkway" classification and improved to County standards to include, but not be limited to, pavement widening, construction of curb, gutter, and sidewalk, and relocation of utilities underground. Said lot shall be dedicated to the County upon acceptance of the improvements. The slope of said proposed collector road shall not exceed eight (8) percent as per AASHTO standards.
- 2. A 50' radius shall be provided at the intersection of the proposed collector road and the adjoining State road. Please confirm with the State Department of Transportation, Highways Division, for additional requirements.
- 3. A final detailed drainage master and erosion control plan including, but not limited to, hydrologic and hydraulic calculations and scheme for controlling erosion and disposal of runoff water shall be submitted to the Department of Public Works, Engineering Division, for our review and approval. The master plan shall provide verification that the grading and runoff water generated by the project will not have an adverse effect on the adjacent and downstream properties.

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Mr. David W. Blane June 30, 1997 Page 2 ĺ

# 4. A site plan and a "sight distance" report to determine required sight distance and available sight distance at existing and proposed street intersections shall be provided for our review and approval.

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- 5. The 100-year flood inundation limits shall be shown on the project site plans.
- 6. Construction waste should be taken to the Maui Demolition and Construction Landfill on North Kihei Road near its intersection with Honoapiilani Highway.
- 7. A subdivision application for the proposed project has not yet been received as of this date. The subdivision shall be in conformance with the approved community plan and zoning amendments prior to granting of final approval.

If you have any questions, please call David Goode at 243-7845.

#### DG:co/mt

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xc: Engineering Division Solid Waste Division Wastewater Reclamation Division S:LUCA\CZM\KULAMALU.

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### KULAMALU LIMITED PARTNERSHIP

July 18, 1997

Mr. Charles Jencks, Director Department of Public Works and Waste Management 200 South High Street Wailuku, Hawaii 96793

> SUBJECT: Kulamalu Project TMK 2-3-8:por. 5, por. 38, por. 39 Pukalani, Hawaii

Dear Mr. Jencks:

We have received a copy of your memorandum dated June 30, 1997 to the Director of Planning relating to the subject project. We would like an opportunity to provide a response to the issues raised in your letter.

With regard to the slope of the proposed collector road, we note that adjacent land uses within the project site will consist of business uses. On abutting makai lands, there is a planned school and other lands zoned for single family residential uses. Under these conditions, it would be appropriate to characterize the adjacent land use as mountainous urban and to use a lower design speed for the highway. Therefore, the design criteria could be adjusted to utilize a design speed of 40 miles per hour (posted 35 mph) and maximum grade of 10 percent (AASHTO Green Book, page 525). Since the project site is close to the terminus of the collector road, it is desirable to reduce the highway speed limit approaching Kula Highway to provide the transition from the open highway to the Stop condition at Kula Highway.

We will comply with a 50 foot radius at the intersection of the collector road and the adjoining State road. A final detailed drainage master and erosion control plan will be submitted to the Engineering Division for review and approval.

A sight distance report will be submitted to the Department for review and approval. We will show the 100-year flood inundation limits on the project site plans.

We intend to arrange for construction waste to be taken to the Maui Demolition and Construction Landfill.

Mr. Charles Jencks July 16, 1997 Page Two

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We understand that any future subdivision application must be in conformance with applicable community plan and zoning provisions.

Thank you for the opportunity to provide a response. If you have any questions, please feel free to call me.

P. O. Box 1417 • WALLIKU, HAWAH 96793 • 608/244-1500 • 808/242-2777

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Very truly yours,

KUDAMALU LIMITED PARTNERSHIP  $\mathcal{W}$ 0 By\_ Don S. Fujimoto Its Vice President

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DF:to cc: Don Schneider, Planning Department Milton Arakawa, Munekiyo & Arakawa, Inc. M 1 1 BENJAMIN J. CAYETANO GOVERNOR



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STATE OF HAWAII DEPARTMENT OF TRANSPORTATION 869 PUNCHBOWL STREET HONOLULU, HAWAII 96813-5097

July 3, 1997 N. -

KAZU HAYASHIDA DIRECTOR DEPUTY DIRECTORS

IN REPLY REFER TO: STP 8.8023

Mr. David W. Blane Director Planning Department County of Maui 250 South High Street Wailuku, Hawaii 96793

Dear Mr. Blane:

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Subject: Kulamalu Project Applications for Community Plan Amendment and Change in Zoning I.D.: CPA97002, CIZ970005, EA970005 TMK: 2-3-008: por 5, por 38 & por 39

Thank you for your transmittal requesting our review on the subject applications.

Our comments are as follows:

- 1. The Maui Long Range Land Transportation Plan (MLRLTP) recommends a new two lane Upcountry-Kihei roadway which will connect Haleakala Highway to Piilani Highway. Currently there are several alternative alignments, including one which runs through the subject development. The developer should coordinate with our Highways Division for any right-of-way (ROW) requirements and dedicate the land when necessary.
- 2. The MLRLTP also recommends the widening of Kula Highway, fronting the subject project from two to four lanes. Additional ROW or setback may be required and should be coordinated with our Highways Division.
- 3. The developer should be responsible for those required transportation improvements attributable to his project and for his pro-rata share of required regional roadway improvements.

Mr. David W. Blane Page 2 July 3, 1997 (

## STP 8.8023

The proposed intersection improvements identified in the Traffic Impact Analysis Report (TIAR) including traffic signals should be closely coordinated with our Highways Division.

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- 4. The design of the park in proximity to the highway right-of-way (ROW) should consider the prevention of balls entering the highway ROW.
- 5. Plans for construction work within the State highway right-of-way must be coordinated and approved by our Highways Division.

Very truly yours,

mhide n br KAZŬ HAYASHIDA

Director of Transportation

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## KULAMALU LIMITED PARTNERSHIP

July 18, 1997

Mr. Kazu Hayashida, Director State of Hawaii Department of Transportation 869 Punchbowl Street Honolulu, Hawaii 96813

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## Subject: Kulamalu Project TMK 2-3-8:por. 5, por. 38 and por. 39 Pukalani, Maui, Hawaii

Dear Mr. Hayashida:

We have received a copy of your letter dated July 3, 1997 to the County of Maui Planning Department relating to the subject project. We would like to take this opportunity to provide a response to the issues raised in the letter.

With regard to the Upcountry-Kihei roadway, we understand that several alternative alignments are being considered. Our intent is to coordinate with the Highways Division regarding applicable right-of-way requirements.

We understand that the Maui Long Range Transportation Plan recommends the widening of Kula Highway, from two to four lanes, in the vicinity of the project. In conjunction with the Highways Division, Maui Office of the DOT, we have shown a structure setback line of 40 feet from the existing right-of-way line to allow space for future widening in the vicinity of the project.

We will construct, at our cost, those transportation improvements specified in our traffic impact study as project related. We have no objection to entering into discussions with the Highways Division regarding pro rata share of regional roadway improvements. The implementation of traffic signals a the project roadway-Kula Highway intersection will also be coordinated with the Highways Division.

Mr. Kazu Hiyashida July 16, 1997 Page Two

It is intended that park design be conducted by the County of Maui. Thus, we will forward concerns regarding balls entering the State highway right-of-way tot he Department of Parks and Recreation.

We also intend to coordinate construction work within the State highway right-of-way with the Highways Division.

Thank you for the opportunity to provide a response. If you have any questions, please feel free to call me.

Very truly yours,

KHEAMALU LIMITED PARTNERSHIP Me By Don S. Fujimoto Its Vice President

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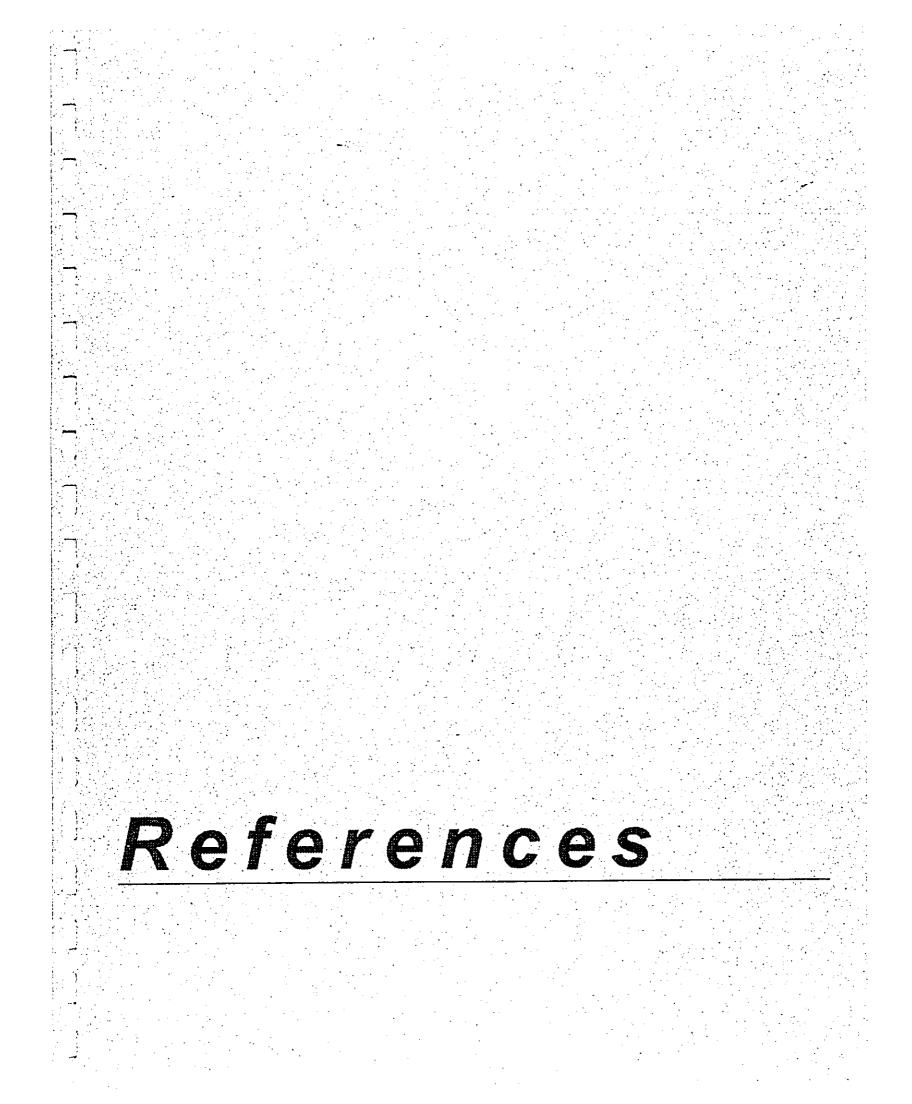
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cc: Don Schneider, Planning Department Milton Arakawa, Munekiyo & Arakawa, Inc.

P. O. Box 1417 • Walliku, Hawai 96793 • 808/244-1500 • 808/242-2777



#### <u>References</u>

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Department of Geography, University of Hawaii, <u>Atlas of Hawaii</u>, Second Edition, University of Hawaii Press, 1983.

R.W. Beck, Solid Waste Characterization Study- Maui, Hawaii, December 1994.

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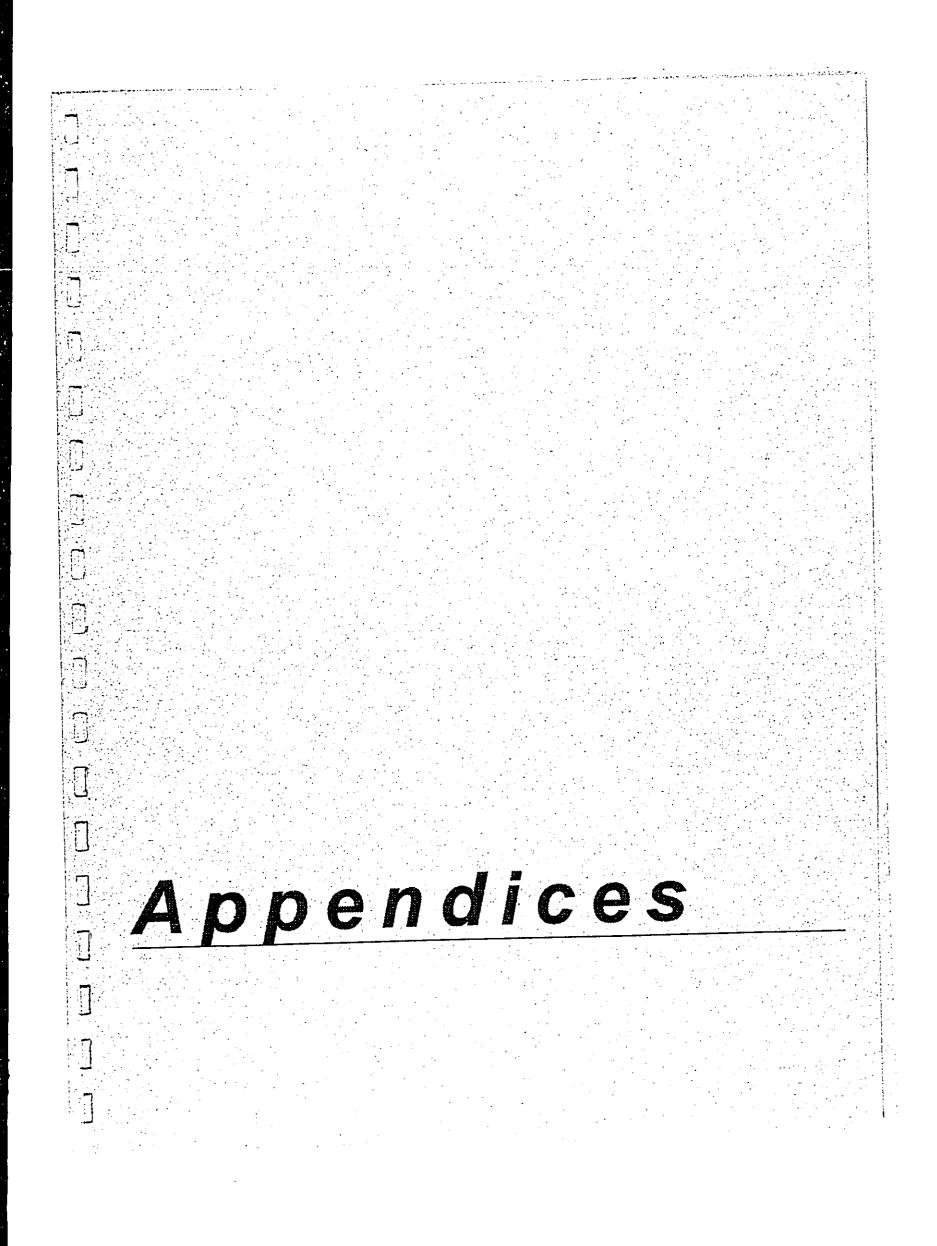
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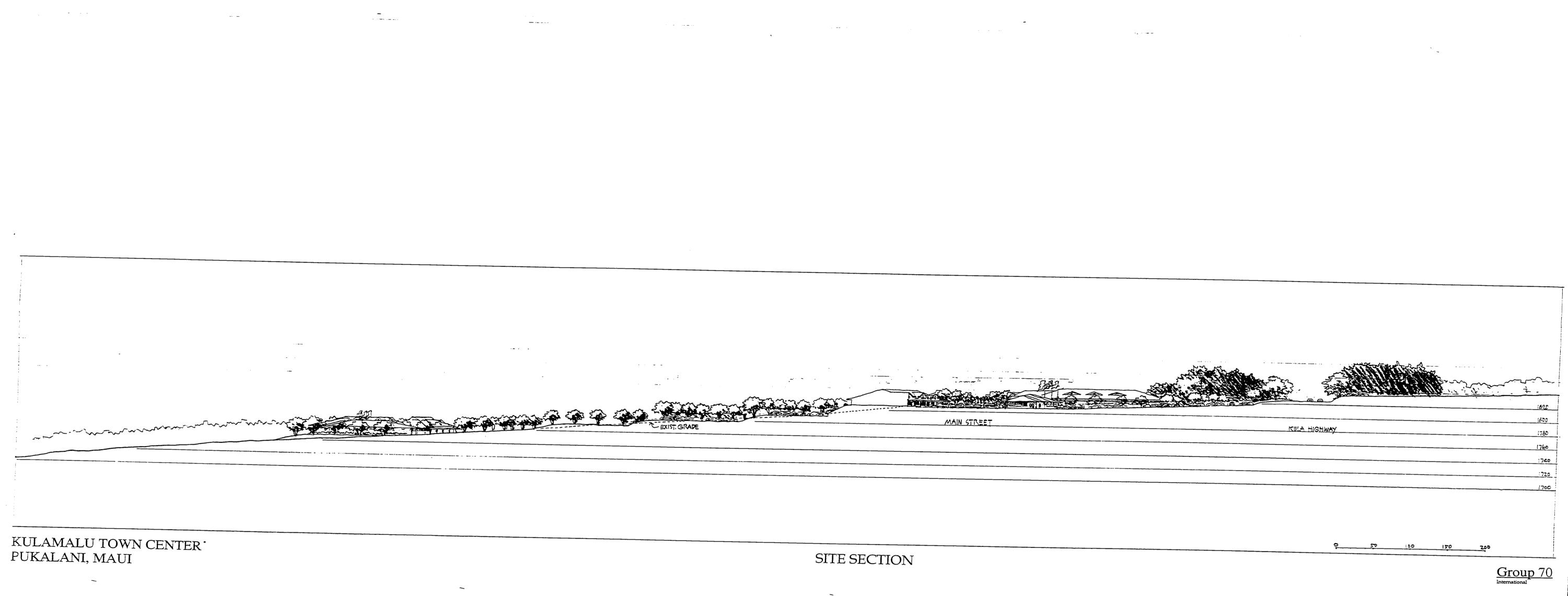
# **Appendix A** Site Plan and Site Section

# OVERSIZED DRAWING/MAP

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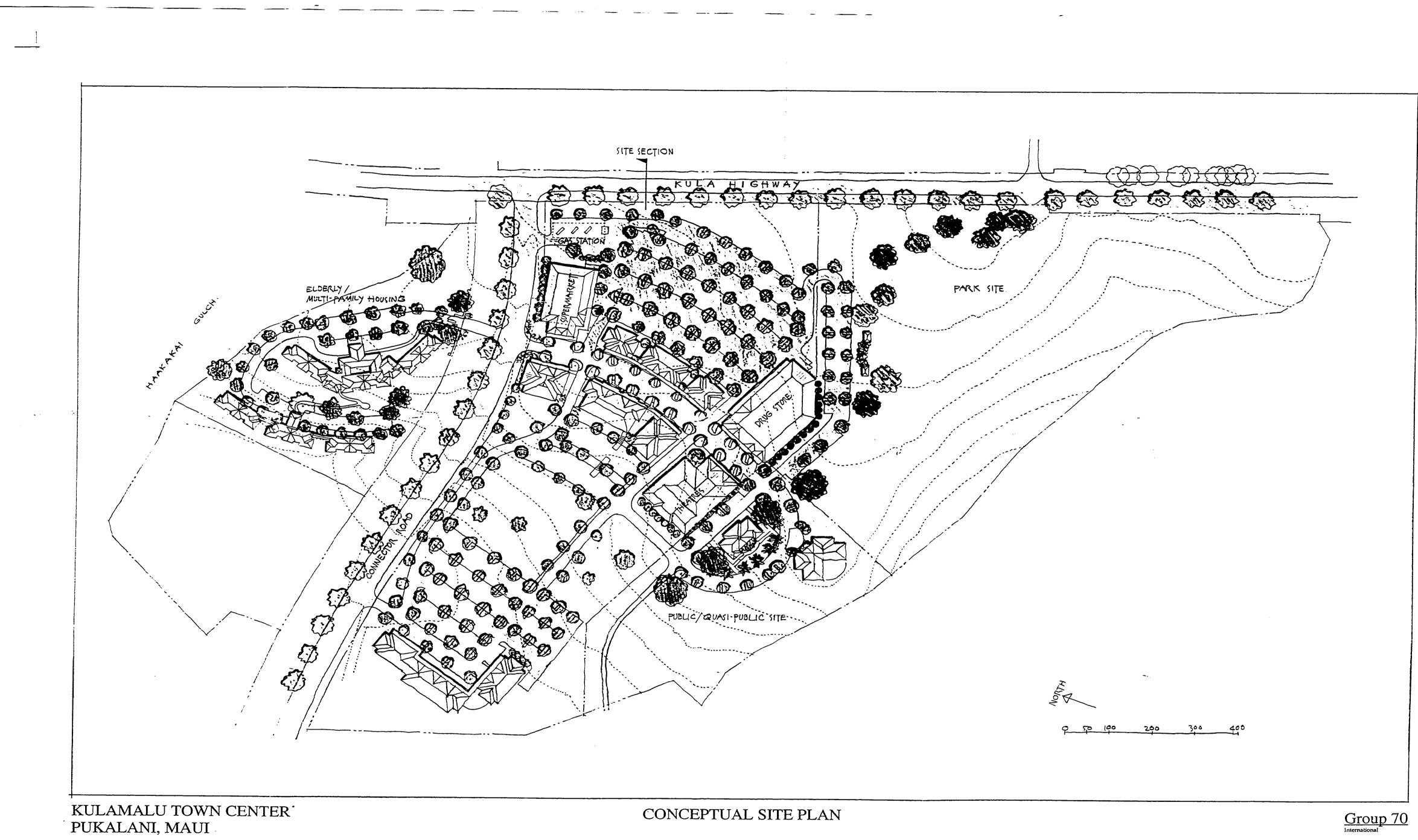
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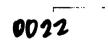
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# Appendix B-1

# Archaeological Inventory Survey

Report 1700-030196

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# **Archaeological Inventory Survey** 44-Acre Pukalani Terrace Subdivision III Land of 'A'apueo, Makawao District Island of Maui Paul H. Rosendahl, Ph.D., Inc. Archaeological • Historical • Cultural Resource Management Studies & Services P

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# Archaeological Inventory Survey 44-Acre Pukalani Terrace Subdivision III

Land of 'A'apueo, Makawao District Island of Maui (TMK:2-3-08:Por.5)

BY Warren Wulzen, B.A. • Projects Supervisor and Paul H. Rosendahl, Ph.D. • Principal Archaeologist with Helen Wong Smith, M.A. • Historical Researcher PREPARED FOR Dowling Company, Inc. c/o Munekiyo & Arakawa, Inc. 1823 Wells Street, Suite 3 Wailuku, Hawai'i 96793 MARCH 1996 C1996 Paul H. Rosendahl, Ph.D., Inc. Paul H. Rosendahl, Ph.D., Inc. Archaeological • Historical • Cultural Resource Management Studies & Services HAWAII: 204 Walanuanua Ava. - Hilo, Hawaii 96720 - (808) 969-1762 - GLAM: P.O. Box 23305 - G.M.F., Guam 96921 - (671) 472-3117

### SUMMARY

At the request of Mr. Don Fujimoto, vice president of Dowling Company, Inc., Paul H. Rosendahl, Ph.D., Inc. (PHRI) conducted an archaeological inventory survey of a 44-acre parcel located in the Land of 'A'apueo, Makawao District, Island of Maui (TMK:2-3-08:Por.5). The purpose of the survey was to identify all sites of potential archaeological significance present within the project area and evaluate each site for significance.

The project area contains previously recorded sites. Two are petroglyph sites located in the gulches that border the PukalaniTerrace property (50-50-10-1061<sup>•</sup> and 50-50-10-1062). A third, Site 50-50-10-4179 (previously reported as PHRI temporary Site 1707-1, McPhatter and Rosendahl 1996) is a petroglyph site in a tributary of Kaluapalani Gulch, south of Pu<sup>•</sup>u o Weli. The fourth is a wall, Site 50-50-10-4178 (previously reported as PHRI temporary Site 1707-2, ibid.) In addition, two other unrecorded collections of rock, apparently cleared from pineapple fields, were located on the fringe of the present project area during reconnaissance survey in the adjoining property (ibid.).

One site (Site 4181) was identified during the current work (previously reported as PHRI temporary site 1700-1; Wulzen and Rosendahl 1996). The site consists of four features: two agricultural clearing piles, and two rock alignments connecting the clearing piles. The two rock alignments function as terrace walls.

Two test unit excavations were placed against the rock alignments forming the terrace features. Only one excavation yielded artifacts, and neither yielded ecofacts. Site 4181 is assigned a function of historic to modern agriculture, and has been evaluated as no longer significant. No further archaeological work is recommended.

 State Inventory or Historic Places site number (50=State of Hawai'i; 50=Maui; 10=USGS 7.5' Quad [1983; "Pu'u o Kali"].

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## INTRODUCTION

#### BACKGROUND

At the request of Mr. Don Fujimoto, vice president of Dowling Company, Inc., Paul H. Rosendahl, Ph.D., Inc. (PHRI) conducted an archaeological inventory of a 44-acre parcel that is a portion of the 305-acre Pukalani Terrace Subdivision Unit III. The subject property is located in the Land of 'A'apueo, Makawao District, Island of Maui (TMK:2-3-08:Por.5) (Figure 1, in Appendix A; USGS 1957).

The overall purpose of the survey was to satisfy the cultural resources requirements of the Department of Land and Natural Resource - State Historic Preservation Division (DLNR-SHPD). The project was conducted February 1 and 2, 1996 by Crew Chief Blair McPhatter, B.A., and Field Archaeologist Harley Lanham, B.A. Additional Survey, site recording, and testing were conducted on February 6-9, 1996 by Projects supervisor, Warren Wulzen, B.A. Principal Archaeologist Paul H. Rosendahl, Ph.D., and Hawaii Projects Director, Alan T. Walker, B.A. provided overall guidance for the project.

#### SCOPE OF WORK

The basic purpose of an archaeological inventory survey is to identify—to discover and locate on available maps—all sites and features of potential archaeological significance present within a specified project area. An inventory survey is an initial level of archaeological investigation. It is extensive rather than intensive in scope, and is conducted primarily to determine the presence or absence of archaeological resources. A survey of this type indicates both the general nature and variety of archaeological remains present and the general distribution and density of such remains. It permits a general significance assessment of the archaeological resources and assists in the formulation of recommendations and estimates for any subsequent mitigation work that might be necessary or appropriate. Such mitigative work could include further data collection involving detailed recording of sites and features, and selected test excavations; in addition, mitigation could include further data-recovery excavations, construction monitoring, interpretive planning and development, and/or preservation of sites and features with significant scientific research, interpretive, and/or cultural values.

The basic objectives of the survey would be four-fold: (a) to identify all sites and site complexes present within the project area; (b) to evaluate the potential general significance of all identified archaeological remains; (c) to determine the possible impacts of proposed development upon the identified remains; and (d) to define the general scope of any subsequent further data collection and/or other mitigation work that might be necessary or appropriate.

Based on a review of readily available background literature, basic familiarity with the general project area, and extensive familiarity with the current requirements of pertinent review authorities, the following specific tasks were determined to constitute an adequate and appropriate scope of work:

1. Review archaeological and historical literature relevant to the project area, and conduct historical documentary research (emphasis on readily available literature and documentary sources);

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- Conduct 100% coverage high intensity ground survey of the entire project area, to find and record (a) any previously identified sites and features, and (b) any previously unidentified sites and features;
- Conduct limited subsurface testing by manual excavations of the proposed culvert area and the features identified during a December 13, 1995 field inspection of the property, (a) to determine the presence or absence of potentially significant subsurface cultural features or deposits, and (b) to obtain suitable samples for age determination analyses;
- 4. Laboratory analyses—the principal areas of analysis include age determination, artifactual analysis, and ecofactual; and
- 5. Analyze field and historical research data, and prepare appropriate reports.

The inventory survey was carried out in accordance with the current standards for inventorylevel survey required by DLNR-SHPD. The significance of all archaeological remains identified within the project area was assessed in terms of (a) the National Register criteria contained in the Code of Federal Regulations (36 CFR Part 60), and (b) the criteria for evaluation of traditional cultural values prepared by the National Park Service (1990). DLNR-SHPD and Maui County Planning Department use these criteria to evaluate eligibility for both the Hawaii State and National Register of Historic Places.

To further facilitate client management decisions regarding the subsequent treatment of resources, the preliminary significance of all archaeological remains identified during the survey was to also be evaluated in terms of three PHRI cultural resource management value modes that are derived from the previously mentioned federal evaluation criteria. Sites were to be evaluated in terms of potential scientific research, interpretive, and/or cultural values. Scientific research value refers to the potential of archaeological resources for producing information useful in the understanding of culture history, past lifeways, and cultural processes at the local, regional, and interregional levels of organization. Interpretive value refers to the potential of archaeological resources for public education and recreation. Cultural value, within the framework for significance evaluation used here, refers to the potential of archaeological resources for archaeological resources for the preservation and promotion of cultural and ethnic identity and values.

#### PROJECT AREA DESCRIPTION

The project area consists of c. 44 acres, a portion of the 305-acre Pukalani Terrace Subdivision Unit III, and is located in the Land of 'A'apueo, Makawao District, Island of Maui (TMK:2-3-08:Por.5). The project area is depicted on two topographic maps, "Kilohana, Hawaii" (USGS 1983a), and "Puu O Kali, Hawaii" (USGS 1983b) (*Figure 1*). 'A'apueo may have been located in the old Kula District (for more detail, see Appendix B, Historical Documentary Research). The parcel is primarily former pineapple land, bounded on the north and south by branches of Kaluapulani Gulch (Kaakakai Gulch on tax maps). The eastern project boundary is the Kula Highway (Hawaii State Route 37). On the west, the project area is adjacent to a 250acre parcel that was subjected to reconnaissance survey by PHRI just prior to the present work (McPhatter and Rosendahl 1996). Pu'u o Weli, which has been used as a cinder quarry, is within the 250-acre parcel, just west of the present project area.

Most of the project area was originally part of a 160-acre parcel deeded to Aui as Grant 1167. A small triangular wedge on the northwest side of the project area was a portion of Grant 1829, Apana 1, to Keawe. The Maui Land and Pineapple Company later acquired these properties, and cultivated pineapple there until c. 1970 (D. Fujimoto, pers. comm.). The gently rolling slopes were modified during pineapple planting by plowing and the construction of roads and irrigation ridges. The parcel is currently in use as cattle pasture.

The elevation in the project area ranges from c. 518 m(1,700 ft) above mean sea level (AMSL) at the northwestern end, to c. 572 m(1,875 ft) AMSL at the eastern end of the parcel. Rainfall reported at the Kula Sanitorium station (916 m, 3,004 ftAMSL) averages less than 12.7 cm (five inches) per month (Armstrong 1983:62), and the temperature ranges between highs of 21-26 degrees C (70-78 degrees F) and lows of 16-11 degrees C (60-52 degrees F) (Armstrong 1983:64).

Terrain within the project area slopes moderately from the east end towards the west. Soils comprise Keahua silty clay loam (3%-5% slopes and 7% -15% slopes), Keahua silty clay (7%-15% slopes), Keahua cobbly silty clay (7%-15% slopes), and Keahua cobbly silty clay loam (15%-25% slopes). (Foote et al. 1972: Maps 106 and 115). The Keahua Series comprises "...well drained soils on uplands on the island of Maui. These soils developed in material weathered from basic igneous rock" (Foote et al. 1972:65). Pu'u o Weli is an abandoned cinder quarry, and Kaluapulani Gulch is classified as rock land.

In prehistoric time, this land may have been in the dryland forest and shrub zone (Sohmer and Gustafson 1994). Presently, the vegetation of the Pukalani Terrace project area is dominated by grasses and low-growing shrubs, including guinea grass (*Panicum maximum*), lantana (*Lantana camara L.*), sensitive plant (*Mimosa pudica*), prickly pear (*Opuntia ficus-indica*), agave (*Agave sisalana*), koa-haole (*Leucaena leucocephala*), and other unidentified grasses and weeds. The fringes of the former pineapple fields exhibit a few tree specimens, including a some large koa-haole, silver oak (*Grevillea robusta*), eucalyptus, and Christmas-berry (*Schinus terebinthifolius*) (identifications from Neal 1965).

#### PREVIOUS ARCHAEOLOGICAL WORK

Prior to the reconnaissance of the 250-acre parcel (McPhatter and Rosendahl 1996), no previous archaeological work had been conducted in the Pukalani Terrace Subdivision Unit III project area, and no other archaeological surveys in 'A'apueo are known. However, two survey reports from Omaopio Ahupua'a, to the south of the present project area illustrate the types of sites likely to be found in 'A'apueo. Folk and Hammatt (1993) report three sites, a petroglyph, a rectangular enclosure, and a linear mound. Donham (1992) reports a petroglyph site, three walls, and a rock pile from field clearing.

The DLNR-SHPD has identified two archaeological sites between the Kula Highway and Liholani Street at the far western end of the Pukalani Terrace III property. Both are petroglyph sites; one is in Kaluapulani Gulch (50-50-10-1062), and one is in Kalialinui Gulch to the south (50-50-10-1061) (letter of March 7, 1994 from Don Hibbard, administrator, DLNR-SHPD, to Brian Miskae, director, Maui Planning Department). Sites 1061 and 1062 were formerly known as MA-B22-1 and MA-B22-2 (Cox 1989:92-93). The DLNR site record states of Site 1061 that it stretches for over 500 m along Kalialinui Gulch and contains both rockshelters and numerous (c. 191) petroglyphs (Hommon 1973). Site 1062, in Kaluapulani Gulch, *makai* of the Kula Highway, consists of fewer petroglyphs, and all are on the north side of the gulch, opposite the present project area (Connelly 1973c). These two sites were targeted for relocation.

Two additional sites are reported in the vicinity, but makai of the Pukalani Terrace property, in Kaluapalani Gulch. Site 50-50-10-1231 is another petroglyph site, containing 31 elements (Connelly 1973b). Site 50-50-10-1264 is a burial cave (Connelly 1973a).

During the reconnaissance survey of the contiguous 250-acre portion of the Pukalani Terrace Subdivision III, two previously unrecorded sites were identified (McPhatter and Rosendahl 1996). Site 50-50-10-4179 (reported as PHRI temporary Site1707-1) is located in a branch of Kaluapulani Gulch at the southern foot of Pu'u o Weli and consists of two petroglyph panels containing at least five elements of canoes and crab claw sails. Site 50-50-10-4180 (reported as PHRI temporary Site 1707-2) is an apparent boundary wall located on the bluff above Kalialinui Gulch (*Figure 2*, in back pocket). Two land-clearing piles associated with prior pineapple cultivation were noted just outside of the present project area, but these were not recorded as sites (ibid.). Based on the findings of previous archaeological work in the project area vicinity and on the results of historical documentary research, site types expected were petroglyphs, walls, and sites relating to pineapple cultivation.

# FIELD METHODS AND PROCEDURES

The 100% pedestrian survey was conducted on February I and 2, 1996, by Crew Chief Blair McPhatter, B.A., and Field Archaeologist Harley Lanham, B.A., immediately after concluding the reconnaissance of the contiguous 250-acre parcel. Additional survey, site recording, and testing were conducted on February 6 through 9, 1996, by Projects Supervisor Warren Wulzen. PrincipalArchaeologist Paul H. Rosendahl, Ph.D., and Hawai'i Projects DirectorAlanT. Walker, B.A., provided overall guidance for the project.

Blue-and-white flagging was used by field personnel throughout the project area to mark the start and termination points of each transect. Pink flagging was used at the beginning and ending of every other transect to facilitate sighting from a distance. The single site identified during the pedestrian survey was marked with pink flagging tape and assigned a PHRI temporary number, 1700-1. The site was tagged with an aluminum strip bearing the date, the letters "PHRI" and the site number. All transects and sites were plotted onto a 1"= 300' scale project map (10ft contours) supplied by Austin, Tsutsumi & Associates, Inc., of Wailuku, Maui. Previously recorded sites were relocated using copies of the SIHP site records.

A PHRI site record form was completed for the single recorded site, along with a site map. The site map was produced using metric tape and compass. A complete 35-mm black-and-white photographic record of field work was kept. One artifact was collected from the site surface for analysis.

Subsurface excavation was undertaken at two features of the newly recorded Site 50-50-10-4181. Feature A was excavated with a 2.0 by 0.5 m trench that was placed through the rock alignment to discern architectural detail and soil differences above and below the terrace. Feature B was excavated with a 1.0 by 1.0 m unit placed *mauka* of the center of the rock alignment forming

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the terrace. The two test units were excavated according to natural stratigraphic layers. When necessary, excavation by arbitrary 10 cm levels was employed within thick layers. Excavation proceeded by hand using carefully controlled methods. A datum was established for stratigraphic control. Line levels, trowels, brushes, dust pans and various other small instruments were employed. Excavation of the units terminated below the rock alignments that formed the terraces.

Field documentation of the controlled excavation units consisted of recording the horizontal and vertical proveniences of recovered portable materials, samples, and the subsurface features and strata encountered. These data were recorded on standard PHRI archaeological excavation grid and feature forms. Plan views and stratigraphic section drawings were made to scale. Black-and-white photographs were taken to document the field work and to support the written and graphic record. All recovered matrices were passed through 1/4-inch and 1/8-inch nested screens, and sorted in the field for cultural material, including charcoal, ecofacts, and artifacts.

After an excavation was completed, at least one representative sidewall was profiled and the soils in each natural layer were described on standard PHRI stratigraphic forms, according to U.S. Soil Conservation Guidelines (Soil Survey Staff 1962) and Munsell Color Charts (Kollmorgen Instruments Corp. 1990). Both units were backfilled to their original appearance.

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## FINDINGS

#### SITE 4181

During the inventory survey, a single previously unrecorded site, SIHP No. 50-50-10-4181 (PHRI temporary Site 1700-1) containing four component features, was identified (*Table 1* and *Figure 3*). Features A and B of this site are alignments forming terraces in a small swale between former pineapple fields (*Figures 4* and 5). Features C and D are land-clearing piles of rock, associated with pineapple cultivation. These are similar to the previously reported land-clearing piles that were noted but not recorded as sites during the survey of the 250-acre parcel (McPhatter and Rosendahl 1996).

#### Table 1. Summary of Identified Sites and Features

| SIHP<br>Site |                         | Formal<br>Site or    |                       |     | Functional                                                                                              | *CRM Value<br>Mode Assessment |         |               | Completed<br>FieldWorkTasks |    |    |
|--------------|-------------------------|----------------------|-----------------------|-----|---------------------------------------------------------------------------------------------------------|-------------------------------|---------|---------------|-----------------------------|----|----|
| No.          | Fea.                    | Feature T            | ype                   |     | Interpretation                                                                                          | R                             | I       | C             | DR                          | SC | EX |
| 4181         |                         | Complex              |                       |     | Historic Agriculture                                                                                    | L                             | L       | L             | +                           | +  | +  |
|              | Α                       | Terrace              |                       |     |                                                                                                         |                               |         |               |                             |    |    |
|              | в                       | Terrace              |                       |     |                                                                                                         |                               |         |               |                             |    |    |
|              | С                       | Land Clea            | ring                  | Roc | ck Pile                                                                                                 |                               |         |               |                             |    |    |
|              | D                       | Land Clea            | ring                  | Roc | ck Pile                                                                                                 |                               |         |               |                             |    |    |
|              | al Resourc<br>lueModeAs |                      | R<br>1                | =   | Scientific research<br>Interpretive<br>Cultural                                                         |                               |         |               |                             |    |    |
|              |                         | sessment             | R<br>C<br>H<br>M      |     | Interpretive<br>Cultural                                                                                |                               |         |               |                             |    |    |
| Vai          | lueModeA                | -Nature:             | R<br>C<br>H<br>M      |     | Interpretive<br>Cultural<br>High<br>Moderate                                                            | phs, and                      | written | descriptions) |                             |    |    |
| Vai          | lueModeA                | -Nature:<br>-Degree: | R<br>C<br>H<br>M<br>L |     | Interpretive<br>Cultural<br>High<br>Moderate<br>Low<br>Detailed recording<br>(scaled drawings, photogra | phs, and                      | written | descriptions) |                             |    |    |

Overall, Site 4181 measures c. 100 m in length (SE-NW) and from 20 m to 35 m in width (*Figure 3*). The features are arrayed along a swale, the head of which is c. 25 m southeast of the beginning of Feature C, and continues to an eventual steep drop-off into Kaluapalani Gulch, c. 250 m to the northwest. Features C and D line the upper edges of the swale, while Features A and B run across the swale, perpendicular to the natural flow of water down the drainage.

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Features A and B appear to be constructed from rock removed from the land-clearing piles. Each spans a distance of c. 16 m between the Features C and D, and is one to two meters wide. The greatest height of the architecture is c. 0.7 m. The soil deposit on the uphill side of the alignment is level with the architecture. Both features exhibit some careful stacking in some places, but haphazard piling in others. Cattle trails cut through the features and may have degraded the architecture.

The land-clearing piles, Features C and D, extend along the upper interior edge of the swale. Feature C is much larger, extending for the whole site length, c. 100 m, and with widths of two to five meters. Most of the rock appears to have been tossed over the edge of the swale, but there are a few areas which exhibit piling. Features A and B are both directly connected to Feature C. Feature D runs from the northeast end of Feature A for c. 45 m, terminating near Feature B. The rock piles of Feature D are smaller than those of Feature C, and exhibit some stacking.

Two artifacts were noted during the recording of the site, a short piece of iron rail and a base fragment of a clear glass soda bottle. The bottle fragment was collected from Feature C, south of Feature A, and accessioned as ID No. 1700-1. The diameter of the bottle base is 2¼ in. (5.6 cm) and the glass is 5/16 in. (0.7 cm) thick. The bottle fragment measures 2½ in. (6.8 cm) in maximum height. Embossed around the base of the bottle is the legend, "NET CONTENTS 6½ FLUID OUNCES CITRIC ACID ADDED." The addition of citric acid would indicate that the bottle contained a lemonade or orange soda. The base of the bottle contains manufacturer's marks indicating that the Owens-Illinois Pacific Coast Company, Oakland, California, plant produced the bottle in the 1950s (Toulouse 1972:406-9). Large capital letters "S.Y." presumably indicate the brand of soda, but this does not match any known distributor in Hawai'i (Millar 1988).

Two one-square-meter test units (TU) were excavated at Site 4181. Feature A was tested with TU-1, a 2.0 m by 0.5 m excavation, the orientation of which was perpendicular to the axis of the rock alignment (*Figure 4*). TU-2, a 1.0 m by 1.0 m excavation, was placed against the uphill side of the Feature B alignment (*Figure 5*). In both units, an architectural layer of rock and two soil layers were revealed. The architectural layer at both features rests atop the lower soil layer, and retains the upper layer to the depth of the stacked rock on the uphill side of the alignment.

#### TU-1, Feature A

The datum for TU-1 was established 8.0 cm above the ground surface of the southwest corner of the unit. The rock alignment divided the 2.0 meter-long test unit into two smaller units. The soil surface of the uphill (south) half of the unit sloped from the southeast corner 3.0 cm below datum (cmbd), to 23 cmbd against the rock alignment. Below the alignment, the soil surface ranged from 74 cmbd against the base of the alignment to 91 cmbd in the northwest corner of the unit. In order to retain the integrity of the terrace, architectural rocks were removed only after the soil had been excavated from behind them, and some were not moved at all.

This unit yielded no ecofactual material. A total of 115+ artifacts (the "+" indicating that due to the degradation of the plastic, small pieces continue to break off in storage) were collected from the screens and *in situ*. Pieces of black plastic, commonly used in the pineapple fields as mulch, made up 114+ of the artifactual total. These were found behind the alignment as deep as 97 cmbd, or deeper than the existing architecture. The only other artifact was a small (1.0 cm by 2.3 cm by 2.2 cm) triangular piece of ceramic, 0.5 cm thick, composed of light brown clay and glazed white on both sides. This artifact is not large enough to be diagnostic. No artifacts were found in Layer II.

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The excavation of Feature A revealed two soil layers (Figure 6). The designation "A" was used for architectural rock that was clearly a part of the design and construction of the alignment forming the terrace. For purposes of differentiation of the collections from south and north of the alignment, Layer I was subdivided into Layer IA, uphill (south) of the stacked rock, and Layer IB, below (north of) the alignment. The soil descriptions for Layer IA and IB were identical. The Layer I soil appears to have been deposited contemporaneously with the construction of the terrace alignment, which consists of only a single line of basalt boulders and cobbles. Layer II was found beneath Layer IB, and appeared to represent natural soil development. A description of the soil stratigraphy follows:

#### Layer

#### Description

- A 17-93 cmbd, ranging from 0-76 cm in thickness; architectural layer; basalt boulders; very abrupt, irregular boundary; cultural layer, constructed by humans;
- IA 3-93 cmbd, ranging from 70-88+ cm in thickness; very dusky red (2.5YR 2.5/3 moist); clay loam; dark reddish brown (SYR 3/3 dry); moderate, fine, crumb structure; slightly hard, friable, sticky, plastic consistence; many, fine, tubular roots; many, fine, interstitial pores; unknown boundary; cultural layer containing one ceramic piece and 109+ pieces of black plastic;
- IB 88-98 cmbd, ranging from 8-11 cm in thickness; very dusky red (2.5YR 2.5/3 moist); clay loam; dark reddish brown (5YR 3/3 dry); moderate, fine, crumb structure; slightly hard, friable, sticky, plastic consistence; many, fine, tubular roots; many, fine, interstitial pores; abrupt, smooth bound-ary; cultural layer containing five pieces of black plastic;
- II 97-113+ cmbd, ranging from 11-14+ cm in thickness; very dusky red (2.5YR 2.5/2 moist); clay loam; dusky red (2.5YR 3/3 dry); weak, medium, subangular blocky; slightly hard, friable, slightly sticky, slightly plastic consistence; common, medium, tubular roots; common, medium, interstitial pores; non-cultural layer.

#### TU-2, Feature B

The datum for TU-2 was established 10 cm above the ground surface of the southwest corner of the unit. The basalt boulders of the terrace alignment formed the north wall of the unit and were not excavated. Unlike at Feature A, numerous cobbles and small boulders were piled to the south of the alignment, apparently to protect it from erosion. The surface of the unit sloped from the southwest corner, 10 cmbd, to 18 cmbd in the southeast corner, to 23 cmbd against the rock alignment. Below the piled rock, the soil surface ranged from 56 cmbd to 59 cmbd.

TU-2 yielded neither ecofactual nor artifactual material. The excavation of Feature B revealed two soil layers designated Layer I and II, similar to those found in Feature A. The designation "A" was used for architectural rock that was clearly a part of the design and construction of the alignment forming the terrace. Layer II was found beneath Layer I, and appeared to represent natural soil development. A description of the soil stratigraphy follows:

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| Layer                                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                            | A 20-73 cmbd, ranging from 0-53 cm in thickness; stony texture; architec-<br>tural layer - terrace alignment along north side of unit; very abrupt<br>boundary; cultural layer;                                                                                                                                                                                                                                                                                                                                                                                |
|                                            | I 10-64 cmbd, ranging from 31-48 cm in thickness; dark reddish brown<br>(5YR 3/2 moist); clay loam; dark reddish brown (5YR 3/3 dry); moderate,<br>medium, crumb structure; slightly hard, friable, sticky, plastic consis-<br>tence; common, fine, tubular roots; common, fine, interstitial pores; clear,<br>smooth boundary; non-cultural layer;                                                                                                                                                                                                            |
|                                            | II 55-73+ cmbd, ranging from 0-12 cm in thickness; dusky red (2.5YR 3/4 moist); clay loam; dusky red (2.5YR 4/4 dry); weak, medium, subangular blocky structure; hard, friable, slightly sticky, slightly plastic consistence; few, fine, tubular roots; few, fine, interstitial pores; non-cultural layer.                                                                                                                                                                                                                                                    |
| Sumn                                       | nary, Site 4181                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| a recent<br>that the<br>to have<br>Feature | persistence of clearly modern artifacts into the deepest level of Layer I in TU-1 indica<br>age for the terrace. No evidence of prehistoric activity was observed in the site. It apper<br>swale itself may be the result of agricultural irrigation, and Features C and D are lik<br>been the result of clearing of the adjacent fields. The bottle fragment collected for<br>C dates to the 1950s. Features A and B must postdate Features C and D, if the supposi-<br>blic memory are constructed of rock from the land-clearing piles is correct. Based on |

cates pears likely from sition that the alignments are constructed of rock from the land-clearing piles is correct. Based on the homogeneity of the soil deposit, the Layer I fill uphill of the alignments appears to have been placed there as the rocks were stacked, as opposed to being an alluvial deposit. Thus, it may be that the terracing of Features A and B was intended as a soil conservation effort.

#### SITES 1061 AND 1062

In order to be able to report the location of sites 50-50-10-1061 and -1062 to the client, their reported locations were revisited. The Kalialinui petroglyphs, Site 1061, were relocated (Figure 2), and they appear to match the existing site record (Hommon 1973). In Kaluapalani Gulch, a panel of petroglyphs belonging to Site 1062 was located farther west than expected (as shown on Figure 2); however, all the petroglyphs were on the north side of the gulch, as reported (Connelly 1973c).

## CONCLUSION

#### DISCUSSION

The 44-acre Pukalani Terrace Subdivision has been thoroughly surveyed for archaeological resources. The existence of irrigation ditches, furrows, and the remnants of roads indicates that this parcel was planted in pineapple in the past, although it has not been cultivated for c. 25 years. The lack of precipitation would have made prehistoric agriculture unlikely on this land, and therefore, prehistoric habitation would have also been unlikely. However the existence of three petroglyph sites in the gulches bounding the Pukalani Terrace property, with no associated evidence of traditional Hawaiian agriculture, suggests that 'A'apueo Ahupua'a was visited for non-subsistence activities.

The fact that six land grants were made in the Pukalani Terrace property might indicate the existence of historic house sites or agricultural improvements, but the only possible trace of that era was the previously reported Site 50-50-10-4180, a possible boundary wall in the contiguous 250-acre parcel (McPhatter and Rosendahl 1996). Modification of the land to accommodate pineapple growing probably eliminated any other archaeological evidence in the current project area.

During the current work, only one site (50-50-10-4181) was identified. This site consists of two land-clearing rock piles (Features C and D) and two terrace alignments (Features A and B). The site was recorded and tested, and is assigned a late historic to recent age, based on the Feature C and D apparent association with pineapple agriculture and artifacts of recent origin from the excavations in Features A and B.

#### TENTATIVE GENERAL SIGNIFICANCE ASSESSMENT AND RECOMMENDED GENERAL TREATMENT

Site 50-50-10-4181 has been assessed for significance based on the National Register Criteria for Evaluation, as outlined in the Code of Federal Regulations (36 CFR Part 60 n.d.). DLNR-SHPD uses these criteria for evaluating cultural resources (DLNR Draft Rules 1994). To be assessed as significant a site must possess integrity of location, design, setting, materials, workmanship, feeling, and association and must be characterized by one or more of the following four criteria:

- (A) It must be associated with events that have made a significant contribution to the broad patterns of our history;
- (B) It must be associated with the lives of persons significant in the past;
- (C) It must embody distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic value or represent a significant and distinguishable entity whose components may lack individual distinction; or

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# (D) It must have yielded or may be likely to yield, information important in prehistory or history.

Sites are also assessed for cultural significance using: (a) guidelines prepared by the National Park Service (1990), and (b) guidelines established by the DLNR-SHPD (DLNR Draft Rules 1994). The Hawaii State guidelines utilize this additional fifth criteria (Criterion E) which defines significant cultural resources as ones that "have an important traditional cultural contribution or value to the native Hawaiian people or to other ethnic groups of the state" (Ibid.).

Most archaeological sites are initially evaluated as significant under Criterion D. After the evaluative process of an inventory survey, or the data recovery process of a mitigation program, the research potential of some sites may be exhausted (i.e., after extensive mapping, testing, surface collection, historical research, etc.). In these cases, the sites may maintain their information content value but lose their information content significance. Hence, the sites would be considered as "No Longer Significant" (NLS).

Based on the federal criteria described above, Site 50-50-10-4181, which has been recorded, tested, as reported here, is assessed as no longer significant, based on the recent age of the features and the demonstrated lack of information content important to history. No further work is recommended for this site.

The previously recorded petroglyph sites (50-50-10-4179, 50-50-10-1061, and 50-50-10-1062) have been relocated. To insure they are not impacted by development of the Pukalani Terrace Subdivision Unit III, a monitoring plan for the sites should be prepared and implemented prior to any construction in the area.

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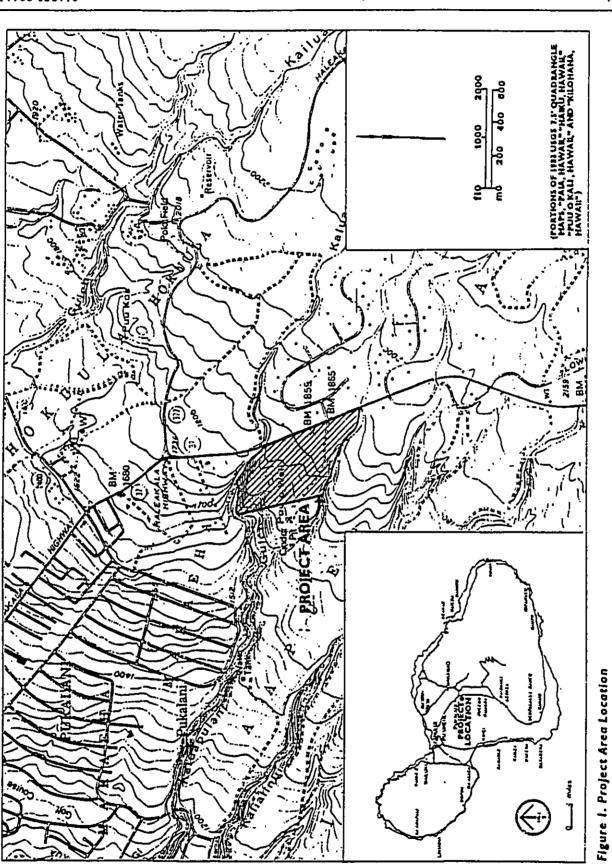
# **APPENDIX A: ILLUSTRATIONS**

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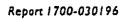
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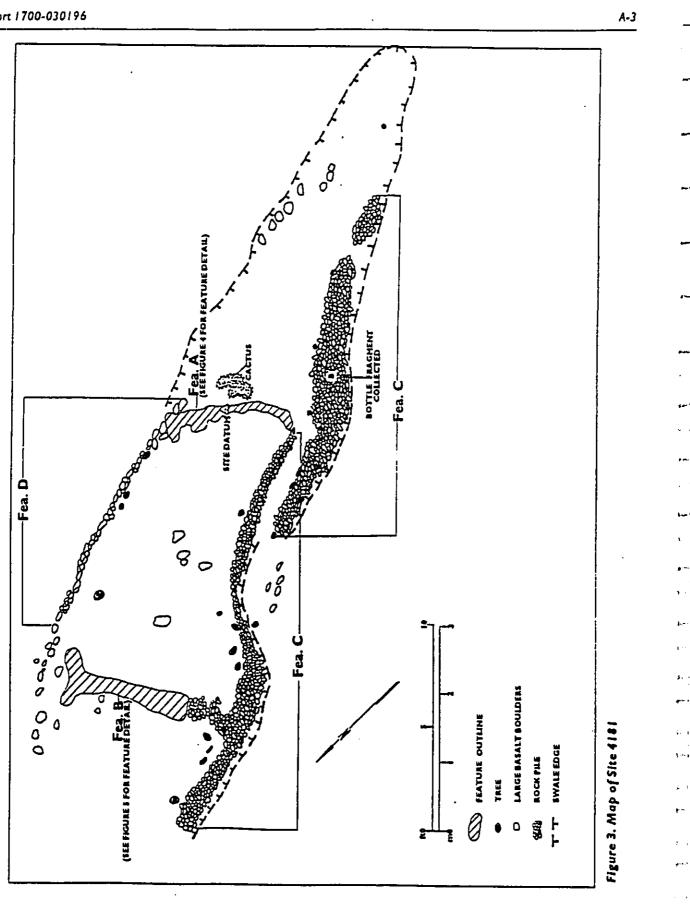
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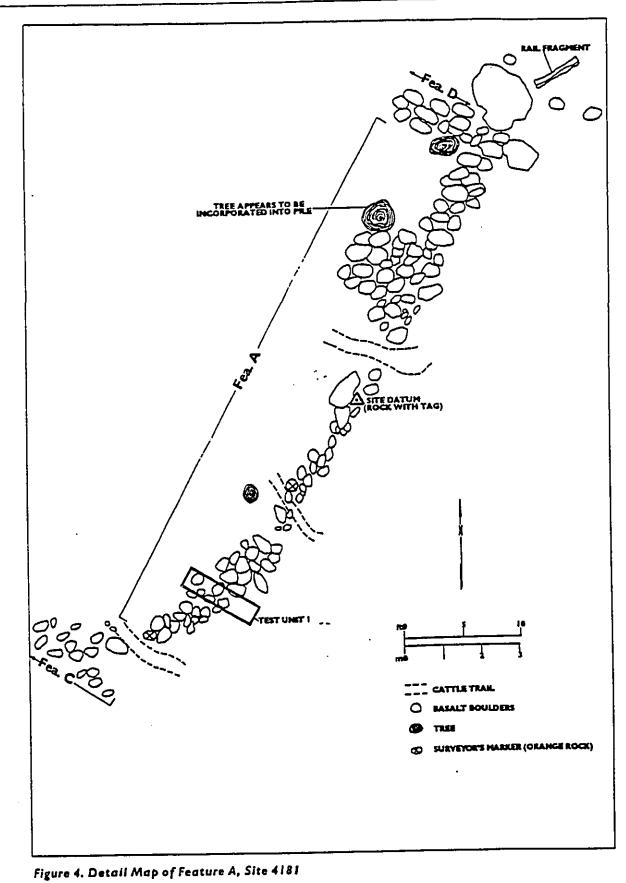
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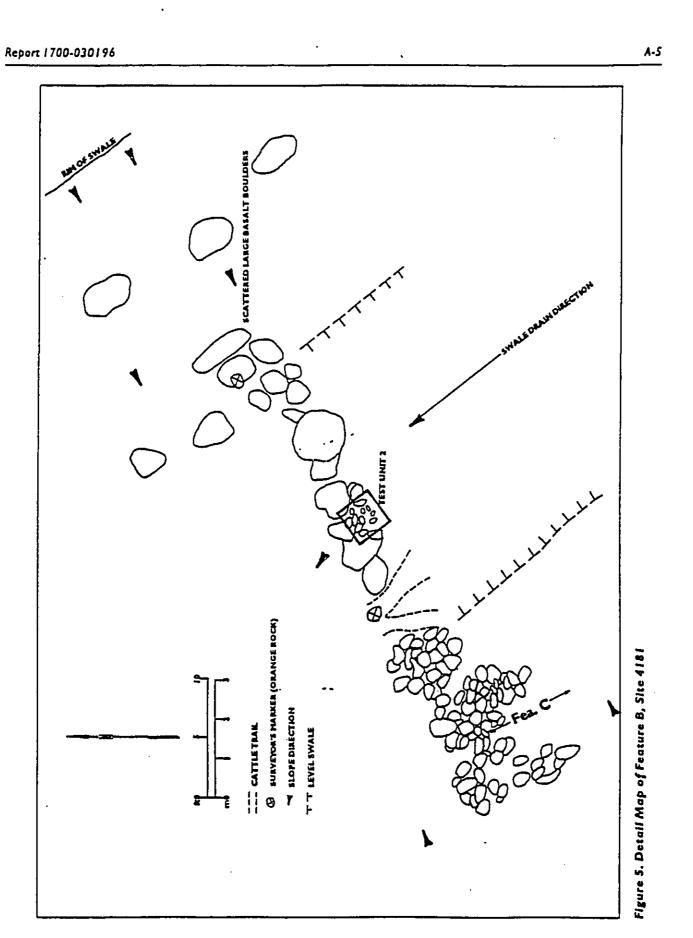
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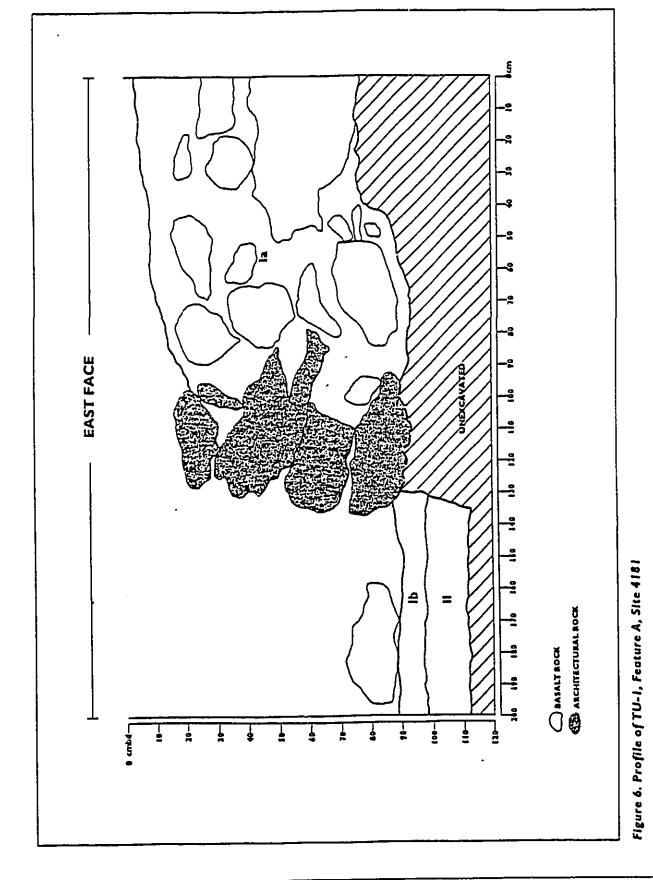
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## APPENDIX B: HISTORICAL DOCUMENTARY RESEARCH

by Helen Wong Smith, Historical Researcher

#### INTRODUCTION

#### Background

This research project was conducted at the request of Paul H. Rosendahl, Ph.D., Inc., in conjunction with an archaeological inventory survey for the Pukalani Terrace Unit III, Maui, project area, situated in the Land of 'A'apueo, Makawao District, Island of Maui (TMK:2-3-08:por.5).

#### Scope of Work

The current research included review of Land CommissionAward (LCA) testimonies, grant survey notes, correspondence addressed to the Hawai'i Kingdom's Minister of the Interior, published historical documents, cartographic material, and reports on previous archaeological work conducted in nearby areas. This report does not include oral history interviews; however, other interviews in previous archaeological reports are discussed.

#### Project Area Description

With the exception of Land CommissionAward testimonies and occasional correspondence during the monarchy, direct references to 'A'apueo are meager. For this reason, the following description of the project area is derived from descriptions of the more general areas of Makawao and Kula.

'A'apueo is in the district of Makawao, which encompasses four older Hawaiian political districts: Hamakuapoko, Hamakualoa, Honualua, and Kula (Figure B-1). Hamakualoa is along the windward slopes of Haleakala, while Kula is along the western flank (Kennedy 1991:4, Riford 1987:1). 'A'apueo is not listed in the bibliography of archaeological reports by Spriggs and Tanaka (Spriggs and Tanaka 1988). However, Spriggs and Tanaka place the adjacent *ahupua* 'a of Kalialinui in Hamakualoa. Based on Kalialinui's inclusion in Hamakualoa, the author surmises that 'A'apueo also fell into the district of Hamakualoa. Many archaeological reports refer to 'A'apueo in the district of Kula (Jadelyn Moniz, pers. comm. 2/96). Modern vernacular places the area as "lower Kula" (pers. comm., Emma Desha Araki 2/7/96).

#### PREHISTORIC PERIOD

#### Legendary Setting

Notes of Sterling and Ashdown, located in the Maui Historical Society's archival collection, provide the following two references to Makawao. The first is in reference to 'olohe on the plains of Kama'oma'o:

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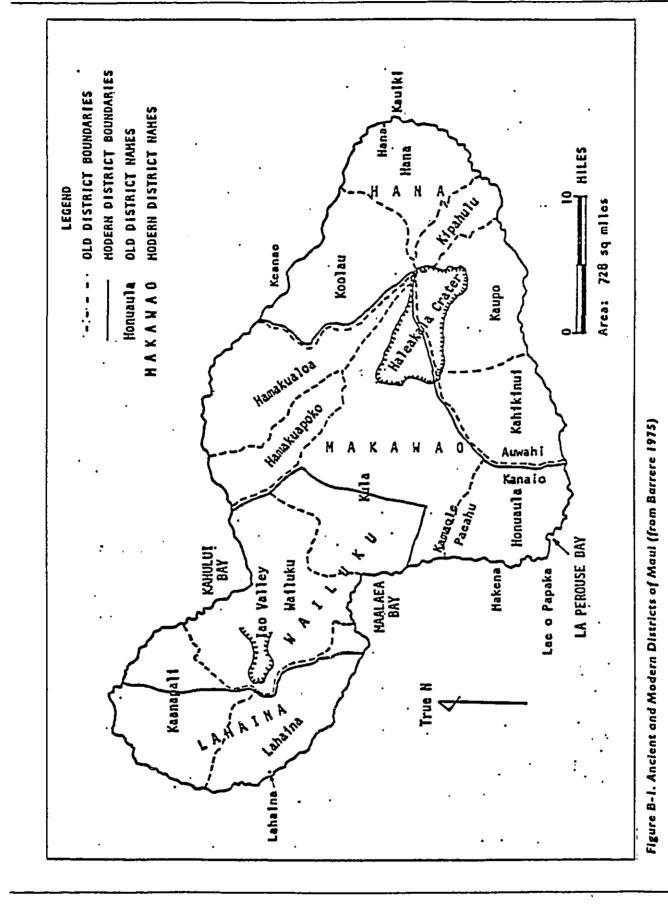
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O native sons of those sections, the ones who watch for the dancing (ha'a) of the naked ones ('olohe) on the plains of Kama'oma'o, where the 'iwa birds dwell in the ukiuku rain of Makawao....S. W. Nailiili, "E noho ana oe e oe ehoolono iki mai ana" KeAu Okoa, Nov. 6, 1865, Hamakuapoko and Hamakualoa (Sterling n.d.).

Ashdown's reference mentions a legend associated with an area in the vicinity:

In the area of Wahine'oma'o (now called the "Baseball Park" above the modern Poli-Poli camp) and nearby Lua-ma-ma-ne, was a structure said to be for bird catching ceremonies because that region was full of birds. The 'Oma'o bird is known as the Hawaiian Thrush, and they were plentiful and provided green feathers. The Woman of 'Omao' dwelt at Mamane and she was called Mamao because she was of such very high rank. She was so sacred that others must keep their distance. A handsome lesser chief fell in love with her beauty and tried to win her. Of course this was kapu. Her heart was heavy with the knowledge that because he came near to her shadow he had to be punished. A high priest conducted ceremonies of purification at the temple there and revived happiness. Today the Mamane trees are stunted and soon the foreign trees such as California Redwood, Norfolk Pines and others will be replacing the former green verdure (Ashdown 1971:46).

#### Prehistoric Land Divisions and Control

Traditionally, Maui was divided into twelve political districts (Kolb 1991:61). Nine of those districts, of which Hamakualoa is one, were in East Maui. Kolb classified the '*ahupua*'a of Hamakualoa as in Zone 1, which is characterized by perennial streams. Hamakualoa, like Hamakupoko, is "characterized by gently sloping land dissected by a series of steep gulches which widen at the mouth" (Kolb 1991:62).

In her report on Waile'a, Makawao, Dorothy Barrere provides a history of Maui's prominent ali'i. Barrere commences with the 15th century chief, Ka-malo-o-Hua, who ruled "over the greater part of Maui," and a presumed relative, Wakalana, who ruled over the "windward side of the island (Barrere 1975:5). She continues the lineage until Ka-'ula-hea, circa A.D. 1750. Ka-'ula-hea was the great-great-great-grandson of the great chief, Pi'ilani, who was the first to rule the entire island by joining the lineages of East and West Maui in A.D. 1600. Pi'ilani's reign was recognized as a time of peace and expansion. Formander writes:

...through his good and wise government, and through his connection with the reigning chief families of Oahu and Hawaii, [he] brought Maui up to a political consideration in the group which it never had enjoyed before....During Pillani's reign, and perhaps that of his father, the Hana chiefs acknowledged the suzerainty of the Moi of Maui... (Fornander 1880:87 IN Barrere 1975:5).

Pi'ilani's successor, second son Kiha-a-Pi'ilani, is noted to be associated with the construction of the Kihaapiilani Trail, a pavement of smooth rocks in the Hana and Koolau districts (Barrere 1975:6).

Kiha-a-Pi'ilani was not the original heir of Pi'ilani. He sought refuge in Kula when his brother sought him after the death of their father:

Upon the death of Piilani in c.a. A.D. 1600, the kingdom of Maui fell into the hands of two of Piilani's sons (Lono-a-Piilani and Kiha-a-Piilani). The rule of

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Maui passed on to Lono-a-Piilani, the oldest son of Pi'ilani. Kiha-a-Piilani, was not present at the death of his father because he was on the island of Oahu where he was raised. Bitterness arose between the two brothers, and Lono tried to kill Kiha when he believed that Kiha was trying to undermine his rule. Kiha fled, first to Molokai and then to Lanai. Eventually, he found himself back on Maui. He lived in disguise first at the boundary between Honua'ula and Kula, and then later "close to the boundary of Kula and Makawao) (Kamakau 1992:22-23).

Another account cites an ali'i seeking refuge in the Kula area. This account, which takes place in 18th century, supports Figure B-1, which shows Kula extending to the sea:

When Kekaulike heard that Alapa'i, the ruling chief of Hawaii was at Kohala on his way to war against Maui, he was afraid and fled to Wailuku in his double war cance named Ke-aka-milo. He sailed with his wives and children..., his officers, war leaders, chiefs, and fighting men, including warriors, spearmen, and counselors. Some went by cance and some overland, and the fleet landed at Kapa'ahu at the pit of 'Aihako'ko in Kula [old name for Makawao]. Here on the shore the chiefs prepared a litter for Kekaulike and bore him upland to Haleki'i in Kukahua (Kamakau 1961:69).

A contemporary of Kekaulike, Ke-a-ulu-moku, who had ties to both Maui and Hawai'i island, is mentioned in association with the general vicinity of the current project area:

Ke-a-ulu-moku was another celebrated man of Kalaniopu'u's day. His father was the great chief Kau-ua-kahi-akua-nui, son of Lono-maka'i-honua and Kaha-po'ohiwi, but his mother belonged to Naohaku in Kohala. He was celebrated as a composer of war chants, chants of praise, love chants, prophetic chants, and genealogical chants. When he went back to Hawaii with Kalaniopu'u he was homesick for the two Hamakua districts of Maui where he had lived with Kamehameha-nui and Kahekili. His love for the place found expression in a chant he composed, of which the following is an excerpt:

> Aloha, Aloha Affectionate longing, Aloha wale o'u maku-a la Affection for my (foster) parents, e oʻu makua, my parents, Aloha wale o'u makua Affection for my parents Mai na 'aina Hamakua, Who belong to Hamakua, He mau \*aina Hamakua elua, The two districts of Hamakua No'u mua kaikua'ana i noho ai Where my elder brothers live. He ala pali na 'u he mau ali'i ia My hillside trails are theirs to rule (Kamakau 1961:112).

Formander (1969) includes an account of an uprising by Kula farmers that takes place some time shortly after 1781:

During the fleeing of Kekaulike, [while] Kahekili was carrying on the war on Oahu and suppressing the revolt of the Oahu chiefs, (Kamakau dates this 1785) a serious disturbance on Maui had occurred which gave him much uneasiness. It appears that he had given the charge of his herds of hogs that were running in the Kula district and on the slopes of Haleakala to a petty chief named Kukeawe. This gentleman, not satisfied with whatever he could embezzle from his master's herds, made raids upon the farmers and country people of Kula, Honuaula, Kahikinui, and even as far as Kaupo, robbing them of their hogs, under pretext that they belonged to Kahekili. Indignant at this tyranny and oppression, the country people rose in arms and a civil war commenced. Kukeawe called the military forces left by Kahekili at Wailuku to his assistance; a series of battles were fought, and finally Kukeawe was killed at Kamaole-i-kai, near Palauea, and the revolted farmers remained masters of the situation (Fornander 1969:228).

This uprising of the country people was called the "Battle of the pig-eating Ku-keawe" ('Aipua'a-a-Ku-keawe) (Kamakau 1961:142).

### Heiau in the Vicinity

Several references to *heiau* in the Makawao and Kula districts were found. In his discussion of archaeological remains in the Kula District, Winslow Walker postulates on the extent of habitation:

Much of the Kula land was inhabited, judging from the number of heiaus found there, but the mountainous parts of both East and West Maui were sparsely inhabited if at all (Walker 1931:66).

Walker located an unidentified *heiau* (Site 228), in 'A'apueo, which he described as a small L-shaped enclosure, 22 meters long, with a maximum width of 16 meters. Adjacent to the enclosure was a terraced platform 12 meters square (Walker 1931:291).

T.G. Thrum reported on a heiau in Makawao named Kailua:

Kailua...Makawao, one-half mile west of Makawao - Wailuku road; about 80x50 ft. in size; its ruins yet to be seen. Kula, Makawao, on Grant 3085, M. Previer. No particulars obtained further than it is still standing (Hawaiian Annual 1909:39).

In his 1930 survey Winslow Walker places this *heiau* in the Hali'imaile region, as "Heiau Site 58." He situates it near Kailua Gulch, half a mile west of the Paia Road. He did not actually find the *heiau*, and he postulates that it was "[P]robably destroyed in cane (Walker 1931:152).

A heiau located even further from 'A'apueo is located in Makawao town:

Across from the Makawao Post Office (the old one) stood a large heiau on land once owned by Louis von Tempski, and another just above where Bullock's is now on the Puka-lani road. That entire area was upland farming for natives B-S

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and particularly for Kiha-a-Pi'lani who lived near Pi'iholo and planted his sweet potatoes on the red hill called Pu'u o Kali where many petroglyphs and human footprints in the lava still are to be found. Kiha had the reputation of being so powerful that he could do the work of eighty strong men. He and his wife, Ku-maka, being of aristocratic lineage and gods, did not know how to make tapa or farm until they were driven from Hana by his brother, Lono-a-Pi'ilani (Ashdown 1970:58).

In Kula, the residents of Kula and Honua'ula practiced a religious ritual. Traveling to the west or south rims of Haleakala Crater at night, they would, "toss into the crater the bones of their dead" (Handy and Handy 1972:336). Kamakau notes that:

...the people were paying homage to Pele, the goddess who dwelled in the crater of Kilauea on Hawai'i island. The inhabitants of that island who wished for their dead to become a volcanic manifestation would take the "bones, hair, fingernails or some part of the dead body" to the crater and offer them to Pele (Kamakau 1991:64).

Pele controlled most of the south or leeward areas of the islands that were dry, and whose people depended on sweet potato. Thus, the people in the Kula area came under the domain of Pele. They were part of the "Clan of Pele" (Handy and Handy 1972:337). Under Pele's domain the people "developed rain-making ritual" and were closely tied to Lono-makua (Lono-the-parent) who was Pele's uncle, the keeper of fires and the rain maker (Kamakau 1991).

### Ka-Miki References

There is no mention of 'A'apueo in *The Tale of Ka-Miki*; however, there is a reference to Kaluanui in the Makawao District (Maly in prep; issue date 6/3/1915):

Ka-lua-nui (the great pit) (from the account of Kumauna and Ha'ao, Ka'u) Kumauna prepared food and 'awa from Puna for Ka-Miki. The 'awa was very powerful, and like the strong wind at Makawao which strip the bark from the trees, Kumauna was overtaken. But for Ka-Miki: *He ua li'ili 'inoenoe ala, ke hele a hihi i ka lau o ke pili lauholu o Kaluanui.* The 'awa [was like] a fine mist rain which blows tangling the swaying pili grass of Kaluanui (Maly, in prep).

### **Regional Place Names**

The only reference that includes a translation of the name 'A'apueo is found in Winslow Walker's survey of archaeological sites on Maui, where he notes, "Aapueo: owl call-land section in Kula" (Walker 1931:48). Hawaiian language instructor and authoress, Kahi Wight, was contacted for an interpretation of the name. She stated that 'a'a is the term for a girdle or belt, which was made of feathers, which was reserved for royalty (pers. comm 2/14/96). Based on her proposed translation, the *ahupua'a*, in this text, will be spelled with the glottal marks.

It is common for place names to reflect natural phenomena of the area. In Makawao, the rain appears to have influenced the name. In 1854, Edward G. Beckwith toured Maui, and noted in his journal:

We noticed a peculiar meteorological phenomenon through the whole ride. The trade wind which blows from the ocean across the Northwestern slope of Haleakala, is highly charged with vapor, which is condensed by the cool mountain air, and falls in abundant rains over the region of Makawao. Along the west side of the mountains about half way to the summit, lay a long line of cumulo stratus clouds, and between this and the nimbus there was but little space. The former lay along side of the mountain, apparently immovable, while the latter would advance and recede, now coming very near and coquettishly scattering its shining rain-drops beneath the very head of immovable cumulus, and now retreating as though afraid of its more dignified companion. While mentioning this latter peculiarity to a gentleman this evening, he remarked that it was this feature of the clouds which gave the place its name - Makawao, Mako = to be afraid, wao = a cloud (*Journal of a Tour on Maui*, Hawaiian Mission Childrens' Society June 5, 1854). B-7

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Sterling, however, notes that this is incorrect, stating that "afraid translates maka'u and ao is cloud" (Sterling n.d.).

The rain of Makawao is described by Mrs. Minerva Kalama to Sterling (n.d.) as: "ukiu rain = a soft drizzle (the ua Kama'aina of Makawao) when the kiu rain cloud from Makawao meets the Naulu rain cloud from Kula then the rain comes, the typical Makawao rain" (Sterling n.d.). Mary Kawena Pukui mentions this rain as well in her anthology of poetical sayings 'Olelo No 'eau (Pukui 1983:#1602). Early European accounts concerning the Makawao District generally comment on the weather.

Pukui provides additional proverbs regarding Makawao:
Keiki holoholo kuaua o Makawao
The lad of Makawao who goes about in the rain.
Said of a native of that place who is not afraid of being wet (ibid:#1705).
E hu'e mai 'oe i ke koai'e o Makawao!

I defy you to tackle a lad of Makawao!

A boast from a native of Makawao, Maui. (1983:#298)
O 'Alelele ke awa kaulana o Makawao.

'Alelele, the famous diving pool of Makawao.
'Alelele, the famous diving pool of Makawao.

Refers to Makawao, Maui. (1983:#2355)

Ulu kukui o Liliko'i.
Kukui grove of Liliko'i. (1983:#2869)

This kukui grove, in Makawao, Maui, was much visited by travelers, for it was a favorite spot of the chiefs. The nuts gathered from the trees produced a fragrant, tasty relish.

### PROTO-HISTORIC AND EARLY HISTORIC PERIODS (1778-1820)

### Land Tenure

Ethnohistoric accounts of Kula are sparse. Jadelyn Moniz notes, "In an island wide perspective, the Kula area of Maui was not a chiefly center" (pers. comm., 2/96). According to Moniz, it may have to do with late settlement of areas in the district and the size of the population living in the district.

Michael Kolb identified land use by partitioning the island into four zones based primarily on an ecological and geographical criteria. The districts of Kahikinui, Honua'ula, and Kula fall within Zone 4, which is land that was "very arid" and where dryland agricultural fields were planted late in Hawaiian history (Kolb 1991).

Kula land is described by Handy and Handy (1972:510) as "open country, or plain, as distinct from valley...and has often been used as a term to distinguish between dry, or 'kula land' and 'wet-taro land'". Specific to Maui, E.G. Handy reports:

KULA was always an arid region; throughout its long, low seashore vast stony kula lands, and broad uplands. Both on the coast, where fishing was good, and on the lower westward slopes of Haleakala a considerable population existed. So far as I can learn Kula supported no Hawaiian taro, and the fisherman in this section must have depended for vegetable food mainly on poi brought from Waikapu and Wailuku across the plain to supplement their sweet potato staple diet (Handy 1940:161).

To postulate the extent of prehistoric and proto-historic communities and the associated land tenure, archaeological findings should be recognized:

Modern settlements like...Makawao, Kula...are probably built on the sites of older villages....But there is now no accurate way to determine just how large their former populations may have been. The villages on Maui were, in general, placed at the mouths of the larger gulches or at least within sight of the sea. No villages were seen in the higher forested parts of the island although a few scattered house sites were observed (Walker 1931:67).

Despite Handy's contention that dryland taro was not a crop of the vicinity, Walker reports that it was:

Dryland taro required no special terrace for its cultivation, so there is nothing to indicate where it was grown formerly, but the natives say it was cultivated on the Kula side of Haleakala (Walker 1931:72).

In their discussion of Hawaiian sweet potato planting techniques, Handy and Handy (1972) mention the Kula area of Maui and describe it as "[w]here potatoes are planted in crumbling lava with humus, as on eastern Maui and in Kona, [in] Hawaii the soil is softened and heaped carelessly in little pockets and patches using favorable spots on slopes...[r]ocky lands in the olden days were walled up all around with the big and small stones of the patch until there was wall (*kuaiwi*) about 2' high" (Handy and Handy 1972:131).

Land Commission awardee claims confirm that within the Kula district crops included dryland taro, banana, sugar cane, and sweet potato (Handy and Handy 1972:27; Kuykendall 1938:6). In the uplands, dryland (non-irrigated) taro patches grew up to an altitude of 3,000 ft. (Handy and Handy 1972:337).

Although sweet potato crops grew well in these areas when the conditions were right, there were frequent setbacks in the form of grubs, caterpillars, blight, frost or too much sun (Malo 1951:204). As a result, the people of Kula and Makawao were burdened with famine when sweet potato crops failed. At these times they were forced to subsist on "laulele, pualele, popolo (glossy nightshade, Solanum americanum) and other weeds" (Kamakau 1992:23).

Kamakau notes that Kiha-a-Piilani found Kula and Makawao to be a waterless region (Kamakau 1992:23). As a result, the people of Kula and Makawao were at time forced to subsist on weed species found in the area (ibid.).

Notations on the hardship brought on by drought continued throughout the centuries. This one by John B. Whitman who kept a journal of his experiences in Hawai'i from 1813-1815:

In 1806 these Islands were visited by a severe calamity. I am informed by a respectable American who lived at that time on the Island of Mowee that no rain fell on that Island from October to April of the succeeding year, consequently almost every thing that could support life was destroyed. The earth was parched and barren not a green thing was to be seen on any of the low lands, even the taro patches which were usually covered with water to the depth of from four to eight inches were dry and cracked in fissures opening in numerous places from four to sic inches wide and to the depth of three feet or the length of his walking cane. Goats, hogs and poultry were destroyed by it in great numbers and their carcasses lay about to rot on the ground, not a cloud was seen during this time, a burning sun poured down its destroying influence, and every thing seemed doomed to perish (Whitman 1979:65).

### Transitions in Hawaiian Subsistence Practices and Land Tenure

Traditional agriculture was labor intensive and relatively restricted in the less than ideal environment of Kula. However, with the increased demand for provisions for the whaling industry and then the gold miners in California, Kula experienced an escalation in cultivation.

Historian Ralph Kuykendall (1968 [1]:313) discusses the period when Kula yields turned from subsistence crops to commodities:

...Before that time the whalers had created a limited market for fresh vegetables, fresh meat, and fruit; the great increase in the number of whaleships after 1840 caused a corresponding increase in the demand for such products of the soil. In bulk and value, potatoes (sweet and Irish) ranked first in this traffic. In the early days only sweet potatoes had been obtainable at the islands, but after 1830, if not sooner, cultivation of the Irish potato was taken up and during the 1840s and 1850s became of great importance. It was shortly before 1840 that Irish potatoes were first raised in the Kula district, which proved to be so well s. -.

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adapted to them that it soon came to be called the "potato district." Jarves describes the region as it appeared to him in July 1846:

It ranges along the mountain (Haleakala) between 2000 and 5000 feet elevation, for the distance of 12 miles. The forest is but partially cleared, and the seed put into the rich virgin soil. The crop now in the ground is immense. The fields being all in blossom have a fine appearance, spreading as they do, over the broad surface of the mountain.

From this upland region the potatoes were carried down to the shore and taken to Lahaina or were sold directly to ships which called at Kalepolepo. In the spring of 1847 it was estimated that the crop would amount to 20,000 barrels. In 1854, G.D. Gilman estimated that the local Hawaiian market, including whaleships, could be depended on to consume about 20,000 barrels of Irish potatoes annually.

The influx of gold seekers together with the comparative neglect of agriculture in California created a demand for potatoes and other vegetables, as well as for sugar, molasses, and coffee. This demand began to be felt strongly in 1847, but the potato "boom" commenced in the fall of 1849. At the beginning of November a correspondent wrote from Maui to the *Polynesian*:

The call for [potatoes] is loud and pressing, as some vessels bound for California have taken as many as 1,000 barrels each. The price is high, and the probability is that the market can not be supplied this autumn. Kula, however, is full of people. Strangers from Wailuku, Hamakua, and Lahaina are there preparing the ground and planting, so that if the demand from California shall be as urgent next spring as it is now the people will reap a rich harvest...They often repeat the saying of a foreigner, who after visiting the mines of California, came back to Maui quite satisfied, and said to his neighbors at Waikapu, "California is yonder in Kula. There is the gold without the fatigue and sickness of the mining country."

The foreigner's remark caught the fancy of the Hawaiians and they were soon referring to Kula as "Kalifonia" or "Nu Kalifonia" and working with great diligence to extract the wealth from the rich pay dirt on the slopes of Haleakala. To encourage the spirit of enterprise which had been thus awakened among the native people, the privy council voted to have the government lands in Kula surveyed and divided into small lots of from 1 to 10 acres and offered for sale to the natives at a price of \$3/acre (1968:321).

C. Speakman (1978), in his book entitled *MOWEE* also remarks on the fervor of cashcropping:

During the gold rush, hundreds of Hawaiians were going into business for themselves on Maui-growing potatoes and hauling them to the port where they were snapped up and shipped to San Francisco. The Maui fields were called Nu Caliponi, or New California; potatoes were gold, and a fortune could be dug out of the ground by one man. The potato boom was short lived, and, when the prices dropped, the Hawaiians lost interest. Perhaps the problem was that Hawaiians did not share the white man's concept of time (Speakman 1978:116). Kuykendall states, kula plots were cultivated for personal use, but many tenants were involved in ranching and cash crops (1968).

### HISTORIC PERIOD

### Mahele of 1848, Land Commission Awards (LCA)

A discussion of LCA awards in the Makawao District (traditionally Kula) must begin prior to the 1848 Mahele because Makawao was involved in a pre-Mahele experimental program of land awards. Kuykendall recounts the reasons for this trial fee ownership program:

It will be remembered that the year 1845, during which the new land law was written and in part enacted, was disturbed by an anti-foreign agitation, accompanied by a rather pointed suggestion that lands be given or sold to the common people and that the legislative committee, in its reply to the petitions of the people, approved the idea of selling land to Hawaiian subjects. This was directly in line with suggestions contained in Dr. Judd's report as minister of the interior, and there were frequent allusions to the subject in the proceedings of the legislature. The agitation among the people probably hastened the decision of the government to make an experimental beginning without waiting for the new law to go into operation. The places selected for the experiment were the Makawao district of Maui and Manoa valley on Oahu.

During the King's tour of Maui in December, 1845, and January 1846, the party visited Makawao and it was announced that the entire district, with the exception of McLane's plantation, was to be offered for sale to the people in fee simple. Rev. J.S. Green, pastor of the Hawaiian church at Makawao, undertook to manage the business of selling the land. In afterwards relating his experience in connection with the project, Green said he called the people together, showed them his instructions from the government, and explained the plan to them.

A few of them purchased at once, others had less confidence that lands thus purchased would be secure, but soon abandoned their scruples, while others still could not for a long time, be persuaded that there was not some catch about it—some design to enrich the chiefs at their expense. But nearly all of these were finally talked out of their suspicions & took up each a small piece of land (letter in *Polynesian*, July 14, 1849).

Another missionary, Rev. Richard Armstrong, assisted the enterprise by making surveys. The land was sold at \$1 per acre, and nearly a 100 parcels were taken up, most of them ranging from 5 to 10 acres. Altogether about 900 acres were purchased by the people of the district. (Kuykendall 1968 [1]:283).

The "Great" Mahele took place during the reign of Kamehameha III. The Mahele separated and defined the undivided land interests of the King and the high-ranking chiefs and konohiki [konohiki originally referred to the person in charge of a tract of land on behalf of the king or chief. It is in the later statues that the chiefs or landlords were referred to as "konohikis" (Chinen 1958:vii and Chinen 1961:13)]. More than 240 of the highest ranking chiefs and konohiki in

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the kingdom joined Kamehameha III in this division. The first mahele was signed on Jan. 27, 1848 by Kamehameha III and Princess Victoria Kamamalu by her guardians Mataio Kekuanaoa and Ione Ii. The last mahele was signed by the King and E. Enoka on March 7, 1848 (Chinen 1958:16). The mahele did not convey any title to any land. The chiefs and konohiki were required to present their claims to the Land Commission and to receive awards for the lands quitclaimed to them by Kamehameha III. Until an award for these lands was issued, title remained with the government. Because of the lack of surveyors at the time of the Mahele, the lands were divided by name only, with the understanding that the ancient boundaries would prevail until a survey of such lands could be made in the future. Thus the Land Commission awarded lands to chiefs and konohiki by their names only. These awarded lands became known as Konohiki Lands (Chinen 1961:13).

During this process all land was placed in one of three categories: King's Land (In 1865, during the reign of KamehamehaV, these were renamed "Crown" land in order to prevent dowager Queen Emma from retaining lands held by her husband Kamehameha IV, thus making them the property of the occupant of the throne), Government Lands, and Konohiki Lands. These were all "subject to the rights of native tenants" (Laws of Hawaii, 1848:22). Native tenants were the commoners who lived and worked the land for their subsistence.

Whenever *ali*'i procured an entire *ahupua*'a, they were bound to respect the rights of the existing tenants. These tenants, if they filed a claim to The Board of Commissioners to Quiet Land Titles (Board of Commissioners 1929), could continue to cultivate and reside on their parcels.

The Kuleana Act of 1850 permitted the Land Commissioners to issue awards to the farmers for houselots and gardens cultivated by them for their own subsistence only, providing the claimants had fulfilled all other legal requirements, such as making a written application before February 14, 1848, having two witnesses give sworn testimony regarding applicant's past occupation and use of the land for an extended period, and having no counter claims made by others (Kelly 1971:6). The parcels for house and garden purposes became known as *kuleana* (responsibility). Until its dissolution on March 31, 1855, the Land Commission issued thousands of awards to native tenants for their *kuleana*; even so, less than 30,000 acres of land were awarded to the native tenants as Kuleana Lands.

The ali'i and commoners had to file a claim to Quiet Land Titles with the Board of Commissioners, usually referred to as the Land Commission. When such a claim was filed, a Land Commission Award (LCA) was assigned and, upon payment of a fee, a Royal Patent was awarded (Erickson 1980:9).

Lilikala Kame'eleihiwa's treatise, Native Land and Foreign Desires, tallies the apportionment of lands in Kula and the transactions that follow. Of the 26 *ahupua'a* in Kula, three went to the King, and 23 went to the Government (Kame'eleihiwa 1992:234). Kamehameha III (Keauikeaouli) then gave the government seventy-five percent of his land on Maui, including all of Makawao (ibid.:238).

The principal awardee for 'A'apueo was Analea Keohokalole, who held the fifth largest number of 'aina after the Mahele. Keohokalole was mother of King Kalakaua, Queen Liliuokalani, Miriam Likelike Cleghorn, and William Pitt Leleiohoku (Indices 1929). As a result of the Mahele, this young woman of 34 years now held 96 'aina. The majority of her holdings were on Maui and Hawai'i Island. Her holdings on Maui were mostly in Kula. She relinquished 48 percent of her 'aina to the government, leaving her with 50 parcels, 25 of which were on Maui (Kame'eleihiwa 1992:245).

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| *A *apuco (assumedly one) and 'A *apuco 3 are listed as Government Land. The parcel of 'A *ap<br>2, granted to A. Keohokalole, was surrendered for commutation (Indices 1929). | ouco |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| LCA 8452 to A. Keohokalole                                                                                                                                                     |      |
| Netice Testimony and 10-726                                                                                                                                                    |      |
| Native Testimony vol. 10:326<br>"Below is a list of the lands I wish to convey to the government. Aapueo                                                                       |      |
| ahupuaa Kula, Maui. (dated Jan. 3, 1850)                                                                                                                                       |      |
|                                                                                                                                                                                |      |
| Resolved, that the Minister of the Interior be and is hereby authorized to transfer to the list of lands belonging to Keohokalole,and Aapueo 2, Kula,                          |      |
| Manister to the first of lands belonging to Reonokalore,and Rapieo 2, Rula,<br>Maui, and transfer to the Government and list one of the Alae's in Kula, Maui,                  |      |
| on lieu of Aapueo 2, sold by Kapaakea through mistake. By order of Privy                                                                                                       |      |
| Council Dec. 22, 1850                                                                                                                                                          |      |
| Following are the LCA testimonies for parcels awarded to the native tenants of 'A'apu                                                                                          | 100: |
| LCA 8630 to Koolau                                                                                                                                                             |      |
| Native Desister vol. 6.172                                                                                                                                                     |      |
| Native Register vol. 6:473<br>Here are the names of my land claîms at Aapueo in Kula, Maui. The claims on                                                                      |      |
| the east are Kahaukakahe, Koloakapeelua, without a konohiki. On the west,                                                                                                      |      |
| Kahanumaule, Kauhiku, Kailikoa. That ends our claims at AapueoHere is                                                                                                          |      |
| an explanation to you, the Land Commissioners, concerning our house lot at                                                                                                     |      |
| Aapueo — our names are set here: Koolua, Kauahi. (Signed) Koolau Kula, 31<br>Jan. 1848                                                                                         |      |
| Foreign Testimony vol. 8:182                                                                                                                                                   |      |
| Section 1 - Pasture in Koloakapeelua ili of Aapueo ahupuaa                                                                                                                     |      |
| Section 2 - Pasture in Kauhiuhi ili of Aapueo ahupuaa                                                                                                                          |      |
| Section 3 - Pasture in Papawahanui ili of Aapueo                                                                                                                               |      |
| Section 4 - Pasture in Makoleiki ili of Kalialinui.                                                                                                                            |      |
| Land from Koolau's parents long ago at the time of Kamehameha I, no dispute from the beginning.                                                                                |      |
|                                                                                                                                                                                |      |
| .CA 9022 [Aapueonui, Kula, Maui] to Kekahuna                                                                                                                                   |      |
| Native Register vol. 6:496                                                                                                                                                     |      |
| I hereby state my claim for land in the ahupuaa of Aapuueo. My land of Pakaka                                                                                                  |      |
| is at Kiloa. On the east is a collection of houses, on the west is Kauhiuhi, on                                                                                                |      |
| the north is a ridge, on the south is broken ground. I cultivate in jumps in some                                                                                              |      |
| of these places. At Makehu of Welehine, I have a claim for fishing rights. On<br>the north is a road, on the east is a road, on the south is a stream, on the west             |      |
| is a road. Kula, 20, Jan. 1848                                                                                                                                                 |      |
| Native Testimony vol. 7:106                                                                                                                                                    |      |
| Malai sworn he has seen this land - 2 sections                                                                                                                                 |      |
| Section 1 - Pasture ili of Kamakaula, Aapueo                                                                                                                                   |      |
| Inherited land from parents at time of Kame I., no objections, 2 poalimas in                                                                                                   |      |
| section 1. [bound by] Mauka - Malai, Makawao - Aapueo Stream, Makai -<br>Kanuku, Honuaula - Aapueo stream.                                                                     |      |

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### LCA 9025 [Aapueo 1] to Kama

#### Native Register vol. 6:498

...I hereby state my claim for land. At Aapueo I are four claims. At Kaluli I, Kauluha II, there are eight mo'o, and 3 makmaki trees. I received them from Kaapohuehue. At Aapueo two places were from him. One piilani /obscure/.

Native Testimony vol. 7:49

Koolau sworn he has seen Kama's land of 2 sections

Sec 1 - Ili pasture Waieli, Aapueo

Sec 2 - Ili pasture Popolo, Aapueo

Land from Kaaipohuehue in 1845, no disputes, 1 poalima in section 1. [bound] Sec 1 - mauka - Kaai, Makawao - Koolau, Makai - Makahuloli, Honuaula -Kamole stream. Sec 2 mauka - Aupuni, Makawao - Koolau, Makai - Kikiana, Honuaula - Waieli stream

### LCA 9026 to Kaaipohuehue

#### Native Register vol. 6:498

...at Aapueo 1, two claims for sweet potatoes, five claims for Irish potatoes. The names are Paikukui, and Paili. At Aapueo 2 I have two places, Paipala and Papawahanui, two claims for sweet potatoes. I received them from Keohokalole. There are three "jump" claims at Aapueo which I received from Nahuina. A claim for sweet potatoes at Waiohuli was received from Ihu. There is a claim for a planting of Irish potatoes. This ends my claims 24 Jan. 1848

Native Testimony vol. 7:53

Kalama sworn = 2 pasture land sections.

Sec 1 - Pasture ili Ohiamukumuku, Aapueo

Sec 2 - Pasture ili Kailikoa, Aapueo

Ancient land from parents at the time of Kamehameha I, no objections, to Kaaipohuehue. [bound] Sec 1 - mauka - Koolau, Makawao - Nahuina, Makai, Aupuni/Koolau, Honuaula - Road for descending Sec 2 - mauka Kikiana, Makawao - Koolau, Makai - Kalama, Honuaula - Aapueo stream.

This last award is for the adjoining *ahupua* 'a of Kalialinui, but it does mention crops in 'A'apueo:

### LCA 9024 [Kalialinui, Kula, Maui] to Kikiaua

#### Native Register vol. 6:497

...at Kalialianui, four claims, first, a kula, second, a boggy place, third, a claim for a planting of Irish potatoes, fourth, a house claim. The name of the claim for winter kula is Paa of Pahoa, bounded on the east by Ahua, on the west by stream, on the north by mountain top, on the south by a gulch. ...There are jump claims at Omaopio and a claim for Irish potatoes at Aapueo. Dated: 26 Jan 1848

Native Testimony vol. 7:50 Kuaihulu sworn - 5 land sections: Sec 5 - Ili pasture Waieli of Aapueo ahupuaa. Boundaries similar to Sec 1 (A konohiki is on all sides).

Correspondence and other records housed at the Hawai'i State Archives provide us with information on land transactions and tenure in the *ahupua'a*. The documents provide us with knowledge of the most common uses of the land from the time immediately following the Mahele through the 20th century.

Privy Council Vol. 6:427 Resolution authorizing the Minister of the Interior to grant a fee simple title to E.W. Clark for 490 acres of the above land, providing that he relinquish his right to the land at Wahiawa.

Privy Council Vol. 8:193 Resolution confirming the sale of 190 acres of land in Koheilo & the above lands to Nathan F. Sayre.

Aapueonui

Privy Council Vol. 7:149 Resolution confirming the sale of 86 1/2 acres of the ahupuaa to Keawe.

Privy Council Vol. 7:209 Resolution confirming the sale...to several persons as per list.

Aapueo 1 & 2

Public Instruction 1851 March 25 Letter from E. Bailey to R. Armstrong In reference to his desire to secure the above lands for \$500 or \$600 if Kapaakea wants the money immediately borrow it. Have applied the land of Koheilo, in his own name &c.

Public Instruction 1852 Jan 28 Letter from E. Bailey to Minister of Public Instruction Acknowledging receipt of his notes of 22nd and 23rd. As to above land, the greater part of said land is first rate land for cane.

Aapueo 1

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Interior Department 1860 Dec. 10 In letter from P. Nahaolelua to Minister of the Interior, forwarding list of ahupuaa, which had been sold to Needham & Cook, the above and being one.

Interior Department 1861 Oct 19 Report showing that P. Nahaolelua, had received amounts from the following persons for the rent of the above land, Kula Maui. Nahau, Kekahuna & Kailianu.

Interior Department 1863 April 21 In statement by P.N. showing amounts collected for the Government lands leased to Kailianu in the above land. 8-15

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Interior Department 1865 March 31

In report by the Governor of Maui (Nahaolelua) showing that \$20 had been received as rent for the above land.

Interior Department 1866 Aug 31

In letter from P.N. to the Minister of Interior stating that the above ahupuaa is situated in the district of Kahikinui by does not know whether the same has been sold to Needham & Cooke.

Interior Department 1876 May 4 In letter from K. Kauhi to the Minister of Interior applying to lease the above land.

Interior Department Book 13:355 1876 May 5 In letter from Min of Interior to K. Kauhi, have received his application to lease the above land in Kula Maui at \$75.00 a year for the term of 10 years.

Interior Department 1877 March 21 In letter from W.D. Alexander to the Minister of Interior informing that 400 acres of land in the upper end of the above places was leased to Kauhi.

### Interior Department 1877 June 30

In report from W.L. Mochonua to the Minister of Interior showing that \$75 had been received from Kauhi for the rental of a piece of Government land in the above place.

### Interior Department 1891 March 19

In letter from L.A. Thurston to Minister of Interior, applying on behalf of the Haleakala Ranch Co., for a remnant:

"...of the Government land in Aapueo, Kula, Maui, lying above the Government road, containing 376 acres." The land is entirely surrounded by the land of the Haleakala Ranch Co. lying a bout a half mile from and above the Government road, the Company's land lying between it and the road, and all around it. The piece is a long narrow one, very much cut up with three gulches running through its length. It is pasture land and of much less value per acre than the piece somewhat similarly situated, which was purchased a short time since by the Company. The land is not, an has not to my knowledge, brought or is it bringing any income to the Government. I hereby offer the sum of \$500 as purchase price of the same on behalf of the said Company as an upset price.

Report of Government Survey Office regarding this parcel. March 19, 1891. Application Number 438.

Nature of land: Upland grazing land broken by gulches. Notes: From the best information I have, I judge that this land is not specially desirable for Homestead or cultivation purposes. And I believe that no other application has ever been made for it and would accordingly recommend its sale at upset price named. Signed, J.F. Brown per Walter E. Wall.

Properties in Aapueo

Interior Department 1898 Nov. 25 S.E.K. Apapau to Minister of Interior applying for a copy of the properties belonging to the Estate of Malai (k),

#### Aapueoiki, Land at

Liliuokalani's Collection 1908 May 28 A.F. Tavares to Joseph K. Aea Advising him to sell the 17 acres of land at the above place Kula, Maui, assessed to W.K. Kaleihua at \$170.00 at \$15.00 an acre & if he can obtain \$20.00 an acre for same, to sell same at said figure, &c.

### Aapueo Nui

Interior Department 1875 Feb. 24 In letter from Chas. Koelling to the Minister of Interior applying to lease the above land for a term of 25 or 30 years.

### Historic Maps

Three maps of the vicinity were studied at the Hawai'i State Archives (Kahikinui, Nakula, and Papaanui Government tracts, Feb. 1915; Portion of Kula, 1909; and Makawao and Kalialinui, 1904). None of the maps, however, provided information on the attributes of 'A'apueo. Two maps were sought at the Hawai'i State Survey Office. The older of the two was too fragile to handle. The second map, HTS Plat 1026, a portion of which is provided as *Figure B-2*, is made from information from a number of surveys conducted by W.D. Alexander and Monsarrat between 1872-1879. 'A'apueo is shown as a single *ahupua'a*, not one divided into four parcels as referenced in LCA testimonies and later correspondence. From this map, grant numbers were obtained and the survey notes for these grants were examined.

The project area includes Grant 1167 to Aui and Grant 1829:1 to Keawe. Grant 1167 states that this area is called "Kohoilo" and is bounded by the *ahupua*'a of Makaehu on the north, Aapueo 4 on the south, and the *aupuni* (watercourse) on the eastern and western boundaries. Aui purchased the 160 acres at the cost of \$2.00 per acre on February 7, 1853. Grant 1829:1 is located on Pu'u o Weli and the record states that it is located in the *ahupua*'a of Aapueo Nui. One can surmise that this is 'A'apueo 4 as well. Grant 836 is located in 'A'apueo 1 and 2 alongside these two project area grants. Grantee K. Kapaakea purchased the 683.69 acres for the price of \$1.00.

## **Residence Patterns and Economic Development**

The Chinese were among those who took advantage of the agricultural opportunities discussed earlier. During the 1840s, Chinese farmers leased lands in Kula. Their initial success motivated many Chinese to move to that region and lease land for farming. They moved from places such as Makawao, Paia, and Wailuku on Maui, Kohala on the Big Island, and from Honolulu. Some went to Kula directly from China. The vast majority of Chinese, about 95%, were Hakkas from Kwangtung Province. During the 1840s, most Kula Chinese acquired their farmland by lease or deed from the *haole* ranchers or Hawaiian homesteaders. Much of this land was owned by the Hawaiian government, which leased it to the ranchers, who in turn subleased it to the Chinese. In some cases, the farmers made their lease payments in farm produce, in lieu of monetary transaction. One family which leased land from Ulupalakua Ranch paid five bags of corn for every acre of land they farmed (Interview, Willie Fong IN Mark 1975). Although by the mid-1850s, the demand for Kula potatoes had diminished, the Chinese population continued to grow. By between 1880 and 1910 approximately 80 Chinese families had moved to Kula; by 1900 there were some 700 Chinese living there. For a period of 30 to 40 years, Kula supported

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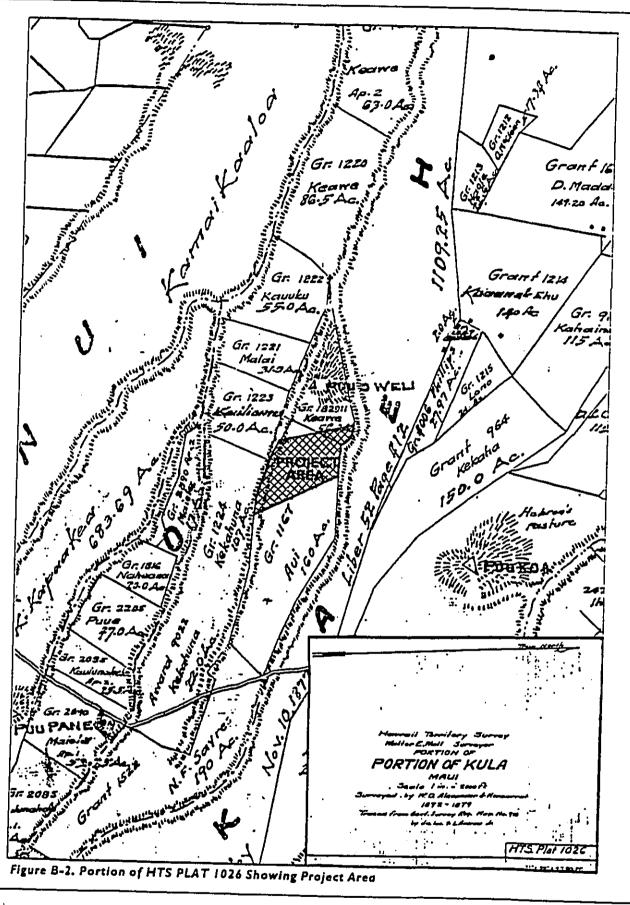
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a thriving community which included Chinese and English schools, Christian churches, a Hung Men society, gambling joints and opium dens, general stores, and dozens of operating farms and cattle ranches (Mark 1975).

In addition to Irish potatoes, the Kula farmers planted corn, beans, onions, Chinese cabbage, round cabbage, sweet potatoes, wheat and other grains, and even cotton. When the Hawaiian market showed no demand for corn, the farmers used the corn to raise pigs, ducks, and chickens, and marketed the animals instead. When the corn, potatoes, and other crops were harvested, they were packed and transported on mule teams or wagons to Kahului and Makena harbors, and were then shipped to Honolulu. Those who lived in the southern districts of Keokea and Kamaole usually brought their produce to the Makena landing. Most of Kula's produce, poultry, and beef was sent to two or three markets in Honolulu Chinatown, including Wing Hong Yuen and Sing Loy. The two stores, in turn, supplied Kula's general stores with Chinese dry goods and staples such as rice, flour, sugar, and canned milk (Mark 1975).

Early farming in Kula was adapted to the topography. In planting crops, rather than terracing the land, the farmers followed the natural contour of the land and depended on moist air and rainfall rather than irrigation. Until 1905, there was little water piped into the area, and during droughts—which occurred every several years—the farmers had to pack barrels of water on mules from Polipoli Springs, or from the beach or Olinda, both about eight miles away (Mark 1975). An article in *The Honolulu Advertiser* points out the changes in the topography in Kula and their effect on the water supply:

Before 1850 Kula was supplied with moisture naturally through the existence of a large forest. "That forest was cut down when land was cleared in Kula to open farm plots in 1850. This was in answer to the demand for food in California during the gold rush....by ranchers clearing for pasture." Secondary result of clearing forests was destruction of existing fresh water ponds in Kihei on the Maaloaea (sic) Bay coast below Kula. When forest was cleared, water was free to rush down the mountains carrying soil from Kula and filling with mud, the ponds for which Kihei was once famous. Meanwhile Kula is dependent on pipe from Waikamoi watershed (Korte 1962 A:15).

By the 1880s the lower Kula sections, such as the project area, had largely become pasture for the booming cattle industry. Large sections of crown land were leased for grazing (Silva IN Miura 1982). In 1905 the Kula Pipeline was built during perhaps the worst drought in Kula history. The water source for the pipeline was in Olinda, northeast of Kula. The contractor who built the pipeline was a prominent Kula resident named Shim Mook, and labor was supplied by the men and women of the area (Mark 1975).

In 1911 the Hawaiian government released a large amount of public land, and it became possible for citizens to purchase property in Kula. The sale of the land was advertised in English and Hawaiian newspapers, but word was somehow not communicated to the Chinese, whose lives these land sales would most affect. According to the Hawaiian Church Chronicle (Oct. 1911:12), the Kula Chinese "were not aware of what was taking place until the land was sold and the Hawaiians came and told them that the property belonged to them. They (Chinese) had relied on the information which they had received that the disposal of the land would not take place for a considerable time." Faced with eviction, the Kula Chinese decided to remain on the land and organize themselves. Ninety-eight young residents signed a petition expressing the desire of the Chinese to be allowed to reside on certain lots their families had farmed for many years.

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In a letter to the Commissioner of Public Lands dated September 27, 1911, Governor Frear suggested that leases be made to occupants of unsold lots for approximately ten years, subject to withdrawal for homestead purposes. Then, as the older children of those families reached 18 years of age, they would be able to apply for the lots as homesteads. In October 1911 the Hawaiian Church Chronicle reported that the government had promised to do so under these terms. Chinese who applied for homesteads and were granted them were given three years to improve their lot...after that period, they could apply for a "right of purchase" lease, and then buy the land outright from the government. Before this special arrangement was arrived at, however, a number of Kula farmers saw their land divided into homesteads and leased to others. These farmers, with the loss of their farmland, were forced to move out of Kula and change their livelihoods.

### Contemporary Land Use (20th Century)

During the 1910s and 1920s many families left Kula for various reasons: severe drought which ruined crops and killed livestock, soil which was reaching depletion level after years of harvesting and tilling, lack of educational opportunities for children, and loss of land due to parceling homesteads. In 1918 another mass exodus occurred—some 40 families left Kula because the land they were leasing was sold to a man named Harold Rice, who intended to use the land for ranching. In the book *Mowee*, the author writes regarding the sale of farms to Rice: "The leases to the land had not expired, but the farmers were unaware of their right to challenge the eviction" (Speakman 1978:143).

The town of Makawao lost its rural status during World War II when military troops stationed nearby encouraged the opening of various businesses to serve the soldiers (Harden and Engledow 1988:91). After the war ended, so did most of the commerce and the town reverted to its slower pace (ibid).

A 1974 planning study for the Makawao-Pukalani-Kula area provides this modern history:

Up until the 1960's, there was a general out-migration of residents from Maui....The Makawao-Pukalani-Kula area served as the primary ranching and small farming area on Maui....There are a variety of reasons why small farming occurred primarily in the Kula area. First, there were a large number of small parcels available, unlike most of Maui where land was held by a limited number of large landowners for the sugar, pineapple. or cattle grazing uses. Secondly, the soils in the Kula, as well as the Olinda areas, were highly adaptable to truck crop production. Thirdly, the climatic conditions in the Kula area, including sun, rain, and cool nights were also favorable to small farming activities. Major amounts of cabbage, onions, tomatoes, snap beans, and lettuce were produced in the area.

The small farms served as both the place of work and residence. In order to service both the farms and the homes, public services such as roads and water were located near the farms. The old Lower Kula Road and the Upper Kula Road, as well as the Omnopio Road, helped provide convenient access for the farmers to town (Donald Wolbrink & Assoc. 1974:32).

Water has historically presented a problem for the Kula area....The Kula water system was created in 1912 with the installation of a dam and intake pipe at the Waikamoi Stream and pipeline that extended across the west face of Haleakala through the Kula district to the Ulupalakua Ranch (ibid.:33).

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| state, accou<br>tion. About<br>Approximat<br>are produce<br>broccoli, and | Kula area is one of the major vegetable growing areas in the 50th<br>nting for approx 35% of the State's total vegetable crop produc-<br>86% of the head cabbage produced in Hawaii is grown here.<br>ely 83% of the State's dry onions and about 65% of the tomatoes |  |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Approximat<br>are produce<br>broccoli, and                                | 86% of the head cabbage produced in Hawaii is grown here.                                                                                                                                                                                                             |  |
| are produce<br>broccoli, and                                              |                                                                                                                                                                                                                                                                       |  |
| broccoli, and                                                             | i in the Kula area. Other truck crops such as carrots, head lettuce,                                                                                                                                                                                                  |  |
| and the second second                                                     | i snap beans area also grown There are 35 family-operated farms                                                                                                                                                                                                       |  |
|                                                                           | 480 acres under cultivation in the project areaMost of the                                                                                                                                                                                                            |  |
|                                                                           | and area is devoted to livestock grazing by about 20 full-time and                                                                                                                                                                                                    |  |
| part-time ia                                                              | mers (Tri-Isle Resource Company 1971:5).                                                                                                                                                                                                                              |  |
|                                                                           | roject area, one of the sites that has been investigated, for an Intermediate<br>329:1 on Pu'u o Weli:                                                                                                                                                                |  |
| This site is h                                                            | ocated along lower Kula Road makai of the Kula 200 subdivision                                                                                                                                                                                                        |  |
|                                                                           | the 1,800 foot elevation as shown in Fig. 17 and 18. The site was                                                                                                                                                                                                     |  |
|                                                                           | capple field, is currently zoned Urban but is vacant. The owners                                                                                                                                                                                                      |  |
|                                                                           | e Messrs. Munoz and Tokunaga for TMK:2-3-08:por. 5. This site                                                                                                                                                                                                         |  |
|                                                                           | reased to 9 acres to provide a minimum of 8 usable acres based                                                                                                                                                                                                        |  |
|                                                                           | slope (A Staff Study on the Site Selection and EIS for an                                                                                                                                                                                                             |  |
| Intermediate                                                              | School for the Makawao-Pukalani-Kula Area, 1977).                                                                                                                                                                                                                     |  |
| A 1981 environr                                                           | nental assessment by Maui Land and Pine Company discusses a parcel                                                                                                                                                                                                    |  |
|                                                                           | he "Filipino Camp," located along Kailua Gulch, one gulch removed from                                                                                                                                                                                                |  |
| Kaluapulani Gulch, o                                                      | n which the project area lies. The assessment reports that:                                                                                                                                                                                                           |  |
| Several year                                                              | s ago pineapple was planted on a portion of the site after removal                                                                                                                                                                                                    |  |
|                                                                           | uses. However, according to older ML&P employees, the results                                                                                                                                                                                                         |  |
|                                                                           | or due to the heavy incidence of Phytopthora sp., a very serious                                                                                                                                                                                                      |  |
|                                                                           | sease which persists in the soil. Pineapple production was                                                                                                                                                                                                            |  |
| terminated fo<br>(1981:[2]30)                                             | or this reason. The site is currently vacant and used only for pasture                                                                                                                                                                                                |  |
| Maui I and and I                                                          | ine Company owned much of the land in the immediate vicinity. Donna                                                                                                                                                                                                   |  |
|                                                                           | management department could not verify if the present project area was                                                                                                                                                                                                |  |
| formerly controlled by                                                    | y the company. She suspected that it was used for pasturage (pers. comm.                                                                                                                                                                                              |  |
| 2/7/96).                                                                  | , ,                                                                                                                                                                                                                                                                   |  |
| Maui Land and P                                                           | ine Company has its roots in Alexander and Baldwin, one of the original                                                                                                                                                                                               |  |
| "Big 5" corporations                                                      | in Hawaii. The inception of this company is documented in the book                                                                                                                                                                                                    |  |
| Mowee:                                                                    |                                                                                                                                                                                                                                                                       |  |
| Acompanyo                                                                 | alled Baldwin Packers was acquired by "H.P." along with its lands                                                                                                                                                                                                     |  |
|                                                                           | on the northwest coast of Maui. Baldwin Packers eventually                                                                                                                                                                                                            |  |
|                                                                           | Pineapple Company, the largest producer of pineapple on Maui.                                                                                                                                                                                                         |  |
| Its developm                                                              | ent was watched over carefully by J. Walter Cameron who had                                                                                                                                                                                                           |  |
| married Fran                                                              | ces Baldwin, granddaughter of "H.P." Taking over Maui Pine-                                                                                                                                                                                                           |  |
| apple, of whi                                                             | ch A & B owned controlling interest, he led the Maui company                                                                                                                                                                                                          |  |

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as it developed over the 1950s and 1960s. On his father's retirement, Colin C. Cameron became manager for A & B, then resigned from Maui Pineapple as a struggle for its control ensued. In a surprise move, a multimillion dollar deal in which the Camerons traded A & B stock and cash for controlling stock in the pineapple company, the Camerons won control. Colin became president, [and] the name was changed to Maui Land & Pineapple Company (Speakman 1978:130-131).

A report on Kula would not be complete without some mention of Kula Sanatorium, founded for the care of tuberculosis sufferers. The sanatorium is located near the project area at an elevation of 3,000 feet (*The Honolulu Advertiser* 9/20/85, B:3). Land for the sanatorium was requested by Bill Pogue in 1909. Initially the sanatorium consisted of two tent-houses which accommodated 12 patients. The tent-houses, which included kitchen and dining facilities, was financed by the County and Territory and cost \$500.00. The first permanent ward was built by W.E. Foster, former patient and superintendent. Around 1932, the Hawaiian Homes Commission granted 100 acres to the sanatorium, and in 1937 a new sanatorium was constructed (Jones 1940).

### PREVIOUS ARCHAEOLOGICAL RESEARCH

No archaeological reports were found for 'A'apueo. Reports for neighboring Kalialinui, and reports on the Kula vicinity were examined. Although the project area falls within the district of Makawao, most reports for this district refer to the coastal areas of Wailea and Makena. It was determined that the information in these reports was not relevant to this report. If a report has already been cited and discussed earlier in this report, it will not be included in this section.

The earliest archaeological surveys conducted in the current project area have already been discussed (in discussion of *heiau*). The State Inventory of Historic Places has on file a number of sites near the project area as a result of a 1973 survey. The Hamakua Burial Cave (50-50-05-1264) is located at the southwestern edge of Pukalani town, along the cliffs of the Kalialinui Gulch (Kennedy 1991:7):

In 1973 Robert Connolly mapped and registered this 33 meter long lava tube which divided into two 3 meter wide chambers. In it, he found the disarticulated remains of 30-50 individuals, along with 3 pieces of worked wood, and 8 water wom stones. At the time of his inspection, the site may have been vandalized in historic times for nearly all crania and mandibles were removed from their skeletons. It is equally possible that these abnormalities were prehistoric in origin (ibid.)

Three petroglyph sites along the cliffs in 'A'apueo are registered on the State inventory. Two sets of petroglyphs were located, one containing 191 figures (50-50-10-1061) and the other 31 figures (50-50-10-1231). The petroglyphs were predominately of single and double canoes, and human figures (ibid.)

Connolly visited the Pu'u Pane, south of the project area in 1973 and found possible remnants of a *heiau*. Kennedy reports that Pu'u Pane is a sacred hill and the *heiau* was that of the high chiefs (Kennedy 1991:7).

An archaeological report was prepared for the Pukalani Highland Subdivision project area, located in the *ahupua* 'a of Kailua (Kennedy 1991). In his report Kennedy maintains that LCA

testimonies for 'A'apueo shows that the primary usage of the land at that time was for pasturage (ibid.:5). Kennedy identifies a possible *heiau* site in Kailua (ibid.:8). He suggested preservation of the remains.

Later the same year, Demaris L. Fredericksen and Walter M. Fredericksen conducted additional archaeological data collection in the same parcel primarily to address the dispute over the remnants identified by Kennedy as a possible *heiau* and burial site (Fredricksen and Fredericksen 1991). After Kennedy's recommendation, State Historic Preservation Officer Annie Griffin examined the sites and concluded that several anomalies concerning the features were present and requested further testing and data collection. As a result of oral interviews, the Fredericksens concluded that the features (outcroppings) were the result of historic agriculture.

### ORAL INTERVIEWS

Oral interviews were not conducted for this project; however, those conducted by Kennedy and Fredericksen are discussed here. Kennedy interviewed George Fernandez, who lived in the Kailua project area for over 80 years (Kennedy 1991:5). Mr. Fernandez recalled that that land had been used for growing pineapples until the 1930's, and that after that it was used for pig farming and pasture for horses (ibid.)

When Fredericksen and Fredericksen conducted their archaeological data collection project later the same year, they were confronted with Hawaiian activist Charles Maxwell who claimed he informed Kennedy that the outcroppings were sacred and that he was not to "touch a stone" on them (Frederickson and Fredrickson1991:1). Fredericksen and Fredericksen interviewed five informants who were kama 'aina of the area. Through the informants it was learned that the outcroppings were built by Portuguese farmers and were "agricultural clear piles," and that many had accounts of collecting 'ulu maika and adzes in the area. Some also recounted that there were Hawaiian graves in the vicinity (ibid. 4,5).

### SUMMARY AND CONCLUSION

It is difficult to confirm how project area land was used in the past because there is no information specific to the *ahupua* 'a. One can, however, postulate on activities and the remains that may be found in the project area based on studies of nearby areas.

The remains of a *heiau* in 'A'apueo was identified by Walker in 1931; however, no other survey searched for or located it. A site identified in 1991 as a possible *heiau* in the adjoining *ahupua'a* of Kailua, turned out to be a result of modern agricultural clearing.

Winslow Walker maintains that villages were customarily located at the mouths of gulches. Since the project area is far from the mouth of the gulch, the likelihood of prehistoric remains are diminished. However, according to LCA information, there were once housesites in the project area, and these, along with agricultural remnants, may be located.

In 1973 Connolly discovered a burial cave located along the cliffs of Kalialinui Gulch and vast numbers of petroglyphs. Based on his findings, it is possible that either one of these features will be found in the project area.

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In early times the Kula area was recognized for sweet potato and dryland taro cultivation. By the mid 1800s, most of the land in 'A'apueo was used for pasturage and agriculture. During the late 19th and during the 20th century the vicinity was utilized primarily for pasturage and pineapple cultivation. Due to agricultural clearing it is highly likely that the terrain in the project area has been significantly altered in modern times.

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# Appendix B-2

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# Archaeological Reconnaissance Survey

# Archaeological Reconnaissance Survey 250-Acre Pukalani Project Area

Land of Aapueo, Makawao District Island of Maui

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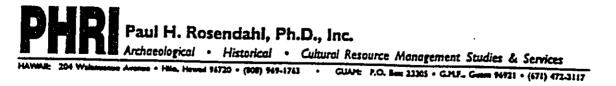
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Paul H. Rosendahl, Ph.D., Inc. Archoeological • Historical • Cultural Resource Monogement Studies & Services

# Archaeological Reconnaissance Survey 250-Acre Pukalani Project Area

Land of Aapueo, Makawao District Island of Maui (TMK: 2-3-08:Por. 5)

| Blair McPhatter, B.A. •    | Crew Chief           |        |
|----------------------------|----------------------|--------|
| AND                        |                      |        |
| Paul H. Rosendahl, Ph.D.   | • Principal Archaeol | logist |
| PREPARED FOR               |                      |        |
| Dowling Company, Inc.      |                      |        |
| c/o Munekiyo & Arakawa, I  | nc.                  |        |
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| EBRUARY 1996               |                      |        |



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# SUMMARY

At the request of Mr. Don Fujimoto, Vice President of Dowling Company, Inc., Paul H. Rosendahl, Ph.D., Inc. (PHRI), conducted Archaeological Reconnaissance of a 250-acre parcel located in the Land of Aapueo, Makawao District, Island of Maui (TMK:2-3-08:Por.5). The purpose of an Archaeological Reconnaissance survey is to identify all sites of potential archaeological significance present within the specific project area and assign each site a tentative significance evaluation.

Two sites were identified during the survey, a petroglyph (Site 1707-1), and a wall (Site 1717-2). In addition, a number of land-clearing piles associated with historic pineapple cultivation were also noted.

The wall site (Site 1707-2) is tentatively evaluated as significant solely for information content and further data collection only is recommended for this site. The petroglyph site (Site 1707-1) is significant for information content and for cultural value. Because this site is near the project area boundary, it is recommended this site be preserved with interpretive development.

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# INTRODUCTION

### BACKGROUND

At the request of Mr. Don Fujimoto, Vice President of Dowling Company, Inc., Paul H. Rosendahl, Ph.D., Inc. (PHRI), conducted an archaeological reconnaissance of the 250-acre Pukalani project area (TMK:2-3-08:Por.5), situated in the Land of Aapueo, Makawao District, Island of Maui (*Figure 1*).

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Most of the project area is primarily former pineapple lands. Two large gulches (Kaluapulani and Kalialinui Gulch) are also present in the general area, and the State of Hawai'i has identified several archaeological sites within those gulches (letter of March 7, 1994 from Don Hibbard, Administrator, DLNR-SHPD, to Brian Miskae, Director, Maui Planning Department). In addition to work in the 250-acre Pukalani project area, Dowling Company, Inc. would like to excavate and place a culvert through a swale within the project area without affecting any previously identified archaeological sites

The overall objective of the present reconnaissance survey was to locate and identify all archaeological sites in conjunction with a due diligence investigation. The reconnaissance survey does not generate sufficient information to qualify as an inventory survey. An inventory survey would provide information appropriate and sufficient to satisfy all current historic preservation regulatory review requirements of the Department of Land and Natural Resources-State Historic Preservation Division (DLNR-SHPD) as contained within Hawaii Administrative Rules, Title 13, Department of Land and Natural Resources, Subtitle 6, State Historic Preservation Division Rules (DLNR Draft Rules 1994).

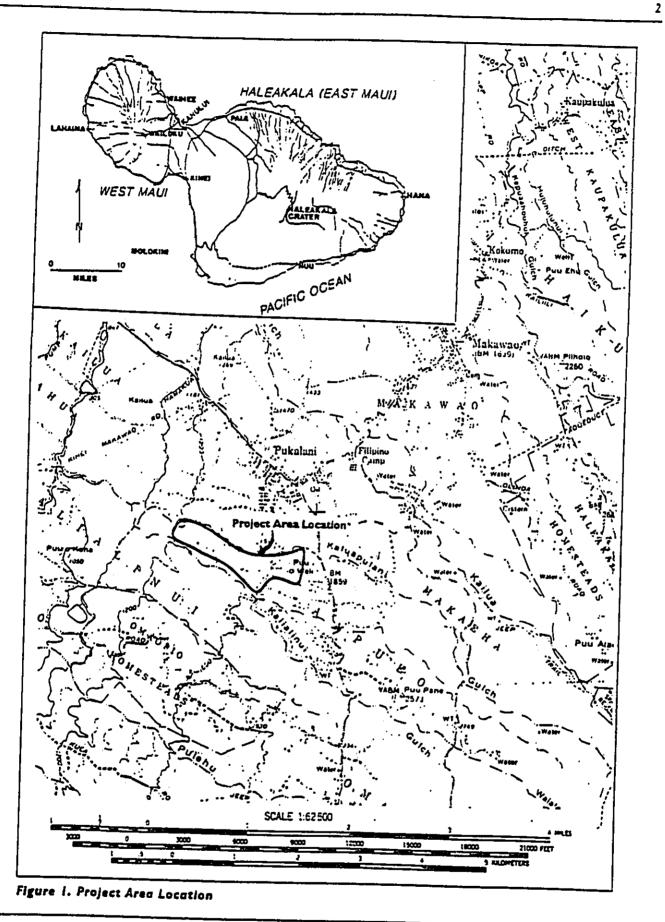
### SCOPE OF WORK

The basic purpose of a reconnaissance survey is to identify all sites and features of potential archaeological significance present within a specified project area. A reconnaissance survey is the initial level of archaeological investigation and is conducted with the basic aim of determining the presence or absence of archaeological resources within a specified project area. Finally, it indicates both the general nature and variety of archaeological remains present, and the general distribution and density of such remains.

The basic objectives of the survey were fourfold: (a) to identify all sites and site complexes present within the project area; (b) to evaluate the preliminary significance of all identified archaeological remains; (c) to determine the possible impacts of proposed development upon the identified remains; and (d) to define the general scope of any subsequent further inventory, data collection, and/or other mitigation work that might be necessary or appropriate.

Based on a review of readily available background literature, basic familiarity with the general project area, and extensive familiarity with the current requirements of pertinent review authorities, the following specific tasks were determined to constitute an adequate and appropriate scope of work to comply with current reconnaissance level survey requirement:

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- 1. Review archaeological literature relevant to the project area (emphasis on readily available literature);
- 2. Conduct 100% coverage, high-intensity ground survey of the entire project area, to find and list (a) any previously identified sites and features, and (b) any previously unidentified sites and features; and
- 3. Analyze field data, and prepare appropriate reports.

The preliminary significance of all archaeological remains identified within the project area is tentatively assessed in terms of (a) the National Register criteria contained in the Code of Federal Regulations (36 CFR Part 60), and (b) the criteria for evaluation of traditional cultural values prepared by the National Park Service (1990). DLNR-SHPD uses these criteria to evaluate eligibility for both the Hawaii Sate and National Registers of Historic Places.

To further facilitate client management decisions regarding the subsequent treatment of resources, the preliminary significance of all archaeological remains identified during the survey is evaluated in terms of three cultural resource management value modes, which are derived from the previously mentioned federal evaluation criteria. Sites are evaluated in terms of potential scientific research, interpretive, and/or cultural values. Scientific research value refers to the potential of archaeological resources for producing information useful in the understanding of culture history, past lifeways, and cultural processes at the local, regional, and interregional levels of organization. Interpretive value refers to the potential of archaeological resources for public education and recreation. Cultural value, within the framework for significance evaluation used here, refers to the potential of archaeological resources for the preservation and promotion of cultural and ethnic identity and values.

### **PROJECT AREA DESCRIPTION**

The parcel consists of c. 250 acres, situated in the Land of Aapueo, Makawao District, Island of Maui (*Figure 1*). The project area is bounded by the Kula Highway on the east, by Kaluapulani Guich (Kaakakai Guich on Tax maps) on the north, by the Pukalani Golf Course on the west, and by undeveloped land to the south. Historical information has shown that approximately 75% of the project area was planted in pineapple in AD 1979 (by Maui Land and Pine Company) and is now used as pasture for cattle (H.W. Smith, pers. comm.). The eastern 25% of the project area consists of two golf holes for the Pukalani Golf Course and intervening areas of short grass.

The elevation in the project area ranges from c. 1,190 ft above mean sea level (AMSL), on the western end, to c. 1,810 ft AMSL, at the eastern end of the parcel. Rainfall in the general vicinity of the project area averages 75 inches per year, and the mean annual temperature is 70-75 degrees F (Armstrong 1983).

Terrain within the project area slopes moderately from the east end towards the west. Soils are comprised primarily of Keahua silty clay loam (3%-5% slopes and 7%-15% slopes), Keahua silty clay (7%-15% slopes), Keahua cobbly silty clay (7%-15% slopes), and Keahua cobbly silty clay loam (15%-25% slopes). An abandoned quarry is present in the eastern portion of the project area and is comprised of Keahua cobbly silty clay loam soil. Kaluapukani Gulch is comprised of rough broken lands (Foote et al. 1972). The Keahua Series is comprised of "...well drained soils on uplands on the island of Maui. These soils developed in material weathered from basic igneous rock" (Foote et al. 1972:65). The Keahua soils are used for sugar cane, pasture, and wildlife habitat, with smaller lands used for home sites, pineapple, and truck crops.

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The vegetation of the Pukalani project area is dominated by grasses and low growing shrubs, including guinea grass (*Panicum maximum*), lantana (*Lantana camara L.*), sensitive plant (*Mimosa pudica*), prickly pear (*Opuntia ficus-indica*), agave (*Agave sisalana*), and *koahaole* (*Leucaena leucocephala*), and other unidentified grasses and weeds. The fringes of the former pineapple fields exhibit a few trees including a some large *koa-haole*, silver oak (*Grevillea robusta*), eucalyptus, and Christmas-berry (*Schinus terebinthifolius*).

### PREVIOUS ARCHAEOLOGICAL WORK

Other than the DLNR-SHPD letter to Mr. Miskae, there are no records indicating that archaeological work has previously been conducted in the parcel examined during this survey. The DLNR-SHPD letter indicates that there are several petroglyph sites and a burial site within Kaluapulani and Kalialinui Gulches (*Figure 2, at end*). The letter states that Site 1061 (Kalialinui Petroglyphs) and Site 1062 (Kaluapulani Petroglyphs) are present immediately outside the present project area. The DLNR-SHPD letter also goes on to state that Sites 1061 and 1062 are significant for information content, as excellent examples of traditional Hawaiian petroglyphs), and 1264 (Hamakua Burial Cave) are located slightly downslope of the project area. In the letter, DLNR-SHPD states that these final two sites (Sites 1231 and 1264) could be impacted by future development or use of the current project area.

### FIELD METHODS AND PROCEDURES

The 100% pedestrian survey was undertaken between January 29 and February 2, 1996, by Crew Chief Blair McPhatter, B.A., and Field Archaeologist Harley Lanham, B.A. Principal Archaeologist Dr. Paul H. Rosendahl and Hawai'i Projects Director Mr. Alan T. Walker, B.A., provided overall guidance for the project. The surface reconnaissance survey of the project area was accomplished by using a systematic series of transects, nearly all oriented at 120-300 degrees, approximately parallel to the long axis of the project area. The intervals between the crew members were 10 meters in the western portion of the project area (specifically Land Grants 1829 and 1220 to Keawe). Because of the excellent visibility in the eastern portion (Land Grants 1221 to Malai, 1222 to Kauuku, and 1829, Apana 1 to Keawe), the intervals were increased there to 20 meters. The terrain in Kaluapulani Gulch (Kaakakai Gulch) was mostly composed of vertical cliffs, and pedestrian survey was impossible. Mr. Don Fujimoto of Dowling Company, Inc., confirmed that this area would not be developed.

During the pedestrian survey, all transects were identified sequentially and plotted on the project area map, in order to monitor the daily progress of the project. Pink and blue- and -white flagging were used by field personnel throughout the project area to mark the start and termination points of each transect. As sites were identified during the pedestrian survey, they were marked with pink flagging tape and assigned sequential PHRI temporary numbers prefixed by "1707-" beginning with "1707-1." Sites were tagged with an aluminum strip bearing the site number, PHRI project number (96-1707), and the date. All sites were plotted onto a 1"= 300" scale project map (10-ft contours) supplied by Austin, Tsutsumi & Associates, Inc.

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A PHRI site record form was completed for each site, along with a site map (excluding Site 1707-2, a petroglyph), and notes on each site were kept in a field book. The site map was produced using a metric tape and compass, with the scale dependent upon the size of the site. A complete 35 mm black-and-white photographic record of field work was kept. No subsurface excavation was undertaken.

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# FINDINGS

During the present reconnaissance survey, two sites containing two component features were identified (*Table 1*). Both were newly recorded sites. They included Site 1707-1, a peroglyph, and Site 1707-2, a wall (*Figure 2*). No archaeological sites were identified in the area proposed for a culvert crossing. Numerous land clearing piles associated with prior pineapple cultivation were also noted but not recorded as sites. Below are descriptions of the two sites. 6

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### SITE 1707-1

Site 1707-1 is a petroglyph of what appears to be a cance with a "crab claw" sail. It measures approximately 0.32 m (N-S) in length, by 0.28 m (E-W) wide, with the bow facing south. The hull of the cance is c. 0.03 m wide and it contains a raised and pointed bow. The entire hull is clearly etched, but the stern appears less distinct. Two separate rigging lines are present on each side of the sail and appear to be mirror images of each other. The southernmost line is attached to the point of the bow, while the stern line is attached to the hull. Both of these outside lines are attached to the top of the sail and the two interior lines are attached to the middle part of the sail. This appears to be a prehistoric petroglyph. The petroglyph appears unaltered and no portable remains were observed in the area. This site is located on the northern side of the gully in Land Grant 1829, Apana 1, and is south of the quarry. It is likely that a few other petroglyphs are present.

### SITE 1707-2

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Site 1707-2 is a boundary wall on the north side of Kalialinui Gulch. The wall measures c. 184.0 m long (E-W), by 0.5 m wide, by 0.8-1.4 m high. It consists of a loosely stacked alignment of small-to-large basalt cobbles and boulders with sections of the wall being collapsed. The wall is not constructed in a straight line, but meanders north and south along its length. The wall is generally oriented approximately 100-280 degrees. The west side of this wall merges into the natural cliffline on the project-area side of the gulch. On the east end, the wall curves to the north for c. 3.5 m and abuts the natural cliffline of the gulch. This short north-south section is oriented approximately 60-240 degrees. This wall is located at the only available point of entry into the gulch in this portion of the project area. The wall appears to be historic in age, given its loose construction.

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| PHRITemp.<br>Site Number S | Formal<br>Site/Feature | Functional<br>Interpretation | *CRM Value<br>Mode Assess. |   | Completed<br>Field Work Tasks |    |    |    |
|----------------------------|------------------------|------------------------------|----------------------------|---|-------------------------------|----|----|----|
|                            | Туре                   |                              | R                          | 1 | С                             | DR | SC | EX |
| 1707-1                     | Petroglyph             | Rock art                     | M                          | L | M                             | +  | •  | -  |
| 1707-2                     | Wall                   | Boundary                     | L                          | L | L                             | +  | •  | -  |

### Table 1. Summary of Identified Sites and Features

### \* Cultural Resource Management Yalue Mode Assessment

| R = | Scientific | research |
|-----|------------|----------|

| –Nature: | R | = | Scientific re |
|----------|---|---|---------------|
|          | 1 | = | Internetive   |

1 = Interpretive

C = Cuitural

-Degree: H = High

M = Moderate

L = Low

**Completed Field Work Tasks:** 

DR = Detailed recording

(scaled drawings, photographs, and written descriptions),

SC = Surface collections,

EX = Test excavations.

# CONCLUSION

### DISCUSSION

The present reconnaissance survey has shown that the parcel was cultivated in pineapple during the historic period, and this explains why so few archaeological sites were identified. The two remaining sites consist of a prehistoric petroglyph (Site 1707-1) and a historic wall (Site 1707-2). Given the location on Maui of the project area (rainfall, elevation, soil, etc.), it is likely that this area was used for the cultivation of dryland agricultural crops and habitation during the Prehistoric Period. The presence of Site 1707-1 is not unusual, since several other petroglyph sites are already known to be in the area (Sites 1061, 1062, 1231). Occupation of the general area is also evidenced by Site 1264 (Hamakua Burial Cave). All petroglyph sites and the burial cave are tentatively assigned a prehistoric age. Early Historic/Historic occupation is also suggested by the presence of Site 1707-2, a wall. No archaeological features were identified in the swale area proposed for a culvert crossing. It must be noted here that because no radiocarbon age determination analysis has been done within the project area, the conclusions regarding the age of sites presented here are tentative.

### TENTATIVE GENERAL SIGNIFICANCE ASSESSMENTS AND RECOMMENDED GENERAL TREATMENTS

The sites located within the boundaries of the 250-acre Pukalani project area have been tentatively assessed for significance based on the National Register Criteria for Evaluation, as outlined in the Code of Federal Regulations (36 CFR Part 60). The Department of Land and Natural Resources-State Historic Preservation Division (DLNR-SHPD) uses these criteria for evaluating cultural resources. To be assessed as significant a site must possess integrity of location, design, setting, materials, workmanship, feeling, and association and must be characterized by one or more of the following four criteria:

- (A) It must be associated with events that have made a significant contribution to the broad patterns of our history;
- (B) It must be associated with the lives of persons significant in the past;
- (C) It must embody distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic value or represent a significant and distinguishable entity whose components may lack individual distinction; or
- (D) It must have yielded or may be likely to yield, information important in prehistory or history.

Sites are also assessed for cultural significance using: (a) guidelines prepared by the National Park Service (1990), and (b) guidelines established by the State of Hawaii ("Draft Rules"

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Report 1707-020996

Governing Procedures for Historic Preservation Review" [DLNR Draft Rules 1994]). The Hawaii State guidelines utilize this additional fifth criteria (Criterion E) which defines significant cultural resources as ones that "have an important traditional cultural contribution or value to the native Hawaiian people or to other ethnic groups of the state" (DLNR Draft Rules 1994). 9

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Most archaeological sites are initially evaluated as significant under Criterion D. After the evaluative process of an inventory survey, or the data recovery process of a mitigation program, the research potential of some sites may be exhausted (i.e., after extensive mapping, testing, surface collection, historical research, etc.). In these cases, the sites may maintain their information content value but lose their information content significance. Hence, the sites would be considered as "No Longer Significant" (NLS).

Based on the federal criteria described above, Sites 1707-1 and 1707-2 are tentatively assessed as significant for information content (*Table 2*). However, Site 1707-1 is also assessed as being culturally significant. Both sites are recommended for inventory survey (detailed recording and mapping), and historical documentary research should be conducted on the parcel.

The four sites located outside the project area noted by DLNR-SHPD and discussed above in the section on previous archaeological work (Sites 1061, 1062, 1231, and 1264) (letter of March 7, 1994 from Don Hibbard, Administrator, DLNR-SHPD, to Brian Miskae, Director, Maui Planning Department), should not be impacted by proposed development of the present parcel. To insure they are not impacted, a monitoring plan should be prepared and implemented prior to any construction in the area. i

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| Recommended General Treatments |            |                          |   |   |   |                         |     |   |     |   |   |
|--------------------------------|------------|--------------------------|---|---|---|-------------------------|-----|---|-----|---|---|
| PHRI Temp.                     |            | Significance Evaluations |   |   |   | General Recommendations |     |   |     |   |   |
| Site No.                       | Site Type  | Ā                        | B | Ċ | D | E                       | NLS |   | NFW |   |   |
| 1707-1                         | Petroglyph | •                        |   | - | + | +                       |     | + |     |   |   |
| 1707-2                         | Wall       | •                        | • | • | + | -                       | -   | + | •   | - | - |
| Total:                         |            | 0                        | 0 | 0 | 2 |                         | 0   | 2 | 0   |   | 0 |

Table 2. Summary of Tentative General Significance Assessments and

| General Significance Categories:                                              |                                                                                                                      |
|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| A = Associated with events that have made a significant contribution          |                                                                                                                      |
| to the broad patterns of history                                              |                                                                                                                      |
| B = Associated with the lives of persons significant in our past              |                                                                                                                      |
| C = Excellent example of site type at local, regional, island, state, or      | <b>a</b>                                                                                                             |
| national level (PHRI=interpretive value); and                                 | -                                                                                                                    |
| D = Important for information content, further data collection                | •                                                                                                                    |
| necessary (PHRI=research value);                                              |                                                                                                                      |
| E = Culturally significant (PHRI=cultural value);                             |                                                                                                                      |
| NLS = Important for information content, no further data callection           | •                                                                                                                    |
| necessary (PEPI=meensth value, DI NR SUPP-res                                 |                                                                                                                      |
| necessary (PHRJ=research value, DLNR-SHPD=not significant).                   | يو <u>ي</u> م                                                                                                        |
| Recommended General Treatments:                                               | •                                                                                                                    |
| FDC = Further data collection necessary                                       | •                                                                                                                    |
| (detailed recording, surface collections, and limited excavations,            | ~                                                                                                                    |
| and possibly subsequent data recovery/mitigation excavations);                | ۰.,                                                                                                                  |
| NFW = No further work of any kind necessary, sufficient data collected        | ۲                                                                                                                    |
| archaeological clearance recommended, no preservation potential;              | £- *,                                                                                                                |
| PID = Preservation with some level of interpretive development recommended    |                                                                                                                      |
| (including appropriate related data recovery work);                           | 1. S. A.                                                                                                             |
| PAI = Preservation "as is," with no further work (and possible inclusion into |                                                                                                                      |
| landscaping), or possibly, minimal further data collection necessary.         | £**.                                                                                                                 |
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#### **National Park Service**

1990 Guidelines for Evaluating and Documenting Traditional Cultural Properties. National Register Bulletin 38. U.S. Department of the Interior, National Park Service, Washington, D.C.

## OVERSIZED DRAWING/MAP

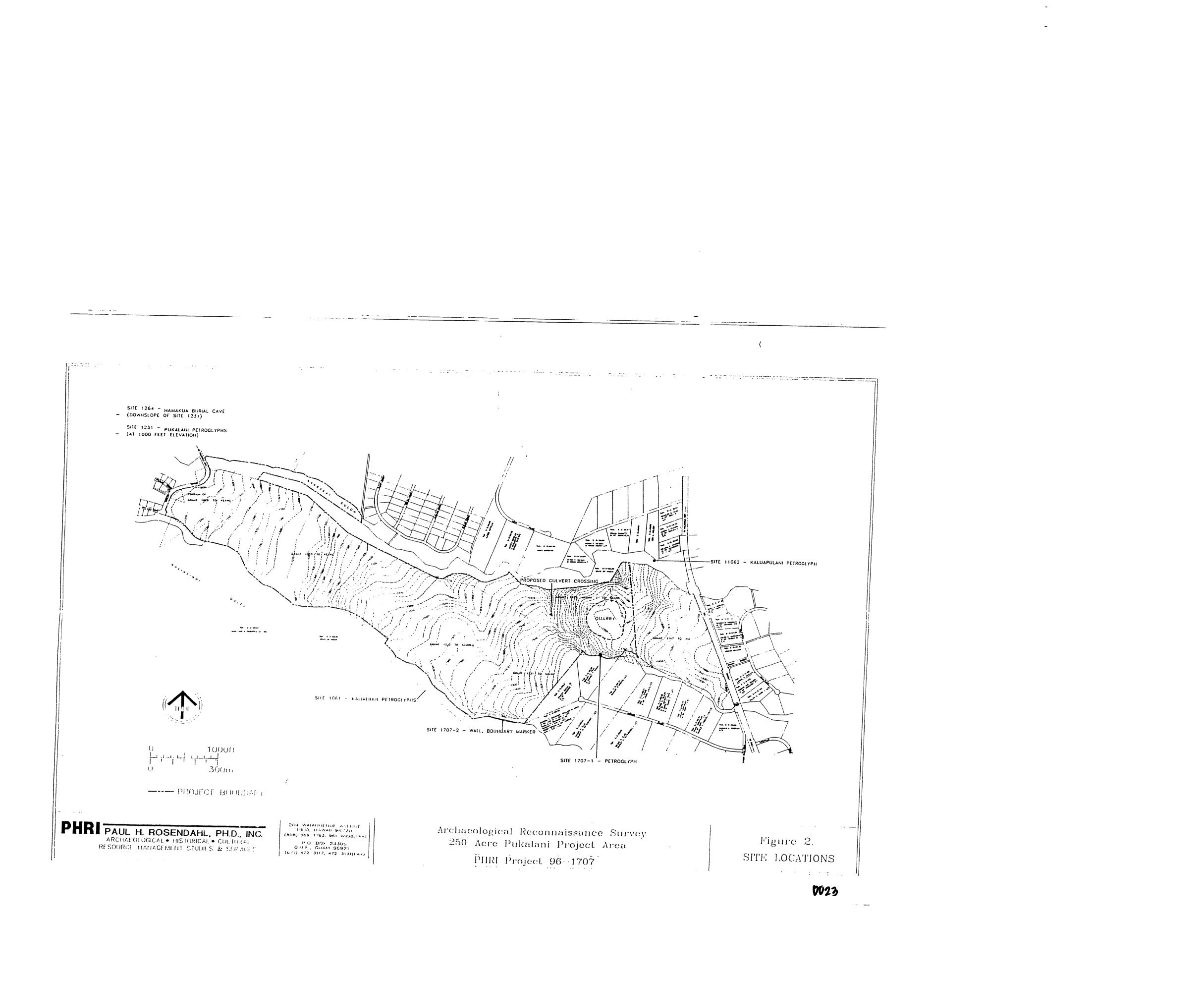
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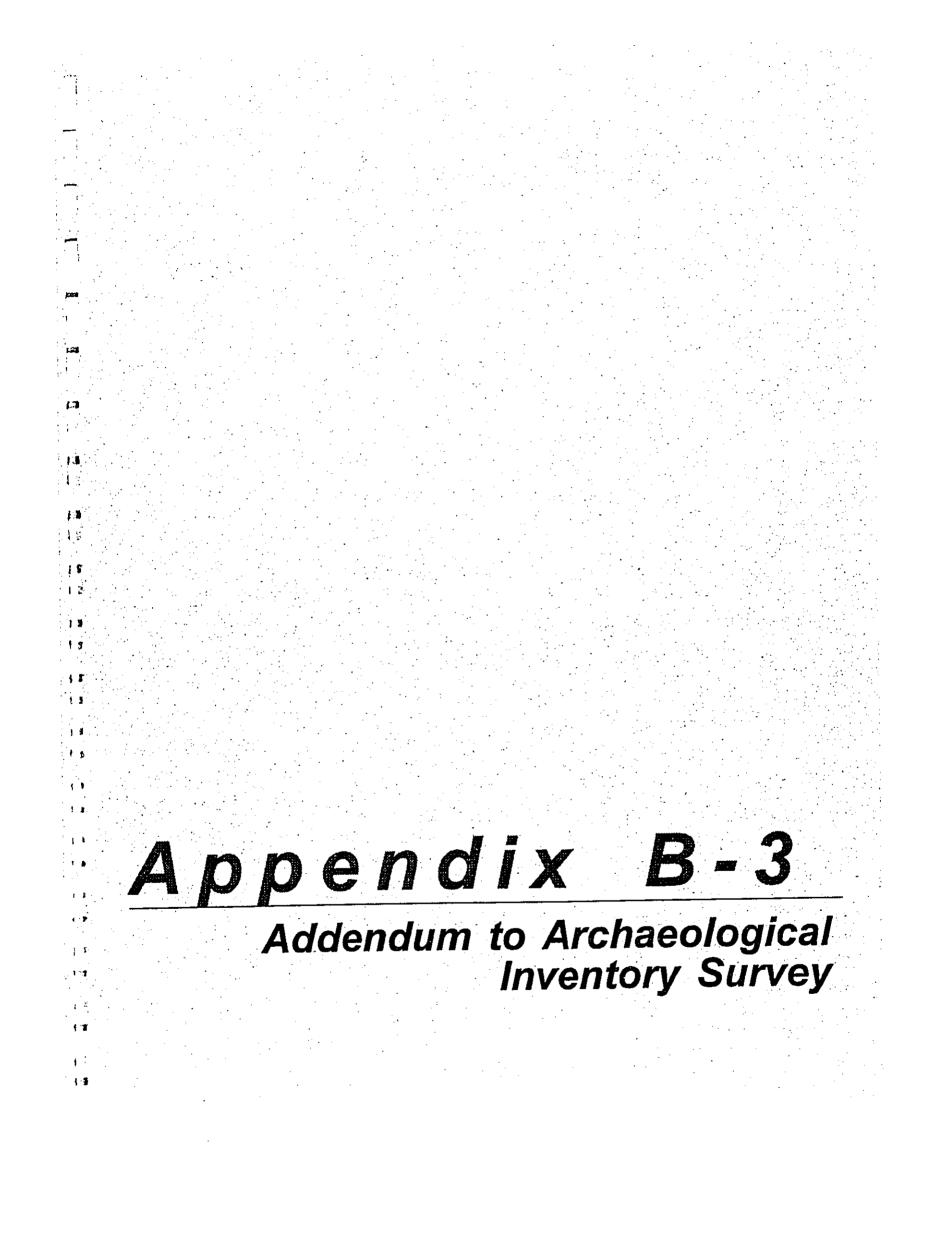


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PHRI

Paul H. Rosendahi, Ph.D., Inc. Archaeological • Historical • Cultural Resource Management Studies & Services 204 Walanuenue Avenue • Hilo, Hawall 96720 • (808) 969-1763 • FAX (808) 961-6998 P.O. Box 23305 • G.M.F., Guam 96921 • (671) 472-3117 • FAX (671) 472-3131

Letter 1803-041597

April 15, 1997

Dowling Company, Inc. c/o Mr. Milton Arakawa Munekiyo & Arakawa, Inc. 305 High Street, Suite 104 Wailuku, Hawai'i 96793

#### Subject: Addendum to PHRI Report 1700-030196, Archaeological Inventory Survey, 44-Acre Pukalani Terrace Subdivision III

At the request of Mr. Don Fujimoto, Vice President of Dowling Company, Inc., Paul H. Rosendahl, Ph.D., Inc. (PHRI) conducted and previously reported (Wulzen and Rosendahl 1996b) archaeological inventory of a 44-acre parcel. The project area was a portion of the 305-acre former Pukalani Terrace Subdivision Unit III (the project is now known as Kalumalu Subdivision) that was [reviously subjected to reconnaissance survey (McPhatter and Rosendahl 1996; Wulzen and Rosendahl 1996a). As shown on the revised *Figure 2*, this addendum expands the inventory survey to include an additional 9.67 acres, for a total of 53.67 acres.

The subject property is located in the Land of 'A'apueo, Makawao District, Island of Maui (TMK:2-3-08:Por.5), and is depicted on two topographic maps, "Kilohana, Hawaii" (USGS 1983a), and "Puu O Kali, Hawaii" (USGS 1983b). The parcel is primarily former pineapple land, bounded on the north and south by branches of Kaluapulani Gulch (Kaakakai Gulch on tax maps). The eastern project boundary is the Kula Highway (Hawaii State Route 37). On the west, the project area now extends approximately to the 1740 foot contour, the west edge of the cinder cone known as Pu'u O Weli, which had been used until recently as a cinder quarry.

During the archaeological reconnaissance surveys on February 1 and 2, 1996, the entire 305 acres were subjected to surface inspection of equal intensity. Leter, additional survey, along with site recording and subsurface testing of Site 50-50-10-4181, was conducted on February 6 through 9, 1996. This survey covered the entire east portion of the 305-acre project area, including Pu'u O Weli. Neither phase of the survey revealed any evidence of any other sites in the 53.52 acre parcel, as indicated on *Figure 2*.

Prior to the reconnaissance surveys (McPhatter and Rosendahl 1996; Wulzen and Rosendahl 1996a), no previous archaeological work had been conducted in the Pukalani Terrace Subdivision Unit III project area, and no other archaeological surveys in 'A'apueo are known. One site, 05-50-50-4181, was identified during the inventory survey. Features of the site included two agricultural clearing piles and two rock alignments. The site was subjected to subsurface testing, and assigned a function of late historic to modern agriculture, based on artifacts. This site was evaluated as not eligible for the National Register of Historic Places (NRHP) (Wulzen and Rosendahl 1996b).

During the surface survey of the contiguous portion of the 305 acre parcel, one previously unrecorded site was identified just south and outside of the current project boundary. Site 50-50-10-4179 is located in a branch of Kaluapulani Gulch at the southern foot of Pu'u O Weli and consists of two

۱., هنه، و 1.4 5.4 1., 5 4 ÷. 1 1.4 1.1 17 1.8 10 1 7 i i 1 18 petroglyph panels containing at least five elements of canoes and crab claw sails (McPhatter and Rosendahl 1996). This site may require protection during land clearing and grading of the expanded project area. Two land-clearing piles associated with prior pineapple cultivation have been noted near the northwest and southwest corners of the present project area, but are not considered sites (McPhatter and Rosendahl 1996). Two other previously recorded petroglyph sites (50-50-10-1061; 50-50-10-1062) are located in Kalialinui Gulch and Kaluapalani Gulch. respectively. Neither of these sites should be affected by the expansion of the project area.

If you have any questions, or if we can be of further service to you, please call me at our main Hilo office (808) 969-1763.

Sincerely yours, Paul H. Rosendahl, Ph.D. President and Principal Archaeologist

Attachment: Revised Figure 2

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#### **References Cited**

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#### McPhatter, B., and P.H. Rosendahl

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1983a Kilohana, Hawaii, Scale 1:24,000. Denver: USGS.

1983b Puu o Kali, Hawaii, Scale 1:24,000. Denver: USGS.

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1996b Archzeological Inventory Survey, 44-Acre Pukalani Terrace Subdivision III, Land of Aapueo, Makawao District, Island of Maui (TMK: 2-3-08:Por. 5). PHRI Report 1700-030196. Prepared for Dowling Company, Inc., Wailuku, HI 96793.

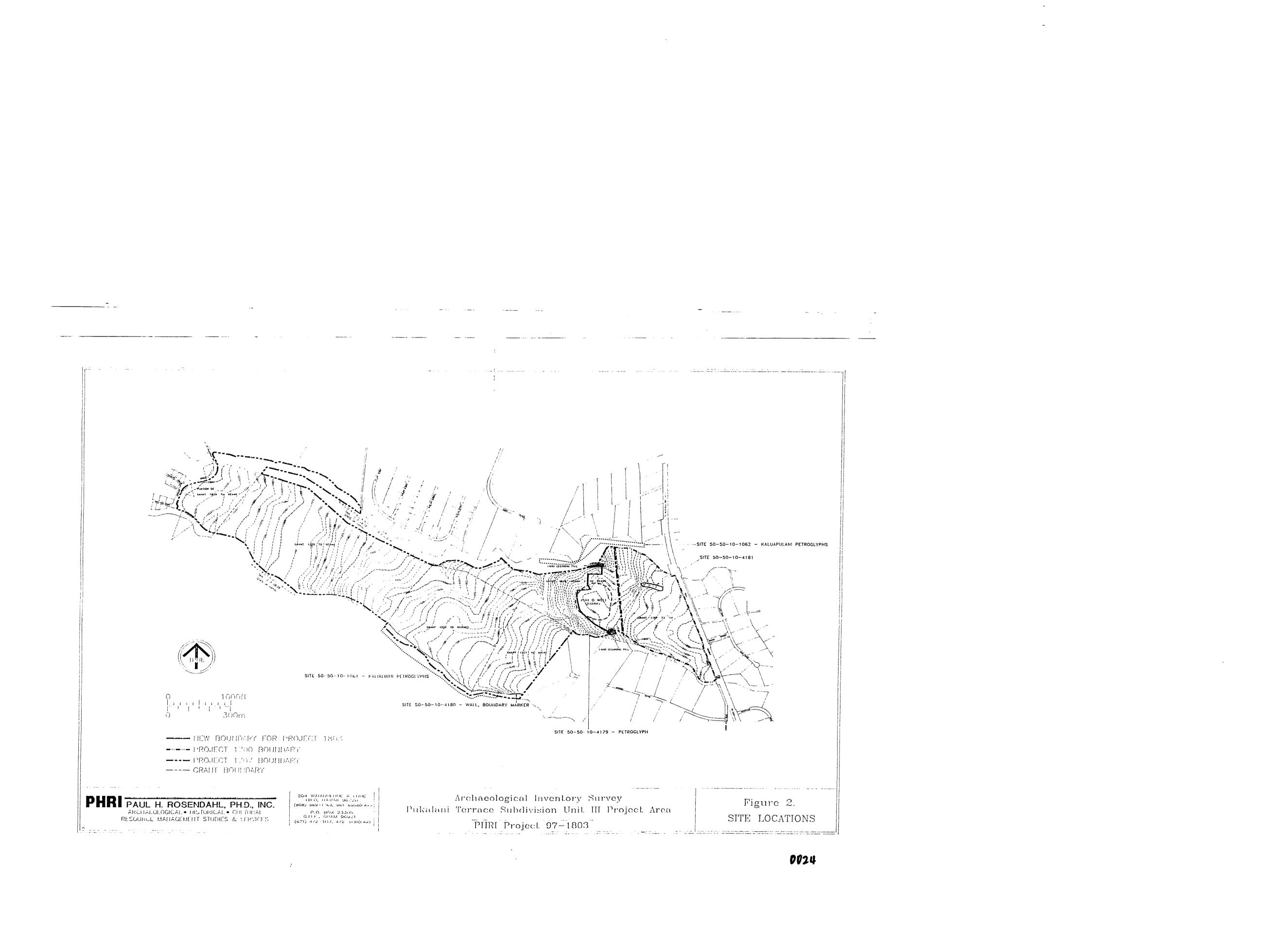
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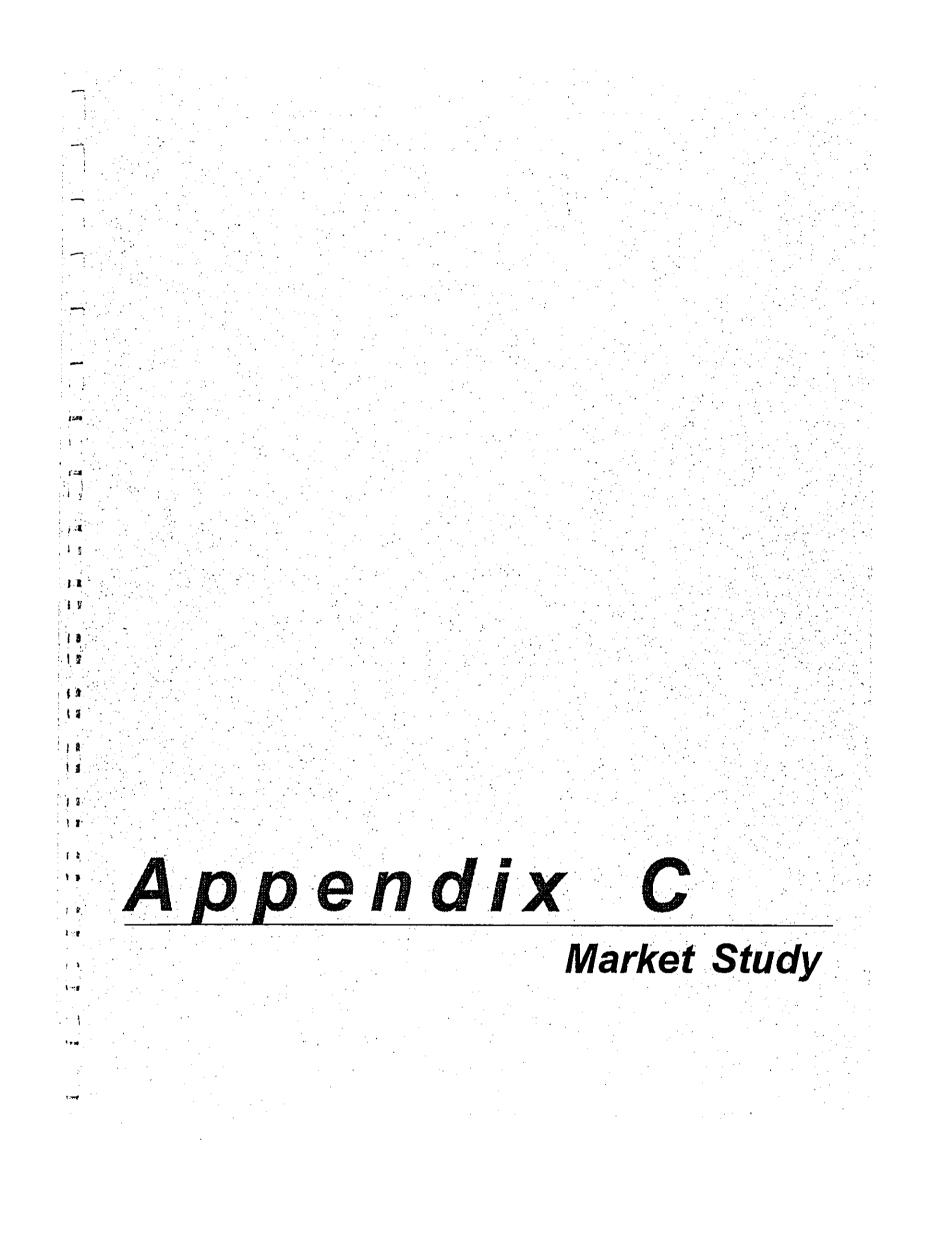


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## JOHN CHILD & COMPANY REAL ESTATE CONSULTANTS & APPRAISERS

Report to

Dowling Company, Inc.

Covering the

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### KULAMALU COMMERCIAL MARKET STUDY

Pukalani, Maui, Hawaii

March 1996

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#### JOHN CHILD & COMPANY BOLM ENTITE CONSTITUTING APPRASERS

March 22, 1996

Mr. Everett R. Dowling Dowling Company, Inc. 1997 East Main Street Wailuku, Maui, Hawaii 96793

Dear Everett:

Re: Kulamalu Commercial Market Study

At your request, John Child & Company has provided real estate consulting services to estimate and project the market support for commercial retail and ancillary office development at Kulamalu. This letter summarizes our findings that are presented in the accompanying report.

#### BACKGROUND

Dowling Company, Inc. (DCI) owns Kulamalu, a 300-acre parcel in Pukalani, Maui, Hawaii. The property is zoned R-2 Residential. The County may approve the rezoning of about 20 acres of the property from R-2 to Commercial, provided an additional 20 acres are offered for Park use.

The 20-acre Kulamalu commercial site accounts for about 77% of the undeveloped commercial land in Upcountry Maui. The remaining sites are smaller, non-contiguous properties that would not have the same potential as a major retail center in the region.

DCI is evaluating the feasibility of commercial retail and ancillary office development on the 20acre portion of Kulamalu. In this regard, you have asked us to assist you by assessing the current and projected market support for commercial retail and ancillary office development at Kulamalu.

#### STUDY OBJECTIVE AND PURPOSE

The objective of our assistance is to assess the market support for commercial retail and ancillary office development on the 20-acre portion of Kulamalu.

The purpose of our assistance is to provide market assessments and projected market support that can be used for internal information and decision-making.

John Child & Compony, Inc. 100 Alalen Street, 30th From Bonolulu, Brwan 98813 Telephone 2019533, 2951 Telephone 2019533, 2951 Karen Char, Wei elle Robert J. Vernon, MA Paul D. Cool, Wei and Son V. Ewart, Mu May M. S. Wong-Tsu (Synthia C. Nakamua, Curt A. Wakatsus) Walnes B. Furuta Burton S. Yuen Michael J. Robinson

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## EFFECTIVE DATE OF REPORT

The effective date of this report is March 15, 1996.

## STUDY APPROACH

The study approach to complete our assistance is as follows:

#### Orientation

1. Met with you to review the study objective and approach.

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- 2. Reviewed any relevant studies or plans for Kulamalu.
- 3. Visited Kulamalu and its surrounding neighborhood.

## **Commercial Market Assessment**

- 1. Identified the competitive market area for commercial development.
- 2. Updated retail market trends in the competitive market area in terms of:
  - Demographic trends •
  - Market demand

  - Historical and projected occupancy rates Tenant profile

  - Minimum and percentage rents
  - Lease characteristics.
- 3. Identified planned and proposed developments in the competitive market area.
- 4. Projected the demand for commercial retail and ancillary office space in terms of:
  - Annual additional space requirements ۲
  - Tenant profile •

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- Minimum and percentage rents •
- Lease characteristics.

Projected Market Support

1. Evaluated Kulamalu's competitive advantages and disadvantages for commercial development.

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- 2. Projected the market support for the commercial retail and ancillary office development at Kulamalu in terms of:
  - Target markets
  - Market share
  - Physical characteristics
  - Tenant profile
  - Rents and other lease characteristics
  - Projected occupancy rates.

#### REPORT FORMAT

This report is presented in a summary appraisal report that is intended to comply with the reporting requirements set forth under Standards Rule 2-2(b) of the Uniform Standards of Professional Appraisal Practice for a Summary Appraisal Report.

The report summarizes the data, reasoning and analyses that were used in the appraisal process to develop the projected market support. Supporting documentation concerning the data, reasoning and analyses is available in our files. The summary appraisal report format is specific to the needs of the client and for the intended use stated in this report.

#### STUDY CONDITIONS

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This report is subject to the study conditions that are presented in Section I of this report.

## PROJECTED MARKET SUPFORT

The evaluation of the competitive advantages and disadvantages of the Kulamalu commercial site and the estimated market support are discussed under the following subheadings.

#### Competitive Advantages

The Kulamalu commercial site has competitive advantages for commercial retail development, including:

- Large land area
- Extensive frontage along Kula Highway for advertising prominence
- Generally level topography
- Within residential growth area of Pukalani
- Currently no new competing large retail and ancillary office facilities planned.

#### **Competitive Disadvantages**

The Kulamalu commercial site has competitive disadvantages, including:

- No direct access from Kula Highway
- · Close proximity to major retailing areas of Kahului and Wailuku
- Traffic passing by would largely be limited to residents of Kula, Pulehu, Waiakoa and Keokea or visitors to the Upcountry area.[1]

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#### Estimated Market Share

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Upcountry Maui is under-serviced in terms of neighborhood shopping facilities. Because of the limited retail facilities in the Upcountry area, goods and services for day-to-day living needs that normally would be purchased in the area, are largely purchased in Kahului.

Kahului has historically been the major retail hub serving the residential communities of Central and Upcountry Maui. Kahului offers a wide array of retail facilities for residents in relatively close proximity of each other.

[1] This condition may ultimately be mitigated with the completion of the County's proposed bypass linking Kihei to Kula. However, the development timetable has not been determined.

Major retail outlets in Kahului that could be most competitive to a neighborhood shopping facility in Upcountry Maui include:

- K-Mart and Costco
- Maui Mall (Star Market)
- Foodland, Safeway and Longs
- Kahului Shopping Center.

The recent introduction of K-Mart and Costco have provided Maui consumers a variety of products at extremely competitive prices. This has afforded residents significant savings and has reduced the profit margins for other retailers in Kahului. The proposed Maui Marketplace, an outlet mall to feature Eagle Hardware, Sports Authority, Border Books & Music, and Office Max, will continue to place pressures on retailers to lower margins or find newer market niches.

The Kulamalu commercial site is a major component of the proposed 300-acre master-planned community. The 20-acre site accounts for 77% of the undeveloped commercial land in Upcountry Maui. Alternative commercial sites suitable for large scale retail development are not available in the area. As a result, retail development at Kulamalu could have a significant competitive advantage to capture a significant share of the projected retail demand. The demand for retail facilities in Upcountry Maui would continue to exceed the available supply, even after the completion of the retail development at Kulamalu.

Kulamalu could benefit from the additional market support from visitors in the region. This segment could account for up to about 10% of the total demand at Kulamalu.

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#### Groceries

Residents of Upcountry Maui are virtually limited to Foodland and Pukalani Superette for grocery items. Therefore, additional grocery stores in Upcountry Maui could capture a significant share of resident grocery expenditures. Considering its competitive position, the projected grocery expenditures could support a grocery store of about 45,000<sup>ff</sup> to 55,000<sup>ff</sup> at the Kulamalu commercial site.

#### Other Retail Goods

Between 45% and 60% of demand for all other retail goods is currently satisfied by existing retail facilities in Upcountry Maui. Based on its competitive advantages, the Kulamalu commercial site could capture about 25% of total demand for other retail goods. Based on the estimated market share, the Kulamalu commercial site could capture about 75,000<sup>f</sup> to 95,000<sup>f</sup> in 1995. The Kulamalu commercial site could capture an additional 15,000<sup>f</sup> to 20,000<sup>f</sup> every five years thereafter, as shown in Exhibit II-P.

#### **Target Markets**

The target market is projected to be the residents of Upcountry Maui, primarily dual income families with children. The 1995 median household income of the area is estimated to be about \$46,900, about 4% to 5% above the 1995 median household income of Maui County.

The residents of Upcountry Maui have discretionary purchasing power and are quality and cost conscious. A large number of the residents are estimated to have limited time available for shopping and are likely to make planned rather than spontaneous shopping trips. Therefore, residents would likely shop at one retail facility if it offered a variety of retail goods as well as services, including medical and professional services.

Visitors to the area would be a secondary target market for the site. After the planned park and amphitheatre are developed, the market share for the visitor market could increase.

#### Tenant Profile

Based on the characteristics of the target markets and retail trends in the area, the shopping facility could be anchored by a full-service supermarket and drug/variety store. Other tenants could include:

- Entertainment, such as video, records or electronic/computer games
- Theatres
- Restaurants, including fast food
- Medical and dental offices
- Other personal services, such as hair styling or dry cleaning.

In addition, the center could probably support a gas station to service both residents and visitors.

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Space requirements for the major tenants of the center are estimated as follows:

| Туре          | Area     | % of Total |         |  |
|---------------|----------|------------|---------|--|
| Grocery       | 45,000 - | 55,000     | 25 - 30 |  |
| Drug/variety  | 20,000 - | 30,000     | 15 - 20 |  |
| Theatres      | 15,000 - | 20,000     | 8 - 10  |  |
| Entertainment | 5,000 -  | 8,000      | 3 - 4   |  |
| Gas station   | 12,000 - | 15,000     | [1]     |  |

[1] Land area required.

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In addition to retail space, the Kulamalu commercial site could support medical/dental and other office uses. A large health care provider, such as Kaiser Permanente or Straub Clinic, could have a local clinic in the facility as they have in other retail facilities on Oahu.

#### Rents and Lease Characteristics

Rents in Upcountry Maui generally range between about 1.55/4 and 2.00/4 for ground floor spaces that typically range from 5004 to 2,0004 in size. Second floor rents typically range from about 1.25/4 to 1.45/4 for similar size spaces. Common area maintenance charges typically range from about 0.30/4 to 0.45/4. Percentage rents on retail space range from about 8% to 9%, although currently, many centers do not charge percentage rents.

Lease terms typically range from three to five years for smaller tenants. Lease terms for grocery stores, other anchor tenants and large restaurants could range from about 15 to 30 years.

#### Projected Occupancy Rates

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The anchor tenants could occupy about 50% to 65% of the facility's gross leasable area; therefore, occupancy rates could be relatively high. Assuming prudent marketing and preleasing, the facility could be about 75% preleased at opening. Based on the estimated additional space requirements the retail facility the Kulamalu commercial site could be fully leased by 2000.

\* \* \* \* \*

We appreciate having the opportunity to assist you on this interesting assignment. Please contact us if you have any questions.

 $\bigcirc$ 

Sincerely,

JOHN CHILD & COMPANY, INC.

(10 2. 1YVA

Paul D. Cool, MAI Vice President

CypHia C. Natamuna

Cynthia C. Nakamura Appraiser

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Projected Total Retail Expenditures in Upcountry Maui 1995 - 2010

| •                         | 1995                       |                                            | 2005          | 2010          |
|---------------------------|----------------------------|--------------------------------------------|---------------|---------------|
| Residents:                |                            |                                            |               |               |
| Groceries<br>Other retail | \$97,600,000<br>89,500,000 | <b>\$117,800,000</b><br><u>108,000,000</u> | \$137,400,000 | \$157,300,000 |
|                           |                            |                                            | 126,000,000   | 144,200,000   |
| Subtotal - residents      | 187,100,000                | 225,800,000                                |               |               |
| Visitors:                 |                            |                                            |               |               |
| Grocerics<br>Other retail | 3,200,000                  | 3,900,000                                  | 4,500,000     | 5,100,000     |
| Otter retail              | 24,200,000                 | 30,100,000                                 | 34,800,000    | 39,000,000    |
| Subtotal - visitors       | 27,400,000                 | 34,000,000                                 | 39,300.000    | 44,100,000    |
| Total:                    |                            |                                            |               |               |
| Groceries                 | 100,800,000                | 121,700,000                                | 142,000,000   | 162,400,000   |
| Other retail              | 113,700,000                | 138,200,000                                | 160,800,000   | 183,300,000   |
| Total retail expenditures | \$214.500,000              | \$259,900,000                              | \$302,800,000 | \$345,700,000 |

## Source: John Child & Company.

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Exhibit II-L

Retail Land Use Inventory in Upcountry Maui

| Land use                             | Building<br>_area (sf) | % of<br>Total |
|--------------------------------------|------------------------|---------------|
|                                      |                        |               |
| Shopping center                      | 47,149                 | 18%           |
| Grocery stores                       | 44,323                 | 17            |
| General retail                       | 89,736                 | 35            |
| Restaurants, including fast food     | 35,052                 | 14            |
| Auto service, including gas stations | 6,631                  | 3             |
| Office, including banks              | 36,269                 | 14            |
| Total                                | 259,160                | _100%         |

Source: John Child & Company based on online data from REsearch/TMK, MLS Hawaii, Inc. March 13, 1996.

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Exhibit II-M

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### Projected Demand Satisfied and Unsatisfied by Retail Facilities in Upcountry Maui 1995 - 2010

|                   |               | Satisfied Demand |               | Unsatisfie   | d Demand       |
|-------------------|---------------|------------------|---------------|--------------|----------------|
|                   | Total         | Low              | High          | Low          | High           |
|                   |               |                  |               |              |                |
| Grocery:          |               |                  |               | CON 000 000  | - \$85,800,000 |
| 1995              | \$100,800,000 | \$15,000,000 -   | \$20,000,000  | \$80,800,000 |                |
| 2000              | 121,700,000   | 15,000,000 -     | 20,000,000    | 101,700,000  | - 106,700,000  |
| 2005              | 142,000,000   | 15,000,000 -     | 20,000,000    | 122,000,000  | - 127,000,000  |
| 2010              | 162,400,000   | 15,000,000 -     | 20,000,000    | 142,400,000  | - 147,400,000  |
| All other retail: |               |                  |               |              | (0, 500, 000   |
| 1995              | 113,700,000   | 51,000,000 -     | 69,000,000    | 44,700,000   | - 62,700,000   |
| 2000              | 138,200,000   | 51,000,000 -     | 69,000,000    | 69,200,000   | - 87,200,000   |
| 2005              | 160,800,000   | 51,000,000 -     | 69,000,000    | 91,800,000   | - 109,800,000  |
| 2010              | 183,300,000   | 51,000,000 -     | 69,000,000    | 114,300,000  | - 132,300,000  |
| Total:            |               |                  |               | 105 500 000  | - 148,500,000  |
| 1995              | 214,500,000   | 66,000,000 -     | 89,000,000    | 125,500,000  | • •            |
| 2000              | 259,900,000   | 66,000,000 -     | ** ** = = * * | 170,900,000  | - 193,900,000  |
| 2005              | 302,800,000   | 66,000,000 -     | 89,000,000    | 213,800,000  | - 236,800,000  |
| 2010              | 345,700,000   | 66,000,000 -     | 89,000,000    | 256,700,000  | - 279,700,000  |

Source: John Child & Company.

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Exhibit II-N

### Projected Additional Retail Space Requirements in Upcountry Maui 1995 - 2010

(In Square Feet)

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|                    | Gr        | Grocery All Other Ret |         | ther Retail | ITotal                 |           |  |
|--------------------|-----------|-----------------------|---------|-------------|------------------------|-----------|--|
| <u>Time Period</u> | Low       | High                  | Low     | High        | Low                    | High      |  |
| 1995               | 224,000 - | 288,000               | 284,000 | - 379,000   | 509 000                | 667 000   |  |
| 1995 - 2000        | 47,000 -  | <i></i>               | 61,000  | - 82,000    | 508,000 -<br>108,000 - | 007,000   |  |
| 2000 - 2005        | 45,000 -  |                       | 57,000  | - 75,000    | 102,000 -              | 100       |  |
| 2005 - 2010        | 45,000 -  | 58,000                | 56,000  | - 75,000    | 101,000 -              | 133,000   |  |
| Cumulative:        |           |                       |         |             |                        |           |  |
| 1995               | 224,000 - | 288,000               | 284,000 | - 379,000   | 508,000 -              | 667,000   |  |
| 2000               | 271,000 - | 348,000               | 345,000 | - 461,000   | 616,000 -              | 000 000   |  |
| 2005               | 316,000 - | 406,000               | 402,000 | - 536,000   | 718,000 -              | 942,000   |  |
| 2010               | 361,000 - | 464,000               | 458,000 | - 611,000   | 819,000 -              | 1,075,000 |  |

Source: John Child & Company.

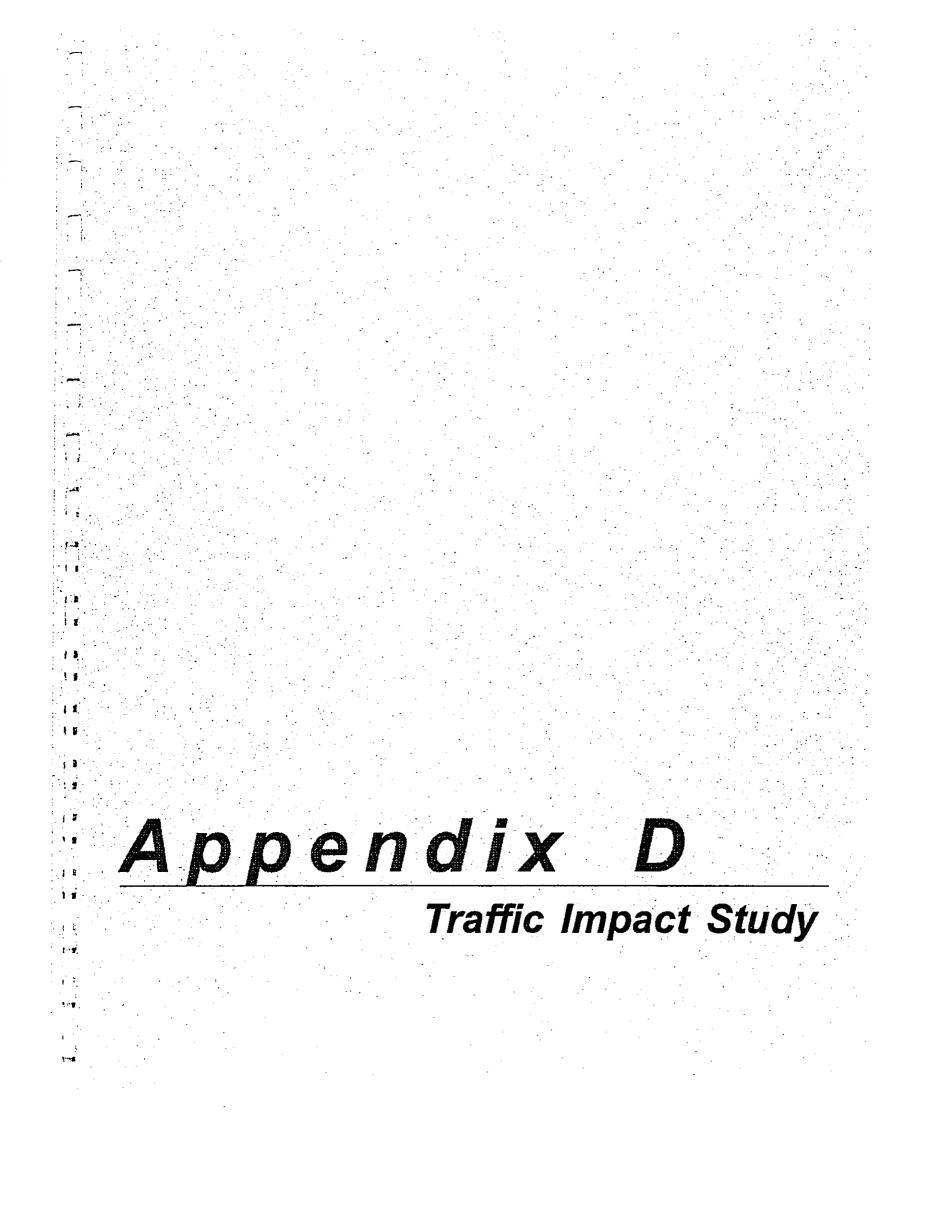
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Exhibit II-O

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## **KULAMALU TRAFFIC STUDY**

Prepared For

## KULAMALU LIMITED PARTNERSHIP

MARCH 1997 REVISED JULY 1997

Prepared By

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Austin, Tsutsumi & Associates, Inc. Civil Engineers • Surveyors 501 Sumner Street, Suite 521 Honolulu, Hawaii 96817-5031 Telephone: (808) 533-3646 Facsimile: (808) 526-1267 Honolulu • Wailuku • Hilo, Hawaii

## **KULAMALU TRAFFIC STUDY**

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## ATA AUSTIN, TSUTSUMI & ASSOCIATES, ".=

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#### PREFACE

This traffic study for the Kulamalu development was originally initiated in Year 1996 and has been revised as the project land uses have evolved, as part of the normal development process. The Final Report was completed in March 1997; however, the Kulamalu land uses continue to be refined. The most recent modification includes a reduction of the expected student enrollment of the private school from 500 to 200 students for kindergarten to the eighth grade. In addition, as much as 75% of the students will be bused to the school from various parts of the island. These changes would decrease the project-generated traffic volumes and lessen the traffic impact of the project on the external roadway system. Thus, despite the recent project land use modification, the study findings and recommendations are conservative and remain relevant.

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## ATA AUSTIN, TSUTSUMI & ASSCOLATES, INC.

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- B LEVEL OF SERVICE CALCULATIONS

-iv-

AUSTIN, TSUTSUMI & ASSOCIATES, INC. CIVIL ENGINEERS . SURVEYORS CONTINUING THE ENGINEERING PRACTICE FOUNDED BY H. A. R. AUSTIN IN 1934

TED S. KAWAHIGASHI, P.E. KENNETH K. KUROKAWA, P.E. IVAN K. NAKATSUKA, P.E. LAMBERT J. YAMASHITA, P.E. HOWARD H W. MAU, P.E.

## KULAMALU TRAFFIC STUDY

#### I. INTRODUCTION

This report documents the findings of the traffic study conducted by Austin, Tsutsumi & Associates, Inc. to evaluate the potential traffic impacts of the development of the Kulamalu Conceptual Planning Area, in Pukalani, Maui. Rezoning for the Kulamalu Project, a 53.67-acre portion of the Conceptual Planning Area along Kula Highway, is being requested by Kulamalu Limited Partnership for the development of commercial uses, elderly dwelling units, a park, amphitheater, and public/quasi-public uses. The Kulamalu Project is adjacent to a larger 251.04acre area; the total 304.71 acres is herein designated as the Kulamalu Conceptual Planning Area. Additional uses in the 251.04-acre area include single-family residential units and a private school which are currently permissible under the existing zoning of this property. Although the extent and timing of the 251.04-acre area is uncertain and predicated by market conditions, this report addresses the traffic impacts of the requested rezoning area of 53.67 acres for the Kulamalu Project as a part of the Kulamalu Conceptual Planning Area.

#### A. Project Description

Kulamalu Limited Partnership proposes to develop the Kulamalu Project, which will include approximately 65 elderly dwelling units, a 140,000 square foot shopping center, a public park site of 14.74 acres and a separate area of 5.03 acres for halau use. The project also contains a public/quasi-public area of 5.10 acres. Possible uses for this public/quasi-public area include a church, day care center, and/or other public uses. The Kulamalu Project area would need to be rezoned to implement these proposed land uses.

REPLY TO: 501 SUMMER STREET, SUITE 521 • HONOLULU, HAWAII 96617-5031 PHONE (808) 533-3646 • FAX (808) 526-1267 OFFICES IN: HONOLULU, HAWA!! WAILUKU, MAUI, HAWA!! • HILO, HAWA!! 8-5

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ATA AUSTIN, TOUTOUNI & ASSOCIATES, P.C.

The adjacent 251.04-acre area could include as much as 324 single-family dwelling units, 65 multi-family dwelling units, and a private school for about 500 students. The single-family residential uses and the private school are allowable under the existing zoning. Although actual buildout schedule is dependent on market conditions, for this study, the entire Kulamalu development is assumed to be completed by the Year 2010.

The general location of the Kulamalu development is shown in Figure 1. The development is situated south of Pukalani town and west of Kula Highway, as depicted by the vicinity map in Figure 2. A preliminary layout of the project land uses in relation to the boundary of the conceptual planning area is provided in Figure 3. The Kulamanu project site is specifically identified as TMK: 2-3-8 portions of 5, 38 and 39.

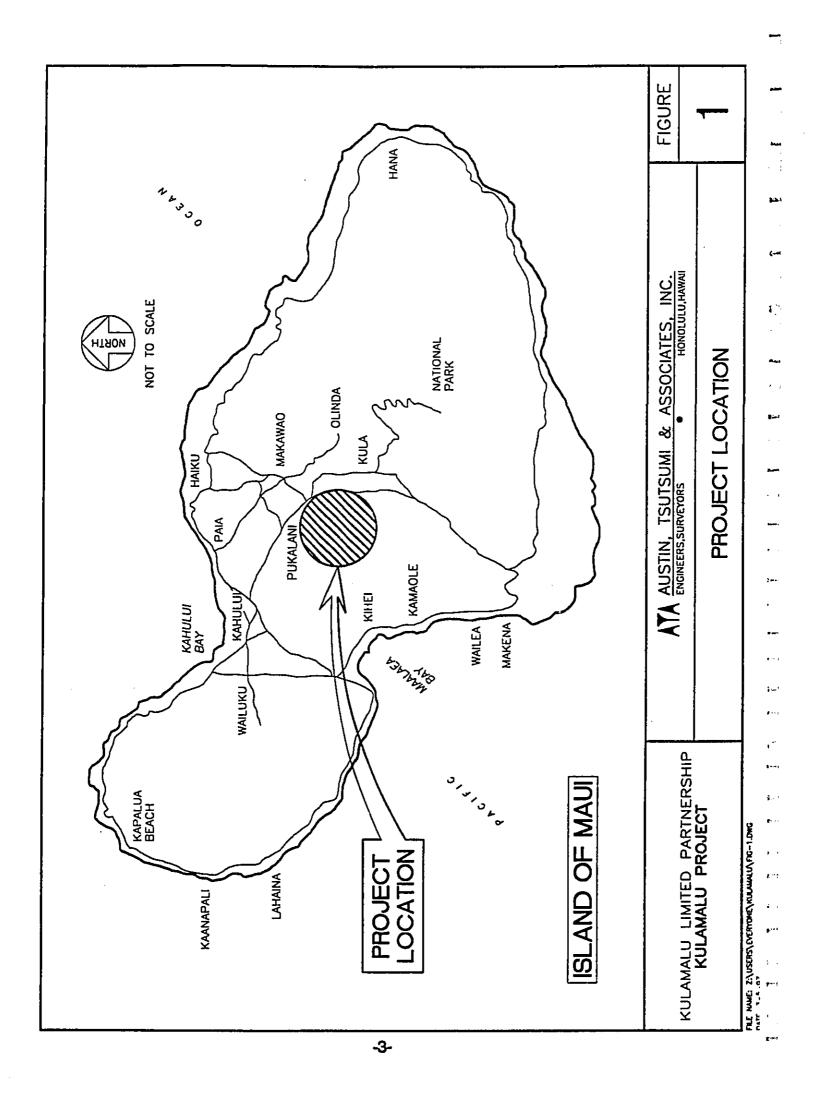
The Kulamalu development will access the existing roadway system at two locations. The primary access for the project will be located at a new intersection on Kula Highway, which will be located approximately 1,100 feet north of the Ohana Street intersection. The project road will also connect to the intersection of Liholani Street and Aina Lani Drive; project traffic utilizing this access would travel onto Pukalani Street to reach Haleakala Highway.

#### B. Study Methodology

The purpose of the study is to analyze the potential conceptual planning area traffic impacts on the roadway system within the study area. Proposed roadway improvements, which are required to allow the street system to accommodate the regional growth in future traffic volumes without, as well as with the development of the conceptual planning area, are identified in this study, as needed.

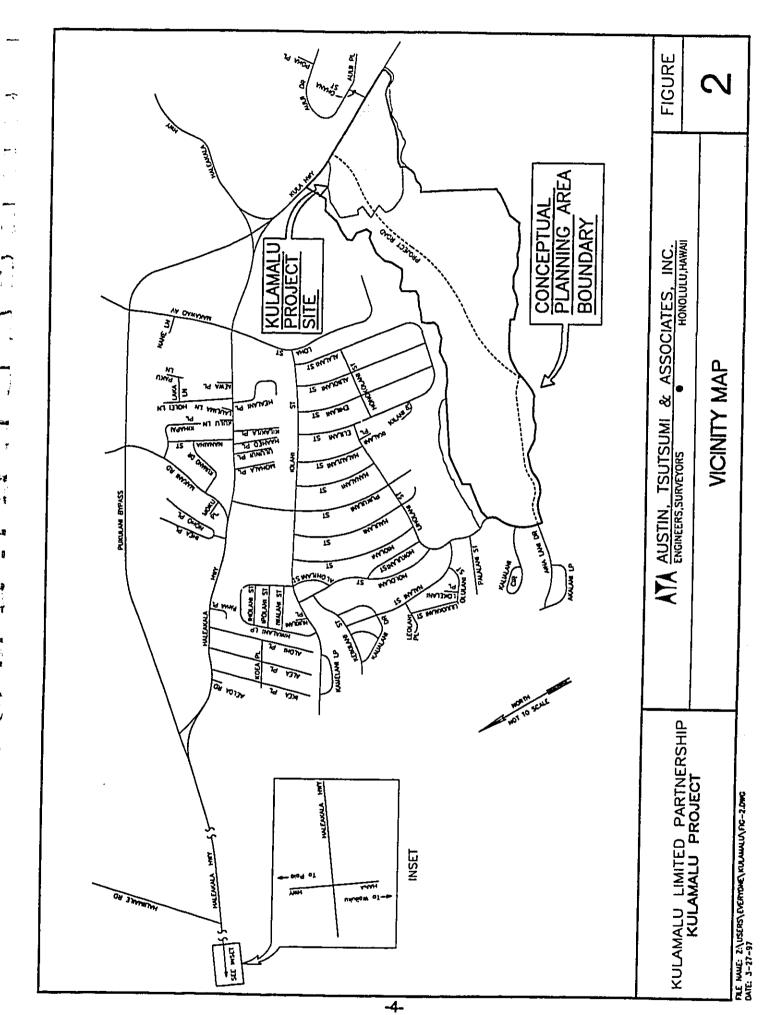
Traffic volume counts and observations were taken at the key intersections to identify existing traffic conditions. Nine existing intersections and one future intersection along the major roadways in the study area, which are listed below, were analyzed during the morning and afternoon peak hours of traffic.

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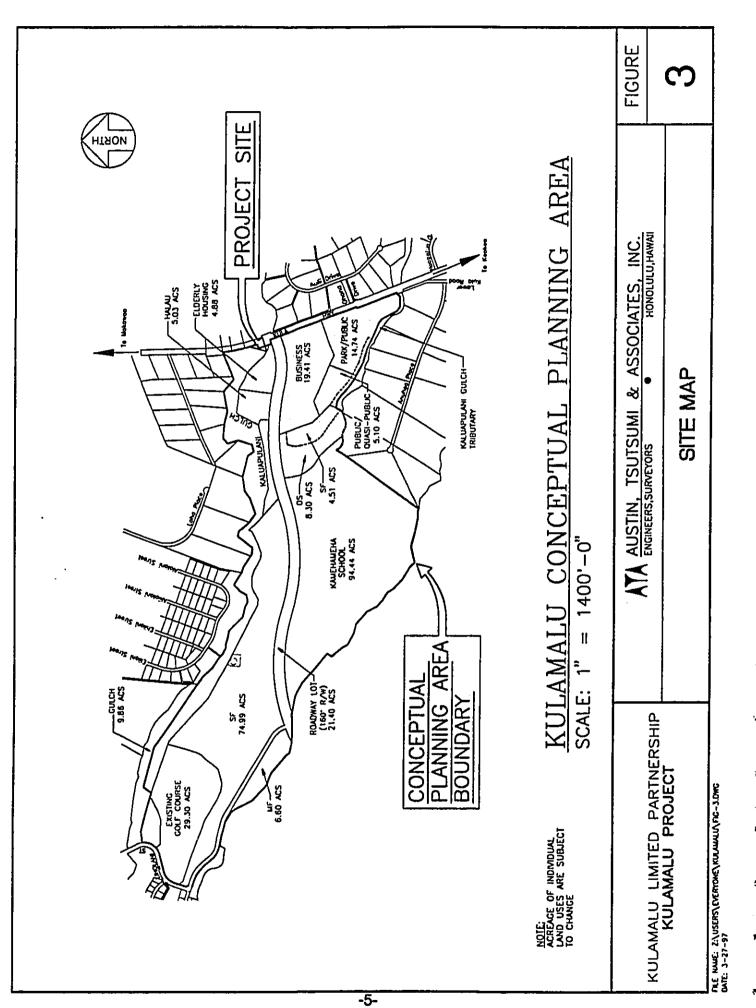
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# ATA AUSTIN. TSUTSUMI & ASSOCIATES TO

- 1. Hana Highway and Haleakala Highway
- 2. Haleakala Highway and Pukalani Bypass Road (West Terminus)
- 3. Pukalani Bypass Road and Makani Road
- 4. Pukalani Bypass Road and Makawao Avenue
- 5. Haleakala Highway, Pukalani Bypass Road and Kula Highway (Five Trees)
- 6. Haleakala Highway and Pukalani Street
- 7. Haleakala Highway, Makawao Avenue and Loha Street
- 8. Pukalani Street and Iolani Street
- 9. Kula Highway and Project Road (Future Intersection)
- 10. Kula Highway and Ohana Street

In order to assess the traffic impacts of the Kulamalu Conceptual Planning Area in context with other growth expected to occur in the region, two future year traffic assignments were developed for Year 2010 when the conceptual planning area is anticipated to be completed. First, the future base conditions were established by estimating future traffic volumes without the Kulamalugenerated traffic. For the second future traffic assignment, the forecasted traffic volumes generated by the Kulamalu Conceptual Planning area were added to future base traffic volumes. Traffic impacts are identified through the comparison of the analyzed results of these two future Year 2010 traffic assignments.

#### **II. EXISTING CONDITIONS**

A field investigation was undertaken to develop a description of existing conditions and infrastructure at the study intersections. Information relevant to the study includes land use, an inventory of streets, traffic volumes, and the current operating conditions of traffic on the roadway system.

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# ATA AUSTIN, TSUTSUMI & ASSOCIATES, INC.

#### A. Existing Roadway System

This section describes the existing circulation system serving the area, including number of travel lanes, street classifications, and traffic control devices. Brief descriptions of the roadway facilities addressed in this study are described below.

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- <u>Hana Highway</u>: Hana Highway is a major State highway which links Kahului and Hana. Hana Highway is a four-lane, divided highway with channelization at major intersections between Kahului and the Haleakala Highway intersection. North of the Haleakala Highway intersection, Hana Highway serves as a two-lane highway to Hana.
- <u>Haleakala Highway</u>: Haleakala Highway is a major arterial between Hana Highway and the Haleakala National Park and passes through the town of Pukalani. The section of Haleakala Highway between Hana Highway and the Pukalani Bypass Road is striped for two lanes in the east-bound (mauka) direction and one lane in the west-bound (makai) direction. During the morning peak period of traffic, Haleakala Highway is coned to provide a contra-flow lane from Pukalani Bypass Road to Hana Highway with two lanes in the west-bound direction and one lane in the east-bound direction. East of the Pukalani Bypass Road, Haleakala Highway continues as a two-lane road through Pukalani Town to the Haleakala National Park.
- Pukalani Bypass Road: In the vicinity of Pukalani town, the Pukalani Bypass Road, a limited access roadway, serves as an alternative route to Haleakala Highway with its western terminus at the intersection with Haleakala Highway and the eastern terminus at the intersection of Kula Highway and Haleakala Highway (Five Trees). The Pukalani Bypass Road is a three-lane highway, between the Haleakala Highway intersection (west terminus) and Makawao Avenue, providing two lanes in the east-bound direction and one lane in the west-bound direction. South of Makawao

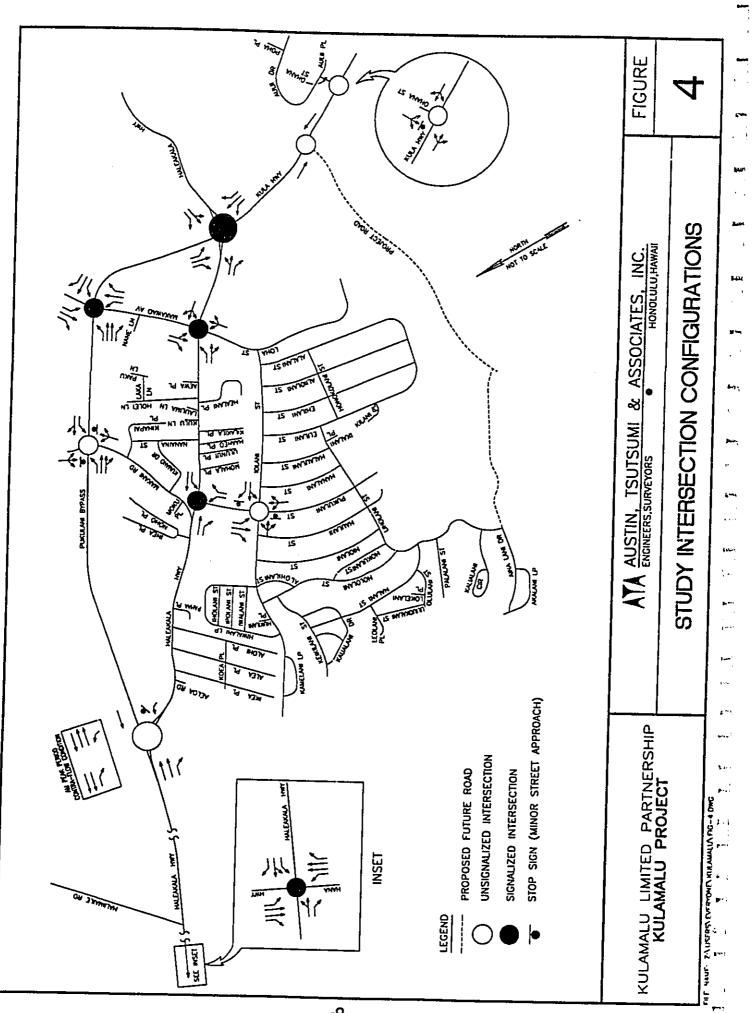
-7-

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Avenue, the Pukalani Bypass Road reduces to a two-lane highway with one travel lane in each direction.

- <u>Makawao Avenue</u>: Within the study area, Makawao Avenue is a two-lane County collector road serving Pukalani town and Makawao town. Makawao Avenue originates within Pukalani, at its intersection with Haleakala Highway, and extends northeasterly through Makawao town. At the intersection with Baldwin Avenue, Makawao Avenue continues as Kaupakulua Road and eventually connects with Hana Highway in the vicinity of Ulumalu. Baldwin Avenue extends in a northwesterly direction and connects with Hana Highway in Paia town.
- <u>Kula Highway</u>: Kula Highway is a two-lane arterial highway serving the Upcountry area from its intersection with Haleakala Highway and the Pukalani Bypass Road (Five-Trees) to the Kula area. Kula Highway is a north-south arterial serving mainly residential/agricultural uses.
- <u>Pukalani Street</u>: Pukalani Street is a local two-lane collector roadway serving residential and commercial areas in Pukalani town and connects to Haleakala Highway in a T-intersection.
- <u>Iolani Street</u>: Iolani Street serves as a two-lane collector roadway within the residential area of Pukalani town.
- <u>Ohana Street</u>: Ohana Street, a two-lane roadway, provides access to a local residential area and connects to Kula Highway. An existing gated private driveway to the Kulamalu site is situated directly across the Ohana Street intersection on Kula Highway.

The existing laneage configurations at the study intersections are illustrated in Figure 4. The types of traffic controls at each study intersection, including signalization or stop-controlled approaches at unsignalized intersections, are also identified in Figure 4.



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#### **B.** Existing Traffic Operations

The following sections present the existing intersection peak hour traffic volumes and a description of the methodology utilized to analyze the intersection operating conditions at each of the nine existing key intersections.

#### 1. Existing Traffic Volumes

Manual turning movement counts at the key intersections were conducted by ATA during weekday morning (AM) and afternoon (PM) peak periods on February 7, 8 and 29, 1996, except for the traffic counts at the Pukalani Bypass Road/Makani Road intersection and at the Pukalani Street/Iolani Street intersection, which were collected on July 1, 1996. For the Makani Road intersection, the counted through traffic volumes on Pukalani Bypass Road were increased to correlate to the higher February 1996 peak hour traffic counts. The count data are provided in Appendix A and the peak hour volumes are presented in Figure 5.

Generally, the traffic flows are heavy on Haleakala Highway and the Pukalani Bypass Road with noticeable delays at intersections. At the signalized intersection of Hana Highway and Haleakala Highway, extensive queuing during the morning peak period was observed for the makaibound double left-turn movement. During the afternoon peak period, queuing was also observed for the Hana-bound right-turn movement from Hana Highway to Haleakala Highway.

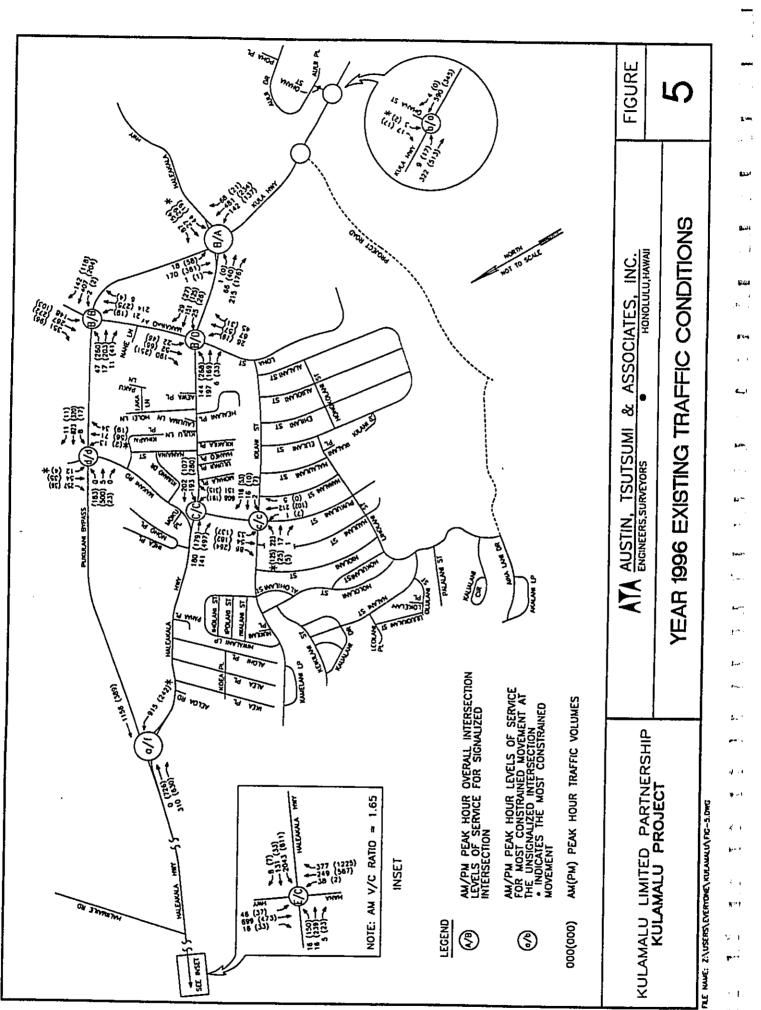
Traffic on Kula Highway is relatively light, with little delays at the intersections.

The three-lane section of Haleakala Highway between the Hana Highway intersection and the Pukalani Bypass Road intersection, as well as the Pukalani Bypass Road, are striped to provide two mauka-bound

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and one makai-bound travel lanes. During the morning peak period, the center mauka-bound lane is coned to provide a contraflow lane in the makai-bound direction. At the intersection of Haleakala Highway and Pukalani Bypass Road, the mauka-bound through movement is diverted to Haleakala Highway into Pukalani town. This mauka-bound diversion eliminates the conflicting movements and traffic flows smoothly through this unsignalized intersection during the morning peak period. However, during the afternoon peak period, the makai-bound left-turn movement on Haleakala Highway at the Pukalani Bypass Road intersection experiences delays due to the heavy traffic on mauka-bound Pukalani Bypass Road.

#### 2. Technical Analysis

The technical analysis of traffic conditions is described in this section for signalized and unsignalized intersections. Level of service (LOS) is a qualitative measure used to describe the condition of traffic flow, ranging from free-flow conditions at LOS A to congested conditions at LOS F.

The <u>1994 Highway Capacity Manual. Special Report 209</u>, Operational Method for signalized intersections was applied to each of the signalized intersections analyzed in this study; this method provides results in terms of stopped delay per vehicle, LOS and the volume-to-capacity (v/c) ratio. The stopped delay per vehicle and LOS reflect the delay and discomfort to motorists. The capacity of a signalized intersection is calculated, based upon laneage configuration and the traffic signal operations (in terms of phasing and timing) of the intersection. The v/c ratio quantifies the utilization of capacity; a v/c ratio greater than 1.00 indicates that traffic volumes exceed the calculated capacity of the signalized intersection.

Unsignalized intersections are controlled by stop signs or yield signs on minor street approach(es). The "Two-Way Stop Control" method described in the 1994 Highway Capacity Manual (Transportation Research Board, 1994) was employed to determine the available reserve capacity

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and corresponding level of service for each of the constrained movements (approaches from minor streets and left-turn movements from major streets) at the unsignalized intersections.

Level of service definitions for both signalized and unsignalized intersections are included in Table 1 and Table 2, respectively.

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## 3. Analysis Results

This section describes the current levels of service at the nine existing intersections. Four of the study intersections are signalized, including the intersections of Hana Highway with Haleakala Highway, Pukalani Bypass Road with Makawao Avenue, Haleakala Highway with Pukalani Bypass Road/Kula Highway, Haleakala Highway with Pukalani Street and Haleakala Highway with Makawao Avenue/Loha Street. The remaining intersections are unsignalized with stop controls on the minor approaches. Figure 5 and Table 3 present the existing level of service at each of the nine existing key intersections.

- <u>Hana Highway and Haleakala Highway</u> During the morning peak hour, this intersection operates at overall Level of Service E with the westbound (makai-bound) approach at Level of Service F. The field observation noted that the queue on the makai-bound Haleakala Highway approach extends about one mile from the intersection in the morning peak period. The overall intersection v/c ratio is at 1.65 and 0.64 during the morning and afternoon peak hours, respectively.
- <u>Haleakala Highway and Pukalani Bypass Road (West Terminus)</u> The coning for the contraflow lane eliminates conflicting movements at this intersection with a Level of Service A designation during the morning peak hour. However, during the afternoon peak hour, the left-turn movement from the makai-bound Haleakala Highway experiences long delays at Level of Service F and the overall intersection operation is at Level of Service C.

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| LEVEL OF SERVICE | DELAY<br>(SECONDS/VEHICLE) | DESCRIPTION                  |
|------------------|----------------------------|------------------------------|
| A                | 0.0 - 5.0                  | Little or no delay           |
| 8                | 5.1 - 15.0                 | Short traffic delay          |
| с                | 15.1 - 25.0                | Moderate traffic delay       |
| D                | 25.1 - 40.0                | Long traffic delay           |
| E                | 40.1 - 60.0                | Very long traffic delay      |
| F                | > 60.0                     | Failure - extreme congestion |

TABLE 1 LEVEL OF SERVICE DEFINITIONS FOR SIGNALIZED INTERSECTION

SOURCE "Highway Capacity Manual", Transportation Research Board, 1994.

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| LEVEL OF SERVICE | DELAY<br>(SECONDS/VEHICLE) | DESCRIPTION                  |
|------------------|----------------------------|------------------------------|
| A                | 0.0 - 5.0                  | Little or no delay           |
| 8                | 5.1 - 10.0                 | Short traffic delay          |
| с                | 10.1 - 20.0                | Moderate traffic delay       |
| D                | 20.1 - 30.0                | Long traffic delay           |
| E                | 30.1 - 45.0                | Very long traffic delay      |
| F                | > 45.0                     | Failure - extreme congestion |

TABLE 2 . LEVEL OF SERVICE DEFINITIONS FOR UNSIGNALIZED INTERSECTION

SOURCE: "Highway Capacity Manual", Transportation Research Board, 1994.

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Table 3 EXISTING YEAR 1996 TRAFFIC CONDITIONS

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|                                                                           |              |             | AM Peak Hour |          | _     | PM Peak Hour | Ħ       |
|---------------------------------------------------------------------------|--------------|-------------|--------------|----------|-------|--------------|---------|
|                                                                           | Type of      | vic         | Delay        | Level of |       | Delay        |         |
|                                                                           | intersection | Ratio       | (Seconds)    | Service  | Raito | (Seconds)    | Service |
| <ol> <li>Hene Highway and Halookale Highway</li> </ol>                    | Signalized   |             |              |          |       |              |         |
| Northbound Approach                                                       |              | :           | 16.1         | v        | :     | 17.4         | υ       |
| Southbound Approach                                                       |              | :           | 29.4         | ٥        | :     | 21.2         | U       |
| Eastbound Approach                                                        |              | :           | 17.4         | υ        | :     | 19.4         | U       |
| Westbound Approach                                                        |              | :           | 66.0         | Ŀ        | :     | 45.4         | ш       |
| Overal Intersection                                                       |              | 1.65        | 52.5         | ш        | 0.64  | 24.3         | ပ       |
| <ol><li>Pukalani Bypass Road (West Terminus)</li></ol>                    | Unsignalized |             |              |          |       |              |         |
| and Haleakata Highway                                                     | •            |             |              |          |       |              |         |
| Northbound Left Turn                                                      |              | :           | •            | <        | ;     | 130.5        | u.      |
| Overall intersection                                                      |              | :           | •            | <        | :     | 17.3         | υ       |
| <ol><li>Putalani Bypass Road and Matani Road</li></ol>                    | Unsionalited |             |              |          |       |              |         |
| Northbound Approach                                                       |              | :           | 18.0         | U        | :     | 21.5         | 0       |
| Southbound Approach                                                       |              | :           | 28.4         | 0        | :     | 15.5         | U       |
| Eastbound Approach                                                        |              | :           | 0.0          | ۲        | :     | 1,3          | <       |
| Westbound Approach                                                        |              | :           | 0.0          | <        | :     | 0.2          | <       |
| Overall Intersection                                                      |              | :           | 9.7          | B        | :     | 3.5          | <       |
| <ol> <li>Pukalari Bypass and Makawao Avenue</li> </ol>                    | Signalized   |             |              |          |       |              |         |
| Northbound Approach                                                       | •            | :           | 1.1          | 8        | ;     | 10.6         | œ       |
| Southbound Approach                                                       |              | :           | 9.0          | 8        | :     | 11.4         | ۵       |
| Eastbound Approach                                                        |              | :           | 13.2         | æ        | :     | 17.4         | o       |
| Westbound Approach                                                        |              | :           | 5.3          | 8        | :     | 9.8          | 8       |
| Overall Intersection                                                      |              | <b>4</b> .0 | 9.1          | 8        | 0.43  | 13.0         | 8       |
| 5. Pukalani Bypass (East Terminus),<br>Hakaskela Highway and Kuta Highway | Signatized   |             |              |          |       |              |         |
| (Five Trees" Intersection)<br>Northbound Approach                         |              | :           | 2.8          | <        | ;     | 76           | ٩       |
| Southbound Approach                                                       |              | :           | 1.6          | <        | :     | 20           | <       |
| Eastbound Approach                                                        |              | :           | 13.6         | . 63     | :     | 10.1         | .α      |
| Westbound Approach                                                        |              | :           | 13.0         | - 50     | :     | 121          | . 60    |
| Overal Intersection                                                       |              | 070         | 55           | 0        |       |              | •       |

\* Note: Contratiow coning during AM peak period eliminates conflicting movements at this intersection.

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Table 3 EXISTING YEAR 1996 TRAFFIC CONDITIONS (continued)

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|                                                           |                |       | AM Peak Hour |          |       | PM Peak Hour | 5        |
|-----------------------------------------------------------|----------------|-------|--------------|----------|-------|--------------|----------|
|                                                           | Type of        | v/c   | Delay        | Level of | vic   | Delay        | Level of |
| Intersection                                              | Intersection   | Ratio | (Seconds)    | Service  | Ratio | (Seconds)    | Service  |
| <ol> <li>Haleakala Highway and Pukalani Street</li> </ol> | Signalized     |       |              |          |       |              |          |
| Northbound Apprnach                                       | •              | :     | 26.0         | ٥        | :     | 5.8          | 8        |
| Eastbound Approach                                        |                | ;     | 10.7         | 8        | ;     | 30.1         | ۵        |
| Westbound Approach                                        |                | :     | 6.7          | 8        | :     | 7.8          | 8        |
| Overal Intersection                                       |                | 0.65  | 17.3         | U        | 0.55  | 17.0         | υ        |
| 7. Haisakala Higliway, Makawao Avenue<br>and Loha Street  | Signatized     |       |              |          |       |              |          |
| Northbound Approach                                       |                | :     | 6.7          | 8        | :     | 6.0          | 8        |
| Southbound Approach                                       |                | ;     | 6.4          | æ        | :     | 5.9          | ß        |
| Eastbound Approach                                        |                | ;     | 15.0         | U        | :     | 51.6         | ш        |
| Westbound Approach                                        |                | :     | 5.0          | <        | ;     | 62           | æ        |
| Overall Intersection                                      |                | 0.36  | 9.6          | æ        | 0.58  | 29.1         | ٥        |
| 8. Pukatani Street and Iolani Street                      | Unsignalized   |       |              |          |       |              |          |
| Northbound Approach                                       | I              | :     | 0.0          | <        | :     | 0.3          | <        |
| Southbound Approach                                       |                | :     | 0.6          | <        | ;     | 0.7          | <        |
| Eastbound Approach                                        |                | :     | 12.1         | U        | :     | 10.4         | υ        |
| Westbound Approach                                        |                | ;     | 4.0          | <        | :     | 4.0          | <        |
| Overall Intersection                                      |                | :     | 5.1          | 8        | :     | 2.7          | <        |
| 9. Kula Highway and Project Road                          | Not Applicable | :     | :            | ;        | ;     | :            | :        |
| 10. Kula Highway and Ohana Street                         | Unsignalized   |       |              |          |       |              |          |
| Northbound Approach                                       |                | :     | 0.0          | <        | :     | 0.0          | <        |
| Southbound Approach                                       |                | ;     | 0.1          | <        | :     | 0.1          | <        |
| Westbound Approach                                        |                | ;     | 6.4          | •        | ;     | 4.8          | <        |
| Overal! Intersection                                      |                |       | 0.0          | •        | 1     | 5            |          |
|                                                           |                |       | 1            | c        | ;     | 7.0          | <        |

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- Pukalani Bypass Road and Makani Road During the morning peak hour, . traffic on the southbound approach operates at Level of Service D; and, overall, the unsignalized intersection operates at Level of Service B in the morning peak hour. During the afternoon peak hour, the northbound approach left turn is at Level of Service D with overall intersection operations at Level of Service A.
- Pukalani Bypass Road and Makawao Avenue Overall, this signalized intersection operates at Level of Service B in the morning and afternoon peak hours of traffic.
- Pukalani Bypass Road (East Terminus), Haleakala Highway and Kula Highway (Five Trees intersection) - When the traffic counts were conducted, this intersection operated as an unsignalized intersection. Subsequently, traffic signals were installed and became operable in April 1996. Overall, this signalized intersection operates at Level of Service B during the morning peak hour and at Level of Service A during afternoon peak hour.
- Haleakala Highway and Pukalani Street During the morning peak hour, the traffic exiting at Pukalani Street from the residential areas results in Level of Service D operation for the Pukalani Street approach, with an overall operational Level of Service C intersection. During the afternoon peak hour, Haleakala Highway eastbound (mauka-bound approach) operates at Level of Service D with the overall intersection operating at Level of Service C.
- Pukalani Street and Iolani Street Overall, during the morning peak hour, • this intersection experiences Level of Service B conditions and operates at Level of Service A during the afternoon peak hour.
- Haleakala Highway, Makawao Avenue and Loha Street This signalized ۲ intersection operates at an overall Level of Service B during the morning peak hour. The Haleakala Highway eastbound (mauka-bound) approach

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is at Level of Service E in the afternoon peak hour with the overall intersection operating at Level of Service D.

 <u>Kula Highway and Ohana Street</u> - This intersection was analyzed as an unsignalized T-intersection. Overall, this intersection operates at Level of Service A in the morning and afternoon peak hours.

In summary, under existing traffic conditions, there are three study intersections where traffic operates with long delays (LOS E or LOS F conditions) or traffic volumes exceed the intersection capacity (v/c ratio > 1.00). At the Hana Highway/Haleakala Highway intersection, the traffic on the westbound approach experiences LOS F conditions during the morning peak hour and LOS E conditions during the afternoon peak hour; also, queuing is observed for the Hana-bound right-turn movement to Haleakala Highway, mauka-bound, during the afternoon peak hour. At the intersection of Pukalani Bypass Road/Haleakala Highway, traffic operations on the northbound approach are at LOS F during the afternoon peak hour. Also, the eastbound traffic at the Haleakala Highway/Makawao Avenue/Loha Street intersection operates at LOS E during the afternoon peak hour. Possible roadway improvements to improve traffic operation are discussed in Section III. D, Base Roadway Improvements.

### III. FUTURE BASE PROJECTIONS AND ANALYSIS

In order to properly evaluate the potential impact of the project on the local traffic conditions, forecasts of future traffic volumes in the study area under conditions both with and without the traffic generated by the proposed Kulamalu conceptual planning area were developed. The methodologies and key assumptions used to develop these forecasts are described below.

The future base traffic forecasts for Year 2010 without the proposed conceptual planning area-generated traffic are based on the background traffic growth of existing traffic volumes and proposed related development projects expected to be

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completed by the Year 2010 which could contribute traffic to the roadway system within the study area.

## A. Background Traffic Growth

The background growth rate, which was applied to existing traffic volumes to estimate Year 2010 future conditions, is based on the preliminary projections from the <u>Maui Long-Range Land Transportation Plan</u> by Kaku Associates (Draft Final Report, February 1996) and historical traffic counts obtained from the State Department of Transportation.

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The average annual traffic growth rate of approximately 0.5 percent per year in the Upcountry area was utilized to forecast the Year 2010 future base traffic conditions.

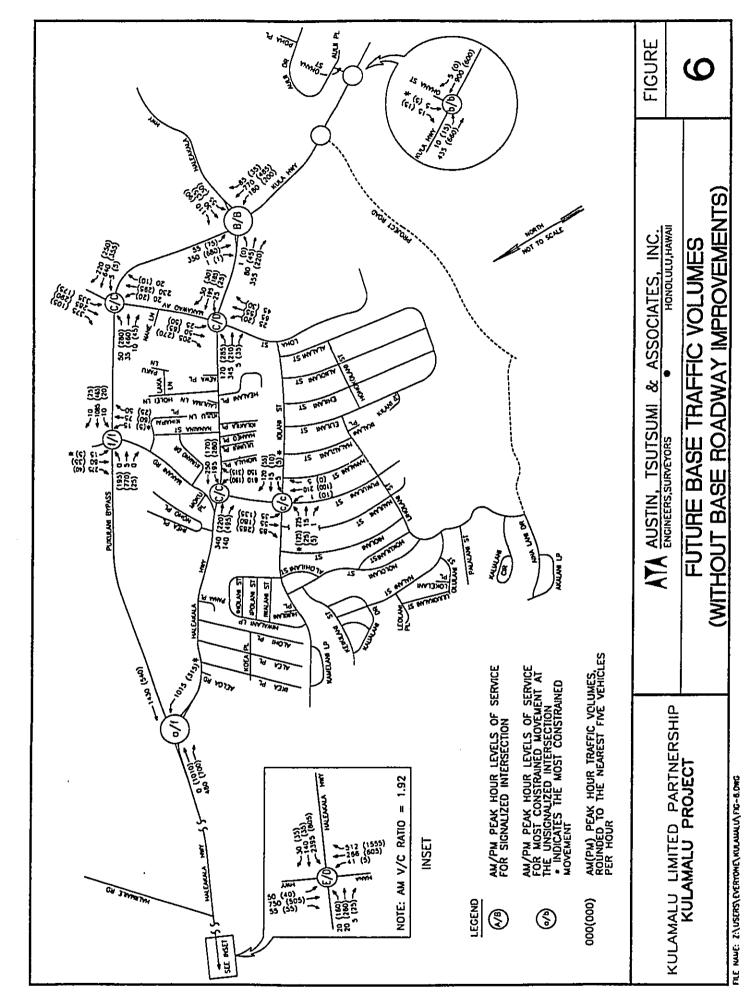
## B. Traffic from Nearby Development

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Traffic generated by two nearby developments, the King Kekaulike (Upcountry) High School and the Department of Hawaiian Home Lands (DHHL) Kula Residence Lots, Unit 1 are included in this study. The trip generation and distribution of the high school traffic were obtained from the November 1992 "Final Report, Traffic Impact Study, Upcountry Maui High School," prepared by Parsons Brinckerhoff Quade & Douglas, Inc. For the DHHL project, the estimate of project traffic developed by ATA as identified in ATA's August 1995 "Traffic Impact Analysis Report, Kula Residence Lots, Unit 1," was utilized for this study.

# C. Future Base Volumes and Level of Service Analysis

The future Year 2010 base traffic volumes for the nine existing study intersections are shown in Figure 6. For future conditions, the widening of Haleakala Highway to four lanes, between Hana Highway and the Pukalani Bypass intersections, is the only construction project proposed in the study area during the next few years; this improvement would provide two permanent travel lanes in each direction and eliminate the need for the contraflow lane on



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Haleakala Highway during the morning peak period. The Haleakala Highway widening project has initiated the processing for environmental requirements; however, the future laneage configurations for the intersections of Hana Highway/Haleakala Highway and Pukalani Bypass Road (West Terminus)/ Haleakala Highway have yet to be determined. Therefore, the analysis of future base conditions assumes the widening of Haleakala Highway without improvements to the existing intersection laneage configurations. The results of the overall intersection Level of Service analysis are summarized in Figure 6 and more detailed LOS results for the intersection approaches are provided in Table 4.

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Generally, the analysis indicates the increases in traffic volumes due to the growth in the future base traffic volumes would result in longer delays at the study intersections. A review of the Table 4 analysis results show that traffic operations at the existing intersections, listed below, are expected to experience long delays and to operate at Level of Service E or F conditions during the morning or afternoon peak hours:

- Hana Highway and Haleakala Highway
- Pukalani Bypass Road (West Terminus) and Haleakala Highway
- Pukalani Bypass Road and Makani Road
- Haleakala Highway, Makawao Avenue and Loha Street

#### D. Base Roadway Improvements

The following roadway improvements are necessary to alleviate the Level of Service F operating conditions expected for future base traffic conditions. These improvements are consistent with the roadway improvements recommended in the February 1996 Draft Final Report of the <u>Maui Long-Range</u> Land Transportation Plan.

Haleakala Highway: Widen to four travel lanes, two in each direction, between Hana Highway and Pukalani Bypass Road. The processing of

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Table 4 FUTURE BASE TRAFFIC CONDITIONS YEAR 2010 WITHOUT THE CONCEPTUAL PLANNING AREA

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Type of      | ¢<br>Y | CM rear hour | f<br>Level of | ş                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | PALFERK HOUT | r<br>Level of | Type of      | ,<br>Ş | Odav Leak Hour | Level of<br>Level of | vic   | PIA Peak Hour<br>Delav | <u>f</u><br>Level of |
| Intersection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Interaction  | Ratio  | (Seconds)    | Service       | Batto                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | (Seconds)    | Service       | Intersection | Ratio  | (Seconds)      | Service              | Ratio | (Seconds)              | Service              |
| 1. Hans Highway and Haleskala Highway                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Signafized   |        |              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |               | Signalized   |        |                |                      |       |                        |                      |
| Northbound Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              | :      | 16.2         | U             | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 17.71        | U             |              | :      | 11.8           | 8                    | :     | 16.4                   | U                    |
| Southbound Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              | :      | 35.4         | ٥             | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 22.0         | v             |              | :      | 17.2           | с<br>С               | :     | 14.3                   | 8                    |
| Eastbound Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              | :      | 17.4         | U             | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 62.5         | IL.           |              | :      | 13.1           | 8                    | :     | 14.5                   | 8                    |
| Westbound Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              | :      | 68.0         | Ŀ             | ;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 26.5         | ٥             |              | :      | 49.9           | ш                    | :     | 14.1                   | 8                    |
| Overal Intersection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              | 1.92   | 54.4         | ш             | 0.74                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 29.7         | 0             |              | 1.31   | 38.9           | ٩                    | 0.69  | 14.8                   | 8                    |
| 2. Pukatani Bypass Road (West Terminus)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Unsignalized |        |              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |               | Signalized   |        |                |                      |       |                        |                      |
| and Haleakale Highway                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |              |        |              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |               |              |        |                |                      |       |                        |                      |
| Northbound Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              | :      | :            | <             | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.877        | u.            |              | :      | C.11           | ۵                    | :     | 11.5                   | 8                    |
| Eastbound Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | •            | ;      | :            | :             | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ;            | ;             |              | ;      | 5.5            | 8                    | :     | 3.3                    | <                    |
| Westbound Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              | :      | ;            | :             | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | :            | :             |              | :      | 10.1           | •                    | :     | 2.7                    | <                    |
| Overall Intersection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              | •      | •            | <             | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 103.2        | u.            |              | 0.73   | 10.0           | œ                    | 12.0  | 4.5                    | <                    |
| 3. Pukalani Bypass Road and Makani Road                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Unsionalized |        |              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |               | Signalized   |        |                |                      |       |                        |                      |
| Northbound Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              | ;      | <b>6</b> .96 | Ŀ             | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 78.8         | u             |              | ;      | 7.6            | œ                    | ;     | 10.7                   | œ                    |
| Southbound Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              | :      | 124.2        | . <b>t</b> .  | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 47.9         | . 11          |              | :      | 9.1            |                      | ;     | 23                     | 1                    |
| Eastbound Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              | :      | 0.0          | <             | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.1          | <             |              | :      | 1              | •                    | :     | 2.8                    | <                    |
| Westbound Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              | :      | 0.0          | <             | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.2          | <             |              | :      | 6,0            |                      | :     | 9.1                    | -                    |
| Overal Intersection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              | :      | 39.0         | ш             | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 8.0          | w             |              | 0.43   | 5.6            | 8                    | 0.32  | 5.4                    | 8                    |
| 4. Putalari Brpass Road and Matawao Avenue                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Signalized   |        |              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |               | Signalized   |        |                |                      |       |                        |                      |
| Northbound Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              | :      | 7.8          | 8             | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 10.8         | 8             |              | :      | 14.0           | 8                    | :     | 11.4                   | œ                    |
| Southbound Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              | ;      | 29.7         | 0             | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 34.6         | 0             |              | :      | 1.1            |                      | :     | 9.6                    | . 62                 |
| Eastbound Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              | :      | 12.2         | 8             | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 17.0         | U             |              | :      | 6.8            | æ                    | :     | 8.6                    | •                    |
| Westbound Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              | :      | 18.9         | U             | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 111          | 8             |              | ;      | 12.1           |                      | :     | 13.1                   |                      |
| Overall intersection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              | 0.70   | 24           | U             | 0.54                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 18.6         | υ             |              | 0.46   | 9.7            | 6                    | 0.46  | 10.3                   | 8                    |
| 5. Putalani Bypass Road (East Terminus),                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Signatized   |        |              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |               | Signalized   |        |                |                      |       |                        |                      |
| Haleakala Highway and Kula Highway<br>2011 - Yoore Islumorius                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |              |        |              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |               |              |        |                |                      |       |                        |                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              |        |              | •             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              | •             |              |        | ;              | ſ                    |       | 2                      | •                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              | :      | 19           | <             | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3            | <             |              | :      | 6.3            | Ð                    | :     | 2.6                    | <                    |
| Sourbound Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              | ;      | 6.5          | đ             | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 6.9          | •             |              | :      | 4,9            | <                    | :     | 6.9                    | œ                    |
| Eastbound Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              | :      | 9.0          | ۵             | ;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 10.8         | 8             |              | :      | 11.1           | 8                    | :     | 10.8                   | 8                    |
| Westbound Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              | :      | 2,01         | 8             | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 14.3         | 8             |              | :      | 12.9           | 8                    | :     | 14.3                   | 8                    |
| Contraction of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second seco |              |        |              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |               |              |        |                |                      |       |                        |                      |

\* Note: Contratiow coning during AM peak period eliminates conflicting movements at this intersection.

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Table 4 FUTURE BASE TRAFFIC CONDITIONS YEAR 2010 WITHOUT THE CONCEPTUAL PLANNING AREA (continued)

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|---------------------------------------------------------------------------------|----------------|------------|---------------|-----------------------------------------------------|------------|----------------|----------|----------------|-----------|---------------|--------------------------------------------------|------------|----------------------|------------|
|                                                                                 |                |            | AM Peak Hou   |                                                     |            | P.M. Peak Hour |          |                |           | AM Peak Hour  |                                                  |            | <u> PM Peak Hour</u> | ä          |
|                                                                                 | Type of        | ţ          | Delay         | Level of                                            | Å          | Delay          | Level of | Type of        | Å         | Delay         | Level of                                         | Å          | Delay                | Level of   |
| Intersection                                                                    | Intersection   | Reto       | (Seconda)     | Sentce                                              | Retto      | (Seconda)      | Service  | Intersection   | Ratio     | (Seconds)     | Service                                          | Ratio      | (Seconds)            | Service    |
| <ul> <li>Hatastala Hinhway and Put alari Street</li> </ul>                      | Signalized     |            |               |                                                     |            |                |          | Signalized     |           |               |                                                  |            |                      |            |
| Linthourd Annuch                                                                |                | :          | 26.0          | ۵                                                   | ;          | 5.8            | 8        |                | :         | 4,5           | <                                                | :          | 10.4                 | œ          |
| Factoring Amment                                                                |                | :          | 14.3          |                                                     | :          | 26.9           | ۵        |                | :         | 11.5          | 8                                                | ;          | 11                   | <          |
|                                                                                 |                | :          | 18            | . 65                                                | :          | 8.8            | 0        |                | :         | 14.0          | 80                                               | :          | 4                    | <          |
| Overall Intersection                                                            |                | 0.71       | 17.4          | . U                                                 | 0.56       | 16.8           | U        |                | 0.59      | 8.6           | 83                                               | 75.0       | 5.8                  | æ          |
| 7. Haloakala Higtmey, Makeweo Avenue                                            | Signatized     |            |               |                                                     |            |                |          | Signalized     |           |               |                                                  |            |                      | E 4        |
| and Loha Street                                                                 |                |            | 5             | c                                                   | }          |                | œ        |                | ;         | 8.0           | •                                                | ;          | 12.4                 | ۴          |
|                                                                                 |                |            |               | 0 0                                                 | : :        |                |          |                | :         | 6.7           | 0                                                | ;          | 9.7                  | ⊳<br>₽́∕   |
|                                                                                 |                | :          | , and         | o c                                                 | : :        |                | <b>.</b> |                | :         | 4             | <                                                | :          | 2.8                  | Ň          |
|                                                                                 |                | : :        | į             | 2 🖻                                                 | : :        | 598            |          |                | ;         | 4             | <                                                | :          | 8.0                  | ŝĒ         |
| rresuounu Approacti<br>Overal Intersection                                      |                | 0.58       |               | <u>ں</u> د                                          | 0.74       | 207<br>207     | • •      |                | 0.23      | 6.1           | œ                                                | 0.32       | 60                   | 2          |
|                                                                                 |                |            |               |                                                     |            |                |          |                |           |               |                                                  |            |                      | 2          |
| 8. Puicatani Street and Iolani Street                                           | Unsignalized   |            |               |                                                     |            |                |          | Unsignalized   |           |               |                                                  |            |                      | •          |
| Northbound Approach                                                             | •              | ;          | 0.0           | <                                                   | ;          | <b>C</b> 0     | <        |                | :         | 0.0           | <                                                | :          | 10                   | <          |
| Southbound Acomach                                                              |                | :          | <u>9</u> .0   | <                                                   | :          | 0.7            | <        |                | ;         | 0.6           | <                                                | :          | 0.7                  | <          |
| Farburd Annach                                                                  |                | :          | 12.1          | U                                                   | :          | 10.4           | U        |                | :         | 12.1          | υ                                                | :          | 10.4                 | o          |
| Westhound Annoach                                                               |                | :          | 0.4           | <                                                   | :          | 4.0            | <        |                | :         | 9.4           | <                                                | :          | 4.0                  | <          |
| Overal Interaction                                                              |                | :          | 5.1           | 8                                                   | :          | 2.7            | <        |                | ;         | 5             | 8                                                | :          | 2.7                  | <          |
| <ol><li>Kula Highway and Project Road</li></ol>                                 | Not Applicable | :          | :             | :                                                   | :          | ;              | :        | Not Applicable | :         | :             | :                                                | :          | :                    | :          |
| 10. Kula Highway and Chana Street<br>Northbound Approach<br>Southbourd Approach | Unsignalized   | ::         | 0.0           | < <                                                 | ::         | 0.0            | < <      | losignaŭzed)   | ::        | 0.0           | < < :                                            | ::         | 0.0                  | < < 0      |
| Westbound Approach<br>Overall Intersection                                      |                | t i        | 10.0<br>0.2   | ∞ ≺                                                 | ::         | 7.0<br>0.2     | ∞ ≺      |                | ::        | 10.0<br>0.2   | ∞ <                                              | ::         | 0.2                  | <b>2</b> < |

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this widening project through the environmental regulatory requirements has already been initiated.

<u>Pukalani Bypass Road</u>: Widen this roadway to four lanes to provide two mauka-bound lanes and two makai-bound lanes.

Intersection of Pukalani Bypass Road (West Terminus) and Haleakala Highway: Signalize the intersection and reconfigure the intersection laneage to provide two westbound lanes on the Pukalani Bypass Road approach, double left-turn lanes with optional right-turn movement on the Haleakala Highway northbound approach and two through lanes with a separate right-turn lane on the Haleakala Highway eastbound approach.

Intersection of Pukalani Bypass Road and Makani Road: Widen, reconfigure and signalize this intersection to provide two mauka-bound lanes and two makai-bound lanes on Pukalani Bypass Road.

Intersection of Pukalani Bypass Road and Makawao Avenue: Widen and reconfigure this signalized intersection to provide two mauka- and two makai-bound lanes on Pukalani Bypass Road.

Optimization of Traffic Signal Operations: Adjust traffic signal timing as traffic volumes increase to better accommodate the increased traffic flows and to reduce delays at the signalized intersection. In addition, the proposed traffic signal system at the Pukalani Bypass Road/Makani Road intersection should be interconnected with the existing traffic signal systems at the Pukalani Bypass Road/Makawao Avenue intersection and the Haleakala Highway/Pukalani Bypass Road/Kula Highway (Five Trees) intersection to provide for efficient traffic progression.

With these improvements, the coning of the contraflow lane during the morning peak period of traffic would not be needed. In addition, mauka-bound (eastbound) traffic in the morning peak period would be permitted to remain on the Pukalani Bypass Road without having to divert through Pukalani town.

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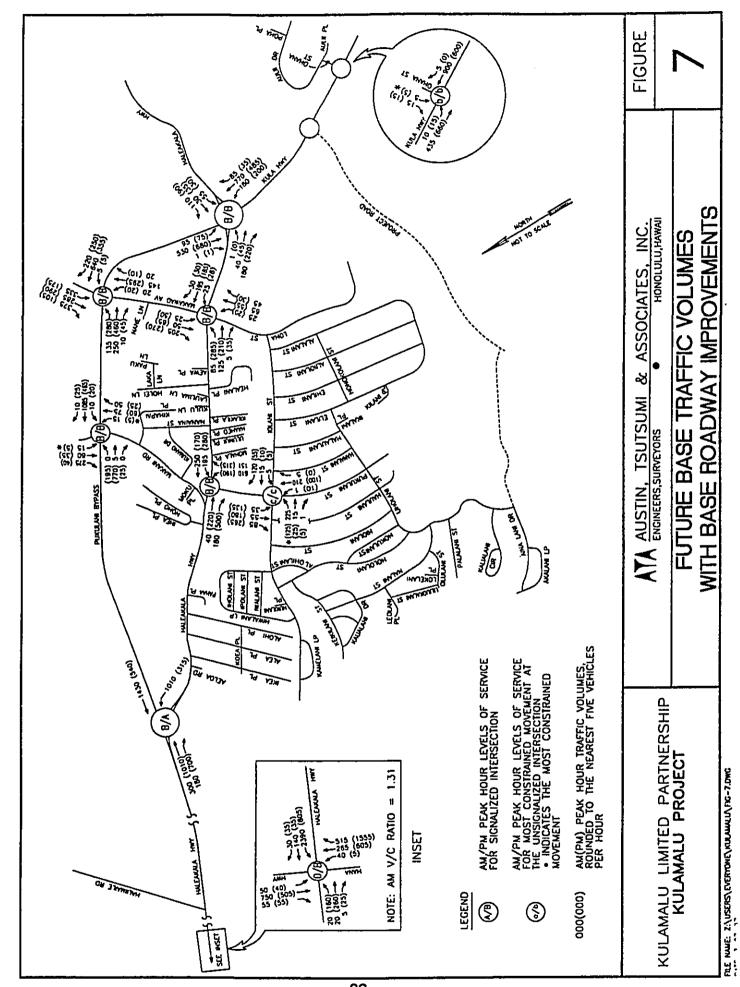
Accordingly, the future morning peak hour traffic volumes would increase on the Pukalani Bypass Road and the traffic volumes on Haleakala Highway travelling through Pukalani town would be expected to decrease. The afternoon peak hour volumes are not expected to change significantly with the proposed base roadway improvements since there is no contraflow operation and the diversion of mauka-bound traffic only occurs during the morning peak period. Figure 7 shows the traffic assignment for the Year 2010 base traffic volumes with the base roadway improvements.

The results of analysis of the future base traffic volumes with the base roadway improvements are shown in Table 4. At the intersection of Hana Highway and Haleakala Highway, the AM peak hour v/c ratio would exceed 1.0, however, the analysis shows that the overall traffic conditions at the study intersections would improve to Level of Service D or better when the base roadway improvements are implemented.

Long-term solutions are needed to alleviate the traffic congestion at the intersection of Hana Highway and Haleakala Highway. Possible roadway improvements include grade separation structure(s), such as a flyover connector from westbound Haleakala Highway to southbound Hana Highway, or the provision of alternate access routes to the Upcountry area. A gradeseparated connector ramp for the Haleakala Highway makai-bound left-turn would reduce conflicting movements at the Hana Highway intersection, but it would not decrease the traffic demand on Hana Highway. The introduction of new routes could be accomplished through the construction of new roadways, such as the proposed Upcountry-Kihei Road or through the upgrade/realignment of existing rural, winding roads, such as Omaopio Road and Pulehu Road. New Upcountry routes to other areas would reduce travel time and decrease traffic demand on Haleakala Highway and Hana Highway.

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# IV. PROJECT AND CONCEPTUAL PLANNING AREA GENERATED TRAFFIC VOLUMES

The development of traffic projections for the proposed project involves trip generation, trip distribution, and traffic assignment. A description of each process follows:

## A. Trip Generation Rates

The traffic expected to be generated by the conceptual planning area was estimated by applying the trip generation rates for the appropriate land uses, which are shown in the table below:

|                      | Parameter               | Daily | AM    | Peak H | lour | РМ    | Peak H | our  |
|----------------------|-------------------------|-------|-------|--------|------|-------|--------|------|
| Land Use             | ratameter               | Rate  | Rate  | Enter  | Exit | Rate  | Enter  | Exit |
| Residential          |                         | }     |       |        |      |       |        |      |
| Single-Family        | dwelling units          | 9.55  | 0.74  | 26%    | 74%  | 1.01  | 64%    | 36%  |
| Multi-Family         | dwelling units          | n/a   | 0.66  | 25%    | 75%  | 0.83  | 57%    | 43%  |
| Eiderly              | dwelling units          | 4.29  | 0.19  | 58%    | 58%  | 0.27  | 44%    | 56%  |
| Shopping Center      | thousand<br>square feet | 64.77 | 1.47  | 63%    | 37%  | 6.03  | 50%    | 50%  |
| Government<br>Office | thousand<br>square feet | 68.93 | 5.88  | 84%    | 16%  | 6.22  | 15%    | 85%  |
| Day Care             | thousand<br>square feet | 79.26 | 13.02 | 53%    | 47%  | 13.62 | 47%    | 53%  |
| Church               | thousand square feet    | 9.32  | 0.74  | 64%    | 36%  | 0.72  | 54%    | 46%  |
| Private School       | students                | n/a   | 0.93  | 63%    | 37%  | 0.13  | 33%    | 67%  |
| Park                 | acres                   | n/a   | 2.87  | 72%    | 28%  | 3.14  | 35%    | 65%  |

# Table 5 TRIP GENERATION RATES

These trip rates are based upon data from Trip Generation, Fifth Edition, Institute of Transportation Engineers (ITE), 1991 except for the elderly

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residential dwelling units rates which are from Site-Oriented Trip Generation Rates for Oahu User's Manual, 1988, prepared by ATA. The application of these rates provides an estimate of the total increases in future traffic expected to be generated by the conceptual planning area. The trip generation estimates are given in Table 6.

For the Kulamalu shopping center, some of the trips would be from motorists already travelling on Kula Highway who stop at the shopping center then continue to their original destination. While these types of trips would increase turning movements entering and exiting the shopping center driveway, these passby trips would not increase the highway traffic volumes. Approximately 25 percent of the morning and 35 percent of the afternoon peak hour shopping center traffic were estimated to be passby trips. Accordingly, the total conceptual planning area traffic assigned on the external highway system was adjusted for the shopping center passby trips.

Due to the mixed land uses within the Kulamalu conceptual planning area, some trips would be expected to remain within the Kulamalu site; trips between the residential units to the shopping center, office, day care center, school or park would be considered as internal trips. These internal trips, which is estimated to be about 8 percent of the total Kulamalu conceptual planning area trips, were deducted from the total trips prior to assigning the conceptual planning area traffic to the external roadway system.

## **B.** Traffic Distribution

The direction distribution pattern developed for the Kulamalu development was based on the existing traffic distribution pattern as well as consideration of future residential and employment areas on the island of Maui. The general distribution pattern used to distribute external traffic is identified in Figure 8.

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## Table 6

## CONCEPTUAL PLANNING AREA TRIP GENERATION

|                                                         | CONCEPTUA                               |                   | NING                     | AREA                     |                  |
|---------------------------------------------------------|-----------------------------------------|-------------------|--------------------------|--------------------------|------------------|
| Land Use                                                | Parameter                               | AM F<br>Ho        |                          | PM F<br>Ha               |                  |
|                                                         |                                         | Enter             | Exit                     | Enter                    | Exit             |
| Project Area<br>Residential<br>Elderly                  | 65 dwelling units                       | 7                 | 5                        | 8                        | 10               |
| Shopping Center                                         | 140,000 square feet                     | 129<br>64         | 75<br>12                 | 419<br>12                | 419<br>69        |
| Government Office<br>Day Care                           | 13,000 square feet<br>9,000 square feet | 62                | 55                       | 58                       | 65               |
| Church                                                  | 4,000 square feet                       | 2                 | 1                        | 2                        | 1                |
| Park<br>Back (Llalau)                                   | 14.74 acres                             | 30                | 12                       | 16                       | 30               |
| Park (Halau)<br>Subtotal                                | 5.03 acres                              | <u>11</u><br>305  | _ <u>4</u><br>164        | <u>_6</u><br>521         | <u>10</u><br>604 |
| Adjacent Planning Area<br>Residential                   |                                         |                   |                          |                          |                  |
| Single-Family                                           | 324 dwelling units                      | 62                | 178                      | 209                      | 118              |
| Multi-Family                                            | 80 dwelling units                       | 13                | 40                       | 38                       | 28               |
| Private School<br>Subtotal                              | 500 students                            | <u>293</u><br>368 | <u>172</u><br><u>390</u> | <u>_21</u><br><u>268</u> | <u>44</u><br>190 |
| Total Conceptual Planning<br>Area Trips                 |                                         | 673               | 554                      | 789                      | 794              |
| Deductions<br>Internal Trips<br>Commercial Passby Trips |                                         | 49<br><u>26</u>   | 49<br><u>26</u>          | 64<br><u>148</u>         | 64<br><u>148</u> |
| Subtotal                                                |                                         | 75                | 75                       | 212                      | 212              |
| Net External Trips                                      |                                         | 598               | 479                      | 577                      | 582              |

# C. Traffic Assignment

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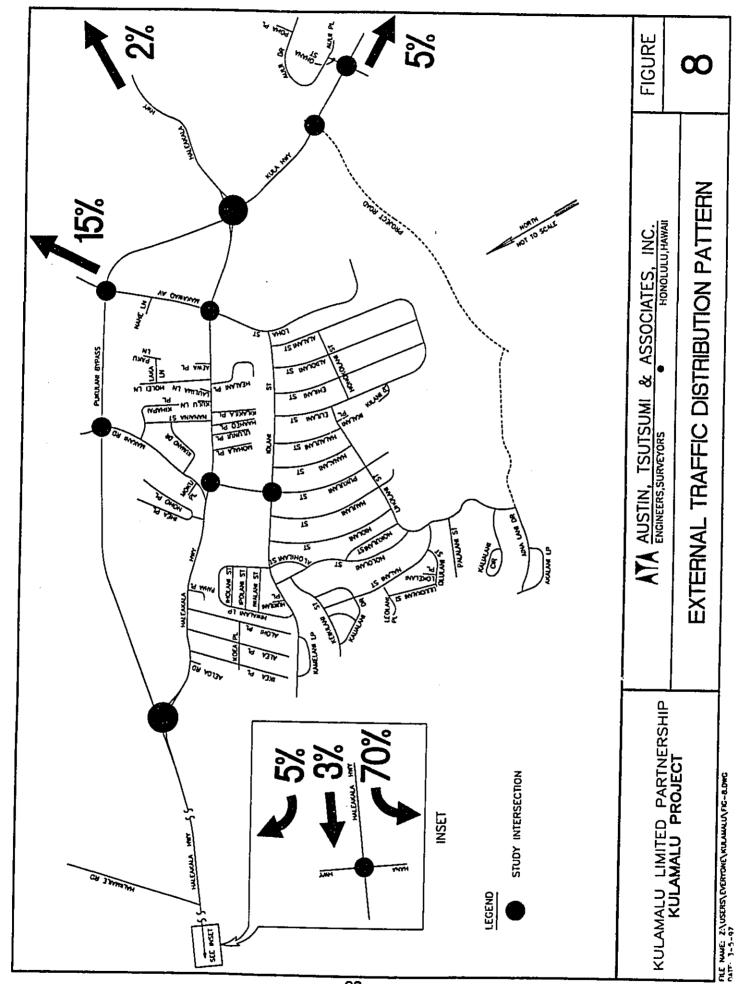
The trip distribution pattern identified in Figure 8 was used to assign the conceptual planning area-generated traffic to the local street network. The

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traffic assignment to specific streets and intersections was based on the available access into and out of the site and the availability of local routes to access the regional highway system. The resulting estimated conceptual planning area-generated peak hour traffic volumes at each of the study intersections without and with the base roadway improvements are shown in Figures 9 and 10, respectively.

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# V. FUTURE WITH CONCEPTUAL PLANNING AREA ANALYSIS

This section discusses the traffic operating conditions when the conceptual planning area-generated traffic volumes are added to the future base traffic volumes.

A. Future Traffic Volumes With Conceptual Planning Area-Generated Traffic

For the future Year 2010 traffic volumes with the conceptual planning area, two sets of traffic assignments were developed, without and with the base roadway improvements, and are shown in Figures 11 and 12, respectively. The base roadway improvements, which are described in detail in the previous Section III. D., primarily involve the widening of Haleakala Highway to four lanes between Hana Highway and Pukalani Bypass Road and the widening of the Pukalani Bypass Road to four lanes and associated intersection modification.

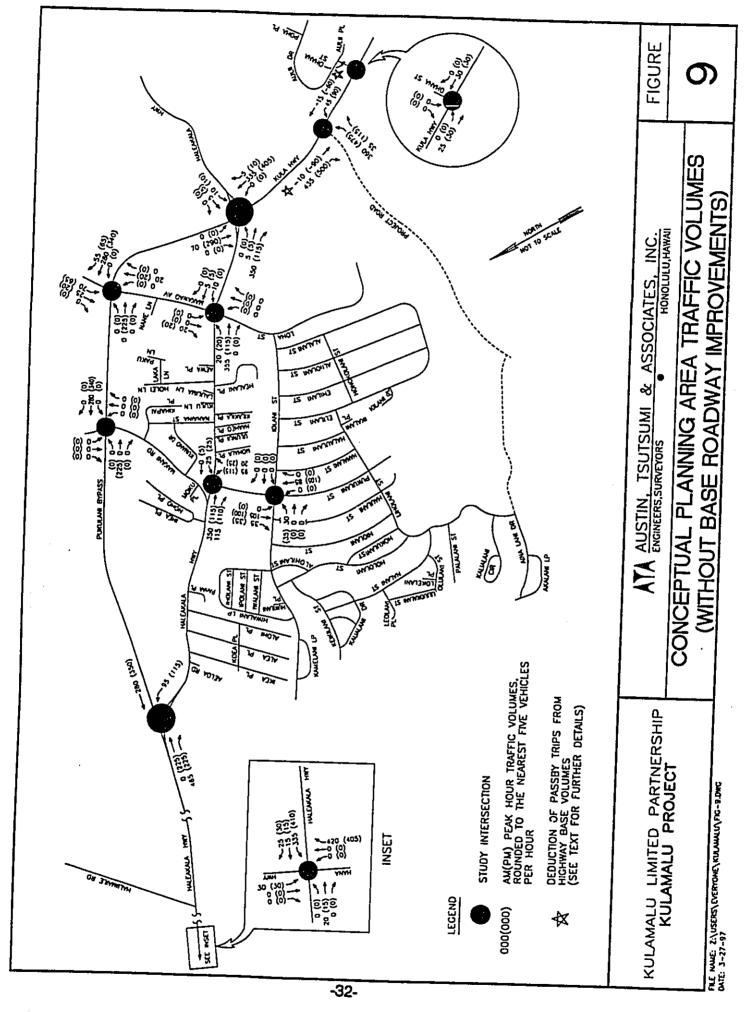
## B. Level of Service Analysis

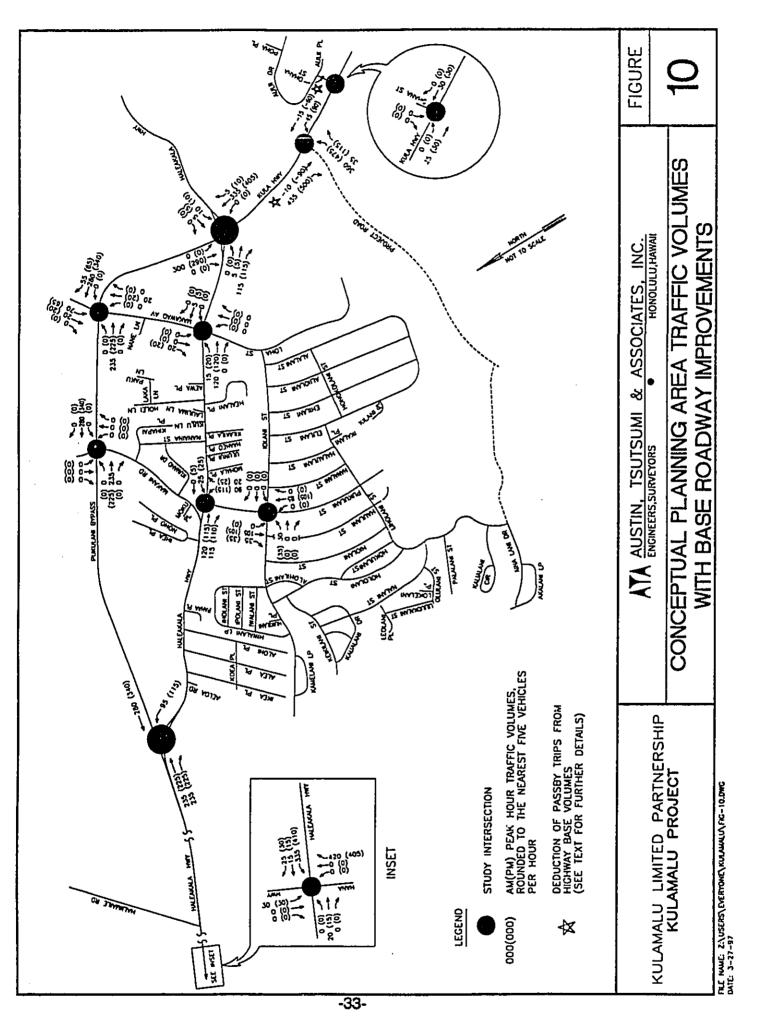
The results of the analysis of the future traffic volumes with the conceptual planning area-generated traffic are shown in Table 7. Without the base roadway improvements, traffic operations at the existing intersections, identified below, would be expected to be at Level of Service E or F, or poor operating conditions with long delays for the future conditions with the conceptual planning area-generated traffic.

- Hana Highway and Haleakala Highway
- Pukalani Bypass Road (West Terminus) and Haleakala Highway
- Pukalani Bypass Road and Makani Road
- Pukalani Bypass Road and Makawao Avenue



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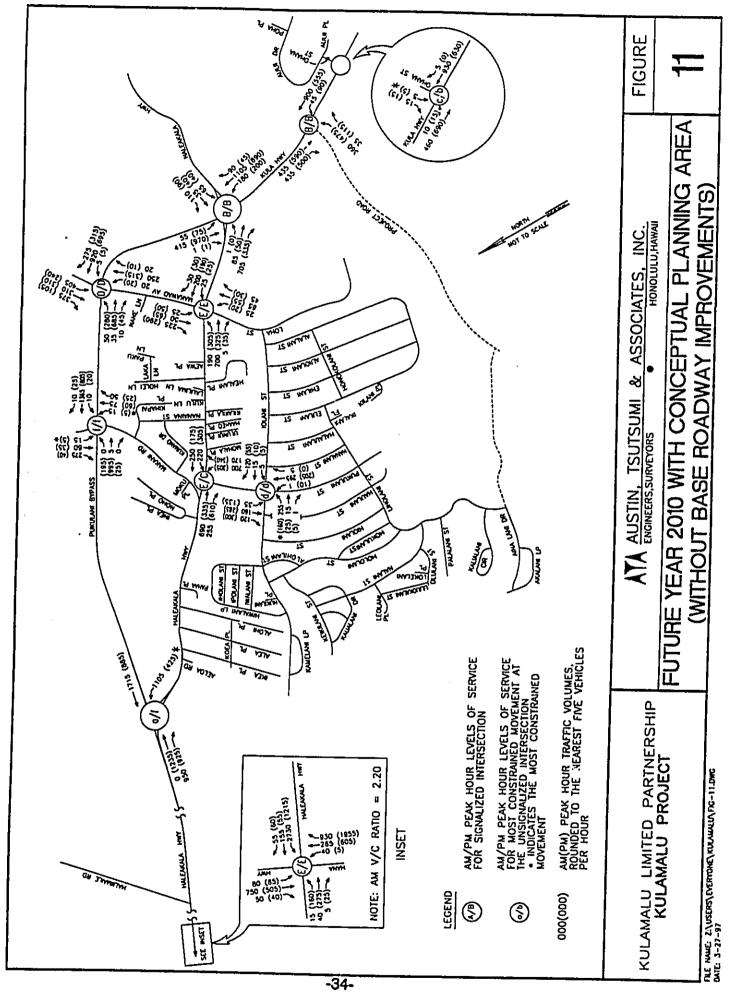




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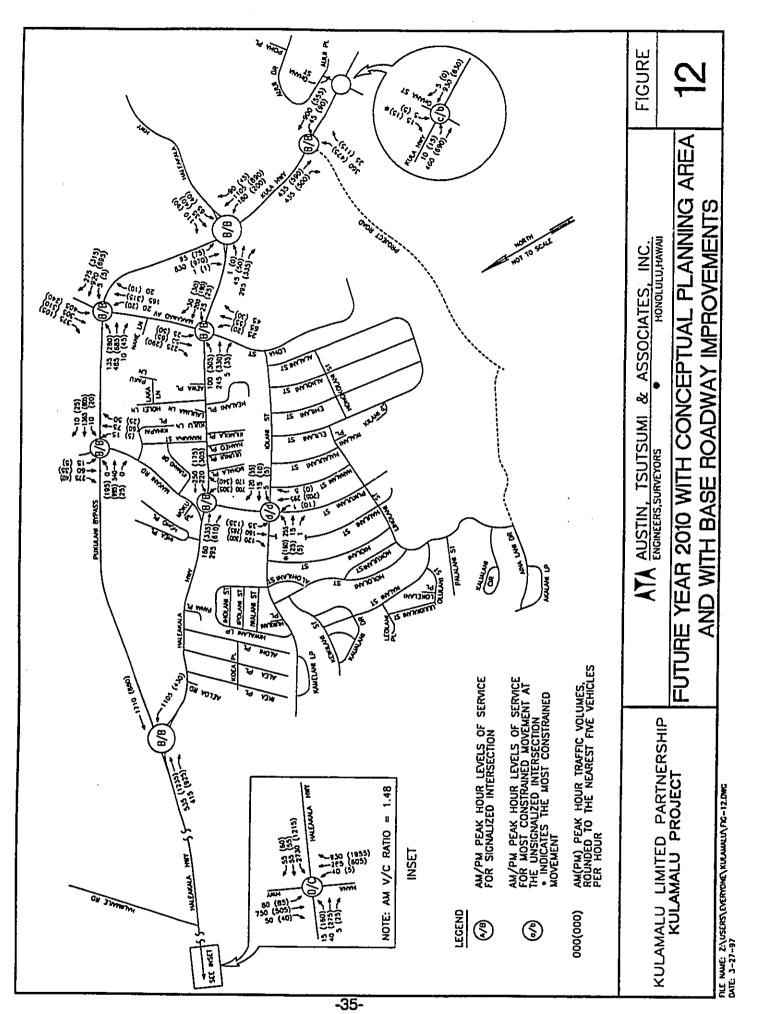
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Table 7 FUTURE YEAR 2010 TRAFFIC CONDITIONS WITH THE CONCEPTUAL PLANNING AREA

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|                                                                          | 1                      | Future Cond  | uortin withou      | Future Conditions without Base Roadway Improvements | y Improvem | ents               |                     |                         | Future Cr   | inditions with     | Future Conditions with Base Roadway Improvements | ay Improv <del>o</del> m | ents               |                     |
|--------------------------------------------------------------------------|------------------------|--------------|--------------------|-----------------------------------------------------|------------|--------------------|---------------------|-------------------------|-------------|--------------------|--------------------------------------------------|--------------------------|--------------------|---------------------|
|                                                                          |                        |              | 6                  |                                                     |            | PM Peek Hour       |                     | -                       | _           | AM Peak Hour       |                                                  | _                        | PM Peak Hour       |                     |
| Literaection                                                             | Type of<br>Interaction | Seto<br>Seto | Delay<br>(Seconds) | Level of<br>Service                                 | Å<br>Belo  | Delay<br>(Seconds) | Level of<br>Service | Type of<br>Intersection | sk<br>Bilio | Delay<br>[Seconds] | Level of<br><u>Service</u>                       | <sup>옷</sup> 튑           | Delay<br>(Seconds) | Level of<br>Serrice |
| 1 Hora Workway and Halaatala Hindray                                     | Simulyad               |              |                    |                                                     |            |                    |                     | Signalized              |             |                    |                                                  |                          |                    |                     |
| Northbound Approach                                                      |                        | :            | 16.2               | U                                                   | :          | 17.7               | U                   |                         | :           | 11.0               | •                                                | :                        | 246                | U                   |
| Southbound Approach                                                      |                        | :            | 35.6               | 0                                                   | :          | 23.0               | υ                   |                         | :           | 17.1               | v                                                | :                        | 18.5               | v                   |
| Easthound Approach                                                       |                        | :            | 17.6               | U U                                                 | :          | 883                | Ŀ                   |                         | :           | 13.3               | 8                                                | :                        | 23.6               | ۵                   |
| Westbound Approach                                                       |                        | :            | 660                | ٤.                                                  | :          | 66.0               | Ŀ                   |                         | :           | 49.9               | ω                                                | ;                        | 195                | υ                   |
| Overall Intersection                                                     |                        | 2.20         | 55.1               | ш                                                   | 16:0       | 47.4               | w                   |                         | 1.48        | 39.5               | ٥                                                | 0.84                     | 21.0               | U                   |
| 2. Pukatani Bypass (West Terminus) and                                   | Unsignalized           |              |                    |                                                     |            |                    |                     | Signalized              |             |                    |                                                  |                          |                    |                     |
| Maioakala Mighway<br>Northound Acoroach                                  |                        | :            | ٠                  | <                                                   | :          | 3031.2             | ١Ŀ                  |                         | :           | 16.3               | U                                                | ;                        | 11.7               | 8                   |
| Eastbound Approach                                                       |                        | :            | ;                  | :                                                   | :          | :                  | :                   |                         | :           | 5.5                | ۵                                                | :                        | 14                 | <                   |
| Westbound Appresch                                                       |                        | :            | :                  | :                                                   | :          | ;                  | :                   |                         | :           | 14.3               | B                                                | :                        | 33                 | <                   |
| Overall Intersection                                                     |                        | :            | •                  | <                                                   | :          | 1.101              | Ŀ.                  |                         | 0.81        | 13.6               | 60                                               | 0.49                     | 5.1                | 8                   |
| <ol><li>Pukalani Bypass Road and Makani Road</li></ol>                   | Unsignalized           |              |                    |                                                     |            |                    |                     | Signatzed               |             |                    |                                                  |                          |                    |                     |
| Northbound Approach                                                      | ı                      | :            | 00                 | <                                                   | :          | :                  | u.                  |                         | :           | 88                 | 8                                                | :                        | 107                | œ                   |
| Southbound Approach                                                      |                        | :            | 343.8              | u                                                   | :          | :                  | Ŀ                   |                         | :           | 10.9               | 8                                                | ţ                        | 7.3                | 8                   |
| Eastbound Approach                                                       |                        | :            | 0.0                | <                                                   | :          | 22                 | <                   |                         | :           | 3.8                | <                                                | ;                        | 32                 | <                   |
| Westbound Approach                                                       |                        | :            | 00                 | <                                                   | ;          | 0.2                | <                   |                         | :           | 5.7                | ۵                                                | ;                        | 108                | 8                   |
| Overalt Intersection                                                     |                        | :            | 68.5               | Ŀ                                                   | :          | 6.08               | LL.                 |                         | 0.50        | 62                 | ۵                                                | 0.48                     | 6.6                | 8                   |
| 4. Putalani Bypass and Makawao Avenue                                    | Signalized             |              |                    |                                                     |            |                    |                     | Signalized              |             |                    |                                                  |                          |                    |                     |
| Northbound Approach                                                      |                        | ;            | 7.9                | 8                                                   | :          | 11.0               | •                   |                         | ;           | E.71               | υ                                                | ;                        | 13.7               | •                   |
| Southbound Approach                                                      |                        | :            | 32.6               | ٥                                                   | :          | 0.14               | ш                   |                         | ;           | 9.0                | æ                                                | ;                        | 12.2               | 8                   |
| Eastbound Approach                                                       |                        | :            | 12.2               | 8                                                   | :          | 16.1               | υ                   |                         | :           | 5.0                | æ                                                | :                        | 8.3                | 8                   |
| Westbound Approach                                                       |                        | :            | 51.5               | ш                                                   | :          | 46.2               | ш                   |                         | :           | 13.1               | æ                                                | :                        | 12.4               | æ                   |
| Overall Intersection                                                     |                        | 0.95         | 36.2               | ۵                                                   | 0.77       | 30.6               | a                   |                         | 0.55        | 10.3               | 8                                                | 0.57                     | 11.1               | B                   |
| 5. Putalari Bypass (East Terminus).<br>Hahatala Hichway and Kuta Hichway | Signalized             |              |                    |                                                     |            |                    |                     | Signalized              |             |                    |                                                  |                          |                    |                     |
| ('Fre Treas' Intersection)                                               |                        | •            |                    |                                                     |            |                    |                     |                         |             |                    |                                                  |                          |                    |                     |
| Northbound Approach                                                      |                        | :            | 6.1                | ۵                                                   | :          | 15.8               | U I                 |                         | :           | 12.4               | •                                                | :                        | 12.4               |                     |
| Southbound Approach                                                      |                        | :            | 7.2                | æ                                                   | :          | 12.4               | 8                   |                         | :           | 15.8               | U                                                | :                        | 15.8               | 5                   |
| Eastbound Approach                                                       |                        | :            | 19.2               | <b>U</b> 1                                          | :          | 8                  | < (                 |                         | :           | 89                 | æ (                                              | :                        | :<br>:<br>:        | <b>•</b> •          |
| Westbound Approach<br>Owned Everyonics                                   |                        | : 20         | 133                |                                                     | -90        |                    | ບແ                  |                         | : 20        | 13.2<br>10.9       | <b>2)</b> 41                                     |                          |                    | < ≈                 |
|                                                                          |                        | 5            | 2                  | 9                                                   | 55         | 5                  | נ                   |                         |             | 2                  | 1                                                |                          | 5                  | 1                   |

\* Note: Contratiow coning during AM peak period eliminates conflicting movements at this intersection.

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Table 7 FUTURE YEAR 2010 TRAFFIC CONDITIONS WITH THE CONCEPTUAL PLANNING AREA (continued)

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|                                        |              | ষ        | WI Poak Hour | A Post Hour PM P |       | PM Pout Hour | 3        |               |            | AM Pook Hour |         |          |            | AM Papk Hour PM Paak Hour |
|----------------------------------------|--------------|----------|--------------|------------------|-------|--------------|----------|---------------|------------|--------------|---------|----------|------------|---------------------------|
|                                        | Type of      |          |              | Level of         | vic   | Delay        | Level of | Type of       |            | Delay        | 2       | Level of |            | vic                       |
| <u>Intersection</u>                    |              | Ratio    | (Seconds)    | Service          | Balio | (Seconds)    | Service  | intersection. | Ratio      | (Seconds)    | Service | vice     | vice Batio |                           |
| 6. Heleskels Highway and Pusalam Sueet | Signatured   |          |              | I                |       | :            |          | Signatured    |            |              |         |          |            |                           |
| Northbound Approach                    |              | ;        | 498          | ω                | :     | 6.5          | 8        |               | :          | 10.4         | _       |          |            | :                         |
| Eastbound Approach                     |              | :        | 56.6         | w                | ;     | 0.96         | ٥        |               | :          | 10.5         | -       | 8        |            |                           |
| Westbound Approach                     |              | :        | <b>0.</b> 6  | 8                | :     | 19.6         | U        |               | :          | 14.0         |         | -        |            | :                         |
| Overall Intersection                   |              | 8.1      | 0.54         | Ψ                | 0.68  | 23.3         | Q        |               | 0.67       | 11.7         |         |          | U          | 0.49                      |
| 7. Haleakala Highway, Makawao Avenue   | Signalized   |          |              |                  |       |              |          | Signafized    |            |              |         |          |            |                           |
| and Lots Sirvet                        |              |          | ļ            | 1                |       | ł            | ſ        |               |            | 1            |         |          |            |                           |
| Nurthbound Approach                    |              | :        | 6.7          | ۵                | :     | 6.0          | æ        |               | :          | 7.7          |         | ~        | :          | :                         |
| Southbound Approach                    |              | :        | 64           | 8                | :     | 5.9          | 8        |               | :          | 7.7          | ш       | -        |            |                           |
| Eastbound Approach                     |              | :        | 67.3         | ц,               | :     | 66.6         | ٤.,      |               | :          | 5.0          | -       | _        | :          | :                         |
| Westbound Approach                     |              | :        | 52           | Ð                | :     | 99           | 8        |               | 1          | 5,2          | 8       |          |            |                           |
| D Overal interaction                   |              | <b>8</b> | 1.54         | w                | 0.87  | 39.3         | ω        |               | 0.27       | 6.1          | 60      |          | 0.35       |                           |
| 6. Putalari Street and Jolani Street   | Unsignatized |          |              |                  |       |              |          | Unsignatizad  |            |              |         |          |            |                           |
| Northbound Approach                    |              | :        | 00           | <                | ;     | 0.2          | <        |               | ;          | 0.0          | <       |          | :          |                           |
| Southbound Appresets                   |              | ;        | 05           | <                | :     | 9.0          | <        |               | . <b>:</b> | 02           | <       |          | :          |                           |
| Eastbound Approach                     |              | :        | 26.0         | 0                | :     | 202          | ٥        |               | :          | 26.0         | ٥       |          | :          |                           |
| Westbound Approach                     |              | :        | 4,5          | <                | :     | 6,4          | <        |               | :          | ų<br>Ŧ       | <       |          | :          |                           |
| Overall Intersection                   |              | :        | 6.9          | Ð                | :     | 43           | <        |               | :          | 9.3          | 8       |          | ;          | 43                        |
| 9. Kuta Kichway and Project Road       | Sirrafrad    |          |              |                  |       |              |          | Sinnatined    |            |              |         |          |            |                           |
| Northbound Approach                    |              | :        | 151          | 0                | ;     | 5            | æ        |               | :          | 15.1         | C       |          | :          |                           |
| Southbound Approach                    |              | ;        | 8.8          |                  | ;     | 6            |          |               | :          | 8.8          |         |          | :          |                           |
| Eastbound Approach                     |              | :        | 12.1         | 8                | :     | C.71         | υ        |               | ;          | 12.1         | 8       |          | :          | 17.3                      |
| Overall Intersection                   |              | 0 72     | 12.6         | Ð                | 0.62  | 103          | 8        |               | 0.72       | 12.6         | 8       |          | 0 62       |                           |
| to. Kula Highway and Ohana Street      | besignatized |          | 1            |                  |       |              |          | Unsignatized  |            |              |         |          |            |                           |
| Normound Approach<br>Southound Acomach |              | : :      | 85           | < <              | : :   | 8 e          | < •      |               | ; ;        | 0 +<br>0 c   | < •     |          | :          | ;;                        |
| Westbound Approach                     |              | :        | 10.5         | :0               | :     | 12           | . 82     |               | ::         | 10.5         | ( )     |          | ::         |                           |
| Overal Interaction                     |              | :        | 02           | <                | :     | 0.2          | ۲        |               | :          | 02           | <       |          | ;          |                           |

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# ATA AUSTIN, TSUTSUMI & ASSOCIATES, INC

- Haleakala Highway, Makawao Avenue and Loha Street
- Haleakala Highway and Pukalani Street

With the base roadway improvements implemented, the traffic operations at these intersections is expected to improve to Level of Service D or better, except at the Hana Highway/Haleakala Highway intersection where the makaibound (westbound) approach which would continue to operate at Level of Service E. The long-term regional impacts for traffic traveling to and from the Upcountry area must be considered in the assessment of improvements, such as grade-separated connection roadways at the Hana Highway/Haleakala Highway intersection, or construction/upgrade of alternate Upcountry routes.

# VI. SUMMARY OF FINDINGS AND RECOMMENDATIONS

This section summarizes the findings and recommendations of this traffic impact assessment report for the Kulamalu Conceptual Planning Area.

## A. Findings

### 1. Existing Conditions

Generally, traffic operates fairly well on the roadways in the study section, except at the following locations:

- a. Hana Highway/Haleakala Highway Intersection In spite of the double left-turn movement on the makai-bound Haleakala Highway approach, traffic desiring to head southbound on Hana Highway operates at LOS F and LOS E during the morning and alternoon peak hours of traffic, respectively. Also, queuing is observed for the Hana Highway northbound right-turn movement to Haleakala Highway, mauka-bound.
- b. Pukalani Bypass Road/Haleakala Highway Intersection This intersection operates with near free flow conditions during the morning peak hour of traffic due to the contraflow operations where

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mauka-bound traffic is directed to continue on Haleakala Highway through Pukalani town. This eliminates the conflict for makai-bound traffic from Haleakala Highway from Pukalani town to the contraflow section of Haleakala Highway. However, during the afternoon peak hour of traffic, the heavy mauka-bound traffic continuing on to the Pukalani Bypass Road causes makai-bound traffic on Haleakala Highway from Pukalani town to experience serious delays (LOS F).

C. Haleakala Highway/Makawao Avenue/Loha Street Intersection -Traffic on the mauka-bound approach at this intersection experiences LOS E operations during the afternoon peak hour of traffic due to the high left-turn demand to northbound Makawao Avenue.

#### Future Base Year 2010 Traffic (Without Project-Generated Traffic) 2.

- a. Without any new roadway improvements, the increase in traffic demand due to population growth and other developments in the area will further aggravate traffic operations at the existing locations where traffic is currently operating poorly (see Item 1 above). In addition, traffic operations at the following locations will deteriorate to LOS E or F:
  - Pukalani Bypass Road/Makani Road Intersection Traffic on the Makani Road approaches to the intersection will operate at LOS F and the overall operations of the intersection will be at LOS E.

#### 3. Future With Base Year 2010 With Roadway Improvements (Without **Project-Generated Traffic)**

Under the future base conditions with the base roadway a. improvements, the traffic operation at the study intersections would improve and operate at Level of Service D or better, except at the Hana Highway/Haleakala Highway intersection. The traffic on the makai approach to this intersection will continue to operate at LOS F.

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# 4. Kulamalu Conceptual Planning Area

- a. The Kulamalu conceptual planning area will generate 1,227 morning peak hour vehicular trips and 1,583 afternoon peak hour vehicular trips. The deduction for internal traffic and commercial passby trips results in 1,077 (morning) and 1,159 (afternoon) peak hour trips on the external roadways.
- b. Under Year 2010 conditions with the Kulamalu conceptual planning area traffic added to the base year traffic and without the base roadway improvements in place, the intersections listed below would operate at Level of Service E or F, or with v/c ratios greater than 1.00.
  - 1. Hana Highway and Haleakala Highway.
  - 2. Pukalani Bypass Road (West Terminus) and Haleakala Highway.
  - 3. Pukalani Bypass Road and Makani Road.
  - 4. Pukalani Bypass Road and Makawao Avenue.
  - 5. Haleakala Highway, Makawao Avenue and Loha Street.
  - 6. Haleakala Highway and Pukalani Street.
- c. With the base roadway improvements implemented, traffic operations in the Year 2010 with the Kulamalu conceptual planning area traffic, the study intersections would operate at Level of Service D or better, with the exception of Hana Highway intersection with Haleakala Highway. Traffic on the makai-bound approach will continue to operate at LOS F.

## **B.** Recommendations

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# 1. Base Roadway Improvements

The base roadway improvements, described below, are required to accommodate the projected de facto growth of traffic (without the

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Kulamalu generated traffic) at an acceptable level of operation (LOS D or better). The recommended intersection configurations for the study intersections are shown in Figure 13. These improvements are consistent with the recommendations of the <u>Maui Long-Range Land Transportation</u> <u>Plan</u> (Draft Final Report, February 1996).

- a. <u>Haleakala Highway</u>: Widen to four travel lanes, two in each direction, between Hana Highway and the makai (west) terminus of the Pukalani Bypass Road. This project is currently funded for preparation of the plans, specifications and construction cost estimate and is being processed to meet the environmental regulatory requirements.
- b. <u>Pukalani Bypass Road</u>: Widen this roadway to four travel lanes to provide two mauka-bound lane and two makai-bound lanes.
- c. Intersection of Pukalani Bypass Road (West Terminus) and Haleakala Highway: Widen, reconfigure and signalize the intersection to provide two makai-bound lanes on the Pukalani Bypass Road approach, double left-turn lanes on the Haleakala Highway northbound approach and two through lanes with a separate right-turn lane on the Haleakala Highway mauka-bound approach.
- d. <u>Intersection of Pukalani Bypass Road/Makani Road</u>: Widen, reconfigure and signalize this intersection to provide two maukabound lanes, two makai-bound lanes on the Pukalani Bypass Road approaches, and separate turn lanes on the Makani Road approaches.

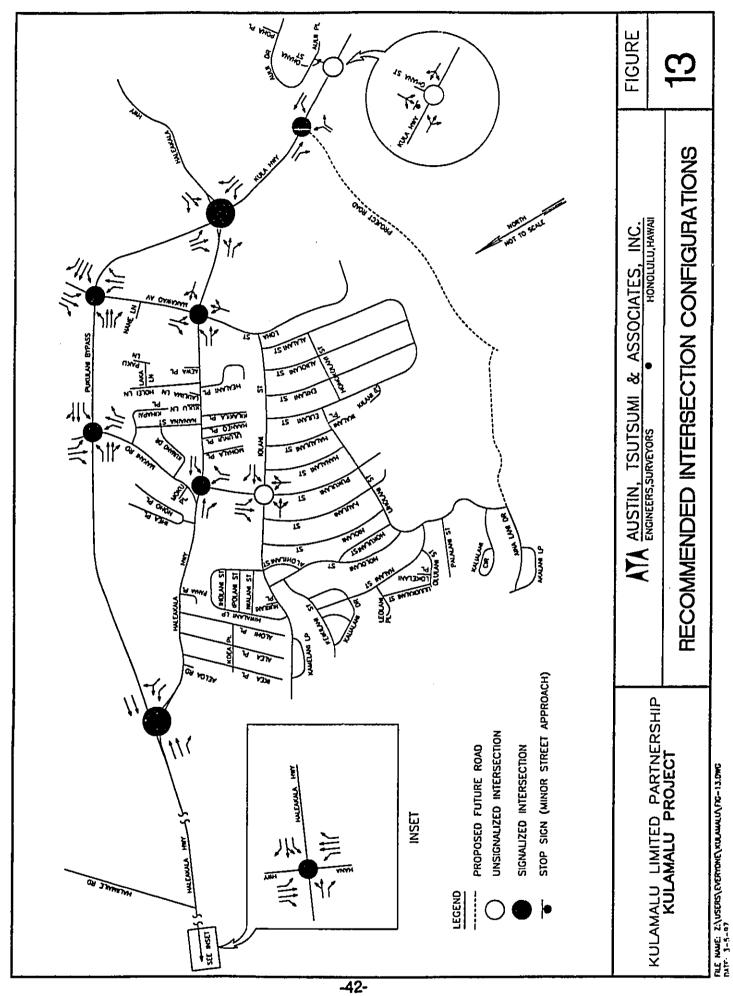
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e. Intersection of Pukalani Bypass Road and Makawao Avenue: Widen and reconfigure to allow the widening of Pukalani Bypass Road to two maukabound and two makaibound lanes.



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- f. <u>Optimization of Traffic Signal Operations</u>: Adjust traffic signal timing as traffic volumes increase to better accommodate the increased traffic flows and to reduce delays at signalized intersections. Also, the existing traffic signals at the intersections of Haleakala Highway/Pukalani Bypass Road/Kula Highway (Five Trees) and Pukalani Bypass Road/Makawao Avenue should be interconnected with the traffic signals at the Pukalani Bypass Road/Makani Road intersection to maintain traffic progression through Pukalani town.
- g. <u>Alternate Upcountry Access Roads</u>: Provide alternate access routes to the Upcountry area to alleviate the traffic congestion at the intersection of Hana Highway and Haleakala Highway. The introduction of new routes could be accomplished through the construction of new roadways, such as the proposed Upcountry-Kihei Road, or through the upgrade/realignment of existing rural, winding roadways, such as Omaopio Road and Pulehu Road. While grade-separated ramps may be constructed at the intersection of Hana Highway and Haleakala Highway, the provision of new/ upgraded Upcountry routes would reduce travel times to other areas and redistribute regional traffic volumes from Haleakala Highway and Hana Highway.

## 2. Project Related Roadway Improvements

 Project related roadway improvements which are recommended for implementation by the developer are at the proposed intersection of Kula Highway and the Kulamalu development primary access road: A .....

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Intersection of Kula Highway and Project Road: Provide a separate left-turn storage lane on northbound Kula Highway, and a deceleration/right-turn lane on southbound Kula Highway. Provide ATA AUSTIN, TSUTSUMI & ASSOCIATES, INC. CIVIL END NEERS + SURVEYORS

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separate left-turn lane and right-turn lane on the Project Road approach to Kula Highway. Install a traffic signal system when traffic volumes meet the Traffic Signal Warrants of the "Manual on Uniform Traffic Control Devices".

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# APPENDIX A

# **TRAFFIC COUNTS**

AUSTIN, TSUTSUMI & ASSOCIATES, INC.

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HTERECTION COUNT SUMMARY HALEAUALA HOHMAY AND HUNA HIGHMAY

AM PERIOD: Fabruary 7, 1996, Wednesday WEATHER: Class

Aftersection VOLIME Total Harry Houty 102 102 102 103 103 103 103 103 54555 28 WESTBOURD WESTBOUND 84 \$8555558 \$\$ \$29826829 4 660 745 2-=== \$₽ HUNA HIGHWAY HW M HOI MAY ſ Houry 1221 Heury 1711 1812 1825 1725 122855882 32 **3**85883533 EASTBOLND EASTBOUND 58 82255888<u>5</u>82 54955588 549555888 35-5-5500 25 440000--₩ E Houth 22252 쏞옥宕츱츥 33232<u>2</u>886 7 90000 907 10 12 12 12 12 12 12 14 SOUTHBOUND **UNDOH** 50 Man Cianos **NI P** ŝ 582238333 682238333 (in the second •~~~~~ 22 4004440000 28 HULENULA HORMAY HULENCULA HICHMAY l 4 £8885 Hourly 1878 2182 2182 2182 2182 1828 2182 NORTHBOUND ONDERTRON 501000000 2 2000-0000 -4 0 PM PERUOD: February 7, 1998, Wednesday WEATHER: Court 612020-01 88 612020-01 88 \$855589585 E <u>5</u>5 102 102 103 Istessate St 1243334433 1 8.30-845 8.45-700 7.30-7.15 7.15-7.20 7.15-7.15 7.30-815 8.15-815 8.15-810 1.50-815 8.15-810 1.50-800 1.50-800 TIME PERIOD TIME PERIOD

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INTERSECTION COUNT SUMMARY Haleakala highway and pukalahi Bypass

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AM PERIOD: February 7, 1996, Wednesday WEATHER: Clear

|                 | NTERSECTION      | Hourly<br>2381<br>2377<br>2371<br>2371<br>1808                                                                                                                                   |
|-----------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | INTERS           | 1001           530           536           536           536           537           333           333           333           2340           2340                               |
|                 |                  | Houth<br>915<br>810<br>810<br>547                                                                                                                                                |
| ž               |                  | Subtotel<br>208<br>208<br>208<br>208<br>208<br>245<br>161<br>150<br>150<br>108<br>108<br>868                                                                                     |
| HALEAKALA HWY   | EASTBOUND        |                                                                                                                                                                                  |
| HALE            | E                | Left Through<br>208 0<br>208 0<br>254 0<br>254 0<br>255 0<br>150 0<br>128 0<br>128 0<br>128 0<br>128 0<br>128 0<br>128 0<br>128 0<br>128 0<br>128 0<br>108 0                     |
|                 |                  | Left Left 208<br>208<br>208<br>208<br>208<br>208<br>150<br>150<br>150<br>150<br>158<br>915<br>915<br>868                                                                         |
|                 |                  | Hourity<br>3 10<br>3 36<br>3 36<br>3 36<br>3 39<br>6<br>3 39<br>6                                                                                                                |
|                 | 9                | Subvotat<br>66<br>57<br>57<br>57<br>57<br>100<br>100<br>95<br>95<br>94<br>94<br>310<br>310<br>310                                                                                |
|                 | <b>OUTHBOUND</b> | Right<br>57<br>57<br>100<br>103<br>95<br>95<br>95<br>95<br>95<br>95<br>310<br>310<br>310                                                                                         |
|                 | ŝ                |                                                                                                                                                                                  |
| YPASS           |                  |                                                                                                                                                                                  |
| PUKALANI BYPASS |                  | Hourly<br>1156<br>1142<br>991<br>871                                                                                                                                             |
|                 | 9                | Subtotal<br>256<br>251<br>251<br>251<br>251<br>256<br>254<br>1187<br>191<br>191<br>191<br>191<br>191<br>191                                                                      |
|                 | NORTHBOUND       | 20000000000000000000000000000000000000                                                                                                                                           |
|                 | Ŷ                | Left Through<br>256<br>0 251<br>0 251<br>0 251<br>0 251<br>0 256<br>0 187<br>0 187<br>0 191<br>0 1156<br>0 1156                                                                  |
|                 |                  |                                                                                                                                                                                  |
|                 | TIME PERIOD      | 6:30 - 6:45<br>8:45 - 7:00<br>7:00 - 7:15<br>7:15 - 7:30<br>7:45 - 8:30<br>8:00 - 8:15<br>8:15 - 8:30<br>8:00 - 8:15<br>8:15 - 8:30<br>8:00 - 8:15<br>8:30 - 7:30<br>8:45 - 7:45 |

PM PERIOD: February 7, 1996, Wednesday WEATHER: Clear

|                 | ICTION<br>ME           | Hourly<br>Hourly<br>1866<br>1890<br>1983<br>1983                                                                                                       |             |
|-----------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
|                 | INTERSECTION<br>VOLUME | Total<br>452<br>474<br>457<br>457<br>457<br>457<br>457<br>455<br>521<br>521<br>501                                                                     |             |
|                 |                        | Hourity<br>243<br>243<br>247<br>242<br>242<br>242                                                                                                      |             |
| λ               |                        | Sublotal<br>57<br>57<br>57<br>57<br>57<br>57<br>57<br>57<br>57<br>57<br>57<br>57<br>57                                                                 |             |
| HALEAKALA HWY   | STBOUND                | 200000000<br>2000000000000000000000000000                                                                                                              |             |
| HALE            | ă                      | 40000000<br>100000000000000000000000000000                                                                                                             |             |
|                 |                        | 55<br>57<br>55<br>55<br>55<br>55<br>55<br>55<br>55<br>55<br>55<br>55<br>55<br>5                                                                        |             |
|                 |                        | Hourly<br>1204<br>1258<br>1322<br>1356                                                                                                                 |             |
|                 | 9                      | Subtotal<br>281<br>285<br>285<br>334<br>335<br>335<br>335<br>335<br>335<br>335                                                                         |             |
|                 | SOUTHBOUND             | Rght<br>131<br>167<br>138<br>136<br>136<br>148<br>153                                                                                                  | 013         |
|                 | Š                      | Through<br>150<br>167<br>150<br>165<br>169<br>193<br>182<br>182                                                                                        | 378         |
| BYPASS          |                        | L 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                                                                                                                | c           |
| PUKALANI BYPASS |                        | Hourly<br>419<br>392<br>379<br>389                                                                                                                     |             |
|                 | 9                      | Subleta<br>114<br>94<br>112<br>95<br>87<br>87<br>101<br>101<br>109                                                                                     | 389         |
|                 | NORTHBOUND             | 200000000<br>2                                                                                                                                         | 9           |
|                 | SON                    | Left Through<br>0 114<br>0 112<br>0 112<br>0 112<br>0 112<br>0 101<br>0 109<br>0 109                                                                   | 389         |
|                 |                        |                                                                                                                                                        | 0           |
|                 | TIME PERIOD            | 440 - 415<br>416 - 415<br>450 - 446<br>450 - 446<br>510 - 546<br>515 - 550<br>515 - 550<br>545<br>516<br>516<br>516<br>516<br>516<br>516<br>516<br>516 | 5:00 - 6:00 |

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AUSTIN, TSUTSUMI & ASSOCIATES, INC.

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INTERSECTION COUNT SUMMARY PUKALAM BYPASS AND MAKAMI ROAD

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AUSTIN, TSUTSUMI & ASSOCIATES, INC.

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INTERSECTION COUNT SUMMARY PUKALANI BYPASS AND MAKAWAO AVENUE

|                                           | -              |           | Hourty      |            |             | 5           | 255        | 82       |            | e 5       | 760      |      |    |                             |         |                   | ¥            | ŀ           | lunoit       |          |         | 1931    | 59        |         | 59         | 3         | 5              |
|-------------------------------------------|----------------|-----------|-------------|------------|-------------|-------------|------------|----------|------------|-----------|----------|------|----|-----------------------------|---------|-------------------|--------------|-------------|--------------|----------|---------|---------|-----------|---------|------------|-----------|----------------|
|                                           | NJERSECTION    | VOLUME    |             |            |             |             |            |          |            |           |          |      |    |                             |         |                   | INTERSECTION |             |              | 3        | 2 5     |         | 2 4       | 2 2     | 5.5        |           | 2              |
|                                           | NTER           | Š         | Total       |            | 23          | <b>\$</b> { | <b>Ç</b> : | 2        | 5          |           | Ŕ        | 1633 |    |                             |         |                   | NATER        | S           |              | \$ 2     |         |         |           | 57      | 5          | 57        | 5              |
|                                           | 1              |           | ₹           |            |             | ;           | Q 9        | 3 :      | 8          | នន        | 3        |      |    |                             |         | ſ                 |              | ŀ           | Houny        |          |         |         |           | 3       |            |           | 5              |
|                                           |                |           | AUTOH N     |            |             |             |            |          |            |           |          | 9    |    |                             |         |                   |              |             |              | 2 2      | 3 8     |         |           |         | <u>s</u> s |           |                |
|                                           |                | ę         | Sublotal    | 2          | 2           | 21          | 2          | <u>8</u> | 791        | 2 :       | 2        | 766  |    |                             |         |                   |              | P           | 9            |          |         |         |           |         |            |           |                |
|                                           |                | WESTBOUND | Post.       | 8          | 3           | Ē           | 5          |          | 3 1        | ;;        | 5        | 156  |    |                             |         | ļ                 |              | WESTBOUND   | <b>B</b>     | 3 2      | 12      | 58      | 28        | 25      | 9:         | 77        | 5              |
|                                           | ļ              | Ň         | Through     | <b>g</b> : | ₽:          | -           | 3 :        | 5 1      | 2          | ¥ (       | 2        | 267  |    |                             |         |                   |              | ×           |              | 3 5      | 5 2     | 2 (     | 8 %       | 2 (     | 3 3        | 3 :       | 5              |
|                                           | NUE            |           |             | 21         | e :         | 31          | 5          | Ç:       | <b>Ş</b> : | 2         | 2        | 148  |    |                             |         | ENUE              |              |             |              | 3 4      | 2 2     | 8 8     | 9 8       | 9 2     | 57         | 5         | 2              |
|                                           | MAKAWAO AVENUE |           | !<br>!      |            |             |             | _          | _        |            | _         | _        |      |    |                             |         | MAXAWAD AVENUE    |              | 1           | *            |          |         |         |           | - •     |            |           |                |
|                                           | ILAKAW         |           | Hout        |            |             |             |            | 22       | 2          | ~ 1       |          |      |    |                             |         | MAKA              |              | 1           | Auroy .      | _        |         |         | ;;        |         |            | 3         |                |
|                                           |                | _         | Sublet      | 3          | <b>•</b>    | 9           | 8          | 2        | 3          | 8:        | 8        | 241  |    |                             |         |                   |              | _           | Sbook        |          | 3 1     | 21      | 21        | = ;     | 21         |           | 8              |
|                                           |                | FASTBOUND | Ron         | •          | -           | -           | -          | -        | -          | -         | n        | 9    | I  |                             |         |                   |              | EASTBOUND   | Ĕ            |          |         |         | - •       | - 1     |            | •         | -              |
|                                           |                | EAS'      | Through     | 5          | ÷           | 3           | 3          | 61       | \$         | 9         | ą        | 214  | i  |                             |         |                   |              | B           | Linerij      | 2 8      | 21      | 21      | 2         | 3       | 3          | 3         | 5              |
|                                           |                |           | Len Th      | 2          | m           | -           | •0         | ø        | •          | •         | •0       | 12   | ;  |                             |         |                   | Ì            |             | •            |          | •       | -       | i qu      | ~ •     | ŝ          | -         | ~              |
|                                           |                |           | 1           |            |             |             |            |          |            |           |          |      |    |                             |         |                   |              |             |              |          |         |         |           |         |            |           |                |
|                                           | 1              |           | Houry       |            |             |             | 3          | 22       | 2          | 2         | 3        |      |    |                             |         |                   |              |             | HOLTY        |          |         |         | 182       | 924     | 3          | 22        | 523            |
|                                           | ļ              |           | Sublobi     | 5          | =           | 12          | 23         | 2        | =          | 12        | 12       | ž    | 2  |                             |         |                   |              | 0           | Sublated     | 2        | =       | 8       | Ē         | Ē       | ž          | 2         | 3              |
|                                           | 1              |           | Rot 5       | -          | ~           | -           | ~          | ŝ        | •          | 2         | m        |      |    |                             |         |                   |              | SOUTHBOUND  | H            | <u>e</u> | •       | ø       | 2         | ₽       | 12         | -         | ~              |
|                                           |                |           | 5           | -          | •           | 0           | ŝ          | 9        | 9          | 2         | •        | ¢    | :  |                             |         |                   |              | SOUT        | Through      | 8        | 5       | 4       | \$        | ÷       | 3          | \$        | 2              |
|                                           | S              |           | Let Through | 5          | ŝ           | •0          | 8          | -        | \$         | •0        | ø        | 4    | ;  |                             |         | 2                 | 2            |             | Len Thr      | 3        | 3       | 3       | 78        | 8       | \$         | 3         | 8              |
|                                           | <b>BYPAS</b>   |           |             |            |             |             |            |          |            |           |          |      |    |                             |         | CHINAL AND RVDASS |              |             |              |          |         |         |           |         |            |           |                |
|                                           | PUKALAN BYPASS |           | Houth       | •          |             |             | 55         | 572      | 651        | 115       | 482      |      |    |                             |         | CINAL A           |              |             | Houry        |          |         |         | 25        | 20      | 324        | Ē         | 279            |
|                                           |                |           | Setete      |            | 121         | 191         | 139        | 145      | <b>1</b> 0 | 121       | 91       | 121  | 8  |                             |         |                   |              | _           | Sbot         | R        | 3       | 8       | 5         | 59      | 2          | <b>\$</b> | 2              |
|                                           |                |           |             |            | 1           | 16          | <b>7</b>   | 46       | 53         | <u>16</u> | 2        | 5    | ž  | *                           |         |                   | 1            | NORTHBOUND  | <b>bon</b> S | 2        | 38      | 2       | ጽ         | *       | 23         | 11        | 8              |
| li și și și și și și și și și și și și și |                |           | Ē           |            | 101         | 8           | 57         | 8        | <b>62</b>  | 8         | 16       |      | i. | (ednesda                    |         |                   |              | HORT        | 5            | 8        | 8       | 5       | 3         | 7       | 51         | Ŧ         | 5              |
| 1996, W                                   |                |           |             | -          |             | -           |            | -        |            |           | -        |      | *  | 1996, M                     |         |                   |              |             | Len Through  | -        | 0       | 2       | 0         | 0       | •          | -         | o              |
| February 7, 1996, Wednesday<br>Clear      |                |           |             | 1          |             |             |            |          |            |           |          |      |    | February 7, 1996, Wednesday | N N     |                   |              |             | ٦            |          |         |         |           |         |            |           |                |
| **                                        |                | ļ         | 3           | 6.45       | 200         | 7.15        | 87         | 7.45     | 00         | 8 15      | 0,0      | _    | B  | ä                           |         |                   |              | 008         | ł            | 400-415  | 415-430 | 130-445 | 445-500   | 500-515 | 5.15-530   | 530-645   | <b>843-600</b> |
| AM PEROD:<br>WEATHER:                     | -              |           | TIME PERIOD | 630-645    | 6.45 - 7.00 | 700-7.15    | 7.15-7.30  | 130-745  | 745-800    | 600-615   | 8 15-830 | Ŧ    |    | PM PEROO:                   | WEATHER |                   |              | TIME PERIOD |              | ŝ        | 115     | ġ       | 145-<br>1 | ŝ       | 615        | 8,9       | <b>6</b> 43    |
| ->                                        |                |           | -1          |            |             |             |            |          |            |           |          |      |    | -                           |         |                   |              |             | •            |          |         |         |           |         |            |           |                |

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# AUSTIN, TSUTSUMI & ASSOCIATES, INC.

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# MTERSECTION COUNT SUMMARY PUKALAW BYPASS, KULA HIGHMAY AND HALEAKALA HIGHMAY

AM PEROO: February 3, 1996, Tharsday WEATHER: Clear

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AUSTIN, TSUTSUMI & ASSOCIATES, INC.

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INTERSECTION COUNT SUMMARY PUKALANI STREET AND HALEAKALA HIGHWAY

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AM PERIOD: February 29, 1896, Thursday WEATHER: Clear

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|                |                        | NOIL:        | Houily          |             |             | 1.475       | 1.450       | 1,237       | 1,196       |      |             |
|----------------|------------------------|--------------|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|------|-------------|
|                |                        | INTERSECTION | Total           | 367         | 412         | 351         | 320         | 254         | 271         |      | 1,475       |
|                |                        |              | Hourly          |             |             | 395         | 414         | 392         | 333         |      |             |
|                |                        | DNNC         | Subtotal<br>7A  | 6           | 126         | 102         | 97          | 67          | 67          |      | 395         |
|                |                        | WESTBOUND    | Left Through    | 4           | 64          |             |             |             |             |      | <b>50</b>   |
|                | <b>IGHWAY</b>          |              | Left 7<br>23    | 4           | 62          | 65          | 55          | R           | 9           |      | <b>193</b>  |
|                | HALEAKALA HIGHWAY      |              | Hourly          |             |             | 321         | 329         | 352         | 375         |      |             |
|                | H                      | OND          | Subtotal<br>A5  | 15          | 35          | 69          | 8           | 8           | <u>109</u>  |      | 321         |
|                |                        | EASTBOUND    | Right           | 5           | 4           | 51          | ¥           | <b>5</b> 2  | ¥           |      | 141         |
|                |                        |              | Through         | 8           | \$          | 4           | ß           | 55          | 8           |      | 150         |
|                |                        |              | Hourly          |             |             | 759         | 707         | 593         | 466         |      |             |
|                | STREET                 | OUND         | Subtotal<br>182 | 221         | 20          | 156         | 130         | 107         | <u>9</u> 5  |      | 759         |
|                | <b>PUKALANI STREET</b> | NORTHBOUND   | Hgh<br>EE       | đ           | 39          | 45          | ž           | <b>7</b> 3  | 76          |      | 151         |
|                | ď                      |              | Left<br>149     | 187         | 161         | Ħ           | 8           | 2           | 58          |      | 603         |
| WEATHER: Clear |                        | TIME PERIOD  | 6:45 - 7:00     | 7:00 - 7:15 | 7:15 - 7:30 | 7:30 - 7:45 | 7:45 - 8:00 | 8:00 - 8:15 | 8:15 - 8:30 | Hour | 6:45 - 7:45 |

PM PERIOD: February 29, 1996, Thuraday WEATHER: Clear

|                |                   | NOIL:                  | Hourly   | •           |              |             | 1.432       | 1,493       | 1.551       | 1.554       | 1,569       |                                    |
|----------------|-------------------|------------------------|----------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------------------|
|                |                   | INTERSECTION<br>VOLUME | Total    | 333         | 336          | 575         | 390         | 394         | 394         | 376         | 405         | 1,551<br>1,569                     |
|                |                   |                        | Hourty   |             |              |             | MEC         | 353         | 390         | 392         | 387         |                                    |
|                |                   | DNNO                   | Subtotal | 51          |              |             |             |             | 111         |             |             | 390<br>387                         |
|                |                   | WESTBOUND              | Through  | 26          | 15           | 21          | 33          | 24          | 76 33       | 36          | 24          | 110<br>107                         |
|                | IGHWAY            |                        | Lef      | 55          | 65           | <b>9</b> 9  | 8           | 76          | 2           | 63          | 63          | 280<br>280                         |
|                | HALEAKALA HIGHWAY |                        | Hourly   |             |              |             | 652         | 679         | 702         | 685         | 676         |                                    |
|                | H                 | anno                   | Subtotal | 145         | 152          | 15 <b>8</b> | 156         | 5           | 175         | 151         | 177         | 702<br>676                         |
|                |                   | EASTBOUND              | Right    |             | <del>2</del> | 117         | iet         | 126         | 129         | ₽           | 132         | 503<br>497                         |
|                |                   |                        | Through  | 16          | 4            | 51          | 55          | 47          | 46          | 4           | 45          | 199<br>179                         |
|                |                   |                        | Hourly   |             |              |             | 445         | 461         | 459         | 477         | 506         |                                    |
|                | STREET            | RTHBOUND               | Subtotal | ĝ           | 10           | 115         | 112         | 121         | 10 <b>8</b> | 136         | 141         | 459<br>508                         |
|                | PUKALANI STREET   | NORTHE                 | Right    | ន           | 5            | 77          | 52          | 8           | 2           | 82          | 59<br>6     | 284<br>315                         |
| -              | 8                 |                        | left     | 51          | 2            | ¥           | 66          | 4           | 4           | 3           | 52          | 165<br>191                         |
| WEATHER: Clear |                   | TIME PERIOD            |          | 4:00 - 4:15 | 4:15 - 4:30  | 4:30 - 4:45 | 4:45 - 5:00 | 5:00 - 5:15 | 5:15 - 5:30 | 5:30 - 5:45 | 5:45 - 6:00 | Hour<br>4:30 - 5:30<br>5:00 - 6:00 |

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AUSTIN, TSUTSUMI & ASSOCIATES, INC.

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MTERSECTION COUNT SUMMARY HALEAKALA HIGHWAY AND MAKAWAO AVENUE

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AM PEROD: Fernary 29, 1996, Thursday WEATHER: Clear

| HITERSCION         MATHEORID         FATIBOLIO         MITERSCION           1         1         2         1         2         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | MONTHEORYNO         SOUTHEORYNO         SOUTHEORYNO         FASTERNIKO           10         7         78         10         7         74         11         2         74           10         7         78         5         8         2         2         7         2         7           10         7         78         10         17         26         10         1         2         7         1         2         7         1         1         2         7         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1                                                                                                                                                                                                                |          |               |       |          |      | HAVANAO AVENUE | <u>VENUE</u> |       |         |          |    |    |         | -   | <u>M</u> EAKALA | HALEAKALA HIGHWAY |          |            |         |      |             |       |
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| Yi         Katoo         Italy         Ital         Italy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Yi       Carrier Intervent       Hauty       Left       Heavy       Hea                                                                                                                     | E PERIOD |               | HORT  | CONTO BI |      | :              |              | ROUTH | DNUND   |          |    |    | WINDUN. | ¢   |                 |                   |          |            |         | ĺ    | MTERS       | ECTIO |
| 2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2     2 <th></th> <th></th> <th></th> <th></th> <th></th> <th>_</th> <th><b>Vinot</b></th> <th>10</th> <th>1 012</th> <th>2.12</th> <th>14 14 14</th> <th> </th> <th></th> <th></th> <th></th> <th></th> <th></th> <th><b>5</b></th> <th>STBOAIND</th> <th></th> <th>-</th> <th>ş</th> <th>CINE:</th>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |               |       |          | _    | <b>Vinot</b>   | 10           | 1 012 | 2.12    | 14 14 14 |    |    |         |     |                 |                   | <b>5</b> | STBOAIND   |         | -    | ş           | CINE: |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35       35 <td< th=""><th>0-645</th><th>đ</th><th>2</th><th>~</th><th>8</th><th>•</th><th>Ľ</th><th>-</th><th> <br/>  ?</th><th></th><th></th><th></th><th></th><th></th><th>ίmou</th><th>Lei</th><th>litough</th><th>191</th><th>Jak And</th><th>Runk</th><th></th><th>1</th></td<> | 0-645    | đ             | 2     | ~        | 8    | •              | Ľ            | -     | <br>  ? |          |    |    |         |     | ίmou            | Lei               | litough  | 191        | Jak And | Runk |             | 1     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 35       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33       33 <td< td=""><td>5-700</td><td>~</td><td>9</td><td>• •</td><td>2</td><td></td><td></td><td>• 6</td><td></td><td>;:</td><td>"</td><td>;;</td><td>N</td><td>2</td><td></td><td>~</td><td>5</td><td>ŝ</td><td>8</td><td></td><td>991</td><td></td></td<>                       | 5-700    | ~             | 9     | • •      | 2    |                |              | • 6   |         | ;:       | "  | ;; | N       | 2   |                 | ~                 | 5        | ŝ          | 8       |      | 991         |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 21.2     |               | 1     | • ;      | 1    |                | <b>n</b> (   |       |         | Ţ        |    | 8  | m       | 8   |                 | 4                 | ส        | ~          | 8       |      | Ę           |       |
| 32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32       32 <td< td=""><td>2 2 2 2 3       2 3 2 3       2 3 2 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       &lt;</td><td></td><td>3</td><td>2</td><td>2</td><td>7</td><td></td><td>0</td><td>Ð</td><td></td><td></td><td></td><td>3</td><td>c</td><td>ŝ</td><td></td><td></td><td>2</td><td>•</td><td></td><td></td><td></td><td></td></td<> | 2 2 2 2 3       2 3 2 3       2 3 2 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       2 3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       3 3       <                                                                                                                                                     |          | 3             | 2     | 2        | 7    |                | 0            | Ð     |         |          |    | 3  | c       | ŝ   |                 |                   | 2        | •          |         |      |             |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 062-0    | 5<br>5        | 5     | 7        | 4    | 2              | •7           | đ     |         |          |    |    | • •     | 3 7 |                 | י ה               | 5        | •          | Ŧ       |      | 211         |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0-245    | *             | 5     | :        | ; ;; |                | • ;          | ;;    |         |          |    | 5  | Ŧ       | 2   | 215             | φ                 | 37       | ~          | 5       | 143  | 210         |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          | >             | •     | 5        | 8    | 3              | 2            | 2     |         |          |    |    | -       | 2   | 101             | •                 | ;        |            |         |      |             |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 88-5     | ~             | 2     | ~        | 24   | 138            | •            | 17    |         |          |    |    | •••     | 5 ( | 5               | 0                 | የ        | -          | 3       | 221  | <b>X</b>    |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3     4     3     4     3     4     3       3     4     3     4     3     4     3     4     1       3     1     1     1     1     1     1     1     1     1       3     1     1     1     1     1     1     1     1     1     1       3     1     1     1     1     1     1     1     1     1     1     1       3     1     1     1     1     1     1     1     1     1     1     1     1       3     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1 <td>0-815</td> <td>c</td> <td>÷</td> <td>ŕ</td> <td>Ş</td> <td></td> <td>• •</td> <td>: '</td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td>3</td> <td>3</td> <td>ø</td> <td>ç</td> <td>16</td> <td>3</td> <td>282</td> <td>260</td> <td></td>                                                                                                                                                                                                                                        | 0-815    | c             | ÷     | ŕ        | Ş    |                | • •          | : '   |         |          |    |    | -       | 3   | 3               | ø                 | ç        | 16         | 3       | 282  | 260         |       |
| 3       17       97       6       5       35       46       5       16       35       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3 </td <td>3       17       97       6       5       35       45       53       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3<td></td><td></td><td>-</td><td>,</td><td>5</td><td>171</td><td>•</td><td>-</td><td></td><td></td><td></td><td></td><td>-</td><td>2</td><td>344</td><td>•</td><td>;</td><td>e</td><td></td><td>1</td><td></td><td></td></td>                                                                                                                                                                                                                                     | 3       17       97       6       5       35       45       53       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3 <td></td> <td></td> <td>-</td> <td>,</td> <td>5</td> <td>171</td> <td>•</td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td>2</td> <td>344</td> <td>•</td> <td>;</td> <td>e</td> <td></td> <td>1</td> <td></td> <td></td>                                                                                 |          |               | -     | ,        | 5    | 171            | •            | -     |         |          |    |    | -       | 2   | 344             | •                 | ;        | e          |         | 1    |             |       |
| 45     13     23     25     19     6     31     9     9       23     23     53     16     31     53     15     1       23     45     15     214     10     379     23     15       24     15     214     10     379     23     15     1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 45       138       22       52       190       264       144       197       6       347       53         23       97       22       46       185       234       144       197       6       347       53       53         23       87       23       88       253       155       214       10       379       23       53         24       185       253       155       214       10       379       23       53       53                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.0.0    | 64            | ₽     | n        | 17   | 97             | u            | ŝ     |         |          |    |    | •       | i ä | 926             |                   | = 8      | N 6        | 27      | 29   | 21          |       |
| 45 [38 22 52 [90 264 [14 197 6 347 25 151 28 225<br>28 97 22 46 [15 234 115 214 10 379 21 120 28 [69                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 45 138 22 52 190 264 144 197 6 347 25 151<br>23 97 22 45 183 253 145 214 10 379 23 150                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          |               |       |          |      |                |              |       |         |          |    |    |         |     | •               | •                 | 3        | •          | 3       | 6    | Ę           |       |
| 45 138 22 52 190 264 144 197 6 347 23 151 29 265<br>28 97 22 48 105 253 155 214 10 379 21 120 28 169<br>21 120 28 169                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 45     138     22     52     150     264     144     197     6     347     25     151       23     97     22     46     185     254     155     214     10     379     21     170                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1        |               |       |          |      |                |              |       |         |          |    |    |         |     |                 |                   |          |            |         |      |             |       |
| 45         138         22         25         190         264         144         197         6         377         25         151         28         255           23         97         23         53         24         145         10         379         23         53         235           23         97         23         23         23         23         23         53         235           24         105         379         23         23         23         53         55           26         53         53         514         10         379         23         56         56                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 45     138     22     29     264     144     197     6     347     25     155       23     45     155     234     10     379     23     155       24     155     234     10     379     23     155                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |               |       |          |      |                |              |       |         |          |    |    |         |     |                 |                   |          |            |         |      |             |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 89-0     | 8             | 6     | 5        | 22   |                | 2            |       |         | 3        |    |    | ť       |     |                 | ;                 | ļ        |            |         |      |             |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.8.0    | 15            | 3     | 8        | 6    |                | 8            | -     |         | 5 5      | Ξŝ |    | • •     | ž   |                 | 8                 | 5        | <b>R</b> : | ß       |      | <b>3</b> 26 |       |
| ROO. February 29, 1996, Thursday<br>MED: Pebruary 29, 1996, Thursday                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ROO: February 29, 1996, Thursday<br>HER: Clear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |               |       |          |      |                | l            |       |         | }        | !  |    | 2       | 222 |                 | 2                 | 8        | 28         | 691     |      | 868         |       |
| ROD. February 29, 1996, Thursday<br>MED: Course                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1800: February 29, 1996, Thursday<br>HER: Calar                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |               |       |          |      |                |              |       |         |          |    |    |         |     |                 |                   |          |            |         |      |             |       |
| 1800. February 20, 1936, Thursday<br>Letter - Character                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1800: Fébruary 29, 1996, Thursday<br>HER: Clast                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |               |       |          |      |                |              |       |         |          |    |    |         |     |                 |                   |          |            |         |      |             |       |
| ERDOR. February 20, 1996, Thursday<br>HEB - Maria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | EROOD: February 29, 1996, Thursday<br>HER: Catar                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |               |       |          |      |                |              |       |         |          |    |    |         |     |                 |                   |          |            |         |      |             |       |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | TEAN. COMM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.1      |               |       |          |      |                |              |       |         |          |    |    |         |     |                 |                   |          |            |         |      |             |       |

|                | NOIL         | Hourly<br>1,069<br>1,118<br>1,118                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 690°1           |
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|                | RATERSECTION |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1,116           |
|                |              | Hourty<br>167<br>178<br>178                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | •               |
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| VENUE          |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 8               |
| MAKAWAD AVENUE |              | 451<br>452<br>453<br>453<br>453<br>453<br>453<br>453<br>453<br>453<br>453<br>453                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                 |
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|                | EASTROUND    | 또<br>로마아프트마の소리<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 8               |
|                | E            | Left Trough<br>66 Trough<br>73 42<br>75 46<br>57 46<br>75 24<br>75 24<br>75 46                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 631             |
|                |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2               |
| 1              |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                 |
|                | ٥            | 1944<br>1944<br>1945<br>1945<br>1945<br>1945<br>1945<br>1945                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 363             |
|                | SOUTHBOUND   | 2888855688<br>288855688                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 221             |
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| AVENUE         |              | <b>2</b> 200022000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 84              |
| MUKAWAO AVENUE |              | Hourly<br>101<br>101<br>101                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                 |
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| -              | TIME PERIOD  | 400 - 415<br>415 - 430<br>445 - 540<br>445 - 550<br>515 - 550<br>515 - 550<br>515 - 550<br>545 - 660                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Hour<br>130-530 |

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|-----------------------------------------------|-------------|---------|-------------|-------|-----------------|------------|---------|------------|---------------|------|--------------|------------|------------|------------|---------------|--------------|------------|------------|------------|------------|------------------------|-------|--|
| I                                             |             |         |             |       | PUKALANI STREET | REET       |         |            |               |      |              |            |            | -          | IOLANI STREET | EET          |            |            |            |            |                        |       |  |
| TIME PERIOD                                   |             | NORT    | ्र          |       | ,               |            | Sou     | _ £        |               |      |              | EAST       | EASTBOUND  |            |               |              | WEST       | WESTBOUND  |            | }          | INTERSECTION<br>VOLUME | I ON  |  |
|                                               |             | Through | u<br>F      |       | Houry           | 5          | Through |            | <b>Moldue</b> | Anot | Left Through |            | Rogin SL   | Subloted H | Hout          | Left Through | 5          | Right Sub  | Schotal Ho | Hour       |                        | Hour  |  |
|                                               |             | 8       | 0           | 8     |                 | ø          | F       | 9          | 2             |      | \$           | m          | -          | 64         |               | -            | 2          | 1          | ж          | •          | 5                      |       |  |
| 6 45 - 7.00                                   | 0           | 4       | -           | 1     |                 | <u>9</u>   | 11      | 21         | 48            |      | 84           | •          | ¢          | 52         |               | -            |            | 1          |            |            |                        |       |  |
| 7.00 - 7:15                                   | •           | 76      | -           | #     |                 | 40         | 5       | 2          | 4             |      |              | •          |            | 12         |               | <b>,</b>     | , <b>.</b> | 8 8        | <b>,</b> ; |            | 8                      |       |  |
| 7.15-7.30                                     | 0           | 8       | 0           | 8     | 224             | đ          | =       | 2          |               | 161  | 5            | <b>,</b> 4 |            | 9 0        | Ę             | •            | - ,        | 3 2        |            | į          | 213                    |       |  |
| 7.30 - 7.45                                   | -           | Ģ       | •           | 4     | 216             |            | : :     | :=         | ; ;           | 5    | ; 2          | • •        |            | 3 5        |               |              | ~ •        | 5          | ۶.         | 2          | 8                      | 751   |  |
| 7 45 - 8 00                                   |             | 2       | -           | 5     | 142             | •          | : :     | 2 7        | } :           | 26   | 5 5          | • •        |            | 5          |               | -            | n          | 17         |            | 136        | 21                     | 763   |  |
| AM. A 15                                      | • •         |         | • •         | 3 3   |                 | •          | 2 9     | 5          | 2 1           | 2    | <b>;</b> ;   | <b>7</b> 4 |            | 10         | 246           | 0            | -          | 61         |            | 2          | 164                    | 746   |  |
|                                               | • •         | 8 8     | ••          | 2 2   | 2 9             | - •        | 2 :     | <u>n</u> ( | ¥             | Kol  | 5            | 7          | N          | 42         | 677           | •            | -          | 15         |            | <b>106</b> | Ξ                      | 677   |  |
| 06-0-01-0                                     | •           | Q       | -           | R     | 531             | a          | 5       | 21         | ç             | 170  | 51           | 6          | -          | 5          | 224           | •            | 2          | z          |            | 16         | 3                      | 2     |  |
| Hhr                                           |             |         |             |       |                 |            |         |            |               |      |              |            |            |            |               |              |            |            |            |            |                        |       |  |
|                                               | ų           | ş       | ,           | 52    |                 | ;          | ;       | 1          | ļ             |      |              |            |            |            |               |              |            |            |            |            |                        |       |  |
|                                               | •••         | 33      |             | R     |                 | <b>-</b> 1 | 3       | 8          | 2             |      | 2            | 8          | ~          | 246        |               | 2            | 11         | <u>101</u> | 8          |            | 746                    |       |  |
| C+ 7 - C+ 0                                   | -           | 717     | n           | 012   |                 | 3          | 7       | 8          | 5             |      | 8            | 11         | -          | 241        |               | 7            | 16         | 118        | 136        |            | 765                    |       |  |
|                                               |             |         |             |       |                 |            |         |            |               |      |              |            |            |            |               |              |            |            |            |            |                        |       |  |
|                                               |             |         |             |       |                 |            |         |            |               |      |              |            |            |            |               |              |            |            |            |            |                        |       |  |
| PM PERDOC: July 16, 1996, Tuesday<br>WEATHER: | 6, 1996, Tu | vabca   |             |       |                 |            |         |            |               |      |              |            |            |            |               |              |            |            |            |            |                        |       |  |
| 1                                             |             | ļ       |             |       | PUKALANI BYPASS | SSVU       |         |            |               |      |              |            |            | -          | IOLANI STREET | EET          |            |            |            |            |                        |       |  |
| TIME PERIOD                                   |             | NOR     | NOR THBOUND | _     |                 |            | SOS     | SOUTHBOUND |               |      |              | FAST       | FASTRONIND |            |               |              |            |            |            |            | INTERSECTION           | CTION |  |
|                                               | Left Th     | Through | Richt S     | Shide | Hark            | T DA L     | t and   | MMR        | Abrilla       | 1    | 140          | Turnet     | 2000       | C. Marriel |               |              | i i i      |            |            |            | NOLUHE                 | -     |  |
| 400-415                                       | -           | 8       |             |       |                 | 18         | Я       |            |               |      |              |            | }<br>}     |            | (innu         |              |            |            |            | Houry      | C a                    | Houry |  |
| 4 15 - 4 30                                   | 0           | 2       | -           | 8     |                 | 2          | 8       | 12         | ġ             |      | ; 5          | , -        | , -        | 3 6        |               |              | <b>,</b>   | ₽ ;        | e ;        |            | 8                      |       |  |
| 4:30 - 4.45                                   | -           | 2       | 0           | 8     |                 | 51         | Ş       | 3          | ā             |      |              | • •        |            | 2          |               | - (          | •••        | 3 9        | 2          |            | 196                    |       |  |
| 4.45-500                                      | •           | 3       | •           | 27    | 106             | 5          | Ş       | 16         | 021           | 523  |              | ģ          |            | 4          |               | ••           | • •        | 2 \$       | 2 :        | ;          | 212                    |       |  |
| <b>500 - 5:15</b>                             | •           | 8       | •           | 8     | ē               | 32         | 3       | 3          |               | 22   | 2            |            | , -        | ; ;        | ŝ             | - (          | • •        | 2:         | = 8        | 2          | 83                     |       |  |
| 5:15-6:30                                     | 7           | 8       | •           | 2     | 8               | Ţ          | 4       | 3          | 143           |      | 1            | • •        | · c        | ; 8        | 3 ž           | • •          |            | - :        | 2 :        | 3 \$       |                        | 5     |  |
| 5.30-5.45                                     | •           | 27      | 0           | 21    | 114             | R          | 4       | 3          | 2             | 582  | 2            | • •        | , a        | 18         | 32            | 4 6          |            | = =        | 2 2        | 28         | 3                      | 16    |  |
| 545-600                                       | •           | 8       | 0           | 8     | <b>1</b> 09     | 24         | 2       | 3          | Ξ             | 526  | 8            | -          |            | : ::       | 22            |              | ~          | 2 2        | 2 2        | 6 5        | 5                      | 2     |  |
|                                               |             |         |             |       |                 |            |         |            |               |      |              |            |            |            | ł             | •            | ,          | :          |            | 2          | 8                      | 2     |  |

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AUSTIN, TSUTSUMI & ASSOCIATES, INC.

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INTERSECTION COUNT SUMMARY KULA HIGHWAY AND OHANA STREET

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AM PERIOD: February 5, 1996, Thursday WEATHER: Clear

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|              | CTION<br>ME  | Hourly<br>763<br>907<br>903<br>863                                                                                                          |
|--------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------|
|              | INTERSECTION | Total<br>141<br>185<br>185<br>205<br>205<br>205<br>205<br>205<br>185<br>191<br>191                                                          |
| i            |              | Hourly<br>15<br>20<br>22<br>22<br>22                                                                                                        |
| er           | _            | Right Subtotal Hourly<br>5 5 5<br>5 5 5 16<br>7 8 216<br>4 5 20<br>7 7 22<br>17 20<br>17 20                                                 |
| OHANA STREET | WESTBOUND    | 式<br>1<br>1<br>1<br>1<br>2<br>1<br>2<br>1<br>2<br>1<br>2<br>1<br>2<br>1<br>2<br>1<br>2<br>1<br>2                                            |
| OHA          | WE           | ده<br>م<br>م<br>ب<br>ب<br>ب<br>م<br>م<br>م<br>م<br>م<br>م<br>م<br>م<br>م<br>م<br>م<br>م<br>م<br>م                                           |
|              |              | <u> </u>                                                                                                                                    |
|              |              | Hourly<br>224<br>305<br>312<br>310                                                                                                          |
|              | Ģ            | Right Subfocal Hourity<br>0 45<br>0 45<br>0 45<br>0 234<br>1 72<br>1 332<br>0 53<br>310<br>54 342<br>312<br>1 332<br>1 332                  |
|              | SOUTHBOUND   | N<br>200000000<br>7000000000000000000000000000                                                                                              |
|              | 50           | Len Through<br>0 41<br>2 42<br>4 42<br>4 42<br>4 42<br>4 42<br>4 42<br>4 42<br>4                                                            |
| HWAY         |              | 2<br>2<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3                                                 |
| KULA HIGHWAY |              | Hourly<br>523<br>578<br>541<br>541                                                                                                          |
|              | Ð            | Subtotal<br>36<br>136<br>156<br>157<br>157<br>152<br>123<br>152<br>123                                                                      |
|              | NORTHBOUND   | Right<br>20<br>20<br>11<br>20<br>11<br>20<br>4<br>20<br>11<br>20<br>20<br>20<br>20<br>20<br>20<br>20<br>20<br>20<br>20<br>20<br>20<br>20    |
|              | NON          | Left Through<br>0 133<br>0 133<br>0 155<br>0 155<br>0 155<br>0 150<br>0 120<br>0 121<br>0 121<br>0 121                                      |
|              |              |                                                                                                                                             |
|              | TIME PERIOD  | 6:30 - 6:45<br>6:45 - 7:00<br>7:15 - 7:30<br>7:30 - 7:45<br>7:30 - 7:45<br>7:30 - 7:45<br>8:15 - 8:30<br>8:15 - 8:30<br>Hour<br>7:00 - 8:00 |

PM PERIOD: February 8, 1996, Thursday

|             |     |              |          |                | KULA HIGHWAY | -WAY  |              |            |          |        |      | <b>N</b>     | OHANA STREET | ĒT       |        |
|-------------|-----|--------------|----------|----------------|--------------|-------|--------------|------------|----------|--------|------|--------------|--------------|----------|--------|
| TIME PERIOD |     | NON<br>N     | RTHBOUND | ę              |              |       | SOL          | SOUTHBOUND | g        |        |      | WE           | WESTBOUND    | ام       | Ì      |
|             | Len | Left Through | Right    | Subtatal<br>20 | Hourly       | Len . | Left Through | Right      | Subtotal | Hourly | L AN | Left Through | Right        | Subtotat | Hourly |
| 4:00 - 4:15 | •   | 8            | •        | 8              |              | N     | ₽            | 0          | 112      |        | 0    | 0            | *            | 4        |        |
| 4:15 - 4:30 | 0   | 67           | -        | 8              |              | 4     | 107          | 0          | 111      |        | 3    | σ            | •            | n        |        |
| 4:30 - 4:45 | 0   | 8            | -        | 56             |              | 4     | 116          | 0          | 120      |        | 7    | σ            | 4            | 9        |        |
| 4:45 - 5:00 | 0   | 82           | 0        | 82             | 55           | Ű     | ŝ            | 0          | 109      | 452    |      | •            | 2            | m        | Ŧ      |
| 5:00 - 5:15 | 0   | <b>S</b>     | ø        | 85             | 332          | 4     | 129          | 0          | <b>E</b> | 473    |      | a            | φ            | ~        | 6      |
| 5:15 - 5:30 | 0   | 2            |          | 2              | 358          | 4     | 139          | 0          | 143      | 505    | o    | 0            | 4            | - 4      | 7      |
| 5:30 - 5:45 | 0   | 2            |          | a              | 345          | •     | 123          | o          | 126      | 511    | •    | 0            | ~~~~         | 2        | ;      |
| 5:45 - 6:00 | 0   | 82           | Ö        | 62             | 345          | 60    | 122          | •          | 128      | 530    |      | a            | n.           | 6        | -      |
| Hour        |     |              |          |                |              |       |              |            |          |        |      |              |              |          |        |
| 5:00 - 6:00 | a   | 345          | 0        | 345            |              | 17    | 513          | 0          | 530      |        | 2    | a            | 11           | 19       |        |

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ALATIN, TSUTSUMI & ASSOCIATES, INC.

# APPENDIX B

# LEVEL OF SERVICE CALCULATIONS

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| <b></b>                                                      | EXISTING 1996<br>AM PEAK HOUR                                                                                                                                                                                                                       | CONDITIONS                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 10/22/96<br>09:59:01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                              | SIGNAL94/TEAPA                                                                                                                                                                                                                                      | CIVE L1.41 - Summ                                                                                                                                                                                                                               | mary of Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Values                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                              |                                                                                                                                                                                                                                                     | n Parameters for                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | AKALA HWY & HANA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | A HWV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| -                                                            | METROAREA<br>LOSTTIME<br>LEVELOFSERVICE<br>NODELOCATION                                                                                                                                                                                             | NONCBD<br>2.0<br>C S<br>O C                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| • • •                                                        | Approach Par                                                                                                                                                                                                                                        | ameters                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                              | APPLABELS<br>GRADES<br>PEDLEVELS<br>PARKINGSIDES<br>PARKVOLUMES<br>BUSVOLUMES<br>RIGHTTURNONREDS                                                                                                                                                    | 58<br>.0<br>LOW<br>NONE<br>20<br>0<br>0                                                                                                                                                                                                         | WB<br>. O<br>LOW<br>NONE<br>20<br>0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | NB<br>.0<br>LOW<br>NONE<br>20<br>0<br>0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | EB<br>.0<br>LOW<br>NONE<br>20<br>0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1 1                                                          | Movement Par                                                                                                                                                                                                                                        | ameters.                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Look<br>Look<br>Look<br>Look<br>Look<br>Look<br>Look<br>Look | MOVLABELS<br>VOLUMES<br>WIDTHS<br>LANES<br>UTILIZATIONS<br>TRUCKPERCENTS<br>PEAKHOURFACTORS<br>ARRIVALTYPES<br>ACTUATIONS<br>REQCLEARANCES<br>MINIMUMS<br>IDEALSATFLOWS<br>FACTORS<br>DELAYFACTORS<br>NSTOPFACTORS<br>GROUPTYPES<br>SATURATIONFLOWS | RT TH LT<br>46 699 16<br>12.0 24.0 12.0<br>1 2 1<br>1.00 1.00 1.00<br>2.0 2.0 2.0<br>.95 .95 .95<br>3 3 3<br>NO YES YES<br>4.0 4.0 4.0<br>5.0 5.0 5.0<br>1900 1900 1900<br>1.00 1.00 1.00<br>1.00 1.00 1.00<br>NORM NORM NORM<br>1539 3725 1770 | RT       TH       LT         8       131       2043         12.0       12.0       12.0         1       1       1         1.00       1.00       1.00         2.0       2.0       2.0         .95       .95       .95         3       3       3         NO       YES       YES         4.0       4.0       4.0         5.0       5.0       5.0         1900       1900       1900         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00 | RT       TH       LT         377       249       38         12.0       24.0       12.0         1       2       1         1.00       1.00       1.00         2.0       2.0       2.0         .95       .95       .95         .3       3       3         ND       YES       YES         4.0       4.0       4.0         5.0       5.0       5.0         1900       1900       1900         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         5725       1770 | RT       TH       LT         5       16       16         12.0       12.0       .0         1       1       0         1.00       1.00       1.00         2.0       2.0       2.0         .95       .95       .95         3       3       3         NO       YES       YES         4.0       4.0       4.0         5.0       5.0       5.0         1900       1900       1900         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         NORM       NORM       NORM |
|                                                              | SEQUENCES<br>PERMISSIVES<br>OVERLAPS<br>CYCLES<br>GREENTIMES<br>YELLOWTIMES<br>CRITICALS<br>EXCESS                                                                                                                                                  | 67<br>NO NO<br>NO NO<br>60 180                                                                                                                                                                                                                  | ND ND<br>ND ND<br>10<br>22.00 25.00 19.<br>.00 4.00 4.<br>5 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | LEADLAGS<br>OFFSET<br>PEDTIME<br>00<br>2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | NONE NONE<br>.00 1<br>.00 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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| AM PE                                                                                                                                | ING 1996 CON<br>AK HOUR                                                                                                      | DITIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                         |                                                                                        |                                                                                                                                               | 10/22/96<br>09:59:07                                                                                                                            |            |
|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| SIGNAL                                                                                                                               | _94/TEAPAC(V                                                                                                                 | 1 E1.41 - Car                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | acity Analys                                                                            | is Summarv                                                                             |                                                                                                                                               |                                                                                                                                                 |            |
|                                                                                                                                      |                                                                                                                              | ages for Int                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                         |                                                                                        |                                                                                                                                               |                                                                                                                                                 |            |
|                                                                                                                                      |                                                                                                                              | aturation (v/<br>more delay d                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | CI I & S. V.S.S.                                                                        | <u>í mla 15-1</u>                                                                      | <b>-</b>                                                                                                                                      | of Service E                                                                                                                                    |            |
| 67<br>**/**                                                                                                                          |                                                                                                                              | Phase 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                         |                                                                                        |                                                                                                                                               | -                                                                                                                                               |            |
| ,                                                                                                                                    | ; +                                                                                                                          | ;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <br>  + +                                                                               |                                                                                        |                                                                                                                                               | -<br>-                                                                                                                                          |            |
|                                                                                                                                      | +<br>+ + >                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | + +                                                                                     | 1<br>1<br>•                                                                            |                                                                                                                                               |                                                                                                                                                 |            |
|                                                                                                                                      |                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | !<+ +<br>! ∨                                                                            | <++++                                                                                  |                                                                                                                                               |                                                                                                                                                 |            |
|                                                                                                                                      |                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | > V<br>                                                                                 | ++++                                                                                   | ╄╉╋┩<br>┇                                                                                                                                     |                                                                                                                                                 |            |
| orth<br>!                                                                                                                            | <+<br>  +                                                                                                                    | ! <+ +<br>! + +                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | +                                                                                       | •                                                                                      | ++++>                                                                                                                                         |                                                                                                                                                 |            |
| •                                                                                                                                    |                                                                                                                              | · · · ·                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 4<br>                                                                                   |                                                                                        | ++++                                                                                                                                          |                                                                                                                                                 |            |
|                                                                                                                                      |                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | · · · · · · · · · · · · · · · · · · ·                                                   |                                                                                        | V !                                                                                                                                           |                                                                                                                                                 |            |
|                                                                                                                                      | ; G/C= .056<br>! G= 5 0"                                                                                                     | G/C= .033                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | G/C= .244 !                                                                             | G/C= .278 !                                                                            | G/C= .211                                                                                                                                     |                                                                                                                                                 |            |
|                                                                                                                                      | Y+R= 4.0"                                                                                                                    | ' Y+R= 4 0" '                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | G- 22.0 ;                                                                               | G= 25.0"                                                                               | G= 19.0" ;                                                                                                                                    |                                                                                                                                                 | •          |
| <br>                                                                                                                                 | OFF= .0%                                                                                                                     | OFF=10.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | OFF=17.8%                                                                               | OFF=42.2%                                                                              | 1+R= 4.0"  <br>DFF=74 4%                                                                                                                      |                                                                                                                                                 |            |
|                                                                                                                                      |                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                         |                                                                                        |                                                                                                                                               |                                                                                                                                                 | ~          |
|                                                                                                                                      |                                                                                                                              | 3= 74.0 sec =                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 02.2% Y=16                                                                              | .0 sec = 17.                                                                           | 8% Ped= .0                                                                                                                                    | Sec = .0%                                                                                                                                       |            |
| Lane                                                                                                                                 |                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                         |                                                                                        |                                                                                                                                               |                                                                                                                                                 | •          |
| Grou                                                                                                                                 | P   Lanes R                                                                                                                  | g/C :<br>eqd Used :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Service Rat                                                                             | e: Adj !                                                                               | HCM                                                                                                                                           | L 190% Max:                                                                                                                                     | ~          |
|                                                                                                                                      | ******                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                         | ivolume; v                                                                             | /C ¦ Delay !                                                                                                                                  | S I Duqua I                                                                                                                                     |            |
|                                                                                                                                      |                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                         |                                                                                        |                                                                                                                                               | J , WUGUE ;                                                                                                                                     | •          |
|                                                                                                                                      |                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                         |                                                                                        |                                                                                                                                               |                                                                                                                                                 | •          |
| Appr<br>=====                                                                                                                        | oach                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                         |                                                                                        | 29.4                                                                                                                                          | D+                                                                                                                                              |            |
| Appr<br>=====<br>RT                                                                                                                  | oach<br>====================================                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                         | =======================================                                                | 29.4                                                                                                                                          | D+                                                                                                                                              | •<br><br>, |
| Appr<br>=====<br>RT<br>TH                                                                                                            | oach<br>====================================                                                                                 | ======================================                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 239   342                                                                               | 48 \ .14                                                                               | 29.4<br>====================================                                                                                                  | D+<br>====================================                                                                                                      | ۰<br><br>, |
| Appr<br>=====<br>RT<br>TH                                                                                                            | oach<br>====================================                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 239   342                                                                               | 48 \ .14                                                                               | 29.4<br>====================================                                                                                                  | D+<br>====================================                                                                                                      | ۰          |
| Appr<br>=====<br>RT<br>TH<br>LT                                                                                                      | oach<br>                                                                                                                     | ======================================                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 239   342                                                                               | 48 \ .14                                                                               | 29.4<br>====================================                                                                                                  | D+<br>====================================                                                                                                      | -          |
| Abpr<br>=====<br>RT<br>TH<br>LT<br>                                                                                                  | oach<br>12/1 :<br>24/2 :<br>12/1 :<br>24/2 :<br>Dach                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 239   342<br>656   828<br>18   125                                                      | 48 ! .14<br>  736   .88<br>  17   .12                                                  | 29.4<br>10   18.2  <br>39   30.2  *<br>23   25.0  <br>16.1                                                                                    | D+<br>C+: 47 ft:<br>D+: 362 ft:<br>C : 25 ft:                                                                                                   | •          |
| ADD r<br>=====<br>RT<br>TH<br>LT<br>ADD ro<br>=====<br>TH                                                                            | oach<br>12/1  <br>24/2  <br>12/1  <br>24/2  <br>bach<br>24/2                                                                 | 096   .222  <br>242   .222  <br>078   .078                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 239   342<br>656   828<br>18   125                                                      | 48 ! .14<br>; 736 ! .88<br>; 17 ; .12                                                  | 29.4<br>10   18.2  <br>39   30.2  <br>23   25.0  <br>16.1                                                                                     | D+<br>C+: 47 ft:<br>D+: 362 ft:<br>C : 25 ft:<br>C+                                                                                             | ۹          |
| ADD r<br>=====<br>RT<br>TH<br>LT<br>ADD ro<br>=====<br>TH                                                                            | oach<br>12/1  <br>24/2  <br>12/1  <br>24/2  <br>bach<br>24/2                                                                 | 096   .222  <br>242   .222  <br>078   .078                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 239   342<br>656   828<br>18   125                                                      | 48 ! .14<br>; 736 ! .88<br>; 17 ; .12                                                  | 29.4<br>10   18.2  <br>39   30.2  <br>23   25.0  <br>16.1                                                                                     | D+<br>C+: 47 ft:<br>D+: 362 ft:<br>C : 25 ft:<br>C+                                                                                             | ۹          |
| ADD r<br>=====<br>RT<br>TH<br>LT<br>ADD r<br>=====<br>TH<br>LT                                                                       | oach<br>12/1  <br>24/2  <br>12/1  <br>Dach<br>24/2  <br>24/2  <br>24/2                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 239   342<br>656   828<br>18   125                                                      | 48 ! .14<br>; 736 ! .88<br>; 17 ; .12                                                  | 29.4<br>10   18.2  <br>39   30.2  <br>23   25.0  <br>16.1                                                                                     | D+<br>C+: 47 ft:<br>D+: 362 ft:<br>C : 25 ft:<br>C+                                                                                             | •          |
| Abpr<br>=====<br>RT<br>TH<br>LT<br>Abpro<br>TH<br>LT                                                                                 | oach<br>12/1  <br>24/2  <br>12/1  <br>Dach<br>24/2  <br>24/2  <br>24/2  <br>24/2  <br>24/2                                   | 096 ; .222 ;<br>242 ; .222 ;<br>078 ; .078 ;<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 239   342<br>656   828<br>18   125<br>979   1118<br>160   269                           | 48   .14<br>736   .88<br>17   .12<br>262   .23<br>40   .14                             | 29.4<br>10   18.2  <br>39   30.2  *<br>23   25.0  <br>16.1<br>14   15.3  <br>5   21.2  *                                                      | D+<br>C+! 47 ft!<br>D+! 362 ft!<br>C ! 25 ft!<br>C+<br>C+<br>C+<br>C+<br>C+<br>C+<br>C+<br>C+<br>C+<br>C+                                       | ۹          |
| Abpr<br>=====<br>RT<br>TH<br>LT<br>Abpro<br>TH<br>LT<br>Appro                                                                        | oach<br>12/1 :<br>24/2 :<br>12/1 :<br>Dach<br>24/2 :<br>24/2 :<br>12/1 :<br>0ach                                             | 096   .222  <br>242   .222  <br>078   .078  <br>.078   .078  <br>.26   .300  <br>.087   .156                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 239   342<br>656   828<br>18   125<br>979   1118<br>160   269                           | 48   .14<br>736   .88<br>17   .12<br>262   .23<br>40   .14                             | 29.4<br>10   18.2  <br>39   30.2  *<br>23   25.0  <br>16.1<br>16.1<br>16.1<br>15.3  <br>5   21.2  *<br>66.0@                                  | D+<br>C+: 47 ft:<br>D+: 362 ft:<br>C : 25 ft:<br>C+<br>C+<br>C+: 116 ft;<br>C : 43 ft:                                                          | •          |
| ADD r<br>=====<br>RT<br>TH<br>LT<br>ADD r c<br>=====<br>TH<br>LT                                                                     | oach<br>12/1  <br>24/2  <br>12/1  <br>Dach<br>24/2  <br>12/1  <br>bach<br>12/1  <br>12/1  <br>bach<br>12/1                   | 242       .222         242       .222         078       .078         242       .222         078       .078         078       .078         078       .078         078       .078         078       .078         078       .078         078       .078         078       .078         078       .078         078       .078         078       .078         078       .078         078       .078         078       .078         078       .078         078       .078         078       .078         078       .078         078       .078         078       .078         077       .000         047       .000 | 239   342<br>656   828<br>18   125<br>979   1118<br>160   269                           | 48   .14<br>736   .88<br>17   .12<br>262   .23<br>40   .14                             | 29.4<br>10   18.2  <br>29   30.2  *<br>23   25.0  <br>16.1<br>16.1<br>4   15.3  <br>5   21.2  *<br>66.0@                                      | D+<br>C+! 47 ft!<br>D+! 362 ft!<br>C ! 25 ft!<br>C+<br>C+: 116 ft!<br>C ! 43 ft!                                                                | •          |
| ADD r<br>=====<br>RT<br>TH<br>LT<br>ADD r c<br>=====<br>TH<br>LT                                                                     | oach<br>12/1  <br>24/2  <br>12/1  <br>Dach<br>24/2  <br>12/1  <br>bach<br>12/1  <br>12/1  <br>bach<br>12/1                   | 096   .222  <br>242   .222  <br>078   .078  <br>.078   .078  <br>.26   .300  <br>.087   .156                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 239   342<br>656   828<br>18   125<br>979   1118<br>160   269                           | 48   .14<br>736   .88<br>17   .12<br>262   .23<br>40   .14                             | 29.4<br>10   18.2  <br>29   30.2  *<br>23   25.0  <br>16.1<br>16.1<br>4   15.3  <br>5   21.2  *<br>66.0@                                      | D+<br>C+! 47 ft!<br>D+! 362 ft!<br>C ! 25 ft!<br>C+<br>C+: 116 ft!<br>C ! 43 ft!                                                                |            |
| ADD r<br>=====<br>RT<br>TH<br>LT<br>ADD r c<br>=====<br>TH<br>LT<br>ADD r c<br>=====<br>TH<br>LT                                     | oach<br>12/1  <br>24/2  <br>12/1  <br>bach<br>24/2  <br>12/1  <br>bach<br>12/1  <br>bach<br>12/1                             | 242       .222         242       .222         078       .078         126       .300         087       .156         .72       .300         .47       .300                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 239   342<br>656   828<br>18   125<br>979   1118<br>160   269                           | 48   .14<br>736   .88<br>17   .12<br>262   .23<br>40   .14                             | 29.4<br>10   18.2  <br>29   30.2  *<br>23   25.0  <br>16.1<br>16.1<br>4   15.3  <br>5   21.2  *<br>66.0@                                      | D+<br>C+! 47 ft!<br>D+! 362 ft!<br>C ! 25 ft!<br>C+<br>C+: 116 ft!<br>C ! 43 ft!                                                                |            |
| ADD r<br>=====<br>RT<br>TH<br>LT<br>ADD r<br>ADD r<br>ADD r<br>TH<br>LT<br>ADD r<br>ADD r<br>E<br>TH<br>LT<br>ADD r<br>E<br>TH<br>LT | oach<br>12/1  <br>24/2  <br>12/1  <br>pach<br>24/2  <br>12/1  <br>pach<br>12/1  <br>pach<br>12/1  <br>pach<br>12/1           | 096   .222  <br>242   .222  <br>078   .078  <br>078   .078  <br>126   .300  <br>087   .156  <br>087   .156                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 239   342<br>656   828<br>18   125<br>979   1118<br>160   269<br>433   535<br>429   531 | 48   .14<br>736   .88<br>17   .12<br>262   .23<br>40   .14<br>1174  2.19<br>1115  2.10 | 29.4<br>10   18.2  <br>39   30.2  <br>23   25.0  <br>16.1<br>16.1<br>15.3  <br>5   21.2  *<br>66.0@<br>4   65.9@ * <br>0   66.0@  <br>17.4 () | D+<br>C+: 47 ft:<br>D+: 362 ft:<br>C : 25 ft:<br>C+<br>C+<br>C+: 116 ft;<br>C : 43 ft:<br>C : 43 ft:<br>F<br>: 1040 ft:<br>F<br>: 987 ft:<br>C+ |            |
| ADDr<br>=====<br>RT<br>TH<br>LT<br>ADDrC<br>=====<br>TH<br>LT<br>ADDrC<br>=====<br>RT                                                | oach<br>12/1  <br>24/2  <br>12/1  <br>Dach<br>24/2  <br>12/1  <br>Dach<br>12/1  <br>Dach<br>12/1  <br>Dach<br>12/1  <br>Dach | 242       .222         242       .222         078       .078         126       .300         087       .156         .72       .300         .47       .300                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 239   342<br>656   828<br>18   125<br>979   1118<br>160   269<br>433   535<br>429   531 | 48 ! .14<br>736 ! .88<br>17 ! .12<br>262 ! .23<br>40 ! .14<br>1174 !2.19<br>1115 !2.10 | 29.4<br>10   18.2  <br>39   30.2  <br>23   25.0  <br>16.1<br>4   15.3  <br>5   21.2  *<br>66.0@<br>4   65.9@ * <br>0   66.0@  <br>17.4 (      | D+<br>C+! 47 ft!<br>D+! 362 ft!<br>C ! 25 ft!<br>C+<br>C+<br>C+<br>C+! 116 ft!<br>C ! 43 ft!<br>C ! 43 ft!<br>C ! 987 ft!                       |            |

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KULAMALU EXISTING 1996 CONDITIONS PM PEAK HOUR

### 10/22/9c 09:59:45

SIGNAL94/TEAPAC(V1 L1.4) - Summary of Parameter Values

Intersection Parameters for Int # 0 - HALEAKALA HWY & HANA HWY

| METROAREA      | NON | IC8D |
|----------------|-----|------|
| LOSTTIME       |     | 2.0  |
| LEVELOFSERVICE | C   | 5    |
| NODELOCATION   | 0   | 0    |

Approach Parameters

| APPLABELS       | SB   | WB   | NB   | EB   |
|-----------------|------|------|------|------|
| GRADES          | .0   | .0   | .0   | .0   |
| PEDLEVELS       | LOW  | LOW  | LOW  | LOW  |
| PARKINGSIDES    | NONE | NONE | NONE | NONE |
| PARKVOLUMES     | 20   | 20   | 20   | 20   |
| BUSVOLUMES      | 0    | 0    | 0    | Q    |
| RIGHTTURNONREDS | Ŭ    | 0    | 0    | 0    |

### Movement Parameters

| MOVLABELS       | RT   | тн   | LT   | RT   | тн   | LT   | RŤ   | тн   | LT   | RT   | тн   | ET   |
|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| VOLUMES         | 37   | 473  | 33   | 7    | 33   | 611  | 1225 | 567  | 2    | 23   | 239  | 150  |
| WIDTHS          | 12.0 | 24.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 24.0 | 12.0 | 12.0 | 12.0 | .0   |
| LANES           | 1    | 2    | 1    | 1    | 1    | l    | 1    | 2    | 1    | 1    | 1    | ۲.   |
| UTILIZATIONS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| TRUCKPERCENTS   | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  |
| PEAKHOURFACTORS | .95  | .95  | .95  | .95  | .95  | . 95 | .95  | .95  | . 95 | . 95 | .95  | .95  |
| ARRIVALTYPES    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| ACTUATIONS      | NO   | YES  | ŕES  | NO   | YES  | YES  | NO   | YES  | YES  | NO   | YES  | YES  |
| REQCLEARANCES   | 4_0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.C  |
| MINIMUMS        | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  |
| IDEALSATFLOWS   | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| FACTORS         | 1.00 | 1.00 | J.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| DELAYFACTORS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| NSTOPFACTORS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| GROUPTYPES      | NORM | NORM | NORM | FFLW | NORM | DOPT | FFLW | NORM | NORM | NORM | NORM | NORM |
| SATURATIONFLOWS | 1539 | 3725 | 1770 | 0    | 1783 | 1770 | 0    | 3725 | 1770 | 1539 | 1828 | C٠   |

### Phasing Parameters

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| SEQUENCES   | <u>67</u> |      |       |       |       |          |      |      |
|-------------|-----------|------|-------|-------|-------|----------|------|------|
| PERMISSIVES | Ю         | NO   | NO    | NO    |       | LEADLAGS | NONE | HONE |
| OVERLAPS    | NO        | NO   | NO    | NO    |       | OFFSET   | .00  | 1    |
| CYCLES      | 60        | 180  | 10    |       |       | PEDTIME  | .0   | ¢*   |
| GREENTIMES  | 5.00      | 3.00 | 22.00 | 25.00 | 19.00 |          |      |      |
| YELLOWTIMES | 4.00      | 4 00 | .00   | 4.00  | 4.00  |          |      |      |
| CRITICALS   | 1 2       | Ū    | 11    | 8     | V     |          |      |      |
| EXCESS      | Q         |      |       |       |       |          |      |      |

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|          |                       |                           |                    |                                         |                      | 10/22/96                    |
|----------|-----------------------|---------------------------|--------------------|-----------------------------------------|----------------------|-----------------------------|
| MAL      | U<br>G 1996 CONC      |                           |                    |                                         |                      | 09:59:50                    |
|          | HOUR                  | 11120.00                  |                    |                                         |                      |                             |
|          |                       |                           |                    |                                         |                      |                             |
| AL9      | 4/TEAPAC[V]           | LI_4) - Capa              | acity Analys:      | is Summary                              |                      |                             |
| rse      | ction Avera           | ges for Int               | # O - HALE         | AKALA HWY &                             | HANA HWY             |                             |
| D        | egree of Sa           | turation (v/)             | c) .64 Veh:        | icle Delay                              | 24.3 Level           | of Service C                |
| -        |                       |                           |                    |                                         |                      | -                           |
| 7        | Phase 1               | ! Phase 2                 | Phase 3            | Phase 4                                 | ! Phase 5            | ;<br>-                      |
| * -<br>¦ | +                     | !                         | + +                | 6<br>•                                  | 1                    | 1<br>1                      |
|          | +<br>+>               | 1                         | ; + +<br>!<+ +     | ¦ ~++++                                 | i                    |                             |
| i        | +2                    | •                         | l v                | ++++                                    |                      |                             |
| .        | <+                    | ! <+ +                    | {<br>! +           |                                         | ╎┾┾┾┾<br>╎┽┽┿┽╳      |                             |
| h  <br>  | ۰.<br>۲               | + +                       | +                  |                                         | ¦++++<br>! ∨         |                             |
| :        | +                     | ;                         | ¦                  | ;<br>                                   | ; •                  |                             |
|          | G/C= .056             | G/C= .033                 | G/C= .244          | G/C= .278                               | G/C= .211<br>G= 19.0 | 4<br>9<br>1                 |
|          | G= 5.0"               | 'G= 3.0"<br>'Y+R= 4.0"    |                    | G= 25.0"<br>Y+R= 4.0                    |                      |                             |
|          |                       | OFF=10.0%                 | •                  | OFF=42.2%                               | OFF=74.4%            | -                           |
| -        | := 90 sec             | G= 74.0 sec               | = 82.2% Y=1        | 6.0 sec = 17                            | .8% Ped= .           | 0 sec = .0%                 |
| Ļ        | - 70 380              | 3- 74.0 000               |                    |                                         |                      |                             |
|          | <br>{Width/;          | a/C                       | : Service Ra       | te! Adj ¦                               | HCM                  | L 90% Max                   |
| irou     | p   Lanes!            | Read Used                 | : @C (vph) @       | E :Volume:                              | v/c ; Delay          | ! 5 : Aueue :               |
|          |                       |                           |                    |                                         | - · · -              |                             |
|          | roach                 |                           |                    |                                         | 21.2                 |                             |
|          | 1                     |                           | 1 070 1 74         | 2 2 2 2                                 | 114 18.0             | : UT: 30 10                 |
|          |                       |                           | 1 154 97           | w ' 497                                 |                      | *C   245 ft <br>  D+! 41 ft |
| LT       | ; ]2/1 ;              | .085 ; .078               |                    |                                         |                      |                             |
|          |                       |                           |                    |                                         | 17.4                 | C+                          |
|          | -oach<br>:=========== |                           | ================== | ======================================= |                      |                             |
|          | 1 12/1 1              | 073 1 156                 | 160 26             | 9 ( 2 )                                 |                      | *C+  264 ft <br>  C   25 ft |
|          |                       |                           |                    |                                         |                      |                             |
|          | oach                  |                           |                    |                                         | 19.4                 | C+                          |
|          |                       | ========================= | ================== | ======================================= |                      |                             |
| тн       | 12/1-                 | .257 ! .300               | + 433 + 53         | 5 ' 348 ; .<br>1 ! 330 !                | .650 ; 19.7          | C+  292 ft                  |
|          | ; 12/1+;              | .247 / .300               |                    |                                         |                      |                             |
|          |                       |                           |                    |                                         | 45.4                 | E+                          |
|          | OACO                  |                           |                    |                                         |                      |                             |
| ומסו     |                       |                           | =============      |                                         |                      | C+  25 ft <br> #F+! 398 ft! |

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| Major Street: FUKALAWI<br>Minor Street: HALEAKAL<br>Peak Hour: PM<br>Scenario: EXISTING                        | BYPASS<br>A HXY |                                         |                         |        |                |         |        | ī       | rint Det<br>Anelve<br>File Neu<br>Gersectig | st: B<br>Ie: HALBY         | 5 |
|----------------------------------------------------------------------------------------------------------------|-----------------|-----------------------------------------|-------------------------|--------|----------------|---------|--------|---------|---------------------------------------------|----------------------------|---|
| Feak Hour Factor:                                                                                              | 1.00            | :                                       |                         |        |                |         |        |         |                                             | v5                         | * |
| NAJOR STREET<br>Num of Lanes - V2:                                                                             |                 |                                         |                         |        |                |         |        | ····· , | 107                                         | 15                         |   |
| Exc1 RT - V3 (Y/N):                                                                                            |                 |                                         | 50                      |        |                |         |        |         | 6                                           | ¥4                         |   |
| Stor/Yield - V3 (Y/K):                                                                                         |                 | •                                       | ١.                      |        |                |         | :      |         |                                             |                            |   |
| % Grade - VZ,V3:                                                                                               |                 | :                                       | ٧                       |        |                |         | •      |         | IOR STREE                                   |                            |   |
| Nus of Lanes - V3:                                                                                             | 1               |                                         |                         | :      |                | ,       |        | PUI     | (ALANI E                                    | 17833                      |   |
| Excl LT - V4 (Y/W):                                                                                            |                 | •                                       |                         | ì      |                | 1       |        |         |                                             |                            |   |
| 1 Grade - 94,95:                                                                                               |                 |                                         |                         |        |                | •       |        |         |                                             | •                          |   |
| 4 41 44 8 1 - 1 41 41                                                                                          | ~               | •                                       |                         | 1      |                | :       |        |         |                                             | T                          |   |
| NINOR STREET                                                                                                   |                 | :                                       |                         | 242    |                | 0       |        |         | ×                                           | NERTH                      |   |
| Num of Lanes - V7.V7:                                                                                          |                 | :                                       | •                       |        |                |         |        |         |                                             |                            |   |
| Shared Lane (Y/N):                                                                                             | N               | ;                                       |                         | 7      |                | V7      |        |         |                                             |                            |   |
| % Grade - V7&V9:                                                                                               | ¢               | ;                                       | MINCR 3                 | TREET: | HALEAKA        | ila Hi  | IY<br> |         |                                             |                            |   |
| VCLUME ADJUSTMENTS                                                                                             |                 |                                         |                         |        |                |         |        |         | _                                           |                            |   |
| MOVEMENT NO.                                                                                                   |                 | :                                       | 5                       | +      |                |         | 5      |         | 7                                           | ę                          |   |
| VOLUME, V (vph)                                                                                                |                 |                                         | 630                     | Q      |                |         |        |         |                                             | 0                          |   |
| VOLUME, v (ccph)                                                                                               |                 | 72±                                     | 620                     | ¢      |                |         | 787    |         | 265                                         | 0                          |   |
| Conflicting Flows:<br>Fotential Capacity:<br>Movement Capacity:<br>STEP 2: LT FROM MAJOR<br>Conflicting Flows: | 1 C<br>; C      | p,= =<br>a,g = 23,9<br>                 |                         |        | +<br>          | 725<br> | 725    |         | 571<br>574                                  | voh<br>poph<br>aoph<br>voh |   |
| Potential Capacity:                                                                                            |                 | : 26                                    | .4 =                    |        |                |         |        |         | 822                                         | rcoh                       |   |
| Movement Capacity:                                                                                             |                 | ` .<br>Da                               | 4 = Cp.4 =              |        |                |         |        |         | 6==                                         | poph                       |   |
| Free, of Queue-free                                                                                            |                 | 30 30                                   | .4 = 1-v4/8m.4 =        |        |                |         |        |         | 1.01                                        |                            |   |
| Major Left Shared La<br>Prop. of Bueue-free                                                                    |                 |                                         |                         |        |                |         |        |         | 1.0                                         |                            |   |
|                                                                                                                |                 |                                         |                         | *      |                |         |        |         |                                             |                            |   |
| STEP 1: 1T FROM MINOR                                                                                          | STREET          | - 7                                     | 7                       |        |                |         |        |         | =                                           | veh                        |   |
| Conflicting Flows:<br>Potential Capacity:<br>Canacity Adjustment                                               |                 |                                         | 17 = 172V3+724V3<br>7 = | τ¥4 Ξ  |                |         |        |         |                                             | poph                       |   |
| Capacity Adjustment                                                                                            | Factor          | لوم ۱                                   | • • -                   |        |                |         |        |         | <b>4</b> 5 7                                | P - P - 1                  |   |
| Bua To Langding May                                                                                            | esonts:         | 47                                      | =80.4=                  |        |                |         |        |         | 1.00                                        |                            |   |
| Movement Capacity:                                                                                             |                 | . Se                                    | .7 = Cc.7 =             |        |                |         |        |         |                                             | poph                       |   |
|                                                                                                                |                 |                                         |                         |        |                |         |        |         |                                             |                            |   |
| DELAY AND LEVEL OF SER                                                                                         | WICE 53         | бЛНАХ<br>                               | /                       | •      | ics⊅<br>(accā) |         | SCLAV  |         | 12                                          |                            |   |
| Novenent                                                                                                       |                 | • • • • • • • • • • • • • • • • • • • • | 239<br>274<br>374       | -      |                |         |        |         |                                             |                            |   |
| MINIR LEFT TURN (7                                                                                             |                 | 1:5                                     | 209                     |        | ¥A             |         | 170.5  |         | F                                           |                            |   |
|                                                                                                                |                 |                                         | 574                     |        | 86             |         | é.:    |         | Ξ                                           |                            |   |
| - MINCE RIGHT TURN 19                                                                                          |                 |                                         |                         |        |                |         | 5.7    |         | 4                                           |                            |   |
| MINGE RIGHT TURN 15<br>MAJOR LEFT TURN 14                                                                      | 1               |                                         | 277                     |        |                |         | •••    |         |                                             |                            |   |

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| Najor Street: FUKALANI PYFASS<br>Nimor Street: HAKANI ST<br>Scenaric: EZISTING 1996<br>Feak Hour: AN |        |      |           |     |          |       |       |             |       | 1     |        | int<br>Anal<br>ile<br>ectio | lyst<br>Na <b>r</b> e | <br>       | 25-Jul-3<br>BC<br>FURMAR- |
|------------------------------------------------------------------------------------------------------|--------|------|-----------|-----|----------|-------|-------|-------------|-------|-------|--------|-----------------------------|-----------------------|------------|---------------------------|
|                                                                                                      | <br>   |      |           |     | ¥12      |       | ¥11   |             | V19   |       |        |                             |                       | •          | ••••                      |
| Feak Hour Factor: 1.00                                                                               |        |      |           |     | 237      |       | 54    |             | 12    |       |        |                             | 3                     | :<br>ICETH |                           |
|                                                                                                      | i<br>t |      |           |     | 122      |       | 1     |             | 1     |       |        |                             |                       |            |                           |
| Run of Lanes - V2: 2                                                                                 | 1      |      |           |     | - i      |       | ł     |             | i     |       |        |                             |                       |            |                           |
| Ercl LT - VI (Y/N): T                                                                                | !      |      |           |     | '        |       | i     |             | ί,    |       |        |                             |                       |            |                           |
| Eicl ET - V3 (Y/N): 5                                                                                |        |      |           |     | ċ        |       | 7     |             | >     |       |        |                             |                       |            |                           |
| Stop/Tield - V3 (Y/N): N                                                                             | !      |      |           |     | •        |       | •     |             |       |       |        |                             |                       |            |                           |
|                                                                                                      |        |      |           | •   |          |       |       |             |       |       |        |                             |                       |            |                           |
| Grade - V1,V2,V3: 2                                                                                  | 1      |      |           | ,   |          |       |       |             |       |       | ١      |                             |                       |            |                           |
| Hun of Long o MS.                                                                                    | 71     | 0    |           | '   |          |       |       |             |       |       |        |                             | 11 7                  |            |                           |
|                                                                                                      |        | e i  |           |     |          |       |       |             |       |       |        |                             |                       | -          |                           |
|                                                                                                      | 72     | ٢.   |           |     |          |       |       |             |       |       | (      | 8                           | 23 T                  |            |                           |
| · · · ·                                                                                              |        | 1    |           |     |          |       |       |             |       |       |        | •                           |                       | •          |                           |
| Stop/Tield - V6 (T/R): 5                                                                             | 72     | •    |           |     |          |       |       |             |       |       |        |                             | 8 Y                   |            |                           |
| Grade - V4,V5,V6: -2                                                                                 | 1      | •    |           | ١.  |          |       |       |             |       |       | ,      |                             | • •                   |            |                           |
| WITCH PERFECT                                                                                        | ł      |      |           | 7   |          |       |       |             |       | 7     | ,<br>1 | KAJO                        | 9 SI                  | TREET      |                           |
| Rum of Lanes - V8: 1                                                                                 | 1      |      |           | •   |          |       |       |             |       | •     |        |                             |                       | I ETPI     | 33                        |
|                                                                                                      |        |      |           |     | <        |       |       |             |       | >     |        |                             |                       |            |                           |
| Grade - V7,V8,V9: 0                                                                                  | i,     |      |           |     | Ì,       |       | 1     |             | ,     |       |        |                             |                       |            |                           |
| Shared Lane-V7,8,9: 3                                                                                | i      |      |           |     | <u>`</u> |       | !     |             | · '   |       |        |                             |                       |            |                           |
| {0=H,1=LT,C=TR,3=LTR}                                                                                | i      |      |           |     | i<br>t   |       | :     |             |       |       |        |                             |                       |            |                           |
|                                                                                                      | į      |      |           |     | 13       |       | ÷     |             | 34    |       |        |                             |                       |            |                           |
| Rem of Lanes - Vil: 1                                                                                | 1      |      |           |     | 10       |       |       |             | 34    |       |        |                             |                       |            |                           |
| Grade - V10,V11,V12: 0                                                                               | 1      |      |           |     | 77       |       | 78    |             | ¥3    |       |        |                             |                       |            |                           |
| Shared Lane-V10,11,12: 3                                                                             | 1      |      |           |     | .,       |       |       |             | •     |       |        |                             |                       |            |                           |
| (0=K,1=LT,2=TP,3=LTR)                                                                                | i      |      |           |     | NINOF    | R STR | 657 - | KAEANI      | 57    |       |        |                             |                       |            |                           |
|                                                                                                      | ·      |      | - • - • • |     |          |       |       | • • • • • • |       |       |        |                             |                       |            |                           |
| VOLUME ADJUSTMENTS<br>NOVEMENT NO.                                                                   | 1      | 1    | •         | 3   | 3        | 5     | 6     | 7           | 9     | 9     | 10     |                             | 11                    | 12         |                           |
| ROURLY FLOW RATE, V(vph)                                                                             |        | o    | 5         |     | ŝ        | 822   |       | :3          |       | 34    | 12     |                             | 54                    | 257        |                           |
|                                                                                                      | ;      | õ    | -         | ð   |          |       | :1    | -           | 78    |       |        |                             | 59                    |            |                           |
| VƏLUNE, v (pcph)                                                                                     | 1<br>  |      |           |     |          |       |       |             |       |       |        |                             |                       |            |                           |
| STEP 1: ET FROM MINOR STREET                                                                         | :      |      |           |     |          |       |       | 1           |       |       |        |                             |                       |            |                           |
| Conflicting Flows:                                                                                   | Vc? .  | 1/2  | 73 +      | ¥2  | 1        | 3     | vbp   | 1           | Vc12  | = 1/2 | VE +   | ¥5                          |                       |            |                           |
| Potential Capacity:                                                                                  | [Cp.9  |      |           |     |          | 1391  | 509F  | :           | Cp,12 |       |        |                             |                       |            | րշըհ                      |
| Novement Capacity:                                                                                   | Cz.?   |      | T         |     |          |       | pept  |             | Cz,12 | •Cp,1 | Ŧ      |                             |                       | 527        | pcph                      |
| Prb. cf Queu-free State:                                                                             | [po,?= |      |           |     |          | 0.97  |       |             | P0,12 | =1-Vl | 2/02,  | 12=                         |                       | 2.46       |                           |
|                                                                                                      |        |      |           |     |          |       |       |             |       |       | ••••   |                             |                       |            |                           |
| STEP 2: LT FRON MAJOR STREET                                                                         | 1      |      |           |     |          |       |       |             |       |       |        |                             |                       |            |                           |
| Conflicting Flews:                                                                                   | 7c.4   |      |           | . * |          |       | vip   |             |       |       | + 76   | 2                           |                       |            |                           |
| Potential Capacity:                                                                                  | Cp.4   | x    |           |     |          |       | peph  |             |       |       |        |                             |                       |            | bebp                      |
| Hovement Capacity:                                                                                   | ,Ca,44 | Cp,4 | ×         |     |          | 1704  | sest  |             | Cz,1= |       |        |                             |                       |            | bebp                      |
| Frb. of Queu-free State:                                                                             | 100.10 |      |           |     |          | 1.00  |       | :           | ₽0,I= | 1-v1/ | Cal=   |                             |                       | :.00       |                           |
| Major Left Shared Lage                                                                               | :      |      |           |     |          |       |       |             |       |       |        |                             |                       |            |                           |
|                                                                                                      |        | •    |           |     |          | 23    |       |             | F*0,1 | _     |        |                             |                       | 53         |                           |

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| Hajor Street: PUEALARI EYPAS<br>finor Street: HARARI ST<br>Scemaric: EXISTING 1996<br>Peak Epur: AN                                                                                                | 5                                     |                                         |                                        |                                                                    | atesection                           | DAT<br>Analys<br>File Ram<br>Intesection (             | 5: 25-Jul-96<br>L: BC<br>e: FUKHAK-A<br>F:                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-----------------------------------------|----------------------------------------|--------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------------------|
| ITEP 3: TH FROM MINGR STREET                                                                                                                                                                       |                                       |                                         |                                        |                                                                    |                                      |                                                        |                                                                                      |
| Conflicting Tlows:                                                                                                                                                                                 |                                       |                                         | 7:+V6+V5+V4                            |                                                                    | Vc.,11 = 1                           | L/2V6+V5+V4+V                                          |                                                                                      |
| Detertial Conseins                                                                                                                                                                                 | T T                                   |                                         | 847                                    | 7ph                                                                | :                                    |                                                        | 842 <del>7</del> ph                                                                  |
| Potential Capacity:<br>Capacity Adj Tacter:                                                                                                                                                        | UD,9 =<br>!f0 = no                    | 1100 1 -                                | 349                                    | peps ;                                                             | Cp,11 =                              | P                                                      | 351 peph                                                                             |
|                                                                                                                                                                                                    |                                       |                                         |                                        |                                                                    | EII * 20,4                           | *po,1 =                                                | 1.00                                                                                 |
| Novement Capacity:<br>Prob. of Queue-free State:                                                                                                                                                   | 01,3 =<br> 21,3 =                     | 1-v8/Cz.8                               | = 0.75                                 | popu                                                               | E0,11 + 1-                           | v11/Cm,11 =                                            | 349 pcpn<br>0.83                                                                     |
| TEP 4: LT FROM MINCH STREET                                                                                                                                                                        | ·                                     | ••••••                                  |                                        | <br>1                                                              |                                      |                                                        |                                                                                      |
| Ceaflicting Flows:                                                                                                                                                                                 | 1%c.7 =                               | 1/283+82+8                              | 1+1/206+05+                            | -¥4+                                                               | Vc.10 = 17                           | 246+45+44+1/2                                          | V3+V7+V1+                                                                            |
|                                                                                                                                                                                                    |                                       | 1/2(11+71                               | 1'= 937                                | 705                                                                |                                      | (V8+V9) *                                              |                                                                                      |
| Potential Capanny:<br>Kajor Left, Nimer Through                                                                                                                                                    | 12:7 =                                |                                         | 244                                    |                                                                    |                                      |                                                        |                                                                                      |
| Impedance Factor:<br>Rajor Left, Minor Through                                                                                                                                                     | 17.15 po                              | ,11*f11 +                               | 0.83                                   | ļ                                                                  | F′′10≠po,8                           | *f8 =                                                  | 0.77                                                                                 |
| Adjusted Impedance Factor:                                                                                                                                                                         | 1p17 =                                |                                         | 3.87                                   | 1                                                                  | a'10 =                               |                                                        | 0.87                                                                                 |
| Adjusted Impedance Factor:<br>Capality Adjustment Factor:                                                                                                                                          | 117 = p*                              | /*po.12 =                               | 0.45                                   | i                                                                  | f10 = c'10                           | *00.9 =                                                | 9.80                                                                                 |
| Novement Capacity:                                                                                                                                                                                 | Cz.7 =                                | [7*Cp,7 =                               | 98                                     | քշքե                                                               | Cu,10 = f1                           | 0°Cp,10 =                                              | 233 pcph                                                                             |
| BLAY AND LEVEL OF SERVICE SUM                                                                                                                                                                      | IART                                  |                                         |                                        |                                                                    |                                      | <br>                                                   | •••••                                                                                |
| KOVEKENT                                                                                                                                                                                           | v(popb)                               | cc(pcpb)                                | csb(pcpb)                              | totai<br>Dela'                                                     | l<br>T los                           | i<br>I                                                 |                                                                                      |
|                                                                                                                                                                                                    |                                       |                                         |                                        |                                                                    |                                      |                                                        |                                                                                      |
| HIRCE LEFT TOES (7)                                                                                                                                                                                |                                       |                                         | SHRD                                   | SHRD                                                               |                                      | <br>  LEVEL OF S                                       | SRVICE CRITERI                                                                       |
|                                                                                                                                                                                                    | 14<br>72                              | 93<br>]47                               | SHRD<br>327                            | SHRD                                                               |                                      | <br>  LEVEL OF S<br>                                   | ERVICE CRITERI                                                                       |
|                                                                                                                                                                                                    | 14<br>72<br>27                        | 99<br>347<br>1381                       | SHRD<br>327<br>SHRD                    | SHRD                                                               | <br>5 C                              | <br>  LEVEL OF S<br> <br>                              | ERVICE CRITERI<br>AVG                                                                |
| NINCE THROUGH (3)<br>NINCE RIGHT TURK (?)                                                                                                                                                          | 72<br>27                              | 347<br>1381                             | 327<br>Shrd                            | 58RD<br>19.0                                                       | <br>5 C                              | i                                                      | AVG                                                                                  |
| HINCE THROUGH (3)<br>HINCE RIGET TUEN (2)<br>HINCE LEFT TUEN (10)                                                                                                                                  | 72<br>27<br>13                        | 347<br>1381<br>233                      | 327<br>Shrd<br>Serd                    | SHRD<br>19.0<br>Shrd<br>Shrd                                       | <br>c<br>                            | LEVEL                                                  | AVG<br>Total                                                                         |
| NINCE THROUGH (3)<br>NINCE RIGHT TURK (?)<br>HINCE LEFT TURK (10)<br>NINCE THROUGH (11)                                                                                                            | 72<br>27<br>13<br>52                  | 347<br>1381<br>233<br>349               | 327<br>Shrd<br>Serd<br>466             | SHRD<br>19.0<br>SHRD<br>SHRD<br>23.4                               | <br>C<br>                            | <br>  LEVEL<br>  GF                                    | AVG<br>Total<br>Delat                                                                |
| NINCE TEROUGE (3)<br>NINCE RIGET TURK (?)<br>NINCE LEFT TURK (10)                                                                                                                                  | 72<br>27<br>13                        | 347<br>1381<br>233<br>349               | 327<br>Shrd<br>Serd                    | SHRD<br>19.0<br>Shrd<br>Shrd                                       | <br>c<br>                            | LEVEL<br>GF<br>SERVICE                                 | AVG<br>TOTAL<br>Delat<br>{SSC/Veh;                                                   |
| NINCE THROUGH (3)<br>NINCE RIGET TURN (?)<br>NINCE LEFT TURN (10)<br>NINCE THROUGH (11)<br>NINCE RIGET TURN (12)                                                                                   | 72<br>27<br>13<br>59<br>283           | 347<br>1381<br>233<br>343<br>527        | 327<br>SHRD<br>SERD<br>466<br>SHRD     | SHRD<br>19.0<br>SHRC<br>SHRD<br>23.4<br>SHRD                       | <br><br><br>                         | LEVEL<br>  GF<br>  SERVICE<br> <br>  A                 | AVG<br>TOTAL<br>DELAT<br>{SEC/VEH;<br><=5                                            |
| HINCE THROUGH (3)<br>HINCE RIGET TURK (?)<br>HINCE LEFT TURK (10)<br>HINCE THROUGH (11)<br>HINCE RIGET TURK (12)<br>HAJCE LEFT (1)                                                                 | 72<br>27<br>13<br>59<br>283<br>0      | 347<br>1381<br>233<br>349<br>527<br>611 | 327<br>SHRD<br>SERD<br>466<br>SHRC<br> | SHRD<br>19.0<br>SHRC<br>SHRD<br>23.4<br>SHRD<br>5.9                |                                      | <br>  LEVEL<br>  GF<br>  SERVICE<br> <br>  A<br>  B    | AVG<br>TOTAL<br>DELAT<br>{SSC/VEH;<br><=5<br>>\$&<=10                                |
| NINCE THROUGH (3)<br>NINCE RIGET TURK (?)<br>NINCE LEFT TURK (10)<br>NINCE THROUGH (11)<br>NINCE RIGET TURE (12)                                                                                   | 72<br>27<br>13<br>59<br>283           | 347<br>1381<br>233<br>349<br>527<br>611 | 327<br>SHRD<br>SERD<br>466<br>SHRD     | SHRD<br>19.0<br>SHRC<br>SHRD<br>23.4<br>SHRD                       |                                      | LEVEL<br>GF<br>SERVICE<br>A<br>B<br>C                  | AVG<br>TOTAL<br>DELAT<br>{SEC/VEH;<br><=5<br>>S&<= 10<br>>10G<=20                    |
| NINCE TEROUGE (3)<br>NINCE RIGET TURK (2)<br>NINCE LEFT TURK (12)<br>NINCE THROUGH (11)<br>NINCE RIGET TURK (12)<br>NAJCE LEFT (1)<br>NAJCE LEFT (1)                                               | 72<br>27<br>13<br>59<br>283<br>0      | 347<br>1381<br>233<br>349<br>527<br>611 | 327<br>SHRD<br>SERD<br>466<br>SHRC<br> | SHRD<br>13.0<br>SHRC<br>31.4<br>SHRD<br>5.9<br>2.1                 |                                      | LEVEL<br>  GF<br>  SERVICE<br>  A<br>  B<br>  C<br>  D | AVG<br>TOTAL<br>DELAT<br>{SSC/VEH<br>>5&<= 10<br>>10&<= 20<br>>20&<= 30              |
| HINCE THROUGH(3)HINCE RIGHT TURK(2)HINCE LEFT TURK(12)HINCE THROUGH(11)HINCE RIGHT TURK(12)HAJCE LEFT(1)MAJCE LEFT(4)HINCE AFFRDACH(7)(8)(9)                                                       | 72<br>27<br>13<br>59<br>283<br>0<br>3 | 347<br>1381<br>233<br>349<br>527<br>611 | 327<br>SHRD<br>SERD<br>466<br>SHRC<br> | SHRD<br>13.0<br>SHRD<br>23.4<br>SHRD<br>5.9<br>2.1<br>12.0         |                                      | LEVEL<br>CF<br>SERVICE<br>A<br>B<br>C<br>D<br>S        | AVG<br>TOTAL<br>DELAT<br>{SSC/VEH<br>>S&<= 10<br>>10&<= 20<br>>20&<= 30<br>>30&<= 45 |
| HINCE THROUGH(3)HINCE RIGET TURK(2)HINCE LEFT TURK(12)HINCE THROUGH(11)HINCE RIGET TURK(12)HAJCE LEFT(1)HAJCE LEFT(1)                                                                              | 72<br>27<br>13<br>59<br>283<br>0<br>3 | 347<br>1381<br>233<br>349<br>527<br>611 | 327<br>SHRD<br>SERD<br>466<br>SHRC<br> | SHRD<br>13.0<br>SHRC<br>31.4<br>SHRD<br>5.9<br>2.1                 |                                      | LEVEL<br>  GF<br>  SERVICE<br>  A<br>  B<br>  C<br>  D | AVG<br>TOTAL<br>DELAT<br>{SSC/VEH<br>>5&<= 10<br>>10&<= 20<br>>20&<= 30              |
| HIBCE THROUGH(3)HINCE RIGET TUEN(2)HINCE LEFT TUEN(12)HIRCE THROUGH(11)HIRCE RIGET TUEN(12)HAJCE LEFT(1)MAJCE LEFT(4)HIRCE AFFROACE(7)(8)(9)HINCE AFFROACE(12)(11)(12)                             | 72<br>27<br>13<br>59<br>283<br>0<br>3 | 347<br>1381<br>233<br>349<br>527<br>611 | 327<br>SHRD<br>SERD<br>466<br>SHRC<br> | SHRD<br>13.0<br>SHRD<br>23.4<br>SHRD<br>5.9<br>2.1<br>18.0<br>28.4 | с<br>с<br>л<br>д<br>д<br>д<br>д<br>д | LEVEL<br>CF<br>SERVICE<br>A<br>B<br>C<br>D<br>S        | AVG<br>TOTAL<br>DELAT<br>{SSC/VEH<br>>S&<= 10<br>>10&<= 20<br>>20&<= 30<br>>30&<= 45 |
| NINCE THROUGH (3)<br>NINCE RIGET TURN (2)<br>HINCE LEFT TURN (10)<br>NINCE THROUGH (11)<br>NINCE RIGET TURN (12)<br>NAJCE LEFT (1)<br>NAJCE LEFT (1)<br>NAJCE LEFT (4)<br>NINCE AFFROACH (7)(8)(9) | 72<br>27<br>13<br>59<br>283<br>0<br>3 | 347<br>1381<br>233<br>349<br>527<br>611 | 327<br>SHRD<br>SERD<br>466<br>SHRC<br> | SHRD<br>13.0<br>SHRD<br>23.4<br>SHRD<br>5.9<br>2.1<br>12.0         |                                      | LEVEL<br>CF<br>SERVICE<br>A<br>B<br>C<br>D<br>S        | TOTAL<br>DELAT<br>{SSC/VEH<br>>S&<=10<br>>IQ&<=20<br>>20&<=30<br>>30&<=45            |

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| Hajor Street: PUKALANI I<br>Higor Street: HAKANI ST<br>Scenarie: EXISTING<br>Feak Hour: PK |          |                  |       |            |                                        | Print Date:<br>Analyst:<br>File Rame:<br>Intesection #: | BC      |
|--------------------------------------------------------------------------------------------|----------|------------------|-------|------------|----------------------------------------|---------------------------------------------------------|---------|
|                                                                                            |          |                  | ¥12   | ¥11        | ¥10                                    |                                                         |         |
| Peak Hour Factor:                                                                          | 1.00     |                  | 36    | 35         | 4                                      | NOF                                                     | TH      |
| NAJOE STREET                                                                               | !<br>!   |                  | 30    | 1          | 1                                      |                                                         |         |
| Aun of Lanes - V2:                                                                         | 2        |                  |       | ł          | I I                                    |                                                         |         |
|                                                                                            | 1 I I    |                  | · /   | 1          | · · · ·                                |                                                         |         |
| Excl LT - 71 (Y/R):                                                                        |          |                  |       | 1          | `````````````````````````````````````` |                                                         |         |
| Excl RT - V3 (V/R):                                                                        | 2        |                  | •     | •          |                                        |                                                         |         |
| Stop/Yield - Y3 (Y/R):                                                                     | N        |                  | 1     |            |                                        |                                                         |         |
| Grade - V1,V2,V3;                                                                          | 2 ]      | ,                |       |            |                                        | ١                                                       |         |
| Rog of Lages - VS:                                                                         | , i      | VJ 183           |       |            |                                        | 11 V6                                                   |         |
|                                                                                            | T        |                  |       |            |                                        |                                                         |         |
| Excl LT - V4 (Y/N):<br>Excl RT - V6 (Y/N):                                                 |          | V2 500           | •     |            |                                        | < 320 V5                                                |         |
| Stop/Yield - VE (Y/N):                                                                     | R        |                  | •     |            |                                        |                                                         |         |
| Grad± - %4,%5,%6:                                                                          | -2       |                  |       |            |                                        | 17 V4                                                   |         |
| Atanz - Jakaties                                                                           |          | 1. 1.5           |       |            |                                        | 1                                                       |         |
| NINGE STREET                                                                               |          | ,<br>Y           |       |            |                                        | V NAJOR STRE                                            | 5T      |
| Num of Lanes - VS:                                                                         | 1        | •                |       |            |                                        | PUTALANI E                                              |         |
| Grade - V7,V8,V9:                                                                          | ej       |                  | <     | 4          | >                                      | •••••••                                                 |         |
| Shared Lane-17,8,3:                                                                        | 3        |                  | i.    | 1          | i                                      |                                                         |         |
| (0=S,1=LT,2=TE,3=LTR)                                                                      |          |                  | ,     | i          | · ·                                    |                                                         |         |
| (n-n-1-n-610-n-n-v)                                                                        | 1        |                  | i i   |            | i i                                    |                                                         |         |
| Rum of Lanes - VII:                                                                        | 1        |                  | 2     | 56         | 19                                     |                                                         |         |
| Grade - V12,V11,V12:                                                                       | 0        |                  | -     |            | ••                                     |                                                         |         |
| Shared Lane-V10,11,12:                                                                     | 3        |                  | 77    | 78         | ¥9                                     |                                                         |         |
| (C=B,1=LT,2=TR,3=LTR)                                                                      |          |                  | •••   |            |                                        |                                                         |         |
| (                                                                                          | i        |                  | HINOR | STREET - H | ARANI ST                               |                                                         |         |
| VOLUNE ADJUSTMENTS                                                                         | ···<br>! |                  |       |            |                                        | *****                                                   |         |
| HOVENERT NO.                                                                               | ł        | 1 2              | 34    | 5 6        | 789                                    | 10 11                                                   | 12      |
| HOJELT FLOW RATE, V(TE                                                                     | b 1      | -                | 3 17  |            | 2 56 19                                |                                                         | 36      |
| VOLUNE, v (poph)                                                                           | -, i     | 255 500 2        |       |            | 2 62 21                                |                                                         | 40      |
|                                                                                            |          |                  |       |            |                                        |                                                         |         |
| STEP 1: RT FROM MINOR STRE                                                                 | ST       |                  |       |            |                                        |                                                         |         |
| Conflicting Flows:                                                                         | !        | Vc3 = 1/2 V3 + V | 2 =   | 262 vhp    | Vc12 = I                               |                                                         | 26 vbp  |
| Potential Capacity:                                                                        | 1        | Cp.9 +           |       | 1021 poph  | Cp,12 *                                |                                                         | 47 peph |
| Novement Capacity:                                                                         |          | C=,9=Cp,9=       |       | 1021 poph  | CE,12=Cp                               | -                                                       | 47 pcph |
| Prb. of Queu-free State                                                                    | :        | po,9=1-v3/Cm,9=  |       | 0.93       | po,12=1-1                              | v12/Ce,12= 0.                                           | 96      |
|                                                                                            |          |                  |       |            |                                        |                                                         |         |
| STEP 2: LT FROM HAJOR STRE                                                                 |          |                  |       |            |                                        |                                                         | ••      |
| Conflicting Flows:                                                                         |          | Vc,4 = V2 + V3 = |       | 523 vbp    | Vc.1 = V                               |                                                         | 31 vhp  |
| Potential Capacity:                                                                        | •        | Cp,4 =           |       | 832 poph   | [ Cp,1 =                               |                                                         | 39 pcph |
| Movement Capacity:                                                                         | -        | C1,4=Cp,4=       |       | gead ees   | Cz,1=Cp,                               |                                                         | 39 pcpł |
| Frb. of Quey-free State                                                                    |          | 20,4=1-V4/Cz4=   |       | 0.93       | [ po,1=1-v)                            | 1/Cal= 0.                                               | 78      |
| Najor Left Shared Lane                                                                     |          |                  |       |            | 1                                      | -                                                       |         |
| Prob. cf Queue-free St                                                                     | 314      | 277.Is           |       | <u>81</u>  | p*3,1+                                 | 3                                                       | Y       |

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| Street: FUFALARI BYPASS<br>Street: NAKARI ST<br>enario: EXISTING 1996<br>k Hour: PN                      |           |           |              | Int                 | tesection I | Analys      | t:<br>E:     | 26-Jul-96<br>BC<br>PUKNAK-P |
|----------------------------------------------------------------------------------------------------------|-----------|-----------|--------------|---------------------|-------------|-------------|--------------|-----------------------------|
| TH FROM MINOR STREET                                                                                     |           |           |              | 1                   |             |             |              |                             |
| flicting Ylows:                                                                                          | Yc.,8 +   | 1/2V3+V2+ | V1+V6+V5+V4  | Ì                   | Vc.,11 = 1/ | 246+85+84+8 | 3+72+1       | 71 ·                        |
| -                                                                                                        | 1 1       |           | 1043         | vph ]               | 2           |             |              |                             |
| ential Capacity:                                                                                         | Cp.8 =    |           | 268 p        | ocph [              | Cp,11 =     |             | 256          | pcph                        |
| acity Adj Factor:                                                                                        | f8 = po,  | 4°p0,1 =  | 0.76         |                     | f11 = po,4* | po,1 =      | 0.75         |                             |
| ement Capacity:                                                                                          | [Cx.8 = C | p,3*f8 =  | 204 p        | ocph                | CE,11 = Cp, | 11°f11 =    | 282          | bctp                        |
| b. of Queue-free State:                                                                                  | F0.8 = 1  | -v8/Cz,8  | . 0.70       |                     | po,11 = 1-V | 11/Cz,11 =  | 0.51         |                             |
| LT PRON MINOR STREET                                                                                     | }<br>}    |           |              |                     |             |             |              |                             |
| flicting Flows:                                                                                          |           |           | 1+1/2V6+V5+V |                     | Vc.10 = 1/2 | V6+V5+V4+1/ | 273+72       | 2+V1+                       |
| ·                                                                                                        | 1 1       |           | 2) = 1073    |                     |             | ¥8+¥9} =    | 1854         | vph                         |
| ential Capacity:                                                                                         | Cp7 =     |           | 218 p        | cpb                 | Cp10 =      |             | 225          |                             |
| er Left, Hinor Through                                                                                   | Ì         |           |              | 1                   |             | _           |              |                             |
|                                                                                                          | P' 7=pG.  | 11°f11 =  | 0.61         |                     | P''10=po,8* | f8 =        | 0.53         |                             |
| or Left, Nimor Through                                                                                   |           |           |              | l                   |             |             |              |                             |
| justed Impedance Factor:                                                                                 | 1p'7 *    |           | 0.70         | !                   | p'10 =      |             | 0.63         |                             |
| acity Adjustment Factor:                                                                                 | E7 = p'7  | "po,12 =  | 0.57         | i i                 | 110 = p'10' | po,y =      | 0.52         |                             |
| ement Capacity:                                                                                          | ;C2,7 = 1 | 1°C0,7 ×  | 146 p        | ocpa i              | LE,10 * 110 |             | ۲:.<br>····· |                             |
| AND LEVEL OF SERVICE SUMM                                                                                | 142T      |           |              | ÅŸG                 |             |             |              |                             |
|                                                                                                          |           |           |              | TOTAL               |             | İ           |              |                             |
| ENENT                                                                                                    | v(poph)   | ca(peph)  | csh(pcph)    | DELAY               | LOS         | 1           |              |                             |
|                                                                                                          |           |           |              |                     |             |             | er=#**       |                             |
| OR LEFT TURN (7)                                                                                         | 2         | 146       |              |                     |             | L PPARP OX  | 97V.LI       | CE CRITERIA                 |
| DR THROUGH (8)                                                                                           | 62        | 204       | 251<br>CURR  | 21.5                |             | 1           |              | ATG                         |
| OR RIGHT TUEN (3)                                                                                        |           | 1921      | SARD         | SHAD                |             | I LEVEL     |              | TOTAL                       |
| OR LEFT TURE (10)                                                                                        | 4         | 112       | SHRD         | SHRD                |             |             |              | DELAY                       |
| DR THROUGH (11)                                                                                          |           |           |              | 15.5                |             |             |              | (SEC/VEH)                   |
|                                                                                                          | 40        |           |              | SHRD                |             | 1           |              |                             |
|                                                                                                          |           |           | - 4 11 2     |                     |             | Å           |              | <*5                         |
|                                                                                                          |           | 1139      | ¤A           | 4.1                 | Y           |             |              | >56<=10                     |
|                                                                                                          | Z36       |           |              | •                   |             |             |              | >19£<=20                    |
| OR LEFT (1)                                                                                              | 256<br>17 | 898       | #8           | 4.1                 | Å           |             |              | >205<=30                    |
| OR LEFT (1)                                                                                              |           |           |              | 4.1                 | ۸           |             |              |                             |
| OR LEFT (1)                                                                                              |           |           |              | 21.5                | D           | •           |              | >30&<=45                    |
| OR LEFT (1)<br>OR LEFT (4)                                                                               |           |           |              |                     | D           | j D         |              |                             |
| OR LEFT (1)<br>DR LEFT (4)<br>OR APPROACH (7)(9)(3)<br>DR APPROACH (10)(11)(12)                          |           |           |              | 21.5<br>15.5        | D<br>C      | D<br>  E    |              | >30&<=45                    |
| OR LEFT (1)<br>OR LEFT (4)<br>OR APPROACH (7)(9)(3)<br>OR APPROACH (10)(11)(12)<br>CR AFPROACH (1)(2)(3) |           |           |              | 21.5<br>15.5<br>1.3 | р<br>с<br>д | D<br>  E    |              | >30&<=45                    |
| OR LEFT (1)<br>DR LEFT (4)<br>OR APPROACH (7)(9)(3)<br>DR APPROACH (10)(11)(12)                          |           |           |              | 21.5<br>15.5        | р<br>с<br>д | D<br>  E    |              | >30&<=45                    |

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| KULAMALU                        |                               |              |         |                                  | 10/22/96                         | 1             |
|---------------------------------|-------------------------------|--------------|---------|----------------------------------|----------------------------------|---------------|
| EXISTING 1996 CO                | NDITIONS                      |              |         |                                  | 10:02:57                         | ·             |
| AM PEAK HOUR                    |                               |              |         |                                  |                                  | ***           |
|                                 |                               |              |         |                                  |                                  | ,             |
|                                 |                               |              | metor   | Voluee                           |                                  |               |
| SIGNAL94/TEAPAC(                | V1 L1.41 - Sum                | mary or Para | ameter  | VALUES                           |                                  |               |
| Interpretion                    | Parameters for                | Tot # 0      | - PUKAL | ANI BYPASS & MAK                 | AWAO AV                          | :             |
| INCERSECTION                    | Farameters for                | 1110 11 0    |         |                                  |                                  | ·• •          |
| METROAREA                       | NONCBD                        |              |         |                                  |                                  | flores.       |
| LOSTTIME                        | 2.0                           |              |         |                                  |                                  |               |
| LEVELOFSERVICE                  | C S                           |              |         |                                  |                                  | i             |
| NODELOCATION                    | 0 0                           |              |         |                                  |                                  |               |
| Assussed Bres                   | matara                        |              |         |                                  |                                  | Çagas         |
| Approach Para                   | meters                        |              |         |                                  |                                  | •             |
| APPLABELS                       | SB                            | Wi           | в       | NB                               | E8                               |               |
| GRADES                          | .0                            | -6.          |         | .0                               | . 6.0                            | 5m-1          |
| PEDLEVELS                       | LOW                           | LO           | W       | LOW                              | LOW                              | ,             |
| PARKINGSIDES                    | NONE                          | NON          |         | NONE                             | NONE                             |               |
| PARKVOLUMES                     | 20                            | 20           |         | 20                               | 20<br>0                          |               |
| BUSVOLUMES                      | 0                             |              | 0       | 0                                | 11                               | •             |
| RIGHTTURNONREDS                 | 33                            | 10           | 4       | Ŧ                                | **                               |               |
| Movement Para                   | weters                        |              |         |                                  |                                  | <b>1</b> 444- |
| HOVEMENT Para                   |                               |              |         |                                  |                                  | • • •         |
| MOVLABELS                       | RT TH L                       | T RT T       | H LT    | RT TH LT                         | RT TH LT                         | •             |
| VOLUMES                         | 351 267 14                    |              | 72      | 6 214 <b>2</b> 1                 | 11 17 47                         | **** _        |
| WIDTHS                          | 12.0 12.0 12.                 | 0 12.0 12.0  | 0 12.0  | 12.0 12.0 12.0                   | 12.0 24.0 12.0                   | ·             |
| LANES                           |                               |              | 1 1     | 1 1 1                            | 1 2 1                            |               |
| UTILIZATIONS                    | 1.00 1.00 1.0                 |              |         | 1.00 1.00 1.00 2.0 2.0 2.0       | 1.00 1.00 1.00<br>2.0 2.0 2.0    | _             |
| TRUCKPERCENTS                   | 2.0 2.0 2.                    |              |         | 2.0 2.0 2.0<br>.95 .95 .95       | .95 .95 .95                      |               |
| PEAKHOURFACTORS<br>ARRIVALTYPES | .95 .95 .9<br>3 3             |              | 3 3     | 3 3 3                            | 3 3 3                            | •             |
| ACTUATIONS                      | NO YES YE                     |              |         | NO YES YES                       | NO YES YES                       |               |
| REQCLEARANCES                   | 4.0 4.0 4.                    |              |         | 4.0 4.0 4.0                      | 4.0 4.0 4.0                      |               |
| MINIMUMS                        | 5.0 5.0 5.                    | 0 5.0 5.     | 0 5.0   | 5.0 5.0 5.0                      | 5.0 5.0 5.0                      | •••           |
| IDEALSATFLOWS                   | 1900 1900 190                 |              |         | 1900 1900 1900                   | 1900 1900 1900                   |               |
| FACTORS                         | 1.00 1.00 1.0                 |              |         | 1.00 1.00 1.00                   | 1.00 1.00 1.00                   | <b>Wel</b>    |
| DELAYFACTORS                    | 1.00 1.00 1.0                 |              |         | 1.00 1.00 1.00                   | 1.00 1.00 1.00<br>1.00 1.00 1.00 | er.t          |
| NSTOPFACTORS                    | 1.00 1.00 1.0                 |              |         | 1.00 1.00 1.00<br>NORM NORM NORM | NORM NORM NORM                   |               |
| GROUPTYPES<br>SATURATIONFLOWS   | NORM NORM NOR<br>1539 1863 81 |              |         | 1539 1863 623                    | 1493 3614 1717                   | A             |
| SATURATION FLOWS                | 1009 1000 01                  |              | / 1020  |                                  | • • • • • • • •                  | <b>6</b> 11 B |
| Phasing Param                   | eters                         |              |         |                                  |                                  |               |
|                                 |                               |              |         |                                  |                                  | à -           |
| SEQUENCES                       | 14                            |              |         |                                  |                                  | ر<br>منظ      |
| PERMISSIVES                     | YES NO                        |              | NO      | LEADLAGS                         | NONE NONE                        | •             |
| OVERLAPS                        | NO NO                         | NO           | NO      | OFFSET<br>PEDTIME                | 1 00.<br>0 0.                    |               |
| CYCLES                          | 60 180<br>25 00 8 00          |              |         | PEDITIE                          |                                  |               |
| GREENTIMES<br>Yellowtimes       | 25.00 8.00                    | 25.00        |         |                                  |                                  | <b>F</b> •••1 |
| CRITICALS                       | 0 0                           |              |         |                                  |                                  | <b>L</b>      |
| EXCESS                          | õ                             | ·            |         |                                  |                                  | • •           |
|                                 | -                             |              |         |                                  |                                  | ¢1            |
|                                 |                               |              |         |                                  |                                  |               |
|                                 |                               |              |         |                                  |                                  | ъ. ·          |
|                                 |                               |              |         |                                  |                                  | <b>**</b> * 1 |
|                                 |                               |              |         |                                  |                                  |               |

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KULAMALU EXISTING 1996 CONDITIONS AM PEAK HOUR

### 10/22/96 10:03:01

SIGNAL94/TEAPACIV1 L1.41 - Capacity Analysis Summary

Intersection Averages for Int # 0 - PUKALANI BYPASS & MAKAWAD AV Degree of Saturation (v/c) .44 Vehicle Delay 9.1 Level of Service B+ \_\_\_\_\_

| Sq 14<br>**/** | ! Phase 1        | ¦ Phase 2          | Phase 3     |          |          |               |
|----------------|------------------|--------------------|-------------|----------|----------|---------------|
| **/**          | : + + +          | !                  |             |          |          |               |
| •              | <del>+</del> + + |                    | ++++        | l<br>t   |          |               |
| 711            | \<+ + +>         | 1                  | {           |          |          |               |
|                | l v              | ++++               | 1           |          |          |               |
| i              |                  | !++++ v            |             |          |          |               |
| North          | . <+ + +>        | 1                  | ++++>       |          |          |               |
| !              | . + + +          |                    | ++++        |          |          |               |
| •              | + + +            | •                  | l v         |          |          |               |
|                |                  |                    |             | -        |          |               |
|                | ! G/C= 431       | G/C= .138          | G/C= .431   | 1        |          |               |
|                |                  | G= 8.0"            |             |          |          |               |
|                | -                | Y+R= .0"           |             |          |          |               |
|                |                  | OFF=43.1%          |             |          |          |               |
|                |                  | , UFI-40.1%        |             | •        |          |               |
| •              | C= 58 sec        | $c = EB \land coc$ | -100 0% Y-  | 0 600 7  | .0% Ped= | .0 sec = .0%  |
| -              | C- 30 50C        | - 30.0 Sec -       | -100.0% 1-  | .0 580 - | .0% Feu- | .0 3600%      |
|                |                  |                    |             |          |          |               |
| Lane           | Width/;          | g/C                | Service Ral | al Adi l |          | ¦ L ¦90% Max¦ |
| I LANG         |                  | 9/0                |             |          | 1 1011   |               |

Group | Lanes | Read Used | @C (vph) @E !Volume | v/c | Delay | S | Queue | \_\_\_\_\_

SB Approach

· .. .· • • •

9.0 B+ 

 RT
 12/1
 .254
 .397
 564
 610
 335
 .549
 9.5
 B+!
 165
 ft!

 TH
 12/1
 .183
 .397
 693
 739
 281
 .380
 8.2
 B+!
 138
 ft!

 LT
 12/1
 .246
 .397
 280
 323
 156
 .483
 9.4
 B+!
 77
 ft!

| :=: | ===== | ==== | ===== | = = : | ====== | = = : | ====== | :== | ===== | = = = | ===== | : = = | ===== | : = : | ===== | ===: | ====== | :=: | ===== | === | = = = |
|-----|-------|------|-------|-------|--------|-------|--------|-----|-------|-------|-------|-------|-------|-------|-------|------|--------|-----|-------|-----|-------|
|     | RT    | 1    | 12/1  | 1     | .009   | :     | .397   | ł   | 564   | :     | 610   | 1     | 5     | :     | .008  | :    | 6.8    | 1   | 84 [  | 25  | ft    |
|     | тн    | İ    | 12/1  | 1     | .152   | ;     | .397   | 1   | 693   | 1     | 739   | !     | 225   | 1     | . 304 | ł    | 7.8    | 1   | B+ {  | 111 | ft    |
|     | LT    | 1    | 12/1  | 1     | .000   | 1     | .397   | 1   | 207   | 1     | 247   | ;     | 22    | -     | .089  | 1    | 7.1    | 1   | B+¦   | 25  | ft    |

WB Approach 9.3 B+ RT | 12/1 | .044 | .397 | 583 | 629 | 40 | .064 | 7.0 | 84 | 25 ft; TH | 12/1 | .254 | .397 | 715 | 761 | 428 | .562 | 9.5 | 84 | 211 ft LT | 12/1 | .004 | .103 | 138 | 185 | 2 | .011 | 15.1 | C+! 25 ft; ~~~~~ EB Approach 13.2 8 

 RT
 12/1
 .002
 .397
 546
 592
 1
 .002
 6.8
 8+
 25
 ft

 TH
 24/2
 .010
 .397
 1401
 1433
 18
 .013
 6.9
 8+
 25
 ft

 LT
 12/1
 .048
 .103
 128
 173
 49
 .275
 15.7
 C+
 36
 ft

 LT

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                     |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| KULAMALU<br>EXISTING 1996 CC<br>PM PEAK HOUR                                                                                                                                                                                                        | DNDITIONS                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 10/22/96<br>10:04:18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| SIGNAL94/TEAPACI                                                                                                                                                                                                                                    | VI LI.4  - Summar                                                                                                                                                                  | y of Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Values                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Intersection                                                                                                                                                                                                                                        | Parameters for In                                                                                                                                                                  | t # 0 - PUKAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ANI BYPASS & MAK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | AWAD AV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | LC>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| METROAREA<br>LOSTTIME<br>LEVELOFSERVICE<br>NODELOCATION                                                                                                                                                                                             | NONCBD<br>2.0<br>C S<br>O O                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 40.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Approach Para                                                                                                                                                                                                                                       | ameters                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| APPLABELS<br>GRADES<br>PEDLEVELS<br>PARKINGSIDES<br>PARKVOLUMES<br>BUSVOLUMES<br>RIGHTTURNONREDS                                                                                                                                                    | SB<br>.0<br>LDW<br>NONE<br>20<br>0<br>96                                                                                                                                           | WB<br>-6.0<br>LOW<br>NONE<br>20<br>0<br>72                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | NB<br>.0<br>LOW<br>NONE<br>20<br>0<br>1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | EB<br>6.0<br>LOW<br>NONE<br>20<br>0<br>13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Movement Para                                                                                                                                                                                                                                       | meters                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| MOVLABELS<br>VOLUMES<br>WIDTHS<br>LANES<br>UTILIZATIONS<br>TRUCKPERCENTS<br>PEAKHOURFACTORS<br>ARRIVALTYPES<br>ACTUATIONS<br>REQCLEARANCES<br>MINIMUMS<br>IDEALSATFLOWS<br>FACTORS<br>DELAYFACTORS<br>NSTOPFACTORS<br>GROUPTYPES<br>SATURATIONFLOWS | 1 1 1<br>1.00 1.00 1.00<br>2.0 2.0 2.0<br>.95 .95 .95<br>3 3 3<br>NU YES YES<br>4.0 4.0 4.0<br>5.0 5.0 5.0<br>1900 1900 1900<br>1.00 1.00 1.00<br>1.00 1.00 1.00<br>NORM NORM NORM | RT       TH       LT         118       204       2         12.0       12.0       12.0         1       1       1         1.00       1.00       1.00         2.0       2.0       2.0         .95       .95       .95         .3       .3       .3         NO       YES       YES         4.0       4.0       4.0         5.0       5.0       5.0         1900       1900       1900         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         NDRM       NDRM       NDRM         1585       1917       1823 | RT       TH       LT         4       275       19         12.0       12.0       12.0         1       1       1         1.00       1.00       1.00         2.0       2.0       2.0         .95       .95       .95         3       3       3         NO       YES       YES         4.0       4.0       4.0         5.0       5.0       5.0         1900       1900       1900         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         NORM       NORM       NORM | RT       TH       LT         41       203       260         12.0       24.0       12.0         1       2       J         1.00       1.00       1.00         2.0       2.0       2.0         .95       .95       .95         3       3       3         ND       YES       YES         4.0       4.0       4.0         5.0       5.0       5.0         1900       1900       1900         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.493       3614       1717 | <ul> <li>a</li> <li>b</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <li>c</li> <lic< li=""> <li>c</li> <li>c</li> <li>c</li></lic<></ul> |
| Phasing Param                                                                                                                                                                                                                                       | eters                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>4</b> - [                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| SEQUENCES<br>PERMISSIVES<br>OVERLAPS<br>CYCLES<br>GREENTIMES<br>YELLOWTIMES<br>CRITICALS<br>EXCESS                                                                                                                                                  | 14<br>YES NO<br>NO NO<br>60 180<br>25.00 15.00 25<br>.00 .00<br>0 0                                                                                                                | YES ND<br>ND ND<br>10<br>.00<br>.00<br>.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | LEADLAGS<br>OFFSET<br>PEDTIME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | NONE NONF<br>.00 1<br>.0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | a f                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                     |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ₿+₩*1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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KULAMALU EXISTING 1996 CONDITIONS PM PEAK HOUR

10/22/96 10:05:01

SIGNAL94/TEAPACIV1 L1.41 - Capacity Analysis Summary

Intersection Averages for Int # 0 - PUKALANI BYPASS & MAKAWAG AV Degree of Saturation (v/c) .43 Vehicle Delay 13.0 Level of Service B

| Sa 14<br>**/**                 | Phase 1                                                     | ¦ Phase 2                                       | l Phase 3                           | -                                        |                                                                       |
|--------------------------------|-------------------------------------------------------------|-------------------------------------------------|-------------------------------------|------------------------------------------|-----------------------------------------------------------------------|
| North                          | + + +<br>+ + +<br><+ + +><br>V<br><+ + +><br>+ + +<br>+ + + |                                                 |                                     | •                                        |                                                                       |
|                                | G= 25.0"<br>  Y+R= .0"<br>  DFF= .0%                        | G/C:= .231<br>G= 15.0"<br>Y+R= .0"<br>OFF=38.5% | G= 25.0"<br>Y+R= .0"<br>OFF=61.5%   |                                          |                                                                       |
|                                | C= 65 sec                                                   | G= 65.0 sec =                                   | =100.0% Y=                          | .0 sec = .0%                             | * Ped= .0 sec = .0*                                                   |
| ¦ Land<br>¦ Gro                | Width/;<br>Dup ¦ Lanes;                                     | q/C<br>Reqd Used                                | Service Rat<br>@C (vph) @E          | e¦ Adj  <br> Volume¦ v/c                 | HCM   L  90% Max <br>: Delay   S   Queue                              |
| SB Apr                         | proach                                                      |                                                 |                                     |                                          | 11.4 B                                                                |
| R1<br>  TF<br>  L1             | 12/1   .                                                    | .003   .354  <br>.190   .354  <br>.267   .354   | 601 ¦ 659                           | 1   .002<br>  286   .434<br>  108   .548 |                                                                       |
| NB App                         | roach                                                       |                                                 |                                     |                                          | 10.6 B                                                                |
| ======<br>  RT<br>  TH<br>  LT | 12/1                                                        | 007   .354  <br>192   .354  <br>000   .354      | 488 ! 545<br>601 ! 659<br>159 ! 199 | 289 .439                                 | ======================================                                |
| WB App                         |                                                             |                                                 |                                     |                                          | 9.8 K+                                                                |
| RT<br>TH                       | 12/1 .                                                      | 055   .354  <br>147   .354                      | 504   561<br>620   679<br>297   365 | 48 .086                                  | 9.8 B+<br>9.0   B+  28 ft!<br>10.0   B+! 127 ft!<br>13.5   B   25 ft! |
|                                | roach                                                       |                                                 |                                     |                                          | 17.4 C+                                                               |
| TH                             |                                                             | 081 ( .354 (<br>081 ( .354 (                    | 47]   528                           | 29 .055                                  | 17.4 C+<br>8.9   8+1 25 ft<br>9.3   8+1 63 ft<br>24.6   1 200 ft      |

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| ULAMALU<br>XISTING 1996 CO<br>M PEAK HOUP:                                                                                                                                                                                                          | DNDITIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 10/22/96<br>10:05:27                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IGNAL94/TEAPACI                                                                                                                                                                                                                                     | V1 L1.41 - Summa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ry of Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Values                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Intersection                                                                                                                                                                                                                                        | Parameters for I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | nt# 0 - BYPA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | SS/KULA HWY & HAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | EAKALA HY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| ETROAREA<br>OSTTIME                                                                                                                                                                                                                                 | NONCBD<br>2.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| EVELOFSERVICE<br>ODELOCATION                                                                                                                                                                                                                        | C S<br>0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Approach Para                                                                                                                                                                                                                                       | ameters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| PPLABELS<br>RADES<br>EDLEVELS<br>ARKINGSIDES<br>ARKVOLUMES<br>USVOLUMES                                                                                                                                                                             | SB<br>3.0<br>MODER<br>NONE<br>20<br>0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | WB<br>.0<br>MODER<br>NONE<br>20<br>0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | NB<br>-3.0<br>MODER<br>NONE<br>20<br>O                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | EB<br>.C<br>MODER<br>NONE<br>20<br>C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| IGHTTURNONREDS                                                                                                                                                                                                                                      | o                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Movement Para                                                                                                                                                                                                                                       | ameters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| DVLABELS<br>OLUMES<br>IDTHS<br>ANES<br>TILIZATIONS<br>RUCKPERCENTS<br>EAKHOURFACTORS<br>RRIVALTYPES<br>CTUATIONS<br>EQCLEARANCES<br>INIMUMS<br>DEALSATFLOWS<br>ACTORS<br>ELAYFACTORS<br>STOPFACTORS<br>ROUPTYPES<br>ATURATIONFLOWS<br>Phasing Param | RT       IH       LT         1       170       18         12.0       12.0       12.0         1       1       1         1.00       1.00       1.00         2.0       2.0       2.0         .95       .95       .95         3       3       3         YES       YES       YES         4.0       4.0       4.0         5.0       5.0       5.0         1900       1900       1900         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.385       1835       244 | RT       TH       Lf         87       27       44         12.0       12.0       .0         1       1       0         1.00       1.00       1.00         2.0       2.0       2.0         .95       .95       .95         3       3       3         YES       YES       YES         4.0       4.0       4.0         5.0       5.0       5.0         1900       1900       1900         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00 | RT       TH       LT         68       481       142         12.0       12.0       .0         1       1       0         1.00       1.00       1.00         2.0       2.0       2.0         .95       .95       .95         3       3       3         YES       YES       YES         4.0       4.0       4.0         5.0       5.0       5.0         1900       1900       1900         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.427       1611       0 | RT       TH       L1         215       66       1         12.0       12.0       .0         1       1       C         1.00       1.00       1.00         2.0       2.0       2.0         .95       .95       .95         .3       3       3         YES       YES       YES         4.0       4.0       4.0         5.0       5.0       5.0         1900       1900       1900         1.00       1.00       1.00         1.00       1.00       1.00         NORM       NORM       NORM         1406       1859       C |
| PRASING PAPAN<br>EQUENCES<br>ERMISSIVES<br>VERLAPS<br>YCLES<br>REENTIMES<br>ELLOWTIMES<br>RITICALS<br>XCESS                                                                                                                                         | 11 ALL<br>YES YES<br>NU NO<br>60 120<br>41.77 10.23<br>4.00 4.00<br>8 10<br>0                                                                                                                                                                                                                                                                                                                                                                                                                                              | YES YES<br>NO NO<br>10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | LEADLAGS<br>OFFSET<br>PEDTIME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | NONE NONE<br>.00 1<br>.0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| SIGNA             | 94/TEAPAC[V1 L1.4] - Capacity Analysis Summary                                                                                                                                                                     |                  |
| Inters            | action Averages for Int # 0 - BYPASS/KULA HWY & HALEAKALA HY<br>Degree of Saturation (v/c) .40 Vehicle Delay 5.5 Level of Serv:                                                                                    | ice B+           |
| Sq 11<br>**/**    | Phase 1 ; Phase 2 ;                                                                                                                                                                                                |                  |
| North             | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                              |                  |
| <u>.</u>          | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                              |                  |
| · .               | = 60 sec G= 52.0 sec = 36.7% Y= 8.0 sec = 13.3% Ped= .0 sec =                                                                                                                                                      | - 0%             |
| Lane<br>Grou      | D Lanes! Read Used ! @C (upb) @S [up]                                                                                                                                                                              | Max  <br>Bue     |
| SB App            | Dach 1.6 A                                                                                                                                                                                                         |                  |
| RT<br>TH<br>LT    |                                                                                                                                                                                                                    | =====<br>5       |
| NB Appr           | ach                                                                                                                                                                                                                |                  |
| 1 1/1             | 2.8 A<br>  12/1   .049 ! .729   1034   1041   39   .037   1.5   A   25<br>  12/1   .434   .729 ! 1173   1175   655   .557   2.8  *A   149                                                                          |                  |
| W8 Appr<br>====== | палания 13.0 В                                                                                                                                                                                                     |                  |
| LT+TH             | 12/1   .081   .204   231   287   73   .254   13.1   B   49<br>  12/1   .073   .204   265   324   74   .228   13.0   B   50                                                                                         | የ Ե 🕇            |
| EB Appro          | ach                                                                                                                                                                                                                |                  |
|                   | 13.6       в         12/1       .204       231       287       121       .422       14.1       *8       81         12/1       .060       .204       .17       .379       70       .185       12.8       B       4/ |                  |
|                   |                                                                                                                                                                                                                    |                  |

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|---------------------------------------------|----------------------------------|-------------------------------|----------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                             |                                  |                               |                                  |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| KULAMALU                                    |                                  |                               |                                  |                                  | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| KULAMALU<br>EXISTING 1996 (<br>PM PEAK HOUR | CONDITIONS                       |                               |                                  | 10/22/96<br>10:07:45             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                             |                                  |                               |                                  |                                  | <u></u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| SIGNAL94/TEAPAC                             | (V1 L1.4) - Sumn                 | nary of Paramete:             | ^ Values                         |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                             | Parameters for                   |                               | ASS/KULA HWY & HA                |                                  | E-bea                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| METROAREA                                   | NONCBD                           |                               |                                  |                                  | · ·                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| LOSTTIME<br>LEVELOFSERVICE                  | 2.0<br>C S                       |                               |                                  |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| NODELOCATION                                | 0 0                              |                               |                                  |                                  | ,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Approach Par                                | ameters                          |                               |                                  |                                  | <b>8</b> .46.71                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| APPLABELS<br>GRADES                         | SB                               | WB                            | NB                               | EB                               | ,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| PEDLEVELS                                   | 3.0<br>MODER                     | . O<br>MODER                  | -3.0                             | .0                               | gan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| PARKINGSIDES                                | NONE                             | NONE                          | MODER<br>NONE                    | MODER<br>NONE                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| PARKVOLUMES<br>BUSVOLUMES                   | 20<br>Ú                          | 20                            | 20                               | 20                               | , سلند ت                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| RIGHTTURNONREDS                             | ŏ                                | 0<br>41                       | 0<br>14                          | 0<br>96                          | •                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Movement Para                               | ameters                          |                               |                                  |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| MOVLABELS                                   | RT TH LT                         | RT TH LT                      | RT TH LT                         | RT TH LI                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| VOLUMES<br>WIDTHS                           | 1 361 58                         | 54 29 19                      | 21 234 137                       | 176 40 0                         | ~                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| LANES                                       | 12.0 12.0 12.0                   | 12.0 12.0 .0<br>1 1 0         | 12.0 12.0 .0                     |                                  | 4 -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| UTILIZATIONS                                | 1.00 1.00 1.00                   | 1.00 1.00 1.00                | 1 1 0                            | 1 1 0                            | <b>*</b> ***                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| TRUCKPERCENTS<br>PEAKHOURFACTORS            | 2.0 2.0 2.0                      | 2.0 2.0 2.0                   | 2.0 2.0 2.0                      | 2.0 2.0 2.0                      | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| ARRIVALTYPES                                | .95 .95 .95<br>3 3 3             | .95 .95 .95<br>3 3 3          | .95 .95 .95                      | .95 .95 .95                      | 50m F                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| ACTUATIONS                                  | YES YES YES                      | YES YES YES                   | 3 3 .3<br>Yes yes yes            | 3 3 5<br>Yes yes yes             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| REQCLEARANCES<br>MINIMUMS                   | 4.0 4.0 4.0                      | 4.0 4.0 4.0                   | 4.0 4.0 4.0                      | 4.0 4.0 4.0                      | <b></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| IDEALSATFLOWS                               | 5.0 5.0 5.0<br>1900 1900 1900    | 5.0 5.0 5.0<br>1900 1900 1900 | 5.0 5.0 5.0                      | 5.0 5.0 5.0                      | too                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| FACTORS                                     | 1.00 1.00 1.00                   | 1.00 1.00 1.00                | 1900 1900 1900<br>1.00 1.00 1.00 | 1900 1900 1900                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| DELAYFACTORS                                | 1.00 1.00 1.00                   | 1.00 1.00 1.00                | 1.00 1.00 1.00                   | 1.00 1.00 1.00<br>1.00 1.00 1.00 | and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s |
| NSTOPFACTORS<br>GROUPTYPES                  | 1.00 1.00 1.00<br>NORM NORM NORM | 1.00 1.00 1.00                | 1.00 1.00 1.00                   | 1.00 1.00 1.00                   | 911 - E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| SATURATIONFLOWS                             | 1385 1835 672                    | NORM NORM NORM                | NORM NORM NORM                   | NORM NORM NORM                   | 5 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Phasing Param                               | eters                            |                               | •                                | 1400 1883 ()                     | #"J                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| SEQUENCES                                   | 11 ALL                           |                               |                                  |                                  | â                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| PERMISSIVES                                 | YES YES                          | YES YES                       | LEADLAGS                         | NONE NONE                        | g+                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| OVERLAPS<br>CYCLES                          | NÜ NÜ<br>60 120                  | NO NO                         | OFFSEI                           | .00 1                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| GREENTIMES                                  | 60 120<br>40.76 11.24            | 10                            | PEDTIME                          | .0 U                             | 4-4<br>-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| YELLOWTIMES<br>CRITICALS                    | 1.00 1.00                        |                               |                                  |                                  | <b>T</b> ~~1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| EXCESS                                      | 8 5<br>0                         |                               |                                  |                                  | · :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                             | ·                                |                               |                                  |                                  | :<br>•***                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                             |                                  |                               |                                  |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                             |                                  |                               |                                  |                                  | y P                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                             |                                  |                               |                                  |                                  | <b>W-24</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                             |                                  |                               |                                  |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                             |                                  |                               |                                  |                                  | <b>b</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                             | · .                              |                               |                                  |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                             |                                  |                               |                                  | •                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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| KULAMALU<br>EXISTING<br>PM PEAK I | 1996 CONC                     | DITIONS                                               |                 |                 |          |                  |            |            | 10/22/96<br>10:07:49       |
|-----------------------------------|-------------------------------|-------------------------------------------------------|-----------------|-----------------|----------|------------------|------------|------------|----------------------------|
| SIGNAL94                          | /TEAPACÍVJ                    | LI.4] - Cap                                           | acity A         | nalvsis         | Summar   | Y                |            |            |                            |
|                                   |                               | ages for Int a<br>aturation (v/d                      |                 |                 |          |                  |            |            | Service A                  |
| <br>Sq 11 ¦<br><*/**              | Phase 1                       | ¦ Phase 2                                             | -               |                 |          |                  |            |            |                            |
|                                   | + + +<br>+ + +<br>+ + +><br>V | ··<br>++++<br>< ****<br>****                          |                 |                 |          |                  |            |            |                            |
| lorth  <br>   <br>                | <* * +><br>* * +<br>* * +     | ++++<br>  V                                           |                 |                 |          |                  |            |            |                            |
| C<br>  Y                          | G= 40.8"<br>(+R= 4.0"         | G/C= .187<br>  G= 11.2"<br>  Y+R= 4.0"<br>  OFF=74.6% |                 |                 |          |                  |            |            |                            |
| C=                                | 60 sec                        | G= 52.0 sec =                                         | 86.7%           | Y= 8.0          | ) sec =  | 13.3%            | Ped= .     | 0 sec      | := .0*                     |
|                                   |                               | g/C ;<br>Read Used ;                                  |                 |                 |          |                  |            |            | 90% Max¦<br>Queue ¦        |
| B Approa                          | ch                            |                                                       |                 |                 |          |                  | 2.0        | A          |                            |
| тн                                | 12/1   .                      | .003   .713  <br>.241   .713  <br>.000   .713         | 1308            | 1308            | 380      | .291             | 2.1<br>1.8 | A  <br>  A | 25 ft!<br>92 ft!<br>25 ft! |
| 3 Approa                          | ch ·                          |                                                       |                 |                 |          |                  | 2.7        | A          |                            |
| RT<br>T+TH                        | 12/1   .<br>  12/1   .        | .013 ¦ .713 ¦<br>.377 ¦ .713 ¦                        | 1007 ¦<br>814 ¦ | 1017 :<br>830 : | 7<br>390 | .007             | 1.6<br>2.7 | A<br>*A    | 25 ft:<br>95 ft:           |
| Approa                            | ch                            |                                                       |                 |                 |          |                  | 12 1       | F          |                            |
| RT<br>.T+TH                       | : 12/1 : .<br>: 12/1 : .      | .022 ¦ .221 ¦<br>.049 ¦ .221 ¦                        | 254 ¦<br>329 ¦  | 310 ¦<br>390 ¦  | 14<br>51 | .045 ¦<br>.131 ¦ | 11.9       | 8 !        | 25 ft;                     |
|                                   | ch                            |                                                       |                 |                 |          |                  | 12.4       |            |                            |
| Approa                            |                               |                                                       |                 |                 |          |                  |            |            |                            |

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|                                                  |                          |                               |                                  |                      | <b>Firm</b>        |
|--------------------------------------------------|--------------------------|-------------------------------|----------------------------------|----------------------|--------------------|
|                                                  |                          |                               |                                  |                      |                    |
| KULAMALU                                         |                          |                               |                                  |                      | <b></b>            |
| EXISTING 1996 (<br>AM PEAK HOUR                  | CONDITIONS               |                               |                                  | 10/22/96<br>10:54:46 | •                  |
|                                                  |                          |                               |                                  |                      | ب <b>مت</b> ق<br>ر |
| SIGNAL94/TEAPAC                                  | (VI L1.4) - Summ         | ary of Paramete               | r Values                         |                      | *                  |
| Intersection                                     | Parameters for           | Int # 0 - HAL                 | EAKALA HWY & PUKA                | ALAN1 ST             | <b>8244</b>        |
| METROAREA                                        | NONCBD                   |                               |                                  |                      | · 1                |
| LOSTTIME                                         | 2.0                      |                               |                                  |                      |                    |
| LEVELOFSERVICE                                   | C S                      |                               |                                  |                      | - 1                |
| NODELOCATION                                     | 0 0                      |                               |                                  |                      | - ,                |
| Approach Par                                     |                          |                               |                                  |                      | Binet              |
| APPLABELS                                        | ев<br><del>-5</del> 8    | 56                            | WB                               | NB                   | 7 1                |
| GRADES                                           | 8.0                      | ₩₽                            | NB                               | -85                  |                    |
| PEDLEVELS                                        | MODER                    | .0                            | -8.0                             | 2.0                  | <b></b>            |
| PARKINGSIDES                                     | NONE                     | MODER<br>NONE                 | MODER                            | MODER                | ,                  |
| PARKVOLUMES                                      | 20                       |                               | NONE                             | NONE                 |                    |
| BUSVOLUMES                                       | 0                        | 20                            | 20                               | 20                   | <b></b>            |
| RIGHTTURNONREDS                                  | 141                      | 0                             | 0                                | 0                    | •                  |
| Movement Para                                    | uneters                  |                               | Ŭ                                | 135                  | Ballar,            |
| MOVLABELS                                        |                          |                               |                                  |                      |                    |
|                                                  | RT TH LT                 | RT TH LT                      | RT TH LT                         | RT TH LT             | • •                |
| VOLUMES<br>WIDTHS                                | 141 180 0<br>12.0 12.0 0 | 0 0 0                         | 0 202 193                        | 151 0 608            |                    |
| LANES                                            |                          | 0.0.0.                        | .0 12.0 12.0                     | 12.0 .0 12.0         | A                  |
| UTILIZATIONS                                     | 1.00 1.00 1.00           |                               | 0 1 1                            |                      | • 11               |
| TRUCKPERCENTS                                    | 2.0 2.0 2.0              | 1.00 1.00 1.00                | 1.00                             | 1.00 1.00 1.00       |                    |
| PEAKHOURFACTORS                                  | .95 .95 .95              | 2.0 2.0 2.0                   | 4.0                              | 2.0 2.0 2.0          | • •••••            |
| ARRIVALTYPES                                     | 3 3 3                    |                               | .95 .95 .95                      | .95 .95 .95          |                    |
| ACTUATIONS                                       | NO YES YES               |                               | 3 3 3                            | 3 3 3                |                    |
| REQCLEARANCES                                    | 4.0 4.0 4.0              |                               | NO YES YES                       | NO YES YES           | P                  |
| MINIMUMS                                         | 5.0 5.0 5.0              |                               | 4.0 4.0 4.0                      | 4.0 4.0 4.0          |                    |
| IDEALSATFLOWS                                    | 1900 1900 1900           | 5.0 5.0 5.0<br>1900 1900 1900 | 5.0 5.0 5.0                      | 5.0 5.0 5.0          | 1 · · · · ·        |
| FACTORS                                          | 1.00 1.00 1.00           | 1.00 1.00 1.00                | 1900 1900 1900                   | 1900 1900 1900       |                    |
| DELAYFACTORS                                     | 1.00 1.00 1.00           | 1.00 1.00 1.00                | 1.00 1.00 1.00                   | 1.00 1.00 1.00       | £,                 |
| NSTOPFACTORS                                     | 1.00 1.00 1.00           | 1.00 1.00 1.00                | 1.00 1.00 1.00                   | 1.00 1.00 1.00       | <b>9</b> 4         |
| GROUPTYPES                                       | NORM NORM NORM           | NORM NORM NORM                | 1.00 1.00 1.00<br>NORM NORM NORM | 1.00 1.00 1.00       | -                  |
| SATURATIONFLOWS                                  | 1350 1788 0              | 0 0 0                         | 0 1919 1823                      | NORM NORM NORM       | 4.                 |
| Obacia- C-                                       |                          | <b>V</b>                      | 0 1010 1020                      | 1392 0 1392          |                    |
| Phasing Parame                                   | ers                      |                               |                                  |                      | Be a d             |
| SEQUENCES                                        | 31                       |                               |                                  |                      | ā                  |
| PERMISSIVES                                      | YES YES                  | YES YES                       | LEADLAGS                         |                      | <b>*</b> *** •     |
| OVERLAPS                                         | NO NO                    | NO NO                         | OFFSET                           | NONE NONE            |                    |
| CYCLES                                           | 60 180                   | 10                            | PEDTIME                          | .00 1                | 6 - 1              |
| COFENITIMES                                      |                          | 0.00                          |                                  | .0 0                 |                    |
|                                                  |                          |                               |                                  |                      | Part 1             |
| YELLOWTIMES                                      | 4.00 4.00                | .00                           |                                  |                      |                    |
| YELLOWTIMES<br>CRITICALS                         | 4.00 4.00 9 12           | .00<br>12                     |                                  |                      |                    |
| YELLOWTIMES<br>CRITICALS                         | 4.00 4.00                |                               |                                  |                      | <b>3</b> - 1       |
| YELLOWTIMES<br>CRITICALS                         | 4.00 4.00 9 12           |                               |                                  |                      |                    |
| YELLOWTIMES<br>CRITICALS                         | 4.00 4.00 9 12           |                               |                                  |                      | йн ц<br>н<br>агт 1 |
| GREENTIMES<br>YELLOWTIMES<br>CRITICALS<br>EXCESS | 4.00 4.00 9 12           |                               |                                  |                      | <b>3</b> - 1       |

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| KULAMA<br>EXISTI<br>AM PEA                | ALU<br>ING 1996 CONI<br>AK HOUR         | DITIONS                                 |                                         |                |                                         |                  |                       |             | 10/22/9<br>10:54:5 |
|-------------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|----------------|-----------------------------------------|------------------|-----------------------|-------------|--------------------|
|                                           |                                         | LI.4) - Cap                             |                                         |                |                                         | -                |                       |             |                    |
| 111001 3                                  | Degree of Sa                            | ages for Int<br>aturation (v/           | # 0 =<br>c) _65                         | Vehic          | le Dela                                 | & PUKA<br>V 17.3 | LANI S<br>Leve.       | I<br>L of S | ervice C           |
| Sq 31<br>**/**                            | Phase 1                                 | Phase 2                                 | Phase                                   | <br>3 ¦        |                                         |                  |                       |             |                    |
| •                                         |                                         |                                         | <br>!<br>!                              |                |                                         |                  |                       |             |                    |
|                                           | 1<br>1<br>1                             | <pre>&lt;+ +</pre>                      | -<br>-<br>                              |                |                                         |                  |                       |             |                    |
| Weist<br>North                            | <pre></pre>                             | <+ +                                    | ****<br>                                | 1              |                                         |                  |                       |             |                    |
| :                                         | *+                                      | ; + +                                   | ++++<br>V                               | :              |                                         |                  |                       |             |                    |
|                                           | G/C= .086                               | ¦ G/C= .259<br>¦ G= 15.0"               | G/C= .:                                 | 517 !          |                                         |                  |                       |             |                    |
|                                           | Y+R= 4.0"                               | Y+R= 4.0"                               | Y+R=                                    | .0" :          |                                         |                  |                       |             |                    |
| -                                         |                                         | G= 50.0 sec                             |                                         |                | ) sec =                                 | 13.8%            | Ped=                  | .0 sec      | = .0%              |
| Lane                                      | Width/                                  | g/C                                     | Service                                 | Rate           | Adj                                     |                  | нсм                   | <br>! L     | 90% Max            |
| св<br>Ев                                  |                                         | Read Used                               |                                         | 1) @E ;        | ; Volume ;                              | v/c ;            | Delay                 | S  <br>     | Queue              |
| SB Appr                                   | roach                                   | ======================================= |                                         | ======         |                                         |                  | 10.7                  | В           |                    |
| RT<br>TH                                  | 12/1   .<br>  12/1   .                  | .003   .293  <br>137   .293             | 343<br>468                              | 396 ¦<br>524 ¦ | 1 !<br>189 !                            | .003 :<br>.361 ; | 9.4<br>10.7           | B+ <br>  B  | 25 tt:<br>109 ft;  |
| NB<br>HB Appr                             | ·····                                   |                                         |                                         |                |                                         |                  |                       |             |                    |
| ======<br>TH                              | ======================================= |                                         | ======================================= |                |                                         | ======           | 6.7                   |             | =======            |
|                                           | 12/1                                    | 142 ¦ .448 ¦<br>000 ¦ .121 ¦            | 448                                     | 487 ;          | 213 :                                   | .248 ;           | 6.4<br>6.9            | B+ <br> *B+ | 96 ft¦<br>91 ft¦   |
|                                           |                                         |                                         |                                         |                |                                         |                  |                       |             |                    |
| <br>16<br>8 Appr                          |                                         |                                         |                                         |                |                                         |                  | 26.0                  | D+          |                    |
| NG<br>B Appr<br>E E E E E E E<br>RT<br>LT | ======================================  |                                         | =======<br>634 ¦                        | =====<br>672 : | ======================================= | .025             | 26.0<br>======<br>5.1 | ·           | ======<br>25 ft!   |

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| STING 1996 CONDITIONS       10:56:24         PEAK HOUR       NAL94/TEAPACIVI LI.41 - Summary of Parameter Values         Intersection Parameters for Int # 0 - HALEAKALA HWY & PUKALANI ST         ROAREA       NONCBD         TTIME       2.0         ELOFSERVICE       C         PELOFSERVICE       C         BES       8.0         Approach Parameters       0         LABELS       -BF         MUDER       MODER         MODER       NONE         KINGSIDES       NONE         KUNGLMES       20         20       20         VOLUMES       0         0       0         NONE       NONE         NONE       NONE         VOLUMES       0         110:00       0         VOLUMES       10:00         12:0       12:0         NTH       17         TH UT       TH         LABELS       RT         11:1       0       0         NOWE       NONE         NOMES       10:0       10:0         ILEXELS       RT       TH       LT       RT         LLEXELS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |                 |                  |                    |             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------------|------------------|--------------------|-------------|
| STING 1996 CONDITIONS       10:56:24         PEAK HOUR       NAL94/TEAPACIVI LI.41 - Summary of Parameter Values         Intersection Parameters for Int # 0 - HALEAKALA HWY & PUKALANI ST         ROAREA       NONCBD         TTIME       2.0         ELOFSERVICE       C         PELOFSERVICE       C         BES       8.0         Approach Parameters       0         LABELS       -BF         MUDER       MODER         MODER       NONE         KINGSIDES       NONE         KUNGLMES       20         20       20         VOLUMES       0         0       0         NONE       NONE         NONE       NONE         VOLUMES       0         110:00       0         VOLUMES       10:00         12:0       12:0         NTH       17         TH UT       TH         LABELS       RT         11:1       0       0         NOWE       NONE         NOMES       10:0       10:0         ILEXELS       RT       TH       LT       RT         LLEXELS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | JLAMALU                      |                 |                  |                    |             |
| Intersection Parameters for Int # 0 - HALEAKALA HWY & PUKALANI ST         ROAREA       NONCBD         ITTIME       2.0         ELOPSERVICE       C         C       S       VIG       MØ       MØ         Approach Parameters         LABELS       6B       SO       VIG       VIG       MØ       TE         LABELS       MODER       MODER       MODER       MODER       MODER         NONE       NONE       NONE       NONE         MODER       MODER       MODER       MODER         MOVELMES       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0 </td <td></td> <td>DNDITIONS</td> <td></td> <td></td> <td>10:56:24</td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                              | DNDITIONS       |                  |                    | 10:56:24    |
| RDAREA         NDNCBD           RDAREA         NDNCBD           TITIME         2.0           FELOPSERVICE         C           SELOCATION         0           Approach         Parameters           NLABELS         -00           JES         8.0           JES         8.0           LEVELS         MODER           MODER         NONE           NONE         NONE           KVOLUMES         20           20         20           VOLUMES         0           0         0           Movement Parameters           LABELS         RT           12.0         12.0           12.0         1.00           1         0           0         0           12.0         1.00           1.0         1.00           1.0         1.00           1.00         1.00           1.00         1.00           1.00         1.00           1.00         1.00           1.00         1.00           1.00         1.00           1.00         1.00           1.00 <td>[GNAL94/TEAPACI</td> <td>V1 L1.41 - Summ</td> <td>ary of Parameter</td> <td>Values</td> <td></td>                                                                                                                                                                                                                                                                                                                                                                                                                      | [GNAL94/TEAPACI              | V1 L1.41 - Summ | ary of Parameter | Values             |             |
| ITTME       2.0         ELOPSERVICE       C       S         ELOCATION       O       O         Approach       Parameters       KB       SG       VIS       MB         TLABELS       GB       SG       VIS       MB       THE       TES         DES       8.0       .0       -8.0       2.0       2.0         LEVELS       MODER       MDDER       MDDER       NDNE         KINGSIDES       NONE       NONE       NONE       NONE       NONE         Movement Parameters       0       0       0       177       20       0       0       11       0       1         LIZATIONS       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00                                                                                                                                                                                                                                                                                                                                                                                                    | Intersection                 | Parameters for  | Int # O - HALEA  | AKALA HWY & PUKALA | ANI ST      |
| NELOCATION         0         0           Approach Parameters         EB         SS3         VB         VB           LABELS         -66         -406         -78.0         2.0           DES         8.0         .0         -8.0         2.0           LEVELS         MODER         MDDER         MDDER         MDDER           KINGSIDES         NONE         NONE         NONE         NONE           KVOLUMES         20         20         20         20           VOLUMES         0         0         0         0         0           Movement Parameters         134         0         0         107         280         315         191           UMES         497         179         0         0         0         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1                                                                                                                                                                                                                                                                                                                                                                     | ETROAREA<br>DSTTIME          |                 |                  |                    |             |
| EB         5%         WB         MB         MDE                                                                                                                                                                                                                                                                                    | EVELOFSERVICE<br>DDELOCATION |                 |                  |                    |             |
| LABELS         -BF         -WB         THB         -E8           JDES         8.0         .0         -8.0         2.0           LEVELS         MODER         MDDER         MDDER         MDDER           KINGSIDES         NONE         NONE         NONE         NONE           KINGSIDES         NONE         NONE         NONE         NONE         NONE           VOLUMES         20         20         20         20         .0           WOLUMES         0         0         0         0         0         0           Movement Parameters         134         0         0         0         107         280         315         0         191           UHES         12.0         12.0         0         0         0         0         1         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0                                                                                                                                                                                                                                                                                                                                                                      | Approach Para                |                 | 40               | . 12               | AIB         |
| LEVELS         MODER         MODER <t< td=""><td>PPLABELS</td><td>-88-</td><td>WB.</td><td>-14B</td><td>-28</td></t<>                                                                                                              | PPLABELS                     | -88-            | WB.              | -14B               | -28         |
| KINGSIDES         NONE                                                                                                                                                                                                                                 | RADES<br>EDLEVELS            |                 |                  |                    | MODER       |
| Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution         Involution <thinvoluticon< th="">         Involuticon         Involu</thinvoluticon<>                     | ARKINGSIDES                  | NONE            | NONE             |                    |             |
| NULLINES         134         0         0         196           Movement Parameters         Movement Parameters         124         0         0         107         280         315         0         196           Movement Parameters         Movement Parameters         12.0         12.0         12.0         179         0         0         0         0         107         280         315         0         191           UMES         497         179         0         0         0         0         107         280         315         0         12.0         12.0         12.0         12.0         12.0         0         12.0         12.0         0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0                                                                                                                                                                                                                                                              | ARKVOLUMES                   |                 |                  |                    |             |
| PLABELS       RT       TH       LT                                                                                                                                                                                                                                                                                                                                                                                                                           | JSVOLUMES<br>GHTTURNONREDS   | -               |                  |                    | -           |
| LHBELS         AT         AT <th< td=""><td>Movement Para</td><td>ameters</td><td></td><td></td><td></td></th<>                                                                                                                                                                                                                                    | Movement Para                | ameters         |                  |                    |             |
| LONES         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0         12.0 <t< td=""><td>VLABELS</td><td></td><td></td><td></td><td></td></t<>                                                                                                                                                                 | VLABELS                      |                 |                  |                    |             |
| IES         1         1         0         0         0         0         1         1         1         0         1           ILIZATIONS         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00 <td>LUMES</td> <td></td> <td></td> <td></td> <td></td>                                                                                                                                                                                            | LUMES                        |                 |                  |                    |             |
| LIZATIONS 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                              |                 |                  |                    |             |
| JCKPERCENTS       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0                                                                                                                                                                                                                                                                                                                                                                    | ILIZATIONS                   |                 |                  | 1.00 1.00 1.00     |             |
| INVALTYPES       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | RUCKPERCENTS                 |                 |                  |                    |             |
| UATIONS         NO         YES         YES         YES <t< td=""><td>AKHOURFACTORS</td><td></td><td></td><td></td><td></td></t<>                                                                                                                                                                                                        | AKHOURFACTORS                |                 |                  |                    |             |
| OCLEARANCES       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0                                                                                                                                                                                                                                                                                                                                                                    |                              |                 |                  |                    |             |
| IMUMS       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0 <td< td=""><td></td><td></td><td></td><td></td><td></td></td<>                                                                                                                                                                                                                                                                                                           |                              |                 |                  |                    |             |
| ALSATFLOWS       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00                                                                                                                                                                                                                                                                                                                   | INIMUMS                      |                 |                  |                    | 5.0 5.0 5.0 |
| AYFACTORS       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00                                                                                                                                                                                                                                                                                                                    | DEALSATFLOWS                 | 1900 1900 1900  |                  |                    |             |
| OPFACTORS         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00                                                                                                                                                                                                                                 | ACTORS                       |                 |                  |                    |             |
| OUPTYPESNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORMNORM <t< td=""><td>ELAYFACTORS</td><td></td><td></td><td></td><td></td></t<>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ELAYFACTORS                  |                 |                  |                    |             |
| OURATIONFLOWS         1350         1788         0         0         0         0         0         1919         1823         1392         0         1392           Phasing Parameters         Ouration         O                                                                                                                          |                              |                 |                  |                    |             |
| DUENCES31MISSIVESYESYESYESYESLEADLAGSNONENONERLAPSNONONONOOFFSET.001LES6018010PEDTIME.00ENTIMES5.0015.0030.00.00.00LOWTIMES4.004.00.00.00TICALS91212.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | TURATIONFLOWS                |                 |                  |                    |             |
| MISSIVES         YES         YES         YES         YES         YES         LEADLAGS         NONE         NONE           RLAPS         NO         NO         NO         NO         OFFSET         .00         1           LES         60         180         10         PEDTIME         .0         0           ENTIMES         5.00         15.00         30.00         .00         .00         .00           TICALS         9         12         12         .0         .0         .0         .0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Phasing Para                 | neters          |                  |                    |             |
| Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial         Initial <thinitial< th=""> <thinitial< th=""> <thi< td=""><td>EQUENCES</td><td></td><td>YES VES</td><td>LEADLAGS</td><td>NONE NONE</td></thi<></thinitial<></thinitial<> | EQUENCES                     |                 | YES VES          | LEADLAGS           | NONE NONE   |
| LES 60 180 10 PEDTIME .0 0<br>ENTIMES 5.00 15.00 30.00<br>LOWTIMES 4.00 4.00 .00<br>TICALS 9 12 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | VERLAPS                      |                 |                  |                    |             |
| ENTIMES 5.00 15.00 30.00<br>LOWTIMES 4.00 4.00 .00<br>TICALS 9 12 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | CLES                         |                 |                  |                    |             |
| TICALS 9 12 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | EENTIMES                     | 5.00 15.00      |                  | ,                  |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | LLOWTIMES                    |                 |                  |                    |             |
| ,E99 V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | RITICALS                     |                 | 12               |                    |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | CESS                         | 0               |                  |                    |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                              |                 |                  |                    |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                              |                 |                  |                    |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                              |                 |                  |                    |             |

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SIGNAL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary Intersection Averages for Int # 0 - HALEAKALA HWY & PUKALANI ST Degree of Saturation (v/c) .55 Vehicle Delay 17.0 Level of Service C+ Sq 31 ; Phase 1 ; Phase 2 ; Phase 3 ; + + + ; + + ¦<+ +  $Z_{1N}$ • 1 V ~ \*\*\*\* .... Weist : <+ + <\* + North | + + **|+++**+ \* + : , TT \* + \*\*\*\*\* | G/C= .086 | G/C= .259 | G/C= .517 | G= 5.0" G= 15.0" G= 30.0 Y+R= 4.0" | Y+R= 4.0" | Y+R= .0" OFF= .0% | OFF=15.5% | OFF=48.3% C= 58 sec G= 50.0 sec = 86.2% Y= 8.0 sec = 13.8% Ped= .0 sec = .0% Lane |Width/| g/C | Service Rate| Adj | | HCM | L 90% Max| | Group | Lanes| Regd Used | @C (vph) @E |Volume! v/c | Delay | S | Queue | EB 30.1 D+ SB Approach RT | 12/1 | .321 | .293 | 343 | 396 | 382 | .965 | 39.6 | D | 220 ft| TH | 12/1 | .137 | .293 | 468 | 524 | 188 | .359 | 10.7 | B | 108 ft| \_\_\_\_\_ \_\_\_\_\_ WB. 7.8 8+ NB- Approach TH | 12/1 | .084 | .448 | 821 | 860 | 113 | .131 | 6.1 | 8+| 51 tt| LT | 12/1 | .041 | .121 | 449 | 488 | 295 | .605 | 8.5 !\*B+| 133 tt| NB 5.8 8+ EB Approach RT | 12/1 | .124 | .483 | 634 | 672 | 125 | .186 | 5.5 | 8+| 53 ft| LT | 12/1 | .183 | .483 | 634 | 672 | 201 | .299 | 5.9 |\*8+| 85 ft|

KULAMALU EXISTING 1996 CONDITIONS PM PEAK HOUR

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|----------------------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|------------------------------------------------------------------------------------------|
| KULAMALU<br>EXISTING 1996 CC<br>AM PEAK HOUR | ONDITIONS                        |                                  |                                  | 10/22/96<br>10:53:1e             |                                                                                          |
| SIGNAL94/TEAPAC                              | ľV1 L1.4l − Summa:               | ry of Parameter                  | Values                           |                                  | <b>2004</b><br>1                                                                         |
| Intersection                                 | Parameters for I                 | nt # 0 - HALEA                   | AKALA HWY & MAKAM                | NAO AY                           | BLA1                                                                                     |
| METROAREA                                    | NONCBD                           |                                  |                                  |                                  | т. (                                                                                     |
| LOSTTIME<br>LEVELOFSERVICE                   | 2.0<br>C S                       |                                  |                                  |                                  | B#41                                                                                     |
| NODELOCATION                                 | 0 0                              |                                  |                                  |                                  | × 1                                                                                      |
| Approach Para                                | ameters<br>EB                    | 5B                               | WB                               | NB                               | <b>1</b> 424                                                                             |
| APPLABELS                                    | -95-                             | WB-                              | 118                              | -EB                              | • 1                                                                                      |
| GRADES<br>PEDLEVELS                          | 8.0<br>MODER                     | .0<br>MODER                      | -8.0<br>MODER                    | MODER                            | 5.00 m                                                                                   |
| PARKINGSIDES<br>PARKVOLUMES                  | NONE<br>20                       | NONE<br>20                       | NONE<br>20                       | NONE<br>20                       | 1                                                                                        |
| BUSVOLUMES                                   | 0                                | 0                                | 0                                | с<br>0                           | -                                                                                        |
| RIGHTTURNONREDS                              | -                                | 101                              | U                                | v                                |                                                                                          |
| Movement Para                                |                                  |                                  |                                  |                                  | _                                                                                        |
| MOVLABELS<br>VOLUMES                         | RT TH LT<br>& 197 144            | RT TH LT<br>190 52 22            | RT TH LT<br>29 151 25            | RT TH LI<br>45 67 26             |                                                                                          |
| WIDTHS                                       | .0 12.0 12.0                     | 12.0 12.0 .0                     | .0 12.0 .0                       | .0 12.0 .0                       | <b></b> .                                                                                |
| UTILIZATIONS                                 | 1.00 1.00 1.00                   | 1.00 1.00 1.00                   | 1.00 1.00 1.00                   | 1.00 1.00 1.00                   | 7. I                                                                                     |
| TRUCKPERCENTS<br>PEAKHOURFACTORS             | 2.0 2.0 2.0<br>.95 .95 .95       | <b>(1</b> , <b>1</b> , <b>1</b> , <b>1</b> , <b>1</b> , <b>1</b> , <b>1</b> , <b>1</b> , |
| ARRIVALTYPES                                 | 3 3 3<br>YES YES YES             | ***                                                                                      |
| REQCLEARANCES                                | 4.0 4.0 4.0                      | 4.0 4.0 4.0                      | 4.0 4.0 4.0                      | 4.0 4.0 4.0                      | ga air                                                                                   |
| MINIMUMS<br>IDEALSATFLOWS                    | 5.0 5.0 5.0<br>1900 1900 1900    | 5.0 5.0 5.0<br>1900 1900 1900    | 5.0 5.0 5.0<br>1900 1900 1900    | 5.0 5.0 5.0<br>1900 1900 1900    | ( <b>~</b> )                                                                             |
| FACTORS<br>DELAYFACTORS                      | 1.00 1.00 1.00<br>1.00 1.00 1.00 | 1.00 1.00 1.00<br>1.00 1.00 1.00 | 1.00 1.00 1.00<br>1.00 1.00 1.00 | 1.00 1.00 1.00<br>1.00 1.00 1.00 | <b>b</b> er (                                                                            |
| NSTOPFACTORS<br>GROUPTYPES                   | 1.00 1.00 1.00<br>NORM NORM NORM | 1.00 1.00 1.00<br>NORM NORM NORM | 1.00 1.00 1.00<br>NORM NORM NORM | 1.00 1.00 1.00<br>NORM NORM NORM | 9 - I                                                                                    |
| GROUPTYPES<br>SATURATIONFLOWS                | NORM NORM NORM<br>0 1776 931     | 1406 1720 0                      | 0 1663 0                         | 0 1482 0                         | 1 s                                                                                      |
| Phasing Param                                | neters                           |                                  |                                  |                                  |                                                                                          |
| SEQUENCES                                    | 31                               | _                                |                                  |                                  | <b>3</b> 44                                                                              |
| PERMISSIVES<br>OVERLAPS                      | YES YES<br>NO NO                 | YES YES<br>ND NO                 | LEADLAGS<br>OFFSET               | NONE NONE                        | <b>a</b>                                                                                 |
| CYCLES<br>GREENTIMES                         | 60 180                           | 10                               | PEDTIME                          | .0 0                             | <b>,</b> (                                                                               |
| YELLOWTIMES                                  | .00 .00                          | .00                              |                                  |                                  | Brog                                                                                     |
| CRITICALS<br>EXCESS                          | 0 0<br>0                         | Ċ                                |                                  |                                  | 1                                                                                        |
|                                              |                                  |                                  |                                  |                                  | grad.                                                                                    |
|                                              |                                  |                                  |                                  |                                  | 1                                                                                        |
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| EXISTI<br>AM PEA                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       | CONI                  | JITI                                                                         | ONS                       |                                                                                     |                                                                                                  |                                                                                  |                      |                                                                                            |                       |                                                       |                                             |                                          |      |                                |                                                                      |          |                                                 | 10:                           |                                                                   |
|---------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-----------------------|------------------------------------------------------------------------------|---------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------|-----------------------|-------------------------------------------------------|---------------------------------------------|------------------------------------------|------|--------------------------------|----------------------------------------------------------------------|----------|-------------------------------------------------|-------------------------------|-------------------------------------------------------------------|
| SIGNAL<br>Inters                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | n Av                                                  | vera                  | ages                                                                         | foi                       | r Int                                                                               | : #                                                                                              | ¢                                                                                | -                    | HALE                                                                                       | ака                   | LA H                                                  | WY.                                         | & M4                                     | 1KA1 | WAO<br>L                       | AV<br>eve                                                            | 1 c      | of S                                            | ervi                          | .ce                                                               |
| Sa 31<br>**/**                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                       |                                                                              | has                       | se 2                                                                                |                                                                                                  | Ph                                                                               | ase                  | <br>3                                                                                      | -<br>;                |                                                       |                                             |                                          |      |                                |                                                                      |          |                                                 |                               |                                                                   |
| Weist<br>North                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <br><+ +<br>+ +                                       | · + >                 | + + +                                                                        | + +<br>+ +<br>~<br>~      | • <b>:</b> >                                                                        | +  <<br>+                                                                                        |                                                                                  | ~                    | ++++<br>++++<br>++++                                                                       |                       |                                                       |                                             |                                          |      |                                |                                                                      |          |                                                 |                               |                                                                   |
|                                                                                 | G/C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | = .2<br>15                                            | 0"                    | G=                                                                           | : 1                       | 5.0"                                                                                |                                                                                                  | G=<br>Y+R:                                                                       | 25<br>:              | .0" !<br>.0" !                                                                             |                       |                                                       |                                             |                                          |      |                                |                                                                      |          |                                                 |                               |                                                                   |
| _                                                                               | Y+R                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | = .                                                   |                       |                                                                              |                           | 7.3%                                                                                | !                                                                                                | OFF                                                                              | :54                  | .5%                                                                                        |                       |                                                       |                                             |                                          |      |                                |                                                                      |          |                                                 |                               |                                                                   |
| _                                                                               | Y+R                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | = .                                                   | 0%<br>                | ; OF                                                                         | F=2                       | 7.3%<br>                                                                            |                                                                                                  |                                                                                  |                      |                                                                                            | .0                    | sec                                                   | =                                           | .0                                       | *    | Pec                            | j=                                                                   | .0       | se                                              | c = '                         |                                                                   |
| -<br>(<br>Lane                                                                  | Y+R<br>OFF<br>C= 55                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | sec                                                   | 0%<br><br>/¦          | ; OF<br><br>G= 5                                                             | F=2<br>5.0<br>            | 7.3%<br><br>sec<br>                                                                 | <br>=1<br><br>¦                                                                                  | oo.o<br>Serv                                                                     | )%<br>               | Y=<br>Y=<br>B Rat                                                                          | <br>e¦                | Adj                                                   | <br>i !                                     |                                          |      | <br>ŀ                          | <br>ICM                                                              | · ·<br>! | :<br>L                                          | <br>! 90%                     | <br>Ma                                                            |
| Lane<br>Grou                                                                    | Y+R<br>OFF<br>55<br>1W<br>1P                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | sec                                                   | 0%<br><br>/¦          | ; OF<br><br>G= 5                                                             | F=2<br>5.0<br>            | 7.3%<br><br>sec<br>                                                                 | <br>=1<br><br>¦                                                                                  | oo.o<br>Serv                                                                     | )%<br>               | Y=<br>Y=<br>B Rat                                                                          | <br>e¦                | Adj                                                   | <br>i !                                     |                                          |      | Þ<br>De                        | ICM<br>Blay                                                          | ,        | L<br>S                                          | <br>! 90%                     | <br>Ma                                                            |
| Lane<br>Grou<br>B Appr<br>TH+                                                   | Y+R<br>OFF<br>55<br>1W<br>1P                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | = .<br>sec<br>idth<br>ane                             | 0%<br><br>5:<br>= : : | ; OF<br>G= 5<br>Read<br>                                                     | F=2<br>5.0<br>g/C<br>==== | 7.3%<br>sec<br>Used                                                                 | <br>= 1<br><br>:<br>:<br>:<br>:<br>:<br>:<br>:<br>:<br>:<br>:<br>:<br>:<br>:<br>:<br>:<br>:<br>: | 00.0<br>Serv<br>@C (                                                             | /ice                 | Y=<br>B Rat<br>h) @E<br>=====<br>420                                                       | e:<br>!v<br>====<br>} | Ad;<br>olum<br>                                       | i :<br>ie:<br>:==:                          | v/<br>                                   | <br> | <br>De<br>                     | ICM<br>1 ay<br>5.0                                                   |          | L<br>S<br>C+                                    | 90%<br>Qui                    | <br>Ma<br>eue<br>                                                 |
| Lane<br>Grou<br>B Appr<br>TH+<br>LT<br>B Appr                                   | Y+R;<br>OFF;<br>DFF;<br>V= 55<br>V;<br>V;<br>V;<br>V;<br>V;<br>V;<br>V;<br>V;<br>V;<br>V;<br>V;<br>V;<br>V;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | sec<br>idth<br>ane<br>2/1                             | 0%<br>                | ; DF<br>G= 5<br>Read<br><br>.151<br>.210                                     | F=2<br>5.0<br>g/C         | 7.3%<br>sec<br>Used<br>.236<br>.236                                                 | =                                                                                                | 00.0<br>Serv<br>@C (<br>====<br>365<br>176                                       | )%<br>/iC(<br>vp)    | Y=<br>B Rat<br>h) @E<br>420<br>220                                                         | ===                   | Adj<br>olum<br>213<br>152                             |                                             | v/<br>                                   |      |                                | ICM<br>1.2.6<br>8.4<br>5.0                                           |          | L<br>S<br>C+<br>====<br>C+                      | 90%<br>Qui                    | <br>Ma<br>eue<br>                                                 |
| Lane<br>Grou<br>BB Appr<br>TH+<br>LT<br>B Appr<br>LT+TH+                        | <pre>Y+R;<br/>OFF;<br/>DFF;<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poac</pre> | sec<br>idth<br>ane<br>2/1<br>2/1                      | 0%<br>                | ; DF<br>G= 5<br>Read<br>.151<br>.210<br>.210                                 | F=2<br>5.0<br>g/C         | 7.3%<br>sec<br>Used<br>.236<br>.236<br>.236                                         |                                                                                                  | 00.0<br>Serv<br>@C (<br>====<br>365<br>176<br>                                   |                      | Y=<br>P Rat<br>h) @E<br>420<br>220                                                         |                       | Ad ;<br>olum<br>213<br>152<br>                        |                                             | v/<br>.50<br>.69                         |      |                                | 5.0<br>5.0                                                           |          | L<br>S<br>C+<br>C+<br>C+                        | 90%                           | <br>Ma<br>eue<br><br>5 f<br>                                      |
| EB<br>BB<br>Appr<br>TH+<br>LT<br>WB<br>BB<br>Appr<br>LT+TH+<br>Sp<br>BB<br>Appr | <pre>Y+R;<br/>OFF;<br/>OFF;<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach<br/>Poach</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | sec<br>idth<br>ane<br>2/1<br>2/1<br>2/1               | 0%<br>/ ;<br>5 ;<br>  | ; DF<br>G= 5<br>                                                             | F=2<br>5.0<br>g/C         | 7.3%<br>sec<br>Used<br>.236<br>.236                                                 |                                                                                                  | 00.0<br>Serv<br>@C (<br>====<br>365<br>176                                       | /ica<br>/ica<br>/vpl | Y=<br>B Rat<br>h) @E<br>420<br>220                                                         | e:<br>.v              | Ad ;<br>olum<br>213<br>152<br>216                     |                                             | v/<br>.50<br>.69                         |      | +<br>De<br><br>1<br>1<br>      | ICM<br>5.0<br>2.6<br>8.4<br>5.0<br>===<br>5.0                        |          | L<br>S<br>C+<br>C+<br>C+                        | 90%<br>Qu<br>120<br>90        | Ma<br>eue<br><br>5 f<br>2 f                                       |
| LT+TH+                                                                          | Y+R;<br>OFF;<br>DFF;<br>DF;<br>V;<br>Oach<br>Coach<br>RT;<br>RT;<br>Doach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | sec<br>idth<br>ane<br>2/1<br>2/1<br>2/1               |                       | ; DF<br>G= 5<br>Read<br>.151<br>.210                                         | F=2<br>5.0<br>g/C         | 7.3%<br>sec<br>Used<br>.236<br>.236<br>.509                                         |                                                                                                  | 00.0<br>Serv<br>@C (<br>365<br>176                                               | /ica<br>/ica<br>/vpl | Y=<br>P Rat<br>h) @E<br>420<br>220                                                         |                       | Ad ;<br>olum<br>213<br>152<br>216                     | ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;      | v/<br>.50<br>.69                         |      | +<br>De<br><br>1<br>1<br>      | ICM<br>5.0<br>2.6<br>8.4<br>5.0<br>===<br>5.0                        |          | L<br>S<br>C+<br>C+<br>C+<br>A<br>A<br>B+        | 90%                           | Ma<br>eue<br>5 f<br>2 f                                           |
| LT+TH+<br>Sp<br>Br Appr<br>LT+TH+<br>Sp<br>RT                                   | Y+R;<br>OFF;<br>DFF;<br>DF;<br>V;<br>V;<br>V;<br>V;<br>V;<br>V;<br>V;<br>V;<br>V;<br>V;<br>V;<br>V;<br>V;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | sec<br>idth<br>ane<br>2/1<br>2/1<br>2/1               |                       | ; DF<br>G= 5<br>Read<br>.151<br>.210<br>.162                                 | F=2<br>5.0<br>g/C         | 7.3%<br>sec<br>Used<br>.236<br>.236<br>.509                                         |                                                                                                  | 00.0<br>Serv<br>@C (<br>====<br>365<br>176<br>====<br>817                        | /ica<br>/ica<br>/vpl | Y=<br>P Rat<br>h) @E<br>420<br>220                                                         |                       | Ad ;<br>olum<br>213<br>152<br>216<br>216              | j    <br> = = = = = = = = = = = = = = = = = | v/<br>====<br>.50<br>.69<br>.255         |      | +<br>De<br>= = =<br>1<br>1<br> | ICM<br>5.0<br>2.6<br>8.4<br>5.0<br>5.0<br>6.4<br>1121<br>5.0         |          | L S<br>C+<br>BC+<br>A<br>A<br>B+                | 90%                           | Ma<br>eue<br>5 f<br>2 f                                           |
| LT+TH+                                                                          | Y+R;<br>OFF;<br>OFF;<br>P 55<br>P 10<br>P 10<br>P 10<br>P 10<br>P 10<br>P 10<br>P 10<br>P 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | sec<br>idth<br>ane<br>2/1<br>2/1<br>2/1<br>2/1<br>2/1 |                       | ; DF<br>G= 5<br>Read<br>.151<br>.210<br>.151<br>.210<br>.162<br>.096<br>.068 | F=2<br>5.0<br>g/C         | 7.3%<br>sec<br>Used<br>.236<br>.236<br>.236<br>.236<br>.236<br>.236<br>.236<br>.236 |                                                                                                  | 00.0<br>Serv<br>@C (<br>====<br>365<br>176<br>=====<br>817<br>====<br>546<br>678 |                      | Y=<br>P Rat<br>P Rat<br>420<br>220<br>420<br>220<br>420<br>220<br>420<br>220<br>588<br>719 |                       | Ad;<br>olum<br>213<br>152<br>216<br>216<br>216<br>216 |                                             | v/<br>.50<br>.69<br>.255<br>.160<br>.108 |      |                                | ICM<br>1 ay<br>5.0<br>2.6<br>8.4<br>5.0<br>6.4<br>1 ay<br>6.5<br>6.7 |          | L S<br>C+<br>BC+<br>A=A<br>B+<br>B+<br>B+<br>B+ | 90%<br>90%<br>120<br>90<br>82 | Ma<br>eue<br>5 f<br>2 f<br>3 f<br>3 f<br>3 f<br>3 f<br>1 f<br>3 f |

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                       |                                                                                                                                                                                                              |                                                                                                                                                                                                             |                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| KULAMALU<br>EXISTING 1996 C<br>PM PEAK HOUR                                                                                                                                                                                           | ONDITIONS                                                                                                                                                                                                    |                                                                                                                                                                                                             |                                                                                                                                                                                                           | 10/22/9c<br>10:54:16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| SIGNAL94/TEAPAC                                                                                                                                                                                                                       | [V1 L1.4] - Summa                                                                                                                                                                                            | ary of Parameter                                                                                                                                                                                            | Values                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Intersection                                                                                                                                                                                                                          | Parameters for .                                                                                                                                                                                             | Int # 0 - HALE                                                                                                                                                                                              | АКАLА НWY & МАКАИ                                                                                                                                                                                         | IAD AV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| METROAREA<br>LOSTTIME<br>LEVELOFSERVICE<br>NODELOCATION                                                                                                                                                                               | NONCBD<br>2.0<br>C S<br>0 O                                                                                                                                                                                  |                                                                                                                                                                                                             |                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Approach Par                                                                                                                                                                                                                          | ameters                                                                                                                                                                                                      |                                                                                                                                                                                                             |                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| APPLABELS<br>GRADES<br>PEDLEVELS<br>PARKINGSIDES<br>PARKVOLUMES<br>BUSVOLUMES<br>RIGHTTURNONREDS<br>Movement Para                                                                                                                     | EB<br>SB<br>8.0<br>MODER<br>NONE<br>20<br>0<br>0<br>0                                                                                                                                                        | SB<br>WB<br>ODDER<br>NONE<br>20<br>0<br>188                                                                                                                                                                 | VB<br>THB<br>-8.0<br>MODER<br>NONE<br>20<br>0<br>0                                                                                                                                                        | NB<br>-EB<br>-O<br>MODER<br>NONE<br>20<br>O<br>O                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| MOVLABELS                                                                                                                                                                                                                             |                                                                                                                                                                                                              | RT TH LT                                                                                                                                                                                                    | RT TH LT                                                                                                                                                                                                  | RT TH LT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| VOLUMES<br>WIDTHS<br>LANES<br>UTILIZATIONS<br>TRUCKPERCENTS<br>PEAKHOURFACTORS<br>ARRIVALTYPES<br>ACTUATIONS<br>REDCLEARANCES<br>MINIMUMS<br>IDEALSATFLOWS<br>FACTORS<br>DELAYFACTORS<br>STOPFACTORS<br>GROUPTYPES<br>SATURATIONFLOWS | 33 169 268<br>.0 12.0 12.0<br>0 1 1<br>1.00 1.00 1.00<br>2.0 2.0 2.0<br>.95 .95 .95<br>3 3 3<br>YES YES YES<br>4.0 4.0 4.0<br>5.0 5.0 5.0<br>1900 1900 1900<br>1.00 1.00 1.00<br>1.00 1.00 1.00<br>1.00 1.00 | 251 66 46<br>12.0 12.0 .0<br>1 1 0<br>1.00 1.00 1.00<br>2.0 2.0 2.0<br>.95 .95 .95<br>3 3 3<br>YES YES YES<br>4.0 4.0 4.0<br>5.0 5.0 5.0<br>1900 1900 1900<br>1.00 1.00 1.00<br>1.00 1.00 1.00<br>1.00 1.00 | 27 125 26<br>.0 12.0 .0<br>0 1 0<br>1.00 1.00 1.00<br>2.0 2.0 2.0<br>.95 .95 .95<br>3 3 3<br>YES YES YES<br>4.0 4.0 4.0<br>5.0 5.0 5.0<br>1900 1900 1900<br>1.00 1.00 1.00<br>1.00 1.00 1.00<br>1.00 1.00 | 31       57       1°         31       57       1°         .0       12.0       .0         0       1       0         1.00       1.00       1.00         2.0       2.0       2.0         .95       .95       .95         3       3       3         YES       YES       YES         4.0       4.0       4.0         5.0       5.0       5.0         1900       1900       1900         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         NDRM       NDRM       NDRM         0       1485       0 |
| Phasing Param                                                                                                                                                                                                                         |                                                                                                                                                                                                              |                                                                                                                                                                                                             |                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| SEQUENCES<br>PERMISSIVES<br>DVERLAPS<br>CYCLES<br>GREENTIMES<br>YELLOWTIMES<br>CRITICALS<br>EXCESS                                                                                                                                    | 31<br>YES YES<br>NG NO<br>60 180<br>15.00 15.00<br>.00 .00<br>0 0                                                                                                                                            | YES YES<br>NO NO<br>10<br>30.00<br>.00<br>0                                                                                                                                                                 | LEADLAGS<br>OFFSET<br>PEDTIME                                                                                                                                                                             | NONE NONE<br>.00 1<br>.0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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|                       | LU<br>NG 1996 CONE<br>K HOUR     | DITIONS                                      |                                         |                                                     | 10/22/<br>10:54:                                |
|-----------------------|----------------------------------|----------------------------------------------|-----------------------------------------|-----------------------------------------------------|-------------------------------------------------|
| SIGNAL                | 94/TEAPAC(V)                     | . L1.4) - Cap                                | acity Analysis                          | s Summary                                           |                                                 |
| Inters                | Degree of Sa                     | ituration (v/                                | c) .58 Vehic                            | KALA HWY & MAKA<br>cle Delay 29.1<br>v/c`s (see EVA | 10 level of Service (                           |
| Sq 31<br>**/** -      |                                  |                                              | Phase 3 ;                               |                                                     |                                                 |
| //\<br>W4 s+<br>Horth | ~                                | <pre></pre>                                  | ¦+++↓                                   |                                                     |                                                 |
| 9<br>1<br>1<br>1<br>- | G= 15.0"<br>Y+R= .0"<br>OFF= .0% | G/C= .250<br>G= 15.0<br>Y+R= .0<br>OFF=25.0% | G= 30.0"<br>Y+R= .0"<br>DFF=50.0%       | 0 sec = .0%                                         | Ped= .0 sec = .0                                |
| Lane<br>Grou          | Width/ <br>p   Lanes  F          | g/C ;<br>Read Used ;                         | Service Rate<br>@C (vph) @E             | Adj  <br> Volume  V/c                               | HCM   L  90% Max<br>  Delay   S   Queue         |
| EB<br>BB Appro        | oach                             |                                              |                                         |                                                     |                                                 |
| ======                | ===================              | ===============                              | ======================================= | .================                                   | 51.60 E<br>==================================== |
|                       | RT¦ 12/1 ¦ .<br>  12/1 ¦ .       | 159   _217  <br>325   _217                   | 311 ¦ 372<br>172 ¦ 220                  |                                                     | 15.2   C+  141 ft<br>  79.10  F   186 ft        |
| WB<br>HB Appro        |                                  |                                              |                                         |                                                     | · //.10, r ; 186 Tt                             |
| ======                |                                  | =======================================      |                                         |                                                     | 6.2 B+                                          |
| LT+TH+F               | RT: 12/1 : .                     | 147 ¦ .467 ¦                                 | 735 ¦ 775 ¦                             | 187   .241                                          | 6.2   B+  84 ft                                 |
| B                     |                                  |                                              |                                         |                                                     |                                                 |
| 8 Appro               | ach<br>============              |                                              |                                         |                                                     | 5.9 B+                                          |
| RT                    | 12/1   .                         | 075 ! .467 !                                 | 615 656 9                               | 66 ! 101 !                                          | 5.8   8+  30 ft<br>5.9   8+  53 ft              |
| <br>IB                |                                  |                                              |                                         |                                                     | J. 7 , BT; JS FC.                               |
| B Appro               |                                  |                                              |                                         |                                                     | 5.0 B+                                          |
| ======                |                                  | =======================================      | ======================================= | =======================================             | 6.0   8+! 51 ft                                 |
|                       |                                  |                                              |                                         |                                                     |                                                 |

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| ajor Street: F<br>inor Street: I<br>Scenario: E<br>Peak Hour: | UKALANI ST<br>OLANI ST<br>XISTING 1996<br>AM |            |            |      |       |      |        |        |        |            | I     | Fi   | nt Dat<br>Analys<br>le Ram<br>ction | le:   | 25-Jul-96<br>BC<br>PUKIOL-A |
|---------------------------------------------------------------|----------------------------------------------|------------|------------|------|-------|------|--------|--------|--------|------------|-------|------|-------------------------------------|-------|-----------------------------|
|                                                               |                                              | <br>1      |            |      |       | V12  |        | ¥11    |        | VIE        |       |      |                                     |       |                             |
| Peak Hour Fa                                                  | ctor: 1.0                                    | 0 <u>†</u> |            |      |       | 118  |        | 16     |        | 2          |       |      | (                                   | Rorth |                             |
| MAJOR ST                                                      | REET                                         | - 1        |            |      |       |      |        |        |        |            |       |      |                                     |       |                             |
| Rum of Lanes                                                  |                                              | L İ        |            |      |       |      |        | 1      |        | 1          |       |      |                                     |       |                             |
| Ercl LT - VI (                                                |                                              | 7          |            |      |       | 1    |        | 1      |        | ١          |       |      |                                     |       |                             |
| EICL RT - V3 (                                                |                                              | i i        |            |      |       | ۲    |        | ۷      |        | >          |       |      |                                     |       |                             |
| top/Yield - V3 (                                              |                                              | NÍ         |            |      |       |      |        |        |        |            |       |      |                                     |       |                             |
| Grade - VI,V                                                  |                                              | ) j        |            |      | ۸     |      |        |        |        |            | •     |      |                                     |       |                             |
| •••••                                                         |                                              | i          |            | 1    | 1     |      |        |        |        |            | 4     | 1    |                                     |       |                             |
| Aum of Lanes                                                  | - V5:                                        | L į VI –   | 33 -       |      |       |      |        |        |        |            |       | •    | 5                                   | ¥6    |                             |
| Excl LT - V4 (                                                |                                              | RÍ         |            |      |       |      |        |        |        |            |       |      |                                     |       |                             |
| Ercl RT - V6 (                                                |                                              | 1 j V2     | 54 -       |      | ->    |      |        |        |        |            | •     | (    | 212                                 | V5    |                             |
| top/Tield - V6 (                                              |                                              | NJ         |            |      |       |      |        |        |        |            |       |      |                                     |       |                             |
| Grade - V4,V                                                  |                                              | 3   V3     | 36 -       |      |       |      |        |        |        |            |       |      | 1                                   | V4    |                             |
| 41400 1111                                                    | ••••                                         | 1          |            |      | 1     |      |        |        |        |            |       | 1    |                                     |       |                             |
| NIKOR ST                                                      | REET                                         | - i        |            |      | ۷     |      |        |        |        |            | ۷     |      | AJOR S                              |       |                             |
| Rum of Lanes                                                  |                                              | 1          |            |      |       |      |        |        |        |            |       | 1    | POKALAI                             | AI ST |                             |
| Grade - V7.V                                                  |                                              | e i        |            |      |       | <    |        | •      |        | >          | •     |      |                                     |       |                             |
| Shared Lane-Vi                                                |                                              | 3          |            |      |       | 1    |        |        |        | 1          |       |      |                                     |       |                             |
| @=R,1=LT,2=TR,3=                                              |                                              | Ĩ İ        |            |      |       | 1    |        | Ì      |        | 1          |       |      |                                     |       |                             |
|                                                               | ,                                            | i          |            |      |       | Ì    |        | 1      |        | 1          |       |      |                                     |       |                             |
| Hum of Lanes -                                                | V11:                                         | 1 j        |            |      |       | 223  |        | 17     |        | 1          |       |      |                                     |       |                             |
| Grade - ¥10,¥11                                               |                                              | 0          |            |      |       |      |        |        |        |            |       |      |                                     |       |                             |
| hared Lane-VI0.1                                              |                                              | 11         |            |      |       | ¥7   |        | 78     |        | <b>V</b> 9 |       |      |                                     |       |                             |
| (0=K,1=LT,2=TE,3=                                             | LTR)                                         |            |            |      |       | KINO | R STRE | IBT -  | IOLANI | I ST       |       |      |                                     |       |                             |
|                                                               |                                              |            |            |      |       |      | *****  |        |        |            |       |      |                                     | *     |                             |
| OLUKE ADJUSTNENT                                              | 15                                           | ļ          |            | •    | ,     |      | 5      | 6      | 7      | 8          | 9     | 10   | 11                                  | 12    |                             |
| HOVENENT NO.                                                  |                                              | ł          | 1          | 54   | 3     | 1    |        | 6<br>5 | 223    |            | 1     | 2    | 16                                  |       |                             |
| HOURLY FLOW R                                                 |                                              | 1          | 33         |      |       | -    | 212    | 5      | 245    | 19         | 1     | 2    | 18                                  |       |                             |
| VOLUKE, v (pc;                                                | ( a (                                        | 1          | 36         | 54   | 00    | 1    |        | ,<br>  |        |            | •     |      |                                     |       |                             |
|                                                               | ATVAD CTOTT                                  | 1          |            |      |       |      |        |        | 1      |            |       |      |                                     |       |                             |
| STEP 1: RT FROM S                                             |                                              | i<br>Ives  | = 1/2      | ¥1 . | 82    |      | 54     | vbp    | i      | Vci2       | = 1/2 | ¥6 + | ¥5 =                                | 215   | i vhp                       |
| Conflicting F                                                 |                                              | •          |            | 15 - |       | -    | 1360   | •      | i      | Cp,12      |       |      |                                     |       | pcph                        |
| Potential Capit                                               |                                              | Cp,9       | -<br>-Cp,9 |      |       |      |        | pcph   |        | Cz,12      |       | 2=   |                                     |       | peph                        |
| Novement Capa                                                 | -                                            | po,9       |            |      |       |      | 1.00   | 2.20   | -      | pa,12      |       |      | 12=                                 | 0.88  | • -                         |
| Prb. of Queu-                                                 | [[ee Jlale:                                  | 16012      | •1-43      |      | -<br> |      |        |        |        |            |       |      | •••••                               |       |                             |
| STEP 2: LT FROM I                                             | ATOR STOFFT                                  | 1          |            |      |       |      |        |        | 1      |            |       |      |                                     |       |                             |
|                                                               |                                              | 180.4      | = ¥2       | + 11 | =     |      | 140    | vtp    |        | Ve,1       | * ¥5  | + ¥6 | F                                   | 217   | vàp                         |
| Conflicting F                                                 |                                              | Cp,4       |            |      |       |      | 1478   |        |        | Cp,1 :     |       |      |                                     |       | peph                        |
| Potential Capa                                                | -                                            |            | -Cp,4      |      |       |      |        | peph   | i      | C1,1*      |       | :    |                                     |       | pcpb                        |
| Kovement Capa<br>Prb. of Queu-                                | uluy:<br>Free States                         |            | -1-r4      |      |       |      | 1.00   | -      |        | F2,1*      |       |      |                                     | 0.97  |                             |
| Najor Left Sh                                                 |                                              | 15444      | - ••       |      |       |      |        |        | į      | • •        |       |      |                                     |       |                             |
|                                                               | aten ndni                                    | 1          |            |      |       |      |        |        |        | p*0,1      |       |      |                                     | R.X.  |                             |

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| Kajor Street: PUKALAKI ST<br>Linor Street: IOLAHI ST<br>Scenaric: EXISTING 1996<br>Peak Hour: AK |                        |                      |                        |              |                                      | DATE:<br>Analyst:<br>File Hame:<br>Intesection \$: | 25-Jul-96<br>BC<br>PUKIOL-A |
|--------------------------------------------------------------------------------------------------|------------------------|----------------------|------------------------|--------------|--------------------------------------|----------------------------------------------------|-----------------------------|
| TEP 3: TH FROM MINOR STREET<br>Conflicting Flows:                                                | 1 1                    |                      | V1+V6+V5+V4<br>305 vp! | ı İ          |                                      | /2V6+V5+V4+V3+V<br>3                               | 80 vph                      |
| Potential Capacity:<br>Capacity Adj Factor:                                                      | Cp.8 =<br> f8 = po,    | 4°po,1 =             | 755 pcp<br>0.97        |              | Cp,11 =<br>f11 = po,4                | 7<br>*po,1 = 0.                                    | 59 pcph<br>97               |
| Kovement Capacity:<br>Prob. of Queue-free State:                                                 | (Cz.8 = C              | ε.δ'fS =             | 734 popi               | } {          | cz,II = Cp                           | , 11°111 # /                                       | sa beba                     |
| TEP 4: LT FROM MINOR STREET<br>Conflicting Flows:                                                | <br> Vc.7 = 1          | /2¥3+¥2+¥            | 1+1/2V6+V5+V4+         |              | Vc,10 = 1/                           | 2V6+V5+V4+1/2V3                                    | +72+71+                     |
|                                                                                                  | 1 1                    | /2(V11+V1)           | 2) = 370 vpl           | 1            | 1/2                                  | (48+48) = 3                                        | 12 vph                      |
| Potential Capacity:<br>Najor Left, Ninor Through<br>Impedance Pactor:                            | Í.                     |                      | 647 pcp.<br>0.95       |              |                                      | 6<br>'f8 = 0.                                      |                             |
| Najor Left, Ninor Through<br>Adjusted Impedance Factor:<br>Capacity Adjustment Factor:           | <br>]f'7 =             |                      | 0.96                   |              | p'10 =                               | 0.                                                 |                             |
| Capacity Adjustment Pactor:<br>Novement Capacity:                                                | [f7 = p'7<br>[Cm,7 = 1 | *po,12 =<br>7*Cp,7 = | 0.85<br>547 pcp        |              | $C_{10} = p^{-10}$<br>$C_{10} = f_1$ | *po,9 = 0.<br>0*Cp.10 = 6                          |                             |
| DELAY AND LEVEL OF SERVICE SUN                                                                   | NARY                   |                      |                        | AVG<br>Total |                                      | <br>                                               |                             |
| Kovenert                                                                                         |                        |                      | csh(pcph)              | DELAY        |                                      |                                                    |                             |
| •••                                                                                              | 245                    | 547                  |                        |              | <br>C                                | LEVEL OF SER                                       | VICE CRITERI                |
|                                                                                                  | 19                     |                      | SHRD                   |              |                                      | <br>  LEVEL                                        | AVG<br>Total                |
|                                                                                                  | 2                      |                      | SHRD                   | SHRD         |                                      | j OF                                               | DELAY<br>{SEC/VEH           |
|                                                                                                  | 18<br>130              | 738<br>1078          | 731<br>#X              | 5.1<br>3.8   | B<br>Å                               | SERVICE                                            | {551/468                    |
|                                                                                                  |                        |                      |                        |              | _                                    | Å                                                  | <=5                         |
| HAJOR LEFT (1)<br>HAJOR LEFT (4)                                                                 | 36<br>1                | 1351<br>1470         | FA<br>HA               | 2.7<br>2.5   | Å<br>Å                               | I B<br>I C                                         | >5&<=10<br>>10&<=20         |
| uneva Butt 171                                                                                   | •                      |                      |                        |              |                                      | ) D                                                | >20&<=30                    |
| MINCR APPROACE (7)(8)(9)                                                                         | -                      | -                    | -                      | 12.1<br>4.0  | C<br>A                               | E<br>  E                                           | >30&<=45<br>>45             |
| HINOR APPROACH (10)(11)(12)                                                                      | -                      | •                    | •                      | 9.0          | n                                    |                                                    | ~13                         |
| NAJOR AFFROACH (1)(2)(3)                                                                         | •                      | •                    | •                      | 0.6          | ¥                                    | ļ                                                  |                             |
| NAJOE AFFROACH (4)(5)(6)                                                                         | -                      | -                    | •                      | 0.0          | K                                    | 1                                                  |                             |
| TOTAL INTERSECTION (1-12)                                                                        |                        | -                    | -                      | 5.1          | 2                                    | i                                                  |                             |

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| Najor Street: PUKALA<br>Ninor Street: IOLANI<br>Scenario: EXISTI<br>Peak Hour: Pi | ST<br>Ng 1996 |              |          |          |              |             | In               | Print<br>Ana<br>File<br>tesectio | lyst:<br>Name:  | 25-Jul-<br>BC<br>PUKIOL |
|-----------------------------------------------------------------------------------|---------------|--------------|----------|----------|--------------|-------------|------------------|----------------------------------|-----------------|-------------------------|
| Besk Deve Bester                                                                  |               | 1            |          | ¥12      | ¥11          | V I         |                  | ******                           |                 |                         |
| Peak Hour Factor:                                                                 | 1.00          | 1            |          | 53       | 10           |             | -                |                                  |                 |                         |
| HAJOR STREET                                                                      |               | ĺ            |          | 1        | 10           |             | 7                | (                                | NORTH           |                         |
| Non of Lanes - V2:                                                                | 1             | ļ            |          | Í        | i            | i           |                  |                                  |                 |                         |
| Ercl LT - VI (Y/R):                                                               | Y             |              |          | 1        | 1            | •           | ١                |                                  |                 |                         |
| Excl RT - V3 (Y/R):                                                               | ľ             |              |          | <        | Ţ            |             | >                |                                  |                 |                         |
| Stop/Tield - V3 (Y/R);                                                            | R             | :            |          |          |              |             |                  |                                  |                 |                         |
| Grade - ¥1,¥2,¥3:                                                                 | 0             | }            |          |          |              |             | •                |                                  |                 |                         |
| Hum of Lanes - V5:                                                                | 1             | <br>  V1 137 | /        |          |              |             | 1                |                                  |                 |                         |
| Excl LT - V4 (T/R):                                                               | ı<br>N        |              |          |          |              |             | ••               |                                  | 0 V6            |                         |
| Ercl RT - V6 (T/R):                                                               |               |              | >        |          |              |             |                  |                                  |                 |                         |
| Stop/Tield - V6 (T/N):                                                            | A I<br>N      |              | )        |          |              |             |                  | 10                               | 2 75            |                         |
| Grade - ¥4,¥5,¥6:                                                                 |               | V3 264       |          |          |              |             |                  |                                  | 7 44            |                         |
| NIROR STREET                                                                      | ·•••••        |              | ۲<br>۲   |          |              |             | 1                |                                  |                 |                         |
| Rum of Lanes - V8:                                                                | 1             |              | •        |          |              |             | ٧                |                                  | STREET          |                         |
| Grade - V7, V8, V9;                                                               | 0             |              |          | <        | •            |             |                  | POKALI                           | ANI ST          |                         |
| Shared Lane-V7,8,9:                                                               | 3             |              |          | Ì        | 1            |             | <b>&gt;</b><br>/ |                                  |                 |                         |
| (@=#,1=LT,2=TR,3=LTR)                                                             | ļ             |              |          | ì        | į            | ł           | 1                |                                  |                 |                         |
| Num of Lanes - Vil:                                                               | 1             |              |          | 125      | 25           | Į           |                  |                                  |                 |                         |
| Grade - V10,V11,V12;                                                              | 9             |              |          |          | £.4          | 3           |                  |                                  |                 |                         |
| Shared Lane-Vi0,11,12:<br>(0=N,1=LT,2=TR,3=LTR)                                   | 1 [           |              |          | ٧7       | ¥\$          | ۷9          |                  |                                  |                 |                         |
|                                                                                   | İ.            |              |          | KINOR ST | IRBET - 1    | IOLAHI ST   |                  |                                  |                 |                         |
| VOLCKE ADJUSTMENTS                                                                | !             |              | ******** |          |              | *********   |                  | *                                |                 |                         |
| NOVENERT RO.                                                                      | . 1           | 1            | 23       | 4        | 55           | 78          | 9 10             | 11                               | 12              |                         |
| EOURLY FLOW RATE, V(V)                                                            | ph)           |              | 182 264  | 7 10     | 2 0          | 125 25      |                  |                                  |                 |                         |
| VOLUME, v (pcpb)                                                                  |               | 151          | 182 264  | 8 10     | 20           | 133 28      | 68               | 11                               | 58              |                         |
| STEP 1: RT FROM MINOR STR                                                         | EET           |              |          | *        |              |             |                  |                                  |                 |                         |
| Conflicting Flows:                                                                |               |              | ¥3 + ¥2  | = 18     | 2 vàp        | ¥c12        | = 1/2 ¥6         | + 75 =                           | 102 v           | հթ                      |
| Potential Capacity:                                                               |               | p,9 =        |          |          | 0 peph       | Cp,12       |                  | ••                               | 1229 p          | •                       |
| Kovement Capacity:                                                                |               | ∎,9=Cp,9     |          | 112      | 0 pepb       |             | =Cp,12=          |                                  | 1229 p          | -                       |
| Prb. of Queu-free Stat                                                            | e: 1p         | 0,9=1-v9/    | ′C≡,9×   | 0.9      | 9            | po,12       | =1-v12/Cm        | 12=                              | 0.95            | •                       |
| STEP 2: LT FROM MAJOR STR                                                         | EBT I         | ••           |          |          |              | <br>!       | **               |                                  |                 |                         |
| Conflicting Flows:                                                                | •             | c,4 = V2     | + ¥3 =   |          | 5 thp        | <br>  17~ 1 | - 96 - 96        | _                                |                 |                         |
| Potential Capacity:                                                               | •             | ),4 = 14     |          |          | peph         |             | = V5 + V6        | 1                                | 102 vl          | •                       |
| Revenent Capacity:                                                                | 10            |              |          |          | bcbp<br>bcbp | Cp,1 =      |                  |                                  | 1533 pc         |                         |
| Prt. of Queu-free State                                                           |               | ,4=1-74/     |          | 0.99     |              |             | L6'11(C#1=       |                                  | 1533 pc<br>0.90 | :Pa                     |
| Hajor Left Shared Lane                                                            | 1             |              |          |          |              | [<br>[      |                  |                                  | V.JU            |                         |
| Frob. of Queue-free St                                                            | ate [p        | 0,4=         |          | 0.99     |              | p*0,1=      | r                |                                  | SA              |                         |

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| ajor Street: PUKALARI ST<br>inor Street: IOLARI ST<br>Scenario: EXISTING 1996<br>Peak Hour: PH                                                                                                                                              |                           |                                    | ************               |                                                                |                                     | DATE:<br>Analyst:                                       | 25-Jul-96<br>BC<br>PUKIOL-P                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------------------------|----------------------------|----------------------------------------------------------------|-------------------------------------|---------------------------------------------------------|----------------------------------------------------------------------------|
| TEP 3: TH YRON MINOR STREET                                                                                                                                                                                                                 |                           |                                    |                            | ļ                                                              | Va 11 a 1/                          | 2V6+V5+V4+V3+V                                          | 7181                                                                       |
| Conflicting Flows:                                                                                                                                                                                                                          |                           |                                    | 1+76+75+74                 | ,                                                              | *****                               |                                                         | 28 vph                                                                     |
|                                                                                                                                                                                                                                             | *                         |                                    | 428 vpb<br>650 pcpb        |                                                                | Cp,11 =                             |                                                         | 50 pcph                                                                    |
| Potential Capacity:                                                                                                                                                                                                                         | Cp.8 =                    |                                    |                            |                                                                | fii - no 4*                         | po,1 • 0.                                               | 90 2020                                                                    |
| Capacity Adj Factor:                                                                                                                                                                                                                        | 18 = po,                  | 4°00,1 ×                           | 0.89                       |                                                                |                                     | 11*f11 = 5                                              |                                                                            |
| Capacity Roj Factor:<br>Novement Capacity:<br>Prob. of Queue-free State:                                                                                                                                                                    | [CB,8 = U                 | .p,8-18 =                          | 202 PcPu                   |                                                                |                                     | $11/C_{1,11} = 0.$                                      |                                                                            |
| Prob. of Queue-free State:                                                                                                                                                                                                                  | jp0,8 = 1                 | -78/01,8 •                         | 0.33                       | <br>                                                           |                                     |                                                         | ,                                                                          |
| TEP 4: LT YRON MINOR STREET                                                                                                                                                                                                                 | <br>                      |                                    |                            | I                                                              |                                     |                                                         |                                                                            |
| Conflicting Flows:                                                                                                                                                                                                                          | Vc.7 = 1                  | /2¥3+¥2+¥1                         | +1/2V6+V5+V4+              | i                                                              |                                     | ¥6+¥5+¥4+1/2¥3                                          |                                                                            |
|                                                                                                                                                                                                                                             |                           |                                    | ) = 460 vpb                |                                                                | 1/2(                                | /8+¥9] = 4                                              |                                                                            |
| Potential Capacity:                                                                                                                                                                                                                         | Cp7 =                     |                                    | 574 poph                   |                                                                | Cp10 =                              | 5                                                       | 87 peph                                                                    |
| Najor Left, Kinor Through                                                                                                                                                                                                                   | 1                         |                                    |                            | ļ                                                              |                                     |                                                         | <b>A</b> 7                                                                 |
| Impedance Factor:                                                                                                                                                                                                                           | [P''7=po,                 | 11*fll *                           | 0.88                       |                                                                | P''10=po,8*                         | £8 = 0.                                                 | .85                                                                        |
| Major Left, Kinor Through                                                                                                                                                                                                                   | 1                         |                                    |                            |                                                                |                                     | _                                                       |                                                                            |
| Adjusted Impedance Pactors                                                                                                                                                                                                                  | p'7 =                     |                                    | 0.91                       | I                                                              | p'10 =                              |                                                         | 89                                                                         |
| Capacity Adjustment Factor:                                                                                                                                                                                                                 | £7 = p'7                  | *po,12 =                           | 0.86                       | 1                                                              | f10 = p'10*                         |                                                         | 88                                                                         |
| Novement Capacity:                                                                                                                                                                                                                          | [Ca,7 = 1                 | E7*Cp.7 *                          | 495 popi                   | h                                                              | Ca, 10 = f10                        | *Cp,10 = !                                              | i17 pcpb                                                                   |
|                                                                                                                                                                                                                                             |                           |                                    |                            | <br>۸۷G                                                        |                                     | <br>ł                                                   |                                                                            |
| ELAY AND LEVEL OF SERVICE SUN                                                                                                                                                                                                               | (ARY                      |                                    |                            | TOTAL                                                          |                                     |                                                         |                                                                            |
| NOVENERT                                                                                                                                                                                                                                    | v(nenh)                   | cm(pcph)                           | csb(pcpb)                  | DELAY                                                          | LOS                                 | 1                                                       |                                                                            |
|                                                                                                                                                                                                                                             |                           |                                    |                            |                                                                |                                     | İ                                                       |                                                                            |
| MINOR LEFT TURE (7)                                                                                                                                                                                                                         | 138                       | 495                                | SHRD                       | SHRD                                                           |                                     | LEVEL OF SEI                                            | RVICE CRITERIA                                                             |
|                                                                                                                                                                                                                                             | 28                        | 582                                | 518                        | 10.4                                                           | C                                   |                                                         |                                                                            |
|                                                                                                                                                                                                                                             | 20                        |                                    |                            |                                                                |                                     |                                                         | ۸ŸG                                                                        |
| HIROR THROUGE (8)                                                                                                                                                                                                                           | 20<br>6                   | 1120                               | SHRD                       | SHRD                                                           |                                     | 1                                                       |                                                                            |
|                                                                                                                                                                                                                                             |                           |                                    |                            |                                                                |                                     | LEVEL                                                   | TOTAL                                                                      |
| NINOR THROUGE (8)<br>MINOR RIGHT TURE (9)                                                                                                                                                                                                   | 6                         | 1120                               |                            |                                                                |                                     | <br>  level<br>  of                                     |                                                                            |
| NINOR THROUGE (8)<br>MINOR RIGHT TURM (9)<br>MINOR LEFT TURM (10)                                                                                                                                                                           | 6<br>8                    | 1120<br>517                        | SHRD                       | SHRD                                                           |                                     |                                                         | TOTAL                                                                      |
| NINOR THROUGE (8)<br>MINOR RIGHT TURN (9)<br>MINOR LEFT TURN (10)<br>MINOR THROUGH (11)                                                                                                                                                     | 6                         | 1120<br>517<br>582                 | SHRD<br>SHRD               | SHRD<br>SHRD                                                   |                                     | OF                                                      | TOTAL<br>Delay                                                             |
| NINOR THROUGE (8)<br>MINOR RIGHT TURM (9)<br>MINOR LEFT TURM (10)                                                                                                                                                                           | 6<br>8<br>11              | 1120<br>517                        | SHRD<br>SHRD<br>552        | SHRD<br>SHRD<br>6.7                                            | <br>B                               | OF<br>SERVICE                                           | TOTAL<br>DELAY<br>(SEC/VEH)<br><= 5                                        |
| NIKOR THROUGE (8)<br>MIROR RIGHT TURN (9)<br>MIROR LEIT TURN (10)<br>MIROR THROUGH (11)<br>MIROR RIGHT TURN (12)                                                                                                                            | 6<br>8<br>11<br>58        | 517<br>582<br>1229                 | SHRD<br>SHRD<br>552        | SHRD<br>SHRD<br>6.7                                            | B<br>A                              | OF<br>SERVICE                                           | TOTAL<br>DELAY<br>(SEC/VEH                                                 |
| NIKOR THROUGH (8)<br>MIROR RIGHT TURN (9)<br>MINOR LEFT TURN (10)<br>MINOR THROUGH (11)<br>MINOR RIGHT TURN (12)<br>MAJOR LEFT (1)                                                                                                          | 6<br>8<br>11              | 1120<br>517<br>582<br>1229<br>1533 | SHRD<br>SFRD<br>552<br>FA  | SHRD<br>SHRD<br>6.7<br>3.1                                     | B<br>A                              | OF<br>SERVICE                                           | TOTAL<br>DELAT<br>(SEC/VEH<br><br><=5<br>>5&<=10<br>>10&<=20               |
| NIKOR THROUGE (8)<br>MIROR RIGHT TURN (9)<br>MIROR LEIT TURN (10)<br>MIROR THROUGH (11)<br>MIROR RIGHT TURN (12)                                                                                                                            | 6<br>8<br>11<br>58<br>151 | 517<br>582<br>1229                 | SHRD<br>SERD<br>552<br>\$\ | SHRD<br>SHRD<br>6.7<br>3.1<br>2.6                              | E<br>A<br>A                         | OF<br>SERVICE<br>A<br>B                                 | FOTAL<br>DELAY<br>(SEC/VEH<br><br><= 5<br>>5&<=10                          |
| NIKOR THROUGE (8)<br>MINOR RIGHT TURN (9)<br>MINOR LEFT TURN (10)<br>MINOR THROUGH (11)<br>MINOR RIGHT TURN (12)<br>MAJOR LEFT (1)<br>MAJOR LEFT (4)                                                                                        | 6<br>8<br>11<br>58<br>151 | 1120<br>517<br>582<br>1229<br>1533 | SHRD<br>SERD<br>552<br>\$\ | SHRD<br>SHRD<br>6.7<br>3.1<br>2.6                              | B<br>A<br>A<br>A                    | OF<br>  SERVICE<br> <br>  A<br>  E<br>  C               | TOTAL<br>DELAT<br>(SEC/VEH<br><br><=5<br>>5&<=10<br>>10&<=20               |
| NINOR THROUGE (8)<br>MINOR RIGHT TURN (9)<br>MINOR LEFT TURN (10)<br>MINOR THROUGH (11)<br>MINOR RIGHT TURN (12)<br>MAJOR LEFT (1)<br>MAJOR LEFT (4)<br>MINOR APPROACH (7)(8)(9)                                                            | 6<br>8<br>11<br>58<br>151 | 1120<br>517<br>582<br>1229<br>1533 | SHRD<br>SERD<br>552<br>\$\ | SHRD<br>SHRD<br>6.7<br>3.1<br>2.6<br>3.5<br>10.4               | B<br>A<br>A<br>A                    | OF<br>  SERVICE<br> <br>  A<br>  E<br>  C<br>  D        | TOTAL<br>DELAY<br>(SEC/VEH<br><br>*5<br>>5&<*10<br>>10&<*20<br>>20&<*30    |
| NIKOR THROUGE (8)<br>MINOR RIGHT TURN (9)<br>MINOR LEFT TURN (10)<br>MINOR THROUGH (11)<br>MINOR RIGHT TURN (12)<br>MAJOR LEFT (1)<br>MAJOR LEFT (4)                                                                                        | 6<br>8<br>11<br>58<br>151 | 1120<br>517<br>582<br>1229<br>1533 | SHRD<br>SERD<br>552<br>\$\ | SHRD<br>SHRD<br>6.7<br>3.1<br>2.6<br>3.5                       | <br>B<br>A<br>A<br>C                | OF<br>  SERVICE<br> <br>  A<br>  E<br>  C<br>  D<br>  K | TOTAL<br>DELAY<br>(SEC/VEH<br>>5&<*10<br>>10&<20<br>>20&<20<br>>30&<*45    |
| NINOR THROUGH (8)<br>MINOR RIGHT TURN (9)<br>KINOR LEIT TURN (10)<br>MINOR THROUGH (11)<br>MINOR RIGHT TURR (12)<br>MAJOR LEIT (1)<br>MAJOR LEIT (4)<br>MIROR APPROACH (7)(8)(9)<br>MIROR APPROACH (16)(11)(12)                             | 6<br>8<br>11<br>58<br>151 | 1120<br>517<br>582<br>1229<br>1533 | SHRD<br>SERD<br>552<br>\$\ | SHRD<br>SHRD<br>6.7<br>3.1<br>2.6<br>3.5<br>10.4<br>4.0        | <br>B<br>A<br>A<br>A<br>A<br>C<br>A | OF<br>  SERVICE<br> <br>  A<br>  E<br>  C<br>  D<br>  K | TOTAL<br>DELAY<br>(SEC/VEH<br>>5&<*10<br>>10&<20<br>>20&<20<br>>30&<*45    |
| NINOR THROUGH (8)<br>MINOR RIGHT TURN (9)<br>MINOR LEFT TURN (10)<br>MINOR THROUGH (11)<br>MINOR RIGHT TURN (12)<br>MAJOR LEFT (1)<br>NAJOR LEFT (4)<br>MIEOR APPROACH (7)(8)(9)<br>MIEOR APPROACH (10)(11)(12)<br>MAJOR APPROACH (1)(2)(3) | 6<br>8<br>11<br>58<br>151 | 1120<br>517<br>582<br>1229<br>1533 | SHRD<br>SERD<br>552<br>\$\ | SHRD<br>SHRD<br>6.7<br>3.1<br>2.6<br>3.5<br>10.4<br>4.0<br>9.7 | <br>B<br>A<br>A<br>C<br>A           | OF<br>  SERVICE<br> <br>  A<br>  E<br>  C<br>  D<br>  K | TOTAL<br>DELAY<br>(SEC/VEH)<br>>5&<=10<br>>10&<=20<br>>20&<=30<br>>30&<=45 |
| NINOR THROUGH (8)<br>MINOR RIGHT TURN (9)<br>KINOR LEIT TURN (10)<br>MINOR THROUGH (11)<br>MINOR RIGHT TURR (12)<br>MAJOR LEIT (1)<br>MAJOR LEIT (4)<br>MIROR APPROACH (7)(8)(9)<br>MIROR APPROACH (16)(11)(12)                             | 6<br>8<br>11<br>58<br>151 | 1120<br>517<br>582<br>1229<br>1533 | SHRD<br>SERD<br>552<br>\$\ | SHRD<br>SHRD<br>6.7<br>3.1<br>2.6<br>3.5<br>10.4<br>4.0        | <br>B<br>A<br>A<br>A<br>A<br>C<br>A | OF<br>  SERVICE<br> <br>  A<br>  E<br>  C<br>  D<br>  K | TOTAL<br>DELAY<br>(SEC/VEH)<br>>5&<=10<br>>10&<=20<br>>20&<=30<br>>30&<=45 |

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| Major Street: KULA HWY<br>Minor Street: OHANA ST<br>Peak Hour: AM<br>Scenaric: EXISTINS    | 1996                 | ====              |                     |             |                 |            |                |            | ì      | Print<br>An<br>File<br>nterse | Date:<br>alvat:<br>Name: |          | 27-Nar                 |
|--------------------------------------------------------------------------------------------|----------------------|-------------------|---------------------|-------------|-----------------|------------|----------------|------------|--------|-------------------------------|--------------------------|----------|------------------------|
| Feak Hour Factor:<br>MAJOR STREET                                                          | 1.00                 |                   |                     | ·>          |                 |            |                |            |        |                               | 1,5                      | <br>1    | , <b></b> @ <b>-</b> - |
| Num of Lanes - V2:<br>Excl KT - V3 (Y/N):                                                  | 1<br>N               | 1<br>1 V3         | 4                   |             |                 |            | ·              |            |        | ?                             | V                        |          |                        |
| Stop/Yield - V3 (Y/N):<br>% Grade - V2,V3:                                                 |                      |                   |                     | ۱<br>۷      |                 |            | ,              | 1          |        | AJOR S<br>Ula hw              |                          | 1        |                        |
| Num of Lanes - V3:<br>Excl LT - V4 (Y/N):                                                  | Ņ                    | 1                 |                     |             | K<br>N          |            | ì              |            |        |                               | •                        |          |                        |
| Z Grade - V4.V5:<br>MINCR STREET                                                           |                      | ;                 |                     |             | 2<br>;<br>;     |            | ;<br> <br>  17 |            |        |                               |                          | iort:    | <del>{</del> >         |
| Num of Lanes - V7.V7:<br>Shared Lane (Y/N):<br>% Grade - V7&V9:                            | i<br>Y               | ;                 |                     | HTNAD C     | V7<br>IREET: OH |            | V9<br>T        |            |        |                               |                          |          |                        |
| CLUME ACCUSTMENTS                                                                          |                      |                   |                     |             |                 |            |                | • <b>•</b> |        | ******                        |                          |          |                        |
| MOVEMENT NO.<br>VOLUME, V (vph)                                                            |                      | ב<br>570          |                     | 2           | 4               |            |                | Ξ          |        | 7                             |                          | 7        |                        |
| VOLUME, V (vph)<br>VOLUME, V (pcph)                                                        |                      | 570<br>590        |                     | 4           | 5               |            |                | 522<br>522 |        | 3                             |                          | 17<br>19 |                        |
| STEP 1: RT FROM MINOR S<br>Conflicting Flows:<br>Fotential Capacity:<br>Movement Capacity: | STREET<br>; V<br>; C | c,7 = :,<br>0,9 = |                     |             | 2               | +          | 570            |            | :      | :                             | 507<br>174 p<br>574 p    | cph      |                        |
| ETEP 2: LT FROM MAJOR 3                                                                    |                      |                   | 11- 4 - 93          | 197 -       |                 | 4          | <u>،</u>       | 570        | -      | 1                             | 574                      |          |                        |
| Conflicting Flows:<br>Potential Capacity:                                                  |                      | ;                 | Ve,4 = V3<br>Ce.4 = | TV2 -       |                 | -          | •              | 174        | -      |                               | אינ<br>1973 ס            |          |                        |
| Novement Capacity:                                                                         |                      | 1                 | U3.4 = 13           | 4=          |                 |            |                |            |        |                               | 573 a                    |          |                        |
| Frob. of Gueue-free 3<br>Najor Left Shared Lan                                             |                      | ÷                 | po,4 = :-           | v4/Ca,4 =   |                 |            |                |            |        | Ų,                            | <b>,</b> 57              |          |                        |
| Prob. of Queue-free                                                                        | State:               | ;                 | cte,1 =             |             |                 |            |                |            |        |                               | ,ç;                      |          |                        |
| STEP 3: LT FROM MINOR S<br>Conflicting Flows:                                              | TREET                | - 77              | V-7 - 1/            | 2V3+V2+V5+\ | :4 <u>-</u>     |            |                |            |        | ,                             | 723                      | veb      |                        |
| Potential Capacity:<br>Capacity Adjustment F                                               |                      | ;                 | 52,7 = 27           | 210-12-10-1 | -               |            |                |            |        |                               | 507 p                    |          |                        |
| <ul> <li>Capacity Adjustment P</li> <li>Due To Impeding Nove</li> </ul>                    | actor<br>menta:      |                   | ;7=20.4=            |             |                 |            |                |            |        | ٥.                            | . 77                     |          |                        |
| Novement Capacity:                                                                         |                      | ţ                 | Ca,7 = Cp           | ,7 =        |                 |            |                |            |        |                               | 506 p                    | coh      |                        |
| ELAY AND LEVEL OF SERV<br>Movement                                                         | ICE SU               | MARY              | }                   | ce(acch)    | c<br>;;         | sh<br>cph) | AVS TOT<br>Del | AL<br>Ay   |        | LOS                           |                          |          |                        |
| NINOR LEFT TURN (7)                                                                        |                      | 5                 |                     | 306         | Sh              | RD         | SHRD           |            | S      | HRD                           |                          |          |                        |
| MINOR RIGHT TURN (7)<br>MAJOR LEFT TURN (4)                                                |                      | 15                |                     | 674         | 5               | E3         | 6<br>4         | .4         |        | B<br>A                        |                          |          |                        |
| AVERAGE MINOR APPR                                                                         | <br>0407 J           | LAY z             | <br>6,4 ss          | ******      | AVERAG          | E TOTI     | NL INTER       | SECTI      | ION DI | ELAY =                        |                          |          |                        |

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| ATA inc.                                                                                                                                                                                                                                |                                                  |                                         | LED T-INTER                                     | SECTION L                | EVEL OF                | SERV          | ICE A                   | IALYSIS           |   |                                        |                     | 1994 HCM                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-----------------------------------------|-------------------------------------------------|--------------------------|------------------------|---------------|-------------------------|-------------------|---|----------------------------------------|---------------------|--------------------------|
| Major Street: KULA HWY<br>Minor Street: OHANA ST<br>Feak Hour: PM<br>Scenario: EXISTING                                                                                                                                                 |                                                  |                                         |                                                 |                          |                        |               |                         |                   |   | Print D<br>Anal<br>File N<br>Intersect | yst:<br>laee:       | 27-Mar<br>EC<br>KULOHA-P |
| MAJOR STREET<br>Num of Lanes - V2:<br>Excl RT - V3 (Y/N):<br>Stop/Yield - V3 (Y/N):<br>X Grade - V2,V3:<br>Num of Lanes - V5:<br>Excl LT - V4 (Y/N):<br>X Grade - V4,V5:<br>NINCR STREET<br>Num of Lanes - V7,V9:<br>Shared Lane (Y/N); | А<br>1-2<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1 | : V2<br>: V3<br>: :                     | 343                                             | \<br>V                   | <<br>\<br>1<br>2<br>V7 |               | )<br>/<br>1<br>17<br>V7 | (<br>/<br>V       |   | 513<br>17<br>Major Stri<br>Kula Hwy    |                     | H>                       |
| Z Grade - V76V9:<br>VOLUME ADJUSTMENTS<br>NOVEMENT NO.                                                                                                                                                                                  | 0                                                |                                         |                                                 | MINOR S                  |                        |               | ST                      | <br>-             |   |                                        |                     |                          |
| VOLUME, V (vph)<br>VCLUME, v (pcph)                                                                                                                                                                                                     |                                                  | 2<br>343<br>343                         |                                                 | 3<br>1<br>1              | 4<br>17<br>15          |               |                         | 5<br>513<br>513   |   | 7<br>2<br>2                            | 9<br>17<br>17       |                          |
| STEP 1: RT FROM MINOR ST<br>Conflicting Flows:<br>Potential Capacity:<br>Movement Capacity:                                                                                                                                             | 1 V(<br>1 C)                                     | .9 = 1/                                 |                                                 |                          | 1                      | +             | 343                     |                   | = |                                        | vph<br>pcph<br>pcph |                          |
| STEP 2: LT FROM MAJOR ST<br>Conflicting Flows:<br>Fotential Capacity:<br>Movement Capacity:<br>Frob. of Queue-free St<br>Major Left Shared Lane<br>Prob. of Queue-free S                                                                | ate:                                             | ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;; | Ca.4 =                                          | 4 =<br>4/5 <b>z,</b> 4 = |                        |               |                         | 343               | = | 1175                                   | voh<br>pcph<br>pcph |                          |
| STEP 3: LT FROM MINOR ST<br>Conflicting Flows:<br>Potential Capacity:<br>Capacity Adjustment Fac<br>Due To Impeding Moveau<br>Movement Capacity:                                                                                        | ctor                                             | ;                                       | 7c,7 = 1/24<br>Cc,7 =<br>7=00,4=<br>Ca,7 = Co,7 | /3+V2+V5+V               |                        |               |                         |                   |   | 0.95                                   |                     |                          |
| ELAY AND LEVEL OF SERVIC<br>Movement                                                                                                                                                                                                    | CE SUMI                                          | HARY<br>v (vcph)                        |                                                 | ca(pcph)                 |                        | csh<br>(pcph) |                         | TOTAL<br>Delay    |   | LOS                                    |                     |                          |
| MINGR LEFT TURN (7)<br>MINGR RIGHT TURN (9)<br>Kajor Left Turn (4)                                                                                                                                                                      |                                                  | 2<br>17<br>13                           |                                                 | 324<br>927<br>1175       | :                      | iHRD<br>775   |                         | HRD<br>4.B<br>3.1 |   | IRD<br>A<br>A                          |                     |                          |
| AVERAGE MINOR APPRCA<br>Level of                                                                                                                                                                                                        |                                                  |                                         | 4.8 sec/<br>A                                   | v≡h :<br>I               | AVERA                  | 6E TOT        |                         | TERSECT           |   |                                        | 0.2 s<br>A          | izc/veh                  |

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|-----------------|------------------|------------------|-------------------|------------------|------------------|
| KULAMALU        |                  |                  |                   | 03/27/97         |                  |
| FUTURE BASE     |                  |                  |                   | 17:31:17         |                  |
| AM PEAK HOUR    |                  |                  |                   | 1/:21:1/         |                  |
|                 |                  |                  |                   |                  |                  |
| SIGNAL94/TEAPAC | [∨1 L1.4] — Summ | ary of Parameter | Values            |                  | •                |
| Intersection    | Parameters for   | Int # 0 - HALE   | AKALA HWY & HANA  | ншү              |                  |
| METROAREA       | NONCBD           |                  |                   |                  |                  |
| LOSTTIME        | 2.0              |                  |                   |                  |                  |
| LEVELOFSERVICE  | C S              |                  |                   |                  |                  |
| NODELOCATION    | 0 0              |                  |                   |                  | -                |
| Approach Para   |                  |                  |                   |                  |                  |
|                 | EB               | SD               | WB                | NB               | ¥.               |
| APPLABELS       | -88              | -148-            | - <del>NB</del> - | - <del>ED-</del> |                  |
| GRADES          | .0               | .0               | .0                | .0               |                  |
| PEDLEVELS       | LOW              | LOW              | LOW               | LOW              |                  |
| PARKINGSIDES    | NONE             | NONE             | NONE              | NONE             | ي ال             |
| PARKVOLUMES     | 20               | 20               | 20                | 20               | 1                |
| BUSVOLUMES      | Ø                | Ø                | Ø                 | 0                |                  |
| RIGHTTURNONREDS | 0                | Ø                | 0                 | 0                | 2-               |
| Movement Para   | imeters          |                  |                   |                  | •                |
| 10VLABELS       | RT TH LT         | RT TH LT         | RT TH LT          | RT TH LT         | <b>.</b>         |
| VOLUMES         | 5 21 17          | 49 746 53        | 30 142 2392       | 512 266 41       |                  |
| JIDTHS          | 12.0 12.0 .0     | 12.0 24.0 12.0   | 12.0 12.0 12.0    | 12.0 24.0 12.0   | ٠                |
| LANES           | 1 1 0            | 1 2 1            | 1 1 1             | 1 2 1            |                  |
| JTILIZATIONS    | 1.00 1.00 1.00   | 1.00 1.00 1.00   | 1.00 1.00 1.00    | 1.00 1.00 1.00   | معرو<br>-        |
| RUCKPERCENTS    | 2.0 2.0 2.0      | 2.0 2.0 2.0      | 2.0 2.0 2.0       | 2.0 2.0 2.0      | 1 × 1            |
| PEAKHOURFACTORS | .95 .95 .95      | .95 .95 .95      | .95 .95 .95       | .95 .95 .95      |                  |
| ARRIVALTYPES    | 3 3 3            | 3 3 3            | 3 3 3             |                  | _                |
| ACTUATIONS      | NO YES YES       |                  |                   | 3 3 3            |                  |
|                 |                  | NO YES YES       | NO YES YES        | NO YES YES       | <b>L</b>         |
| REQCLEARANCES   | 4.0 4.0 4.0      | 4.0 4.0 4.0      | 4.0 4.0 4.0       | 4.0 4.0 4.0      |                  |
| MINIMUMS        | 5.0 5.0 5.0      | 5.0 5.0 5.0      | 5.0 5.0 5.0       | 5.0 5.0 5.0      |                  |
| IDEALSATFLOWS   | 1900 1900 1900   | 1900 1900 1900   | 1900 1900 1900    | 1900 1900 1900   |                  |
| FACTORS         | 1.00 1.00 1.00   | 1.00 1.00 1.00   | 1.00 1.00 1.00    | 1.00 1.00 1.00   | <b>۴</b> .       |
| DELAYFACTORS    | 1.00 1.00 1.00   | 1.00 1.00 1.00   | 1.00 1.00 1.00    | 1.00 1.00 1.00   |                  |
| NSTOPFACTORS    | 1.00 1.00 1.00   | 1.00 1.00 1.00   | 1.00 1.00 1.00    | 1.00 1.00 1.00   | ι.               |
| GROUPTYPES      | NORM NORM NORM   | NORM NORM NORM   | FFLW NORM DOPT    | FFLW NORM NORM   | <b>y</b>         |
| SATURATIONFLOWS | 1539 1822 0      | 1539 3725 1770   | 0 1783 1770       | 0 3725 1770      | 3                |
| Phasing Param   | eters            |                  |                   |                  | 6                |
| EQUENCES        | 7 G              |                  |                   |                  | <b>9</b> -       |
| ERMISSIVES      | NO NO            | NO NO            | LEADLAGS          | NONE NONE        | i                |
| VERLAPS         | NO NO            | NO NO            | OFFSET            | .00 1            | 2                |
| YCLES           | 60 180           | 10               | PEDTIME           | .0 0             | *                |
| REENTIMES       | 19.00 25.00      |                  | .00               | •                |                  |
| ELLOWTIMES      | 4.00 4.00        | 4.00 4.00        | .00               |                  |                  |
| RITICALS        | 2 9              | 5 0              | 5                 |                  |                  |
| XCESS           | 0                | -                | -                 |                  | 7~4              |
|                 |                  |                  |                   |                  | : ,              |
|                 |                  |                  |                   |                  | <b>K</b> - (     |
|                 |                  |                  |                   |                  | <b>,</b> 1       |
|                 |                  |                  |                   |                  | ₽ <sup>n.1</sup> |
|                 |                  |                  |                   |                  |                  |
|                 |                  |                  |                   |                  | <b>8</b> -11-1   |
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KULAMALU Future base Am peak hour

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# SIGNAL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary

Intersection Averages for Int # 0 - HALEAKALA HWY & HANA HWY Degree of Saturation (v/c) 1.92 Vehicle Delay 54.40 Level of Service E @ expect more delay due to extreme v/c's (see EVALUATE)

|                                                    | Phase 1                                  | Phase 2                                   | Phase 3                                              | Phase 4                               | Phase 5                                    |                                         |
|----------------------------------------------------|------------------------------------------|-------------------------------------------|------------------------------------------------------|---------------------------------------|--------------------------------------------|-----------------------------------------|
| **/**<br>/ \<br> <br>Welst<br><del>North</del><br> | + * *<br>  + * *<br>  <+ * *><br>  V<br> |                                           | <br>  ~ ++++<br> ++++ V<br>                          | -<br> ++++<br> ++++>                  | -<br>++++<br>(****                         |                                         |
|                                                    | G= 19.0"<br>  Y+R≓ 4.0"<br>  OFF= .0%    | G= 25.0"<br>  Y+R= 4.0"<br>  OFF=25.6%    | G/C= .056<br>  G= 5.0"<br>  Y+R= 4.0"<br>  OFF=57.8% | G= 3.0"<br>  Y+R≕ 4.0"<br>  OFF=67.8% | G= 22.0"  <br>  Y+R= .0"  <br>  OFF=75.6%  |                                         |
|                                                    | C≖ 90 sec                                | G= 74.0 sec                               | = 82.2% Y=1                                          | 6.0 sec = 1/                          | .8% Ped= .0                                |                                         |
| Lane<br>  Gro                                      | Width/ <br>up   Lanes                    | g/C<br>Reqd Used                          | Service Ra<br>  @C (vph) @                           | te  Adj  <br>E  Volume                | HCM  <br>v/c   Delay                       | L  90% Max <br>S   Queue                |
| ев<br>\$ <del>8</del> Арр                          | roach                                    |                                           |                                                      |                                       | 17.4                                       | C+                                      |
| RT<br> LT+TH                                       | 12/1  <br>  12/1                         | .074   .233<br>.086   .233                | 257   35<br>  312   42                               |                                       | 014   17.1  <br>094   17.5                 | C+  25 ft <br>*C+  39 ft                |
| WB<br>NB App                                       | roach                                    |                                           |                                                      |                                       | 66.00                                      | F                                       |
| =====<br>  TH<br>  LT                              |                                          | .769   .300<br>.739   .300                | •                                                    | 5   1368  2.<br>1   1299  2.          | 557   65.90<br>446   66.00                 | F  1211 ft <br>*F  1150 ft              |
| <br>-₩5 Арр                                        | roach                                    |                                           |                                                      |                                       | 35.4                                       | D                                       |
| RT<br>  TH<br>  LT                                 | 24/2                                     | .098   .222<br>.254   .222<br>.095   .078 | 656 82                                               | 8   787   .                           | 152   18.2  <br>950   37.1  <br>406   26.6 | C+  51 ft <br>*D   387 ft <br>D+  65 ft |
| NB<br>EB App                                       | roach                                    |                                           |                                                      |                                       | 16.2                                       | C+                                      |
|                                                    | 24/2                                     | .131   .300<br>.088   .156                | 979   111<br>  160   26                              | 8   280   .<br>9   43   .             | 250   15.4  <br>156   21.3                 |                                         |

03/27/97 17:31:49

| IGNAL94/TEAPACT               | V1 L1.4] - Summa                 | ry of Parameter                  | Values           |                |   |
|-------------------------------|----------------------------------|----------------------------------|------------------|----------------|---|
|                               | Parameters for I                 |                                  | AKALA HWY & HANA | ншү            |   |
| 1ETROAREA                     | NONCBD                           |                                  |                  |                |   |
| LOSTTIME                      | 2.0                              |                                  |                  |                | - |
| LEVELOFSERVICE                | C S                              |                                  |                  |                |   |
| NODELOCATION                  | 0 0                              |                                  |                  |                |   |
| Approach Para                 |                                  |                                  |                  |                |   |
|                               | ев                               | SB                               | WB               | NB             |   |
| APPLABELS                     | <del>98</del>                    | -1415                            | -++18-           | -215           |   |
| GRADES                        | .0                               | .0                               | .0<br>Low        | LOW            | • |
| PEDLEVELS                     |                                  | LOW                              | NONE             | NONE           |   |
| PARKINGSIDES                  | NONE                             | NONE                             |                  | 20             | · |
| PARKVOLUMES                   | 20                               | 20<br>0                          | 20<br>0          | 20             |   |
| BUSVOLUMES<br>RIGHTTURNONREDS | Ø<br>Ø                           | 0                                | 0                | ø              |   |
| Mo∨ement Para                 | meters                           |                                  |                  |                |   |
| MOVLABELS                     | RT TH LT                         | RT TH LT                         | RT TH LT         | RT TH LT       |   |
| VOLUMES                       | 25 257 161                       | 40 506 56                        | 34 37 804        |                |   |
| WIDTHS                        | 12.0 12.0 .0                     | 12.0 24.0 12.0                   | 12.0 12.0 12.0   | 12.0 24.0 12.0 |   |
| LANES                         | 1 1 0                            | 1 2 1                            | 1 1 1            | 1 2 1          |   |
| UTILIZATIONS                  | 1.00 1.00 1.00                   | 1.00 1.00 1.00                   | 1.00 1.00 1.00   |                |   |
| TRUCKPERCENTS                 | 2.0 2.0 2.0                      | 2.0 2.0 2.0                      | 2.0 2.0 2.0      | 2.0 2.0 2.6    |   |
| PEAKHOURFACTORS               | .95 .95 .95                      | .95 .95 .95                      | .95 .95 .95      | .95 .95 .95    |   |
| ARRIVALTYPES                  | 3 3 3                            | 3 3 3                            | 3 3 3            |                |   |
| ACTUATIONS                    | NO YES YES                       | NO YES YES                       | NO YES YES       |                |   |
| REQCLEARANCES                 | 4.0 4.0 4.0                      | 4.0 4.0 4.0                      | 4.0 4.0 4.0      |                |   |
| MINIMUMS                      | 5.0 5.0 5.0                      | 5.0 5.0 5.0                      | 5.0 5.0 5.0      |                |   |
| IDEALSATFLOWS                 | 1900 1900 1900                   | 1900 1900 1900                   | 1900 1900 1900   |                |   |
| FACTORS                       | 1.00 1.00 1.00                   | 1.00 1.00 1.00                   |                  |                |   |
| DELAYFACTORS                  | 1.00 1.00 1.00                   | 1.00 1.00 1.00                   |                  |                |   |
| NSTOPFACTORS                  | 1.00 1.00 1.00<br>NORM NORM NORM | 1.00 1.00 1.00<br>Norm Norm Norm |                  |                |   |
| GROUPTYPES<br>Saturationflows | NORM NORM NORM<br>1539 1828 Ø    | 1539 3725 1770                   | 0 1781 1770      |                |   |
| SHIDKHITOHLUMS                | 1939 1020 0                      | 1009 9760 1770                   |                  | ,, _, .        |   |
| Phasing Param                 | eters                            |                                  |                  |                |   |
| SEQUENCES                     | 76                               |                                  |                  |                |   |
| PERMISSIVES                   | NO NO                            | NO NO                            | LEADLAGS         | NONE NONE      |   |
| OVERLAPS .                    | NO NO                            | NO NO                            | OFFSET           | .00 1          |   |
| CYCLES                        | 60 180                           | 10                               | PEDTIME          | .0 6           |   |
| GREENTIMES                    | 19.00 25.00                      |                                  | 2.00             |                |   |
| YELLOWTIMES                   | 4.00 4.00                        | 4.00 4.00<br>12 0                | .00<br>11        |                |   |
| CRITICALS                     | 2 B<br>Ø                         | 12 0                             | **               |                |   |
| EXCESS                        | Ø                                |                                  |                  |                |   |
|                               |                                  |                                  |                  |                |   |
|                               |                                  |                                  |                  |                |   |
|                               |                                  |                                  |                  |                |   |
|                               |                                  |                                  |                  |                |   |
|                               |                                  |                                  |                  |                |   |
|                               |                                  |                                  |                  |                |   |
|                               |                                  |                                  |                  |                |   |
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| KULAMALU<br>Future base<br>Pm peak hour     |                                                                |                                       |                                       |                                           | 17:33:24                     |
|---------------------------------------------|----------------------------------------------------------------|---------------------------------------|---------------------------------------|-------------------------------------------|------------------------------|
| SIGNAL94/TEAPAC[V1                          | 11.4] - Capa                                                   | acity Analysi                         | s Summary.                            |                                           |                              |
| Intersection Averag<br>Degree of Sat        | ges for Int <del> </del><br>turation (v/c                      | ) 0 - HALEA<br>2) .74 Vehi            | KALA HWY &<br>.cle Delay              | HANA HWY<br>29.7 Level (                  | of Ser∨ice D⊣<br>_           |
| Sq 76   Phase 1                             | Phase 2                                                        | Phase 3                               | Phase 4                               | Phase 5                                   | 1                            |
| **/**                                       | ~<br><+ *<br>+ *                                               | ^ ++++<br>**** V                      | ~<br>++++<br>++++ >                   | -<br>++++<br>(++++                        |                              |
| G== 19.0"<br>  Y+R== 4.0"<br>  OFF== .0%    | + -<br>  G/C= .278<br>  G= 25.0"<br>  Y+R= 4.0"<br>  OFF=25.6% | G≕ 5.0"<br>  Y+R≕ 4.0"<br>  OFF≕57.8% | G= 3.0"<br>  Y+R= 4.0"<br>  OFF=67.8% | Y+R≖ .0"<br>  Y+R≖ .0"<br>  OFF¤75.6%     | 1<br> <br> <br>              |
| C= 90 sec                                   | G≖ 74.0 sec :                                                  | = 82.2% Y=1                           | 6.0 sec = 1                           | 7.8% Ped= .                               | 0 sec = .09                  |
| Lane  Width/ <br>  Group   Lanes            | g/C<br>Reqd Used                                               | Service Ra<br>  @C (vph) @            | te  Adj  <br>E  Volume                | HCM<br>v/c   Delay                        | L  90% Max <br>  S   Queue   |
| EB<br>85 Approach                           |                                                                |                                       |                                       | 62.5                                      | F                            |
| RT   12/1                                   | .083   .233<br>.298   .233                                     | 257   35<br>  313   42                |                                       |                                           | C+  25 ft <br> *F   427 ft   |
| <br>₩B<br>₩5 Approach                       |                                                                |                                       |                                       | 26.5                                      | )+<br>                       |
|                                             | .311   .300<br>.301   .300                                     | 432   53<br>  429   53                |                                       | .850   27.8<br>.812   25.3                | *D+  402 ft <br>  D+  382 ft |
| <br>SB<br>₩5 Approach                       |                                                                |                                       |                                       |                                           |                              |
| RT   12/1  <br>  TH   24/2  <br>  LT   12/1 | .092   .222<br>.193   .222<br>.097   .078                      | 239   34<br>  656   82<br>  18   12   | 8 533                                 | .123   18.1<br>.644   21.7<br>.428   26.9 |                              |
| NB<br>EB Approach                           |                                                                |                                       |                                       | 17.7                                      | C+                           |
| TH   24/2  <br>  LT   12/1                  | .218   .300<br>.073   .156                                     | 979   111<br>  160   26               |                                       | .572   17.7<br>.007   20.8                |                              |

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| Kinor Street: HALEAKALA HWY<br>Peak Hour: PM<br>Scenario: FUTURE BASE                                                                                                                                                                                                                                                                                                                                                                                                                           | ;                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                        |             |                          |              |                                               |   |                 | nt Da<br>Analy<br>le Na<br>secti                                                        | st:<br>me:                                         | 27-M<br> <br>HALB' |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------|--------------------------|--------------|-----------------------------------------------|---|-----------------|-----------------------------------------------------------------------------------------|----------------------------------------------------|--------------------|
| Feak Hour Factor: 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                        |             |                          |              |                                               |   |                 | ** ** ** ** **                                                                          |                                                    | *                  |
| MAJOR STREET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                   | 1012                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>}</b>                                                               |             |                          |              | <                                             |   | 541             |                                                                                         | V5                                                 |                    |
| Num of Lanes - V2: 2<br>Excl RT - V3 (Y/N): Y                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                   | 737                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                                                      |             |                          |              |                                               |   | 6               |                                                                                         | V4                                                 |                    |
| Stop/Yield - V3 (Y/N): N                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ١                                                                      |             |                          |              | 1                                             |   | v               |                                                                                         | •                                                  |                    |
| % Grade - V2,V3: 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | !<br>                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ۷                                                                      |             |                          |              | v                                             |   | MAJOR<br>Pukali |                                                                                         |                                                    |                    |
| Num of Lanes - V5:                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                        | ζ           |                          | 2            |                                               |   |                 |                                                                                         |                                                    |                    |
| Excl LT - V4 (Y/N): N<br>X Grade - V4,V3: -3                                                                                                                                                                                                                                                                                                                                                                                                                                                    | :                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                        | ١,          |                          | . !          |                                               |   |                 |                                                                                         |                                                    |                    |
| Y 0/209 - 14,70; -3                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                        |             | •                        | :            |                                               |   |                 |                                                                                         | Ŷ                                                  |                    |
| MINOR STREET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                        | 313         |                          | 0            |                                               |   |                 | ţ٨                                                                                      | NORTH                                              |                    |
| Num of Lanes - V7.V9:                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                        |             |                          |              |                                               |   |                 |                                                                                         |                                                    |                    |
| Shared Lane (Y/N): N<br>% Grade - V76V7: 0                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | MINOR ST                                                               | V7<br>REET: |                          | V9<br>(Ala i | HEY                                           |   |                 |                                                                                         |                                                    |                    |
| VOLUNE ACCUSTNENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <br>~                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                        |             |                          |              |                                               |   |                 |                                                                                         | ·                                                  |                    |
| MOVEHLHI NO.<br>VOLUME, V (voh)                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2<br>1012                                                                                                         | 3<br>702                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                        | 4           |                          |              | 5<br>541                                      |   | 7<br>313        |                                                                                         | ې<br>ن                                             |                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1212                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                        | ð           |                          |              | 541                                           |   | 344             |                                                                                         | ð                                                  |                    |
| Conflicting Flows: Vo<br>Fotential Capacity: Cp                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                        | ·           | +                        |              |                                               | = |                 |                                                                                         | vch<br>Ecch                                        |                    |
| Fotential Capacity: 2 Cp<br>Movement Capacity: 2 Cp                                                                                                                                                                                                                                                                                                                                                                                                                                             | a,5 =<br>a,p = Ca                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                        |             |                          |              |                                               |   |                 | 425                                                                                     |                                                    |                    |
| Fotential Capacity: : Cp<br>Movement Capacity: : Cp<br>STEP 2: LT FROM MAJOR STREET -                                                                                                                                                                                                                                                                                                                                                                                                           | o,5 =<br>A,p = Cp<br>- V4                                                                                         | ,7 =                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                        |             |                          |              |                                               |   |                 | 425<br>425                                                                              | ecet<br>acah                                       |                    |
| Potential Capacity: 1 Cp<br>Novement Capacity: 2 Cp<br>STEP 2: LT FROM MAJCR STREET -<br>Conflicting Flows:                                                                                                                                                                                                                                                                                                                                                                                     | o,5 =<br>a,p = Co<br>- V4                                                                                         | .7 =<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                        |             |                          | +            |                                               |   |                 | 425<br>425<br>1012                                                                      | poph<br>acah<br>vaa                                |                    |
| Potential Capacity: 1 Cp<br>Movement Capacity: 2 Cp<br>STEP 2: LT FROM MAJCR STREET -<br>Conflicting Flows:<br>Fotential Capacity:                                                                                                                                                                                                                                                                                                                                                              | o,5 =<br>a,p = Co<br>- V4<br>; ; ;                                                                                | .7 =<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2 =                                                                    |             |                          |              |                                               |   |                 | 425<br>425<br>1012<br>491                                                               | ecet<br>acah                                       |                    |
| Potential Capacity: : Cp<br>Novement Capacity: : Cp<br>STEP 2: LT FROM MAJCR STREET -<br>Conflicting Flows:<br>Fotential Capacity:<br>Novement Capacity:<br>Prob. of Queue-free State:                                                                                                                                                                                                                                                                                                          | 0,5 =<br>1,p = Co<br>- V4<br>:<br>:<br>:<br>:<br>:<br>:                                                           | .7 =<br>V:.4 = V3+V<br>Cc.4 =<br>Ca.4 = Cc.4<br>co.4 = 1-v4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2 =                                                                    |             |                          |              |                                               |   |                 | 425<br>425<br>1012<br>491                                                               | popt<br>acah<br>vah<br>poph                        |                    |
| Potential Capacity: 1 Cp<br>Novement Capacity: 2 Cp<br>STEP 2: LT FROM MAJCR STREET -<br>Conflicting Flows:<br>Fotential Capacity:                                                                                                                                                                                                                                                                                                                                                              | 0,5 =<br>1,p = Co<br>- V4<br>:<br>:<br>:<br>:<br>:<br>:                                                           | .7 =<br>V:.4 = V3+V<br>Cc.4 =<br>Ca.4 = Cc.4<br>co.4 = 1-v4<br>o+o.4 =                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2 =<br>=<br>/Cr.4 =                                                    |             | ą                        | +            | 1012                                          |   |                 | 425<br>425<br>1012<br>491<br>491                                                        | popt<br>acah<br>vah<br>poph                        |                    |
| Potential Capacity: : Cp<br>Novement Capacity: : Cr<br>STEP 2: LT FROM MAJCR STREET -<br>Conflicting Flows:<br>Fotential Capacity:<br>Novement Capacity:<br>Prob. of Bueue-free State:<br>Major Left Shared Lane<br>Prob. of Gueue-free State:<br>STEP 3: LT FROM MINOR STREET -                                                                                                                                                                                                                | ),5 =<br>, 7 = Cp<br>, 74<br>, 74<br>, 74<br>, 74<br>, 77                                                         | .7 =<br>V:.4 = VJ+V<br>C:.4 =<br>Ca.4 = C:.4<br>:0.4 = 1-v4<br>o+0.4 =                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2 =<br>=<br>/Cr.4 =                                                    |             | ą                        | +            | 1012                                          |   |                 | 425<br>425<br>1012<br>471<br>471<br>1.00<br>1.00                                        | popi<br>Jodh<br>Yoh<br>Poph<br>Podh                |                    |
| Potential Capacity: : Cp<br>Novement Capacity: : Cp<br>STEP 2: LT FROM MAJCR STREET -<br>Conflicting Flows:<br>Fotential Capacity:<br>Novement Capacity:<br>Prob. of Bueue-free State:<br>Major Left Shared Lane<br>Prob. of Queue-free State:<br>STEP 3: LT FROM MINOR STREET -<br>Conflicting Flows:                                                                                                                                                                                          | ),5 =<br>, 0 = Cp<br>, V4<br>; ;<br>;<br>;<br>;<br>;<br>;<br>;<br>;<br>;<br>;<br>;<br>;<br>;<br>;<br>;<br>;<br>;  | .7 =<br>V:.4 = V3+V<br>Cp.4 =<br>Ca.4 = Cp.4<br>co.4 = 1-v4<br>0*o.4 =                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2 =<br>=<br>/Cr.4 =                                                    |             | ą                        | +            | 1012                                          |   |                 | 425<br>425<br>1012<br>471<br>471<br>1.00<br>1.00                                        | popi<br>acah<br>yah<br>poph<br>poph<br>poph        |                    |
| Potential Capacity: : Cp<br>Novement Capacity: : Cr<br>STEP 2: LT FROM MAJCR STREET -<br>Conflicting Flows:<br>Fotential Capacity:<br>Novement Capacity:<br>Prob. of Queue-free State:<br>Major Left Shared Lane<br>Prob. of Queue-free State:<br>STEP 3: LT FROM MINOR STREET -                                                                                                                                                                                                                | • V4<br>• V4<br>• • • • • • • • • • • • • • • • • • •                                                             | .7 =<br>V:.4 = VJ+V<br>C:.4 =<br>Ca.4 = C:.4<br>:0.4 = 1-v4<br>o+0.4 =                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2 =<br>=<br>/Cr.4 =                                                    |             | ą                        | +            | 1012                                          |   |                 | 425<br>425<br>1012<br>471<br>471<br>1.00<br>1.00                                        | popi<br>acah<br>yah<br>poph<br>poph<br>poph        |                    |
| Potential Capacity: : Cp<br>Novement Capacity: : Cr<br>STEP 2: LT FROM MAJCR STREET -<br>Conflicting Flows:<br>Fotential Capacity:<br>Novement Capacity:<br>Prob. of Bueue-free State:<br>Major Left Shared Lane<br>Prob. of Bueue-free State:<br>STEP 3: LT FROM MINOR STREET -<br>Conflicting Flows:<br>Fotential Capacity:<br>Capacity Adjustment Factor<br>Due To Impeding Novements:                                                                                                       | - V4<br>- V4<br>- V4<br>                                                                                          | .7 =<br>V:.1 = V3+V<br>Cc.4 =<br>Ca.4 = Cc.4<br>co.4 = 1-v4<br>e*o.4 =<br>V:.7 = 1/2V<br>Cc.7 =<br>V:.7 =                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2 =<br>=<br>/Cr.4 =<br>3+V2+V3+1                                       |             | ą                        | +            | 1012                                          |   |                 | 425<br>425<br>1012<br>491<br>491<br>1.00<br>1.00<br>1.00<br>1.553<br>134                | ecpi<br>acah<br>Yah<br>ecph<br>ecph<br>ecph<br>coh |                    |
| Potential Capacity: : Cp<br>Novement Capacity: : Cp<br>STEP 2: LT FROM MAJCR STREET -<br>Conflicting Flows:<br>Fotential Capacity:<br>Novement Capacity:<br>Prob. of Queue-free State:<br>Major Left Shared Lane<br>Prob. of Queue-free State:<br>STEP 3: LT FROM MINOR STREET -<br>Conflicting Flows:<br>Fotential Capacity:<br>Capacity Adjustment Factor<br>Due To Impeding Novements:<br>Movement Capacity:                                                                                 | - V4<br>- V4<br>- V4<br>                                                                                          | .7 =<br>V:.4 = V3+V<br>Cc.4 =<br>Ca.4 = Cc.4<br>co.4 = 1-v4<br>e+o.4 =<br>V:.7 = 1/2V<br>Cc.7 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 = V.co.4 =<br>V:co.4 = V.co.4 =<br>V:co.4 = V.co.4 =<br>V:co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 = V.co.4 =                                                                                                                                                                                        | <br>2 =<br>/Cr.4 =<br>3+V2+V3+V                                        |             | ą                        | +            | 1012                                          | = |                 | 425<br>425<br>1012<br>491<br>491<br>1.00<br>1.00<br>1.00<br>1.553<br>134<br>1.00<br>134 | roh<br>coh<br>coh<br>poph<br>coh                   |                    |
| Potential Capacity: : Cp<br>Novement Capacity: : Cp<br>STEP 2: LT FROM MAJCR STREET -<br>Conflicting Flows:<br>Fotential Capacity:<br>Novement Capacity:<br>Prob. of Queue-free State:<br>Major Left Shared Lane<br>Prob. of Queue-free State:<br>STEP 3: LT FROM MINOR STREET -<br>Conflicting Flows:<br>Fotential Capacity:<br>Capacity Adjustment Factor<br>Due To Impeding Novements:<br>Novement Capacity:                                                                                 | D.,5 =<br>A.p = Co<br>- V4<br>- V4<br>                                                                            | .7 =<br>V:.4 = V3+V<br>Cc.4 =<br>Ca.4 = Cc.4<br>co.4 = 1-v4<br>e+o.4 =<br>V:.7 = 1/2V<br>Cc.7 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 =<br>V:co.4 = V:co.4 =<br>V:co.4 = V:co.4 =<br>V:co.4 = V:co.4 =<br>V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = V:co.4 = | 2 =<br>/Cr.4 =<br>5+V2+V5+V                                            | /4 =        | ¢<br>                    | +            | 1012                                          | = |                 | 425<br>425<br>1012<br>491<br>491<br>1.00<br>1.00<br>1.00<br>1.553<br>134<br>1.00<br>134 | roh<br>coh<br>coh<br>poph<br>coh                   |                    |
| Potential Capacity: : Cp<br>Novement Capacity: : Cp<br>STEP 2: LT FROM MAJCR STREET -<br>Conflicting Flows:<br>Fotential Capacity:<br>Prob. of Bueue-free State:<br>Major Left Shared Lane<br>Prob. of Bueue-free State:<br>Major Left Shared Lane<br>Prob. of Bueue-free State:<br>STEP 3: LT FROM MINOR STREET -<br>Conflicting Flows:<br>Fotential Capacity:<br>Capacity Adjustment Factor<br>Due To Impeding Movements:<br>Movement Capacity:<br>DELAY AND LEVEL OF SERVICE SUM             | 0,5 =<br>1,0 = Co<br>V4<br>V4<br>V4<br>V4<br>V4<br>V4<br>V4<br>V4<br>V4<br>V4                                     | .7 =<br>V:.4 = V3+V<br>Cc.4 =<br>Ca.4 = Cc.4<br>co.4 = 1-v4<br>0+0.4 =<br>V:.7 = 1/2V<br>Cc.7 = 1/2V<br>Cc.7 = Cc.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2 =<br>/Cr.4 =<br>3+V2+V3+V<br>=<br>ca(coph)                           |             | Q<br>CST<br>(peah)       | +            | IOI2<br>TOTAL<br>DELAY                        | = | L05             | 425<br>425<br>1012<br>491<br>491<br>1.00<br>1.00<br>1.00<br>1.553<br>134<br>1.00<br>134 | roh<br>coh<br>coh<br>poph<br>coh                   |                    |
| Potential Capacity: : Cp<br>Novement Capacity: : Cp<br>STEP 2: LT FROM MAJCR STREET -<br>Conflicting Flows:<br>Fotential Capacity:<br>Prob. of Bueue-free State:<br>Major Left Shared Lane<br>Prob. of Bueue-free State:<br>Major Left Shared Lane<br>Prob. of Bueue-free State:<br>STEP 3: LT FROM MINOR STREET -<br>Conflicting Flows:<br>Fotential Capacity:<br>Capacity Adjustment Factor<br>Due To Impeding Movements:<br>Movement Capacity:<br>DELAY AND LEVEL OF SERVICE SUM             | 0,5 =<br>1,0 = Co<br>V4<br>V4<br>V4<br>V4<br>V4<br>V4<br>V4<br>V4<br>V4<br>V4                                     | .7 =<br>V:.4 = V3+V<br>Cc.4 =<br>Ca.4 = Cc.4<br>co.4 = 1-v4<br>0+0.4 =<br>V:.7 = 1/2V<br>Cc.7 = 1/2V<br>Cc.7 = Cc.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2 =<br>/Cr.4 =<br>3+V2+V3+V<br>=<br>ca(coph)                           |             | Q<br>CST<br>(peah)       | +            | IOI2<br>TOTAL<br>DELAY                        | = | L05             | 425<br>425<br>1012<br>491<br>491<br>1.00<br>1.00<br>1.00<br>1.553<br>134<br>1.00<br>134 | roh<br>coh<br>coh<br>poph<br>coh                   |                    |
| Potential Capacity: : Cp<br>Novement Capacity: : Cp<br>STEP 2: LT FROM MAJCR STREET -<br>Conflicting Flows:<br>Fotential Capacity:<br>Prob. of Bueue-free State:<br>Major Left Shared Lane<br>Prob. of Bueue-free State:<br>Major Left Shared Lane<br>Prob. of Gueue-free State:<br>STEP 3: LT FROM MINOR STREET -<br>Conflicting Flows:<br>Fotential Capacity:<br>Capacity Adjustment Factor<br>Due To Repeding Movements:<br>Movement Capacity:<br>DELAY AND LEVEL OF SERVICE SUM<br>Movement | 0,5 =<br>1,0 = Co<br>V4<br>V4<br>V4<br>V4<br>V4<br>V4<br>V4<br>V4<br>V4<br>V4                                     | .7 =<br>V:.4 = V3+V<br>Cc.4 =<br>Ca.4 = Cc.4<br>co.4 = 1-v4<br>0+0.4 =<br>V:.7 = 1/2V<br>Cc.7 = 1/2V<br>Cc.7 = Cc.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2 =<br>/Cr.4 =<br>3+V2+V3+V<br>=<br>ca(coph)                           |             | Q<br>CST<br>(peah)       | +            | IOI2<br>TOTAL<br>DELAY                        | = | L05             | 425<br>425<br>1012<br>491<br>491<br>1.00<br>1.00<br>1.00<br>1.553<br>134<br>1.00<br>134 | roh<br>coh<br>coh<br>poph<br>coh                   |                    |
| Potential Capacity: : Cp<br>Novement Capacity: : Cp<br>STEP 2: LT FROM MAJCR STREET -<br>Conflicting Flows:<br>Fotential Capacity:<br>Novement Capacity:<br>Prob. of Bueue-free State:<br>Major Left Shared Lane<br>Prob. of Bueue-free State:<br>STEP 3: LT FROM MINOR STREET -<br>Conflicting Flows:<br>Fotential Capacity:<br>Capacity Adjustment Factor<br>Due To Repeding Movements:<br>Movement Capacity:<br>DELAY AND LEVEL OF SERVICE SUM                                               | 0,5 =<br>1,0 = Cp<br>- V4<br>- V4<br>- V4<br>- V4<br>- V4<br>- C<br>- C<br>- C<br>- C<br>- C<br>- C<br>- C<br>- C | .7 =<br>V:.4 = V3+V<br>Cc.4 =<br>Ca.4 = Cc.4<br>co.4 = 1-v4<br>co.4 =<br>V:.7 = 1/2V<br>c.7 =<br>F=co.4<br>co.7 = Cc.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2 =<br>=<br>/Cr.4 =<br>3+V2+V3+V<br>=<br>ta(zoph)<br>134<br>425<br>471 | /4 =        | 0<br>C3h<br>(pcah)<br>12 | +<br>AV3     | 1012<br>T074L<br>JELAY<br>775.0<br>8.5<br>7.3 | = | L05             | 425<br>425<br>1012<br>491<br>1.00<br>1.60<br>1.553<br>134<br>1.00<br>134                | roh<br>coh<br>coh<br>coh<br>coh                    |                    |

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| Hajor Street: FUEALANI<br>Minor Street: MAKAHI ST<br>Scenario: FUEURE BA<br>Peak Hour: AM |        |         | IT          |       |              |       |               |     |      |       |        |       |       | A<br>Fil | -    | st:<br>ime: | BC          | -Jul-96<br>DENAK-A |
|-------------------------------------------------------------------------------------------|--------|---------|-------------|-------|--------------|-------|---------------|-----|------|-------|--------|-------|-------|----------|------|-------------|-------------|--------------------|
|                                                                                           |        | ļ       |             |       |              | ٧1    | 2             | ų   | /11  |       | V10    |       |       | • - • •  |      | A           |             | ******             |
| Peak Hour Pactor:                                                                         | 1.00   |         |             |       |              | • •   | F             |     |      |       |        |       |       |          |      |             |             |                    |
| NAJOR STREET                                                                              |        | 1       |             |       |              | 27    | ני<br>ו       |     | 58   |       | 13     |       |       |          |      | RORT        | H           |                    |
| HUN OF Lanes - V2:                                                                        | 2      | }       |             |       |              |       | 1             |     | ł    |       |        |       |       |          |      |             |             |                    |
| Excl LT - V1 {T/N}:                                                                       | 7      |         |             |       |              |       | 1             |     | ļ.   |       | 1      |       |       |          |      |             |             |                    |
| Excl RT - V3 (T/N):                                                                       | ,<br>K | ł       |             |       |              |       |               |     |      |       | 1      |       |       |          |      |             |             |                    |
| Stop/Yield - V3 (T/N):                                                                    | л<br>Н | 1       |             |       |              | ¢     |               |     | 7    |       |        | >     |       |          |      |             |             |                    |
| Grade - V1,V2,V3:                                                                         |        | i.      |             |       |              |       |               |     |      |       |        |       |       |          |      |             |             |                    |
| AIGNE - 119129331                                                                         | 2      | i       |             |       |              |       |               |     |      |       |        |       |       |          |      |             |             |                    |
| Rum of Lanes - V5:                                                                        | ,      | 1 11    | ٨           |       | 1            |       |               |     |      |       |        |       | 1     |          | ••   |             |             |                    |
| Excl LT - V4 (T/R):                                                                       |        |         | J           |       | •            |       |               |     |      |       |        |       |       | ••       | 12   | V 6         |             |                    |
|                                                                                           | ï      |         | -           |       |              |       |               |     |      |       |        |       |       |          |      |             |             |                    |
| Excl RT - V6 (7/3):                                                                       |        | 172     | 2           |       | >            |       |               |     |      |       |        |       | <     | -        | 1954 | 75          |             |                    |
| Stop/Yield - 76 (T/N):                                                                    | R      |         | _           |       |              |       |               |     |      |       |        |       |       |          |      |             |             |                    |
| Grade - 74,73,76:                                                                         |        | 173     | Ĵ.          |       |              |       |               |     |      |       |        |       |       | • •      | ;    | V4          |             |                    |
| VINAS CORPO                                                                               |        | ;<br>•  |             |       | 1            |       |               |     |      |       |        |       | 1     |          |      |             |             |                    |
| NINCR STREET                                                                              |        | :       |             |       | V            |       |               |     |      |       |        |       | ۲     |          |      | STREE       |             |                    |
| Num of Lanes - VS:                                                                        | 1      |         |             |       |              |       |               |     |      |       |        |       |       | PŪ.      | KALA | FI BY       | PASS        |                    |
| Grade - V7,V3,V9:                                                                         | e      |         |             |       |              | ٢.    |               |     |      |       |        | >     |       |          |      |             |             |                    |
| Shared Lace-V7,8,9:                                                                       | 3      | 1       |             |       |              | ١.    |               |     | ļ    |       | !      | /     |       |          |      |             |             |                    |
| 0=R,1=LT,2=TR,3+LTR)                                                                      |        | ļ       |             |       |              | ļ     |               |     | ĺ    |       | ļ      |       |       |          |      |             |             |                    |
| Hun of Longo Wet                                                                          |        | į.      |             |       |              | ļ     |               |     |      |       |        |       |       |          |      |             | •           |                    |
| Num of Lanes - Vil:                                                                       | 1      | ĺ       |             |       |              | 14    | i             |     | 76   |       | 51     |       |       |          |      |             |             |                    |
| Grade - V10,V11,V12:                                                                      | 0      | 1       |             |       |              |       |               |     |      |       |        |       |       |          |      |             |             |                    |
| bared Lane-V10,11,12:                                                                     | 3      |         |             |       |              | 77    |               | 41  | 8    |       | ¥9     |       |       |          |      |             |             |                    |
| 0=N,1=LT,2=TR,3=LTR)                                                                      |        | l       |             |       |              | 11-11 |               |     |      |       | ~      |       |       |          |      |             |             | •                  |
|                                                                                           |        |         |             |       |              | 2120  | )R STR        | EET | - Ki | 12421 | SI     |       |       |          |      |             |             |                    |
| OLUKE ADJUSTNENTS                                                                         |        |         |             |       |              |       |               |     |      | ***•• |        |       |       |          |      |             |             | ******             |
| KOVENERT X9.                                                                              |        |         | 1           | :     | 3            | 4     |               |     | ¢    | 7     | 0      | •     | 10    |          | ••   | • •         |             |                    |
| HOURLY FLOW RATE, V(vph                                                                   | ,      |         | 0           | Ę     | C            |       | : 5<br>? 1054 |     | 2    |       |        | 3     | -     |          | ::   |             |             |                    |
| VOLUME, V (pepb)                                                                          | 1      | I       | 0           | 5     | e            |       | 1054          |     |      | 14    |        | 51    | 13    |          | 55   | 275         |             |                    |
|                                                                                           |        |         |             | د<br> | ۲<br>• • • • | ,     | 1034          | 1   |      | 15    | 84     | 30    | 14    |          | 64   | 303         |             |                    |
| TEP 1: RT FEON MINCE STEEL                                                                | 1 13   |         |             |       |              |       |               |     |      | ţ     |        |       |       |          |      |             |             |                    |
| Conflicting Flows:                                                                        |        | 7c? =   | 1/2         | 73 +  | ¥2           | z     | 3             | vt  | םו   | 1     | Vc12   | • 1/3 | 2 48  | + 75     |      | 1998        | vbp         |                    |
| Petential Capacity:                                                                       |        | Cp,9 =  |             | -     |              |       | 1381          |     | -    | -     |        |       | • • • |          |      |             | peph        |                    |
| Novement Capacity:                                                                        |        | Cs,3=C) | , <u></u> ; |       |              |       | 1381          |     |      |       | Cm, 12 |       | 7.    |          |      |             | peph        |                    |
| Frb. of Queu-free States                                                                  |        | 70,9=1- |             |       | r            |       | 0.96          |     | -    |       | 0,12   |       |       |          |      | 0.22        |             |                    |
|                                                                                           |        | ••••••• |             |       |              |       |               |     |      | • •   |        |       |       |          | •••• |             |             |                    |
| TEP 2: LT FROM HAJOR STREE                                                                | IT     |         |             |       |              |       |               |     |      | !     |        |       |       |          |      |             |             |                    |
| Conflicting Flows:                                                                        | Í      | Vc,4 +  | 72          | + ¥3  |              |       | 5             | vh  | p    | 1     | /c.1 : | • VS  | + ¥6  |          |      | 1096        | <b>y</b> ho |                    |
| Potential Capacity:                                                                       |        | Cp,4 +  |             |       |              |       | 1794          |     | -    | •     | p,1    |       |       |          |      |             | pcph        |                    |
| Novement Capacity:                                                                        |        | Ca,4=Cg | . 4=        |       |              |       | 1704          |     |      |       | 1. 1-1 |       |       |          |      |             | popà        |                    |
| Prb. of Queu-free State:                                                                  |        |         |             |       |              |       | 0.99          |     |      |       | 0.1-1  |       |       |          |      | 1.00        | 6.69        |                    |
| Najor Left Stared Lane                                                                    |        |         |             |       |              |       |               |     |      |       |        |       |       |          |      | ••••        |             |                    |
| Prob. if guete-free Sta                                                                   | . !    | 2°:,4=  |             |       |              |       | RA            |     |      | :     | *0,1   |       |       |          |      | 53          |             |                    |

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Minor Street: NAKA<br>Scenaria: FUTI<br>Feak Hour: AM                                                                                                                       |                                                                      |                                             |                                               |                                          |        | Ia                                                                          | tesection                 | DA<br>Analys<br>File Xas<br>Intesection                                  | Be: PURNAR-A                                                                      |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|---------------------------------------------|-----------------------------------------------|------------------------------------------|--------|-----------------------------------------------------------------------------|---------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--|--|
| Potential Capacity:       [Cp,3]:       113 7pb       Cp,11:       211 pcph         Capacity Adj Factor:       [A = cp,4*pc,1:       0.59       [C11: po,4*pc,1:       0.59         Noreacat Capacity:       [Cs,3: Cp,8*68:       243 pcph       Cr,11: po,4*pc,1:       0.59         Prot. of Queue-free State:       [pr,2:::-97(Cs,8:       0.55       [po,11: 1:v11/(L1:1::0.74         STEF 4: LT FRON MINOR STREET       [Cr,7:::1/2V3+V2+V1+1/2V5+T5+V4+       Vc,10::1/2V6+V5+V4+1/2V3+V2+V1+         Conflicting Flows:       [C7:::1/2V3+V2+V1+1/2V5+T5+V4+       Vc,10::1/2V6+V5+V4+1/2V3+V2+V1+         Potential Capacity:       [C7:::1/2V3+V2+V1+1/2V5+T5+V4+       Vc,10::1/2V6+V5+V4+1/2V3+V2+V1+         Potential Capacity:       [C7:::1/2V3+V2+V1+1/2V5+T5+V4+       Vc,10::1/2V6+V5+V4+1/2V3+V2+V1+         Potential Capacity:       [C7:::1/2V3+V2+V1+1/2V5+T5+V4+       Vc,10::1/2V6+V5+V4+1/2V3+V2+V1+         Potential Capacity:       [C7:::1/2V1+V12]::1/2V1+V2+V1+       Vc,10::1/2V6+V5+V4+1/2V3+V2+V1+         Potential Capacity:       [C7:::1/2V1+V12]::1/2V1+V2+V1+       Vc,10::1/2V1+V2+V1+         Potential Capacity:       [C7:::1/2V1+V12]::1/2V1+V2+V1+       Vc,10::1/2V1+V2+V1+         Potential Capacity:       [C7:::1/2V1+V12]::1/2V1+       0.73         Capacity:       [C7:::1/2V1+V12]:1/2V1+       0.74         Potentisty:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                             |                                                                      | <br> Yc.,9 =                                | 1/2¥3+¥2+                                     | V1+V6+V5+V                               |        | <br> <br>                                                                   | Vc11 = 1                  | /2¥6+¥5+¥4+\                                                             | ¥3+¥2+¥1                                                                          |  |  |
| Potential Capacity:       [:D_2,3 *       115 pcpi   [:D_1] *       247 pcph         Capacity: Adj Factor:       [:C_3 * C.P,8'f8 *       243 pcph   [:D_1] * po,4'po,1 *       0.99         Noreacnt Capacity:       [:C_3 * C.P,8'f8 *       243 pcph   [:D_1] *       1.* po,4'po,1 *       0.99         Pret. of Queue-free State:       [:p0,2 * 1-*3/Ca,8 *       0.55       ! po,11 *       1.* r11/Ca,11 *       0.74         STEP 4: LI FROM MINOR STREET :       [:C_01] *       1.* r11/Ca,11 *       0.74       ! /2(Vi+V9) *       1142 vph         Conflicting Flows:       [:V_0,7 *       1/2(Vi+V1)2 *:T: rph         1/2(Vi+V9) *       1142 vph         Potential Capacity:       [:Cp7 *        1:3 pcph         1/2(Vi+V9) *       1142 vph         Najor Left, Minor Through           1       1       0.73         Majusted Inpedance Factor:       [? 7 *       0.74       [? 10*po,8*18 *       0.65         Movement Capacity:       [Ct,7 * f7*Cp,7 *       25 pcp5         Ca,10 * f10*cp,10 *       138 pcpb         DELAT AND LEVEL OF SERVICE SUMMART       Avc         Avc          MINOR LEFT TERM (10)       14       138 SRD       SHRD        LEVEL OF SERVICE CENTERL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | •                                                                                                                                                                           |                                                                      | 1 =                                         |                                               | 1113                                     | 702    | i                                                                           |                           |                                                                          | 1194 vob                                                                          |  |  |
| STEP 4: LT FROM MINOR STREET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Potential Capacit                                                                                                                                                           | ty:                                                                  | Cp,8 +                                      |                                               | 245                                      | i popà | 1                                                                           | Cp,11 =                   |                                                                          | 247 pcph                                                                          |  |  |
| STEP 4: LT FROM MINOR STREET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Capacity Adj Fact                                                                                                                                                           | :101:                                                                | f8 = pc,                                    | ,4°26,1 =                                     | 0.99                                     | )      | 1                                                                           | f11 = po,4                | *po,1 =                                                                  | 0.99                                                                              |  |  |
| STEP 4: LT FROM MINOR STREET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Xorement Capacity                                                                                                                                                           | 7:                                                                   | [Cs,9 =                                     | Cp,8*f8 =                                     | 243                                      | l pcph | 1                                                                           | Cx,11 = Cp                | ,11*f11 ≠                                                                | 245 pcph                                                                          |  |  |
| Conflicting Flows:       Yc, 7 = 1/2V3+V2+V1+1/2V5+V5+V4+<br>I/2(V11+Y12) = 1271 rph<br>I/2(V11+Y12) = 1271 rph<br>I/2(V8+V5+V4+1/2V3+V2+V1+<br>I/2(V8+V5) = 1142 rph<br>I/2(V8+V5) = 0.73<br>I/2(V8+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2(V9+V5) = 0.73<br>I/2( | Prot. of Queue-fr                                                                                                                                                           | cee State:                                                           | po,2 = 1                                    | 1-79/Cm,8                                     | = 0.55                                   |        | !                                                                           | po,11 = 1-                | vi1/Ca,11 =                                                              | 0.74                                                                              |  |  |
| Potential Capacity:       [Cp7 + 1231 rph]       1/2(W8+W9) - 1142 vph         Potential Capacity:       [Cp7 + 153 pcph]       Cp10 + 197 pcph         Hajor Left, Minor Through       P''T*pc,11*f11 - 0.74       P''10=po,8*f8 + 0.65         Hajor Left, Minor Through       P''7*pc,11*f11 - 0.74       P''10=po,8*f8 + 0.65         Hajor Left, Minor Through       P''1 - 0.74       P'10 - 0.73         Capacity Adjustent Factor:       [P' * p' 7*pc,12 + 0.17       E.80       P'10 - 0.73         Capacity Adjustant Factor:       [Ct, 7 = f' * po,12 - 0.17       E.00       F10 - 10*po,9 - 0.70         Movement Capacity:       [Ct, 7 = f' * po,12 - 0.17       E.010 - f10*po,9 - 0.70       I38 pcph         DELAT AND LEVEL OF SERVICE SUMMART       AVG       TOTAL       I         MOVENERT       r(pcph) cm(pcph) csh(pcph)       DELAT       LEVEL OF SERVICE CRITEREL         MINOR LEFT TOER       [1]       52       1381       SHRD          MINOR EFEGRT TOER       [1]       54       245       133       124.2       F       AVG         MINOR THROUGH       [1]       54       245       133       124.2       F       A <<-5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | STEP 4: LT PRON MINO                                                                                                                                                        | R STREET                                                             |                                             |                                               |                                          |        | !                                                                           |                           |                                                                          |                                                                                   |  |  |
| Potential Capacity:       [Cp7 -       153 pcph       [Cp10 -       197 pcph         Major Left, Minor Through       [P''7=pc,11*f11 -       0.74       [P''10=po,8*f8 -       0.65         Major Left, Minor Through       [P''7=pc,11*f11 -       0.74       [P''10=po,8*f8 -       0.65         Major Left, Minor Through       [P''7=pc,11*f11 -       0.74       [P''10=po,8*f8 -       0.65         Major Left, Minor Through       [P''7=pc,11*f11 -       0.74       [P''10=po,8*f8 -       0.65         Adjusted Ispedance Factor:       [P''7 *       0.80       [P'10 -       0.73         Capacity:       [Ct,7 = f7*Cp,7 -       25 pcph       Ca,10 = f10*Cp,10 -       138 pcph         DELAT AND LEVEL OF SERVICE SUMMART       ATG       [       138 pcph       100*Cp,10 -       138 pcph         MINOR LEFT TERM (7)       15       28       SHRD         ILEVEL OF SERVICE CRITERI.         MINOR LEFT TURM (7)       15       28       SHRD       SHRD        ILEVEL OF DELAT       NVG         MINOR LEFT TURM (7)       15       28       SHRD       SHRD        ILEVEL OF DELAT         MINOR LEFT TURM (12)       14       138       SHRD        OT       DELAT<                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Conflicting Flows                                                                                                                                                           | 51                                                                   | Yc,7 = 1                                    | 1/2V3+V2+V                                    | 1+1/285+85                               | +¥4+   | İ                                                                           | Vc.10 = 1/                | 286+85+84+1/                                                             | 2V3+V2+V1+                                                                        |  |  |
| Major Left, Minor Through                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        <                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -                                                                                                                                                                           |                                                                      | 1/2(V11+V12) = 1271 vph                     |                                               |                                          |        |                                                                             |                           |                                                                          |                                                                                   |  |  |
| Impedance Factor:        P''7=pc,11*f11 =       0.74        P''10=po,8*f8 =       0.65         Major Left, Minor Through                                                 Adjusted Inpedance Factor:        P'7 =       0.80               p'10 =       0.73         Capacity Adjustent Factor:        P'7 =       0.80               p'10 =       0.73         Capacity Adjustent Factor:        P'7 =       0.80               p'10 =       0.73         Movement Capacity:        Cx,7 = f7*Cp,7 -       23 pcph        Ca,10 = f10*Cp,10 =       138 pcph         DELAT AND LEVEL OF SERVICE SUMMART       AVG                       100 =               138 pcph         MOVEMENT       '(pcph) cm(pcph) csh(pcph)       pch) bELAT       LOS                                                                                                                                                                                                                                                                                                                                                                         <t< td=""><td></td><td></td><td></td><td></td><td>153</td><td>poph</td><td>1</td><td>Cp10 =</td><td></td><td>197 pcph</td></t<>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                             |                                                                      |                                             |                                               | 153                                      | poph   | 1                                                                           | Cp10 =                    |                                                                          | 197 pcph                                                                          |  |  |
| Najor Left, Kinor Through<br>Adjusted Inpedance Factor:       [p'7 =       0.80       p'10 =       0.73         Capacity Adjustment Factor:       [17 = p'7*po,12 =       0.17       f10 = p'10*po,9 =       0.70         Novement Capacity:       [Cx,7 = f7*Cp,7 =       25 pcpb       Cx,10 = f10*Cp,10 =       138 pcph         DELAT AND LEVEL OF SERVICS SUMMART       AVG       TOTAL       Interpret the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                             |                                                                      |                                             |                                               |                                          |        | i                                                                           |                           |                                                                          |                                                                                   |  |  |
| Adjusted Impedance Factor:       [p'7 *       0.80       p'10 *       0.73         Capacity Adjustment Factor:       [f7 * p'7*p0,12 *       0.17       [f10 * p'10*p0,9 *       0.70         Novement Capacity:       [Cx,7 * f7*p0,12 *       0.17       [f10 * p'10*p0,9 *       0.70         DELAT AND LEVEL OF SERVICE SUMMART       AVG       [oral = f10*Cp,10 *       138 pcph         MOVEMENT       r(pcph) cm(pcph) cm(pcph)       DELAT       LOS           ILEVEL OF SERVICE CRITERI.         MINOR LEFT TURN       [7]       15       28       SHRD          HINOR LEFT TURN       [7]       15       28       SHRD        ILEVEL OF SERVICE CRITERI.         MINOR LEFT TURN       [7]       15       28       SHRD        ILEVEL OF SERVICE CRITERI.         MINOR LEFT TURN       [2]       56       1381       SHRD        AVG         NINOR THROUGH       [11]       64       245       333       124.2       F       SERVICE (SEC/VEH)         NINOR REFT       [1]       0       442      RA       2.1       A       c=5         NINOR LEFT       [1]       0       442       -RA       2.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Impedance Factor                                                                                                                                                            | [:                                                                   | P''7=pc,                                    | ,11°f11 =                                     | 0.74                                     |        | 1                                                                           | P''10=po.8                | *f8 =                                                                    | 0.65                                                                              |  |  |
| Capacity Adjustment Factor:       [f = p'7*po,12 = 0.17       [f10 = p'10*po,9 = 0.70         Hovement Capacity:       [Cm,7 = f7*Cp,7 = 25 pcph]       Cm,10 = f10*Cp,10 = 138 pcph         DELAY AND LEVEL OF SERVICS SUMMART       AVG       TOTAL         MOVEMENT       r(pcph)       cm(pcph)       csh(pcph)       DELAY         LEVEL OF SERVICS SUMMART       AVG       TOTAL       [         MOVEMENT       r(pcph)       cm(pcph)       csh(pcph)       DELAY       LOS         MINOR LEFT TURN       (7)       15       28       SHRD        LEVEL OF SERVICE CRITERI.         MIKOR LEFT TURN       (7)       15       28       SHRD       SHRD        AVG         MIKOR LEFT TURN       (7)       15       28       SHRD       SHRD        AVG         MIKOR LEFT TURN       (7)       15       28       SHRD        AVG         MIKOR LEFT TURN       12       133       SHRD        AVG       LEVEL       IEVEL OF DELAY         NINOR LEFT TURN       12       203       388       SHRD        OF       DELAY         NINOR LEFT       (1)       0       442      HA       8.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                             |                                                                      | }                                           |                                               |                                          |        | 1                                                                           |                           |                                                                          |                                                                                   |  |  |
| Novement Capacity:       (Cr. 7 = f7*Cp. 7 =       28 pcph :       Cr. 10 = f10*Cp. 10 =       138 pcph         DELAT AND LEVEL OF SERVICS SUMMART       AVG         TOTAL         NOVEMERT       7 (pcph)       cr. (pcph)       Cr. (pcph)       Cr. (pcph)       DELAT LOS         MINOR LEFT TUER       (7)       15       28       SHRD        LEVEL OF SERVICE CRITERI.         MINOR LEFT TUER       (7)       15       28       SHRD       SHRD        LEVEL OF SERVICE CRITERI.         MINOR LEFT TUER       (7)       15       28       SHRD       SHRD        LEVEL OF SERVICE CRITERI.         MINOR LEFT TUER       (2)       56       1381       SHRD       SHRD        AVG         MINOR MERGET       111       64       245       333       124.2       F       SERVICE (SEC/VEE)         MINOR LEFT       (1)       0       442      HA       8.1       B       B       56<       10         MINOR LEFT       (1)       0       442      HA       8.1       B       B       56<<       10 <th< td=""><td>Adjusted Impedan</td><td>nce Factor:</td><td>p'7 ×</td><td></td><td>6.80</td><td></td><td>1</td><td></td><td></td><td>0.73</td></th<>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Adjusted Impedan                                                                                                                                                            | nce Factor:                                                          | p'7 ×                                       |                                               | 6.80                                     |        | 1                                                                           |                           |                                                                          | 0.73                                                                              |  |  |
| Novement Capacity:       [Cr. 7 = f7*Cp. 7 =       28 pcp5 ;       Cr. 10 = f10*Cp. 10 =       138 pcp5         DELAY AND LEVEL OF SERVICE SUMMART       AVG         TOTAL       TOTAL         HOVEMENT       r(pcp1;)       CR(pcp1)       DELAY LOS         TOTAL       I         HINOR LEFT TURN       [7]       15       CR(pcp1)       DELAY LOS         HINOR LEFT TURN       [7]       15       CR(pcp1)       DELAY LOS         HINOR LEFT TURN       [7]       15       CR(pcp1)       DELAY LOS         HINOR LEFT TURN       TOTAL       LEVEL OF SERVICE CRITERI.         HINOR LEFT TURN       AVG         NINOR REGHT TURN       AVG         NINOR REGHT TURN       AVG         NINOR REGHT TURN       AVG         NINOR REGHT TURN       AVG         NINOR REGHT TURN       AVG         NINOR REGHT TURN       AVG         NINOR REGHT TURN       AVG         NINOR REGHT TURN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Capacity Adjustme                                                                                                                                                           | nt Pactor:                                                           | f7 = g'7                                    | 7°po,12 =                                     | 2.17                                     |        |                                                                             |                           | •po,9 =                                                                  | 0.70                                                                              |  |  |
| DELAT AND LEVEL OF SERVICE SUMMARY       AVG       TOTAL         NOVEMENT       r(pcpb) cm(pcpb) csb(pcpb)       DELAY       LOS         MINOR LEFT TURN (7)       15       28       SHRD        LEVEL OF SERVICE CRITERI.         MINOR LEFT TURN (7)       15       28       SHRD        Image: Comparison of the service criteri.         MINOR LEFT TURN (7)       15       28       SHRD        Image: Comparison of the service criteri.         MINOR LEFT TURN (7)       15       28       SHRD       SHRD        Image: Comparison of the service criteri.         MINOR LEFT TURN (7)       15       28       SHRD       SHRD        AVG         MINOR LEFT TURN (10)       14       138       SHRD       SHRD        OF       DELAY         NINOR THROUGE (11)       64       245       333       124.2       F       SERVICE (SEC/VEE)         NINOR RIGHT TURN (12)       203       389       SHRD       SHRD        Image: Comparison of the service comparison of the service comparison of the service comparison of the service comparison of the service comparison of the service comparison of the service comparison of the service comparison of the service comparison of the service comparison of the service comparison of the service comparison of the service comparison                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Hovement Capacity                                                                                                                                                           | 7:                                                                   | [Cz,7 = 1                                   | £7*Cp,7 =                                     | 28                                       | i popă | 1                                                                           | Ca,10 = f1                | 0°Cp,10 +                                                                | 138 pcpb                                                                          |  |  |
| TOTAL         HOVEHERT $\tau$ (pcpb) cm (pcph) csh (pcph)       DELAY       LOS         HINOR LEFT TURN       (7)       15       28       SHRD        LEVEL OF SERVICE CRITERI.         MINOR LEFT TURN       (8)       34       243       170       35.9       7         NINOR LEFT TURN       (2)       56       1381       SHRD        AVG         NINOR LEFT TURN       (10)       14       139       SHRD        07       DELAY         NINOR LEFT TURN       (10)       14       139       SHRD        07       DELAY         NINOR HEROUGH       (11)       64       245       333       124.2       F       SERVICE       (SEC/VEH)         NINOR LEFT       (12)       203       388       SHRD        07       DELAY         NINOR LEFT       (1)       0       442      HA       8.1       B       B       556<                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                             |                                                                      | 1427<br>1427                                |                                               |                                          |        | 176                                                                         |                           | <br>1                                                                    |                                                                                   |  |  |
| NOVEMENT       v(pcph) cm(pcph) csh(pcph)       DELAT       LOS         HINOR LEFT TURN       17       15       28       SHRD        LEVEL OF SERVICE CRITERI.         MIROR THROUGH       (8)       34       243       170       36.9       Z       AVG         NIKOR FIGHT TURN       (2)       56       1381       SHRD        AVG         NIKOR LEFT TURN       (10)       14       138       SHRD        OF       DELAY         NINOR LEFT TURN       (10)       14       138       SHRD        OF       DELAY         NINOR LEFT TURN       (12)       12       303       124.2       F       SERVICE       (SEC/VEE)         NINOR RIGHT TURN       (12)       303       SHRD        OF       DELAY         NINOR LEFT       (11)       642      RA       8.1       B       B       SEC/VEE)         NINOR LEFT       (1)       0       642      RA       8.1       B       B       SEC/VEE)         NINOR LEFT       (1)       0       642      RA       8.1       B       B       SEGC/VEE)         NINOR AFFROACH (7)(9)(9)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | hond the price of p                                                                                                                                                         |                                                                      |                                             |                                               |                                          |        |                                                                             |                           |                                                                          |                                                                                   |  |  |
| MINOR LEIT TURN {7}       15       28       SHRD       SHRD        LEVEL OF SERVICE CRITERIAL         MINOR THROUGH       {8}       34       243       170       36.9       F       AVG         MINOR FIGHT TURN {2}       56       1381       SHRD       SHRD        AVG         MINOR LEFT TURN {10}       14       139       SHRD       SHRD        OF       DELAY         NINOR THROUGH       111       54       245       333       124.2       F       SERVICE (SEC/VEH)         NINOR THROUGH       111       54       245       333       124.2       F       SERVICE (SEC/VEH)         NINOR THROUGH       111       54       245       333       124.2       F       SERVICE (SEC/VEH)         NINOR THROUGH       111       54       245       333       124.2       F       SERVICE (SEC/VEH)         NINOR RIGHT TURN (12)       303       389       SHRD        A       <=5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                             |                                                                      |                                             |                                               |                                          |        |                                                                             |                           |                                                                          |                                                                                   |  |  |
| MINOR THROUGH       (8)       24       243       170       96.9       7         MINOR EIGHT TURN       (2)       56       1381       SHRD       SHRD        AVG         MINOR EIGHT TURN       (2)       56       1381       SHRD       SHRD        OF       DELAY         MINOR LEFT TURN       (10)       14       139       SHRD       SHRD        OF       DELAY         MINOR LEFT TURN       (10)       14       139       SHRD       SHRD        OF       DELAY         MINOR THROUGH       (11)       64       245       333       124.2       F       SERVICE       (SEC/VEH)         MINOR RIGHT TURN       (12)       3C3       388       SHRD        Image: Comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the comparison of the com                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | NOVENERT                                                                                                                                                                    |                                                                      |                                             |                                               |                                          |        |                                                                             | LOS                       |                                                                          |                                                                                   |  |  |
| NIKOR EIGHT TURN (?)       56       1381       SHRD       SHRD        AVG         NIKOR LEFT TURN (10)       14       138       SHRD       SHRD        OF       DELAY         NINOR LEFT TURN (10)       14       138       SHRD       SHRD        OF       DELAY         NINOR THROUGH       (11)       64       245       333       124.2       F       SERVICE       (SEC/VEE)         NINOR RIGHT TURN (12)       3C3       389       SHRD       SHRD        Image: Constraint of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                             | {7}                                                                  | •••••                                       |                                               |                                          | -      | *****                                                                       | LOS                       | <br> <br>  LEVEL OF                                                      | SERVICE CRITERI                                                                   |  |  |
| NINOR LEFT TERN (10)       14       138       SHRD       SHRD        OF       DELAY         NINOR THROUGH       (11)       64       245       333       124.2       F       SERVICE       (SEC/VEH)         NINOR RIGHT TURK (12)       303       388       SHRD         0F       DELAY         NINOR RIGHT TURK (12)       303       388       SHRD       SHRD            NAJOR LEFT       (1)       0       642      HA       8.1       B       B       >56<<19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | HINOR LEFT TURN                                                                                                                                                             |                                                                      | 15<br>31                                    | 28<br>243                                     | SHRD                                     | •      | SHRD                                                                        | LOS<br>                   | <br> <br>  level of                                                      | SERVICE CRITERIA                                                                  |  |  |
| NINOR LEFT TURN (10)       14       138       SHRD       SHRD        OF       DELAY         NINOR THROUGH (11)       64       245       333       124.2       F       SERVICE       (SEC/VEH)         NINOR RIGHT TURN (12)       3C3       388       SHRD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | HINOR LEFT TURN<br>NINGR THROUGH                                                                                                                                            | (8)                                                                  | 15<br>31                                    | 28<br>243                                     | SHRD<br>170                              | •      | SHRD<br>95.9                                                                | LOS<br>                   | <br> <br>  LEVEL OF<br>                                                  |                                                                                   |  |  |
| NINOR THROUGH       (11)       64       245       333       124.2       F       SERVICE       (SEC/VEH)         NINOR RIGHT TURN       (12)       303       388       SHED       SHED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | HINOR LEFT TURN<br>NINGR THROUGH                                                                                                                                            | (8)                                                                  | 15<br>31                                    | 28<br>243                                     | SHRD<br>170                              | •      | SHRD<br>95.9                                                                | LOS<br>                   | i<br>I                                                                   | . AVG                                                                             |  |  |
| NIMOR RIGHT TURN (12)       3C3       388       SHRD        A       <=5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | MINOR LEFT TURN<br>MINOR THROUGH<br>MINOR EIGHT TURN                                                                                                                        | (8)<br>(2)                                                           | 15<br>34<br>56                              | 28<br>243<br>1381                             | SHRD<br>170<br>ShrC                      | -      | SHRD<br>96.9<br>SHRD                                                        | LOS<br><br>7<br>          | <br> <br>  Level                                                         | AVG<br>TOTAL                                                                      |  |  |
| MAJOR LEFT       (1)       0       442      HA       B.1       B       B       >5%<=19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | MINOR LEFT TURN<br>NIROR THROUGH<br>NIROR FIGHT TURN<br>NINOR LEFT TURN                                                                                                     | (8)<br>(?)<br>(10)                                                   | 15<br>34<br>56<br>14                        | 28<br>243<br>1381<br>139                      | SHRD<br>170<br>SHRD<br>SHRD              | -      | SHRD<br>95.9<br>SHRD<br>SHRD                                                | LOS<br><br>F<br>          | <br> <br>  Level<br>  Of                                                 | AVG<br>Total<br>Delay                                                             |  |  |
| HAJOR LEFT       (1)       0       442      HA       8.1       B       B       >54<=19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | MINOR LEFT TURN<br>MINOR THROUGH<br>MINOR FIGHT TURN<br>MINOR LEFT TURN<br>MINOR THROUGE                                                                                    | <pre>(8) (2) (10) (11)</pre>                                         | 15<br>84<br>56<br>14<br>64                  | 28<br>243<br>1381<br>138<br>245               | SHRD<br>170<br>SHRC<br>SHRD<br>333       | -      | SHRD<br>35.9<br>SHRD<br>SHRD<br>124.2                                       | LOS<br><br>F<br><br>F     | <br>  LEVEL<br>  OF<br>  SERVICE                                         | AVG<br>Total<br>Delay<br>(Sec/Vee)                                                |  |  |
| HAJOR LEFT       [4]       2       1704      HA       2.1       A       C       >106<=20         NINOR AFFRJACH       [7](2)[2]       -       -       .205<=30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | MINOR LEFT TURN<br>MINOR THROUGH<br>MINOR FIGHT TURN<br>MINOR LEFT TURN<br>MINOR THROUGE                                                                                    | <pre>(8) (2) (10) (11)</pre>                                         | 15<br>84<br>56<br>14<br>64                  | 28<br>243<br>1381<br>138<br>245               | SHRD<br>170<br>SHRC<br>SHRD<br>333       | -      | SHRD<br>35.9<br>SHRD<br>SHRD<br>124.2                                       | LOS<br><br>F<br><br>F     | LEVEL<br>OF<br>SERVICE                                                   | AVG<br>Total<br>Delay<br>(SEC/VEE)                                                |  |  |
| NIROR AFFROACH (7)(9)(9)       -       -       95.9       F       E       >306<=45                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | MINOR LEFT TURN<br>MINOR THROUGH<br>MINOR FIGHT TURN<br>MINOR LEFT TURN<br>MINOR THROUGE<br>MINOR RIGHT TURN                                                                | <pre>(8) (9) (10) (11) (12)</pre>                                    | 15<br>84<br>56<br>14<br>64<br>303           | 28<br>243<br>1381<br>138<br>245<br>388        | SHRD<br>170<br>Shrd<br>333<br>Shrd       | -      | SHRD<br>95.9<br>SHRD<br>SHRD<br>124.2<br>SHRD                               | LOS<br><br>F<br><br>F<br> | LEVEL<br>OF<br>SERVICE                                                   | AVG<br>TOTAL<br>DELAY<br>(SEC/VEE)<br><=5                                         |  |  |
| NIROF AFFRAACH (7)(2)(2)       -       -       96.9       I       E       >306<=45                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | MINOR LEFT TURN<br>MINOR THROUGH<br>MINOR EIGHT TURN<br>MINOR LEFT TURN<br>MINOR THROUGE<br>MINOR RIGHT TURR<br>MAJOR LEFT                                                  | <pre>(8) (2) (10) (11) (12) (1)</pre>                                | 15<br>84<br>56<br>14<br>64<br>303<br>0      | 28<br>243<br>1381<br>138<br>245<br>388<br>442 | SHRD<br>170<br>SHRD<br>333<br>SHED<br>NA | -      | SHRD<br>35.3<br>SHRD<br>SHRD<br>124.2<br>SHRD<br>8.1                        | LOS<br>                   | <br>  LEVEL<br>  OF<br>  SERVICE<br> <br>  A<br>  B                      | AVG<br>TOTAL<br>DELAY<br>(SEC/VEE)<br><= 5<br>>5&<= 19                            |  |  |
| HINOR APPROACH (10)(11)(12) 124.2 F F >45<br>HAJOR AFPROACH (1)(2)(3) 0.0<br>HAJOR AFPROACH (4)(5)(5) 0.0 A<br>TOTAL INTERSECTION (1-12) 32.0 E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | MINOR LEFT TURN<br>MINOR THROUGH<br>MINOR EIGHT TURN<br>MINOR LEFT TURN<br>MINOR THROUGE<br>MINOR RIGHT TURR<br>MAJOR LEFT                                                  | <pre>(8) (2) (10) (11) (12) (1)</pre>                                | 15<br>84<br>56<br>14<br>64<br>303<br>0      | 28<br>243<br>1381<br>138<br>245<br>388<br>442 | SHRD<br>170<br>SHRD<br>333<br>SHED<br>NA | -      | SHRD<br>35.3<br>SHRD<br>SHRD<br>124.2<br>SHRD<br>8.1                        | LOS<br>                   | <br>  LEVEL<br>  OF<br>  SERVICE<br> <br>  A<br>  B<br>  B<br>  C        | AVG<br>TOTAL<br>DELAY<br>(SEC/VEE)<br><=5<br>>5&<=19<br>>10&<=20                  |  |  |
| HAJOR APPROACH (4)(5)(6) 0.0 A<br>TOTAL INTERSECTION (1-12)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | MINOR LEFT TURN<br>MINOR THROUGH<br>MINOR EIGHT TURN<br>MINOR LEFT TURN<br>MINOR THROUGE<br>MINOR RIGHT TURN<br>MAJOR LEFT<br>MAJOR LEFT                                    | <pre>(8) (2) (10) (11) (12) (1) (4)</pre>                            | 15<br>84<br>56<br>14<br>64<br>303<br>0      | 28<br>243<br>1381<br>138<br>245<br>388<br>442 | SHRD<br>170<br>SHRD<br>333<br>SHED<br>NA | -      | SHRD<br>95.9<br>SHRD<br>124.2<br>SHRD<br>8.1<br>2.1                         | LOS<br>                   | <br>  LEVEL<br>  OF<br>  SERVICE<br> <br>  A<br>  B<br>  B<br>  C<br>  D | AVG<br>TOTAL<br>DELAY<br>(SEC/VEE)<br><=5<br>>5&<=10<br>>10&<=20<br>>20&{<3C      |  |  |
| KAJOR APPROACH (4)(5)(6)     -     -     0.0     A       TOTAL INTERSECTION (1-12)     -     -     39.0     E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | MINOR LEFT TURN<br>MINOR THROUGH<br>MINOR EIGHT TURN<br>MINOR LEFT TURN<br>MINOR THROUGH<br>MINOR RIGHT TURN<br>MAJOR LEFT<br>MAJOR LEFT<br>MINOR AFFRDACH (7               | <pre>(8) (2) (10) (11) (12) (1) (4) (3)(2)(2)</pre>                  | 15<br>34<br>56<br>14<br>64<br>303<br>0<br>2 | 28<br>243<br>1381<br>138<br>245<br>388<br>442 | SHRD<br>170<br>SHRD<br>333<br>SHED<br>NA | -      | SHRD<br>95.9<br>SHRD<br>124.2<br>SHRD<br>8.1<br>2.1<br>96.9                 | LOS<br>                   | <br>  LEVEL<br>  OF<br>  SERVICE<br> <br>  A<br>  B<br>  C<br>  D<br>  E | AVG<br>TOTAL<br>DELAY<br>(SEC/VEE)<br>>5&<=19<br>>10&<=20<br>>20&<=30<br>>30&<=45 |  |  |
| TOTAL INTERSECTION (1-12) 39.0 E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | MINOR LEFT TURN<br>MINOR LEFT TURN<br>MINOR LEFT TURN<br>MINOR LEFT TURN<br>MINOR RIGHT TURN<br>MAJOR LEFT<br>MAJOR LEFT<br>MINOR AFFRDACH (7<br>MINOR APPROACH (10)        | <pre>(8) (7) (10) (11) (12) (1) (4) (4) (3)(9) (11)(12)</pre>        | 15<br>34<br>56<br>14<br>64<br>303<br>0<br>2 | 28<br>243<br>1381<br>138<br>245<br>388<br>442 | SHRD<br>170<br>SHRD<br>333<br>SHED<br>NA | -      | SHRD<br>95.9<br>SHRD<br>124.2<br>SHRD<br>8.1<br>2.1<br>96.9<br>124.2        | LOS<br>                   | <br>  LEVEL<br>  OF<br>  SERVICE<br> <br>  A<br>  B<br>  C<br>  D<br>  E | AVG<br>TOTAL<br>DELAY<br>(SEC/VEE)<br>>5&<=19<br>>10&<=20<br>>20&<=30<br>>30&<=45 |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | MINOR LEFT TURN<br>MINOR LEFT TURN<br>MINOR LEFT TURN<br>MINOR LEFT TURN<br>MINOR RIGHT TURN<br>MINOR RIGHT TURN<br>MAJOR LEFT<br>MINOR AFFROACH (10<br>MAJOR AFFROACH (11) | <pre>(8) (7) (10) (11) (12) (1) (4) (3)(9) (9)(11)(12) )(2)(3)</pre> | 15<br>34<br>56<br>14<br>64<br>303<br>0<br>2 | 28<br>243<br>1381<br>138<br>245<br>388<br>442 | SHRD<br>170<br>SHRD<br>333<br>SHED<br>NA | -      | SHRD<br>95.9<br>SHRD<br>124.2<br>SHRD<br>8.1<br>2.1<br>96.9<br>124.2<br>0.0 | LOS<br>                   | <br>  LEVEL<br>  OF<br>  SERVICE<br> <br>  A<br>  B<br>  C<br>  D<br>  E | AVG<br>TOTAL<br>DELAY<br>(SEC/VEE)<br>>5&<=19<br>>10&<=20<br>>20&<=30<br>>30&<=45 |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | MINOR LEFT TURN<br>MINOR LEFT TURN<br>MINOR LEFT TURN<br>MINOR LEFT TURN<br>MINOR RIGHT TURN<br>MINOR RIGHT TURN<br>MAJOR LEFT<br>MINOR AFFROACH (10<br>MAJOR AFFROACH (11) | <pre>(8) (7) (10) (11) (12) (1) (4) (3)(9) (9)(11)(12) )(2)(3)</pre> | 15<br>34<br>56<br>14<br>64<br>303<br>0<br>2 | 28<br>243<br>1381<br>138<br>245<br>388<br>442 | SHRD<br>170<br>SHRD<br>333<br>SHED<br>NA | -      | SHRD<br>95.9<br>SHRD<br>124.2<br>SHRD<br>8.1<br>2.1<br>96.9<br>124.2<br>0.0 | LOS<br>                   | <br>  LEVEL<br>  OF<br>  SERVICE<br> <br>  A<br>  B<br>  C<br>  D<br>  E | AVG<br>TOTAL<br>DELAY<br>(SEC/VEE)<br>>5&<=19<br>>10&<=20<br>>20&<=30<br>>30&<=45 |  |  |

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| inor Street: MAK/                        | ILANI BYP.<br>INI ST |            |                  |                  |      |              |         |       |              |                | Print C<br>Anal   | ate:<br>yst:      | 29-Jul-96<br>8C |
|------------------------------------------|----------------------|------------|------------------|------------------|------|--------------|---------|-------|--------------|----------------|-------------------|-------------------|-----------------|
| Scenaris: fUTU<br>Peak Hour:             | IRE BASE  <br>Pr     |            | ITHOUT           | #IT              |      |              |         |       |              | Int            | File #<br>esectio |                   | PUX NAK-P       |
| Peak Hour Facto                          |                      |            |                  |                  | Vi   | 2            | V11     |       | V10          | ******         |                   | <br>,             |                 |
| reak nout racio                          | or: 1.               | 1 I<br>    |                  |                  | 39   | )            | 37      |       | 4            |                |                   | I<br>Nort         | H               |
| NAJOR STREE                              | T                    | - i        |                  |                  |      | 1            | Ĩ       |       | 1            |                |                   |                   |                 |
| Num of Lanes - V                         |                      | 2          |                  |                  |      |              | 1       |       | Ì            |                |                   |                   |                 |
| Excl LT - V1 (Y/N                        | •                    | Υļ         |                  |                  | - 1  |              | 1       |       | ١            |                |                   |                   |                 |
| Excl RT - V3 (Y/M                        | •                    | N          |                  |                  | (    |              | ۷       |       | >            |                |                   |                   |                 |
| op/Yield - V3 (Y/W                       | -                    | N          |                  |                  |      |              |         |       |              |                |                   |                   |                 |
| 6rade - V1,V2,V                          | 3:                   | 2          |                  | Ĩ                |      |              |         |       |              | -,             |                   |                   |                 |
| Num of Lanes - V                         | 5:                   | 1 1 11     | 196              | '                |      |              |         |       |              | ۱              | ,                 | 5 V6              |                 |
| Excl LT - V4 (Y/N                        |                      | Y ]        |                  | -                |      |              |         |       |              |                | - 2               | . 40              |                 |
| Excl RT - V6 (Y/M                        |                      |            | 778              | )                |      |              |         |       |              | (              | 46                | 7 VS              |                 |
| op/Yield - V6 (Y/W                       |                      | N          |                  |                  |      |              |         |       |              | `              |                   |                   |                 |
| Grade - V4,V5,V                          | 6: -                 | 2   V3     | 25               |                  |      |              |         |       |              |                | - 1               | 8 V4              |                 |
| NINOR STREE                              | T                    | _          |                  | 1                |      |              |         |       |              |                | **100             |                   | ,               |
| Num of Lanes - V                         |                      | 1          |                  | v                |      |              |         |       |              | v              |                   | STREE1<br>NNI BYF |                 |
| Grade - V7,V8,V                          |                      |            |                  |                  | (    |              | •       |       | >            |                | PUNHL             |                   | n               |
| Shared Lane-V7,8,                        |                      | 3          |                  |                  | Ì    |              | - F     |       | í            |                |                   |                   |                 |
| N,1=LT,Z=TR,3=LTR;                       | )                    | i i        |                  |                  | 1    |              | i       |       | ٦Ľ.          |                |                   |                   |                 |
|                                          |                      |            |                  |                  | 1    |              | l       |       | Í            |                |                   |                   |                 |
| Num of Lanes - VII                       |                      | 1          |                  |                  | 2    |              | 60      |       | 26           |                |                   |                   |                 |
| 6rade - V18,V11,V12                      |                      |            |                  |                  |      |              |         |       |              |                |                   |                   |                 |
| red Lane-V18,11,12<br>W,1=LT,2=TR,3=LTR) |                      | 3          |                  |                  | ¥7   |              | V8      |       | V9           |                |                   |                   |                 |
|                                          |                      |            |                  |                  | NINO | R STR        | EET - W | AKANI | ST           |                |                   |                   |                 |
|                                          |                      |            |                  |                  |      |              |         |       |              |                |                   |                   |                 |
| NE ADJUSTNENTS                           |                      | 1          |                  |                  |      |              |         |       |              |                |                   |                   |                 |
| IOVENENT NO.<br>Iourly flow rate,        | Viunhi               | J          |                  | 23               | 4    | 3            | 5       | 1     | 8            | 9 10           |                   |                   |                 |
| OLUME, v (pcph)                          | *(***)               |            | 196 77<br>274 77 |                  |      | 467          |         | 2     | 6∎ 2<br>66 2 |                |                   |                   |                 |
|                                          |                      |            |                  |                  |      |              |         | ء<br> |              | ,<br>,,,,,,,,, | 41<br>            | 43                |                 |
| 1: RT FROM MINDR                         |                      | 1          |                  |                  |      |              |         | 1     |              |                |                   |                   |                 |
| aflicting Flows:                         |                      |            | 1/2 V3           | + V2             | •    | 398          | vhp     | 1 V   | :12 =        | 1/2 V6         | + ¥5 =            | 488               | vhp             |
| tential Capacity                         |                      | Cp.9       |                  |                  |      |              | pcph    |       | ,12 =        |                |                   |                   | pcph            |
| ement Capacity:                          |                      | Ca,9×      |                  |                  |      |              | pcph    |       | ,12≖C        |                |                   |                   | pcph            |
| b. of Queu-free                          | 5C8C8:               | 100.9=     | l-v9/Cm,         | , 9 <del>-</del> |      | <b>1</b> .97 |         | p¢    | ,12=1        | -v12/Cm        | ,12-              | 0.95              |                 |
| 2: LT FROM MAJOR                         | STREET               | 1          |                  |                  |      |              |         | 1     |              |                |                   |                   |                 |
| flicting Flows:                          |                      | JVc.4      | V2 + V           | 13 =             |      | 795          | vhp     | i ve  | ,1 = \       | V5 + V6        |                   | 492               | vhp             |
| tential Capacity                         | :                    | [Cp. 4     | 1                |                  |      |              | pcph    | 1     | ,1 =         |                |                   |                   | pcph            |
| ovement Capacity:                        |                      |            | p,4=             |                  |      |              | pcph    | C     | ,1=Cp,       |                |                   |                   | pcph            |
| b. of Queu-free :                        |                      | [po,4=]    | -v4/Cm4          | *                |      | 1.97         |         | 90    | ,1=1-v       | /1/Cm1=        |                   | 0.71              |                 |
| ajor Left Shared  <br>Prob. of Queue-fri |                      | ا<br>مەما- |                  |                  |      |              |         | 1     |              |                |                   |                   |                 |
| Anene-ILI                                | re glate             | 16.0141    |                  |                  |      | N A          |         | ( P'  | 0,1=         |                |                   | KA                |                 |

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| Najor Street: PUKALANI BYPAS:<br>Kinor Street: NAKANI ST<br>Scenario: FUTURE BASE ###<br>Peak Hour: PN |             | OUT MIT                |           |             | Int         | tesection I                | DAT<br>Analys<br>File Nam<br>ntesection | t: BC<br>e: PUKNAK-P |
|--------------------------------------------------------------------------------------------------------|-------------|------------------------|-----------|-------------|-------------|----------------------------|-----------------------------------------|----------------------|
| STEP 3: TH FROM MINOR STREET                                                                           | 1           |                        |           |             | 1           |                            |                                         |                      |
| Conflicting Flows:                                                                                     | •           | 1/2V3+V2+              |           |             | ļ           | Vc., 11 = 1/               |                                         |                      |
|                                                                                                        |             |                        | 148       |             |             | #<br>4- 14                 |                                         | 1489 vph             |
| Potential Capacity:                                                                                    |             | 44                     |           | 7 pcph      |             | Cp,11 =                    |                                         | 147 pcph             |
| Capacity Adj Factor:                                                                                   |             | ,4°po,1 =              |           |             |             | fil = po,4*<br>Cm,11 = Cp, |                                         |                      |
| Novement Capacity:<br>Prob. of Queue-free State:                                                       |             | Cp,8*f8 =<br>1-v8/Cm,8 |           |             | ł           | pa,11 = 1-v                |                                         |                      |
|                                                                                                        |             |                        |           |             |             |                            |                                         |                      |
| TEP 4: 1T FROM MINOR STREET<br>Conflicting Flows:                                                      | <br> Vc,7 = | 1/2V3+V2+V             | 1+1/2V6+V | 5+V4+       |             | Vc.10 = 1/2                | V6+V5+V4+1/                             | 2V3+V2+V1+           |
| •••••                                                                                                  |             | 1/2(V11+V1             |           |             | Í.          | •                          | V8+V9) =                                |                      |
| Potential Capacity:                                                                                    | Cp7 =       | -                      | 11        | 4 pcph      | ļ           | Cp10 =                     |                                         | 117 pcph             |
| Najor Left, Minor Through<br>Impedance Factor:                                                         | P*'7=po     | ,11*f11 =              | 1.4       | 1           | ļ           | P''18=po,8*                | f8 =                                    | 1.24                 |
| Najor Left, Hinor Through                                                                              |             |                        |           |             | ļ           | - 14 4                     |                                         |                      |
| Adjusted Impedance Factor:                                                                             |             |                        | 1.5       |             | 1           | p'10 =                     |                                         | <b>4.</b> 37         |
| Capacity Adjustment Factor:<br>Novement Capacity:                                                      | T  = p'     | 7°p0,12 =<br>f7°Cp,7 = | €.5<br>2  | T<br>7 nenh |             | f18 = p'18*<br>Cm,18 = f18 |                                         |                      |
|                                                                                                        |             |                        |           |             | ,<br>       |                            |                                         |                      |
| DELAY AND LEVEL OF SERVICE SUMM                                                                        | IARY        |                        |           |             | AVG<br>Otal |                            |                                         |                      |
| NOVENENT                                                                                               | v(pcph)     | c=(poph)               | csh(pcph  | ) DI        | ELAY        |                            | į                                       |                      |
| MINOR LEFT TURK (7)                                                                                    | 2           | 57                     | SHRO      | S           | HRD         |                            | LEVEL OF                                | SERVICE CRITERI      |
| NIXOR THROUGH (8)                                                                                      | 66          |                        |           | i           | 76.8        | F                          | ]                                       |                      |
| MINOR RIGHT TURN (9)                                                                                   | 29          | 871                    | SHRD      | SI          | HRD         |                            |                                         | AVG                  |
|                                                                                                        |             |                        |           | ±.          |             |                            | LEVEL                                   | TOTAL                |
| NINOR LEFT TURK (10)                                                                                   | 4           |                        | SHRD      |             | HRD         |                            |                                         | DELAY                |
| MINOR THROUGH (11)                                                                                     | 41          |                        |           |             | 47.9<br>Krd | F                          | SERVICE                                 | (SEC/VEH)            |
| MINOR RIGHT TURN (12)                                                                                  | 43          | 791                    | SHRO      | 51          | 08.0        |                            | i                                       | (=5                  |
| HAJOR LEFT (1)                                                                                         | 274         | 933                    | ##        |             | 5.5         | 8                          | 8                                       | (=5<br>)5\$(=10      |
| HAJOR LEFT (1)                                                                                         | 18          | 642                    | XA        |             | 5.8         | 8                          | c c                                     | )146(=2#             |
|                                                                                                        | ••          |                        |           |             |             | -                          |                                         | >216(=31             |
| MINOR APPROACH (7)(8)(9)                                                                               | -           | -                      | -         | 1           | 75.8        | F                          | Ε                                       | >346(=45             |
| HINOR APPROACH (10)(11)(12)                                                                            | -           | -                      | -         |             | 17.9        | F                          | F                                       | >45                  |
|                                                                                                        |             |                        |           |             |             |                            | ĺ                                       | -                    |
| MAJOR APPROACH (1)(2)(3)                                                                               | -           | -                      | -         |             | 1.4         | A                          |                                         |                      |
| NAJOR APPROACH (4)(5)(6)                                                                               | -           | -                      | -         |             | 1.2         | ٨                          |                                         |                      |
| TOTAL INTERSECTION (1-12)                                                                              |             | _                      | _         |             | 8.4         | В                          |                                         |                      |

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03/27/97 KULAMALU 17:34:15 FUTURE BASE AM PEAK HOUR SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values Intersection Parameters for Int # 0 - PUKALANI BYPASS & MAKAWAO AV NONCBD METROAREA 2.0 LOSTTIME LEVELOFSERVICE С S 0 Ø NODELOCATION Approach Parameters NΒ ۶B wB ЕB -88 -#8 NB APPLABELS -98--6.0 .0 6.0 .0 GRADES LOW LOW LOW PEDLEVELS LOW NONE NONE NONE NONE PARKINGSIDES PARKVOLUMES 20 20 20 20 BUSVOLUMES 0 0 0 ø 35 RIGHTTURNONREDS 12 219 1 Movement Parameters RT тн LT RT тн LT RT ТН ٤٦ MOVLABELS RT ΤН LT 376 286 335 219 638 2 21 229 22 VOLUMES 33 50 12 12.0 12.0 12.0 12.0 12.0 12.0 12.0 24.0 12.0 12.0 12.0 12.0 WIDTHS 1 1 1 1 LANES 1 2 1 1 1 - 1 1 - 1 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 UTILIZATIONS 2.0 2.0 2.0 2.0 2.9 TRUCKPERCENTS 2.0 2.0 2.0 2.0 2.0 2.0 2.0 .95 .95 .95 .95 .95 .95 .95 .95 .95 .95 PEAKHOURFACTORS .95 .95 2 ARRIVALTYPES з 3 3 3 3 3 з З 3 з 3 NO YES YES YES YES NO YES YES ACTUATIONS NO YES YES NO 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.5 REQCLEARANCES 4.0 4.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.( MINIMUMS 5.0 5.0 5.0 5.0 1900 1900 1900 1900 1900 1900 IDEALSATFLOWS 1900 1900 1900 1900 1900 1900 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 FACTORS 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 DELAYFACTORS 1.00 1.00 1.00 1.00 1.00 1.00 NSTOPFACTORS 1.00 1.00 1.00 1.00 1.00 1.00 NORM NORM NORF GROUPTYPES NORM NORM NORM NORM NORM NORM NORM NORM NORM 1539 1863 565 SATURATIONFLOWS 1493 3614 1717 1539 1863 753 1585 1919 1823 Phasing Parameters SEQUENCES 41 NONE NONE NÜ YES LEADLAGS PERMISSIVES NO YES NO NO OFFSET .00 1 NO NO OVERLAPS 60 180 10 PEDTIME .0 Ŷ CYCLES 8.00 25.00 25.00 GREENTIMES YELLOWTIMES .00 .00 .00 8 6 3 CRITICALS Ø EXCESS

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| FUTURE<br>Am pea                                                                                  |                                                                                                                            |                                                                      |                                                                                                |                                                                                         |                                                                           |                                                                                                       |                                                                            |                                                                                                            |                                                                                                              |                                                                                                          | 27/97<br>34:46                                                     |
|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| SIGNAL                                                                                            | 94/TEAPAC                                                                                                                  | 501 11                                                               | 41 - 65                                                                                        | <b></b>                                                                                 |                                                                           | _                                                                                                     |                                                                            |                                                                                                            |                                                                                                              |                                                                                                          |                                                                    |
|                                                                                                   |                                                                                                                            |                                                                      |                                                                                                |                                                                                         |                                                                           |                                                                                                       |                                                                            |                                                                                                            |                                                                                                              |                                                                                                          |                                                                    |
| incersi                                                                                           | ection Ave<br>Degree of<br>@ expec                                                                                         | sacura                                                               | for Int<br>ation (v<br>e delay                                                                 | /C) .7                                                                                  | 'O Vehi                                                                   | CIA DAL                                                                                               | av 22                                                                      | 40 104                                                                                                     | AV<br>el of                                                                                                  | Serv                                                                                                     | ice (                                                              |
| Sq 41<br>**/** -                                                                                  | Phase 1                                                                                                                    | .   P                                                                | hase 2                                                                                         | Pha                                                                                     | se 3                                                                      |                                                                                                       |                                                                            |                                                                                                            |                                                                                                              |                                                                                                          |                                                                    |
|                                                                                                   | *                                                                                                                          | +                                                                    | +                                                                                              | !                                                                                       | ~ 1                                                                       |                                                                                                       |                                                                            |                                                                                                            |                                                                                                              |                                                                                                          |                                                                    |
| in l                                                                                              | *>                                                                                                                         | +<br>  (+                                                            | +<br>+                                                                                         |                                                                                         | ++++<br> ++++>                                                            |                                                                                                       |                                                                            |                                                                                                            |                                                                                                              |                                                                                                          |                                                                    |
| weist                                                                                             | · ·                                                                                                                        |                                                                      | × _                                                                                            | <b>•</b>                                                                                | ****                                                                      |                                                                                                       |                                                                            |                                                                                                            |                                                                                                              |                                                                                                          |                                                                    |
| North                                                                                             | <-                                                                                                                         |                                                                      | * +                                                                                            | \<br>\<br>\<br>++++>                                                                    | ×                                                                         |                                                                                                       |                                                                            |                                                                                                            |                                                                                                              |                                                                                                          |                                                                    |
|                                                                                                   | ++                                                                                                                         |                                                                      | * + * +                                                                                        | ++++<br>[ ∨                                                                             | ļ                                                                         |                                                                                                       |                                                                            |                                                                                                            |                                                                                                              |                                                                                                          |                                                                    |
| <br>                                                                                              | G/C= .13                                                                                                                   |                                                                      |                                                                                                |                                                                                         |                                                                           |                                                                                                       |                                                                            |                                                                                                            |                                                                                                              |                                                                                                          |                                                                    |
| ļ                                                                                                 | G= 8.0                                                                                                                     |                                                                      | C= .431<br>25.0"                                                                               |                                                                                         | .431  <br>25.0"                                                           |                                                                                                       |                                                                            |                                                                                                            |                                                                                                              |                                                                                                          |                                                                    |
|                                                                                                   | Y+R= .0<br>0FF= .0                                                                                                         |                                                                      | R= .0"<br>F=13.8%                                                                              | Y+R=                                                                                    | .0"                                                                       |                                                                                                       |                                                                            |                                                                                                            |                                                                                                              |                                                                                                          |                                                                    |
| -                                                                                                 |                                                                                                                            |                                                                      |                                                                                                |                                                                                         | 56.9%                                                                     |                                                                                                       |                                                                            |                                                                                                            |                                                                                                              |                                                                                                          |                                                                    |
|                                                                                                   | = 58 sec                                                                                                                   | G= 51                                                                | 8.0 sec                                                                                        | =100.09                                                                                 | έγ₌.                                                                      | .0 sec =                                                                                              | · .0%                                                                      | Ped≕                                                                                                       | .0 se                                                                                                        | C =                                                                                                      | . 01                                                               |
| Lane<br>Grou                                                                                      | Width/                                                                                                                     |                                                                      | <br>]/C                                                                                        | Servi                                                                                   |                                                                           |                                                                                                       |                                                                            |                                                                                                            |                                                                                                              | ~~~~                                                                                                     |                                                                    |
|                                                                                                   | p   Lanes                                                                                                                  | Reqd                                                                 | Used                                                                                           | @C (v                                                                                   | rce kate<br>vph) @E                                                       | ≥  Adj<br> Volume                                                                                     | <br>  V/c                                                                  | HCM<br>  Delay                                                                                             |                                                                                                              | 90%<br>  Oue                                                                                             |                                                                    |
| B                                                                                                 |                                                                                                                            | Reqd<br>                                                             | Used                                                                                           | @C (v                                                                                   | /ph) @E                                                                   | ≥  Adj<br> Volume                                                                                     | v/c                                                                        | HCM<br>  Delay                                                                                             |                                                                                                              | 90%<br>  Que                                                                                             |                                                                    |
|                                                                                                   |                                                                                                                            |                                                                      |                                                                                                | @C (v                                                                                   | /ph) @E<br>                                                               | Volume                                                                                                | /c                                                                         |                                                                                                            | S                                                                                                            |                                                                                                          |                                                                    |
| B Appro                                                                                           | oach                                                                                                                       | .002                                                                 |                                                                                                | @C (v                                                                                   | /ph) @E                                                                   | Volume                                                                                                |                                                                            | Delay                                                                                                      | S<br><br>B                                                                                                   | Que                                                                                                      |                                                                    |
| B Appro                                                                                           | oach<br>  12/1  <br>  24/2                                                                                                 | .002                                                                 | .397<br>  .397                                                                                 | @C (v<br>                                                                               | /ph) @E<br>  592<br>  1433                                                | Volume<br>                                                                                            | v/c<br>  .002<br>  .024                                                    | Delay<br>12.2<br>6.8<br>6.9                                                                                | S<br><br>B<br>  B+<br>  B+                                                                                   | Que                                                                                                      | ue  <br><br>ft <br>ft                                              |
| RT<br>RT<br>LT                                                                                    | oach                                                                                                                       | .002                                                                 | .397<br>  .397                                                                                 | @C (v<br>                                                                               | /ph) @E                                                                   | Volume<br>                                                                                            | v/c<br>  .002<br>  .024                                                    | Delay<br>12.2<br>6.8<br>6.9                                                                                | S<br>~~~~-<br>B<br>=======<br>  B+                                                                           | Que                                                                                                      | ue  <br><br>ft                                                     |
| RT<br>TH                                                                                          | oach<br>  12/1  <br>  24/2  <br>  12/1                                                                                     | .002<br>.018<br>.051                                                 | .397<br>  .397<br>  .103                                                                       | @C (v<br>  546<br>  1401<br>  128                                                       | /ph) @E<br>  592<br>  1433<br>  173                                       | Volume<br>  1<br>  35<br>  53                                                                         | V/c<br>  .002<br>  .024<br>  .298                                          | Delay<br>12.2<br>6.8<br>6.9<br>15.8                                                                        | S<br>  B<br>  B+<br>  B+<br>  +<br>  +<br>  + C+                                                             | Que                                                                                                      | ue  <br><br>ft <br>ft                                              |
| RT<br>RT<br>TH<br>LT                                                                              | oach<br>  12/1  <br>  24/2  <br>  12/1  <br>pach                                                                           | .002<br>.018<br>.051                                                 | .397<br>  .397<br>  .103                                                                       | @C (v                                                                                   | <pre>/ph) @E   592   1433   173</pre>                                     | Volume<br>  1<br>  35<br>  53                                                                         | V/c<br>  .002<br>  .024<br>  .298                                          | Delay<br>12.2<br>6.8<br>6.9<br>15.8<br>18.9                                                                | S<br>  B+<br>  B+<br>  *C+<br> *C+                                                                           | Que<br>  25<br>  25<br>  39                                                                              | ue  <br>ft <br>ft <br>ft                                           |
| RT<br>RT<br>LT<br>LT<br>RB<br>Appro<br>RT<br>TH                                                   | oach<br>  12/1  <br>  24/2  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                                 | .002<br>.018<br>.051<br>.002<br>.002<br>.376                         | .397<br>  .397<br>  .103<br>  .397<br>  .397<br>  .397                                         | @C (v<br>  546<br>  1401<br>  128<br>  583<br>  583<br>  715                            | <pre>/ph) @E   592   1433   173   629   629   761</pre>                   | Volume<br>  1<br>  35<br>  53<br>  1                                                                  | V/c<br>  .002<br>  .024<br>  .298                                          | Delay<br>12.2<br>  6.8<br>  6.9<br>  15.8<br>18.9<br>  6.8                                                 | S<br>  B+<br>  B+<br>  *C+<br>  *C+<br>  C+                                                                  | Que<br>  25<br>  25<br>  39<br>  39                                                                      | ue  <br><br>ft <br>ft <br>ft <br>                                  |
| RT<br>RT<br>TH<br>LT<br>B<br>Appro<br>RT                                                          | oach<br>  12/1  <br>  24/2  <br>  12/1  <br>  ach                                                                          | .002<br>.018<br>.051<br>.002<br>.002<br>.376                         | .397<br>  .397<br>  .103<br>  .397<br>  .397<br>  .397                                         | @C (v<br>  546<br>  1401<br>  128<br>  583<br>  583                                     | <pre>/ph) @E   592   1433   173   629   629   761</pre>                   | Volume<br>  1<br>  35<br>  53<br>  53<br>  1<br>  1<br>  672                                          | v/c<br>  .002<br>  .024<br>  .298<br>  .002<br>  .883                      | Delay<br>12.2<br>  6.8<br>  6.9<br>  15.8<br>18.9<br>  6.8<br>  6.8<br>  18.9                              | S<br>  B+<br>  B+<br>  *C+<br>  *C+<br>  C+                                                                  | Que<br>  25<br>  25<br>  39<br>  39<br>  25<br>  331                                                     | ue  <br><br>ft <br>ft <br>ft <br>                                  |
| RT<br>RT<br>TH<br>LT<br>NB<br>B Appro<br>RT<br>TH<br>LT                                           | oach<br>  12/1  <br>  24/2  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                                 | .002<br>.018<br>.051<br>.002<br>.002<br>.376                         | .397<br>  .397<br>  .103<br>  .397<br>  .397<br>  .397                                         | @C (v<br>  546<br>  1401<br>  128<br>  583<br>  583<br>  715                            | <pre>/ph) @E   592   1433   173   629   629   761</pre>                   | Volume<br>  1<br>  35<br>  53<br>  53<br>  1<br>  1<br>  672                                          | v/c<br>  .002<br>  .024<br>  .298<br>  .002<br>  .883                      | Delay<br>12.2<br>  6.8<br>  6.9<br>  15.8<br>18.9<br>  6.8<br>  18.9<br>  15.1                             | S<br>  B+<br>  B+<br>  *C+<br>  C+<br>  *C+<br>  C+                                                          | Que<br>  25<br>  25<br>  39<br>  39<br>  25<br>  331                                                     | ue  <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft               |
| RT<br>TH<br>LT<br>RT<br>RT<br>RT<br>TH<br>LT<br>G<br>Appro                                        | oach<br>  12/1  <br>  24/2  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                     | .002<br>.018<br>.051<br>.002<br>.376<br>.004                         | .397<br>  .397<br>  .103<br>  .397<br>  .397<br>  .397<br>  .103                               | @C (v<br>  546<br>  1401<br>  128<br>  583<br>  715<br>  138                            | <pre>/ph) @E   592   1433   173   629   629   761   185</pre>             | Volume<br>  1<br>  35<br>  53<br>  53<br>  1<br>  672<br>  2                                          | v/c<br>  .002<br>  .024<br>  .298<br>  .002<br>  .883<br>  .011            | Delay<br>12.2<br>  6.8<br>  6.9<br>  15.8<br>18.9<br>  6.8<br>  18.9<br>  15.1<br>20.16                    | S<br>  B+<br>  B+<br>  *C+<br>  *C+<br>  *C+<br>  *C+<br>  C+                                                | Que<br>  25<br>  25<br>  39<br>  39<br>  25<br>  331<br>  25                                             | ue  <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft                      |
| RT<br>RT<br>TH<br>LT<br>NB<br>B Appro<br>RT<br>TH<br>LT                                           | oach<br>  12/1  <br>  24/2  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                     | .002<br>.018<br>.051<br>.002<br>.376<br>.004<br>.269                 | .397<br>  .397<br>  .103<br>  .397<br>  .397<br>  .397<br>  .103                               | @C (v<br>  546<br>  1401<br>  128<br>  583<br>  715<br>  138<br>  564                   | <pre>/ph) @E   592   1433   173   629   761   185</pre>                   | Volume<br>  1<br>  35<br>  53<br>  53<br>  1<br>  672<br>  2<br>  2                                   | <pre>/ v/c / .002 / .024 / .298 / .002 / .883 / .011 / .589</pre>          | Delay<br>12.2<br>  6.8<br>  6.9<br>  15.8<br>18.9<br>  6.8<br>  18.9<br>  15.1<br>29.76<br>10.0            | S<br>  B+<br>  B+<br>  *C+<br>  *C+<br>  *C+<br>  *C+<br>  C+<br>  C+                                        | Que<br>  25<br>  25<br>  39<br>  25<br>  331<br>  25<br>  331<br>  25                                    | ue  <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft        |
| RT<br>RT<br>TH<br>LT<br>RT<br>RT<br>RT<br>TH<br>LT<br>G<br>Appro<br>RT                            | oach<br>  12/1  <br>  24/2  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                     | .002<br>.018<br>.051<br>.002<br>.376<br>.004<br>.269<br>.194         | .397<br>  .397<br>  .103<br>  .397<br>  .397<br>  .103<br>  .397<br>  .397<br>  .397<br>  .397 | @C (v<br>  546<br>  1401<br>  128<br>  583<br>  715<br>  138<br>  564<br>  693          | <pre>/ph) @E   592   1433   173   629   761   185   610   610   739</pre> | Volume<br>  1<br>  35<br>  53<br>  1<br>  672<br>  2<br>  2<br>  359<br>  301                         | <pre>/ v/c / .002 / .024 / .298 / .002 / .883 / .011 .589 / .407</pre>     | Delay<br>12.2<br>6.8<br>6.9<br>15.8<br>18.9<br>6.8<br>18.9<br>15.1<br>29.70<br>10.0<br>8.3                 | S<br>  B+<br>  B+<br>  *C+<br>  *C+<br>  *C+<br>  *C+<br>  C+<br>  C+<br>  C+<br>  0+                        | Que<br>  25<br>  25<br>  39<br>  25<br>  331<br>  25<br>  331<br>  25<br>  331<br>  25<br>  177<br>  148 | ue  <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft |
| B Appro<br>RT<br>TH<br>LT<br>B Appro<br>RT<br>TH<br>LT<br>B<br>S Appro<br>RT<br>TH<br>LT<br>B     | oach<br>  12/1  <br>  24/2  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1             | .002<br>.018<br>.051<br>.002<br>.376<br>.004<br>.269<br>.194         | .397<br>  .397<br>  .103<br>  .397<br>  .397<br>  .103<br>  .397<br>  .397<br>  .397<br>  .397 | @C (v<br>  546<br>  1401<br>  128<br>  583<br>  715<br>  138<br>  564<br>  693          | <pre>/ph) @E   592   1433   173   629   761   185   610   610   739</pre> | Volume<br>  1<br>  35<br>  53<br>  1<br>  672<br>  2<br>  2<br>  359<br>  301                         | <pre>/ v/c / .002 / .024 / .298 / .002 / .883 / .011 / .589</pre>          | Delay<br>12.2<br>6.8<br>6.9<br>15.8<br>18.9<br>6.8<br>18.9<br>15.1<br>29.76<br>10.0<br>8.3                 | S<br>  B+<br>  B+<br>  *C+<br>  *C+<br>  *C+<br>  *C+<br>  C+<br>  C+<br>  C+<br>  0+                        | Que<br>  25<br>  25<br>  39<br>  25<br>  331<br>  25<br>  331<br>  25<br>  331<br>  25<br>  177<br>  148 | ue  <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft |
| B Appro<br>RT<br>TH<br>LT<br>B Appro<br>RT<br>TH<br>LT<br>C<br>Appro<br>Appro                     | oach<br>  12/1  <br>  24/2  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1 | .002<br>.018<br>.051<br>.002<br>.376<br>.004<br>.269<br>.194<br>.519 | .397<br>  .397<br>  .103<br>  .397<br>  .397<br>  .397<br>  .103                               | @C (v<br>  546<br>  1401<br>  128<br>  583<br>  715<br>  138<br>  564<br>  693<br>  257 | <pre>/ph) @E   592   1433   173   629   761   185   610   739   299</pre> | Volume<br>  1<br>  35<br>  53<br>  53<br>  1<br>  672<br>  2<br>  2<br>  2<br>  359<br>  301<br>  353 | <pre>/ v/c / .002 / .024 / .298 / .002 / .883 / .011 .589 .407 1.181</pre> | Delay<br>12.2<br>6.8<br>6.9<br>15.8<br>18.9<br>6.8<br>18.9<br>15.1<br>29.70<br>10.0<br>8.3<br>68.00        | S<br>  B+<br>  B+<br>  *C+<br>  *C+<br>  *C+<br>  C+<br>  C+<br>  C+<br>  C+<br>  C+<br>  B+<br>  C+<br>  C+ | Que<br>  25<br>  25<br>  39<br>  25<br>  331<br>  25<br>  331<br>  25<br>  177<br>  148<br>  174         | ue  <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft |
| RT<br>TH<br>LT<br>NB<br>8 Appro<br>RT<br>TH<br>LT<br>6<br>7 Appro<br>RT<br>TH<br>LT<br>B<br>Appro | oach<br>  12/1  <br>  24/2  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1             | .002<br>.018<br>.051<br>.002<br>.376<br>.004<br>.269<br>.194<br>.519 | .397<br>  .397<br>  .103<br>  .397<br>  .397<br>  .397<br>  .103                               | @C (v<br>  546<br>  1401<br>  128<br>  583<br>  715<br>  138<br>  564<br>  693<br>  257 | <pre>/ph) @E   592   1433   173   629   761   185   610   739   299</pre> | Volume<br>  1<br>  35<br>  53<br>  53<br>  1<br>  672<br>  2<br>  2<br>  301<br>  353  <br>  353      | <pre>/ v/c / .002 / .024 / .298 / .002 / .883 / .011 .589 .407 1.181</pre> | Delay<br>12.2<br>6.8<br>6.9<br>15.8<br>18.9<br>6.8<br>18.9<br>15.1<br>29.70<br>10.0<br>8.3<br>68.00<br>7.8 | S<br>  B+<br>  B+<br>  C+<br>  C+<br>  C+<br>  C+<br>  C+<br>  C+<br>  C+<br>  B+<br>  C+<br>  C+            | Que<br>  25<br>  25<br>  39<br>  25<br>  331<br>  25<br>  331<br>  25<br>  177<br>  148<br>  174         | ue  <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft        |

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KULAMALU FUTURE BASE PM PEAK HOUR

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# SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int # 0 - PUKALANI BYPASS & MAKAWAO AV

03/27/97

17:35:27

| METROAREA                  |       | NONC | BD   |      |      |              |      |      |      |            |      |      |
|----------------------------|-------|------|------|------|------|--------------|------|------|------|------------|------|------|
| LOSTTIME                   |       |      | .0   |      |      |              |      |      |      |            |      |      |
| LEVELOFSERVICE             |       | С    | S    |      |      |              |      |      |      |            |      |      |
| NODELOCATION               |       | Ø    | Ø    |      |      |              |      |      |      |            |      |      |
| Approach Para              | meter | S    |      |      |      |              |      |      |      |            |      |      |
|                            |       | ен   | ,    |      | SB   |              |      | WB   |      |            | NB   | ł    |
| APPLABELS                  |       | -8-8 |      |      | -++8 |              |      | -148 | -    |            | -58  |      |
| GRADES                     |       | 6.0  |      |      | .0   |              |      | -6.0 |      |            | .0   |      |
| PEDLEVELS                  |       | LOW  |      |      | LOW  |              |      | LOW  | l    |            | LOW  |      |
| PARKINGSIDES               |       | NONE |      |      | NONE |              |      | NONE |      |            | NONE |      |
| PARKVOLUMES                |       | 20   |      |      | 20   |              |      | 20   |      |            | 20   |      |
| BUSVOLUMES                 |       | 0    |      |      | Ø    |              |      | 0    |      |            | 0    |      |
| RIGHTTURNONREDS            |       | 14   |      |      | 103  |              |      | 122  |      |            | 1    |      |
| Movement Para              | meter | s    |      |      |      |              |      |      |      |            |      |      |
| MOVLABELS                  | RT    | тн   | ٤T   | RT   | тн   | LT           | RT   | тн   | LT   | RT         | тн   | ٤٦   |
| VOLUMES                    | 44    | 458  | 278  | 103  | 291  | 174          | 252  | 356  | 2    |            | 294  | 26   |
| WIDTHS                     | 12.0  | 24.0 | 12.0 | 12.0 | 12.0 | 12.0         | 12.0 | 12.0 | -    | 12.0       | 12.0 | 12.6 |
| LANES                      | 1     | 2    | 1    | 1    | 1    | 1            | 1    | 1    | 1    | 1          | 12.0 | .1   |
| UTILIZATIONS               | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00         | 1.00 | 1.00 | 1.00 | 1.00       | 1.00 | 1.00 |
| TRUCKPERCENTS              | 2.0   | 2.0  | 2.0  | 2.0  | 2.0  | 2.0          | 2.0  | 2.0  | 2.0  | 2.0        | 2.0  | 2.9  |
| PEAKHOURFACTORS            | .95   | .95  | .95  | .95  | .95  | .95          | .95  | .95  | .95  | .95        | .95  | .95  |
| ARRIVALTYPES               | 3     | 3    | З    | 3    | 3    | 3            | 3    | 3    |      | . 55       | . 55 |      |
| ACTUATIONS                 | NO    | YES  | YES  | NO   | YES  | YES          | NÖ   | YES  | YES  | NŐ         | YES  | YE   |
| REQCLEARANCES              | 4.0   | 4.0  | 4.0  | 4.0  | 4.0  | 4.0          | 4.0  | 4.0  | 4.0  | 4.0        | 4.0  | 4.6  |
| MINIMUMS                   | 5.0   | 5.0  | 5.0  | 5.0  | 5.0  | 5.0          | 5.0  | 5.0  | 5.0  | 5.0        | 5.0  | 5.6  |
| IDEALSATFLOWS              | 1900  | 1900 | 1900 | 1900 | 1900 | 1900         | 1900 | 1900 | 1900 | 1900       | 1900 | 1900 |
| FACTORS                    | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00         | 1.00 | 1.00 | 1.00 | 1.00       | 1.00 | 1.06 |
| DELAYFACTORS               | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00         | 1.00 | 1.00 | 1.00 | 1.00       | 1.00 | 1.04 |
|                            | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00         | 1.00 | 1.00 | 1.00 | 1.00       | 1.00 | 1.00 |
| STOPFACTORS                |       |      |      |      | NORM | NORM         | NORM | NORM |      |            |      | NOR  |
| NSTOPFACTORS<br>Grouptypes | NORM  | NORM | NORM | NORM | NURM | - NI U IT NI |      |      |      | N F1 12 74 | NORM |      |

| SEQUENCES<br>PERMISSIVES<br>OVERLAPS<br>CYCLES<br>GREENTIMES<br>YELLOWTIMES<br>CRITICALS | 41<br>NO<br>60<br>15.00<br>.00<br>3 | YES<br>NO<br>180<br>25.00<br>.00<br>8 | NO<br>NO<br>10<br>25.00<br>.00<br>6 | YES<br>No | LEADLAGS<br>Offset<br>Pedtime | NONE<br>.00<br>.0 | NONE<br>1<br>ç |
|------------------------------------------------------------------------------------------|-------------------------------------|---------------------------------------|-------------------------------------|-----------|-------------------------------|-------------------|----------------|
| EXCESS                                                                                   | 3<br>0                              | 8                                     | 6                                   |           |                               |                   |                |

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| ALU                                                                      |                                                                                                                                                        |                                                                                                    |                                                                                                           |                                                                                                                        |                                                                                                              |                                                                                                                                                                        |                                                                                       |                                                                                                                           |                                                                                                                                                                                                                                           | 03/27<br>17:36                                                                       |                                                                                                                                                                                                            |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| E BAS                                                                    |                                                                                                                                                        |                                                                                                    |                                                                                                           |                                                                                                                        |                                                                                                              |                                                                                                                                                                        |                                                                                       |                                                                                                                           | •                                                                                                                                                                                                                                         | 17:30                                                                                | :00                                                                                                                                                                                                        |
| 194/                                                                     | TEAPAC[V1                                                                                                                                              | L1.4]                                                                                              | - Capa                                                                                                    | acity An                                                                                                               | alysis                                                                                                       | Summary                                                                                                                                                                |                                                                                       |                                                                                                                           |                                                                                                                                                                                                                                           |                                                                                      |                                                                                                                                                                                                            |
|                                                                          | ion Avera                                                                                                                                              |                                                                                                    |                                                                                                           | ŧ 0 -                                                                                                                  | PUKALAN                                                                                                      | I BYPAS                                                                                                                                                                | S & MAK                                                                               | AWAO AV                                                                                                                   | 6.0-                                                                                                                                                                                                                                      |                                                                                      | <b>c</b> .                                                                                                                                                                                                 |
| Deg                                                                      | ree of Sa                                                                                                                                              | turati                                                                                             | on (v/c                                                                                                   | ;).54                                                                                                                  | Vehicl                                                                                                       | e Delay                                                                                                                                                                | 18.6                                                                                  | Level o                                                                                                                   | от зе                                                                                                                                                                                                                                     | rvice                                                                                | 64                                                                                                                                                                                                         |
|                                                                          | <br>Phase 1                                                                                                                                            | <br>  Pha                                                                                          | se 2                                                                                                      | Phase                                                                                                                  | 3                                                                                                            |                                                                                                                                                                        |                                                                                       |                                                                                                                           |                                                                                                                                                                                                                                           |                                                                                      |                                                                                                                                                                                                            |
|                                                                          |                                                                                                                                                        | <br>  + +                                                                                          |                                                                                                           |                                                                                                                        | ~ !                                                                                                          |                                                                                                                                                                        |                                                                                       |                                                                                                                           |                                                                                                                                                                                                                                           |                                                                                      |                                                                                                                                                                                                            |
| į                                                                        | *<br>*                                                                                                                                                 | + +<br><+ +                                                                                        |                                                                                                           |                                                                                                                        | ++++<br>++++                                                                                                 |                                                                                                                                                                        |                                                                                       |                                                                                                                           |                                                                                                                                                                                                                                           |                                                                                      |                                                                                                                                                                                                            |
|                                                                          |                                                                                                                                                        | V V                                                                                                | ~                                                                                                         |                                                                                                                        | ****                                                                                                         |                                                                                                                                                                        |                                                                                       |                                                                                                                           |                                                                                                                                                                                                                                           |                                                                                      |                                                                                                                                                                                                            |
|                                                                          | <b>&lt;</b> +                                                                                                                                          |                                                                                                    | * +>                                                                                                      | ++++>                                                                                                                  |                                                                                                              |                                                                                                                                                                        |                                                                                       |                                                                                                                           |                                                                                                                                                                                                                                           |                                                                                      |                                                                                                                                                                                                            |
| 1                                                                        | +<br>+                                                                                                                                                 |                                                                                                    | * +                                                                                                       | [++++<br>  V                                                                                                           | 1                                                                                                            |                                                                                                                                                                        |                                                                                       |                                                                                                                           |                                                                                                                                                                                                                                           |                                                                                      |                                                                                                                                                                                                            |
| <br>  G                                                                  | /C= .231                                                                                                                                               | <br>  G/C=                                                                                         | .385                                                                                                      |                                                                                                                        | .385                                                                                                         |                                                                                                                                                                        |                                                                                       |                                                                                                                           |                                                                                                                                                                                                                                           |                                                                                      |                                                                                                                                                                                                            |
|                                                                          | -<br>= 15.0"<br>+R= .0"                                                                                                                                | G=<br>  Y+R=                                                                                       | 25.0"                                                                                                     | G== 25<br>  Y+R=                                                                                                       | 5.0"                                                                                                         |                                                                                                                                                                        |                                                                                       |                                                                                                                           |                                                                                                                                                                                                                                           |                                                                                      |                                                                                                                                                                                                            |
|                                                                          | FF= .0%                                                                                                                                                |                                                                                                    | 23.1%                                                                                                     | 0FF=61                                                                                                                 | L.5%                                                                                                         |                                                                                                                                                                        |                                                                                       |                                                                                                                           |                                                                                                                                                                                                                                           |                                                                                      |                                                                                                                                                                                                            |
|                                                                          | 65 sec                                                                                                                                                 |                                                                                                    |                                                                                                           | =100.0%<br><br>  Servio                                                                                                | Y= .(<br><br>ce Rate                                                                                         |                                                                                                                                                                        | .0%                                                                                   | нсм                                                                                                                       | 0 sec<br><br>  L                                                                                                                                                                                                                          | 90% M                                                                                | .0%<br>                                                                                                                                                                                                    |
| <br>e                                                                    | Width/                                                                                                                                                 | g/                                                                                                 |                                                                                                           | <br>  Servio                                                                                                           |                                                                                                              | Adj                                                                                                                                                                    |                                                                                       | HCM<br>Delay                                                                                                              | L  <br>  S                                                                                                                                                                                                                                |                                                                                      | lax                                                                                                                                                                                                        |
|                                                                          | Width/ <br>  Lanes                                                                                                                                     | g/                                                                                                 |                                                                                                           | <br>  Servio                                                                                                           | ce Rate<br>ph) @E                                                                                            | Adj<br>Volume                                                                                                                                                          | v/c                                                                                   | HCM<br>Delay<br>17.0                                                                                                      | L  <br>  S  <br>C+                                                                                                                                                                                                                        | 90% M<br>Quet                                                                        | lax  <br>le                                                                                                                                                                                                |
| e<br>oup<br>proa                                                         | Width/ <br>  Lanes <br>                                                                                                                                | g/<br>Reqd<br>                                                                                     | /C<br>Used<br>                                                                                            | Servic<br>  @C (v)<br>  471                                                                                            | ce Rate<br>ph) @E<br>                                                                                        | Adj<br>Volume<br>32<br>482                                                                                                                                             | v/c<br>.061<br>.377                                                                   | HCM<br>Delay<br>17.0<br>9.0<br>10.2                                                                                       | L  <br>  S  <br>  C+<br>  B+ <br>  B                                                                                                                                                                                                      | 90% M<br>Quet<br>25<br>142                                                           | ft                                                                                                                                                                                                         |
| e<br>oup<br>proa                                                         | Width/ <br>  Lanes <br>                                                                                                                                | g/<br>Reqd<br>.042<br>.158                                                                         | C<br>Used<br>.354<br>.354                                                                                 | Servic<br>  @C (v)<br>  471<br>  1224                                                                                  | ce Rate<br>ph) @E<br>  528<br>  1279                                                                         | Adj<br>Volume<br>32<br>482                                                                                                                                             | v/c<br>.061                                                                           | HCM<br>Delay<br>17.0<br>9.0<br>10.2                                                                                       | L  <br>  S  <br>  C+<br>  B+ <br>  B                                                                                                                                                                                                      | 90% M<br>Quet<br>25<br>142                                                           | ft                                                                                                                                                                                                         |
| e<br>oup<br>proa<br>T<br>H<br>T                                          | Width/ <br>  Lanes <br>  12/1  <br>  24/2  <br>  12/1                                                                                                  | g/<br>Reqd<br>.042<br>.158                                                                         | /C<br>Used<br>.354<br>.354<br>.200                                                                        | Servic<br>  @C (v)<br>  471<br>  1224<br>  277                                                                         | ce Rate<br>ph) @E<br>  528<br>  1279<br>  343                                                                | Adj<br>Volume<br>32<br>482<br>293                                                                                                                                      | v/c<br>.061<br>.377<br>.854                                                           | HCM<br>Delay<br>17.0<br>9.0<br>10.2<br>29.0<br>11.1                                                                       | L  <br>S  <br>C+<br>  B+  <br>  B  <br> *D+ <br>B                                                                                                                                                                                         | 90% M<br>Quel<br>25<br>142<br>214                                                    | ft <br>ft                                                                                                                                                                                                  |
| e<br>oup<br>proa<br>T<br>H                                               | Width/ <br>  Lanes <br>  12/1  <br>  24/2  <br>  12/1  <br>  ch                                                                                        | g/<br>Reqd<br>.042<br>.158<br>.209                                                                 | C<br>Used<br>.354<br>.354<br>.200<br>.354                                                                 | Servid<br>  @C (v)<br>  471<br>  1224<br>  277<br>  504                                                                | ce Rate<br>ph) @E<br>  528<br>  1279<br>  343<br>  561                                                       | Adj<br>Volume<br>32<br>482<br>293                                                                                                                                      | v/c<br>.061<br>.377<br>.854                                                           | HCM<br>Delay<br>17.0<br>9.0<br>10.2<br>29.0<br>11.1<br>9.6                                                                | L  <br>S  <br>C+<br>  B+  <br>  B  <br>  * D+  <br>B<br>  B+                                                                                                                                                                              | 90% M<br>Quel<br>25<br>142<br>214<br>81                                              | ft <br>ft <br>ft                                                                                                                                                                                           |
| e<br>oup<br>proa<br>T<br>H<br>T<br>proa<br>T                             | Width/ <br>  Lanes <br>  12/1  <br>  24/2  <br>  12/1                                                                                                  | g/<br>Reqd<br>.042<br>.158<br>.209<br>.123<br>.232                                                 | C<br>Used<br>.354<br>.354<br>.200<br>.354<br>.200                                                         | Servic<br>  @C (v)<br>  471<br>  1224<br>  277<br>  504<br>  620                                                       | ce Rate<br>ph) @E<br>  528<br>  1279<br>  343<br>  343<br>  561<br>  679                                     | Adj<br>Volume<br>32<br>482<br>293<br>137<br>137                                                                                                                        | ∨/c<br>.061<br>.377<br>.854                                                           | HCM<br>Delay<br>17.0<br>9.0<br>10.2<br>29.0<br>11.1<br>9.6<br>11.6                                                        | L  <br>S  <br>C+<br>B+ <br>B<br>+<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B                                                                                                                              | 90% M<br>Quel<br>25<br>142<br>214<br>                                                | ft <br>ft <br>ft                                                                                                                                                                                           |
| e<br>oup<br>T<br>T<br>H<br>T<br>Proa<br>T<br>H<br>T                      | Width/ <br>  Lanes <br>  12/1  <br>  24/2  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                                  | g/<br>Reqd<br>.042<br>.158<br>.209<br>.123<br>.232<br>.004                                         | C<br>Used<br>.354<br>.354<br>.200<br>.354<br>.354<br>.354<br>.200                                         | Servic<br>  @C (v)<br>  471<br>  1224<br>  277<br>  504<br>  620<br>  297                                              | ce Rate<br>ph) @E<br>  528<br>  1279<br>  343<br>  561<br>  679<br>  365                                     | Adj<br>Volume<br>32<br>482<br>293<br>137<br>137<br>2                                                                                                                   | v/c<br>.061<br>.377<br>.854<br>.244<br>.552<br>.005                                   | HCM<br>Delay<br>17.0<br>9.0<br>10.2<br>29.0<br>11.1<br>9.6<br>11.6<br>13.5<br>34.6                                        | C+<br>  B+<br>  S  <br>  B+<br>  B  <br>  * D +<br>  B<br>  8 +<br>  B  <br>  B  <br>  B                                                                                                                                                  | 90% M<br>Quel<br>25<br>142<br>214<br>81<br>221<br>25                                 | ft <br>ft <br>ft <br>ft                                                                                                                                                                                    |
| e<br>oup<br>proa<br>T<br>H<br>T<br>proa<br>T<br>H<br>T<br>T              | <pre> Width/    Lanes  cch   12/1     24/2     12/1     12/1     12/1     12/1     12/1   cch</pre>                                                    | g/<br>Reqd<br>.042<br>.158<br>.209<br>.123<br>.232<br>.004                                         | /C<br>Used<br>.354<br>.354<br>.200<br>.354<br>.354<br>.354<br>.200                                        | Servic<br>  @C (v)<br>  471<br>  1224<br>  277<br>  504<br>  620<br>  297<br>  488                                     | ce Rate<br>ph) @E<br>  528<br>  1279<br>  343<br>  561<br>  679<br>  365<br>  545                            | Adj<br>Volume<br>32<br>482<br>293<br>137<br>375<br>2<br>2                                                                                                              | v/c<br>.061<br>.377<br>.854<br>.244<br>.552<br>.005                                   | HCM<br>Delay<br>17.0<br>9.0<br>10.2<br>29.0<br>11.1<br>9.6<br>11.6<br>13.5<br>34.6<br>8.8                                 | C+<br>  B+<br>  S  <br>  S  <br>  B+<br>  B+<br>  B<br>  B+<br>  B  <br>  B  <br>  B+                                                                                                                                                     | 90% M<br>Quel<br>25<br>142<br>214<br>81<br>221<br>25<br>25                           | ft <br>ft <br>ft <br>ft <br>ft <br>ft                                                                                                                                                                      |
| e<br>oup<br>proa<br>T<br>H<br>T<br>Proa<br>T<br>H<br>T<br>Proa<br>T<br>H | Width/ <br>  Lanes <br>  12/1  <br>  24/2  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                                  | g/<br>Reqd<br>.042<br>.158<br>.209<br>.123<br>.232<br>.004<br>.003<br>.202                         | /C<br>Used<br>.354<br>.354<br>.200<br>.354<br>.354<br>.200<br>.354<br>.200                                | Servic<br>  @C (v)<br>  471<br>  1224<br>  277<br>  277<br>  504<br>  620<br>  297<br>  297                            | ce Rate<br>ph) @E<br>  528<br>  1279<br>  343<br>  561<br>  679<br>  365<br>  659                            | Adj<br>Volume<br>32<br>482<br>293<br>137<br>375<br>2<br>2                                                                                                              | v/c<br>.061<br>.377<br>.854<br>.244<br>.552<br>.005                                   | HCM<br>Delay<br>17.0<br>9.0<br>10.2<br>29.0<br>11.1<br>9.6<br>11.6<br>13.5<br>34.6<br>8.8<br>10.9                         | C+<br>C+<br>B+<br>B+<br>B+<br>B+<br>B+<br>B+<br>B+<br>B+<br>B+<br>B                                                                                                                                                                       | 90% M<br>Quel<br>25<br>142<br>214<br>81<br>221<br>25<br>25<br>181                    | ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft                                                                                           |
| e<br>oup<br>T<br>H<br>T<br>Proa<br>T<br>H<br>T<br>T<br>H<br>T            | <pre> Width/    Lanes  cch   12/1     24/2     12/1     12/1     12/1     12/1     12/1     12/1     12/1     12/1     12/1     12/1  </pre>           | g/<br>Reqd<br>.042<br>.158<br>.209<br>.123<br>.232<br>.004<br>.003<br>.202<br>.440                 | C<br>Used<br>.354<br>.354<br>.200<br>.354<br>.200<br>.354<br>.200<br>.354<br>.354<br>.354<br>.354<br>.354 | Servic<br>  @C (v)<br>  471<br>  1224<br>  277<br>  277<br>  504<br>  620<br>  297<br>  297<br>  488<br>  601<br>  139 | ce Rate<br>ph) @E<br>  528<br>  1279<br>  343<br>  561<br>  679<br>  365<br>  659<br>  545<br>  659<br>  175 | Adj<br>Volume<br>32<br>482<br>293<br>137<br>293<br>1375<br>2<br>2<br>1375<br>2<br>1375<br>2                                                                            | v/c<br>.061<br>.377<br>.854<br>.244<br>.552<br>.005<br>.005                           | HCM<br>Delay<br>17.0<br>9.0<br>10.2<br>29.0<br>11.1<br>9.6<br>11.6<br>13.5<br>34.6<br>8.8<br>10.9<br>74.5<br>10.8         | L  <br>S  <br>C+<br>B+<br>B<br>+<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B                                                                                                                               | 90% M<br>Quel<br>25<br>142<br>214<br>81<br>221<br>25<br>25<br>181<br>108             | ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft                                                                                 |
| e<br>oup<br>proa<br>T<br>H<br>T<br>Proa<br>T<br>H<br>T<br>T<br>H<br>T    | <pre> Width/    Lanes  cch   12/1     24/2     12/1     12/1     12/1     12/1     12/1     12/1     12/1     12/1     12/1     12/1     12/1   </pre> | g/<br>Reqd<br>.042<br>.158<br>.209<br>.123<br>.232<br>.004<br>.003<br>.202<br>.440                 | C<br>Used<br>.354<br>.354<br>.200<br>.354<br>.354<br>.200<br>.354<br>.354<br>.354<br>.354<br>.354         | Servic<br>  @C (v)<br>  471<br>  1224<br>  277<br>  277<br>  504<br>  620<br>  297<br>  488<br>  601<br>  139          | ce Rate<br>ph) @E<br>  528<br>  1279<br>  343<br>  561<br>  679<br>  365<br>  659<br>  175<br>  175          | Adj<br>Volume<br>32<br>482<br>293<br>137<br>375<br>2<br>137<br>2<br>137<br>1375<br>2<br>137<br>2<br>137<br>137<br>137<br>137<br>137<br>137<br>137<br>137<br>137<br>137 | v/c<br>.061<br>.377<br>.854<br>.244<br>.552<br>.005<br>.005<br>.002<br>.464<br> 1.028 | HCM<br>Delay<br>17.0<br>9.0<br>10.2<br>29.0<br>11.1<br>9.6<br>11.6<br>13.5<br>34.6<br>8.8<br>10.9<br>74.5<br>10.8<br>10.8 | L  <br>S  <br>C+<br>B+ <br>B<br>  B+ <br>B<br>  B+<br>B<br>  B+<br>B<br>  B+<br>B<br>  B+<br>B<br>  B+<br>B<br>  B+<br>B<br>  B+<br>  B<br>  B+<br>  B<br>  B+<br>  B<br>  B+<br>  B<br>  B+<br>  B<br>  B+<br>  B<br>  B+<br>  B <br>  B | 90% M<br>Quel<br>25<br>142<br>214<br>81<br>221<br>25<br>181<br>108<br>25             | ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft |
| e<br>oup<br>proa<br>T<br>H<br>T<br>proa<br>T<br>H<br>T<br>Proa           | <pre> Width/    Lanes  cch   12/1     24/2     12/1     12/1     12/1     12/1     12/1     12/1     12/1     12/1     12/1     12/1  </pre>           | g/<br>Reqd<br>.042<br>.158<br>.209<br>.123<br>.232<br>.004<br>.003<br>.202<br>.440<br>.014<br>.203 | C<br>Used<br>.354<br>.354<br>.200<br>.354<br>.200<br>.354<br>.354<br>.354<br>.354<br>.354<br>.354<br>.354 | Servia<br>  @C (v)<br>  471<br>  1224<br>  277<br>  504<br>  620<br>  297<br>  488<br>  601<br>  139<br>  488<br>  601 | ce Rate<br>ph) @E<br>  528<br>  1279<br>  343<br>  545<br>  545<br>  545<br>  545<br>  545<br>  545<br>  545 | Adj<br>Volume<br>32<br>482<br>293<br>1375<br>293<br>1375<br>293<br>1375<br>12<br>1306<br>183                                                                           | <pre>v/c .061 .377 .854 .244 .552 .005 .002 .464 1.028 .015 .015 .469</pre>           | HCM<br>Delay<br>17.0<br>9.0<br>10.2<br>29.0<br>11.1<br>9.6<br>11.6<br>13.5<br>34.6<br>8.8<br>10.9<br>74.5<br>10.8<br>10.8 | L  <br>C+<br>C+<br>B+<br>B+<br>B+<br>B+<br>B+<br>B+<br>B+<br>B+<br>B+<br>B                                                                                                                                                                | 90%<br>Quel<br>25<br>142<br>214<br>81<br>221<br>25<br>181<br>108<br>25<br>181<br>108 | ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft        ft |

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KULAMALU FUTURE BASE AM PEAK HOUR

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SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

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|-----------------|--------|-------|--------|--------|--------|--------|-------|-------|--------|--------------|--------------|-----------|
| Intersection    | Para   | neter | s for  | Int #  | 0 -    | - ВҮРА | SS/KU | LA HW | у & на | LEAKAL       | A HY         |           |
| METROAREA       |        | NON   | CBD    |        |        |        |       |       |        |              |              |           |
| LOSTTIME        |        |       | 2.0    |        |        |        |       |       |        |              |              |           |
| LEVELOFSERVICE  |        | c í   | s      |        |        |        |       |       |        |              |              |           |
| NODELOCATION    |        | õ     | 9<br>0 |        |        |        |       |       |        |              |              |           |
|                 |        | U     | Ø      |        |        |        |       |       |        |              |              |           |
| Approach Pari   | ameter | s     |        |        |        |        |       |       |        |              |              |           |
| APPLABELS       |        | SE    | :      |        | WB     | }      |       | NE    | 3      |              | EE           | •         |
| GRADES          |        | 6.0   | )      |        | . 0    |        |       | -6.0  |        |              |              |           |
| PEDLEVELS       |        | LOW   | l –    |        | LOW    |        |       | LON   |        |              | LON          |           |
| PARKINGSIDES    |        | NONE  |        |        | NONE   |        |       | NONE  |        |              | NONE         |           |
| PARKVOLUMES     |        | 20    |        |        | 20     |        |       | 20    |        |              |              |           |
| BUSVOLUMES      |        | Ø     |        |        | ē      |        |       | 20    |        |              | 20           |           |
| RIGHTTURNONREDS |        | 1     |        |        | 37     |        |       | -     |        |              | e            |           |
|                 |        | _     |        |        |        |        |       | 39    | ſ      |              | 127          | ·         |
| Movement Para   | meter  | 5     |        |        |        |        |       |       |        |              |              |           |
| MOVLABELS       | RT     | тн    | LΤ     | RT     | тн     | LT     | RT    | тн    | LT     | RT           | тн           | LT        |
| VOLUMES         | 1      | 350   | 53     | 109    | 32     | 55     | 85    | 769   | 182    | 356          | 79           |           |
| WIDTHS          | 12.0   | 12.0  | 12.0   | 12.0   | 12.0   | .0     | 12.0  |       |        | 12.0         |              |           |
| LANES           | 1      | 1     | 1      | 1      | 1      | Ø      | 1     | 1     | 12.0   | 12.0         | 12.0         |           |
| UTILIZATIONS    | 1.00   | 1.00  | 1.00   | 1.00   | 1.00   | 1.00   | 1.00  |       |        | 1.00         | 1.00         | -         |
| TRUCKPERCENTS   | 2.0    | 2.0   | 2.0    | 2.0    | 2.0    | 2.0    | 2.0   | 2.0   |        | 2.0          | 2.0          |           |
| PEAKHOURFACTORS | .95    | .95   | .95    | .95    | .95    | .95    | .95   | .95   | .95    | .95          | .95          |           |
| ARRIVALTYPES    | 3      | 3     | 3      | 3      | 3      | 3      |       |       |        | . 33         | . 35         |           |
| ACTUATIONS      | NO     | YES   | YES    | NÖ     | YES    | YES    | NO    | YES   | YES    | NO           | -            | -         |
| REQCLEARANCES   | 4.0    | 4.0   | 4.0    | 4.0    | 4.0    | 4.0    | 4.0   | 4.0   | 4.0    |              | YES          |           |
| MINIMUMS        | 5.0    | 5.0   | 5.0    | 5.0    | 5.0    | 5.0    | 5.0   | 5.0   | 5.0    | 4.0<br>5.0   | 4.0          |           |
| IDEALSATFLOWS   | 1900   | 1900  | 1900   | 1900   | 1900   | 1900   | 1900  | 1900  | 1900   | 1900         | 5.0          | 5.0       |
| FACTORS         | 1.00   | 1.00  | 1.00   | 1.00   | 1.00   | 1.00   | 1.00  | 1.00  | 1.00   |              | 1900         | 1900      |
| DELAYFACTORS    | 1.00   | 1.00  | 1.00   | 1.00   | 1.00   | 1.00   | 1.00  | 1.00  | 1.00   | 1.00         | 1.00         | 1.00      |
| NSTOPFACTORS    | 1.00   | 1.00  | 1.00   | 1.00   | 1.00   | 1.00   | 1.00  | 1.00  | 1.00   | 1.00         | 1.00         |           |
| GROUPTYPES      | NORM   | NORM  | NORM   | NORM   | NORM   |        |       | NORM  |        | 1.00         | 1.00         | 1.00      |
| SATURATIONFLOWS | 1493   |       | 240    | 1539   | 1481   | 0      | 1585  | 1919  |        | NORM<br>1539 | NORM<br>1858 | NORM<br>0 |
| Phasing Param   | eters  |       |        |        |        |        |       |       |        |              |              | -         |
| SEQUENCES       | 3      | 1     | ALL    |        |        |        |       |       |        |              |              |           |
| PERMISSIVES     | YĔ     |       | YES    | YES    | YE     | c      |       |       |        | •·· -        |              |           |
| OVERLAPS        | YE     |       | YES    | YES    | YE     |        |       | LEADL |        |              | NE           | NONE      |
| CYCLES          |        | ø     | 120    | 10     | T C    | 3      |       | OFFSE | ••     | •            | 00           | 1         |
| GREENTIMES      | 9.9    |       | .07    | 9.96   |        |        |       | PEDTI | ME     |              | .0           | Ø         |
| YELLOWTIMES     | 4.0    |       | .00    |        |        |        |       |       |        |              |              |           |
| CRITICALS       |        | 9     |        | 4.00   |        |        |       |       |        |              |              |           |
| EXCESS          |        | a     | Ċ,     | 5      |        |        |       |       |        |              |              |           |

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EXCESS

| ULAMA                                                                                      | н                                                                                                                                                                                   |                                                                                             |                                                                                            |                                                                                             | ·                                                                                   |                                                                          |                                                                     |                                                                                                                                   |                                                                                               | )3/27/<br>.7:39:                                                 |                                                            |
|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------|
| UTURE                                                                                      | BASE                                                                                                                                                                                |                                                                                             |                                                                                            |                                                                                             |                                                                                     |                                                                          |                                                                     |                                                                                                                                   | -                                                                                             | . /                                                              | ••                                                         |
| M PEAI                                                                                     | < HOUR                                                                                                                                                                              |                                                                                             |                                                                                            |                                                                                             |                                                                                     |                                                                          |                                                                     |                                                                                                                                   |                                                                                               |                                                                  |                                                            |
| TGNAL                                                                                      | 94/TEAPAC[V                                                                                                                                                                         | 1 L1.4]                                                                                     | - Capa                                                                                     | city Ana                                                                                    | alysis S                                                                            | ummary                                                                   |                                                                     |                                                                                                                                   |                                                                                               |                                                                  |                                                            |
|                                                                                            | ection Aver                                                                                                                                                                         |                                                                                             |                                                                                            | 0 - 8                                                                                       | BYPASS/K                                                                            | ULA HWY                                                                  | & HALE                                                              | EAKALA H<br>Level o                                                                                                               | Y<br>F Sai                                                                                    | rvice                                                            | 84                                                         |
| nters                                                                                      | Degree of S                                                                                                                                                                         | Gaturati                                                                                    | on (v/c                                                                                    | ).44                                                                                        | Vehicle                                                                             | e Delay                                                                  | 5.4                                                                 | Cevel o                                                                                                                           | . 52                                                                                          |                                                                  | -                                                          |
|                                                                                            |                                                                                                                                                                                     |                                                                                             |                                                                                            | <br>Phase                                                                                   | 3 1                                                                                 |                                                                          |                                                                     |                                                                                                                                   |                                                                                               |                                                                  |                                                            |
| 5q 31<br>**/**                                                                             | Phase 1<br>                                                                                                                                                                         | Pha<br>                                                                                     | se 2                                                                                       |                                                                                             |                                                                                     |                                                                          |                                                                     |                                                                                                                                   |                                                                                               |                                                                  |                                                            |
| '                                                                                          | ļ                                                                                                                                                                                   | + +                                                                                         | +                                                                                          |                                                                                             | ~  <br>++++                                                                         |                                                                          |                                                                     |                                                                                                                                   |                                                                                               |                                                                  |                                                            |
| <i>i</i> v                                                                                 |                                                                                                                                                                                     | + +<br> (+ +                                                                                | +>                                                                                         | <                                                                                           | ****                                                                                |                                                                          |                                                                     |                                                                                                                                   |                                                                                               |                                                                  |                                                            |
|                                                                                            |                                                                                                                                                                                     |                                                                                             | ~                                                                                          | ++++                                                                                        | v                                                                                   |                                                                          |                                                                     |                                                                                                                                   |                                                                                               |                                                                  |                                                            |
| l<br>North                                                                                 | <* +                                                                                                                                                                                | +>  <                                                                                       | (+ * +)                                                                                    | ++++>                                                                                       |                                                                                     |                                                                          |                                                                     |                                                                                                                                   |                                                                                               |                                                                  |                                                            |
| 1                                                                                          | ++++ * + ·<br>  ∨ * + ·                                                                                                                                                             | +  <br>+ ]                                                                                  | + * +                                                                                      | · · · · ·                                                                                   | İ                                                                                   |                                                                          |                                                                     |                                                                                                                                   |                                                                                               |                                                                  |                                                            |
|                                                                                            |                                                                                                                                                                                     |                                                                                             | - 468                                                                                      | G/C= .                                                                                      | 166                                                                                 |                                                                          |                                                                     |                                                                                                                                   |                                                                                               |                                                                  |                                                            |
|                                                                                            | G/C= .16<br>  G= 10.0                                                                                                                                                               | "   G=                                                                                      | 28.1"                                                                                      | G= 10                                                                                       | .0"                                                                                 |                                                                          |                                                                     |                                                                                                                                   |                                                                                               |                                                                  |                                                            |
|                                                                                            | Y+R= 4.0                                                                                                                                                                            |                                                                                             | = 4.0"<br>=23.3%                                                                           | Y+R= 4<br>  0FF=76                                                                          |                                                                                     |                                                                          |                                                                     |                                                                                                                                   |                                                                                               |                                                                  |                                                            |
|                                                                                            | UFFE0                                                                                                                                                                               |                                                                                             |                                                                                            |                                                                                             |                                                                                     |                                                                          |                                                                     | D a d -                                                                                                                           | 0 sec                                                                                         |                                                                  | . 09                                                       |
|                                                                                            |                                                                                                                                                                                     | _                                                                                           | -                                                                                          | 00 09                                                                                       | V-12 0                                                                              | 58C =                                                                    | 20.0%                                                               | Ped≓ ∙                                                                                                                            |                                                                                               | •                                                                | •••                                                        |
|                                                                                            | C≖ 60 sec                                                                                                                                                                           | G= 48                                                                                       | .0 sec                                                                                     | = 80.0%                                                                                     | Y=12.0                                                                              | sec ≖                                                                    | 20.0%                                                               | Ped= •                                                                                                                            |                                                                                               |                                                                  |                                                            |
|                                                                                            |                                                                                                                                                                                     |                                                                                             |                                                                                            |                                                                                             | ce Rate                                                                             | Adj                                                                      |                                                                     | НСМ                                                                                                                               |                                                                                               | <br> 90% M                                                       |                                                            |
| Lan                                                                                        |                                                                                                                                                                                     | ·                                                                                           | .0 sec :<br><br>/C<br>Used                                                                 |                                                                                             | e Rate                                                                              |                                                                          | 20.0%<br>                                                           |                                                                                                                                   |                                                                                               |                                                                  |                                                            |
| -                                                                                          | e  Width/                                                                                                                                                                           | ·                                                                                           | /c                                                                                         | <br>  Servic                                                                                | e Rate                                                                              | Adj                                                                      |                                                                     | HCM<br>Delay                                                                                                                      | L  <br>  S                                                                                    |                                                                  |                                                            |
| Gr                                                                                         | e  Width/<br>oup   Lanes                                                                                                                                                            | g<br>  Reqd                                                                                 | /C<br>Used                                                                                 | Servic<br>  @C (vp                                                                          | ce Rate <br>oh) @E                                                                  | Adj  <br>Volume                                                          | v/c                                                                 | HCM<br>Delay<br>6.5                                                                                                               | L  <br>  S<br>  B+                                                                            | 90% M<br>Queu                                                    |                                                            |
| j Gr<br>SB Ap                                                                              | e  Width/<br>oup   Lanes<br>proach                                                                                                                                                  | 9<br>  Reqd                                                                                 | /C<br>Used                                                                                 | Servic<br>  @C (vp<br>                                                                      | ce Rate <br>bh) @E  <br>                                                            | Adj  <br>Volume <br>1  <br>368                                           | .001<br>.405                                                        | HCM<br>Delay<br>6.5<br>4.8<br>5.2                                                                                                 | L  <br>  S<br>  B+<br>  A<br>  B+                                                             | 90% M<br>Queu<br>25<br>155                                       | ft                                                         |
| Gr<br>SB Ap                                                                                | y Width/<br>oup   Lanes<br>proach<br>T   12/1                                                                                                                                       | 9<br>  Reqd<br>  .002                                                                       | /C<br>Used<br>                                                                             | Servic<br>  @C (vp<br>  711<br>  872                                                        | ce Rate <br>oh) @E  <br>                                                            | Adj  <br>Volume <br>1  <br>368                                           | .001<br>.406<br>.467                                                | HCM<br>Delay<br>6.5<br>4.8<br>6.2<br>8.4                                                                                          | L<br>  S<br>  S<br>  A<br>  B+                                                                | 90% M<br>Queu<br>25<br>155<br>25                                 | ft <br>ft                                                  |
| Gr<br>SB Ap                                                                                | y Width/<br>oup   Lanes<br>proach<br>T   12/1                                                                                                                                       | 9<br>  Reqd<br>  .002                                                                       | /C<br>Used<br>                                                                             | Servic<br>  @C (vp<br>                                                                      | ce Rate <br>oh) @E  <br>                                                            | Adj  <br>Volume <br>1  <br>368                                           | .001<br>.406<br>.467                                                | HCM<br>  Delay<br>6.5<br>  4.8<br>  6.2<br>  8.4                                                                                  | L<br>  S<br>  A<br>  B+<br>  B+                                                               | 90% M<br>Queu<br>25<br>155<br>25                                 | ft <br>ft                                                  |
| Gr<br>SB Ap<br>R<br>R<br>T<br>L<br>L                                                       | e  Width/<br>oup   Lanes<br>proach<br>T   12/1<br>H   12/1<br>T   12/1                                                                                                              | g<br>Reqd<br>  .002<br>  .238<br>  .000                                                     | /C<br>Used<br>.501<br>.501<br>.501<br>.501                                                 | Servic<br>  @C (vp<br>  711<br>  872<br>  93                                                | ce Rate <br>bh) @E  <br>748<br>906<br>116                                           | Adj  <br>Volume  <br>1  <br>368  <br>56                                  | v/c<br>.001<br>.406<br>.467                                         | HCM<br>Delay<br>6.5<br>4.8<br>6.2<br>8.4                                                                                          | L<br>  S<br>  A<br>  A<br>  B+<br>  B+                                                        | 90% M<br>Queu<br>25<br>155<br>25                                 | ft <br>ft                                                  |
| Gr<br>SB Ap<br>R<br>R<br>T<br>L<br>L<br>NB Ap                                              | proach<br>T   12/1<br>H   12/1<br>T   12/1<br>proach                                                                                                                                | 9<br>  Reqd<br>  .002<br>  .238<br>  .000                                                   | /C<br>Used<br>                                                                             | Servic<br>  @C (vp<br>  711<br>  872<br>  93                                                | ce Rate<br>bh) @E  <br>748<br>906<br>116                                            | Adj  <br>Volume <br>1  <br>368  <br>56                                   | v/c<br>.001<br>.406<br>.467                                         | HCM<br>Delay<br>6.5<br>4.8<br>5.2<br>8.4<br>2.6                                                                                   | L<br>  S<br>  A<br>  B+<br>  B+<br>  B+                                                       | 90% M<br>Queu<br>25<br>155<br>25                                 | ft <br>ft <br>ft                                           |
| Gr<br>SB Ap<br>R<br>R<br>T<br>L<br>L<br>NB Ap                                              | <pre>width/<br/>oup   Lanes<br/>proach<br/>T   12/1<br/>H   12/1<br/>T   12/1<br/>proach<br/>T   12/1</pre>                                                                         | 9<br>  Reqd<br>  .002<br>  .238<br>  .000                                                   | /C<br>Used<br>\.501<br>\.501<br>\.501<br>\.501                                             | Servic<br>  @C (vp<br>  711<br>  872<br>  93<br>  93<br>  1161<br>  1408                    | ce Rate<br>bh) @E  <br>748<br>906<br>116<br>1163.<br>1408                           | Adj  <br>Volume <br>1  <br>368  <br>56  <br>56  <br>48                   | v/c<br>.001<br>.406<br>.467<br>.041<br>.575                         | HCM<br>  Delay<br>6.5<br>  4.8<br>  6.2<br>  8.4<br>2.6<br>  1.4<br>  2.8<br>  2.1                                                | L<br>  S<br>  A<br>  B+<br>  B+<br>  B+<br>  A<br>  A<br>  A                                  | 90% M<br>Queu<br>25<br>155<br>25<br>25<br>25<br>182<br>182<br>43 | ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft               |
| Gr<br>SB Ap<br>R<br>T<br>L<br>NB Ap<br>R<br>R<br>R<br>R<br>T                               | proach<br>T   12/1<br>H   12/1<br>T   12/1<br>proach                                                                                                                                | 9<br>  Reqd<br>  .002<br>  .238<br>  .000                                                   | /C<br>Used<br>.501<br>.501<br>.501<br>.501<br>.734                                         | Servic<br>  @C (vp<br>  711<br>  872<br>  93<br>  93<br>  1161<br>  1408                    | ce Rate<br>bh) @E  <br>748<br>906<br>116<br>1163.<br>1408<br>618                    | Adj  <br>Volume <br>1  <br>368  <br>56  <br>56  <br>48  <br>809<br>192   | v/c<br>.001<br>.406<br>.467<br>.041<br>.575<br>.311                 | HCM<br>  Delay<br>6.5<br>  4.8<br>  6.2<br>  8.4<br>2.6<br>  1.4<br>  2.8<br>  2.1                                                | L<br>  S<br>  A<br>  B+<br>  B+<br>  B+<br>  A<br>  A<br>  A                                  | 90% M<br>Queu<br>25<br>155<br>25                                 | ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft               |
| SB AP<br>SB AP<br>R<br>T<br>L<br>L<br>NB AP<br>R<br>R<br>R<br>T<br>L<br>L                  | e  Width/<br>oup   Lanes<br>T   12/1<br>H   12/1<br>T   12/1<br>proach<br>T   12/1<br>H   12/1<br>T   12/1<br>T   12/1                                                              | g<br>  Reqd<br>  .002<br>  .238<br>  .000<br>  .052<br>  .443<br>  .000                     | /C<br>Used<br>.501<br>.501<br>.501<br>.501<br>.734<br>.734<br>.199                         | Servic<br>  @C (vp<br>  711<br>  872<br>  93<br>  1161<br>  1408<br>  592                   | ce Rate<br>bh) QE<br>748<br>906<br>116<br>1163.<br>1408<br>618                      | Adj  <br>Volume <br>1  <br>368  <br>56  <br>56  <br>48<br>  809<br>192   | v/c<br>.001<br>.406<br>.467<br>.041<br>.575<br>.311                 | HCM<br>Delay<br>6.5<br>4.8<br>6.2<br>8.4<br>2.6<br>1.4<br>2.6<br>1.4<br>2.8<br>2.1                                                | L<br>  S<br>  A<br>  B+<br>  B+<br>  B+<br>  A<br>  A<br>  A<br>  A<br>  A<br>  A             | 90% M<br>Queu<br>25<br>155<br>25<br>25<br>182<br>182<br>43       | ft <br>ft <br>ft <br>ft <br>ft                             |
| SB AP<br>SB AP<br>R<br>T<br>L<br>NB AP<br>R<br>R<br>R<br>T<br>L<br>L<br>NB AP              | <pre>e  Width/<br/>oup   Lanes<br/>proach<br/>T   12/1<br/>H   12/1<br/>T   12/1<br/>proach<br/>T   12/1<br/>H   12/1<br/>T   12/1<br/>T   12/1</pre>                               | 9<br>  Reqd<br>  .002<br>  .238<br>  .000<br>  .052<br>  .443<br>  .000                     | /C<br>Used<br>.501<br>.501<br>.501<br>.734<br>.734<br>.199                                 | Servic<br>  @C (vp<br>  711<br>  872<br>  93<br>  1161<br>  1408<br>  592                   | ce Rate<br>bh) @E  <br>748<br>906<br>116<br>1163.<br>1408<br>618                    | Adj  <br>Volume <br>1  <br>368  <br>56  <br>56  <br>48<br>  809<br>! 192 | v/c<br>.001<br>.406<br>.467<br>.041<br>.575<br>.311                 | HCM<br>Delay<br>6.5<br>4.8<br>5.2<br>8.4<br>2.6<br>1.4<br>2.8<br>2.1<br>13.3                                                      | L<br>  S<br>  A<br>  B+<br>  B+<br>  B+<br>  A<br>  A<br>  A<br>  A<br>  A<br>  A             | 90% M<br>Queu<br>25<br>155<br>25<br>182<br>182<br>43             | ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft               |
| SB AP<br>SB AP<br>R<br>T<br>L<br>NB AP<br>R<br>R<br>T<br>L<br>U<br>R<br>NB AP              | <pre>width/<br/>oup   Lanes<br/>proach<br/>T   12/1<br/>H   12/1<br/>T   12/1<br/>Proach<br/>T   12/1<br/>H   12/1<br/>T   12/1<br/>T   12/1</pre>                                  | 9<br>  Reqd<br>  .002<br>  .238<br>  .000<br>  .052<br>  .443<br>  .000                     | /C<br>Used<br>.501<br>.501<br>.501<br>.501<br>.734<br>.734<br>.199                         | Servic<br>  @C (vp<br>  711<br>  872<br>  93<br>  1161<br>  1408<br>  592<br>  249          | ce Rate<br>bh) @E  <br>748<br>906<br>116<br>1163.<br>1408<br>618<br>307             | Adj  <br>Volume <br>1  <br>368  <br>56  <br>48  <br>809<br>192           | <pre>∨/c .001 .406 .467 .041 .575 .311 .248 .248 .312</pre>         | HCM<br>Delay<br>6.5<br>4.8<br>5.2<br>8.4<br>2.6<br>1.4<br>2.6<br>1.4<br>2.8<br>2.1<br>13.3<br>13.3                                | L<br>  S<br>  S<br>  A<br>  B+<br>  B+<br>  B+<br>  A<br>  *A<br>  *A<br>  *A<br>  *B         | 90% M<br>Queu<br>25<br>155<br>25<br>182<br>182<br>43             | ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft |
| SB AP<br>SB AP<br>R<br>T<br>L<br>NB AP<br>R<br>R<br>T<br>L<br>U<br>R<br>NB AP              | <pre>e  Width/<br/>oup   Lanes<br/>proach<br/>T   12/1<br/>H   12/1<br/>T   12/1<br/>proach<br/>T   12/1<br/>H   12/1<br/>T   12/1<br/>T   12/1</pre>                               | 9<br>  Reqd<br>  .002<br>  .238<br>  .000<br>  .052<br>  .443<br>  .000                     | /C<br>Used<br>.501<br>.501<br>.501<br>.501<br>.734<br>.734<br>.199                         | Servic<br>  @C (vp<br>  711<br>  872<br>  93<br>  1161<br>  1408<br>  592<br>  249          | ce Rate<br>bh) @E  <br>748<br>906<br>116<br>1163.<br>1408<br>618<br>307             | Adj  <br>Volume <br>1  <br>368  <br>56  <br>48  <br>809<br>192           | <pre>∨/c .001 .406 .467 .041 .575 .311 .248 .248 .312</pre>         | HCM<br>Delay<br>6.5<br>4.8<br>5.2<br>8.4<br>2.6<br>1.4<br>2.6<br>1.4<br>2.8<br>2.1<br>13.3<br>13.3                                | L<br>  S<br>  S<br>  A<br>  B+<br>  B+<br>  B+<br>  A<br>  *A<br>  *A<br>  *A<br>  *B         | 90% M<br>Queu<br>25<br>155<br>25<br>182<br>182<br>43             | ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft |
| SB AP<br>SB AP<br>I R<br>I L<br>NB AP<br>I R<br>I L<br>H<br>U L<br>H<br>SB AP              | <pre>e  Width/<br/>oup   Lanes<br/>T   12/1<br/>H   12/1<br/>T   12/1<br/>T   12/1<br/>H   12/1<br/>T   12/1<br/>T   12/1<br/>F   12/1<br/>F   12/1<br/>H   12/1<br/>H   12/1</pre> | 9<br>  Reqd<br>  .002<br>  .238<br>  .000<br>  .052<br>  .443<br>  .000<br>  .077<br>  .093 | /C<br>Used<br>.501<br>.501<br>.501<br>.501<br>.734<br>.734<br>.734<br>.199<br>.199<br>.199 | Servic<br>  @C (vp<br>  711<br>  872<br>  93<br>  1161<br>  1408<br>  592<br>  249<br>  238 | ce Rate<br>bh) @E<br>748<br>906<br>116<br>1163.<br>1408<br>618<br>307<br>295        | Adj<br>Volume<br>1<br>368<br>56<br>56<br>809<br>192<br>192               | <pre>∨/c .001 .406 .467 .041 .575 .311 .248 .312</pre>              | HCM<br>  Delay<br>6.5<br>  4.8<br>  6.2<br>  8.4<br>  2.6<br>  1.4<br>  2.8<br>  2.1<br>  13.3<br>  13.2<br>  13.2<br>  13.5      | L<br>  S<br>  A<br>  B+<br>  B+<br>  B+<br>  A<br>  *A<br>  *A<br>  *A<br>  *B                | 90% M<br>Queu<br>25<br>155<br>25<br>125<br>182<br>43<br>43       | ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft               |
| Gr<br>SB Ap<br>SB Ap<br>I R<br>I L<br>NB Ap<br>I R<br>I T<br>I L<br>WB Ap<br>I F<br>I LT+1 | <pre>width/<br/>oup   Lanes<br/>proach<br/>T   12/1<br/>H   12/1<br/>T   12/1<br/>Proach<br/>T   12/1<br/>H   12/1<br/>T   12/1<br/>T   12/1</pre>                                  | 9<br>  Reqd<br>  .002<br>  .238<br>  .000<br>  .052<br>  .443<br>  .000<br>  .057<br>  .093 | /C<br>Used<br>.501<br>.501<br>.501<br>.501<br>.734<br>.734<br>.199<br>.199<br>.199         | Servic<br>  @C (vp<br>  711<br>  872<br>  93<br>  1161<br>  1408<br>  592<br>  249<br>  238 | ce Rate<br>bh) @E<br>748<br>906<br>116<br>1163.<br>1408<br>618<br>307<br>295<br>665 | Adj<br>Volume<br>1<br>368<br>56<br>56<br>809<br>192<br>192               | v/c<br>.001<br>.406<br>.467<br>.041<br>.575<br>.311<br>.248<br>.312 | HCM<br>Delay<br>6.5<br>4.8<br>6.2<br>8.4<br>2.6<br>1.4<br>2.6<br>1.4<br>2.8<br>2.1<br>13.3<br>13.3<br>13.3<br>13.2<br>13.5<br>9.0 | L<br>  S<br>  A<br>  A<br>  B+<br>  B+<br>  B+<br>  A<br>  *A<br>  *A<br>  *A<br>  *B<br>  *B | 90% M<br>Queu<br>25<br>155<br>25<br>182<br>182<br>43<br>51<br>62 | ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft               |

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KULAMALU FUTURE BASE PM PEAK HOUR

# 03/27/97 17:39:42

SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

| SIGNAL94/TEAPAC | [V1 L1 | 4] -   | • Summ | ary of | Para | meter | Value  | S     |      |        |      |      |
|-----------------|--------|--------|--------|--------|------|-------|--------|-------|------|--------|------|------|
| Intersection    | Paran  | neters | for    | Int #  | 0 -  | BYPA  | SS/KUL | А НЫУ | & HA | LEAKAL | A HY |      |
| METROAREA       |        | NONC   | BD     |        |      |       |        |       |      |        |      |      |
| LOSTTIME        |        | 2      | .0     |        |      |       |        |       |      |        |      |      |
| LEVELOFSERVICE  |        | С      | S      |        |      |       |        |       |      |        |      |      |
| NODELOCATION    |        | 0      | 0      |        |      |       |        |       |      |        |      |      |
| Approach Para   | ameter | s      |        |        |      |       |        |       |      |        |      |      |
| APPLABELS       |        | SB     |        |        | WB   |       |        | NB    |      |        | ٤B   |      |
| GRADES          |        | 6.0    |        |        | .0   |       |        | -6.0  |      |        | .0   |      |
| PEDLEVELS       |        | LOW    |        |        | LOW  |       |        | LOW   |      |        | LOW  |      |
| PARKINGSIDES    |        | NONE   |        |        | NONE |       |        | NONE  |      |        | NONE |      |
| PARKVOLUMES     |        | 20     |        |        | 20   |       |        | 20    |      |        | 20   |      |
| BUSVOLUMES      |        | Ø      |        |        | 0    |       |        | 0     |      | •      | 0    |      |
| RIGHTTURNONREDS |        | 1      |        |        | 52   |       |        | 21    |      |        | 153  |      |
| Movement Para   | meter  | 5      |        |        |      |       |        |       |      |        |      |      |
| MOVLABELS       | RT     | тн     | LT     | RT     | тн   | LT    | RT     | тн    | LT   | RŤ     | тн   | LT   |
| VOLUMES         | 1      | 680    | 74     | 87     | 36   |       | 33     | 485   | 200  | 218    | 46   | 6    |
| WIDTHS          | 12.0   | 12.0   | 12.0   | 12.0   | 12.0 | .0    |        | 12.0  |      |        | 12.0 | .0   |
| LANES           | 1      | 1      | 1      | 1      | 1    | 0     | 1      | 1     | 1    | 1      | 1    | ē    |
| UTILIZATIONS    | 1.00   | 1.00   | 1.00   | 1.00   | 1.00 | 1.00  | 1.00   | 1.00  | 1.00 | 1.00   | _    | 1.00 |
| TRUCKPERCENTS   | 2.0    | 2.0    | 2.0    | 2.0    | 2.0  | 2.0   | 2.0    | 2.0   | 2.0  | 2.0    | 2.0  | 2.0  |
| PEAKHOURFACTORS | .95    | .95    | .95    | .95    | .95  | .95   | .95    | .95   | .95  | .95    | .95  | .95  |
| ARRIVALTYPES    | 3      | 3      | 3      | 3      | 3    | 3     | 3      | 3     | 3    | 3      | 3    | 5    |
| ACTUATIONS      | NO     | YES    | YES    | NO     | YES  | YES   | NO     | YES   | YES  | NO     | YES  | YES  |
| REQCLEARANCES   | 4.0    | 4.0    | 4.0    | 4.0    | 4.0  | 4.0   | 4.0    | 4.0   | 4.0  | 4.0    | 4.0  | 4.0  |
| MINIMUMS        | 5.0    | 5.0    | 5.0    | 5.0    | 5.0  | 5.0   | 5.0    | 5.0   | 5.0  | 5.0    | 5.0  | 5.6  |
| IDEALSATFLOWS   |        | 1900   | 1900   | 1900   | 1900 | 1900  | 1900   | 1900  | 1900 | 1900   | 1900 | 1900 |
| FACTORS         |        | 1.00   | 1.00   | 1.00   | 1.00 |       | 1.00   | 1.00  | 1.00 | 1.00   | 1.00 | 1.00 |
| DELAYFACTORS    |        | 1.00   |        |        | 1.00 |       | 1.00   | 1.00  | 1.00 | 1.00   | 1.00 | 1.00 |
| NSTOPFACTORS    | 1.00   |        | 1.00   |        | 1.00 |       | 1.00   | 1.00  | 1.00 | 1.00   | 1.00 | 1.00 |
| GROUPTYPES      |        | NORM   |        |        | NORM | NORM  | NORM   | NORM  | NORM | NORM   | NORM | NORM |
| SATURATIONFLOWS | 1493   | 1807   | 300    | 1539   | 1676 | 0     | 1585   | 1919  | 1823 | 1539   | 1863 | ę.   |
|                 |        |        |        |        |      |       |        |       |      |        |      |      |

#### Phasing Parameters

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| SEQUENCES<br>PERMISSIVES<br>OVERLAPS<br>CYCLES<br>GREENTIMES<br>YELLOWTIMES<br>CRITICALS<br>EXCESS | 31<br>YES<br>YES<br>60<br>7.62<br>4.00<br>9 | ALL<br>YES<br>120<br>32.76<br>4.00<br>2 | YES<br>YES<br>10<br>7.62<br>4.00<br>5 | YES<br>YES | LEADLAGS<br>Offset<br>Pedtime | NONE<br>.00<br>.0 | NONE<br>1<br>Q |
|----------------------------------------------------------------------------------------------------|---------------------------------------------|-----------------------------------------|---------------------------------------|------------|-------------------------------|-------------------|----------------|
|----------------------------------------------------------------------------------------------------|---------------------------------------------|-----------------------------------------|---------------------------------------|------------|-------------------------------|-------------------|----------------|

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LAMALU<br>Ture base                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                            |                                                                                                                                                      | 03/27/9<br>17:40::                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| PEAK HOUR                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                            |                                                                                                                                                      |                                                                                                                                                                                        | <b>6</b> 24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| NAL94/TEAPAC[                                                                                                                                                                     | V1 L1.4] - Capa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | acity Analysis                                                                                                                             | Summary                                                                                                                                              |                                                                                                                                                                                        | i                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| ersection Ave                                                                                                                                                                     | rages for Int                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                            | KULA HWY & HAL                                                                                                                                       | EAKALA HY<br>Level of Service                                                                                                                                                          | <b>5</b> -4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Degree of                                                                                                                                                                         | Saturation ( $\vee/0$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | c) .48 Vehic.                                                                                                                              | Te Detay 5.0                                                                                                                                         |                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 31   Phase 1                                                                                                                                                                      | <br>  Phase 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Phase 3                                                                                                                                    |                                                                                                                                                      |                                                                                                                                                                                        | <b>.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| **                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ^                                                                                                                                          |                                                                                                                                                      |                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                   | + * +<br> <+ * +>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ++++ <br>  {****                                                                                                                           |                                                                                                                                                      |                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ****                                                                                                                                       |                                                                                                                                                      |                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| th <* +                                                                                                                                                                           | +>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ++++>                                                                                                                                      |                                                                                                                                                      |                                                                                                                                                                                        | ,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| $\begin{vmatrix} ++++ & + \\ + & \vee & + \end{vmatrix}$                                                                                                                          | $\begin{array}{cccc} + & + & + & + \\ + & + & + & + & + \\ \end{array}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                            |                                                                                                                                                      |                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| G/C= .12                                                                                                                                                                          | 7   G/C= .546                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                            |                                                                                                                                                      |                                                                                                                                                                                        | •••                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| G= 7.6<br>  Y+R≖ 4.0                                                                                                                                                              | "   G= 32.8"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | G= 7.6"<br>Y+R= 4.0"                                                                                                                       |                                                                                                                                                      |                                                                                                                                                                                        | ~~~~                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                                                   | \$   OFF=19.4%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | OFF=80.6%                                                                                                                                  |                                                                                                                                                      |                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| C= 60 sec                                                                                                                                                                         | G= 48.0 sec                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | = 80.0% Y=12.                                                                                                                              | 0 sec ≖ 20.0%                                                                                                                                        | Ped= .0 sec = .                                                                                                                                                                        | 69                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Service Rate                                                                                                                               |                                                                                                                                                      | HCM   L 190% Ma                                                                                                                                                                        | <br>xt <sup>553</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| _ane  Width/                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | I Service Noice                                                                                                                            |                                                                                                                                                      |                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | @C (vph) @E                                                                                                                                | Volume  v/c                                                                                                                                          |                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Group   Lanes                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | @C (vph) @E                                                                                                                                | Volume V/C                                                                                                                                           | Delay   S   Queue                                                                                                                                                                      | Ì                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Group Lanes                                                                                                                                                                       | Reqd Used                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ] @C (vph) @E                                                                                                                              | Volume  V/c                                                                                                                                          | Delay   S   Queue<br>6.9 B+                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Group   Lanes<br>Approach                                                                                                                                                         | Reqd Used                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ] @C (vph) @E                                                                                                                              | Volume  V/c                                                                                                                                          | 6.9 B+                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Group   Lanes<br>Approach                                                                                                                                                         | Reqd Used                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ] @C (vph) @E                                                                                                                              | Volume  V/c                                                                                                                                          | Delay   S   Queue<br>6.9 B+                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Group   Lanes<br>Approach<br>RT   12/1<br>TH   12/1<br>LT   12/1                                                                                                                  | Reqd Used                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ] @C (vph) @E                                                                                                                              | Volume  V/c                                                                                                                                          | Delay   S   Queue<br>6.9 B+<br>3.4   A   25 f<br>7.0  *B+  254 f<br>5.9   B+  28 f                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Group   Lanes<br>Approach<br>RT   12/1<br>TH   12/1<br>LT   12/1<br>Approach                                                                                                      | Reqd Used                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | @C (vph) @E<br>  838   865<br>  1025   1047<br>  145   174                                                                                 | Volume  V/C<br>  1   .001<br>  716   .684<br>  78   .448                                                                                             | Delay   S   Queue<br>6.9 B+<br>3.4   A   25 f<br>7.0  *B+  254 f<br>5.9   B+  28 f<br>2.5 A                                                                                            | t                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Group   Lanes<br>Approach<br>RT   12/1<br>TH   12/1<br>LT   12/1<br>Approach<br>RT   12/1<br>TH   12/1                                                                            | Reqd Used<br>.002 .579<br>.421 .579<br>.086 .579<br>.086 .579<br>.019 .773<br>.297 .773                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | @C (vph) @E<br>  838   865<br>  1025   1047<br>  145   174<br>  1225   1225<br>  1483   1483                                               | Volume  V/C<br>  1   .001<br>  716   .684<br>  78   .448<br>  13   .011<br>  511   .345                                                              | 6.9 B+<br>3.4   A   25 f<br>7.0  *B+  254 f<br>5.9   B+  28 f<br>2.5 A<br>1.0   A   25 f<br>1.4   A   98 f                                                                             | t<br>t<br>t<br>t<br>t<br>t<br>t<br>t<br>t<br>t<br>t<br>t<br>t<br>t                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Group   Lanes<br>Approach<br>RT   12/1<br>TH   12/1<br>LT   12/1<br>Approach<br>RT   12/1<br>TH   12/1                                                                            | Reqd Used<br>.002 .579<br>.421 .579<br>.086 .579<br>.086 .579<br>.019 .773<br>.297 .773                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | @C (vph) @E<br>  838   865<br>  1025   1047<br>  145   174<br>  1225   1225<br>  1483   1483<br>  378   420                                | Volume  V/C<br>  1   .001<br>  716   .684<br>  78   .448<br>  78   .448<br>  13   .011<br>  511   .345<br>  211   .502                               | 6.9 B+<br>3.4   A   25 f<br>7.0  *B+  254 f<br>5.9   B+  28 f<br>2.5 A<br>1.0   A   25 f<br>1.4   A   98 f                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Group   Lanes<br>Approach<br>RT   12/1<br>TH   12/1<br>LT   12/1<br>Approach<br>RT   12/1<br>TH   12/1<br>LT   12/1                                                               | Reqd Used<br>.002 .579<br>.421 .579<br>.086 .579<br>.086 .579<br>.019 .773<br>.297 .773                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | @C (vph) @E<br>  838   865<br>  1025   1047<br>  145   174<br>  1225   1225<br>  1483   1483<br>  378   420                                | Volume  V/C<br>  1   .001<br>  716   .684<br>  78   .448<br>  78   .448<br>  13   .011<br>  511   .345<br>  211   .502                               | 6.9 B+<br>3.4   A   25 f<br>7.0  *B+  254 f<br>5.9   B+  28 f<br>2.5 A<br>1.0   A   25 f<br>1.4   A   98 f<br>5.4  *B+  49 f                                                           | t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t   5 4<br>t |
| Group   Lanes<br>Approach<br>RT   12/1<br>TH   12/1<br>LT   12/1<br>Approach<br>RT   12/1<br>TH   12/1<br>LT   12/1<br>Approach                                                   | Reqd Used<br>.002 .579<br>.421 .579<br>.086 .579<br>.086 .579<br>.019 .773<br>.297 .773<br>.062 .160                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | @C (vph) @E<br>  838   865<br>  1025   1047<br>  145   174<br>  1225   1225<br>  1483   1483<br>  378   420                                | Volume  V/C<br>  1   .001<br>  716   .684<br>  78   .448<br>  13   .011<br>  511   .345<br>  211   .502                                              | 6.9 B+<br>3.4   A   25 f<br>7.0  *B+  254 f<br>5.9   B+  28 f<br>2.5 A<br>1.0   A   25 f<br>1.4   A   98 f<br>5.4  *B+  49 f<br>14.3 B                                                 | Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1       Image: 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Group   Lanes<br>Approach<br>RT   12/1<br>TH   12/1<br>LT   12/1<br>Approach<br>RT   12/1<br>TH   12/1<br>LT   12/1<br>Approach<br>RT   12/1<br>TH   12/1                         | Reqd Used<br>  .002   .579<br>  .421   .579<br>  .086   .579<br>  .086   .579<br>  .086   .579<br>  .019   .773<br>  .297   .773<br>  .297   .773<br>  .062   .160                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <pre>  @C (vph) @E   838   865   1025   1047   145   174   1225   1225   1483   1483   378   420   191   247   211   269</pre>             | Volume  V/C<br>  1   .001<br>  716   .684<br>  78   .448<br>  13   .011<br>  511   .345<br>  211   .502<br>  37   .150<br>  71   .264                | 6.9 B+<br>3.4   A   25 f<br>7.0  *B+  254 f<br>5.9   B+  28 f<br>2.5 A<br>1.0   A   25 f<br>1.4   A   98 f<br>5.4  *B+  49 f<br>14.3 B<br>14.3 B                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Group   Lanes<br>Approach<br>RT   12/1<br>TH   12/1<br>LT   12/1<br>Approach<br>RT   12/1<br>TH   12/1<br>Approach<br>RT   12/1<br>Approach<br>RT   12/1<br>Approach              | Reqd Used<br>.002 .579<br>.421 .579<br>.086 .579<br>.086 .579<br>.019 .773<br>.297 .773<br>.062 .160                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <pre>  @C (vph) @E   838   865   1025   1047   145   174   1225   1225   1483   1483   378   420   191   247   211   269</pre>             | Volume  V/C<br>  1   .001<br>  716   .684<br>  78   .448<br>  13   .011<br>  511   .345<br>  211   .502<br>  37   .150<br>  71   .264                | 6.9 B+<br>3.4   A   25 f<br>7.0  *B+  254 f<br>5.9   B+  28 f<br>2.5 A<br>1.0   A   25 f<br>1.4   A   98 f<br>5.4  *B+  49 f<br>14.3 B<br>14.3 B<br>14.4  *B   26 f<br>14.4  *B   50 f | Image: state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Group   Lanes<br>Approach<br>RT   12/1<br>TH   12/1<br>LT   12/1<br>Approach<br>RT   12/1<br>TH   12/1<br>LT   12/1<br>Approach<br>RT   12/1<br>Approach<br>RT   12/1<br>Approach | Reqd Used<br>Reqd Used<br>.002 .579<br>.421 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.097 .773<br>.297 .773<br>.062 .160<br>.043 .160<br>.067 .160                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <pre>  @C (vph) @E   838   865   1025   1047   145   174   145   174   1225   1225   1483   1483   378   420   191   247   211   269</pre> | Volume  V/C<br>  1   .001<br>  716   .684<br>  78   .448<br>  78   .448<br>  211   .345<br>  211   .502<br>  37   .150<br>  71   .264                | 6.9 B+<br>3.4   A   25 f<br>7.0  *B+  254 f<br>5.9   B+  28 f<br>2.5 A<br>1.0   A   25 f<br>1.4   A   98 f<br>5.4  *B+  49 f<br>14.3 B<br>14.3 B<br>14.4  *B   26 f<br>14.4  *B   50 f | Image: Second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Group   Lanes<br>Approach<br>RT   12/1<br>TH   12/1<br>LT   12/1<br>Approach<br>RT   12/1<br>TH   12/1<br>LT   12/1<br>Approach<br>RT   12/1<br>Approach<br>RT   12/1<br>Approach | Reqd Used<br>Reqd Used<br>.002 .579<br>.421 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.086 .579<br>.062 .160<br>.067 .160 | <pre>  @C (vph) @E   838   865   1025   1047   145   174   145   174   1225   1225   1483   1483   378   420   191   247   211   269</pre> | Volume  V/C<br>  1   .001<br>  716   .684<br>  78   .448<br>  78   .448<br>  13   .011<br>  511   .345<br>  211   .502<br>  37   .150<br>  71   .264 | 6.9 B+<br>3.4   A   25 f<br>7.0  *B+  254 f<br>5.9   B+  28 f<br>2.5 A<br>1.0   A   25 f<br>1.4   A   98 f<br>5.4  *B+  49 f<br>14.3 B<br>14.3 B<br>14.4  *B   26 f<br>14.4  *B   50 f | Image: state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state state                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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| KULAMALU<br>Future base<br>Am peak hour |                 |               |                                    | 03/27/97<br>17:42:09             |
|-----------------------------------------|-----------------|---------------|------------------------------------|----------------------------------|
| SIGNAL94/TEAPAC                         | [V1 L1.4] — Sum | mary of Param | eter Values                        |                                  |
| Intersection                            | Parameters for  | Int # 0 - 1   | HALEAKALA HWY & PUK                | ALANI ST                         |
| METROAREA                               | NONCBO          |               |                                    |                                  |
| LOSTTIME                                | 2.0             |               |                                    |                                  |
| LEVELOFSERVICE                          | C S             |               |                                    |                                  |
| NODELOCATION                            | 0 0             |               |                                    |                                  |
| Approach Par                            | ameters         |               |                                    |                                  |
| APPLABELS                               | EB              | 5e            | WB                                 | NB                               |
| GRADES                                  | -88-            | -48           | NB                                 | -29                              |
|                                         | 8.0             | .0            | -8.0                               | 2.0                              |
| PEDLEVELS                               | MODER           | MODER         | MODER                              | MODER                            |
| PARKINGSIDES                            | NONE            | NONE          | NONE                               | NONE                             |
| PARKVOLUMES                             | 20              | 20            | 20                                 | 20                               |
| BUSVOLUMES                              | 0               | 0             | . 0                                | 20                               |
| RIGHTTURNONREDS                         | 141             | 0             | 0                                  | 135                              |
| Movement Para                           | ameters         |               |                                    |                                  |
| MOVLABELS                               | RT TH LT        | RT TH         | LT RT TH IT                        |                                  |
| VOLUMES                                 | 141 342 0       | 0 0           |                                    |                                  |
| WIDTHS                                  | 12.0 12.0 .0    | .0.0          |                                    |                                  |
| LANES                                   | 1 1 0           | 0 0           |                                    | 12.0 .0 12.0                     |
| UTILIZATIONS                            | 1.00 1.00 1.00  |               |                                    | 1 0 1                            |
| TRUCKPERCENTS                           | 2.0 2.0 2.0     |               |                                    | 1.00 1.00 1.00                   |
| PEAKHOURFACTORS                         | .95 .95 .95     | _             |                                    | 2.0 2.0 2.0                      |
| ARRIVALTYPES                            | 3 3 3           | 3 3           |                                    | .95 .95 .95                      |
| ACTUATIONS                              | NO YES YES      |               |                                    | 3 3 3                            |
| REQCLEARANCES                           | 4.0 4.0 4.0     |               |                                    | NO YES YES                       |
| MINIMUMS                                | 5.0 5.0 5.0     | _             | 7.0 4.0 4.0 4.0<br>5.0 5.0 5.0 5.0 | 4.0 4.0 4.9                      |
| IDEALSATFLOWS                           | 1900 1900 1900  | 1900 1900 1   |                                    |                                  |
| FACTORS                                 | 1.00 1.00 1.00  |               | .00 1.00 1.00 1.00                 | 1900 1900 1900<br>1 00 1 00 1 00 |
| DELAYFACTORS                            | 1.00 1.00 1.00  | 1.00 1.00 1   |                                    |                                  |
| NSTOPFACTORS                            | 1.00 1.00 1.00  | 1.00 1.00 1.  |                                    |                                  |
| GROUPTYPES                              | NORM NORM NORM  | NORM NORM NO  | DRM NORM NORM NORM                 | 1.00 1.00 1.00                   |
| SATURATIONFLOWS                         | 1350 1788 0     | 0 0           | 0 0 1919 1823                      | NORM NORM NORM<br>1392 0 1392    |
| Phasing Parame                          | eters           |               |                                    |                                  |
| EQUENCES                                | 31              |               |                                    |                                  |
| ERMISSIVES                              | YES YES         | YES YES       | • •• • • • •                       |                                  |
| VERLAPS                                 | NO NO           |               | LEADLAGS                           | NONE NONE                        |
| YCLES                                   | 60 180          | NO NO<br>10   | OFFSET                             | .00 1                            |
| REENTIMES                               | 5.00 15.00      | 30.00         | PEDTIME                            | .0 0                             |
| ELLOWTIMES                              | 4.00 4.00       | .00           |                                    |                                  |
| RITICALS                                | 9 2             | .00           |                                    |                                  |
| XCESS                                   | 0 2             | ⊥ <           |                                    |                                  |

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|                                           | E BASE<br>Ak hour                     |                                       |                      |          |                     |              |                     |            |                  | er.                 |
|-------------------------------------------|---------------------------------------|---------------------------------------|----------------------|----------|---------------------|--------------|---------------------|------------|------------------|---------------------|
| GNA                                       | L94/TEAPAC[V1                         | . L1.4] - C                           | apacity A            | nalysis  | Summary             |              |                     |            |                  |                     |
|                                           | section Avera                         | iges for In                           | t# 0-                | HALEAKA  | LA HWY U<br>e Delay | S PUKAL      | ANI ST<br>Level (   | of Ser     | vice C-          | <del>م</del> ت<br>1 |
|                                           | Degree of Sa                          | turation (                            | v/c) ./I             | Venici   | e berby             | 2,           |                     |            |                  | au ا                |
| 31                                        | Phase 1                               | Phase 2                               | Phas                 | e 3      |                     |              |                     |            |                  |                     |
| /**                                       |                                       |                                       |                      | 1        |                     |              |                     |            |                  | 43                  |
| iv.                                       |                                       | <b>⟨</b> + *<br>  <b>∨</b>            | -                    |          |                     |              |                     |            |                  |                     |
| <br> 5 <del> </del><br>  <del>15 </del> 1 | ~                                     | · · · · · · · · · · · · · · · · · · · | ****                 |          |                     |              |                     |            |                  | <b>م</b><br>ي       |
|                                           | · · · · · · · · · · · · · · · · · · · | +++++                                 | ++++<br>  V          |          |                     |              |                     |            |                  |                     |
|                                           | <br>  G/C= .086                       | G/C= .25                              |                      |          |                     |              |                     |            |                  |                     |
|                                           | G= 5.0"<br>Y+R= 4.0"                  | G= 15.0<br>  Y+R= 4.0                 | אין Y+R=             | .0"      |                     |              |                     |            |                  | u d                 |
|                                           | OFF= .0%                              | •                                     |                      |          | 4                   | 13 89        | Ped≖ .              | 0 sec      | <b>=</b> .0      | ,<br>19             |
|                                           | C= 58 sec                             | G= 50.0 S                             | ec ≕ 86.2°           | ς γ= σ.  | v sec               |              |                     |            |                  |                     |
| Lai                                       |                                       |                                       | Serv.<br>ed   @C ('  | ice Rate | Adj  <br> Volume    |              | HCM<br>  Delay      | L  <br>  S | 90% Max<br>Queue | 4                   |
|                                           | roup   Lanes <br>                     | Reqd Us                               |                      |          |                     |              |                     |            |                  | • <b>-</b>          |
| <del>в</del> а                            | pproach                               |                                       |                      |          |                     |              |                     | B          | 25 ft            | ±                   |
|                                           | RT   12/1  <br>TH   12/1              | .003   .2                             | 93   343<br>93   468 | 524      | 1<br>  360          | .003<br>.687 |                     | B+ <br> *8 |                  | t  <br>             |
| <br>В                                     |                                       |                                       |                      |          |                     |              | 7.6                 | B+         |                  |                     |
| 8 A                                       | pproach<br>=================          | : 살중날고 왕동병중권 취                        |                      |          |                     | .305         | # # # # # # # # # # |            | 118 f            | ==<br>t             |
|                                           | TH   12/1  <br>LT   12/1              | .168   .4<br>.060   .1                | 48   821<br>21   316 |          | 202                 | .577         | 8.9                 | * 8 +      | 91 f:            | t <br>              |
|                                           |                                       |                                       |                      |          |                     |              | 26.0                | 0+         |                  |                     |
| A A                                       | pproach                               |                                       |                      |          | 17                  | .025         |                     |            |                  |                     |
|                                           | RT   12/1<br>LT   12/1                | .487 .4                               |                      | 672      | 640                 | .952<br>     | 26.6                | *D+<br>    | 270 f            | t <br>              |
|                                           |                                       |                                       |                      |          |                     |              |                     |            |                  |                     |
|                                           |                                       |                                       |                      |          |                     |              |                     |            |                  |                     |
|                                           |                                       |                                       |                      |          |                     |              |                     |            |                  |                     |

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KULAMALU FUTURE BASE PM PEAK HOUR

# SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int 🛛 0 - HALEAKALA HWY & PUKALANI ST

03/27/97

17:43:24

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| METROAREA      | NON | CBD |
|----------------|-----|-----|
| LOSTTIME       |     | 2.0 |
| LEVELOFSERVICE | С   | S   |
| NODELOCATION   | 0   | 0   |

Approach Parameters

| Approach Parame               | EB    | 5B    | WB               | NB               |
|-------------------------------|-------|-------|------------------|------------------|
| APPLABELS                     | -Se   | -MB   | - <del>NB-</del> | - <del>69-</del> |
| GRADES                        | 8.0   | .0    | -8.0             | 2.0              |
| PEDLEVELS                     | MODER | MODER | MODER            | MODER            |
| PARKINGSIDES                  | NONE  | NONE  | NONE             | NONE             |
| PARKVOLUMES                   | 20    | 20    | 20               | 20               |
|                               | 0     | 0     | Ø                | 0                |
| BUSVOLUMES<br>RIGHTTURNONREDS | 134   | õ     | 0                | 196              |

#### Movement Parameters

| MOVLABELS                  | RT   | тн   | LT   | RT   | тн   | LT   | RT   | тн   | LT   | RT   | тн   | LI   |
|----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| VOLUMES                    | 497  | 220  | 0    | 0    | 0    | 0    | 0    | 168  | 280  | 315  | 0    | 191  |
| WIDTHS                     | 12.0 | 12.0 | .0   | .0   | .0   | .0   | .0   | 12.0 | 12.0 | 12.0 | .0   | 12.0 |
| LANES                      | 1    | 1    | 0    | 0    | 0    | Ø    | 0    | 1    | 1    | 1    | 0    | 1    |
| UTILIZATIONS               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| TRUCKPERCENTS              | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  |
| PEAKHOURFACTORS            | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  |
| ARRIVALTYPES               |      | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| ACTUATIONS                 | NÖ   | YES  | YES  | NO   | YES  | YES  | NO   | YES  | YES  | NO   | YES  | YES  |
| REQCLEARANCES              | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  |
| MINIMUMS                   | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  |
| IDEALSATFLOWS              | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| FACTORS                    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| DELAYFACTORS               | 1.00 | 1.00 |      | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
|                            | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| NSTOPFACTORS<br>Grouptypes | NORM | NORM | NORM | NORM | NORM |      | NORM | NORM | NORM | NORM | NORM | NORM |
| SATURATIONFLOWS            | 1350 | 1788 | 0    | 0    | 0    | 0    | 0    | 1919 | 1823 | 1392 | 0    | 1397 |

#### Phasing Parameters

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| SEQUENCES<br>Permissives<br>Overlaps<br>Cycles | 31<br>YES<br>NO<br>60 | YES<br>NO<br>180 | YES<br>NO<br>10 | YES<br>No | LEADLAGS<br>Offset<br>Peotime | NONE<br>.00<br>.0 | NONE<br>1<br>P |
|------------------------------------------------|-----------------------|------------------|-----------------|-----------|-------------------------------|-------------------|----------------|
| GREENTIMES                                     | 5.00                  | 15.00            | 30.00           |           |                               |                   |                |
| YELLOWTIMES                                    | 4.00                  | 4.00             | .00             |           |                               |                   |                |
| CRITICALS                                      | 9                     | 12               | 10              |           |                               |                   |                |
| EXCESS                                         | Ø                     |                  |                 |           |                               |                   |                |

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# **CORRECTION**

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THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY SEE FRAME(S) IMMEDIATELY FOLLOWING

ուն հայ հայ հետում երկրում է արդելու հետումից է մինչ հայտել է է երկրում է ուրելուծերը, է երկրուծել է է երկրուծ Այս հետում է հայ արդելու հետում է հայտել է հետում է երկրում է հետում է է հետում է է երկրում է երկրուծել է հետում Այս հետում է հետում է հետում է հետում է երկրում է հետում է հետում է է երկրում է է է է է է է է է է է է է է է է է - <u>-</u> - -

KULAMALU Future base Pm peak hour

### 03/27/97 17:43:24

SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

| Intersection    | Paramet | ers for               | Int 🗄 | 0 -         | HALE | AKALA | нмл 8                 | PUKA | LANI S | т                      |      |
|-----------------|---------|-----------------------|-------|-------------|------|-------|-----------------------|------|--------|------------------------|------|
| METROAREA       | N       | ONCBD                 |       |             |      |       |                       |      |        |                        |      |
| LOSTTIME        |         | 2.0                   |       |             |      |       |                       |      |        |                        |      |
| LEVELOFSERVICE  | С       | S                     |       |             |      |       |                       |      |        |                        |      |
| NODELOCATION    | 0       | 0                     |       |             |      |       |                       |      |        |                        |      |
| Approach Para   | meters  |                       |       |             |      |       |                       |      |        |                        | •    |
| APPLABELS       |         | ев<br>- <del>58</del> |       | 50<br>-1478 |      |       | WB<br>- <del>NB</del> |      |        | איק<br><del>53</del> - |      |
| GRADES          |         | 8.0                   |       | .0          |      |       | -8.0                  |      |        | 2.0                    |      |
| PEDLEVELS       |         | DER                   |       | MODER       |      |       | MODER                 |      |        | MODER                  |      |
| PARKINGSIDES    |         | ONE                   |       | NONE        |      |       | NONE                  |      |        | NONE                   |      |
| PARKVOLUMES     | 14      | 20                    |       | 20          |      |       | 20                    |      |        | 20                     |      |
| BUSVOLUMES      |         | 0                     |       | 0           |      |       | 20                    |      |        | 20                     |      |
|                 |         | 134                   |       | 0           |      |       | Ő                     |      |        | -                      |      |
| RIGHTTURNONREDS |         | 134                   |       | v           |      |       | 0                     |      |        | 196                    |      |
| Movement Para   | meters  |                       |       |             |      |       |                       |      |        | •                      |      |
| MOVLABELS       | RT      | тн ст                 | тя т  | тн          | LT   | RT    | тн                    | LT   | RT     | тн                     | LT   |
| VOLUMES         | 497 3   | 220 0                 | ) 0   | 0           | 0    | 0     | 168                   | 280  | 315    | Ø                      | 191  |
| WIDTHS          | 12.0 13 | 2.0.0                 | .0    | .0          | .0   | .0    | 12.0                  | 12.0 | 12.0   | .0                     | 12.0 |
| LANES           | 1       | 1 0                   | 0     | Ø           | Ø    | 0     | 1                     | 1    | 1      | 0                      | 1    |
| UTILIZATIONS    | 1.00 1  | .00 1.00              | 1.00  | 1.00        | 1.00 | 1.00  | 1.00                  | 1.00 | 1.00   | 1.00                   | 1.00 |
| TRUCKPERCENTS   | 2.0     | 2.0 2.0               | 2.0   | 2.0         | 2.0  | 2.0   | 2.0                   | 2.0  | 2.0    | 2.0                    | 2.0  |
| PEAKHOURFACTORS | .95     | .95 .95               | .95   | .95         | .95  | .95   | .95                   | .95  | .95    | .95                    | .95  |
| ARRIVALTYPES    | 3       | 3 3                   | 3     | 3           | 3    | 3     | 3                     | 3    | 3      | 3                      | 3    |
| ACTUATIONS      | NO      | YES YES               | NO    | YES         | YES  | NO    | YES                   | YES  | NO     | YES                    | YES  |
| REQCLEARANCES   | 4.0     | 4.0 4.0               | 4.0   | 4.0         | 4.0  | 4.0   | 4.0                   | 4.0  | 4.0    | 4.0                    | 4.0  |
| MINIMUMS        | 5.0 9   | 5.0 5.0               | 5.0   | 5.0         | 5.0  | 5.0   | 5.0                   | 5.0  | 5.0    | 5.0                    | 5.0  |
| IDEALSATFLOWS   | 1900 19 | 900 1900              | 1900  | 1900        | 1900 | 1900  | 1900                  | 1900 | 1900   | 1900                   | 1906 |
| FACTORS         | 1.00 1. | .00 1.00              | 1.00  | 1.00        | 1.00 | 1.00  | 1.00                  | 1.00 | 1.00   | 1.00                   | 1.00 |
| DELAYFACTORS    | 1.00 1. | .00 1.00              | 1.00  | 1.00        | 1.00 | 1.00  | 1.00                  | 1.00 | 1.00   | 1.00                   | 1.00 |
| NSTOPFACTORS    | 1.00 1. | .00 1.00              | 1.00  | 1.00        | 1.00 | 1.00  | 1.00                  | 1.00 | 1.00   | 1.00                   | 1.00 |
| GROUPTYPES      | NORM NO | DRM NORM              | NORM  | NORM        | NORM | NORM  | NORM                  | NORM | NORM   | NORM                   | NORM |
| SATURATIONFLOWS | 1350 17 | 788 0                 | Ø     | 0           | 0    | Ø     | 1919                  | 1823 | 1392   | Ø                      | 1392 |
| Phasing Param   | eters   |                       |       |             |      |       |                       |      |        |                        |      |
| SEQUENCES       | 31      |                       |       |             |      |       |                       |      |        |                        |      |
| PERMISSIVES     | YES     | YES                   | YES   | ΥE          | ΞS   |       | LEAD                  | AGS  | NO     | DNE                    | NONE |
| OVERLAPS        | NO      | NO                    | NO    | 1           | 0.0  |       | OFFSE                 |      |        | . 00                   | 1    |
| CYCLES          | 60      | 180                   | 10    |             |      |       | PEOTI                 |      |        | .0                     | ø    |
| GREENTIMES      | 5.00    | 15.00                 | 30.00 |             |      |       |                       |      |        |                        |      |
| YELLOWTIMES     | 4.00    | 4.00                  | .00   |             |      |       |                       |      |        |                        |      |
| CRITICALS       | 9       | 12                    | 10    |             |      |       |                       |      |        |                        |      |
| EXCESS          | 0       |                       |       |             |      |       |                       |      |        |                        |      |

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| AMAL<br>Ure                  | .U<br>Base                                                                              |                                            |                                                                        |                                                                   |                                                                                 |                                                                 |                                             |                                                                             |                                                                | 03/2<br>17:4                              |                                         |
|------------------------------|-----------------------------------------------------------------------------------------|--------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------|-------------------------------------------|-----------------------------------------|
| PEAK                         | HOUR                                                                                    |                                            |                                                                        |                                                                   |                                                                                 |                                                                 |                                             |                                                                             |                                                                |                                           |                                         |
| NAL9                         | 4/TEAPAC[V1                                                                             | L L1.4                                     | 1 - Cap                                                                | acity A                                                           | nalysi                                                                          | s Summar                                                        | y                                           |                                                                             |                                                                |                                           |                                         |
|                              | ction Avera                                                                             |                                            |                                                                        | -                                                                 | -                                                                               | KALA HWY                                                        |                                             | LANT ST                                                                     |                                                                |                                           |                                         |
|                              | egree of Sa                                                                             |                                            |                                                                        |                                                                   |                                                                                 |                                                                 |                                             |                                                                             | of S                                                           | ervic                                     | e C+                                    |
| _<br>31                      | Phase 1                                                                                 |                                            | ase 2                                                                  | <br>] Phas                                                        |                                                                                 |                                                                 |                                             |                                                                             |                                                                |                                           |                                         |
| **                           |                                                                                         |                                            |                                                                        |                                                                   |                                                                                 |                                                                 |                                             |                                                                             |                                                                |                                           |                                         |
|                              |                                                                                         | + +                                        |                                                                        | ļ                                                                 |                                                                                 |                                                                 |                                             |                                                                             |                                                                |                                           |                                         |
| \  <br>                      |                                                                                         | <+ +<br>  v                                |                                                                        | ^                                                                 |                                                                                 |                                                                 |                                             |                                                                             |                                                                |                                           |                                         |
| +  <br>th                    | ~<br>{* +                                                                               |                                            | ~<br>(+ +                                                              | ++++<br>                                                          |                                                                                 |                                                                 |                                             |                                                                             |                                                                |                                           | -                                       |
| ļ                            | * +<br>* +                                                                              | İ                                          | `<br>+ +<br>+ +                                                        | ****                                                              | į                                                                               |                                                                 |                                             |                                                                             |                                                                |                                           |                                         |
|                              |                                                                                         | · · · · · · ·                              |                                                                        |                                                                   |                                                                                 |                                                                 |                                             |                                                                             |                                                                |                                           |                                         |
|                              | G/C= .086<br>G= 5.0"                                                                    | G ==                                       | 15.0"                                                                  | G= 3                                                              | 0.0"                                                                            |                                                                 |                                             |                                                                             |                                                                |                                           |                                         |
|                              | Y+R= 4.0"<br>OFF≕ .0%                                                                   |                                            | = 4.0"                                                                 | Y+R=                                                              | .0" ]                                                                           |                                                                 |                                             |                                                                             |                                                                |                                           |                                         |
|                              |                                                                                         | 1 - · ·                                    | =15.5%                                                                 | OFF≕4                                                             |                                                                                 |                                                                 |                                             |                                                                             |                                                                |                                           | r.                                      |
| -<br>c                       | = 58 sec                                                                                |                                            |                                                                        | OFF=4<br><br>= 86.2%                                              | 8.3%                                                                            | .0 sec =                                                        | 13.8%                                       | ₽ed≖ .                                                                      | 0 se                                                           | c =                                       | . 03                                    |
| с<br>                        | ≖ 58 sec                                                                                |                                            |                                                                        |                                                                   | 8.3%                                                                            | .0 sec =                                                        | 13.8%                                       | Ped≖ .                                                                      | 0 se                                                           | c =                                       |                                         |
| <br>ane                      | = 58 sec<br> Width/ <br>p   Lanes]                                                      | G= 50                                      | .0 sec<br>/C                                                           | = 86.2%                                                           | 8.3%  <br>Y= 8<br>                                                              | ej Adj                                                          |                                             | Ped≖ .<br>  HCM<br>  Delay                                                  | <br>  L                                                        | c =<br> 90%  <br> Quel                    | .03<br><br>1ax   5                      |
| ane<br>Grou                  | Width/ <br>p   Lanes                                                                    | G= 50                                      | .0 sec<br>/C                                                           | = 86.2%                                                           | 8.3%  <br>Y= 8<br>                                                              | ej Adj                                                          |                                             | HCM<br>  Delay                                                              | L<br>  S                                                       | 90%                                       | .03<br><br>1ax   5                      |
| ane<br>Grou                  | Width/ <br>p   Lanes <br>oach                                                           | G= 50<br>Reqd                              | .0 sec<br>/C<br>Used                                                   | = 86.2%<br>  Servi<br>  @C (v                                     | 8.3%  <br>Y= 8<br>ce Rat<br>ph) @E                                              | ej Adj                                                          | <br>  v/c                                   | HCM<br>  Delay<br>28.9                                                      | L<br>  S<br>D+                                                 | 90%  <br>  Quei                           | .03<br>1ax   5<br>Je   .                |
| Appr<br>RT                   | Width/ <br>p   Lanes <br>oach<br>  12/1                                                 | G= 50<br>g<br>Reqd<br>.321                 | .0 sec<br>/C<br>Used<br>  .293                                         | = 86.2%<br>  Servi<br>  @C (v                                     | 8.3%  <br>Y= 8<br>ce Rat<br>ph) @E                                              | e   Adj<br> Volume<br>                                          | <br>  v/c<br>  .965                         | HCM<br>  Delay<br>28.9<br>  39.6                                            | L<br>  S<br>  D+                                               | 90%  <br>Quet                             | .03<br>1ax  <br>Je  <br>ft              |
| ane<br>Grou<br>Appr          | Width/ <br>p   Lanes <br>oach                                                           | G= 50<br>g<br>Reqd<br>.321                 | .0 sec<br>/C<br>Used<br>  .293                                         | = 86.2%<br>  Servi<br>  @C (v                                     | 8.3%  <br>Y= 8<br>ce Rat<br>ph) @E                                              | e   Adj<br> Volume<br>                                          | <br>  v/c<br>  .965                         | HCM<br>  Delay<br>28.9<br>  39.6                                            | L<br>  S<br>  D+                                               | 90%  <br>  Quet                           | .03<br>1ax <br>Je  <br>ft <br>ft        |
| Appr<br>RT<br>TH             | Width/ <br>p   Lanes <br>oach<br>  12/1  <br>  12/1  <br>  12/1                         | G= 50<br>g<br>Reqd<br>.321<br>.162         | .0 sec<br>/C<br>Used<br>  .293<br>  .293                               | = 86.2%<br>  Servi<br>  @C (v<br>  343<br>  343                   | 8.3%  <br>Y= 8<br>ce Rat<br>ph) @E<br>  396<br>  524                            | e   Adj<br> Volume<br>  382<br>  232                            | ∨/c<br>  .965<br>  .443                     | HCM<br>  Delay<br>28.9<br>  39.6<br>  11.2<br>8.8                           | L<br>  S<br>  S<br>  D<br>  B<br>  B<br>  B+                   | 90%  <br>Queu<br>  220<br>  134           | .03<br>1ax <br>Je  <br>ft <br>ft        |
| Appr<br>RT<br>TH<br>TH       | Width/ <br>p   Lanes <br>oach<br>  12/1  <br>  12/1  <br>oach                           | G= 50<br>g<br>Reqd<br>.321<br>.162<br>.122 | .0 sec<br>/C<br>Used<br>  .293<br>  .293<br>  .293                     | = 86.2%<br>  Servi<br>  @C (v<br>  343<br>  468<br>  821          | 8.3%  <br>Y= 8<br>ce Rat<br>ph) @E<br>  396<br>  524<br>  524                   | e   Adj<br> Volume<br>  382<br>  232<br>  232                   | ∨/c<br>  .965<br>  .443                     | HCM<br>  Delay<br>28.9<br>  39.6<br>  11.2<br>8.8<br>  6.3                  | L<br>  S<br>  S<br>  D<br>  B<br>  B<br>  B+                   | 90%  <br>  Queu<br>  220<br>  134<br>  80 | .03<br>1ax <br>Je  <br>ft <br>ft <br>ft |
| Appr<br>RT<br>TH             | Width/ <br>p   Lanes <br>oach<br>  12/1  <br>  12/1  <br>  12/1                         | G= 50<br>g<br>Reqd<br>.321<br>.162<br>.122 | .0 sec<br>/C<br>Used<br>  .293<br>  .293<br>  .293                     | = 86.2%<br>  Servi<br>  @C (v<br>  343<br>  468<br>  821          | 8.3%  <br>Y= 8<br>ce Rat<br>ph) @E<br>  396<br>  524<br>  524                   | e   Adj<br> Volume<br>  382<br>  232<br>  232                   | ∨/c<br>  .965<br>  .443                     | HCM<br>  Delay<br>28.9<br>  39.6<br>  11.2<br>8.8<br>  6.3                  | L<br>  S<br>  S<br>  D<br>  B<br>  B<br>  B+                   | 90% M<br>  Queu<br>  220<br>  134         | .03<br>1ax <br>Je  <br>ft <br>ft <br>ft |
| Appr<br>RT<br>TH<br>TH<br>LT | Width/ <br>p   Lanes <br>oach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1             | G= 50<br>g<br>Reqd<br>.321<br>.162<br>.122 | .0 sec<br>/C<br>Used<br>  .293<br>  .293<br>  .293                     | = 86.2%<br>  Servi<br>  @C (v<br>  343<br>  468<br>  821          | 8.3%  <br>Y= 8<br>ce Rat<br>ph) @E<br>  396<br>  524<br>  524                   | e   Adj<br> Volume<br>  382<br>  232<br>  232                   | ∨/c<br>  .965<br>  .443                     | HCM<br>  Delay<br>28.9<br>  39.6<br>  11.2<br>8.8<br>  6.3                  | L<br>  S<br>  S<br>  D+<br>  B<br>  B+<br>  8+<br>  *B         | 90%  <br>  Queu<br>  220<br>  134<br>  80 | .03<br>                                 |
| Appr<br>RT<br>TH<br>LT       | Width/ <br>p   Lanes <br>oach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1 | G= 50                                      | .0 sec<br>/C<br>Used<br>  .293<br>  .293<br>  .293<br>  .448<br>  .121 | = 86.2%<br>  Servi<br>  @C (v<br>  343<br>  468<br>  821<br>  392 | 8.3%  <br>Y= 8<br>ce Rat<br>ph) @E<br>  396<br>  524<br>  524<br>  860<br>  430 | e   Adj<br> Volume<br>  382<br>  232<br>  232<br>  177<br>  295 | ∨/c<br>  .965<br>  .443<br>  .206<br>  .686 | HCM<br>  Delay<br>28.9<br>  39.6<br>  11.2<br>8.8<br>  6.3<br>  10.2<br>5.8 | L<br>  S<br>  S<br>  D+<br>  B<br>  B+<br>  8+<br>  *B<br>  B+ | 90% P<br>Quel<br>220<br>134<br>80<br>133  | .03<br>                                 |

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та странение на на на противание и противники и ракотории со противности противности противности противали по п В такие

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KULAMALU FUTURE BASE AM PEAK HOUR

#### 03/27/97 17:45:14

# SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int # 0 - HALEAKALA HWY & MAKAWAO AV

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| METROAREA      | NON | 1C8D |
|----------------|-----|------|
| LOSTTIME       |     | 2.0  |
| LEVELOFSERVICE | С   | S    |
| NODELOCATION   | 0   | Ø    |
|                |     | -    |

Approach Parameters

| APPLABELS       | ев<br>-\$8 | SB<br>- <del>MB</del> | -NB<br>-NB | NB<br>-EB |
|-----------------|------------|-----------------------|------------|-----------|
| GRADES          | 8.0        | .0                    | -8.0       | .0        |
| PEDLEVELS       | MODER      | MODER                 | MODER      | MÖDER     |
| PARKINGSIDES    | NONE       | NONE                  | NONE       | NONE      |
| PARKVOLUMES     | 20         | 20                    | 20         | 20        |
| BUSVOLUMES      | 0          | Ø                     | 0          | 0         |
| RIGHTTURNONREDS | 0          | 118                   | 0          | 0         |

Movement Parameters

| MOVLABELS       | RT   | тн   | LT   | 07   |      |      |      |      | . –  |      |      |      |  |
|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|--|
|                 |      |      |      | RT   | тн   | LT   | RT   | тн   | LT   | RT   | тн   | LT   |  |
| VOLUMES         | 6    | 345  | 169  | 203  | 52   | 24   | 31   | 195  | 25   | 45   | 67   | 26   |  |
| WIDTHS          | .0   | 12.0 | 12.0 | 12.0 | 12.0 | .0   | . 0  | 12.0 | .0   | .0   | 12.0 | . 0  |  |
| LANES           | 0    | 1    | 1    | 1    | 1    | 0    | 0    | 1    | Ø    | 0    | 1    | 0    |  |
| UTILIZATIONS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |
| TRUCKPERCENTS   | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  |  |
| PEAKHOURFACTORS | .95  | .95  | .95  | . 95 | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  |  |
| ARRIVALTYPES    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 2    |  |
| ACTUATIONS      | YES  | YES  | YES  | YES  | YES  | YES  | YES  | YES  | YES  | YES  | YES  | YES  |  |
| REQCLEARANCES   | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  |  |
| MINIMUMS        | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  |  |
| IDEALSATFLOWS   | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |  |
| FACTORS         | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |
| DELAYFACTORS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |
| NSTOPFACTORS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |
| GROUPTYPES      | NORM | NORM | NORM | NORM | NORM | NORM | NORM | NORM | NORM | NORM | NORM | NORM |  |
| SATURATIONFLOWS | 0    | 1781 | 784  | 1405 | 1706 | 0    | 0    | 1672 | 0    | 0    | 1481 | ę.   |  |

#### Phasing Parameters

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| SEQUENCES   | 31    |       |       |     |   |          |      |      |
|-------------|-------|-------|-------|-----|---|----------|------|------|
| PERMISSIVES | YES   | YES   | YES   | YES |   | LEADLAGS | NONE | NONE |
| OVERLAPS    | NO    | NO    | NO    | NO  |   | OFFSET   | .00  | 1    |
| CYCLES      | 60    | 180   | 10    |     | • | PEDTIME  | .0   | ē    |
| GREENTIMES  | 15.00 | 15.00 | 25.00 |     |   |          |      | -    |
| YELLOWTIMES | .00   | .00   | .00   |     |   |          |      |      |
| CRITICALS   | 3     | 11    | 0     |     |   |          |      |      |
| EXCESS      | 0     |       |       |     |   |          |      |      |

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| AM PEA                                                                                               | LU<br>Base<br>K Hour                                                                                                                                  |                                                                                                                                        |                                                                                                                                                                      |                                                                          |                                                              |                                                                                                                                        | 17:45:45                                                                                         |                |
|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|----------------|
| SIGNAL                                                                                               | 94/TEAPAC[V1                                                                                                                                          | L1.4] - Capa                                                                                                                           | acity Analysi                                                                                                                                                        | s Summary                                                                |                                                              |                                                                                                                                        |                                                                                                  |                |
|                                                                                                      | ection Averag<br>Degree of Sat                                                                                                                        |                                                                                                                                        |                                                                                                                                                                      | KALA HWY &<br>cle Delay                                                  |                                                              | ) AV<br>Level of                                                                                                                       | Service C                                                                                        |                |
| Sq 31                                                                                                | Phase 1                                                                                                                                               | Phase 2                                                                                                                                | Phase 3                                                                                                                                                              |                                                                          |                                                              |                                                                                                                                        |                                                                                                  |                |
| **/**                                                                                                |                                                                                                                                                       | <br>  + + +<br>                                                                                                                        | ^  <br>  ++++                                                                                                                                                        |                                                                          |                                                              |                                                                                                                                        |                                                                                                  | <b>94.</b> 00) |
| /iv                                                                                                  |                                                                                                                                                       | + + +<br>  <+ + +>                                                                                                                     | ++++ <br>  <++++ <br>  ^ ++++                                                                                                                                        |                                                                          |                                                              |                                                                                                                                        |                                                                                                  | · 1            |
| Nelst                                                                                                | -                                                                                                                                                     |                                                                                                                                        | ++++ v                                                                                                                                                               |                                                                          |                                                              |                                                                                                                                        |                                                                                                  | #1~~           |
| North<br>1                                                                                           | $\langle + + + \rangle$<br>, + + +<br>+ + +                                                                                                           | $\begin{vmatrix} \cdot \langle + + + \rangle \\ + + + \\ + + + \end{vmatrix}$                                                          | ++++>  <br> ++++  <br>                                                                                                                                               |                                                                          |                                                              |                                                                                                                                        |                                                                                                  | ، د<br>منبق    |
|                                                                                                      | G/C= .273                                                                                                                                             | G/C= .273                                                                                                                              | G/C= .455  <br>  G= 25.0"                                                                                                                                            |                                                                          |                                                              |                                                                                                                                        |                                                                                                  | <b>9</b> e -4  |
|                                                                                                      | 0 12.0                                                                                                                                                |                                                                                                                                        |                                                                                                                                                                      |                                                                          |                                                              |                                                                                                                                        |                                                                                                  |                |
|                                                                                                      | Y+R= .0"                                                                                                                                              | Y+R≕ .0"<br>  055-27 3%                                                                                                                | Y+R≕ .0"  <br>  055⊒54 5%                                                                                                                                            |                                                                          |                                                              |                                                                                                                                        |                                                                                                  |                |
|                                                                                                      | 0FF= .0%                                                                                                                                              | 0FF=27.3%                                                                                                                              | OFF=54.5%                                                                                                                                                            | .0 Sec =                                                                 | .0% Pe                                                       | ed= .0 se                                                                                                                              | c = .0%                                                                                          |                |
|                                                                                                      | 0FF= .0%                                                                                                                                              |                                                                                                                                        | OFF=54.5%                                                                                                                                                            | .0 sec =                                                                 | .0% Pe                                                       | ed≖ .0 se                                                                                                                              | c = .0%                                                                                          |                |
| Lane<br>  Gro                                                                                        | OFF= .0%<br>C= 55 sec (<br> Width/                                                                                                                    | 0FF=27.3%<br>G= 55.0 sec :                                                                                                             | OFF=54.5%                                                                                                                                                            | e  Adj                                                                   | I                                                            |                                                                                                                                        | c = .0%<br> 90% Max <br>  Queue                                                                  |                |
| Lane<br>  Gro<br>  EB<br>SB App                                                                      | OFF= .0%<br>C= 55 sec (<br> Width/ <br>up   Lanes  F                                                                                                  | OFF=27.3%<br>G= 55.0 sec =<br>g/C<br>Reqd Used                                                                                         | OFF=54.5%  <br>=100.0% Y=<br>  Service Rat<br>  @C (vph) @E                                                                                                          | e  Adj  <br> Volume                                                      | v/c   D                                                      | HCM   L<br>Delay   S                                                                                                                   | 90% Max <br>  Queue                                                                              | '. <u>.</u> -  |
| Lane<br>  Gro<br>EB<br>SB App<br>  TH<br>  LT                                                        | OFF= .0%<br>C= 55 sec (<br> Width/ <br>up   Lanes  F<br>roach<br>+RT  12/1  <br>  12/1                                                                | OFF=27.3%<br>G= 55.0 sec<br>g/C<br>Reqd Used<br>.238   .236<br>.281   .236                                                             | OFF=54.5%  <br>=100.0% Y=<br>  Service Rat<br>  @C (vph) @E<br>  366   421<br>  144   183                                                                            | e  Adj  <br> Volume <br>  369  <br>  178                                 | .876  <br>.962                                               | HCM   L<br>Delay   S<br>35.1 D<br>25.9   D+<br>53.9   *E                                                                               | 90% Max <br>  Queue  <br>                                                                        | ·              |
| Lane<br>  Gro<br>SB App<br>  TH<br>  LT                                                              | OFF= .0%<br>C= 55 sec (<br> Width/ <br>up   Lanes  F<br>roach<br>+RT  12/1  <br>  12/1                                                                | OFF=27.3%<br>G= 55.0 sec<br>g/C<br>Reqd Used<br>.238   .236<br>.281   .236                                                             | OFF=54.5%  <br>=100.0% Y=<br>  Service Rat<br>  @C (vph) @E<br>  366   421<br>  144   183                                                                            | e  Adj  <br> Volume                                                      | .876  <br>.962                                               | HCM   L<br>)elay   S<br>35.1 D<br>25.9   D+<br>53.9   *E                                                                               | 90% Max <br>  Queue  <br>                                                                        |                |
| Lane<br>  Gro<br>SB App<br>  TH<br>  LT<br>WB App                                                    | OFF= .0%<br>C= 55 sec (<br> Width/ <br>up   Lanes  f<br>roach<br>+RT  12/1  <br>  12/1  <br>roach                                                     | OFF=27.3%<br>G= 55.0 sec<br>g/C<br>Reqd Used<br>.238   .236<br>.281   .235                                                             | OFF=54.5%  <br>=100.0% Y=<br>  Service Rat<br>  @C (vph) @E<br>  366   421<br>  144   183                                                                            | e  Adj  <br> Volume <br>  369  <br>  178                                 | v/c   D<br>.876  <br>.962                                    | HCM   L<br>Delay   S<br>35.1 D<br>25.9   D+<br>53.9   *E<br>5.2 B+                                                                     | 90% Max <br>  Queue  <br>  218 ft <br>  105 ft                                                   | <br>           |
| Lane<br>  Gro<br>SB App<br>  TH<br>  LT<br>WB App<br> LT+TH                                          | OFF= .0%<br>C= 55 sec (<br> Width/ <br>up   Lanes  F<br>roach<br>+RT  12/1  <br>roach<br>+RT  12/1                                                    | OFF=27.3%<br>G= 55.0 sec<br>g/C<br>Reqd Used<br>.238   .236<br>.281   .235<br>.191   .509                                              | OFF=54.5%  <br>=100.0% Y=<br>  Service Rat<br>  @C (vph) @E<br>  366   421<br>  144   183                                                                            | e   Adj  <br> Volume <br>  369  <br>  178  <br>  264                     | .876  <br>.962  <br>.310                                     | HCM   L<br>Delay   S<br>35.1 D<br>25.9   D+<br>53.9   *E<br>5.2 B+<br>5.2 B+                                                           | 90% Max <br>  Queue  <br>  218 ft <br>  105 ft <br>  100 ft                                      |                |
| Lane<br>Gro<br>EB App<br>TH<br>UN3 App<br>LT+TH<br>SB App                                            | <pre>  OFF= .0% C= 55 sec ()  Width/  up   Lanes  F roach +RT  12/1     12/1   roach +RT  12/1   roach</pre>                                          | OFF=27.3%<br>G= 55.0 sec<br>g/C<br>Reqd Used<br>.238   .236<br>.281   .236<br>.281   .236                                              | OFF=54.5%  <br>=100.0% Y=<br>  Service Rat<br>  @C (vph) @E<br>  366   421<br>  144   183<br>  821   851                                                             | e   Adj  <br> Volume <br>  369  <br>  178  <br>  264                     | v/c   0<br>.876  <br>.962  <br>.310                          | HCM   L<br>Delay   S<br>35.1 D<br>25.9   D+<br>53.9   *E<br>5.2 B+<br>5.2   B+<br>5.2   B+                                             | 90% Max <br>  Queue  <br>  218 ft <br>  105 ft <br>  100 ft                                      |                |
| Lane<br>Gro<br>EB App<br>TH<br>LT<br>WB App<br>LT<br>TH<br>SB App<br>LT<br>TH<br>SB App<br>LT<br>TH  | <pre>  OFF= .0% C= 55 sec (      Width/  up   Lanes  F roach +RT  12/1   roach       12/1   roach       12/1   </pre>                                 | OFF=27.3%<br>G= 55.0 sec<br>g/C<br>Reqd Used<br>.238   .236<br>.281   .236<br>.191   .509<br>.191   .509<br>.092   .418<br>.070   .418 | OFF=54.5%  <br>=100.0% Y=<br>  Service Rat<br>  @C (vph) @E<br>  366   421<br>  144   183<br>  821   851<br>  821   851<br>  546   588<br>  672   713                | e   Adj  <br> Volume <br>  369  <br>  178  <br>  264  <br>  89  <br>  80 | <pre> /c   □ .876   .962   .310   .151   .151   .112  </pre> | HCM   L<br>Delay   S<br>35.1 D<br>25.9   D+<br>53.9   *E<br>5.2 B+<br>5.2 B+<br>5.2   B+<br>6.4 B+<br>6.4 B+<br>6.3   B+               | 90% Max <br>  Queue  <br>  218 ft <br>  105 ft <br>  100 ft <br>  100 ft <br>  40 ft <br>  36 ft |                |
| Lane<br>Gro<br>EB App<br>TH<br>LT<br>WB App<br>LT+TH<br>SB App<br>LT+TH<br>NB App<br>LT+TH<br>NB App | <pre>  OFF= .0% C= 55 sec (      Width/  up   Lanes  F roach +RT  12/1   roach       12/1         12/1   roach </pre>                                 | OFF=27.3%<br>G= 55.0 sec<br>g/C<br>Reqd Used<br>.238   .236<br>.281   .236<br>.191   .509<br>.092   .418<br>.070   .418                | OFF=54.5%  <br>=100.0% Y=<br>  Service Rat<br>  @C (vph) @E<br>  366   421<br>  144   183<br>  821   851<br>  821   851<br>  546   588<br>  672   713                | e   Adj  <br> Volume <br>  369  <br>  178  <br>  264  <br>  89  <br>  80 | <pre> /c   D .876   .962   .310   .151   .112  </pre>        | HCM   L<br>Delay   S<br>35.1 D<br>25.9   D+<br>53.9   *E<br>5.2 B+<br>5.2   B+<br>6.4 B+<br>6.4 B+<br>6.3   B+<br>6.3   B+             | 90% Max <br>  Queue  <br>  218 ft <br>  105 ft <br>  100 ft <br>  100 ft <br>  40 ft <br>  36 ft | 5              |
| Lane<br>Gro<br>SB App<br>H LT<br>WB App<br>LT+TH<br>SB App<br>LT+TH<br>NB App<br>LT+TH               | <pre>  OFF= .0% C= 55 sec (      Width/  up   Lanes  F roach +RT  12/1   roach       12/1         12/1   roach       12/1   roach       12/1   </pre> | OFF=27.3%<br>G= 55.0 sec<br>g/C<br>Reqd Used<br>.238   .236<br>.281   .236<br>.281   .236<br>.191   .509<br>.092   .418<br>.070   .418 | OFF=54.5%  <br>=100.0% Y=<br>  Service Rat<br>  @C (vph) @E<br>  366   421<br>  144   183<br>  821   851<br>  821   851<br>  546   588<br>  672   713                | e   Adj  <br> Volume <br>  369  <br>  178  <br>  264  <br>  89  <br>  80 | <pre> /c   D .876   .962   .310   .151   .112   .234  </pre> | HCM   L<br>Delay   S<br>35.1 D<br>25.9   D+<br>53.9   *E<br>5.2 B+<br>5.2 B+<br>5.2   B+<br>6.4   B+<br>6.3   B+<br>6.3   B+<br>6.7 B+ | <pre> 90% Max    Queue       218 ft    105 ft    100 ft    100 ft    36 ft    36 ft </pre>       |                |
| Lane<br>Gro<br>SB App<br>H LT<br>WB App<br>LT+TH<br>SB App<br>LT+TH<br>NB App<br>LT+TH               | <pre>  OFF= .0% C= 55 sec (      Width/  up   Lanes  F roach +RT  12/1   roach       12/1         12/1   roach       12/1   roach       12/1   </pre> | OFF=27.3%<br>G= 55.0 sec<br>g/C<br>Reqd Used<br>.238   .236<br>.281   .236<br>.281   .236<br>.191   .509<br>.092   .418<br>.070   .418 | OFF=54.5%  <br>=100.0% Y=<br>  Service Rat<br>  @C (vph) @E<br>  366   421<br>  144   183<br>  144   183<br>  821   851<br>  546   586<br>  672   713<br>  577   619 | e   Adj  <br> Volume <br>  369  <br>  178  <br>  264  <br>  89  <br>  80 | <pre> /c   D .876   .962   .310   .151   .112   .234  </pre> | HCM   L<br>Delay   S<br>35.1 D<br>25.9   D+<br>53.9   *E<br>5.2 B+<br>5.2 B+<br>5.2   B+<br>6.4   B+<br>6.3   B+<br>6.3   B+<br>6.7 B+ | <pre> 90% Max    Queue       218 ft    105 ft    100 ft    100 ft    36 ft    36 ft </pre>       |                |

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| METROAREA       | NONCE     |      |      |      |      |      |      |      |
|-----------------|-----------|------|------|------|------|------|------|------|
| LOSTTIME        | 2.        | .0   |      |      |      |      |      |      |
| LEVELOFSERVICE  | С         | S    |      |      |      |      |      |      |
| NODELOCATION    | 0         | 0    |      |      |      |      |      |      |
|                 |           |      |      |      |      |      |      |      |
| Approach Para   | meters    |      |      |      |      |      |      |      |
|                 | EB        |      |      | 5B   |      |      | WB   |      |
| APPLABELS       | 55        |      |      | ظلمل |      |      | -118 |      |
| GRADES          | 8.0       |      |      | .0   |      |      | -8.0 |      |
| PEDLEVELS       | MODER     |      | M    | ODER |      | קן   | ODER |      |
| PARKINGSIDES    | NONE      |      |      | NONE |      |      | NONE |      |
| PARKVOLUMES     | 20        |      |      | 20   |      |      | 20   |      |
| BUSVOLUMES      | 0         |      |      | 0    |      |      | 0    |      |
| RIGHTTURNONREDS | Ø         |      |      | 201  |      |      | 0    |      |
|                 |           |      |      |      |      |      |      |      |
| Movement Para   | meters    |      |      |      |      |      |      |      |
|                 |           |      |      |      |      |      |      |      |
| MOVLABELS       | RT TH     | LT   | RT   | тн   | LT   | RT   | TH   | LT   |
| VOLUMES         | 33 209    | 287  | 269  | 66   | 49   | 29   | 187  | 26   |
| WIDTHS          | .0 12.0   | 12.0 | 12.0 | 12.0 | .0   | .0   | 12.0 | .0   |
| LANES           | 0 1       | 1    | 1    | 1    | 0    | 0    | 1    | Ø    |
| UTILIZATIONS    | 1.00 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| TRUCKPERCENTS   | 2.0 2.0   | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  |
| PEAKHOURFACTORS | .95 .95   | .95  | .95  | .95  | .95  | .95  | .95  | .95  |
| ARRIVALTYPES    | 33        | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| ACTUATIONS      | YES YES   | YES  | YES  | YES  | YES  | YES  | YES  | YES  |
| REQCLEARANCES   | 4.0 4.0   | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  |
| MINIMUMS        | 5.0 5.0   | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  |
| IDEALSATFLOWS   | 1900 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| FACTORS         | 1.00 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| DELAYFACTORS    | 1.00 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| NSTOPFACTORS    | 1.00 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| GROUPTYPES      | NORM NORM | NORM | NORM | NORM |      |      | NORM | NORM |
| SATURATIONFLOWS | 0 1728    | 808  | 1406 | 1609 | 0    | Ø    | 1673 | 0    |
|                 |           |      |      |      |      |      |      |      |
| Phasing Param   | leters    |      |      |      |      |      |      |      |
| SEQUENCES       | 31        |      |      |      |      |      |      |      |
| PERMISSIVES     | YES       | YES  | YES  | Y    | ES   |      | LEAD | LAGS |
| OVERLAPS        | NO        | NO   | NO   | ł    | NO   |      | OFFS | EΤ   |
| CYCLES          | 60        | 180  | 10   |      |      |      | PEDT | IME  |
| UIULEU          |           |      |      |      |      |      |      |      |

SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int # 0 - HALEAKALA HWY & MAKAWAO AV

| SEQUENCES<br>PERMISSIVES<br>OVERLAPS<br>CYCLES<br>GREENTIMES<br>YELLOWTIMES<br>CRITICALS<br>EXCESS | 31<br>YES<br>NO<br>60<br>15.00<br>.00<br>3<br>0 | YES<br>NO<br>180<br>15.00<br>.00<br>8 | YES<br>NO<br>10<br>30.00<br>.00<br>5 | YES<br>No | LEADLAGS<br>Offset<br>Pedtime | NONE<br>.00<br>.0 | NONE<br>1<br>0 |
|----------------------------------------------------------------------------------------------------|-------------------------------------------------|---------------------------------------|--------------------------------------|-----------|-------------------------------|-------------------|----------------|
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KULAMALU FUTURE BASE PM PEAK HOUR

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| FUTURE                                                                                                                      |                                                                                                                                                                            |                                                                                                                     |                                                                                                          |                                                                           |                                                                                                        | 03/27/97<br>17:46:53                                                                     |          |
|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|----------|
| PM PEAI                                                                                                                     | K HOUR                                                                                                                                                                     |                                                                                                                     |                                                                                                          |                                                                           |                                                                                                        |                                                                                          |          |
| SIGNALS                                                                                                                     | 94/TEAPACTV1                                                                                                                                                               | 11.43 - Cap                                                                                                         | acity Analysi                                                                                            | c Summary                                                                 |                                                                                                        |                                                                                          | *****    |
|                                                                                                                             |                                                                                                                                                                            |                                                                                                                     |                                                                                                          |                                                                           |                                                                                                        |                                                                                          |          |
| inters(                                                                                                                     | Degree of Sa                                                                                                                                                               | ges for Int<br>turation (v/<br>more delay d                                                                         | c) .74 Vehi                                                                                              | AKALA HWY & MA<br>Icle Delay 30<br>¤ v/c's (see E'                        | .20 Level o                                                                                            | f Service D+                                                                             |          |
| -<br>Sq 31                                                                                                                  | Phase 1                                                                                                                                                                    | Phase 2                                                                                                             | <br>  Phase 3                                                                                            | -                                                                         |                                                                                                        |                                                                                          |          |
| **/** -                                                                                                                     |                                                                                                                                                                            | <br>  + + +                                                                                                         |                                                                                                          |                                                                           |                                                                                                        |                                                                                          | ,        |
| in i                                                                                                                        |                                                                                                                                                                            | + + +                                                                                                               | ++++                                                                                                     |                                                                           |                                                                                                        |                                                                                          |          |
|                                                                                                                             | -                                                                                                                                                                          | (+ + +)<br>  v                                                                                                      | ^ ****                                                                                                   |                                                                           |                                                                                                        |                                                                                          | I        |
| Welst  <br>North                                                                                                            | ~<br>(+ + +)                                                                                                                                                               | · · · · · · · · · · · · · · · · · · ·                                                                               | ++++ V<br>++++>                                                                                          |                                                                           |                                                                                                        |                                                                                          | <u>_</u> |
|                                                                                                                             | + + +<br>+ + +                                                                                                                                                             | + * *                                                                                                               | ++++<br>V                                                                                                |                                                                           |                                                                                                        |                                                                                          | • •      |
|                                                                                                                             | G/C= .250                                                                                                                                                                  | G/C= .250                                                                                                           | G/C= .500                                                                                                |                                                                           |                                                                                                        |                                                                                          | -        |
|                                                                                                                             | G= 15.0"<br>Y+R= .0"                                                                                                                                                       | G= 15.0"<br>Y+R= .0"                                                                                                | G= 30.0"                                                                                                 |                                                                           |                                                                                                        |                                                                                          | • •      |
|                                                                                                                             |                                                                                                                                                                            | 1+R= .0"                                                                                                            | Y+R≕ .0"                                                                                                 |                                                                           |                                                                                                        |                                                                                          |          |
|                                                                                                                             | 0FF= .0%                                                                                                                                                                   | OFF=25.0%                                                                                                           | 0FF=50.0%                                                                                                |                                                                           |                                                                                                        |                                                                                          | <b></b>  |
| C                                                                                                                           | = 60 sec (                                                                                                                                                                 | OFF=25.0%  <br>                                                                                                     | · · · · · · · · · · · · · · · · · · ·                                                                    | .0 sec = .09                                                              | s Ped≖ .0                                                                                              | sec ⇔ ,0%                                                                                |          |
| Lane                                                                                                                        |                                                                                                                                                                            | G= 60.0 sec =<br>g/C                                                                                                | · · · · · · · · · · · · · · · · · · ·                                                                    | e  Adj                                                                    | HCM                                                                                                    | sec ≕ .0%<br>L  90% Max <br>S   Queue                                                    |          |
| Lane<br>  Grou<br>  EB                                                                                                      | ≕ 60 sec (<br> Width/ <br>p   Lanes  F                                                                                                                                     | G= 60.0 sec =<br>g/C                                                                                                | 100.0% Y=<br>Service Rat                                                                                 | e  Adj                                                                    | нсм                                                                                                    | L  90% Max                                                                               | <u> </u> |
| Lane<br>  Grou<br>EB<br>S& Appr                                                                                             | = 60 sec (<br> Width/ <br>p   Lanes  F<br>oach                                                                                                                             | G= 60.0 sec =<br>g/C  <br>Reqd Used                                                                                 | 100.0% Y=<br>Service Rat<br>@C (vph) @E                                                                  | e  Adj  <br> Volume  v/c                                                  | HCM  <br>  Delay  <br>54.40                                                                            | L  90% Max <br>S   Queue  <br>E                                                          |          |
| Lane<br>  Grou<br>EB<br>S& Appr<br>  TH+                                                                                    | = 60 sec (<br> Width/ <br>p   Lanes  F<br>oach<br>RT  12/1   .                                                                                                             | G= 60.0 sec =<br>g/C  <br>Reqd Used                                                                                 | 100.0% Y=<br>Service Rat<br>@C (vph) @E                                                                  | e  Adj  <br> Volume  v/c                                                  | HCM  <br>  Delay  <br>54.40                                                                            | L  90% Max <br>S   Queue  <br>E                                                          |          |
| Lane<br>  Grou<br>EB<br>SB Appr<br>  TH+<br>  LT                                                                            | = 60 sec (<br> Width/ <br>p   Lanes  F<br>oach<br>RT  12/1   .                                                                                                             | G= 60.0 sec =<br>g/C  <br>Reqd Used                                                                                 | 100.0% Y=<br>Service Rat<br>@C (vph) @E                                                                  | e  Adj  <br> Volume  v/c                                                  | HCM  <br>  Delay  <br>54.40                                                                            | L  90% Max <br>S   Queue  <br>E                                                          |          |
| Lane<br>  Grou<br>EB<br>SB Appr<br>  TH+<br>  LT<br>WB                                                                      | = 60 sec (<br> Width/ <br>p   Lanes  F<br>oach<br>RT  12/1   .<br>  12/1   .                                                                                               | g/C  <br>g/C  <br>Reqd Used  <br>183   .217  <br>427   .217                                                         | 100.0% Y=<br>Service Rat<br>@C (vph) @E<br>313   374<br>132   171                                        | e  Adj  <br> Volume  V/d<br>  255   .682<br>  302  1.726                  | HCM  <br>  Delay  <br>54.40<br>  17.4  <br>  85.60 *                                                   | L  90% Max <br>S   Queue  <br>E<br>C+  168 ft <br>F   200 ft                             |          |
| Lane<br>  Grou<br>EB<br>SB Appr<br>  TH+<br>LT<br>WB<br>HB Appro                                                            | = 60 sec (<br> Width/ <br>p   Lanes  F<br>oach<br>RT  12/1   .<br>  12/1   .                                                                                               | g/C  <br>g/C  <br>Reqd Used  <br>183   .217  <br>427   .217                                                         | 100.0% Y=<br>Service Rat<br>@C (vph) @E<br>313   374<br>132   171                                        | e  Adj  <br> Volume  v/c                                                  | HCM  <br>  Delay  <br>54.40<br>  17.4  <br>  85.60 *<br>6.6                                            | L  90% Max <br>S   Queue  <br>E<br>C+  168 ft <br>F   200 ft <br>B+                      |          |
| Lane<br>  Grou<br>EB<br>SB Appr<br>  TH+ <br>LT<br>WB<br>HB Appro<br>LT+TH+F                                                | = 60 sec (<br> Width/ <br>p   Lanes  F<br>oach<br>RT  12/1   .<br>  12/1   .<br>RT  12/1   .                                                                               | g/C  <br>g/C  <br>Reqd Used  <br>183   .217  <br>427   .217                                                         | 100.0% Y=<br>Service Rat<br>@C (vph) @E<br>313   374<br>132   171                                        | e  Adj  <br> Volume  v/c<br>  255   .682<br>  302  1.726                  | HCM  <br>  Delay  <br>54.40<br>  17.4  <br>  85.60 *<br>6.6                                            | L  90% Max <br>S   Queue  <br>E<br>C+  168 ft <br>F   200 ft <br>B+                      |          |
| Lane<br>  Grou<br>EB<br>SB Appr<br>  TH+<br>  LT<br>WB<br>HB Appro<br>LT+TH+F                                               | = 60 sec (<br> Width/ <br>p   Lanes  F<br>oach<br>RT  12/1   .<br>  12/1   .<br>cach<br>RT  12/1   .                                                                       | g/C  <br>g/C  <br>Reqd Used  <br>183   .217  <br>427   .217                                                         | 100.0% Y=<br>Service Rat<br>@C (vph) @E<br>313   374<br>132   171<br>741   781                           | e  Adj  <br> Volume  v/c<br>  255   .682<br>  302  1.726<br>  255   .327  | HCM  <br>  Delay  <br>54.40<br>  17.4  <br>  85.60 *<br>6.6<br>  6.6  *                                | L  90% Max <br>S   Queue  <br>E<br>C+  168 ft <br>F   200 ft <br>B+<br>B+  115 ft <br>B+ |          |
| LT+TH+F                                                                                                                     | <pre>= 60 sec (      Width/  p   Lanes  F oach RT  12/1   .       12/1   . oach RT  12/1   . oach   12/1   .</pre>                                                         | g/C  <br>g/C  <br>Reqd Used  <br>183   .217  <br>427   .217  <br>189   .467  <br>080   .467                         | <pre>100.0% Y= Service Rat @C (vph) @E 313   374 132   171 741   781 615   656</pre>                     | e  Adj  <br> Volume  v/c<br>  255   .682<br>  302  1.726<br>  255   .327  | HCM  <br>  Delay  <br>54.40<br>  17.4  <br>  85.60 *<br>6.6<br>  6.6  *<br>5.9                         | L  90% Max <br>S   Queue  <br>E<br>C+  168 ft <br>F   200 ft <br>B+<br>B+  115 ft <br>B+ |          |
| Lane<br>  Grou<br>EB<br>SB Appr<br>  TH+ <br>  LT<br>WB Appro<br>LT+TH+FF<br>SB<br>BB Appro<br>RT<br>LT+TH<br>NB<br>8 Appro | <pre>= 60 sec (      Width/  p   Lanes  F oach RT  12/1   .       12/1   .       12/1   .       12/1   .       12/1   .       12/1   .       12/1   .       12/1   .</pre> | G= 60.0 sec =<br>g/C  <br>Reqd Used  <br>183   .217  <br>427   .217  <br>189   .467  <br>080   .467  <br>107   .467 | 100.0% Y=<br>Service Rat<br>@C (vph) @E<br>313   374<br>132   171<br>741   781<br>615   656<br>711   751 | e   Adj  <br> Volume  v/c<br>  255   .682<br>  302  1.726<br>  255   .327 | HCM  <br>  Delay  <br>54.40<br>  17.4  <br>  85.60  *<br>6.6<br>  6.6  *<br>5.9<br>  5.8  <br>  6.0  * | L  90% Max <br>S   Queue  <br>E<br>C+  168 ft <br>F   200 ft <br>B+<br>B+  115 ft <br>B+ |          |

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| Hajor Street:<br>Hinor Street:<br>Scenario:<br>Peak Hour: |               |            | H & I        | WITH  | IOT KI | Ĩ  |       |       |       |          | *****         |        | Int         | ri   |     |       |              |
|-----------------------------------------------------------|---------------|------------|--------------|-------|--------|----|-------|-------|-------|----------|---------------|--------|-------------|------|-----|-------|--------------|
| Peak Bour                                                 | Factor: 1     | .60        |              |       |        |    | ¥1    | 2     | ¥11   |          | ¥10           |        |             |      |     |       |              |
|                                                           |               |            | i            |       |        |    | 11    | 8     | 16    | i        | 2             |        |             |      | (   | RORT  | 18           |
| KAJOR                                                     | STREET        |            | İ            |       |        |    |       | ł     | 1     |          | Ī             |        |             |      |     |       | -            |
| Num of Lane                                               | s - V2:       | 1          | Í            |       |        |    |       | i     | i     |          | i             |        |             |      | -   |       |              |
| Bicl LT - Vi                                              | (T/R):        | ĩ          | Ì            |       |        |    | 1     |       | i     |          | <u>`۱</u>     |        |             |      |     |       |              |
| Excl RT - V3                                              | (Y/X):        | ĩ          | Í            |       |        |    | <     |       | ÿ     |          | ,             | ,      |             |      |     |       |              |
| Stop/field - V3                                           | (T/X):        | R          | İ            |       |        |    |       |       |       |          |               |        |             |      |     |       |              |
| Grade - Vi                                                | , ¥2, ¥3:     | 0          | ĺ            |       |        | •  |       |       |       |          |               |        | A           |      |     |       |              |
| Num of Lane:                                              | - 24,         | 11         | <br>  ¥1     | 22    |        |    |       |       |       |          |               |        | ١           |      |     | =     |              |
| BICL LT - V4                                              |               |            |              | 22    |        | •  |       |       |       |          |               |        |             |      | 5   | 42    |              |
| BICL RT - V6                                              |               |            | ¥2           | 57    |        |    |       |       |       |          |               |        | _           |      |     | **    |              |
| Stop/Tield - V6                                           |               |            |              | 34    |        | ,  |       |       |       |          |               |        | <b>&lt;</b> | ••   | 212 | 42    |              |
| Grade - V4,                                               |               |            | ¥3           | 92    |        | _  |       |       |       |          |               |        |             |      |     |       |              |
| Argae - 141                                               | 131101        | 1 *        | 13           | 00    |        | -  |       |       |       |          |               |        | ,           | -    | 1   | 74    |              |
| KINOR S                                                   | TREET         |            |              |       |        | 1  |       |       |       |          |               |        | _/          | u a  | 107 |       | -            |
| Run of Lanes                                              |               | 1          |              |       |        |    |       |       |       |          |               |        | T           |      |     | STREE |              |
| Grade - V7.                                               |               | 0 1        |              |       |        |    |       |       |       |          |               | _      |             | 10   |     | RI ST |              |
| Shared Lane-1                                             |               | 3 1        |              |       |        |    | ۲,    |       |       |          |               | >      |             |      |     |       |              |
| (0=H,1=LT,2=TR,3                                          |               | 1 1        |              |       |        |    | · `_  |       |       |          | /             |        |             |      |     |       |              |
| /4-W11-DI11-IV13                                          | - BIRJ        | - {        |              |       |        |    |       |       |       |          |               |        |             |      |     |       |              |
| Rum of Lanes                                              | - 11.         | 1          |              |       |        |    | 223   |       | 17    |          | ļ             |        |             |      |     |       |              |
| Grade - V10,V1                                            |               | 0          |              |       |        |    | 443   |       | 11    |          | Ţ             |        |             |      |     |       |              |
| Shared Lane-Vi0,                                          | •             | i i        |              |       |        |    | 77    |       | 78    |          | 79            |        |             |      |     |       |              |
| {0=#,1=LT,2=TR,3                                          | •             | •          |              |       |        |    |       |       | 10    |          | 13            |        |             |      |     |       |              |
| (• •••• •••• •••••                                        |               |            |              |       |        |    | NINC  | r str | EET - | IOLAE    | I ST          |        |             |      |     |       |              |
| VOLUME ADJUSTNER                                          | <br>FS        | <br>1      |              | ****  |        |    |       | ***** |       |          | • • • • • • • |        |             |      |     |       |              |
| NOVEKENT IO.                                              |               | -          |              | 1     | 2      | 3  |       | 5     |       | 7        | e             |        | 10          |      | ••  |       |              |
| HOURLY FLOW R                                             | ATE, V(voh)   |            |              | 33    |        | 86 | -     | 212   |       | 7<br>223 | 8<br>17       | 9<br>1 | 10<br>2     |      | 11  | 12    |              |
| VOLUME, V (pc                                             |               | - {        |              | 36    | 54     |    |       | 212   |       | 245      |               | Ť      | -           |      | 16  | 118   |              |
|                                                           | ••••••••••••• |            |              |       |        |    | ړ<br> |       |       | 24J      | 19            | 1<br>  | 2           |      | 18  | 130   |              |
| STEP 1: RT FROM                                           |               | ļ          |              |       |        |    |       |       |       |          |               |        |             |      |     |       |              |
| Conflicting Y                                             |               | •          |              |       | 73 +   | ¥2 | *     |       | vbp   |          | Vc12 =        | 1/7    | 2 VG -      | F VS | 5 = | 215   | vhp          |
| Potential Capa                                            |               |            | p,9          |       |        |    |       |       | peph  |          | Cp.12         | 8      |             |      |     | 1078  | pcpb         |
| Kovement Capa                                             |               |            | <b>.</b> ,9• |       |        |    |       |       | pcph  |          | Cz,12=        |        |             |      |     | 1078  | peph         |
| Prb. of Queu-i                                            | iree State:   | 9  <br>  P | 0,9=         | 1-89/ | C1,9   |    |       | 1.00  |       | l.       | po,12=        | 1-11   | 2/Cm,       | 12=  | r   | 0.88  |              |
| STEP 2: LT FROM M                                         | AJOR STREET   | 1          |              |       |        |    |       |       |       | <br>     |               |        |             |      |     |       |              |
| Conflicting T                                             | lows:         | ١v         | 'c,4         | ∎ ¥Z  | + ¥3   |    |       | 140   | vhp   | i        | ¥c,1 =        | 75     | + ¥6        |      |     | 217   | vbp          |
| Potential Capa                                            |               |            | p.4 -        |       |        |    |       |       | pcph  |          | Cp,1 =        |        |             |      |     |       | pcpb         |
| Kovement Capac                                            |               |            | 1,4=1        |       |        |    |       |       | pcph  |          | C∎,1=C        | 0.1=   |             |      |     |       | рсры<br>Рсры |
| Prb. of Queu-f                                            |               |            |              |       | Cz4=   |    |       | 1.00  | 4-6-  |          | po,I=1        | •      |             |      |     | 0.97  | Laka         |
| Anca t                                                    |               |            |              |       |        |    |       |       |       |          |               |        |             |      |     |       |              |
| Najor Left Sha                                            |               | ï          | •            |       |        |    |       |       |       | Ì        | •             |        |             |      |     |       |              |

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| Major Street: PUKALANI ST<br>Minor Street: IOLANI SY<br>Scenario: FUTURE BASE WI<br>Peak Hour: AM | TE & VITB                    | OUT HIT          |                | I              | ntesection ( | Analy:<br>File Nat | e: PUXIOL-A      |
|---------------------------------------------------------------------------------------------------|------------------------------|------------------|----------------|----------------|--------------|--------------------|------------------|
| STEP 3: TH FROM MINOR STREET                                                                      |                              |                  |                | <br>           |              | **********         |                  |
| Conflicting Flows:                                                                                | ¥c.,8 ▪                      | 1/2¥3+¥2+        | ¥1+¥6+¥5+¥4    | İ              | Vc.,11 = 1.  | /286+85+84+1       | 73+¥2+¥1         |
|                                                                                                   | 1 .                          |                  | 305 V          | b į            |              |                    | 300 vph          |
| Potential Capacity:                                                                               | Cp,8 =                       |                  | 755 pcj        | ph j           | Cp,11 =      |                    | 759 pcph         |
| Capacity Adj Factor:                                                                              |                              |                  | 0.97           | 1              | f11 = po,4*  | 'po,1 =            | 0.97             |
| Kovement Capacity:                                                                                | [Cz,8 =                      | Cp,8*f8 =        | 734 pc         | ph             | Ca,11 = Cp.  | ,11°f11 +          | 738 pcph         |
| Prob. of Queue-free State:                                                                        | [po.8 =                      | 1-v8/Ca,8        | • 0.97         | 1              | po,11 = 1-1  | 711/Ca,11 =        | 0.98             |
| STEP 4: LT FROM MIROR STREET                                                                      | }                            |                  |                | i              |              |                    |                  |
| Conflicting Flows:                                                                                | Vc.7 =                       | 1/2V3+V2+V       | 1+1/286+85+84+ | · i            | Vc,10 = 1/2  | 2V6+V5+V4+1/       | 2¥3+¥2+¥1+       |
|                                                                                                   | 1 :                          | 1/2[V11+V1       | 2) = 370 vp    | b į            | 1/2          | ¥8+¥9) =           |                  |
| Potential Capacity:                                                                               | Cp7 =                        |                  | 647 pcp        | 1 d            | Cp10 =       |                    | 699 pcph         |
| Najor Left, Minor Through                                                                         |                              |                  |                |                |              |                    |                  |
| Impedance Factor:                                                                                 | P''7=po                      | ,11°f11 =        | 8.95           | ļ              | P''10=po,8'  | 'f8 =              | 0.95             |
| Kajor Left, Kinor Through                                                                         |                              |                  |                | ļ              |              |                    |                  |
| Adjusted Ispedance Factor:                                                                        | p'7 =                        |                  | 0.96           |                | p'10 =       |                    | 0.95             |
| Capacity Adjustment Factor:<br>Novement Capacity:                                                 | $ \mathbf{I}  = \mathbf{p}'$ | "p0,12 =         | 9.85           |                | 110 = p'10   | po,9 =             | 0.96             |
| avecacat copacity:                                                                                | <b>LE</b>  / = 1             |                  | 347 Beb        | a  <br>        | CE'IA = IIA  |                    | ela bobu         |
| BLAY AND LEVEL OF SERVICE SUM                                                                     | ARY                          |                  |                | AVG            |              | 1                  |                  |
| NCVENENT                                                                                          | v(ocob)                      | cs/neph)         | csh(pcph)      | TOTAL<br>Delay |              | 1                  |                  |
| ********                                                                                          |                              |                  |                |                |              | 1                  |                  |
| HIROR LEFT TURE (7)                                                                               | 245                          | 547              | SHRD           | SURD           |              | LEVEL OF           | SERVICE CRITERIA |
|                                                                                                   |                              | 734              |                | 12.1           |              |                    |                  |
|                                                                                                   | 1                            |                  | SERD           | SURD           |              | j                  | AVG              |
|                                                                                                   |                              |                  |                |                |              | LEVEL              |                  |
| MINOR LEFT TURN (10)                                                                              | 2                            | 670              | SHRD           | SARD           | ••           | •                  | DELAY            |
| MINOR THROUGH (11)                                                                                | 18                           | 738              | 731            | 5.1            |              | SERVICE            | (SEC/VEH)        |
| MIROR RIGHT TURN (12)                                                                             | 130                          | 1078             | #2             | 3.8            | λ            |                    |                  |
|                                                                                                   |                              |                  |                |                |              | ۸ ا                | <=5              |
| HAJOR LEFT (1)                                                                                    | 36                           | 1351             | 11             | 2.7            |              | B                  | >5&<=10          |
| KAJOR LEFT (4)                                                                                    | 1                            | 147 <del>0</del> | #2             | 2.5            | Å            | C C                | >10&<=20         |
| WIWAD INDOALAW (Silation                                                                          |                              |                  |                |                | _            | D                  | >20&<=30         |
| MINOR APPROACE (7)(8)(9)                                                                          | •                            | •                | -              | 12.1           |              | E                  | >30&<=45         |
| MINOR APPROACH (10)(11)(12)                                                                       | *                            | -                | -              | 4.0            | ۶.           | I                  | >45              |
| KAJOR APPROACE (1)(2)(3)                                                                          | -                            | •                | -              | 0.6            | Y            |                    |                  |
| - HAJOR APPROACH (4)(5)(6)                                                                        | -                            | -                | -              | 0.0            | Å            |                    |                  |
| nueau urtuaten falfattat                                                                          |                              |                  |                |                |              |                    |                  |

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| Kajor Street: FUKALANI<br>Minor Street: IOLANI ST<br>Scenario: FUTURE BA<br>Feak Hour: PM |      | TH & VI    | THOD  | T HIT      |            |      |         |        |                 | :       |          | Ana<br>ile  | Date:<br>lyst:<br>Name:<br>Da #: | B    | 8-Nar-97<br>C<br>PUKIOL-P |
|-------------------------------------------------------------------------------------------|------|------------|-------|------------|------------|------|---------|--------|-----------------|---------|----------|-------------|----------------------------------|------|---------------------------|
| Peak Hour Pactor:                                                                         | 1.00 | 1          |       |            | Vi         | 12   | ₹1      | !      | VIO             | ******  |          |             |                                  |      |                           |
| NAJOR STREET                                                                              |      | į –        |       |            | 5          | 3    | 10      | )      | 7               |         |          | <b>(-</b> - | - XOR                            | TE   |                           |
| Num of Lanes - V2:                                                                        |      | !          |       |            |            | Į –  |         |        | 1               |         |          |             |                                  |      |                           |
|                                                                                           | 1    | ļ –        |       |            |            | 1    |         |        | 1               |         |          |             |                                  |      |                           |
| Excl LT - V1 (T/H);                                                                       | Ţ    | !          |       |            | - 1        |      | 1       |        | 1               |         |          |             |                                  |      |                           |
| Ezcl RT - V3 (Y/N):                                                                       | I    | Į          |       |            | <          |      | T       |        | >               |         |          |             |                                  |      |                           |
| Stop/Tield - V3 (Y/N):                                                                    | I    | [          |       |            |            |      |         |        |                 |         |          |             |                                  |      |                           |
| Grade - V1, V2, V3:                                                                       | 0    | Į –        |       | •          | •          |      |         |        |                 | •       |          |             |                                  |      |                           |
| Num of large WE                                                                           |      |            |       | 1          |            |      |         |        |                 | 1       |          |             |                                  |      |                           |
| Num of Lanes - V5:<br>Frail IS - V4 (F(M)                                                 |      | VI 1       | 37    |            |            |      |         |        |                 |         |          | ł           | 0 V6                             |      |                           |
| BICL LT - V4 (T/N):                                                                       | R    |            |       |            |            |      |         |        |                 |         |          |             |                                  |      |                           |
| Excl RT - V6 (Y/R);                                                                       |      | ¥2 18      | 32    |            | >          |      |         |        |                 | ¢.      |          | 10:         | 2 75                             |      |                           |
| Stop/Tield - V6 (T/N):                                                                    | R    |            |       |            |            |      |         |        |                 |         |          |             | •                                |      |                           |
| Grade - V4,V5,V6:                                                                         | 1 6  | ¥3 26      | i4    |            |            |      |         |        |                 |         |          | 7           | 7 74                             |      |                           |
| KINOR STREET                                                                              |      |            |       | ` <b>`</b> |            |      |         |        |                 | _/      |          |             |                                  | _    |                           |
| Rum of Lanes - V8;                                                                        | 1    |            |       | ť          |            |      |         |        |                 |         |          |             | STREE                            |      |                           |
| Grade - ¥7,¥8,¥9;                                                                         | e i  |            |       |            |            |      |         |        | -               |         | PU       | EYE!        | NI SI                            | ,    |                           |
| Sbared Lane-V7,8,9:                                                                       | 3    |            |       |            | <b>`</b> . |      | -       |        | >               |         |          |             |                                  | •    |                           |
| (0=N, 1=LT, 2=TR, 3=LTR)                                                                  | 3 [  |            |       |            | <u>\</u>   |      | !       |        | . /             |         |          |             |                                  |      |                           |
| 1                                                                                         | - !  |            |       |            | ļ          |      | ļ       |        | ļ               |         |          |             |                                  |      |                           |
| Rum of Lanes - Vil:                                                                       | .!   |            |       |            |            |      |         |        | 1               |         |          |             |                                  |      |                           |
| Grade - VI0, V11, V12;                                                                    | 1    |            |       |            | 125        |      | 25      |        | 5               |         |          |             |                                  |      |                           |
| Shared Lane-V10,11,12:                                                                    | 0    |            |       |            |            |      |         |        |                 |         |          |             |                                  |      |                           |
| (0=R,1=LT,2=TR,3=LTR)                                                                     | 1    |            |       |            | 77         |      | ¥8      |        | ¥9              |         |          |             |                                  |      |                           |
| (0-#,1-D1)1-18,3-D18)                                                                     | ł    |            |       |            | NINOS      | STR  | 66T - 1 | TOLANI | [ 5 <b>T</b>    |         |          |             |                                  |      |                           |
| OLUME ADJUSTKERTS                                                                         |      |            |       |            |            |      |         |        |                 |         |          |             |                                  |      |                           |
| NOVEKERT NO.                                                                              |      |            | I     | • •        |            | -    | -       | -      |                 |         |          |             |                                  |      |                           |
| HOURLY FLOW RATE, V(vph)                                                                  | 1    |            |       | 2 3        | 4          | 5    | 6       | 1      | 8               |         | 0        | 11          | 12                               |      |                           |
| VOLDXE, V (cenhi                                                                          | [    |            |       | 2 264      |            | 102  |         | 125    |                 | -       | 7        | 10          | 53                               |      |                           |
| VOLDNE, V (pepb)                                                                          |      | 151        | 18    | 2 264      | 8          | 102  | 0       | 138    | 28              | 6       | 8        | 11          | 58                               |      |                           |
| TEP 1: RT FROM MINOR STREET                                                               | 1    |            |       |            |            |      |         | ·<br>I |                 |         |          |             |                                  |      |                           |
| Conflicting Flows:                                                                        | •    | c9 = 1/    | 2 73  | + ¥2       |            | 182  | Thp     |        | Vett -          | 1/2 11- |          |             |                                  |      |                           |
| Potential Capacity:                                                                       |      | p.9 .      |       |            |            | 1120 |         |        | Vc12 =          | 112 40  | + ¥5     | ۳           |                                  | vhp  |                           |
| Novement Capacity:                                                                        |      | .9=Cp.     | 9=    |            |            | 1120 |         |        | Cp,12 =         |         |          |             |                                  | peph |                           |
| Prb. of Queu-free States                                                                  |      | ),9=1-v:   |       | 9.         |            | 9.99 | 6cbu    |        | Cm, 12=C        |         |          |             |                                  | pcpb | l                         |
|                                                                                           |      |            |       |            |            |      |         |        | po,12=1·        | -712/0  | 1, 1 Z • |             | 0.95                             |      |                           |
| BP 2: LT FROM MAJOR STREET                                                                | 1    |            |       |            |            |      | _       | 1      |                 |         |          |             |                                  |      |                           |
| Conflicting Flows:                                                                        | 170  | .4 = Y     | 2 + 1 | 73 =       |            | 446  | The     | i i    | Yc.1 = 1        | 75 J M  |          |             | 144                              | -1-  |                           |
| Potential Capacity:                                                                       |      | ,4 =       |       | -          | 1          | 1851 |         |        | ;p,1 = (        | 1J T \$ | •        |             |                                  | vhp  |                           |
| Novement Capacity:                                                                        |      | ., 4-Cp, 4 | l e   |            |            | 951  |         |        |                 | 1-      |          |             | 1533                             |      |                           |
| Prb. of Queu-free State:                                                                  |      | ,4=1-74    |       |            |            | .99  | Lekn    |        | Cm,1=Cp,        |         |          |             | 1533                             | bcbp |                           |
| Najor Left Shared Lane                                                                    |      | ,          |       |            |            | 177  |         | 1 B    | 0,1=1- <b>v</b> | 1/681*  | I        |             | <b>8</b> .98                     |      |                           |
| Prob. of Queue-free State                                                                 | 1.1  | 0.4=       |       |            |            | .99  |         | !      | *0,1=           |         |          |             |                                  |      |                           |

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| Major Street: PUKALANI ST<br>Minor Street: IOLANI ST<br>Scebario: FUTURE BASE WITH<br>Peak Hour: PK | £ VITEOD          | f hit     |                | In              | tesection 1  | DATE<br>Analyst<br>File Name<br>Atesection # | : BC<br>: PUKIOL-P |
|-----------------------------------------------------------------------------------------------------|-------------------|-----------|----------------|-----------------|--------------|----------------------------------------------|--------------------|
| STEP 3: TH FROM MINOR STREET                                                                        | -2                |           |                |                 |              |                                              |                    |
| Conflicting Flows:                                                                                  | 'c.,8 = 1         | /273+72+1 | 1+¥6+¥5+¥4     | •               | Vc.,11 = 1/  | 276+75+74+73                                 | 1+V2+V1            |
| •                                                                                                   | *                 |           | 428 vpb        | ı İ             |              |                                              | 428 vpb            |
|                                                                                                     | p.8 =             |           | 650 pcpl       | 1               | Cp,11 =      |                                              | 650 pcph           |
| Capacity Adj Factor: If                                                                             | 8 = po,4          | *po,1 =   | 6.89           |                 | f11 = po,4*  | p0,1 =                                       | 0.87<br>503        |
| Novement Capacity:                                                                                  | <b>1.8 = Cp</b>   | .8°f8 =   | 582 pcpl       |                 | Cz.11 - Cp.  | 11-111 -                                     | 307 bebu           |
| Prob. of Queue-free State:  P                                                                       | 0,8 = 1-          | v8/Cz,8 * | 0.95           |                 | po,11 = 1-v  | 11/C <b>0</b> ,11 *<br>                      | ¥.30               |
| STEP 4: LT FROM MINOR STREET                                                                        |                   |           |                | 1               |              |                                              |                    |
| Conflicting Flows:                                                                                  | ic,7 = 1/         | 273+72+7  | L+1/2V6+V5+V4+ | 1               | Vc,16 = 1/2  | ¥6+¥5+¥4+1/7                                 | 2V3+V2+V1+         |
|                                                                                                     | 1/                | 2(V11+V12 | () = 460 rpb   | : [             | 2/2(         | ¥8+¥9} =                                     | 443 yph            |
|                                                                                                     |                   | - •       |                | b Ì             | Cp10 =       |                                              | 587 gcpb           |
|                                                                                                     | •                 |           |                | 1               |              |                                              |                    |
| Impedance Factor:                                                                                   | ?"7=po.1          | 1*f11 =   | 0.88           | 1               | P''10=p0,8*  | f8 -                                         | 0.85               |
| Major Left, Minor Through                                                                           | • • •             |           |                | 1               |              |                                              |                    |
| Idinated Tanadance Factory It                                                                       | o'7 =             |           | 0.91           | 1               | p'10 =       |                                              | 0.89               |
| According Addinghough Vistors 11                                                                    | '7 = n'7*         | no.12 =   | Ø.86           | 1               | f10 = p'10*  |                                              | 9.88               |
| Novement Capacity:                                                                                  | <b>Ca</b> ,7 = f1 | *Cp,7 =   | 495 pcp        | 6  <br>-        | Cm, 10 - f10 | *Cp,10 =                                     | 517 pcpb           |
| DELAY AND LEVEL OF SERVICE SUNNAL                                                                   |                   |           |                | AVG             |              | ļ                                            |                    |
| KOVENERT                                                                                            | r(pcph)           | cm{pcpb}  | cab(pcpb)      | TOTAL<br>DELAI  | L05          | 1                                            |                    |
|                                                                                                     |                   | 495       | SHRD           | SERD            |              | LEVEL OF :                                   | SERVICE CRITER     |
| HINGH MALL LOUN (.)                                                                                 | 28                |           | 518            | 19.4            |              | İ                                            |                    |
|                                                                                                     | 6                 | 1120      | SERD           | SERD            |              | Ì                                            | AVG                |
| MINOR RIGHT TORM (9)                                                                                | v                 |           |                |                 |              | LEVEL                                        | TOTAL              |
| NTRAD TREP FORT (16)                                                                                | 8                 | 517       | SHRD           | SHRD            |              | 07                                           | DELAY              |
|                                                                                                     | 11                |           | 552            | 6.7             |              | SERVICE                                      | (SEC/VE            |
| NINOR THROUGH (11)<br>KINOR RIGHT TURN (12)                                                         | 58                | 1229      | #1             | 3.1             |              |                                              |                    |
| UTHAN WIADI IANN IICL                                                                               | 44                | /         |                |                 |              | į A                                          | <= 5               |
| KAJOR LEFT (1)                                                                                      | 151               | 1533      | XX             | 2.1             | S A          | j B                                          | >5&<=10            |
|                                                                                                     | 8                 | 1851      | NX             | 3.5             |              | j c                                          | >10&<=20           |
| KAJOR LEFT (4)                                                                                      | v                 |           |                |                 |              | j D                                          | >286<=38           |
| KINOR APPROACE (7)(8)(9)                                                                            | -                 | •         | -              | 10.4            | L C          | j B                                          | >38&<=45           |
| MINOR APPROACE (10)(11)(12)                                                                         | -                 | -         | -              | 4.6             |              | j I                                          | >45                |
| UTBAR VLLVACE (TA)(TT)(TT)                                                                          |                   |           |                |                 |              | Ì                                            |                    |
|                                                                                                     | -                 | -         | -              | 0.1             |              | 1                                            |                    |
| MAJOR APPRUACH (1)(2)(3)                                                                            |                   |           |                | A 3             | 1 A          | 1                                            |                    |
| MAJOR APPROACH (1)(2)(3)<br>Major Approach (4)(5)(6)                                                | -                 | -         | -              | <del>0</del> .3 | ) a          | 1                                            |                    |

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| Major Street: KULA HWY<br>Minor Street: OHANA ST<br>Feak Hour: AM<br>Scenario: FUTURE BASE WI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | THOUT MIT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                |                      |                  |                |                                                                                                                         | lyst: BC<br>Name: KULCHA-                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------|----------------|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Feak Hour Factor: 1.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                |                      |                  |                |                                                                                                                         |                                                                                  |
| NAJCR STREET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 899                                                                                                                            | <b>\</b>             |                  | <b>{</b>       | 436                                                                                                                     | V5                                                                               |
| Nus of Lanes - VZ: 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                |                      |                  |                |                                                                                                                         |                                                                                  |
| Exc1 RT - V3 (Y/N): N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 4                                                                                                                              |                      |                  |                | 9                                                                                                                       | ¥4                                                                               |
| Stop/Yield - V3 (Y/N): K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1                                                                                                                              |                      |                  | 1              |                                                                                                                         |                                                                                  |
| % Grade - V2.V3: 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ¥                                                                                                                              |                      |                  | 4              | KULA HWY                                                                                                                | REET:                                                                            |
| Num of Lanes - VS: 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                | . (                  | >                |                | 1994 <b>1</b> (191                                                                                                      |                                                                                  |
| Excl LT - V4 (Y/N): N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | }                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                | 1                    | i                |                |                                                                                                                         |                                                                                  |
| Z Grade - V4,V5: -3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                |                      | į                |                | ,                                                                                                                       |                                                                                  |
| KINDR STREET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | i                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                | ;<br>3               | ;<br>17          |                |                                                                                                                         | NGRTH>                                                                           |
| Nue of Lanes - V7, V9: 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                | •                    | .,               |                |                                                                                                                         | awarn/                                                                           |
| Shared Lane (Y/N): Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                | ¥7                   | ¥9               |                |                                                                                                                         |                                                                                  |
| % Erade - 97895: 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | MINDE S                                                                                                                        | TREET: OHA           | • •              |                |                                                                                                                         |                                                                                  |
| VOLUHE ADJUSTMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                |                      |                  |                |                                                                                                                         | ************                                                                     |
| MOVEMENT NC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 5 .                                                                                                                            | 4                    |                  | 5              | 7                                                                                                                       | 9                                                                                |
| 1454 ANA# 11 4 4 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                | -                    |                  | 171            | -                                                                                                                       | 17                                                                               |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <u>2</u> 7=                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4                                                                                                                              | Ŧ                    |                  | 435            | ز ز                                                                                                                     | 17                                                                               |
| Conflicting Flows: 1 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | c,= = 1/2€V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4<br>1<br>3÷V2 =                                                                                                               | ;<br>8<br><br>2 -    | <br>279          | 435<br>436     |                                                                                                                         | 15<br>1 voh                                                                      |
| YOLUME, V (ocph)<br>STEP 1: RT FRCM MINOR STREET<br>Conflicting Flows: : :<br>Potential Capacity: : C<br>Movement Capacity: : C<br>STEP 2: LT FROM MAJOR STREET<br>Conflicting Flows:<br>Potential Capacity:<br>Movement Capacity:<br>Movement Capacity:<br>Prob. of Sueue-free State:<br>Major Left Shared Lans<br>Prob. of Queue-free State:<br>Major Left Shared Lans<br>Prob. of Queue-free State:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | c,= = 1/247<br>c,= =<br>c,= = 10,9<br>- 74<br>- 74<br>- Vc,<br>- Cn,<br>- Cn,<br>- co,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | =<br>4 = V3+V2 =<br>4 =<br>4 = Cp,4 =<br>4 = 1-v4/Cp,4 =<br>,4 =                                                               |                      | <br>\$ ÷         | 436<br>        | 48<br>48<br>= 90:<br>63(<br>63(<br>0.99                                                                                 | 19<br>1 voh<br>4 pcph<br>4 pcph<br>5 vph<br>5 pcph<br>5 pcph<br>5 pcph           |
| YOLUME, V (ocph)<br>STEP 1: AT FRCM MINOR STREET<br>Conflicting Flows:<br>Potential Capacity:<br>Movement Capacity:<br>STEP 2: LT FROM MAJOR STREET<br>Conflicting Flows:<br>Potential Capacity:<br>Movement Capacity:<br>Prob. of Sugue-free State:<br>Major Left Shared Lans<br>Prob. of Gugue-free State:<br>Major Left Shared Lans<br>Prob. of Gugue-free State:<br>Major Left Shared Lans<br>Prob. of Gugue-free State:<br>Major Left Shared Lans<br>Prob. of Gugue-free State:<br>Major Left Shared Lans<br>Prob. of Gugue-free State:<br>Major Left Shared Lans<br>Prob. of Gugue-free State:<br>Major Left Shared Lans<br>Prob. of Gugue-free State:<br>Major Left Shared Lans<br>Prob. of Gugue-free State:<br>Major Left Shared Lans<br>Prob. Of Gugue-free State:<br>Major Left Shared Lans<br>Prob. Of Gugue-free State:<br>Major Left Shared Lans<br>Prob. Of Gugue-free State:<br>Major Left Shared Lans<br>Prob. Of Gugue-free State:<br>Major Left Shared Lans<br>Prob. Of Gugue-free State:<br>Major Left Shared Lans<br>Prob. Of State:<br>Major Left Shared Lans<br>Prob. Of State:<br>Major Left Shared Lans<br>Prob. Of Gugue-free State:<br>Major Left Shared Lans<br>Prob. Of State:<br>Major Left Shared Lans | c, = = 1/249<br>s, = =<br>s, z = Is, 9<br>- 94<br>- 94<br>- 05<br>- 07<br>- 07<br>- 77                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | =<br>\$ = V3+V2 =<br>4 =<br>4 = C0,4 =<br>5 = 1-v4/Cn,4 =<br>,4 =                                                              |                      | <br>\$ ÷         | 436<br>        | 48<br>48<br>= 90:<br>63(<br>63(<br>0.99                                                                                 | 19<br>1 voh<br>4 pcph<br>4 pcph<br>5 vph<br>5 pcph<br>5 pcph<br>5 pcph           |
| VOLUME, V (ocph)<br>TEP 1: RT FRCM MINOR STREET<br>Conflicting Flows: V<br>Potential Capacity: V<br>Movement Capacity: C<br>TEP 2: LT FROM MAJOR STREET<br>Conflicting Flows:<br>Potential Capacity:<br>Movement Capacity:<br>Prob. of Sueue-free State:<br>Major Left Shared Lans<br>Prob. of Queue-free State:<br>Major Left Shared Lans<br>Prob. of Queue-free State:<br>Major Left Shared Lans<br>Prob. of Queue-free State:<br>Major Left Shared Lans<br>Prob. of Queue-free State:<br>Major Left Shared Lans                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | c, = = 1/249<br>s, = =<br>s, z = Is, 9<br>- 94<br>- 94<br>- 05<br>- 07<br>- 07<br>- 77                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | =<br>\$ = V3+V2 =<br>4 =<br>4 = C0,4 =<br>5 = 1-v4/Cn,4 =<br>,4 =                                                              |                      | <br>\$ ÷         | 436<br>        | 48<br>48<br>                                                                                                            | 17<br>1 voh<br>4 popt.<br>4 poph<br>5 voh<br>6 popt<br>5 aoph<br>5               |
| VOLUME, V (ocph)<br>TEP 1: RT FRCM MINOR STREET<br>Conflicting Flows: : V<br>Potential Capacity: : C<br>Movement Capacity: : C<br>TEP 2: LT FROM MAJOR STREET<br>Conflicting Flows:<br>Potential Capacity:<br>Movement Capacity:<br>Prob. of Sueue-free State:<br>Major Left Shared Lans<br>Prob. of Queue-free State:<br>Major Left Shared Lans<br>Prob. of Queue-free State:<br>Major Left Shared Lans<br>Prob. of Queue-free State:<br>Major Left Shared Lans<br>Prob. of Queue-free State:<br>Major Left Shared Lans<br>Prob. of Queue-free State:<br>Major Left Shared Lans<br>Prob. of Queue-free State:<br>Potential Capacity:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | c.= :/247<br>s.= =<br>s.c = Io.7<br>- 74<br>- Vc.<br>Ep.<br>Cm.<br>. Cm.<br>. c.<br>. v.<br>. v.<br>. v.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | =<br>\$ = V3+V2 =<br>4 =<br>4 = C0,4 =<br>5 = 1-v4/Cn,4 =<br>,4 =                                                              |                      | <br>\$ ÷         | 436<br>        | 48<br>48<br>                                                                                                            | 17<br>1 voh<br>4 popt<br>4 popt<br>5 voh<br>6 popt<br>5 aoph<br>5                |
| VOLUME, V (ocph)<br>TEP 1: AT FRCH MINOR STREET<br>Conflicting Flows:<br>Potential Capacity:<br>Movement Capacity:<br>TEP 2: LT FROM MAJOR STREET<br>Conflicting Flows:<br>Potential Capacity:<br>Movement Capacity:<br>Movement Capacity:<br>Prob. of Sueue-free State:<br>Major Left Shared Lane<br>Prob. of Queue-free State:<br>MEP 3: LT FROM MINOR STREET<br>Conflicting Flows:<br>Potential Capacity:<br>Sapacity Adjustment Factor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | c,: = :/249<br>s.: = ::<br>s.: = :::<br>. Vc.,<br>. :<br>. :<br>. :<br>. :<br>. :<br>. :<br>. :<br>. :<br>. :<br>. :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | =<br>4 = V3+V2 =<br>4 =<br>4 = Ca,4 =<br>4 = 1-v4/Cm,4 =<br>4 =<br>7 = 1/2V3+V2+V3+V<br>7 =                                    |                      | <br>\$ ÷         | 436<br>        | 48<br>48<br>                                                                                                            | 17<br>1 voh<br>4 popt.<br>4 poph<br>5 voh<br>6 popt<br>5 aoph<br>5               |
| VULUME, V (pcph)<br>TEP 1: RT FRCM MINOR STREET<br>Conflicting Flows: V<br>Potential Capacity: V<br>Movement Capacity: C<br>Movement Capacity: C<br>TEP 2: LT FROM MAJOR STREET<br>Conflicting Flows:<br>Potential Capacity:<br>Movement Capacity:<br>Frob. of Sueue-free State:<br>Major Left Shared Lane<br>Prob. of Gueue-free State:<br>EP 3: LT FROM MINOR STREET<br>Conflicting Flows:<br>Potential Capacity:<br>Conflicting Flows:<br>Potential Capacity:<br>Capacity Adjustment Factor<br>Due To Impeding Novements:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | c,= = 1/249<br>s,= =<br>s,c = Is,9<br>- 74<br>Vc,<br>Ep,<br>Cm,<br>cm,<br>ofc<br>- 77<br>Vc,1<br>Cp,7<br>- 7=                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | =<br>4 = V3+V2 =<br>4 =<br>4 = Co,4 =<br>4 = 1-v4/Co,4 =<br>,4 =<br>7 = 1/2V3+V2+V5+V<br>7 =<br>10,4=                          |                      | <br>\$ ÷         | 436<br>        | 48<br>48<br>                                                                                                            | 19<br>1 voh<br>4 poph<br>3 voh<br>5 poph<br>5 acph<br>5 acph<br>5                |
| YULUME, V (orph)<br>TEP 1: RT FRCM MINOR STREET<br>Conflicting Flows:<br>Potential Capacity:<br>Movement Capacity:<br>TEP 2: LT FROM MAJOR STREET<br>Conflicting Flows:<br>Potential Capacity:<br>Movement Capacity:<br>Frob. of Sueue-free State:<br>Major Left Shared Lane<br>Prob. of Queue-free State:<br>Major Left Shared Lane<br>Prob. of Queue-free State:<br>Major Left Shared Lane<br>Prob. of Queue-free State:<br>Major Left Shared Lane<br>Prob. of Queue-free State:<br>Major Left Shared Lane<br>Protential Capacity:<br>Capacity Adjustment Factor<br>Due To Impeding Movements:<br>Movement Capacity:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | c,: = 1/249<br>s.: = 10,9<br>- 74<br>Vc,<br>D,<br>Ca,<br>Ca,<br>04c<br>477<br>Vz,1<br>50,7<br>177<br>Vz,1<br>50,7<br>177<br>177<br>177<br>177<br>177<br>177<br>177<br>1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | =<br>4 = V3+V2 =<br>4 =<br>4 = Ca,4 =<br>4 = 1-v4/Ca,4 =<br>,4 =<br>7 = 1/2V3+V2+V5+V<br>7 =<br>1a,4=<br>1 = Ca,7 =            |                      | \$ ÷             | 436<br>        | 48<br>48<br>57<br>67<br>67<br>67<br>67<br>67<br>9.78<br>1345<br>176<br>0.58<br>173                                      | 19<br>1 voh<br>4 poph<br>4 poph<br>5 voh<br>6 poph<br>6 poph<br>6 poph<br>6 poph |
| YULUME, V (orph)<br>TEP 1: RT FRCM MINOR STREET<br>Conflicting Flows:<br>Potential Capacity:<br>Movement Capacity:<br>TEP 2: LT FROM MAJOR STREET<br>Conflicting Flows:<br>Potential Capacity:<br>Movement Capacity:<br>Frob. of Sueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Movement Capacity:<br>Capacity Adjustment Factor<br>Due To Ispeding Movements:<br>Movement Capacity:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | c,: = :/247<br>c,: = ::<br>c,: = ::<br>c,: = ::<br>c,:<br>c,:<br>c,:<br>c,:<br>c,:<br>c,:<br>c,:<br>c                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | =<br>4 = V3+V2 =<br>4 =<br>4 = Ca,4 =<br>4 = 1-v4/Ca,4 =<br>,4 =<br>7 = 1/2V3+V2+V5+V<br>7 =<br>1a,4=<br>1 = Ca,7 =            | '4 =                 | <b>4</b> -       | 436            | 48<br>48<br>57<br>67<br>67<br>67<br>67<br>67<br>9.78<br>1345<br>176<br>0.58<br>173                                      | 19<br>1 voh<br>4 poph<br>4 poph<br>5 voh<br>6 poph<br>6 poph<br>6 poph<br>6 poph |
| VULUME, V (pcph)<br>TEP 1: RT FRCM MINOR STREET<br>Conflicting Flows: V<br>Potential Capacity: V<br>Movement Capacity: C<br>Movement Capacity: C<br>Potential Capacity: C<br>Movement Capacity:<br>Prob. of Sueue-free State:<br>Major Left Shared Lans<br>Prob. of Queue-free State:<br>Major Left Shared Lans<br>Prob. of Queue-free State:<br>Major Left Shared Lans<br>Prob. of Queue-free State:<br>Major Left Shared Lans<br>Prob. of Queue-free State:<br>Movement Capacity:<br>Capacity Adjustment Factor<br>Due To Impeding Novements:<br>Movement Capacity:<br>LAY AND LEVEL OF SERVICE SUM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | c,: = 1/249<br>s,: = 10,9<br>- 74<br>: Vc,<br>Cp,<br>Cn,<br>co,<br>04c<br>. V7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7 | =<br>4 = V3+V2 =<br>4 =<br>4 = Cp,4 =<br>4 = 1-v4/Cp,4 =<br>,4 =<br>7 = 1/2V3+V2+V5+V<br>7 =<br>10,4=<br>1 = 2p,7 =            |                      | 4 -<br>AV5<br>h; | 436<br>977<br> | 48<br>48<br>57<br>63/<br>63/<br>6.99<br>0.98<br>1344<br>178<br>0.98<br>173                                              | 19<br>1 voh<br>4 poph<br>4 poph<br>5 voh<br>6 poph<br>6 poph<br>6 poph<br>6 poph |
| YOLUME, V (ocph)<br>TEP 1: RT FRCM MINOR STREET<br>Conflicting Flows: V<br>Potential Capacity: V<br>Movement Capacity: C<br>Movement Capacity: C<br>TEP 2: LT FROM MAJOR STREET<br>Conflicting Flows:<br>Potential Capacity:<br>Movement Capacity:<br>Frob. of Sueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Potential Capacity:<br>Capacity Adjustment Factor<br>Due To Impeding Movements:<br>Movement<br>LAY AND LEVEL OF SERVICE SUM<br>Movement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | c,: = 1/249<br>s,: = 10,9<br>- 74<br>: Vc,<br>Cp,<br>Cn,<br>co,<br>04c<br>. V7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7 | =<br>4 = V3+V2 =<br>4 =<br>4 = Ca,4 =<br>4 = 1-v4/Ca,4 =<br>4 =<br>7 = 1/2V3+V2+V5+V<br>7 =<br>1a,4=<br>1 = Ca,7 =<br>Ca(acph) | <br>/4 =<br><br>(3cs | 4 ÷<br>AV5       | 436<br>377<br> | 48<br>48<br>57(<br>63(<br>63(<br>63(<br>63(<br>63(<br>63(<br>63(<br>63(<br>63(<br>9)))))))))))))))))))))))))))))))))))) | 19<br>1 voh<br>4 poph<br>4 poph<br>5 voh<br>6 poph<br>6 poph<br>6 poph<br>6 poph |
| YOLUME, V (ocph)<br>TEP 1: RT FRCM MINOR STREET<br>Conflicting Flows: : :<br>Potential Capacity: : C<br>Movement Capacity: : C<br>TEP 2: LT FROM MAJOR STREET<br>Conflicting Flows:<br>Potential Capacity:<br>Movement Capacity:<br>Prob. of Sueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Mill Capacity:<br>Capacity Adjustment Factor<br>Due To Isoeding Movements:<br>Movement Capacity:<br>LAY AND LEVEL OF SERVICE SUM<br>Movement<br>MINOR LEFT TURN (7)                                                                                                                                                                                                                                                                                                                                                                                                                                                 | c,: = :/2«V<br>s,: = ::                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | =<br>4 = V3+V2 =<br>4 =<br>4 = Ca,4 =<br>4 = 1-v4/Ca,4 =<br>4 =<br>7 = 1/2V3+V2+V5+V<br>7 =<br>1a,4=<br>1 = Ca,7 =<br>Ca(acph) | <br>/4 =<br><br>(3cs | 4 ÷<br>AV5       | 436<br>377<br> | 48<br>48<br>57(<br>63(<br>63(<br>63(<br>63(<br>63(<br>63(<br>63(<br>63(<br>63(<br>9)))))))))))))))))))))))))))))))))))) | 19<br>1 voh<br>4 poph<br>4 poph<br>5 voh<br>6 poph<br>6 poph<br>6 poph<br>6 poph |
| YOLUME, V (ocph)<br>TEP 1: RT FRCM MINOR STREET<br>Conflicting Flows: V<br>Potential Capacity: V<br>Movement Capacity: C<br>Movement Capacity: C<br>TEP 2: LT FROM MAJOR STREET<br>Conflicting Flows:<br>Potential Capacity:<br>Movement Capacity:<br>Frob. of Sueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Prob. of Gueue-free State:<br>Major Left Shared Lans<br>Potential Capacity:<br>Capacity Adjustment Factor<br>Due To Impeding Movements:<br>Movement<br>LAY AND LEVEL OF SERVICE SUM<br>Movement<br>MINOR LEFT TURN (7)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | c,: = 1/249<br>s,: = 10,9<br>- 74<br>: Vc,<br>Cp,<br>Cn,<br>co,<br>04c<br>. V7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7<br>. Vc,7 | =<br>4 = V3+V2 =<br>4 =<br>4 = Cp,4 =<br>4 = 1-v4/Cp,4 =<br>,4 =<br>7 = 1/2V3+V2+V5+V<br>7 =<br>10,4=<br>1 = 2p,7 =            | <br>/4 =<br><br>(3cs | 4 ÷<br>AV5       | 436<br>377<br> | 48<br>48<br>57(<br>63(<br>63(<br>63(<br>63(<br>63(<br>63(<br>63(<br>63(<br>63(<br>9)))))))))))))))))))))))))))))))))))) | 19<br>1 voh<br>4 poph<br>4 poph<br>5 voh<br>6 poph<br>6 poph<br>6 poph<br>6 poph |

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a server and a server

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| Minor Street: OHANA ST<br>Peak Hour: PM<br>Scenario: FUTURE BASE                                                                                                                                                         | VITEOU                                    |                         |                     |                      |                        |                            |             | I                   | An                | Date:<br>alyst:<br>Name:<br>tion: | 27-Mar<br>BC<br>KULOHA |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------------------------|---------------------|----------------------|------------------------|----------------------------|-------------|---------------------|-------------------|-----------------------------------|------------------------|
| NAJOR STREET                                                                                                                                                                                                             | 00 ;<br>; V2                              |                         |                     |                      |                        |                            | /           | *******             | ******            | ********                          | ******                 |
|                                                                                                                                                                                                                          | 1 :<br>N : 73                             |                         |                     |                      |                        |                            | - <b></b> . |                     | 550               | V5                                |                        |
| Stop/Yield - V3 (Y/N):                                                                                                                                                                                                   | N                                         | 1                       | \<br>\              |                      |                        |                            | ,           |                     | 17                | V4                                |                        |
|                                                                                                                                                                                                                          | 3                                         |                         | v                   |                      |                        |                            | v           |                     | JOR ST            |                                   |                        |
| Num of Lanes - V5:<br>Excl LT - V4 (Y/N):                                                                                                                                                                                |                                           |                         |                     | <u>к</u>             |                        | >                          |             | <b>F</b> , <b>L</b> | 24 041            |                                   |                        |
| <b>F A</b> 1 <b>H H H</b>                                                                                                                                                                                                | 5 :                                       |                         |                     | ۱ <u>.</u>           |                        | ,                          |             |                     |                   |                                   |                        |
| MINOR STREET                                                                                                                                                                                                             | !                                         |                         |                     | i                    |                        |                            |             |                     |                   |                                   |                        |
| Num of Lanes - V7,V9: 1                                                                                                                                                                                                  |                                           |                         |                     | 2                    |                        | 17                         |             |                     |                   | NORTH                             | >                      |
| Shared Lane (Y/N): Y                                                                                                                                                                                                     |                                           |                         |                     | V7                   |                        | V9                         |             |                     |                   |                                   |                        |
| % Grade - ¥7&¥9: 0                                                                                                                                                                                                       |                                           |                         | HINDE S             | STREET:              | OHANA                  | 57                         |             |                     |                   |                                   |                        |
| VOLUME ADJUSTMENTS<br>MOVERENT NO.                                                                                                                                                                                       |                                           |                         |                     |                      |                        |                            |             |                     |                   |                                   |                        |
| VOLUME, V (vph)                                                                                                                                                                                                          |                                           | 2                       | 3                   | 4                    |                        |                            | 5           |                     | 7                 | 7                                 |                        |
| VOLUME, v (pcph)                                                                                                                                                                                                         | 60<br>60                                  |                         | 1                   | 17<br>15             |                        |                            | 660<br>660  |                     | 2                 | 17                                |                        |
| Conflicting Flows: :<br>Potential Capacity: :<br>Movement Capacity: :<br>STEP 2: LT FROM MAJOR STREET                                                                                                                    | Cp.9 =<br>Ce.p = i                        |                         |                     | !                    | r                      | 600                        |             |                     | 601<br>687<br>657 |                                   |                        |
| Conflicting Flows:                                                                                                                                                                                                       | !                                         | Vc.4 = V3               | +V2 =               |                      | 1                      |                            |             |                     | •••               |                                   |                        |
| Potential Capacity:<br>Movement Capacity:                                                                                                                                                                                | , <b>,</b>                                | ip,4 =                  |                     |                      |                        | r                          | 600         | =                   | 601<br>837        | voh                               |                        |
| Prob. of Queue-free State:                                                                                                                                                                                               | ;                                         | Ca,4 = īp               | ,4 =                |                      |                        |                            |             |                     | 587               |                                   |                        |
| Najor Left Shared Lane                                                                                                                                                                                                   | 1                                         | pa.4 = 1-               | ¥4/L£,4 =           |                      |                        |                            |             |                     | 0.95              | F • F ·                           |                        |
| Prob. of Queue-free State:                                                                                                                                                                                               | *******                                   | c#a,4 =                 |                     |                      |                        |                            | <b></b>     |                     | 0.77              |                                   |                        |
| STED 7. IT FROM MANNES                                                                                                                                                                                                   |                                           |                         |                     |                      |                        |                            |             |                     |                   |                                   |                        |
| STEP 3: LT FROM MINOR STREET<br>Conflicting Flows:                                                                                                                                                                       |                                           | Cp.7 =                  | ¥3+¥2+¥5+¥/         | ; =                  |                        |                            |             |                     | 1278              |                                   |                        |
| Conflicting Flows:<br>Potential Capacity:                                                                                                                                                                                | 1                                         | · •                     |                     |                      |                        |                            |             |                     | 193               | pcph                              |                        |
| Conflicting Flows:<br>Potential Capacity:<br>Capacity Adjustgent Factor                                                                                                                                                  | :<br>;                                    |                         |                     |                      |                        |                            |             |                     | 0.77              |                                   |                        |
| Conflicting Flows:<br>Potential Capacity:                                                                                                                                                                                |                                           | f7=pc,4=<br>Cæ,7 = Ca,1 | 7 =                 |                      |                        |                            |             |                     | 127               | *** L                             |                        |
| Conflicting Flows:<br>Potential Capacity:<br>Capacity Adjustment Factor<br>Due To Impeding Movements:<br>Movement Capacity:<br>DELAY AND LEVEL OF SERVICE SUM                                                            | :                                         |                         |                     |                      |                        |                            |             |                     | 187               | pcoh                              |                        |
| Conflicting Flows:<br>Potential Capacity:<br>Capacity Adjustment Factor<br>Due To Impeding Movements:                                                                                                                    | 1<br>1<br>MARY<br>7(vcph                  | Cz,7 = [0,3             | c#(pcph)            | cs<br>(pc            | h<br>ph}               | AVS TO:<br>Del             | TAL<br>.ay  | LOS                 |                   | ¢coh<br>                          |                        |
| Conflicting Flows:<br>Potential Capacity:<br>Capacity Adjustment Factor<br>Due To Impeding Movements:<br>Movement Capacity:<br>DELAY AND LEVEL OF SERVICE SUM<br>Movement<br>MINOR LEFT TURN (7)                         | 1<br>1<br>MARY<br>7(vcph                  | Ca,7 = Co,1             | ca(pcph)<br>        | c3<br>(pc<br>        | հ<br>ph)<br>           | AVS TO<br>Del              | ial<br>Ay   |                     |                   | ¢coh<br>                          |                        |
| Conflicting Flows:<br>Potential Capacity:<br>Capacity Adjustment Factor<br>Due To Impeding Movements:<br>Movement Capacity:<br>DELAY AND LEVEL OF SERVICE SUM<br>Movement<br>MINOR LEFT TURN (7)<br>MINOR RIGHT TURN (9) | 1<br>1<br>1<br>2<br>1<br>1<br>1<br>1<br>7 | Cz,7 = [0,3             | c#(pcph)            | cs<br>(pc<br><br>SHR | h<br>ph)<br><br>D      | AVS TO<br>Del<br>Shrd      | ial<br>.Ay  | SHRD                |                   | £coh                              | ******                 |
| Conflicting Flows:<br>Potential Capacity:<br>Capacity Adjustment Factor<br>Due To Impeding Movements:<br>Movement Capacity:<br>DELAY AND LEVEL OF SERVICE SUM<br>Movement<br>MINOR LEFT TURN (7)                         | 1<br>1<br>MARY<br>7 (vcdh<br>2            | Cz,7 = [0,3             | c#(pcph)<br><br>197 | cs<br>(pc<br><br>SHR | հ<br>ph)<br><br>D<br>5 | AVS TO<br>DEL<br>SHRD<br>7 | ial<br>Ay   |                     |                   | pcoh                              |                        |

•

13

KULAMALU FUTURE BASE W/MIT AM PEAK HOUR

3

### SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int # 0 - HALEAKALA HWY & HANA HWY

03/27/97

18:55:29

| METROAREA      | NO | 1CBD |
|----------------|----|------|
| LOSTTIME       |    | 2.0  |
| LEVELOFSERVICE | С  | S    |
| NODELOCATION   | 0  | 0    |
|                |    |      |

### Approach Parameters 58 38 SΒ WВ ₩В -£8 APPLABELS -#8 -NB .0 GRADES .0 .0 .0 PEDLEVELS LOW LOW LOW LOW PARKINGSIDES Parkvolumes NONE NONE NONE NONE 20 20 20 20 BUSVOLUMES Ø 0 0 0 RIGHTTURNONREDS 0 Ø 0 0

### Movement Parameters

| MOVLABELS       | RT   | тн   | LT   | RT   | тн   | LT   | RT   | тн   | LT   | RT   | тн   | LT   |
|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| VOLUMES         | 5    | 21   | 17   | 49   | 748  | 53   | 30   | 142  | 2392 | 512  | 266  | 41   |
| WIDTHS          | 12.0 | 12.0 | .0   | 12.0 | 24.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 24.0 | 12.0 |
| LANES           | 1    | 1    | 0    | 1    | 2    | 1    | 1    | 1    | 1    | 1    | 2    | 1    |
| UTILIZATIONS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| TRUCKPERCENTS   | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  |
| PEAKHOURFACTORS | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  |
| ARRIVALTYPES    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| ACTUATIONS      | NO   | YES  | YES  | NO   | YES  | YES  | NO   | YES  | YES  | NO   | YES  | YES  |
| REQCLEARANCES   | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  |
| MINIMUMS        | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  |
| IDEALSATFLOWS   | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| FACTORS         | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| DELAYFACTORS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| NSTOPFACTORS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| GROUPTYPES      | NORM | NORM | NORM | NORM | NORM | NÖRM | FFLW | NORM | DOPT | FFLW | NORM | NORM |
| SATURATIONFLOWS | 1539 | 1822 | 0    | 1539 | 3725 | 832  | 0    | 1783 | 1770 | 0    | 3725 | 486  |
|                 |      |      |      |      |      |      |      |      |      |      |      |      |

### Phasing Parameters

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| SEQUENCES   | 71   | ALL   |       |    |          |      |      |
|-------------|------|-------|-------|----|----------|------|------|
| PERMISSIVES | NO   | NO    | NO    | NO | LEADLAGS | NONE | NONE |
| OVERLAPS    | NO   | NO    | NO    | NO | OFFSET   | .00  | 1    |
| CYCLES      | 60   | 90    | 10    |    | PEDTIME  | .0   | 0    |
| GREENTIMES  | 9.09 | 25.59 | 13.32 |    |          |      |      |
| YELLOWTIMES | 4.00 | 4.00  | 4.00  |    |          |      |      |
| CRITICALS   | 2    | 9     | 5     |    |          |      |      |
| EXCESS      | 0    |       |       |    |          |      |      |

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 $\mathbf{v}_{i}^{*}$ 

| AM PE                                                                              | E BASE W/MI<br>Ak hour                                                                                       | [T                                                                                |                                                                                            |                                                                                                            |                                                                                                    |                                                                                      |                                                                       |                                                                                                                                              |                                                                                                               |                                                                                            | 27/97<br>56:04                                   | ,                                                                                                        |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| SIGNA                                                                              | L94/TEAPAC[                                                                                                  | 'V1 L1.                                                                           | 47 - 64                                                                                    | naattu                                                                                                     | <b>A m m h h h h h h h h h h</b>                                                                   |                                                                                      |                                                                       |                                                                                                                                              |                                                                                                               |                                                                                            |                                                  | Bind                                                                                                     |
|                                                                                    |                                                                                                              |                                                                                   |                                                                                            |                                                                                                            |                                                                                                    |                                                                                      |                                                                       |                                                                                                                                              |                                                                                                               |                                                                                            |                                                  |                                                                                                          |
| Incers                                                                             | section Ave<br>Degree of<br>@ expec                                                                          |                                                                                   |                                                                                            |                                                                                                            |                                                                                                    |                                                                                      |                                                                       |                                                                                                                                              |                                                                                                               |                                                                                            |                                                  | <b></b>                                                                                                  |
|                                                                                    | @ expec                                                                                                      | t more                                                                            | delay                                                                                      | due to                                                                                                     | extreme                                                                                            | e v/c's                                                                              | (see E                                                                | -90 Le<br>Valuate                                                                                                                            | vel of<br>)                                                                                                   | f Servi                                                                                    | ce D                                             |                                                                                                          |
| 5q 71                                                                              |                                                                                                              |                                                                                   | hase 2                                                                                     |                                                                                                            | se 3                                                                                               | •                                                                                    |                                                                       |                                                                                                                                              |                                                                                                               |                                                                                            |                                                  |                                                                                                          |
|                                                                                    | <br>  + * *                                                                                                  | <br>!                                                                             |                                                                                            |                                                                                                            |                                                                                                    |                                                                                      |                                                                       |                                                                                                                                              |                                                                                                               |                                                                                            |                                                  | . :                                                                                                      |
| /ix                                                                                | + * *<br> <+ * *>                                                                                            | ļ                                                                                 |                                                                                            |                                                                                                            | ++++                                                                                               |                                                                                      |                                                                       |                                                                                                                                              |                                                                                                               |                                                                                            |                                                  |                                                                                                          |
|                                                                                    |                                                                                                              | Î                                                                                 |                                                                                            | -                                                                                                          | <**** <br>++++                                                                                     |                                                                                      |                                                                       |                                                                                                                                              |                                                                                                               |                                                                                            |                                                  | التشك                                                                                                    |
| elst<br>orth                                                                       | }                                                                                                            | ļ                                                                                 | ~                                                                                          | ++++                                                                                                       | v                                                                                                  |                                                                                      |                                                                       |                                                                                                                                              |                                                                                                               |                                                                                            |                                                  | ·                                                                                                        |
|                                                                                    |                                                                                                              | ļ                                                                                 | <" +<br>* +                                                                                | +++><br>                                                                                                   | 1                                                                                                  |                                                                                      |                                                                       |                                                                                                                                              |                                                                                                               |                                                                                            |                                                  | 5.444                                                                                                    |
|                                                                                    |                                                                                                              |                                                                                   | * +                                                                                        | 1                                                                                                          | i                                                                                                  |                                                                                      |                                                                       |                                                                                                                                              |                                                                                                               |                                                                                            |                                                  | 4                                                                                                        |
|                                                                                    | G/C= .152                                                                                                    | G/C                                                                               | = .426                                                                                     |                                                                                                            |                                                                                                    |                                                                                      |                                                                       |                                                                                                                                              |                                                                                                               |                                                                                            |                                                  | 1 <b>4</b> .41                                                                                           |
| j                                                                                  | G=   9.1"<br>  Y+R= 4.0"                                                                                     | '   G=<br>  Y+R                                                                   | 25.6"<br># 4.0"                                                                            | G== 1<br>  Y+R=                                                                                            |                                                                                                    |                                                                                      |                                                                       |                                                                                                                                              |                                                                                                               |                                                                                            |                                                  | •                                                                                                        |
|                                                                                    | OFF≈ .0%                                                                                                     |                                                                                   | =21.8%                                                                                     |                                                                                                            |                                                                                                    |                                                                                      |                                                                       |                                                                                                                                              |                                                                                                               |                                                                                            |                                                  |                                                                                                          |
| c<br>                                                                              | C= 60 sec                                                                                                    | G= 48                                                                             | .0 sec                                                                                     |                                                                                                            | Y=12.                                                                                              | 0 sec =                                                                              | = 20.0%                                                               | Ped=                                                                                                                                         | .0 se                                                                                                         | °C =                                                                                       | .0%                                              |                                                                                                          |
| Lane<br>Grou                                                                       | C= 60 sec<br> Width/ <br> P   Lanes                                                                          |                                                                                   | <br>/c                                                                                     |                                                                                                            |                                                                                                    |                                                                                      |                                                                       | <br>  нсм                                                                                                                                    | <br>  L                                                                                                       | с =<br> 90% м<br>  Queu                                                                    | ax                                               |                                                                                                          |
| Lane<br>Grou                                                                       | Width/ <br>IP   Lanes                                                                                        |                                                                                   | <br>/c                                                                                     |                                                                                                            |                                                                                                    |                                                                                      |                                                                       | нсм                                                                                                                                          | L<br>  S                                                                                                      |                                                                                            | ax                                               |                                                                                                          |
| Lane<br>Grou<br>Appr                                                               | Width/ <br>IP   Lanes <br>oach<br>  12/1                                                                     | g<br>Reqd                                                                         | /C<br>Used                                                                                 | Servi<br>  @C (v                                                                                           | ce Rate<br>ph) @E                                                                                  | Adj<br> Volume                                                                       | <br>  v/c                                                             | HCM<br>  Delay<br>13.1                                                                                                                       | L<br>  S<br>  B                                                                                               | 90% M<br>  Queu                                                                            | ax <br>e                                         |                                                                                                          |
| Lane<br>Grou<br>Appr<br>RT                                                         | Width/ <br> P   Lanes <br>oach                                                                               | g<br>Reqd                                                                         | /C<br>Used                                                                                 | Servi<br>  @C (v                                                                                           | ce Rate<br>ph) @E                                                                                  | Adj<br> Volume                                                                       | <br>  v/c                                                             | HCM<br>  Delay<br>13.1<br>  12.9                                                                                                             | L<br>  S<br>  B                                                                                               | 90% M<br>  Queu                                                                            | ax <br>e  <br>                                   | <b>partere</b><br>1<br>Pract                                                                             |
| Lane<br>Grou<br>Appr<br>RT<br>T+TH                                                 | Width/ <br> p   Lanes <br>oach<br>  12/1  <br>  12/1                                                         | g<br>Reqd                                                                         | /C<br>Used                                                                                 | Servi<br>  @C (v                                                                                           | ce Rate<br>ph) @E                                                                                  | Adj<br> Volume                                                                       | <br>  v/c                                                             | HCM<br>  Delay<br>13.1<br>  12.9                                                                                                             | L<br>  S<br>  B<br>  B                                                                                        | 90% M<br>  Queu                                                                            | ax <br>e  <br>                                   |                                                                                                          |
| Lane<br>Grou<br>Appr<br>RT<br>T+TH                                                 | Width/ <br>19   Lanes <br>0ach<br>  12/1  <br>  12/1  <br>0ach                                               | g<br>Reqd<br>.009<br>.039                                                         | /C<br>Used<br>.185<br>.185                                                                 | Servi<br>  @C (v<br>  227<br>  225                                                                         | ce Rate<br>ph) @E<br>  284<br>  337                                                                | Adj<br> Volume<br>  5<br>  40                                                        | <br>  v/c<br>  .018<br>  .119                                         | HCM<br>  Delay<br>13.1<br>  12.9<br>  13.2<br>49.9                                                                                           | L<br>  S<br>  B<br>  B<br>  *B                                                                                | 90% M<br>  Queu<br>  25<br>  27                                                            | ax <br>e  <br>ft <br>ft                          |                                                                                                          |
| Lane<br>Grou<br>Appr<br>RT<br>T+TH                                                 | Width/ <br>P   Lanes <br>oach<br>  12/1  <br>  12/1  <br>oach<br>  12/1-                                     | g<br>Reqd<br>.009<br>.039                                                         | /C<br>Used<br>.185<br>.185<br>.185                                                         | Servi<br>  @C (v<br>  227<br>  275<br>  275                                                                | ce Rate<br>ph) @E<br>  284<br>  337<br>  820                                                       | Adj<br> Volume<br>  5<br>  40                                                        | <br>  v/c<br>  .018<br>  .119                                         | HCM<br>  Delay<br>13.1<br>  12.9<br>  13.2<br>49.9                                                                                           | L<br>  S<br>  B<br>  B<br>  *B                                                                                | 90% M<br>  Queu<br>  25<br>  27                                                            | ax <br>e  <br>ft <br>ft                          | рини<br>(<br>)<br>рини<br>рини<br>(<br>)<br>каке (<br>)<br>(<br>)<br>(<br>)<br>(<br>)                    |
| Lane<br>Grou<br>Appr<br>RT<br>T+TH<br>Appro                                        | Width/ <br>19   Lanes <br>0ach<br>  12/1  <br>  12/1  <br>0ach                                               | g<br>Reqd<br>.009<br>.039                                                         | /C<br>Used<br>.185<br>.185<br>.185                                                         | Servi<br>  @C (v<br>  227<br>  275<br>  275                                                                | ce Rate<br>ph) @E<br>  284<br>  337<br>  820                                                       | Adj<br> Volume<br>  5<br>  40                                                        | <br>  v/c<br>  .018<br>  .119                                         | HCM<br>  Delay<br>13.1<br>  12.9<br>  13.2<br>49.9                                                                                           | L<br>  S<br>  B<br>  B<br>  *B                                                                                | 90% M<br>  Queu<br>  25<br>  27                                                            | ax <br>e  <br>ft <br>ft <br>ft                   | рана<br>()<br>рана<br>рана<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>() |
| Lane<br>Grou<br>Appr<br>RT<br>T+TH<br>Appro<br>TH<br>LT                            | Width/ <br>p   Lanes <br>oach<br>  12/1  <br>  12/1  <br>  12/1  <br>oach<br>  12/1- <br>  12/1- <br>  12/1+ | g<br>Reqd<br>.009<br>.039<br>.752  <br>.732                                       | /C<br>Used<br>.185<br>.185<br>.460<br>.460                                                 | Servi<br>  @C (v<br>  227<br>  275<br>  275<br>  780<br>  774                                              | ce Rate<br>ph) @E<br>  284<br>  337<br>  820<br>  814                                              | Adj<br> Volume<br>  5<br>  40<br>  1368<br>  1299                                    | <br>  v/c<br>  .018<br>  .119                                         | HCM<br>  Delay<br>13.1<br>  12.9<br>  13.2<br>  49.9<br>  49.8<br>  49.9                                                                     | L<br>  S<br>  B<br>  * B<br>  * B<br>  * E<br>  * E+                                                          | 90% M<br>  Queu<br>  25<br>  27                                                            | ax <br>e  <br>ft <br>ft <br>ft                   | рини<br>(<br>)<br>рини<br>рини<br>(<br>)<br>каке (<br>)<br>(<br>)<br>(<br>)<br>(<br>)                    |
| Lane<br>Grou<br>Appr<br>RT<br>T+TH<br>Appro<br>TH<br>LT                            | Width/ <br>P   Lanes <br>oach<br>  12/1  <br>  12/1  <br>  12/1- <br>  12/1- <br>  12/1+ <br>oach            | g<br>Reqd<br>.009<br>.039<br>.762  <br>.732                                       | /C<br>Used<br>.185<br>.185<br>.460<br>.460                                                 | Servi<br>  @C (v<br>  227<br>  275<br>  275<br>  776  <br>774                                              | ce Rate<br>ph) @E<br>  284<br>  337<br>  820  <br>814                                              | Adj<br> Volume<br>  5<br>  40<br>  1368<br>  1299                                    | v/c<br>  .018<br>  .119<br> 1.668<br> 1.596                           | HCM<br>  Delay<br>13.1<br>  12.9<br>  13.2<br>  49.9<br>  49.8<br>  49.9<br>  49.8                                                           | L<br>  S<br>  B<br>  *B<br>  *B<br>  *B<br>  *E+<br>] E+<br>] E+<br>] C+                                      | 90% M<br>  Queu<br>  25<br>  27<br>  27<br>  27<br>  592 f                                 | ax <br>e  <br>ft <br>ft <br>ft                   | ранан<br>1<br>2<br>2<br>2<br>2<br>2<br>4<br>- 4<br>- 5<br>- 5<br>- 5<br>- 5<br>- 5<br>- 5<br>- 5<br>- 5  |
| Lane<br>Grou<br>Appr<br>RT<br>T+TH<br>Appro<br>TH<br>LT<br>Appro<br>RT<br>TH       | Width/ <br>P   Lanes <br>oach<br>  12/1  <br>  12/1  <br>  12/1- <br>  12/1+ <br>bach<br>  12/1  <br>  24/2  | g<br>Reqd<br>.009<br>.039<br>.752  <br>.732  <br>.732  <br>.732  <br>.732         | /C<br>Used<br>.185<br>.185<br>.185<br>.460<br>.460                                         | Servi<br>  @C (v<br>  227<br>  275<br>  275<br>  780  <br>774  <br>  774                                   | ce Rate<br>ph) @E<br>  284<br>  337<br>  337<br>  314<br>  393  <br>951                            | Adj<br> Volume<br>  5<br>  40<br>  1368<br>  1299<br>  52                            | / v/c<br>/ .018<br>/ .119<br>/1.668<br>/1.596                         | HCM<br>  Delay<br>13.1<br>  12.9<br>  13.2<br>  13.2<br>  49.9<br>  49.8<br>  49.9<br>  49.8<br>  49.9<br>  17.2<br>  11.1                   | L<br>  S<br>  B<br>  *B<br>  *B<br>  *E+<br>] *E+<br>] *E+<br>] C+                                            | 90% M<br>  Queu<br>  25<br>  27<br>  27<br>  27<br>  27<br>  592 f                         | ax <br>e  <br>ft <br>ft <br>ft <br>ft            |                                                                                                          |
| Lane<br>Grou<br>Appr<br>RT<br>T+TH<br>Appro<br>Appro<br>RT                         | Width/ <br>P   Lanes <br>oach<br>  12/1  <br>  12/1  <br>  12/1- <br>  12/1+ <br>oach<br>  12/1              | g<br>Reqd<br>.009<br>.039<br>.752  <br>.732  <br>.732  <br>.732  <br>.230         | /C<br>Used<br>.185<br>.185<br>.185<br>.460<br>.460                                         | Servi<br>  @C (v<br>  227<br>  275<br>  275<br>  780  <br>774  <br>  774                                   | ce Rate<br>ph) @E<br>  284<br>  337<br>  337<br>  314<br>  393  <br>951                            | Adj<br> Volume<br>  5<br>  40<br>  1368<br>  1299<br>  1299<br>  52  <br>787         | / v/c<br>/ .018<br>/ .119<br>/1.668<br>/1.596                         | HCM<br>  Delay<br>13.1<br>  12.9<br>  13.2<br>  13.2<br>  49.9<br>  49.8<br>  49.9<br>  49.8<br>  49.9<br>  17.2<br>  11.1<br>  17.9         | L<br>  S<br>  B<br>  *B<br>  *B<br>  *E+<br>  E+<br>  E+<br>  C+<br>  B  <br>  *C+                            | 90% M<br>  Queu<br>  25<br>  27<br>  27<br>  27<br>  592 f                                 | ax <br>e  <br>ft <br>ft <br>ft <br>t <br>t       | ранан<br>1<br>2<br>2<br>2<br>2<br>2<br>4<br>- 4<br>- 5<br>- 5<br>- 5<br>- 5<br>- 5<br>- 5<br>- 5<br>- 5  |
| Lane<br>Grou<br>Appr<br>RT<br>T+TH<br>Appro<br>TH<br>LT<br>Appro<br>RT<br>TH<br>LT | <pre> Width/  p   Lanes  oach   12/1     12/1     12/1-    12/1+  oach   12/1     24/2     12/1   ach</pre>  | g<br>Reqd<br>.009<br>.039<br>.039<br>.752<br>.732<br>.757<br>.057<br>.000         | /C<br>Used<br>.185<br>.185<br>.185<br>.185<br>.460<br>.460<br>.460<br>.255<br>.255<br>.255 | Servi<br>  @C (v<br>  227<br>  275<br>  275<br>  275<br>  780  <br>774  <br>774  <br>774  <br>884  <br>167 | ce Rate<br>ph) @E<br>  284<br>  337<br>  337<br>  820  <br>814  <br>814  <br>814  <br>814  <br>951 | Adj<br> Volume<br>  5<br>  40<br>  1368<br>  1299<br>  1299<br>  52  <br>787         | / v/c<br>/ .018<br>/ .119<br>/1.668<br>/1.596<br>.132<br>.828         | HCM<br>  Delay<br>13.1<br>  12.9<br>  13.2<br>49.9<br>  49.8<br>  49.9<br>  49.8<br>  49.9<br>  13.2<br>17.2<br>  11.1<br>  17.9<br>  11.7   | L<br>  S<br>  B<br>  *B<br>  *B<br>  *B<br>  *E+<br>] *E+<br>] *C+<br>  B  <br>  *C+<br>  B                   | 90% M<br>  Queu<br>  25<br>  27<br>  27<br>  27<br>  27<br>  27<br>  27<br>  33 f<br>247 f | ax <br>e  <br>ft <br>ft <br>ft <br>t <br>t <br>t |                                                                                                          |
| Lane<br>Grou<br>Appr<br>RT<br>T+TH<br>Appro<br>TH<br>LT<br>Appro<br>RT<br>TH<br>LT | <pre> Width/  p   Lanes  oach   12/1     12/1     12/1-    12/1+  oach   12/1     24/2     12/1   ach</pre>  | g<br>Reqd<br>.009<br>.039<br>.039<br>.752  <br>.732  <br>.732  <br>.000  <br>.000 | /C<br>Used<br>.185<br>.185<br>.185<br>.185<br>.460<br>.460<br>.460<br>.255<br>.255<br>.255 | Servi<br>  @C (v<br>  227<br>  275<br>  275<br>  275<br>  780  <br>774  <br>774  <br>335  <br>884  <br>167 | ce Rate<br>ph) @E<br>  284<br>  337<br>  337<br>  393  <br>951  <br>212                            | Adj<br> Volume<br>  5<br>  40<br>  1368<br>  1299<br>  1299<br>  52  <br>787  <br>56 | / v/c<br>/ .018<br>/ .119<br>/1.668<br>/1.596<br>.132<br>.828<br>.263 | HCM<br>  Delay<br>13.1<br>  12.9<br>  13.2<br>49.9<br>  49.8<br>  49.9<br>  49.8<br>  49.9<br>  17.2<br>  11.1<br>  17.9<br>  11.7<br>  11.8 | L<br>  S<br>  B<br>  *B<br>  *B<br>  *B<br>  *E+<br>] *E+<br>] *E+<br>  E+<br>] *C+<br>  *C+<br>  B  <br>  *B | 90% M<br>Queu<br>25<br>27<br>27<br>592 f<br>33 f<br>247 f<br>35 f                          | ax <br>e  <br>ft <br>ft <br>t <br>t <br>t        | parton<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1                                  |

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**8**11

KULAMALU FUTURE BASE W/MIT PM PEAK HOUR

### 03/27/97 18:58:47

1

.95

3

NO

4.0

12.0 24.0 12.0

2

1.00 1.00 1.00

2.0 2.0 2.0

.95

YES

4.0

5.0 5.0 5.0

1900 1900 1900

1.00 1.00 1.00

1.00 1.00 1.00

1.00 1.00 1.00

0 3725 541

3

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3

.95

YES

4.0

## SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

| Intersection    | Para   | neters     | for | Int | Ħ  | 0 -  | HALE | AKALA | нωч | 8        | HANA | HWY  |         |    |
|-----------------|--------|------------|-----|-----|----|------|------|-------|-----|----------|------|------|---------|----|
| METROAREA       |        | NONC       | BD  |     |    |      |      |       |     |          |      |      |         |    |
| LOSTTIME        |        |            | . 0 |     |    |      |      |       |     |          |      |      |         |    |
| LEVELOFSERVICE  |        | с          | s   |     |    |      |      |       |     |          |      |      |         |    |
| NODELOCATION    |        | ø          | ø   |     |    |      |      |       |     |          |      |      | •       |    |
| Approach Para   | ameter | <b>`</b> S |     |     |    |      |      |       |     |          |      |      |         |    |
|                 |        | EB         |     |     |    | \$B  |      |       |     |          |      |      |         |    |
| APPLABELS       |        | - 58       |     |     |    | +8   |      |       | 2   | NB-      |      |      | Ng      |    |
| GRADES          |        | .0         |     |     |    | .0   |      |       |     | 0        |      |      | -68     |    |
| PEDLEVELS       |        | LOW        |     |     |    | LOW  |      |       |     |          |      |      | .0      |    |
| PARKINGSIDES    |        | NONE       |     |     |    | NONE |      |       | LO  |          |      |      | LOW     |    |
| PARKVOLUMES     |        | 20         |     |     |    | +    |      |       | NON | -        |      |      | NONE    |    |
| BUSVOLUMES      |        | 20         |     |     |    | 20   |      |       | 2   |          |      |      | 20      |    |
| RIGHTTURNONREDS |        | ø          |     |     |    | 0    |      |       |     | 0        |      |      | 0       |    |
|                 |        | 0          |     |     |    | Ø    |      |       |     | ø        |      |      | Ø       |    |
| Movement Para   | meter  | 5          |     |     |    |      |      |       |     |          |      |      |         |    |
| MOVLABELS       | RT     | тн         | LT  | 1   | ۲۶ | тн   | LT   | RT    | т   | LI       |      |      | <b></b> |    |
| VOLUMES         | 25     | 257        | 161 |     | 40 | 506  | 56   | 34    |     |          | LT   | RT   | TH      | LT |
| LITOTUS         |        |            |     |     |    |      | 50   | 34    | 37  | <i>(</i> | 804  | 1552 | 607     | 2  |

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FFLW NORM DOPT FFLW NORM NORM

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| REQCLEARANCES | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 1 0  |
|---------------|------|------|------|------|------|------|
| MINIMUMS      |      | 5.0  |      |      | 5.0  |      |
| IDEALSATFLOWS | 1900 | 1900 | 1900 |      | 1900 |      |
| FACTORS       | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| DELAYFACTORS  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

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### Phasing Parameters

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SATURATIONFLOWS 1539 1828

| SEQUENCES<br>PERMISSIVES<br>OVERLAPS<br>CYCLES<br>GREENTIMES<br>YELLOWTIMES<br>CRITICALS | 71<br>NO<br>60<br>17.62<br>4.00<br>2 | ALL<br>NO<br>120<br>18.62<br>4.00<br>8 | NO<br>NO<br>10<br>11.76<br>4.00<br>11 | N 0<br>N 0 | LEADLAGS<br>OFFSET<br>PEDTIME | NONE<br>.00<br>.0 | NONE<br>1<br>Ø |
|------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------|---------------------------------------|------------|-------------------------------|-------------------|----------------|
| EXCESS                                                                                   | 0                                    | 0                                      | **                                    |            |                               |                   |                |

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WIDTHS

UTILIZATIONS

ARRIVALTYPES

REQCLEARANCES

NSTOPFACTORS

GROUPTYPES

ACTUATIONS

TRUCKPERCENTS

PEAKHOURFACTORS

LANES

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| LAMALU                                                                         |                                                                                                                                          |                                                                        |                                                                                              |                                                                       |                                                                                                 |                                                                    |                                                                 |                                                                                                   |                                                                                                                    | 03/2                                               | 7/97 —                                                                                                                                                                    |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TURE B<br>PEAK                                                                 | ASE W/MIT<br>Hour                                                                                                                        | -                                                                      |                                                                                              |                                                                       |                                                                                                 |                                                                    |                                                                 |                                                                                                   |                                                                                                                    | 18:5                                               | •                                                                                                                                                                         |
|                                                                                | 4                                                                                                                                        |                                                                        |                                                                                              |                                                                       |                                                                                                 |                                                                    |                                                                 |                                                                                                   |                                                                                                                    |                                                    |                                                                                                                                                                           |
| GNAL94                                                                         | /TEAPAC[V                                                                                                                                | '1 L1.4                                                                | ] - Cap                                                                                      | acity A                                                               | nalysie                                                                                         | s Summar                                                           | гу                                                              |                                                                                                   |                                                                                                                    |                                                    | • ,                                                                                                                                                                       |
|                                                                                | tion Aver<br>gree of S                                                                                                                   |                                                                        |                                                                                              |                                                                       |                                                                                                 | (ALA HWY<br>De Dela                                                |                                                                 |                                                                                                   | lof                                                                                                                | Servi                                              |                                                                                                                                                                           |
|                                                                                | J                                                                                                                                        |                                                                        |                                                                                              | -,                                                                    |                                                                                                 |                                                                    | -,                                                              |                                                                                                   | ,                                                                                                                  |                                                    |                                                                                                                                                                           |
| 71                                                                             | Phase 1                                                                                                                                  | Ph                                                                     | ase 2                                                                                        | Phas                                                                  | e 3                                                                                             |                                                                    |                                                                 |                                                                                                   |                                                                                                                    |                                                    | <b>S</b> istui                                                                                                                                                            |
| /**/<br>  ·                                                                    | <br>+ * *                                                                                                                                |                                                                        |                                                                                              | ·                                                                     | ~ ]                                                                                             |                                                                    |                                                                 |                                                                                                   |                                                                                                                    |                                                    |                                                                                                                                                                           |
| ·   ·                                                                          | + * *                                                                                                                                    | 1                                                                      |                                                                                              | 1                                                                     | ++++ <br>  ++++>                                                                                |                                                                    |                                                                 |                                                                                                   |                                                                                                                    |                                                    |                                                                                                                                                                           |
|                                                                                | v                                                                                                                                        |                                                                        | •                                                                                            | -                                                                     | ++++                                                                                            |                                                                    |                                                                 |                                                                                                   |                                                                                                                    |                                                    |                                                                                                                                                                           |
| st  <br>= <del>th</del>                                                        |                                                                                                                                          | 1                                                                      | ~<br><+ *                                                                                    | ++++<br> ****>                                                        |                                                                                                 |                                                                    |                                                                 |                                                                                                   |                                                                                                                    |                                                    |                                                                                                                                                                           |
|                                                                                |                                                                                                                                          | }                                                                      | + *<br>+ *                                                                                   |                                                                       | Ì                                                                                               |                                                                    |                                                                 |                                                                                                   |                                                                                                                    |                                                    |                                                                                                                                                                           |
|                                                                                |                                                                                                                                          |                                                                        |                                                                                              |                                                                       |                                                                                                 |                                                                    |                                                                 |                                                                                                   |                                                                                                                    |                                                    | p                                                                                                                                                                         |
|                                                                                | G/C= .294<br>G= 17.6"                                                                                                                    |                                                                        |                                                                                              | G/C=<br>  G= 1                                                        |                                                                                                 |                                                                    |                                                                 |                                                                                                   |                                                                                                                    |                                                    | ۰.                                                                                                                                                                        |
|                                                                                | Y+R= 4.0"<br>DFF= .0%                                                                                                                    |                                                                        | - 4.0"<br>-36.0%                                                                             | Y+R≖<br>  OFF≖7                                                       |                                                                                                 |                                                                    |                                                                 |                                                                                                   |                                                                                                                    |                                                    |                                                                                                                                                                           |
|                                                                                |                                                                                                                                          |                                                                        |                                                                                              |                                                                       |                                                                                                 |                                                                    |                                                                 |                                                                                                   |                                                                                                                    |                                                    | <b>.</b>                                                                                                                                                                  |
| C=                                                                             | 60 sec                                                                                                                                   | G= 48.                                                                 | .0 sec                                                                                       | = 80.0%                                                               | Y=12.                                                                                           | 0 sec =                                                            | 20.0%                                                           | Ped= .                                                                                            | .0 se                                                                                                              |                                                    | .0*                                                                                                                                                                       |
|                                                                                |                                                                                                                                          |                                                                        |                                                                                              |                                                                       |                                                                                                 |                                                                    |                                                                 |                                                                                                   |                                                                                                                    |                                                    |                                                                                                                                                                           |
|                                                                                | 1.1.2                                                                                                                                    |                                                                        | <br>/c                                                                                       |                                                                       |                                                                                                 |                                                                    |                                                                 |                                                                                                   |                                                                                                                    |                                                    |                                                                                                                                                                           |
|                                                                                | Width/ <br>  Lanes                                                                                                                       |                                                                        |                                                                                              | Servi<br>  @C (v                                                      |                                                                                                 |                                                                    |                                                                 | HCM<br>  Delay                                                                                    | _                                                                                                                  | 90% M<br>Queu                                      |                                                                                                                                                                           |
|                                                                                |                                                                                                                                          |                                                                        |                                                                                              |                                                                       |                                                                                                 |                                                                    |                                                                 |                                                                                                   | _                                                                                                                  |                                                    |                                                                                                                                                                           |
| Group<br>Approz                                                                | Lanes <br>                                                                                                                               | Reqd                                                                   | Used                                                                                         | @C (v                                                                 | ph) @E<br>                                                                                      | Volume                                                             | / v/c                                                           | Delay<br>14.5                                                                                     | S<br><br>B                                                                                                         | Queu                                               | ie                                                                                                                                                                        |
| Group<br>Approz                                                                | Lanes <br>                                                                                                                               | Reqd<br>.033                                                           | Used<br>                                                                                     | @C (V <br>                                                            | ph) @E                                                                                          | Volume<br>  26                                                     | v/c<br>  .052                                                   | Delay<br>14.5                                                                                     | S<br>                                                                                                              | Queu<br>25                                         | ft                                                                                                                                                                        |
| Group<br>Approa<br>RT<br>+TH                                                   | Lanes <br>                                                                                                                               | Reqd<br>.033<br>.274                                                   | Used<br>.327<br>.327                                                                         | @C (∨ <br>  449<br>  543                                              | ph) @E<br><br>  503<br>  598                                                                    | Volume<br>  26<br>  440                                            | v/c<br>  .052<br>  .736                                         | Delay<br>14.5<br>  8.9<br>  14.8                                                                  | S<br>  B<br>  8+<br> *B                                                                                            | Queu<br>25<br>250                                  | ft <br>ft                                                                                                                                                                 |
| Group<br>Approz<br>RT<br>+TH                                                   | Lanes <br>ach<br>  12/1  <br>  12/1                                                                                                      | Reqd<br>.033<br>.274                                                   | Used<br>.327<br>.327                                                                         | @C (∨ <br>  449<br>  543                                              | ph) @E<br><br>  503<br>  598                                                                    | Volume<br>  26<br>  440                                            | v/c<br>  .052<br>  .736                                         | Delay<br>14.5<br>  8.9<br>  14.8                                                                  | B<br>  8+<br> *8                                                                                                   | Queu<br>25<br>250                                  | ft <br>ft                                                                                                                                                                 |
| Group<br>Approz<br>RT<br>+TH<br>Approa                                         | Lanes <br>  12/1  <br>  12/1  <br>  12/1                                                                                                 | Reqd<br>.033<br>.274                                                   | Used<br>.327<br>.327                                                                         | @C (∨ <br>  449<br>  543                                              | ph) @E<br>  503<br>  598                                                                        | Volume<br>  26<br>  440                                            | v/c<br>  .052<br>  .736                                         | Delay<br>14.5<br>  8.9<br>  14.8<br>  14.1                                                        | S<br>  B+<br> ★B<br>                                                                                               | Queu<br>25<br>250                                  | ft <br>ft <br>ft <br>ft <br>ft                                                                                                                                            |
| Group<br>Approa<br>RT<br>+TH<br>Approa<br>TH                                   | Lanes <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                                                                     | Reqd<br>.033<br>.274                                                   | Used<br>.327<br>.327<br>.327                                                                 | @C (∨ <br>  449<br>  543<br>  558                                     | ph) @E<br>  503<br>  598<br>  612                                                               | Volume<br>  26<br>  440<br>  454                                   | v/c<br>  .052<br>  .736<br>  .742                               | Delay<br>14.5<br>  8.9<br>  14.8<br>  14.1<br>  14.6                                              | S<br>  8+<br> ★B<br> <br> ★B                                                                                       | Queu<br>25<br>250<br>251                           | ie     i       ft      i       ft      i       ft      i       ft      i       ft      i                                                                                  |
| Group<br>Approa<br>RT<br>+TH<br>Approa<br>TH<br>LT                             | Lanes <br>  12/1  <br>  12/1  <br>  12/1                                                                                                 | Reqd<br>.033<br>.274<br>.288 [<br>.277 ]                               | Used<br>.327<br>.327<br>.327<br>.344<br>.344                                                 | @C (∨ <br>  449<br>  543<br>  558<br>  558                            | ph) @E<br>  503<br>  598<br>  612<br>  608                                                      | Volume<br>  26<br>  440<br>  454<br>  454<br>  431                 | ∨/c<br>  .052<br>  .736<br>  .742<br>  .742<br>  .709           | Delay<br>14.5<br>  8.9<br>  14.8<br>14.1<br>  14.6<br>  13.7                                      | S<br>  8+<br> *8<br> <br> *8  <br>  8                                                                              | Queu<br>25<br>250<br>251<br>239                    | ft         ft         ft         ft         ft                                                                                                                            |
| Group<br>Approa<br>RT<br>+TH<br>Approa<br>TH<br>LT                             | Lanes <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1- <br>  12/1- <br>  12/1+                                                            | Reqd<br>.033<br>.274<br>.288 [<br>.277 ]                               | Used<br>.327<br>.327<br>.327<br>.344<br>.344                                                 | @C (∨ <br>  449<br>  543<br>  558<br>  558                            | ph) @E<br>  503<br>  598<br>  612<br>  608                                                      | Volume<br>  26<br>  440<br>  454<br>  454<br>  431                 | ∨/c<br>  .052<br>  .736<br>  .742<br>  .742<br>  .709           | Delay<br>14.5<br>  8.9<br>  14.8<br>14.1<br>  14.6<br>  13.7                                      | S<br>  8+<br> *8<br> <br> *8<br> <br>  8                                                                           | Queu<br>25<br>250<br>251<br>239                    | ft         ft         ft         ft         ft         st                                                                                                                 |
| Group<br>Approa<br>RT<br>+TH<br>Approa<br>TH<br>LT<br>Approa                   | Lanes <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1- <br>  12/1- <br>  12/1+                                                            | Reqd<br>.033<br>.274<br>.288<br>.277                                   | Used<br>. 327<br>. 327<br>. 344<br>. 344<br>. 344                                            | @C (∨ <br>  449<br>  543<br>  558<br>  554                            | ph) @E<br>  503<br>  598<br>  612<br>  608                                                      | Volume<br>  26<br>  440<br>  454<br>  454<br>  431                 | ∨/c<br>  .052<br>  .736<br>  .742<br>  .709                     | Delay<br>14.5<br>  8.9<br>  14.8<br>14.1<br>  14.6<br>  13.7<br>14.3                              | S<br>  B+<br> *B<br>  B<br>  B  <br>  B                                                                            | Queu<br>25<br>250<br>251<br>239                    | ft         ft         ft         ft      2-4       ft      2-4       ft      2-4       ft      2-4       ft      2-4                                                      |
| Group<br>Approa<br>RT<br>+TH<br>Approa<br>TH<br>LT<br>Approa<br>RT<br>TH       | Lanes <br>ch<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1+ <br>ch<br>  12/1  <br>  24/2                                                 | Reqd<br>.033<br>.274<br>.288<br>.277<br>.048<br>.164                   | Used<br>.327<br>.327<br>.327<br>.344<br>.344<br>.344<br>.344                                 | @C (∨ <br>  449<br>  543<br>  558<br>  554<br>  554<br>  295  <br>783 | ph) @E<br>  503<br>  598<br>  612<br>  608<br>  353<br>  854                                    | Volume<br>  26<br>  440<br>  454<br>  431<br>  42<br>  533         | ∨/c<br>  .052<br>  .736<br>  .742<br>  .709<br>  .119<br>  .624 | <pre>14.5 14.5 8.9 14.8 14.1 14.6 13.7 14.3 11.8 14.5</pre>                                       | S<br>  8+<br> *8<br>  8<br>  8<br>  8<br>  8                                                                       | Queu<br>25<br>250<br>251<br>239<br>27<br>173       | ft      ft        ft      ft        ft      ft        ft      ft        ft      ft        ft      ft        ft      ft        ft      ft                                  |
| Group<br>Approa<br>RT<br>+TH<br>Approa<br>TH<br>LT<br>Approa<br>RT<br>TH       | Lanes <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1- <br>  12/1+ <br>  12/1                                                             | Reqd<br>.033<br>.274<br>.288<br>.277<br>.048<br>.164                   | Used<br>.327<br>.327<br>.327<br>.344<br>.344<br>.344<br>.344                                 | @C (∨ <br>  449<br>  543<br>  558<br>  554<br>  554<br>  295  <br>783 | ph) @E<br>  503<br>  598<br>  612<br>  608<br>  353<br>  854                                    | Volume<br>  26<br>  440<br>  454<br>  431<br>  42<br>  533         | ∨/c<br>  .052<br>  .736<br>  .742<br>  .709<br>  .119<br>  .624 | <pre>14.5 14.5 8.9 14.8 14.1 14.6 13.7 14.3 11.8 14.5</pre>                                       | S<br>  8+<br> *8<br>  8<br>  8<br>  8<br>  8                                                                       | Queu<br>25<br>250<br>251<br>239<br>27<br>173       | ft         ft         ft         ft         ft         ft         ft         ft         ft         ft         ft         ft         ft                                    |
| Group<br>Approa<br>RT<br>+TH<br>Approa<br>TH<br>LT<br>Approa<br>RT<br>TH<br>LT | Lanes <br>ch<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1- <br>  12/1+ <br>ch<br>  12/1  <br>  24/2  <br>  12/1                         | Reqd<br>.033<br>.274<br>.288<br>.277<br>.048<br>.164                   | Used<br>.327<br>.327<br>.327<br>.344<br>.344<br>.344<br>.344                                 | @C (∨ <br>  449<br>  543<br>  558<br>  554<br>  554<br>  295  <br>783 | ph) @E<br>  503<br>  598<br>  612<br>  608<br>  353<br>  854                                    | Volume<br>  26<br>  440<br>  454<br>  431<br>  42<br>  533         | ∨/c<br>  .052<br>  .736<br>  .742<br>  .709<br>  .119<br>  .624 | Delay<br>14.5<br>  8.9<br>  14.8<br>14.1<br>  14.6<br>  13.7<br>14.3<br>11.8<br>14.5<br>15.1      | B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>B<br>C<br>+<br>I<br>B<br>C<br>+<br>I<br>C<br>+                   | Queu<br>25<br>250<br>251<br>239<br>27<br>173       | ft      ft        ft      ft        ft      ft        ft      ft        ft      ft        ft      ft        ft      ft        ft      ft                                  |
| Approa<br>RT<br>+TH<br>Approa<br>TH<br>LT<br>Approa<br>RT<br>TH<br>LT          | Lanes <br>ch<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1- <br>  12/1+ <br>ch<br>  12/1  <br>  24/2  <br>  12/1  <br>  24/2  <br>  12/1 | Reqd<br>.033<br>.274<br>.288 [<br>.277 ]<br>.048 ]<br>.164 [<br>.000 ] | Used<br>.327<br>.327<br>.327<br>.344<br>.344<br>.344<br>.344<br>.229<br>.229<br>.229<br>.229 | @C (∨ <br>  449<br>  543<br>  558<br>  554<br>  295  <br>783  <br>89  | ph) @E<br>  503<br>  598<br>  598<br>  612<br>  608<br>  612<br>  608<br>  12<br>  628<br>  117 | Volume<br>  26<br>  440<br>  454<br>  431<br>  42<br>  533<br>  59 | <pre></pre>                                                     | Delay<br>14.5<br>  8.9<br>  14.8<br>14.1<br>14.6<br>  3.7<br>14.3<br>11.8<br>14.5<br>15.1<br>16.4 | S<br>  8+<br> *8<br>  8<br>  8<br>  8<br>  8<br>  8<br>  8<br>  8<br>  7<br>  8<br>  7<br>  7<br>  7<br>  7<br>  7 | Queu<br>25<br>250<br>251<br>239<br>27<br>173<br>38 | ft     ft       ft     ft       ft     ft       ft     ft       ft     ft       ft     ft       ft     ft       ft     ft       ft     ft       ft     ft       ft     ft |

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reader Mark a service grave (1999) in the service and and service services and

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| SIGNAL94/TEAPACL                                                                                                                                                                                                                                    | VI L1.4! - Summa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ary of Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Values                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| Intersection                                                                                                                                                                                                                                        | Parameters for 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Int # ⊙ - BYPA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | SS & HALFANALA HY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| METROAREA<br>LOSTTIME<br>LEVELOFSERVICE<br>NODELOCATION                                                                                                                                                                                             | NDNC6D<br>2.0<br>0 S<br>0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Approach Para                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| APPLABELS<br>GRADES<br>PEDLEVELS<br>PARKINGSIDES<br>PARKVOLUMES<br>BUSVOLUMES<br>RIGHTTURNONREDS                                                                                                                                                    | EB<br>SB<br>LOW<br>NONE<br>20<br>CI<br>S                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 50<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ฟุธ<br>75<br>-6.0<br>Low<br>None<br>10<br>0<br>0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | NB<br>.C<br>LOW<br>NONE<br>20<br>C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Movement Para                                                                                                                                                                                                                                       | meters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| MOVLABELS<br>VOLUMES<br>WIDTHS<br>LANES<br>UTILIZATIONS<br>TRUCKPERCENTS<br>PEAKHOURFACTORS<br>ARRIVALTYPES<br>ACTUATIONS<br>REQCLEARANCES<br>MINIMUMS<br>IDEALSATFLOWS<br>FACTORS<br>DELAYFACTORS<br>NSTOPFACTORS<br>GROUPTYPES<br>SATURATIONFLOWS | RT       TH       LT         17°       302       0         12.0       24.0       .0         1       2       0         1.00       1.00       1.00         2.0       2.0       2.0         .95       .95       .95         3       3       3         N0       FES       .65         4.0       4.0       4.0         5.0       5.0       5.0         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         0       1807       2 | RT       TH       LT         0       0       0       0         0       0       0       0         0       0       0       0         1.00       1.00       1.00         2.0       2.0       2.0       2.0         .95       3       5       3         NO       rES       YES         4.0       4.0       4.0         5.0       5.0       5.0         1900       1900       1900         1.00       1.00       1.00         1.00       1.00       1.00         NORM       NORM       NORM         0       0       0 | RT       TH       LT         0       1432       0         0       24.0       .0         0       24.0       .0         0       24.0       .00         1.00       1.00       1.00         2.0       2.0       2.0         .95       .95       .95         .95       .95       .95         .95       .95       .95         .95       .95       .95         .95       .95       .95         .95       .95       .95         .95       .95       .95         .95       .95       .95         .95       .95       .95         .90       .95       .95         .90       .90       .90         .900       .90       .90         .900       .90       .90         .900       .90       .90         .900       .90       .90         .900       .90       .90         .900       .90       .90         .900       .90       .90         .900       .90       .90         .900       .90 | PT       TH       LT         0       0       1012         0       .0       24.0         0       0       24.0         0       0       24.0         0       0       24.0         0       2.0       2.0         1.00       1.00       1.00         2.0       2.0       2.0         .95       .95       .95         3       3       3         ND       765       765         4.0       4.0       4.0         5.0       5.0       5.0         1.00       3.900       1.900         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         NORM <norm< td="">       NORM       NORM         0       1.5078       1.5078</norm<> |
| Phasing Param                                                                                                                                                                                                                                       | eteri                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| SEQUENCES<br>PERMISSIVES<br>OVERLAPS<br>CYCLES<br>GREENTIMES<br>YELLOWTIMES<br>CRITICALS<br>EXCESS                                                                                                                                                  | 11 AL<br>128 YE5<br>128 YE5<br>120 121<br>27.45 24.55<br>4.00 4.00<br>8 12<br>0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 165 165<br>165 165<br>10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | LEAGLAGS<br>Offset<br>Peotime                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | NONE MONE<br>.00 1<br>.00 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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KULAMALU FUTURE BASE W/MIT AM PEAK HOUR

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| KULAMA<br>FUTURE<br>AM PEA                                   | ALU<br>E BASE W/MIJ<br>K HOUR                                |                                                                                 | 07/03/55<br>10:26:11                                                                                                                                                                                                                        | <b>بدت ک</b><br>ا                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| SIGNAL                                                       | 947 TEAPAC (V                                                | 1 (1.4) - Cap                                                                   | pacity Analysis Summary                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Inters                                                       | ection Aver                                                  | ages for Int                                                                    | # 0 - BYPASS & HALEAKALA HY                                                                                                                                                                                                                 | <b>E</b> dant                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| q 11<br>**/**                                                | Phase 1                                                      | Phase 2                                                                         | 1                                                                                                                                                                                                                                           | <b>حت</b> ه                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| ust<br><del>erth</del>                                       | -<br>                                                        | *****<br>                                                                       | ·                                                                                                                                                                                                                                           | guara.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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|                                                              | G= 27.4"<br>Y+R= 4 0"                                        | G/C= .409<br>  G= 24.6"<br>  Y+R= 4.0"                                          |                                                                                                                                                                                                                                             | •                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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|                                                              |                                                              | OFF=52.4%                                                                       | :<br>-<br>= 86.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%                                                                                                                                                                                      | , .<br>, .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <br>C                                                        | = 60 sec (                                                   | OFF=52.4%<br>G= 52.0 sec :                                                      | <br>-<br>= 86.7% Y= 8.0 sec = 13.3% Ped= _0 sec = _0%                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| C<br><br>Lane                                                | = 60 sec (                                                   | OFF=52.4%<br>G= 52.0 sec :                                                      |                                                                                                                                                                                                                                             | fattern                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Lane<br>Grou                                                 | = 60 sec (<br>/Width/  <br>p   Lanes  /                      | OFF=52.4%<br>G= 52.0 sec :                                                      | <br>= 36.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%                                                                                                                                                                                            | баната.<br>-<br>С —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Lane<br>Grou<br>B<br>Approx                                  | = 60 sec (<br>/Width/}<br>p                                  | OFF=52.4%<br>G= 52.0 sec :<br>g/(<br>Read Used                                  | <br>= 36.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br>  Service Rate! Adj                                                                                                                                                                     | баната.<br>-<br>С —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Lane<br>Grou<br>3<br>Appre                                   | = 60 sec (<br>/Width/}<br>p                                  | OFF=52.4%<br>G= 52.0 sec :<br>g/(<br>Read Used                                  | <br>= 36.7% Y= 8.0 sec = 13.3% Ped= 0 sec = 0%<br>  Service Rate! Adj     HCM ! L [90% Max!<br>  @C (vph) @E !Volume! 27c   Delay : S ! Gueus '                                                                                             | баната.<br>-<br>С —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Lane<br>Grou<br>Appro<br>TH                                  | = 60 sec (<br> Width/ <br>p   Lanes  F<br>Oach<br>  24 2   . | OFF=52.4%<br>G= 52.0 sec :<br>g/(<br>Read Used                                  | <br>= 36.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br>  Service Rate! Adj                                                                                                                                                                     | алан<br>2<br>3<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>3<br>2<br>3<br>2<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Lane<br>Grou<br>Appro<br>TH<br>Appro                         | Width/<br>Width/<br>p   Lanes<br>  Lanes<br>  24'2   .       | OFF=52.4%<br>G= 52.0 sec :<br>g/(<br>Read Used<br>.109 [ .49] !                 | <pre>1 = 36.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0% 1 Service Rate! Adj ! ! HCM ! L !90% Max!! 2 @C (vph) @E !Volume! v/c ! Delay ! S ! Queue !</pre>                                                                                       | аннан<br>-<br>-<br>-<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Lane<br>Grou<br>Appro<br>TH<br>Appro                         | Width/<br>Width/<br>p   Lanes<br>  Lanes<br>  24'2   .       | OFF=52.4%<br>G= 52.0 sec :<br>g/(<br>Read Used<br>.109 [ .49] !                 | <pre>1 = 36.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0% 1 Service Rate! Adj     HCM ! L 190% Max! 2 eC (vph) @E !Volume! v/c   Delay : \$ ! Gueue '</pre>                                                                                       | алан<br>2<br>3<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>3<br>2<br>3<br>2<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Lane<br>Grou<br>3<br>Appro<br>TH<br>Appro<br>TH              | = 60 sec (<br>/Width/ }<br>p                                 | OFF=52.4%<br>G= 52.0 sec :<br>g/(<br>Read Used<br>.109 [ .49] !                 | <pre>1 = 36.7% '= 8.0 sec = 13.3% Ped= .0 sec = .0% 1 Service Rate! Adj     HCM ! L 190% Max! 1 @C (vph) @E !Volume! v/c ! Delay : 5 ! Gueue '</pre>                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Lane<br>Grou<br>Appro<br>TH<br>Appro<br>Appro                | = 60 sec (                                                   | OFF=52.4%<br>G= 52.0 sec :<br><br>Read Used<br>.109 [ .49] !<br>                | <pre>1<br/>= 36.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br/>Service Rate! Adj ! ! HCM ! L !90% Max!!<br/>@C (vph) @E !Volume! v/c ! Delay ! S ! Queue !<br/></pre>                                                                          | ішта<br>1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Lane<br>Grou<br>B<br>Appro<br>TH<br>Appro<br>TH<br>Appro     | = 60 sec (                                                   | OFF=52.4%<br>G= 52.0 sec :<br>g/(<br>Read Used<br>.109 : .49] :<br>401 : .49] ; | <pre>1<br/>= 36.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br/>Service Rate! Adj ! HCM ! L !90% Max!<br/>@C (vph) @E !Volume! V/C   Delay ! S ! Queue '<br/>5.5 B-<br/>1764 ! 1774 318 ! .175 ! 5.5 E+ .08 ft<br/>10.1 E<br/>10.1 E<br/></pre> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Lane<br>Grou<br>B<br>Appro<br>TH<br>Appro<br>TH<br>Appro     | = 60 sec (                                                   | OFF=52.4%<br>G= 52.0 sec :<br>g/(<br>Read Used<br>.109 : .49] :<br>401 : .49] ; | <pre>1<br/>= 36.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br/>Service Rate! Adj ! HCM ! L !90% Max!<br/>@C (vph) @E !Volume! V/C   Delay ! S ! Queue '<br/>5.5 B-<br/>1764 ! 1774 318 ! .175 ! 5.5 E+ .08 ft<br/>10.1 E<br/></pre>            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Lane<br>Grou<br>B<br>Appro<br>TH<br>Appro<br>TH<br>Appro     | = 60 sec (                                                   | OFF=52.4%<br>G= 52.0 sec :<br>g/(<br>Read Used<br>.109 : .49] :<br>401 : .49] ; | <pre>1<br/>= 36.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br/>Service Rate! Adj ! HCM ! L !90% Max!<br/>@C (vph) @E !Volume! V/C   Delay ! S ! Queue '<br/>5.5 B-<br/>1764 ! 1774 318 ! .175 ! 5.5 E+ .08 ft<br/>10.1 E<br/>10.1 E<br/></pre> | анном<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Lane<br>Grou<br>3<br>Appro<br>3<br>TH<br>Appro<br>4<br>Appro | = 60 sec (                                                   | OFF=52.4%<br>G= 52.0 sec :<br>g/(<br>Read Used<br>.109 : .49] :<br>401 : .49] ; | <pre>1<br/>= 36.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br/>Service Rate! Adj ! HCM ! L !90% Max!<br/>@C (vph) @E !Volume! V/C   Delay ! S ! Queue '<br/>5.5 B-<br/>1764 ! 1774 318 ! .175 ! 5.5 E+ .08 ft<br/>10.1 E<br/>10.1 E<br/></pre> | 40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>40000<br>40000<br>4000000 |
| Lane<br>Grou<br>3<br>Appro<br>3<br>TH<br>Appro<br>4<br>Appro | = 60 sec (                                                   | OFF=52.4%<br>G= 52.0 sec :<br>g/(<br>Read Used<br>.109 : .49] :<br>401 : .49] ; | <pre>1<br/>= 36.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br/>Service Rate! Adj ! HCM ! L !90% Max!<br/>@C (vph) @E !Volume! V/C   Delay ! S ! Queue '<br/>5.5 B-<br/>1764 ! 1774 318 ! .175 ! 5.5 E+ .08 ft<br/>10.1 E<br/>10.1 E<br/></pre> | 40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>40000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000<br>4000000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Lane<br>Grou<br>B<br>Appro<br>TH<br>Appro<br>TH<br>Appro     | = 60 sec (                                                   | OFF=52.4%<br>G= 52.0 sec :<br>g/(<br>Read Used<br>.109 : .49] :<br>401 : .49] ; | <pre>1<br/>= 36.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br/>Service Rate! Adj ! HCM ! L !90% Max!<br/>@C (vph) @E !Volume! V/C   Delay ! S ! Queue '<br/>5.5 B-<br/>1764 ! 1774 318 ! .175 ! 5.5 E+ .08 ft<br/>10.1 E<br/>10.1 E<br/></pre> | daman<br>and and and and and and and and and and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Lane<br>Grou<br>B<br>Appro<br>TH<br>Appro<br>TH<br>Appro     | = 60 sec (                                                   | OFF=52.4%<br>G= 52.0 sec :<br>g/(<br>Read Used<br>.109 : .49] :<br>401 : .49] ; | <pre>1<br/>= 36.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br/>Service Rate! Adj ! HCM ! L !90% Max!<br/>@C (vph) @E !Volume! V/C   Delay ! S ! Queue '<br/>5.5 B-<br/>1764 ! 1774 318 ! .175 ! 5.5 E+ .08 ft<br/>10.1 E<br/>10.1 E<br/></pre> | daman<br>a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Lane<br>Grou<br>B<br>Appro<br>TH<br>Appro<br>TH<br>Appro     | = 60 sec (                                                   | OFF=52.4%<br>G= 52.0 sec :<br>g/(<br>Read Used<br>.109 : .49] :<br>401 : .49] ; | <pre>1<br/>= 36.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br/>Service Rate! Adj ! HCM ! L !90% Max!<br/>@C (vph) @E !Volume! V/C   Delay ! S ! Queue '<br/>5.5 B-<br/>1764 ! 1774 318 ! .175 ! 5.5 E+ .08 ft<br/>10.1 E<br/>10.1 E<br/></pre> | anna<br>Anna<br>Anna<br>Anna<br>Anna<br>Anna<br>Anna<br>Anna                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Lane<br>Grou<br>3<br>Appro<br>3<br>TH<br>Appro<br>4<br>Appro | = 60 sec (                                                   | OFF=52.4%<br>G= 52.0 sec :<br>g/(<br>Read Used<br>.109 : .49] :<br>401 : .49] ; | <pre>1<br/>= 36.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br/>Service Rate! Adj ! HCM ! L !90% Max!<br/>@C (vph) @E !Volume! V/C   Delay ! S ! Queue '<br/>5.5 B-<br/>1764 ! 1774 318 ! .175 ! 5.5 E+ .08 ft<br/>10.1 E<br/>10.1 E<br/></pre> | daman<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>annno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>anno<br>ann                                                                                                                                                                                                                                                                                                                                                          |

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| KULAMALU<br>FUTURE BASE W/MI<br>PM PEAK HOUP                                                                                                                                                                                                                                  | IT                                                                             |                                         |                                          | 07/03.4c<br>10:27 00 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-----------------------------------------|------------------------------------------|----------------------|
| SIGNAL94/TEAPACI                                                                                                                                                                                                                                                              | (V1 E1.4) - Summa                                                              | ary of Parameter                        | Values                                   |                      |
| Intersection                                                                                                                                                                                                                                                                  | Parameters for 1                                                               | Int = 0 - E∖PAS                         | SE & HALEAKALA HY                        | <b>,</b>             |
| METROAREA<br>LOSTTIME<br>LEVELOFSERVICE<br>NODELOCATION                                                                                                                                                                                                                       | NONCBD<br>2.0<br>C S<br>0 0                                                    |                                         |                                          |                      |
| Approach Para                                                                                                                                                                                                                                                                 |                                                                                |                                         |                                          |                      |
| APPLABELS<br>GRADES<br>PEDLEVELS<br>PARKINGSIDES<br>PARKVOLUMES<br>BUSVOLUMES<br>RIGHTTURNONREDS                                                                                                                                                                              | EB<br>ED<br>LOW<br>NOINE<br>20<br>C                                            | 58<br>585<br>100<br>100<br>20<br>0<br>0 | שטא<br>דוב<br>ניסא:<br>ניסא:<br>ני<br>ני | NB<br><br>           |
| Movement Para                                                                                                                                                                                                                                                                 | meters                                                                         |                                         |                                          |                      |
| MOVLABELS<br>VOLUMES<br>WIDTHS<br>LANES<br>UTILIZATIONS<br>TRUCKPERCENTS<br>PEAKHOURFACTORS<br>ARRIVALTYPES<br>ACTUATIONS<br>REQCLEARANCES<br>MINIMUMS<br>IDEALSATFLOWS<br>FACTORS<br>DELAYFACTORS<br>STOPFACTORS<br>STOPFACTORS<br>STOPFACTORS<br>STOPFACTORS<br>STOPFACTORS | FFLK NORM NORM<br>0 1807 - 0                                                   | 1,100,1000,000<br>1,000,1000,1000       | 1 60 - 65 - 69                           | 1.00.1.00.1.00       |
| SEQUENCES<br>PERMISSIVES<br>DVERLAPS<br>DYCLES<br>SREENTIMES<br>YELLOWTIMES<br>DRITICALS<br>EXCESS                                                                                                                                                                            | 11 ALL<br>265 265<br>265 265<br>26 120<br>43.97 8.03<br>4.00 4.00<br>2 12<br>3 | <br>전문 <b>사진</b> 전<br>(신)               | LEHLLAGE<br>OFFERT<br>Pertime            | 2 (m) =              |

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|                                                                                                                                   |                                                                                                                                                                                                                                                                                                               | - |
|-----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| AMALU<br>URE BASE W/MIT                                                                                                           | 07/03/94<br>10:27:14                                                                                                                                                                                                                                                                                          |   |
| PEAK HOUR                                                                                                                         |                                                                                                                                                                                                                                                                                                               | - |
| NAL94/TEAPACIVI L1.                                                                                                               | .4) - Capabity Analysis Summary                                                                                                                                                                                                                                                                               | _ |
| ersection Averages<br>Degree of Satura                                                                                            | for Int # - 0 - BYPASS & HALEAKALA HY<br>ation (v/c) .37 Vehicle Delay - 4.5 Level of Service A                                                                                                                                                                                                               |   |
| 11 ; Phase 1 ; P                                                                                                                  | Phase 2                                                                                                                                                                                                                                                                                                       | • |
| **                                                                                                                                |                                                                                                                                                                                                                                                                                                               | - |
|                                                                                                                                   |                                                                                                                                                                                                                                                                                                               |   |
| × ×                                                                                                                               |                                                                                                                                                                                                                                                                                                               |   |
| ***                                                                                                                               | <b>K</b> 入 '                                                                                                                                                                                                                                                                                                  | , |
| th + + + + + + + + + + + + + + + + + + +                                                                                          | •                                                                                                                                                                                                                                                                                                             | • |
| G/C= .623   G/                                                                                                                    | /(:= .243                                                                                                                                                                                                                                                                                                     | , |
| G= 37.4"   G=<br>Y+R= 4.0"   Y+                                                                                                   | = 14.6"  <br>+R= 4.0"                                                                                                                                                                                                                                                                                         |   |
| <u> </u>                                                                                                                          |                                                                                                                                                                                                                                                                                                               | 1 |
| 0FF= .0% } OF<br>                                                                                                                 | 52.0 sec = 86.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%                                                                                                                                                                                                                                                         |   |
| C= 60 sec G= 5                                                                                                                    | 52.0 sec = 86.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%                                                                                                                                                                                                                                                         |   |
| C= 60 sec G= 5                                                                                                                    | 52.0 sec = 86.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br>g/C Service Rate! Adj ;                                                                                                                                                                                                                              |   |
| C= 60 sec G= 5<br>ane ;Width/;<br>Group ; Lanes; Require<br>Approach                                                              | 52.0 sec = 86.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br>g/C Service Rate! Adj ; ! HCM ! L !90% Max!<br>d Used ; @C (vph) @E !Volume! v/c ! Delav ! 5 ; Queue '<br>3.3 4                                                                                                                                      |   |
| C= 60 sec G= 5<br>ane ;Width/;<br>Group ; Lanes; Requ<br>Approach                                                                 | 52.0 sec = 86.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br>g/C Service Rate! Adj ;                                                                                                                                                                                                                              |   |
| C= 60 sec G= 5<br>ane ;Width/;<br>Group ; Lanes; Requ<br>Approach<br>TH : 24/2 ; 310                                              | 52.0 sec = 86.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br>g/C Service Rate! Adj   HCM   L !90% Max <br>d Used   @C (vph) @E !Volume! v/c ! Delav ! 5   Queue '<br>3.3 4<br>3.3 4<br>0 1 .657 ! 2373 ! 2373 ! 1065   .449 ! 3.3 !*A   154 ft                                                                    |   |
| C= 60 sec G= 5<br>ane ;Width/;<br>Group ; Lanes; Requ<br>Approach<br>TH : 24/2 ; 310                                              | 52.0 sec = 86.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br>g/C Service Rate! Adj   HCM   L !90% Max <br>d Used   @C (vph) @E !Volume! v/c ! Delav ! 5   Queue '<br>3.3 4<br>3.3 4<br>0 1 .657 ! 2373 ! 2373 ' 1005   .449 ! 3.3 !*A   154 ft.<br>2.7 4                                                          |   |
| C= 60 sec G= 5<br>ane ;Width/;<br>Group ; Lanes; Requ<br>Approach<br>TH : 24/2 ; 310                                              | 52.0 sec = 86.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br>g/C Service Rate! Adj   HCM   L !90% Max <br>d Used   @C (vph) @E !Volume! v/c ! Delav ! 5   Queue '<br>3.3 4<br>3.3 4<br>0 1 .657 ! 2373 ! 2373 ! 1065   .449 ! 3.3 !*A   154 ft                                                                    |   |
| C= 60 sec G= 5<br>ane ;Width/;<br>Group ; Lanes; Requ<br>Approach<br>TH : 24/2 ; .310<br>Approach<br>TH : 24/2 ; .165             | 52.0 sec = 86.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br>g/C Service Rate! Adj   HCM   L !90% Max!<br>d Used : @C (vph) @E !volume! v/c ! Delav ! 5   Queue '<br>3.3 4<br>3.3 4<br>0 : .657 : 2373 ! 2373 ' 1065   .449 ! 3.3 !*A   154 ft<br>2.7 4<br>2.7 4                                                  |   |
| C= 60 sec G= 5<br>ane ;Width/;<br>Group ; Lanes; Requ<br>Approach<br>TH : 24/2 ; 310<br>Approach<br>TH : 24/2 ; 165               | 52.0 sec = 86.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br>g/C Service Rate! Adj   HCM   L !90% Max!<br>d Used   @C (vph) @E !Volume! v/c ! Delav ! 5   Queue '<br>3.3 4<br>0 1 .657 ! 2373 ! 2373 ! 1055   .449 ! 3.3 !*A   154 ft'<br>2.7 4                                                                   |   |
| C= 60 sec G= 5<br>ane (Width/)<br>Group   Lanes! Requ<br>Approach<br>TH : 24/2   .310<br>Approach<br>TH : 24/2   .310<br>Approach | 52.0 sec = 86.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br>g/C Service Rate! Adj   HCM   L !90% Max!<br>d Used : @C (vph) @E !volume! v/c ! Delav ! 5   Queue '<br>3.3 4<br>3.3 4<br>0 : .657 : 2373 ! 2373 ' 1065   .449 ! 3.3 !*A   154 ft<br>2.7 4<br>2.7 4                                                  |   |
| C= 60 sec G= 5<br>ane ;Width/;<br>Group ; Lanes; Requ<br>Approach<br>TH : 24/2 ; 310<br>Approach<br>TH : 24/2 ; 310               | 52.0 sec = 86.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br>g/C Service Rate! Adj ; HCM ! L !90% Max;<br>d Used : @C (vph) @E !volume! v/c ! Delav ! 5 ! Queue '<br>3.3 4<br>0 : .657 ! 2373 ! 2373 ' 1055 ! .449 ! 3.3 !*A ; 154 ft<br>2.7 4<br>9 : .657 : 2520 ! 2520 ' 569 ! .226 ! 2.7 ! A ! 82 ft<br>j1.5 E |   |
| C= 60 sec G= 5<br>ane ;Width/;<br>Group ; Lanes; Requ<br>Approach<br>TH : 24/2 ; 310<br>Approach<br>TH : 24/2 ; 310               | 52.0 sec = 86.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%<br>g/C Service Rate! Adj ; HCM ! L !90% Max;<br>d Used : @C (vph) @E !volume! v/c ! Delav ! 5 ! Queue '<br>3.3 4<br>0 : .657 ! 2373 ! 2373 ' 1055 ! .449 ! 3.3 !*A ; 154 ft<br>2.7 4<br>9 : .657 : 2520 ! 2520 ' 569 ! .226 ! 2.7 ! A ! 82 ft<br>j1.5 E |   |

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KULAMALU FUTURE BASE W/MIT AM PEAK HOUR

## SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int # 0 - PUKALANI BYP & MAKANI ST

| METROAREA NONCBD   |
|--------------------|
| LOSTTIME 2.0       |
| LEVELOFSERVICE C S |
| NODELOCATION Ø Ø   |

Approach Parameters

| APPLABELS<br>GRADES<br>PEDLEVELS<br>PARKINGSIDES<br>PARKVOLUMES<br>BUSVOLUMES | ビ<br>- 58<br>2 - 0<br>しい<br>いのNE<br>20<br>0 | 58<br>- 0<br>- Low<br>None<br>20<br>0 | WB<br>-78<br>-2.0<br>Low<br>None<br>20<br>0 | NB<br>- <del>EB</del><br>- 0<br>Low<br>None<br>20<br>0 |
|-------------------------------------------------------------------------------|---------------------------------------------|---------------------------------------|---------------------------------------------|--------------------------------------------------------|
| RIGHTTURNONREDS                                                               | 0                                           | 0<br>0                                | 0<br>0                                      | 0<br>0                                                 |

Movement Parameters

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| MOVLABELS       | RT    | тн   | LT   | RT   | тн   | LT   | RT   | тн    | LT   | RT   | ТН   | I LT |  |
|-----------------|-------|------|------|------|------|------|------|-------|------|------|------|------|--|
| VOLUMES         | 0     | 307  | 1    | 275  | 58   | 13   | 12   |       | 9    | 51   | 76   | - •  |  |
| WIDTHS          | .0    | 24.0 | 12.0 | 12.0 |      | 12.0 | .0   |       | -    | 12.0 | 12.0 |      |  |
| LANES           | 0     | 2    | 1    | 1    | 1    | 1    | 0    |       | 1    | 12.0 |      |      |  |
| UTILIZATIONS    | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | _     | 1.00 |      | 1    | _    |  |
| TRUCKPERCENTS   | 2.0   |      | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  |       |      | 1.00 | 1.00 |      |  |
| PEAKHOURFACTORS | .95   | .95  | .95  | .95  | .95  | .95  | .95  |       | 2.0  | 2.0  | 2.0  |      |  |
| ARRIVALTYPES    | 3     | 3    | 3    |      | . 55 | .95  |      | .95   | .95  | .95  | .95  |      |  |
| ACTUATIONS      | YES   | YES  | YES  | YES  | YES  |      | 3    | 3     | 3    | 3    | 3    | -    |  |
| REQCLEARANCES   | 4.0   | 4.0  | 4.0  |      |      | YES  | YES  | YES   | YES  | YES  | YES  | YES  |  |
| MINIMUMS        | 5.0   |      |      | 4.0  | 4.0  | 4.0  | 4.0  | 4.0   | 4.0  | 4.0  | 4.0  | 4.0  |  |
| IDEALSATFLOWS   |       | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0   | 5.0  | 5.0  | 5.0  | 5.0  |  |
| FACTORS         | 1900  | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900  | 1900 | 1900 | 1900 | 1900 |  |
|                 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| DELAYFACTORS    | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| NSTOPFACTORS    | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| GROUPTYPES      | NORM  | NORM | NORM | NORM | NORM | NORM | NORM | NORM  | NORM | NORM | NORM | NORM |  |
| SATURATIONFLOWS | 0     | 3688 | 224  | 1539 | 1863 | 1422 | 0    | 3755  | 936  | 1539 | 1863 | 1492 |  |
| Phasing Param   | eters |      |      |      |      |      |      |       |      |      |      |      |  |
| SEQUENCES       | 1     | .1   | ALL  |      |      |      |      |       |      |      |      |      |  |
| PERMISSIVES     | YE    |      | YES  | YES  | YE   | S    |      | LEADL | 465  |      |      |      |  |
| OVERLAPS        | YE    |      | YES  | YES  | YE   | -    |      | OFFSE |      |      | NE   | NONE |  |
| CYCLES          |       | 0    | 120  | 10   |      |      |      | OFFT  |      | •    | 00   | 1    |  |

| PERMISSIVES<br>OVERLAPS<br>CYCLES<br>GREENTIMES<br>YELLOWTIMES<br>CRITICALS<br>EXCESS | YES<br>YES<br>50<br>30.90<br>4.00<br>8<br>0 | YES<br>YES<br>120<br>21.10<br>4.00<br>4 | YES<br>YES<br>10 | YES<br>YES | LEADLAGS<br>OFFSET<br>PEDTIME | NONE<br>.00<br>.0 | N O N E<br>1<br>0 |
|---------------------------------------------------------------------------------------|---------------------------------------------|-----------------------------------------|------------------|------------|-------------------------------|-------------------|-------------------|
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03/27/97 17:50:24

| LAMAL                                                                                                                                                               | .U<br>BASE W/MIT                                                                                                             |                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                   |                                                                                             |                                                                                                |                                                       |                                                                                                  |                                                                                                  | 03/27/<br>17:50:                                                |                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                     | C HOUR                                                                                                                       |                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                   |                                                                                             |                                                                                                |                                                       |                                                                                                  |                                                                                                  |                                                                 |                                                                                                                                                                                                   |
|                                                                                                                                                                     |                                                                                                                              |                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                   |                                                                                             | <b>6</b>                                                                                       |                                                       |                                                                                                  |                                                                                                  |                                                                 | • <b>•</b>                                                                                                                                                                                        |
| SNAL9                                                                                                                                                               | 94/TEAPAC[V1                                                                                                                 | L L1.4]                                                                                           | — Сара                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                   |                                                                                             |                                                                                                |                                                       |                                                                                                  |                                                                                                  |                                                                 |                                                                                                                                                                                                   |
| erse                                                                                                                                                                | ection Avera<br>Degree of Sa                                                                                                 | ages fo                                                                                           | r Int #                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0 -                                                                               | PUKALAN<br>Vehicl                                                                           | I BYP &<br>e Delav                                                                             | MAKANI<br>6.4                                         | ST<br>Level (                                                                                    | of Se                                                                                            | rvice                                                           | B+                                                                                                                                                                                                |
| L                                                                                                                                                                   | Jegree of Sa                                                                                                                 | ] [ [ ] ] ] ] ] ] ] ] ] ] ] ] ] ] ] ] ]                                                           | 011 (070                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ,                                                                                 |                                                                                             | <b>-</b>                                                                                       |                                                       |                                                                                                  |                                                                                                  |                                                                 |                                                                                                                                                                                                   |
| 11                                                                                                                                                                  | Phase 1                                                                                                                      | Pha                                                                                               | se 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                   |                                                                                             |                                                                                                |                                                       |                                                                                                  |                                                                                                  |                                                                 | <b>5</b> 444                                                                                                                                                                                      |
| /** -                                                                                                                                                               |                                                                                                                              | <br>I                                                                                             | ~ 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                   |                                                                                             |                                                                                                |                                                       |                                                                                                  |                                                                                                  |                                                                 |                                                                                                                                                                                                   |
|                                                                                                                                                                     | ++                                                                                                                           |                                                                                                   | ****                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                   |                                                                                             |                                                                                                |                                                       |                                                                                                  |                                                                                                  |                                                                 | Barri .                                                                                                                                                                                           |
| IV İ                                                                                                                                                                | + +>                                                                                                                         |                                                                                                   | <b>&lt;++++</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                   |                                                                                             |                                                                                                |                                                       |                                                                                                  |                                                                                                  |                                                                 | · · · ·                                                                                                                                                                                           |
| s-p                                                                                                                                                                 | · · ·                                                                                                                        | <br> ++++                                                                                         | ++++ <br>V [                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   |                                                                                             |                                                                                                |                                                       |                                                                                                  |                                                                                                  |                                                                 | بنفسو ا                                                                                                                                                                                           |
| rth                                                                                                                                                                 | <pre></pre>                                                                                                                  | > [ ++++>                                                                                         | ļ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                   |                                                                                             |                                                                                                |                                                       |                                                                                                  |                                                                                                  |                                                                 | ,                                                                                                                                                                                                 |
| 1                                                                                                                                                                   | + * *<br>  + * *                                                                                                             | [++++<br>                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                   |                                                                                             |                                                                                                |                                                       |                                                                                                  |                                                                                                  |                                                                 |                                                                                                                                                                                                   |
| <br>-                                                                                                                                                               |                                                                                                                              |                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                   |                                                                                             |                                                                                                |                                                       |                                                                                                  |                                                                                                  |                                                                 | <b>Jan</b> ie                                                                                                                                                                                     |
| 1                                                                                                                                                                   | G/C = .515                                                                                                                   | G/C=                                                                                              | .352   21.1"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                   |                                                                                             |                                                                                                |                                                       |                                                                                                  |                                                                                                  |                                                                 | ۹.                                                                                                                                                                                                |
|                                                                                                                                                                     | G= 30.9"<br>Y+R= 4.0"                                                                                                        | G=<br>Y+R=                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                   |                                                                                             |                                                                                                |                                                       |                                                                                                  |                                                                                                  |                                                                 |                                                                                                                                                                                                   |
|                                                                                                                                                                     | 0FF= .0%                                                                                                                     | ) 0FF=                                                                                            | 58.2%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                   |                                                                                             |                                                                                                |                                                       |                                                                                                  |                                                                                                  |                                                                 |                                                                                                                                                                                                   |
|                                                                                                                                                                     |                                                                                                                              |                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                   |                                                                                             |                                                                                                |                                                       |                                                                                                  |                                                                                                  |                                                                 |                                                                                                                                                                                                   |
| t                                                                                                                                                                   | C= 60 sec                                                                                                                    | G= 52.                                                                                            | 0 sec =                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 86.7%                                                                             | Y= 8.0                                                                                      | ) sec =                                                                                        | 13.3%                                                 | Ped= .                                                                                           | 0 sec                                                                                            | ; =                                                             | .0*                                                                                                                                                                                               |
|                                                                                                                                                                     |                                                                                                                              | G= 52.<br>g/                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Servi                                                                             | ce Rate                                                                                     | <br>  Adj                                                                                      |                                                       | нсм                                                                                              |                                                                                                  | 90% M                                                           | ax                                                                                                                                                                                                |
| Lane                                                                                                                                                                |                                                                                                                              | g/                                                                                                | 'c                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Servi                                                                             | ce Rate                                                                                     |                                                                                                |                                                       | нсм                                                                                              |                                                                                                  |                                                                 | ax                                                                                                                                                                                                |
| Lane<br>Grou                                                                                                                                                        | Width/ <br>up   Lanes                                                                                                        | g/                                                                                                | 'c                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Servi                                                                             | ce Rate                                                                                     | <br>  Adj                                                                                      |                                                       | нсм                                                                                              |                                                                                                  | 90% M                                                           | ax                                                                                                                                                                                                |
| Lane<br>Grou                                                                                                                                                        | Width/ <br>up   Lanes <br>roach                                                                                              | g/<br>Reqd                                                                                        | C  <br>Used                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Servi<br>@C (v)                                                                   | ce Rate<br>ph) @E                                                                           | Adj  <br> Volume}                                                                              | v/c                                                   | HCM<br>Delay<br>4.3                                                                              | L  <br>  S  <br>                                                                                 | 90% M<br>Queu                                                   |                                                                                                                                                                                                   |
| App<br>TH                                                                                                                                                           | Width/ <br>up   Lanes <br>roach<br>  24/2                                                                                    | g/<br>Reqd<br>.108                                                                                | C  <br>Used  <br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Servio<br>@C (v)<br>                                                              | ce Rate<br>ph) @E<br>                                                                       | <br>  Adj                                                                                      | √/c  <br>.160                                         | HCM<br>Delay<br>4.3<br>4.3                                                                       | L  <br>  S  <br>A                                                                                | 90% M<br>Queu<br>62                                             | ax   .<br>e  <br>ft                                                                                                                                                                               |
| Lane<br>Grou<br>S<br>Appr                                                                                                                                           | Width/ <br>up   Lanes <br>roach<br>  24/2                                                                                    | g/<br>Reqd                                                                                        | C  <br>Used                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Servio<br>@C (v)<br>                                                              | ce Rate<br>ph) @E<br>2022                                                                   | Adj  <br> Volume <br>  323                                                                     | √/c  <br>.160                                         | HCM<br>Delay<br>4.3<br>4.3                                                                       | L  <br>  S  <br>A                                                                                | 90% M<br>Queu<br>62                                             | ax   .<br>e  <br>ft                                                                                                                                                                               |
| Lane<br>Grou<br>Appr<br>TH<br>LT                                                                                                                                    | Width/ <br>up   Lanes <br>roach<br>  24/2  <br>  12/1                                                                        | g/<br>Reqd<br>.108                                                                                | C  <br>Used  <br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Servio<br>@C (v)<br>                                                              | ce Rate<br>ph) @E<br>                                                                       | Adj  <br> Volume <br>  323                                                                     | √/c  <br>.160                                         | HCM<br>Delay<br>4.3<br>4.3                                                                       | L  <br>  S  <br>  A  <br>  A                                                                     | 90% M<br>Queu<br>62                                             | ax                                                                                                                                                                                                |
| Lane<br>Grou<br>Appr<br>TH<br>LT                                                                                                                                    | Width/ <br>up   Lanes <br>roach<br>  24/2  <br>  12/1  <br>roach                                                             | g/<br>Reqd<br>.108  <br>.000                                                                      | C  <br>Used  <br>.548  <br>.548                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Servia<br>@C (v)<br>2022<br>97                                                    | ce Rate<br>ph) @E<br>  2022<br>  119                                                        | Adj  <br> Volume <br>  323  <br>  1                                                            | ∨/c  <br>.160  <br>.008                               | HCM<br>Delay<br>4.3<br>4.3<br>4.0<br>5.0                                                         | L  <br>  S  <br>  A  <br>  A  <br>  A  <br>  B+                                                  | 90% M<br>Queu<br>62<br>25                                       | ax  <br>e  <br>ft  <br>ft  <br>ft                                                                                                                                                                 |
| Lane<br>Grou<br>Appr<br>TH<br>LT<br>Appr                                                                                                                            | Width/ <br>up   Lanes <br>roach<br>  24/2  <br>  12/1  <br>roach                                                             | g/<br>Reqd<br>.108  <br>.000                                                                      | C  <br>Used  <br>.548  <br>.548                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Servia<br>@C (v)<br>2022<br>97<br>2059                                            | ce Rate<br>ph) @E<br>  2022<br>  119<br>  2059                                              | Adj  <br> Volume <br>  323  <br>  1                                                            | ∨/c  <br>.160  <br>.008                               | HCM<br>Delay<br>4.3<br>4.3<br>4.0<br>5.0<br>6.0                                                  | L  <br>  S  <br>  A  <br>  A  <br>  A  <br>  B+                                                  | 90% M<br>Queu<br>62<br>25<br>225                                | ax! .<br>e  <br>ft <br>ft <br>ft <br>ft                                                                                                                                                           |
| Lane<br>Grou<br>S Appr<br>TH<br>LT<br>B<br>3 Appr                                                                                                                   | Width/ <br>up   Lanes <br>roach<br>  24/2  <br>  12/1  <br>roach<br>+RT  24/2                                                | g/<br>Reqd<br>.108  <br>.000                                                                      | C  <br>Used  <br>.548  <br>.548                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Servia<br>@C (v)<br>2022<br>97<br>2059                                            | ce Rate<br>ph) @E<br>  2022<br>  119<br>  2059                                              | Adj  <br> Volume <br>  323  <br>  1                                                            | ∨/c  <br>.160  <br>.008                               | HCM<br>Delay<br>4.3<br>4.3<br>4.0<br>5.0<br>6.0                                                  | L  <br>  S  <br>  A  <br>  A  <br>  A  <br>  B+                                                  | 90% M<br>Queu<br>62<br>25<br>220<br>25                          | ax! .<br>e  <br>ft <br>ft <br>ft <br>ft                                                                                                                                                           |
| Lane<br>Grou<br>F Appr<br>TH<br>LT<br>Appr<br>H-<br>LT                                                                                                              | Width/ <br>up   Lanes <br>roach<br>  24/2  <br>  12/1  <br>roach<br>+RT  24/2  <br>  12/1                                    | g/<br>Reqd<br>.108  <br>.000                                                                      | C  <br>Used  <br>.548  <br>.548                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Servia<br>@C (v)<br>2022<br>97<br>2059                                            | ce Rate<br>ph) @E<br>  2022<br>  119<br>  2059                                              | Adj  <br> Volume <br>  323  <br>  1                                                            | ∨/c  <br>.160  <br>.008                               | HCM<br>Delay<br>4.3<br>4.3<br>4.0<br>6.0<br>6.0<br>4.0                                           | L  <br>  S  <br>  A  <br>  A  <br>  A  <br>  B+                                                  | 90% M<br>Queu<br>62<br>25<br>220<br>25                          | ax  <br>e  <br>ft  <br>ft  <br>ft                                                                                                                                                                 |
| Lane<br>Grou<br>Appr<br>TH<br>LT<br>Appr<br>H-<br>LT                                                                                                                | Width/ <br>up   Lanes <br>roach<br>  24/2  <br>  12/1  <br>roach                                                             | g/<br>Reqd<br>.108  <br>.000                                                                      | C  <br>Used  <br>.548  <br>.548                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Servia<br>@C (v)<br>2022<br>97<br>2059                                            | ce Rate<br>ph) @E<br>  2022<br>  119<br>  2059<br>  513                                     | Adj  <br> Volume <br>  323  <br>  1                                                            | ∨/c  <br>.150  <br>.008  <br>.560  <br>.018           | HCM<br>Delay<br>4.3<br>4.3<br>4.0<br>5.0<br>6.0<br>4.0<br>9.1                                    | L  <br>  S  <br>  A  <br>  A  <br>  A  <br>  B+<br>  *B+<br>  A  <br>  A                         | 90% M<br>Queu<br>62<br>25<br>220<br>25                          | ax!                                                                                                                                                                                               |
| Lane<br>Grou<br>Appr<br>TH<br>LT<br>Appr<br>TH-<br>LT<br>S<br>Appr<br>RT                                                                                            | <pre>[Width/  up   Lanes] roach   24/2     12/1   roach +RT  24/2     12/1   roach   12/1  </pre>                            | g/<br>Reqd<br>.108  <br>.000  <br>.322  <br>.000                                                  | C Used Used .<br>.548 .<br>.548 .<br>.548 .<br>.548 .<br>.548 .<br>.548 .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Servic<br>@C (v)<br>2022<br>97<br>2059<br>477<br>544                              | ce Rate<br>ph) @E<br>  2022<br>  119<br>  2059<br>  513<br>  593                            | Adj  <br> Volume <br>  323  <br>  1<br>  1154<br>  9<br>  289                                  | <pre></pre>                                           | HCM<br>Delay<br>4.3<br>4.3<br>4.0<br>6.0<br>6.0<br>4.0<br>9.1<br>9.5                             | L  <br>  S  <br>  A  <br>  A  <br>  A  <br>  B+<br>  *B+<br>  A  <br>  *B+                       | 90% M<br>Queu<br>62<br>25<br>220<br>25                          | ax          e             ft         ft         ft         ft         ft         ft         ft         ft         ft         ft         ft         ft         ft                                  |
| Lane<br>Grou<br>Appr<br>TH<br>LT<br>Appr<br>TH-<br>LT<br>Appr<br>RT<br>TH-                                                                                          | <pre> Width/  up   Lanes  roach   24/2     12/1   roach +RT  24/2     12/1   roach   12/1     12/1     12/1  </pre>          | g/<br>Reqd<br>.108  <br>.000  <br>.322  <br>.000  <br>.226  <br>.054                              | CUsed<br>Used<br>.548<br>.548<br>.548<br>.548<br>.548<br>.548                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Servia<br>@C (v)<br>2022<br>97<br>2059<br>477<br>544<br>668                       | ce Rate<br>ph) @E<br>  2022<br>  119<br>  2059<br>  513<br>  593<br>  717                   | Adj  <br> Volume <br>  323  <br>  1<br>  1154<br>  9<br>  289<br>  61                          | v/c  <br>.160  <br>.008  <br>.018  <br>.487  <br>.085 | HCM<br>Delay<br>4.3<br>4.3<br>4.0<br>6.0<br>6.0<br>4.0<br>9.1<br>9.5<br>7.6                      | L  <br>  S  <br>  A  <br>  A  <br>  A  <br>  A  <br>  B+<br>  B+<br>  B+                         | 90% M<br>Queu<br>62<br>25<br>220<br>25<br>150<br>32             | ax       .       e             ft         ft         ft         ft         ft         ft         ft         ft         ft         ft         ft         ft                                        |
| Lane<br>Grou<br>Th<br>LT<br>Appr<br>TH<br>LT<br>Appr<br>Appr<br>Appr<br>RT                                                                                          | <pre> Width/  up   Lanes  roach   24/2     12/1   roach +RT  24/2     12/1   roach   12/1     12/1     12/1  </pre>          | g/<br>Reqd<br>.108  <br>.000  <br>.322  <br>.000  <br>.226  <br>.054                              | CUsed<br>Used<br>.548<br>.548<br>.548<br>.548<br>.548<br>.548                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Servia<br>@C (v)<br>2022<br>97<br>2059<br>477<br>477<br>544<br>668<br>498         | ce Rate<br>ph) @E<br>  2022<br>  119<br>  2059<br>  513<br>  593<br>  717                   | Adj  <br> Volume <br>  323  <br>  1<br>  1154<br>  9<br>  289<br>  61                          | <pre></pre>                                           | HCM<br>Delay<br>4.3<br>4.3<br>4.0<br>6.0<br>6.0<br>4.0<br>9.1<br>9.5<br>7.6                      | L  <br>  S  <br>  A  <br>  A  <br>  A  <br>  A  <br>  B+<br>  B+<br>  B+                         | 90% M<br>Queu<br>62<br>25<br>220<br>25<br>150<br>32             | ax       .       e             ft         ft         ft         ft         ft         ft         ft         ft         ft         ft         ft         ft                                        |
| Lane<br>Grou<br>Appr<br>TH<br>LT<br>Appr<br>LT<br>LT<br>Appr<br>RT<br>TH<br>LT<br>B                                                                                 | <pre> Width/  up   Lanes  roach   24/2     12/1   roach +RT  24/2     12/1   roach   12/1     12/1     12/1     12/1  </pre> | g/<br>Reqd<br>.108  <br>.000  <br>.322  <br>.000  <br>.226  <br>.054                              | C Used Used .<br>.548 .<br>.548 .<br>.548 .<br>.548 .<br>.385 .<br>.385 .<br>.385 .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Servia<br>@C (v)<br>2022<br>97<br>2059<br>477<br>477<br>544<br>668<br>498         | ce Rate<br>ph) @E<br>  2022<br>  119<br>  2059<br>  513<br>  593<br>  717                   | Adj  <br> Volume <br>  323  <br>  1<br>  1154<br>  9<br>  289<br>  61                          | v/c  <br>.160  <br>.008  <br>.018  <br>.487  <br>.085 | HCM<br>Delay<br>4.3<br>4.3<br>4.0<br>6.0<br>6.0<br>4.0<br>9.1<br>9.5<br>7.6<br>7.4               | L  <br>  S  <br>  A  <br>  A  <br>  A  <br>  A  <br>  B+<br>  B+<br>  B+                         | 90% M<br>Queu<br>62<br>25<br>220<br>25<br>150<br>32             | ax       .       e             ft        ft        ft        ft        ft        ft        ft        ft                                                                                           |
| Lane<br>Grou<br>Appr<br>TH<br>LT<br>Appr<br>LT<br>LT<br>B<br>Appr<br>RT<br>TH<br>LT<br>B<br>Appr<br>B<br>Appr                                                       | <pre> Width/  up   Lanes  roach   24/2     12/1   roach +RT  24/2     12/1   roach   12/1     12/1     12/1  </pre>          | g/<br>Reqd<br>. 108 [<br>.000 ]<br>.322 ]<br>.000 ]<br>.226 ]<br>.054 ]<br>.000 ]                 | C Used Used .<br>.548 .<br>.548 .<br>.548 .<br>.548 .<br>.385 .<br>.385 .<br>.385 .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Servia<br>@C (v)<br>2022<br>97<br>2059<br>477<br>2059<br>477<br>544<br>668<br>498 | ce Rate<br>ph) @E<br>  2022<br>  119<br>  2059<br>  513<br>  593<br>  717                   | Adj  <br> Volume <br>  323  <br>  1<br>  1154<br>  9<br>  1154<br>  9<br>  289<br>  61<br>  14 | <pre>√/c   .160 .008 .560 .018 .487 .085 .026</pre>   | HCM<br>Delay<br>4.3<br>4.3<br>4.0<br>6.0<br>6.0<br>4.0<br>9.1<br>9.1<br>9.5<br>7.6<br>7.4        | L  <br>  S  <br>  A  <br>  A  <br>  A  <br>  A  <br>  B+<br>  B+<br>  B+<br>  B+<br>  B+         | 90% M<br>Queu<br>62<br>25<br>220<br>25<br>150<br>32<br>25       | ax          ax          e          ft          ft          ft          ft          ft          ft          ft          ft          ft          ft          ft          ft          ft          ft |
| Lane<br>Grou<br>FAppr<br>TH<br>LT<br>B<br>Appr<br>TH-<br>LT<br>B<br>Appr<br>B<br>Appr<br>B<br>Appr<br>B<br>Appr<br>B<br>Appr<br>B<br>Appr<br>B<br>Appr<br>B<br>Appr | <pre>  Width/  up   Lanes  roach</pre>                                                                                       | g /<br>Reqd<br>. 108  <br>. 000  <br>. 322  <br>. 000  <br>. 226  <br>. 054  <br>. 054  <br>. 000 | C  <br>Used  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.548  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385  <br>.385 | Servia<br>@C (v)<br>2022<br>97<br>2059<br>477<br>2059<br>477<br>544<br>668<br>498 | ce Rate<br>ph) @E<br>  2022<br>  119<br>  2059<br>  513<br>  593<br>  717<br>  547<br>  547 | Adj  <br> Volume]<br>  323  <br>  1<br>  1154<br>  9<br>  1154<br>  9<br>  14<br>  14          | <pre>√/c   .150 .008 .560 .018 .487 .085 .026</pre>   | HCM<br>Delay<br>4.3<br>4.3<br>4.0<br>6.0<br>6.0<br>4.0<br>9.1<br>9.1<br>9.5<br>7.6<br>7.4<br>7.6 | L  <br>  S  <br>  S  <br>  A  <br>  A  <br>  A  <br>  B+<br>  B+<br>  B+<br>  B+<br>  B+<br>  B+ | 90% M<br>Queu<br>62<br>25<br>220<br>25<br>150<br>32<br>25<br>25 | ax          ax          e          ft          ft          ft          ft          ft          ft          ft          ft          ft          ft          ft          ft          ft             |

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KULAMALU 03/27/97 FUTURE BASE W/MIT 17:51:39 PM PEAK HOUR SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values Intersection Parameters for Int # 0 - PUKALANI BYP & MAKANI ST NONCBD METROAREA LOSTTIME 2.0 LEVELOFSERVICE С S NODELOCATION 0 0 Approach Parameters ЕB SB WB NB APPLABELS -98--148 -NB -58 GRADES 2.0 .0 -2.0 .0 PEDLEVELS LOW LOW LOW LOW PARKINGSIDES NONE NONE NONE NONE PARKVOLUMES 20 20 20 20 BUSVOLUMES 0 0 0 0 RIGHTTURNONREDS 0 0 0 Ø Movement Parameters MOVLABELS RT ΤН LT RT ТΗ LT RT RT TH LT ΤН LT VOLUMES 25 770 196 39 37 4 25 467 18 26 60 2 WIDTHS .0 24.0 12.0 12.0 12.0 12.0 .0 24.0 12.0 12.0 12.0 12.0 LANES Ø 2 1 1 1 1 0 2 1 1 1 1 1.00 1.00 1.00 UTILIZATIONS 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 TRUCKPERCENTS 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 PEAKHOURFACTORS .95 .95 .95 .95 .95 .95 .95 .95 .95 .95 .95 .95 ARRIVALTYPES з 3 З З З з 3 3 3 3 з 3 ACTUATIONS YES YES YES YES YES YES YES YES YES YES YES YES 4.0 REQCLEARANCES 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 MINIMUMS 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 IDEALSATFLOWS 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 FACTORS 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 DELAYFACTORS 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 NSTOPFACTORS 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 GROUPTYPES NORM NORM NORM NORM NORM NORM NORM NORM NORM NORM NORM NORM SATURATIONFLOWS 0 3668 1752 1539 1863 1448 0 3730 343 1539 1863 1557 Phasing Parameters SEQUENCES ALL 21 PERMISSIVES YES YES YES YES LEADLAGS NONE NONE OVERLAPS YES YES YES .00 YES OFFSET 1 CYCLES 60 120 10 PEDTIME .0 0 GREENTIMES 14.02 19.96 14.02 YELLOWTIMES 4.00 4.00 4.00 CRITICALS 3 8 5 EXCESS 0

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|---------------------------------------------------------|----------------------------------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------|--------------------------|-------------------------|------------------------------|----------------------------------|-----------------------------------------|------------------------------------------------|---------------|
| SIGNA                                                   | L94/TEAPAC[                                                                      | V1 L1.4] -                                               | Capacity                                          | Analysi                  | s Summai                | rv                           |                                  |                                         |                                                |               |
|                                                         | section Ave                                                                      | rages for I                                              | nt# Ø                                             | - PUKAL                  | ANT RYP                 | S MAKA                       | NI ST                            |                                         |                                                |               |
|                                                         | Degree of S                                                                      | Saturation                                               | (v/c) .3                                          | 2 Vehi                   | cle Dela                | ay 5.                        | 4 Level                          | of s                                    | ervice B+                                      |               |
| Sq 21<br>**/**                                          | Phase 1                                                                          | Phase 2                                                  | 2   Pha                                           | se 3                     |                         |                              |                                  |                                         |                                                |               |
|                                                         | ] + + * ^                                                                        | + + +                                                    |                                                   | <br>                     |                         |                              |                                  |                                         |                                                |               |
| /iv                                                     | \{+ + *>                                                                         | $ \langle + + + \rangle$                                 |                                                   | ++++ <br><****           |                         |                              |                                  |                                         |                                                |               |
| Welst                                                   |                                                                                  |                                                          | +++++                                             | ++++ <br>V               |                         |                              |                                  |                                         |                                                |               |
|                                                         |                                                                                  | · · · ·                                                  | *   ++++<br>*   ++++                              |                          |                         |                              |                                  |                                         |                                                |               |
|                                                         | <br>  G/C= .234                                                                  |                                                          |                                                   |                          |                         |                              |                                  |                                         |                                                |               |
|                                                         | G= 14.0"<br>  Y+R= 4.0"                                                          | G= 20.0                                                  | "   G= 1                                          | 4.0"                     |                         |                              |                                  |                                         |                                                |               |
|                                                         | OFF= .0%                                                                         |                                                          |                                                   |                          |                         |                              |                                  |                                         |                                                |               |
|                                                         | C= 60 sec                                                                        | G= 48.0 se                                               | c = 80.0%                                         | Y=12.                    | 0 sec =                 | 20.0%                        | Ped=                             | 0 sed                                   | .0%                                            |               |
| <br>  Lane                                              | <br> Width/                                                                      | g/C                                                      |                                                   |                          |                         |                              |                                  |                                         |                                                |               |
| Gro                                                     |                                                                                  |                                                          |                                                   | ce Rate<br>ph) @E        | Adj<br> Volume          |                              | HCM<br>Delay                     |                                         | 90% Max <br>Queue                              |               |
| <i>е</i> в<br>98 Аррі                                   | roach                                                                            |                                                          |                                                   |                          |                         |                              | ~~~~~                            | ·                                       |                                                | •             |
|                                                         |                                                                                  | .247   .66                                               |                                                   | 2444                     |                         | *******                      | 2.8                              |                                         |                                                |               |
| LT<br>                                                  | 12/1                                                                             | .040   .263                                              | 7   612                                           | 642                      | 206                     | .321                         | 2.9                              | *A                                      | 58 ft                                          | •             |
| NВ                                                      | oach                                                                             |                                                          |                                                   |                          |                         |                              | 9.1                              | <br>8+                                  |                                                | •             |
|                                                         |                                                                                  |                                                          |                                                   |                          |                         |                              |                                  | 0 <b>-</b>                              |                                                |               |
| NE Appr                                                 |                                                                                  |                                                          |                                                   |                          |                         |                              |                                  |                                         | 三世日日世前日出<br>196 壬午!                            |               |
| HE Appr<br>TH+                                          | RT  24/2                                                                         | .160   .366                                              | 5   1323                                          |                          | 518  <br>19             | .379  <br>.152               | 9.1<br>8.3                       | *B+ <br>  8+                            | 138 ft <br>25 ft                               | •             |
| ₩ Appr                                                  | RT  24/2  <br>  12/1                                                             | .160 .366                                                | 5   1323                                          |                          |                         | .379  <br>.152               | 9.1<br>8.3                       | *B+ <br>  8+                            | 138 ft                                         |               |
| NÐ Appr<br>Sesesser<br>TH+                              | RT  24/2  <br>  12/1  <br>oach<br>  12/1                                         | .160   .366<br>.000   .366                               | 5   1323<br>5   94                                |                          | 19                      | .152                         | 9.1<br>8.3<br>7.3                | *B+ <br>  B+ <br>  B+                   | 138 ft <br>25 ft                               | •             |
| ₩E Appr<br>  TH+<br>  LT<br>≤&<br>₩ Appr                | RT  24/2  <br>  12/1  <br>oach<br>  12/1  <br>  12/1  <br>  12/1                 | .160   .366<br>.000   .366<br>.047   .567<br>.038   .267 | 5   1323<br>5   94<br>                            | 120<br>873<br>497        | 19  <br>                | .152  <br><br>.047  <br>.078 | 9.1<br>8.3<br>7.3<br>3.7<br>10.6 | *B+ <br>  S+ <br>  S+ <br>  A  <br>  *B | 138 ft <br>25 ft <br>25 ft <br>25 ft <br>25 ft | 4<br>12<br>14 |
| HE Appr<br>TH+<br>LT<br>SB<br>HE Appr<br>RT<br>TH       | RT  24/2  <br>  12/1  <br>oach<br>  12/1  <br>  12/1  <br>  12/1                 | .160   .366<br>.000   .366                               | 5   1323<br>5   94<br>                            | 120<br>873<br>497        | 19  <br>                | .152  <br><br>.047  <br>.078 | 9.1<br>8.3<br>7.3<br>3.7<br>10.6 | *B+ <br>  S+ <br>  S+ <br>  A  <br>  *B | 138 ft <br>25 ft <br><br>25 ft                 | •             |
| HE Appr<br>TH+<br>LT<br>SB<br>HB Appr<br>RT<br>TH<br>LT | RT  24/2  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1 | .160   .366<br>.000   .366<br>.047   .567<br>.038   .267 | 5   1323<br>5   94<br>  845  <br>  437  <br>  331 | 120<br>873<br>497<br>387 | 19<br>41  <br>39  <br>4 | .152  <br><br>.047  <br>.078 | 9.1<br>8.3<br>7.3<br>3.7<br>10.6 | *B+ <br>  S+ <br>  S+ <br>  A  <br>  *B | 138 ft <br>25 ft <br>25 ft <br>25 ft <br>25 ft | #<br>6<br>#   |

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| -        | KULAMALU<br>FUTURE BASE W/MI<br>AM PEAK HOUR                                                                                                                                                                                                        | т                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                               | 07/03/96<br>10:38:54                                                                                                                                                                                                      |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -        |                                                                                                                                                                                                                                                     | V1 L1.4] - Summa<br>Parameters for J                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ary of Parameter<br>Int # C - PUKAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Values<br>Avi Eypass & Mak                                                                                                                                                                                                    | AWAD AV .                                                                                                                                                                                                                 |
|          | METROAREA<br>LOSTTIME<br>LEVELOFSERVICE<br>NODELOCATION                                                                                                                                                                                             | NONCED<br>2.0<br>C S<br>0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                               |                                                                                                                                                                                                                           |
|          | Approach Para                                                                                                                                                                                                                                       | meters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                               | n/0                                                                                                                                                                                                                       |
| ·<br>••• | APPLABELS<br>GRADES<br>PEDLEVELS<br>PARKINGSIDES<br>PARKVOLUMES<br>BUSVOLUMES<br>RIGHTTURNONREDS                                                                                                                                                    | 6.0<br>LOW<br>NONE<br>20<br>0<br>12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | SB<br>UOW<br>NONE<br>20<br>04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | WB<br>-0.0<br>LOW<br>NONE<br>20<br>235                                                                                                                                                                                        | NB<br><br>                                                                                                                                                                                                                |
| -        | Movement Para                                                                                                                                                                                                                                       | meters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                               |                                                                                                                                                                                                                           |
|          | MOVLABELS<br>VOLUMES<br>WIDTHS<br>LANES<br>UTILIZATIONS<br>TRUCKPERCENTS<br>PEAKHOURFACTORS<br>ARRIVALTYPES<br>ACTUATIONS<br>REQCLEARANCES<br>MINIMUMS<br>IDEALSATFLOWS<br>FACTORS<br>DELAYFACTORS<br>NSTOPFACTORS<br>GROUPTYPES<br>SATURATIONFLOWS | RT       TH       LT         12       251       134         12.0       24.0       12.0         1       0       1.00       1.00         1       2       1         1.00       1.00       1.00         2.0       2.0       2.0         .95       .95       .95         3       3       3         ND       YES       YES         4.0       4.0       4.0         5.0       5.0       5.0         1900       1900       1900         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         NDRM       NORM       NORM         1493       3614       1717 | RT       TH       LT         376       286       335         12.0       12.0       12.0         1       1       1         1.00       1.00       1.00         2.0       2.0       2.0         .95       .95       .95         .3       .3       .3         N0       /ES       YES         4.0       4.0       4.0         5.0       5.0       5.0         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         1.00       1.00       1.00         NDRM       NORM       NORM         1539       1863       1770 | RT TH LT<br>219 638 2<br>12.0 24.0 12.0<br>1 2 1<br>1.00 1.00 1.00<br>2.0 2.0 2.0<br>95 .95 .95<br>3 3 3<br>NO YES YES<br>4.0 4.0 4.0<br>5.0 5.0 1500<br>1.00 1.00 1.00<br>1.00 1.00 1.00<br>NORM NORM NORM<br>1585 3637 1825 | RT TH LT<br>21 145 22<br>12.0 12.0 12.0<br>1 1<br>1.00 1.00 1.00<br>2.0 2.0 2.0<br>.95 .95 95<br>3 3 3<br>NO YES YES<br>4.0 4 0 4.0<br>500 100 1.00<br>1.00 1.00 1.00<br>1.00 1.00 1.00<br>NORM NORM NORM<br>539 1863 728 |
|          | Phasing Param<br>SEQUENCES<br>PERMISSIVES<br>OVERLAPS<br>CYCLES<br>GREENTIMES<br>YELLOWTIMES<br>CRITICALS<br>EXCESS                                                                                                                                 | 42 ALL<br>YES YES<br>YES YES<br>60 150<br>8.73 15.94<br>4.00 4.00<br>3 8<br>0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | YES YES<br>YES YES<br>10<br>10.60 8.73<br>4.00 4.00<br>6 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | LEADLAGS<br>OFFSET<br>PEDTIME                                                                                                                                                                                                 | MOME NONE<br>. CO 3<br>0 0                                                                                                                                                                                                |

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4 : 05 ft<br>7 4 B-<br>5.3   A   72 ft                        | a<br>a<br>a<br>a<br>a<br>a<br>a<br>a<br>a<br>a<br>a<br>a<br>a<br>a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 43<br>45 Appro<br>ET<br>TH<br>LT<br>59<br>5 Appro<br>E Appro<br>E T<br>FT<br>TH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 12/1 : .<br>24/2 : .<br>12/1 : .<br>Dach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 662   .542  <br>195   .299  <br>000   .174  <br>                                            | 829 : 860<br>1089 : 1147<br>570 : 602                                                     | 1   001<br>472   586  <br>2   003  <br>2   303  <br>301   587                                     | A.1   4 ' 05 ft'<br>L2.1   4B , 30 ft<br>4.7 ! 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| W3         10         RT         RT         TP         LT         39         10         11         12         13         14         15         17         17         17         17         17         17         17         17         18         19         10         11         12         13         14         15         16         17         18         19         10         10         11         12         13         14         15         16         17         18         19         10         10         10         11         12         13         14         15         16         17         17 | 12/1   .<br>  24/2   .<br>  12/1   .<br>  12/1   .<br>  12/1   .<br>  12/1  <br>  12/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 665 : .542 :<br>25 : .299 :<br>000 : .179 :<br>231 : .634 :<br>155 : .422 :<br>135 : .210 : | 829 : 860<br>1089 : 1147<br>570 : 602<br>                                                 | 1   001<br>672   586<br>2   003<br>2   003<br>2   003<br>2   003<br>301<br>301   383<br>353   069 | 4.1   4 1 25 41<br>12.1   48                                                                                | 2 - 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| W3<br>+5 Appro<br>RT<br>LT<br>LT<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <pre>     12/1 .     24/2 .     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ;     12/1 ; 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| KULAMALU<br>FUTURE BASE W/MI<br>PM PEAK HOUR | т          |        |       |              |       |        |          |       |         | 207         | 34:5        |
|----------------------------------------------|------------|--------|-------|--------------|-------|--------|----------|-------|---------|-------------|-------------|
| SIGNAL94/TEAPAC(                             | V1 L1.4] - | Summa  | ry o≁ | Param        | eter  | Values | 5        |       |         |             |             |
| Intersection                                 | Parameters | for 1  | nt #  | () -         | PUKAL | ANI B' | YPASS    | * MAK | (AWAQ A | <u>۵</u> ۱۰ |             |
| METROAREA                                    | NONCE      |        |       |              |       |        |          |       |         |             |             |
| LOSTTIME                                     |            | .0     |       |              |       |        |          |       |         |             |             |
| LEVELOFSERVICE                               | C          | S      |       |              |       |        |          |       |         |             |             |
| NODELOCATION                                 | 0          | с<br>С |       |              |       |        |          |       |         |             |             |
| Approach Para                                |            |        |       |              |       |        | 4        |       |         | . 100       |             |
|                                              | EB         |        |       | SB           |       |        | we<br>He |       |         | NB<br>TE    |             |
| APPLABELS                                    | -58-       |        |       |              |       |        | -6.0     |       |         | . 0         |             |
| GRADES                                       | 6.0        |        |       | ، د.<br>NO_I |       |        | LOW      |       |         | LOW         |             |
| PEDLEVELS                                    | LOW        |        |       | NONE         |       |        | NONE     |       |         | 3 HON       |             |
| PARKINGSIDES                                 | NONE       |        |       | 20           |       |        | 20       |       |         | 20          |             |
| PARKVOLUMES                                  | 20         |        |       |              |       |        | C,       |       |         | - c         |             |
| BUSVOLUMES<br>RIGHTTURNONREDS                | 0<br>14    |        |       | 0<br>103     |       |        | 122      |       |         | 1           |             |
| RIGHTTORNONREDS                              | 14         |        |       |              |       |        |          |       |         | -           |             |
| Movement Para                                | meters     |        |       |              |       |        |          |       |         |             |             |
| MOVLABELS                                    | RT TH      | LT     | RT    | тн           | LT    | RT     | TH       | LT    | ВТ<br>П | TH          | L           |
| VOLUMES                                      | 44 458     | 278    | 103   | 291          | 174   | 252    | 356      | . 2   | 0       | 294         | 2           |
| WIDTHS                                       | 12.0 24.0  | 12.0   | 12.0  | 12.0         | 12.0  | 12.0   | 24.0     | 12.0  | 12.0    | :2.0        | 12.         |
| LANES                                        | 1 2        | 1      | 1     | נ            | 1     | 1      |          | 1     | 1       | 1           |             |
| UTILIZATIONS                                 | 1.00 1.00  | 1.00.  | 1.00  |              | 1.00  | 1.00   |          |       |         | 1.00        |             |
| TRUCKPERCENTS                                | 2.0 2.0    | 2.0    | 2.0   | 2.0          | 2.0   | 2.0    | 2.0      | 2.0   | 2.0     | 2.0         |             |
| PEAKHOURFACTORS                              | .95 .95    | .95    | . 95  | . 75         | . ~5  | 95     | . 95     | .95   | . 95    | 95          | 0           |
| ARRIVALTYPES                                 | 3 3        | 3      | 3     | 3            | 3     | 3      | 5        | - 3   | 3       |             |             |
| ACTUATIONS                                   | NO YES     | YES    | NC    | YES          | rES   | NÖ     | YES      | YES   | NO      | · ES        | ΥE          |
| REQCLEARANCES                                | 4.0 4.0    |        | 4.0   | 4 0          | 4.0   | 4.0    | 4.0      | 4.C   | 4 (     | 4 ()        |             |
| MINIMUMS                                     | 5.0 5.0    | 5.0    | 5.0   | 3.0          | 5.0   | 5.0    | 5.0      | 5.0   | 5.0     | 5.0         |             |
| IDEALSATFLOWS                                | 1900 1900  |        |       |              | 1900  |        |          | 1000  |         | 1500        |             |
| FACTORS                                      | 1.00 1.00  |        |       | 1.00         |       |        | 1.00     |       | : 00    |             | 1 5         |
| DELAYFACTORS                                 | 1.00 1.00  |        | 1.00  | 1 00         | 1.00  |        | 1.00     |       | 1.00    | 1.00        |             |
| NSTOPFACTORS                                 | 1.00 1.00  | 1.00   | 1.00  | 1.190        | :.00  | 1.00   | 1.100    | 1.00  | 1 00    | 1 10        | 1.0         |
| GROUPTYPES                                   | NORM NORM  | NORM   | NOF   | NOEM         | NORM  | NORM   | NORM     | NUSW  |         | K DAW       |             |
| SATURATIONFLOWS                              | 1493 1807  | 1717   | 153=  | 15=3         | 1770  | 1585   | 3837     | 588   | : 754   | 1867        | 177         |
| Phasing Param                                | eters      |        |       |              |       |        |          |       |         |             |             |
| SEQUENCES                                    | 24         | ALL    |       |              |       |        |          |       |         |             |             |
| PERMISSIVES                                  |            | TES    | res   | • E          |       |        | LEADE    |       | -       | Dr          | 년<br>년<br>년 |
| OVERLAPS                                     | YES        | YES    | YES   | ΥE           | 5     |        | OFFSI    |       |         |             |             |
| CYCLES                                       | 60         | 180    | 10    |              |       |        | PEDT     | CI1E  |         | 2           |             |
| GREENTIMES                                   | 8.70 1.    | 1.05   | 8.43  | 15.8         | 2     |        |          |       |         |             |             |
| YELLOWTIMES                                  | 4.00 4     | 4.00   | 4.00  | 4.0          | Ċ     |        |          |       |         |             |             |
| CRITICALS                                    | З.         | 2      | ¢.    | 1            | 1     |        |          |       |         |             |             |
| EXCESS                                       | 0          |        |       |              |       |        |          |       |         |             |             |

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            | alysi                  | s Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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| Read<br>.040  <br>.155  <br>.127  <br>.127  <br>.120 ;<br>.118  <br>.000                               | Used<br>                         | ec (vr<br>1456<br>416<br>580<br>624<br>90                                                             |                        | 32<br>32<br>482<br>32<br>482<br>293<br>32<br>32<br>32<br>32<br>32<br>32<br>32<br>32<br>32<br>32<br>32<br>32<br>32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | v/c<br>.034<br>.524<br>.643<br>.218<br>.535<br>.016                            | 8.6<br>2.8<br>7.8<br>10.5<br>13.1<br>7.8<br>15.0<br>13.0                                       | S +                                                                                           | Queue<br>25 f<br>120 f<br>145 f<br>145 f<br>129 f<br>25 f                                              | <pre></pre>      | нын,<br>1977)<br>1973)<br>1974)<br>1974)<br>1974)<br>1974)<br>1974)<br>1974)<br>1974)<br>1974)<br>1974)<br>1974)<br>1974)<br>1974)<br>1974)<br>1974)<br>1974)<br>1974)                                                                                                                                                                                                                                                                                                                                                                                                                                                   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32<br>482<br>482<br>293<br>137<br>375<br>275<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>375<br>2<br>375<br>375<br>375<br>375<br>375<br>375<br>375<br>375                                                                                                                                                                                                 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| Gro<br>B A D R<br>E E R<br>TH<br>L<br>B A D R<br>F<br>L<br>-<br>3 A D R<br>-<br>-<br>3 A D R<br>-<br>-<br>3 A D R                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      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<td>32<br/>482<br/>482<br/>293<br/>137<br/>375<br/>275<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>375<br/>2<br/>375<br/>375<br/>375<br/>375<br/>375<br/>375<br/>375<br/>375</td> <td><pre>v/c .034 .324 .643 .218 .535 .016 .016</pre></td> <td>8.6<br/>2.8<br/>7.8<br/>10.5<br/>13.1<br/>7.8<br/>15.0<br/>13.0<br/>9.6<br/>4.2<br/>11.9</td> <td>S + = = A = = = = = = = = = = = = = = = =</td> <td>Queue<br/>25 f<br/>120 f<br/>145 f<br/>145 f<br/>129 f<br/>25 f<br/>25 f</td> <td></td> <td></td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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                                                                                                    | Reqd<br>.040  <br>.155  <br>.127  <br>.127  <br>.127  <br>.127  <br>.128  <br>.000  <br>.002  <br>.198 | Used<br>                         | <pre>@C (Vr<br/>912<br/>1456<br/>416<br/>416<br/>580<br/>24<br/>90<br/>24<br/>90<br/>90<br/>517</pre> |                        | 32<br>482<br>482<br>293<br>137<br>375<br>275<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>2<br>375<br>375<br>2<br>375<br>375<br>375<br>375<br>375<br>375<br>375<br>375                                                                                                                                                                                                 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| Grope R R R R R R R R R R R R R R R R R R R                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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<td>32<br/>482<br/>482<br/>293<br/>137<br/>375<br/>275<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>2<br/>375<br/>375<br/>2<br/>375<br/>375<br/>375<br/>375<br/>375<br/>375<br/>375<br/>375</td> <td><pre>v/c .034 .324 .643 .218 .535 .016 .001 .533</pre></td> <td>8.6<br/>2.8<br/>7.5<br/>10.5<br/>13.1<br/>7.8<br/>15.0<br/>13.0<br/>9.6<br/>4.2<br/>11.9<br/>5.8</td> <td>S == A == = = = = = = = = = = = = = = =</td> <td>Queue<br/>25 f<br/>120 f<br/>145 f<br/>145 f<br/>129 f<br/>25 f<br/>25 f</td> <td></td> <td>num;<br/>4)<br/>4)<br/>4)<br/>4)<br/>5}<br/>5}<br/>5}<br/>5}<br/>5}<br/>5}<br/>5}<br/>5}<br/>5}<br/>5}</td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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            |                        | 32<br>482<br>482<br>293<br>137<br>375<br>275<br>2<br>137<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375<br>1375    | <pre>v/c .034 .324 .643 .643 .218 .535 .016 .001 .533 .398</pre>               | 8.6<br>2.8<br>7.5<br>10.5<br>13.1<br>7.8<br>15.0<br>13.0<br>9.6<br>15.0<br>13.0<br>9.6<br>11.4 | S == A == = = = = = = = = = = = = = = =                                                       | Queue<br>25 f<br>120 f<br>145 f<br>145 f<br>129 f<br>129 f<br>25 f<br>129 f<br>129 f<br>129 f<br>129 f |                  | num;<br>4.1<br>4.1<br>4.1<br>4.1<br>4.1<br>4.1<br>4.1<br>4.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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KULAMALU 03/27/97 FUTURE BASE W/MIT 17:53:20 AM PEAK HOUR SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values Intersection Parameters for Int # 0 - BYPASS/KULA HWY & HALEAKALA HY METROAREA NONCBD LOSTTIME 2.0 LEVELOFSERVICE С S NODELOCATION Ø 0 Approach Parameters APPLABELS SB WB NΒ ΕB GRADES 6.0 . 0 -6.0 .0 PEDLEVELS LOW LOW LDW LOW PARKINGSIDES NONE NONE NONE NONE PARKVOLUMES 20 20 20 20 BUSVOLUMES ø 0 0 0 RIGHTTURNONREDS 1 65 39 127 Movement Parameters MOVLABELS RT тн LT LT RT TH RT ΤН LT RT тн LT VOLUMES 1 528 93 109 32 55 769 85 182 178 39 1 WIDTHS 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 . 0 12.0 12.0 .0 LANES 1 1 - 1 1 1 ø 1 1 1 1 1 0 UTILIZATIONS 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 TRUCKPERCENTS 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 PEAKHOURFACTORS .95 .95 .95 .95 .95 .95 .95 .95 .95 .95 .95 .95 ARRIVALTYPES 3 З з 3 3 3 3 3 3 3 З З ACTUATIONS NO YES YES NO YES YES NO YES YES NO YES YES 4.0 RECCLEARANCES 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 MINIMUMS 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 IDEALSATFLOWS 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 FACTORS 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 DELAYFACTORS 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 NSTOPFACTORS 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 NORM NORM NORM GROUPTYPES NORM NORM NORM NORM NORM NORM NORM NORM NORM SATURATIONFLOWS 1493 1807 1717 1539 1607 0 1585 1919 1823 1539 1851 Ø Phasing Parameters SEQUENCES 41 ALL PERMISSIVES YES YES YES YES LEADLAGS NONE NONE OVERLAPS YES YES YES YES OFFSET .00 1 CYCLES 60 120 10 PEDTIME . 0 0 GREENTIMES 7.31 33.38 7.31 YELLOWTIMES 4.00 4.00 4.00 CRITICALS 3 8 5 EXCESS 0

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KULAMALU 03/27/97 FUTURE BASE W/MIT 17:53:51 AM PEAK HOUR SIGNAL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary Intersection Averages for Int # 0 - BYPASS/KULA HWY & HALEAKALA HY Degree of Saturation (v/c) .53 Vehicle Delay 6.6 Level of Service B+\_\_\_\_\_ Sq 41 | Phase 1 | Phase 2 | Phase 3 | ~ North (+ <+ \* +>|++++> -+ \* + |++++ + \* + | • V + 1 \_\_\_\_\_ | G/C= .122 | G/C= .556 | G/C= .122 | -G= 7.3" | G= 33.4" | G= 7.3" | Y+R= 4.0" | Y+R= 4.0" | Y+R= 4.0" | . . | OFF= .0% | OFF=18.9% | OFF=81.2% | C= 60 sec G= 48.0 sec = 80.0% Y=12.0 sec = 20.0% Ped= .0 sec = . 0 % | Lane |Width/| g/C | Service Rate| Adj | | HCM | L |90% Max| | Group | Lanes| Reqd Used | @C (vph) @E |Volume| v/c | Delay | S | Queue | 1 SB Approach 4.9 A 

 RT
 12/1
 .002
 .590
 855
 880
 1
 .001
 3.3
 A
 25
 ft

 TH
 12/1
 .338
 .590
 1045
 1065
 556
 .522
 5.1
 B+
 192
 ft

 LT
 12/1
 .006
 .155
 343
 386
 98
 .254
 3.9
 \*A
 28
 ft

 12i. NB Approach 6.3 B+ 먣븜=챴뽜큟칮맽==밝쓝ᆽ땹≒ҵ켡렮캾칅린츴탒삤휸육롣=쑭둮ε놑덎펞忠챧뿨르답之邦르돰쬤갶벼=놡两륬봘윩펞첅즑뽜쐔及듼约찎正봍=츤몎긜훜==ㄹ르쏸삛弓러됕=故 RT | 12/1 | .052 | .590 | 911 | 935 | 48 | .051 | 3.4 | A | 25 ft| TH | 12/1 | .443 | .590 | 1113 | 1131 | 809 | .715 | 7.2 |\*B+| 280 ft| LT | 12/1 | .050 | .155 | 371 | 411 | 192 | .467 | 3.6 | A | 36 ft| 1. WB Approach 12.9 B RT | 12/1 | .052 | .344 | 476 | 529 | 46 | .087 | 8.6 | B+| 25 ft| |LT+TH | 12/1 | .086 | .155 | 192 | 249 | 92 | .369 | 15.1 |\*C+| 66 ft| ÷....' EB Approach 11.1 8 | RT | 12/1 | .059 | .344 | 476 | 529 | 54 | .102 | 8.7 | B+| 30 ft| |LT+TH | 12/1 | .040 | .155 | 227 | 287 | 42 | .145 | 14.2 | B | 30 ft| P=1 ነም ነዋ

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**87**74-1

| KULAMALU<br>Future base w/m<br>PM peak hour | IT                   |        |        |              |            |       |              |              |              |      | /27/9:<br>:26:3: |
|---------------------------------------------|----------------------|--------|--------|--------------|------------|-------|--------------|--------------|--------------|------|------------------|
| SIGNAL94/TEAPAC                             | [V1 L1.4]            | - Summ | ary of | f Para       | meter      | Value | 95           |              |              |      |                  |
| Intersection                                | Paramete             | rs for | Int #  | 0 -          | - ВҮРА     | ss/ku | .A HWY       | ⁄ & HA       | LEAKAL       | A HY |                  |
| METROAREA                                   | NO                   | NCBD   |        |              |            |       |              |              |              |      |                  |
| LOSTTIME                                    |                      | 2.0    |        |              |            |       |              |              |              |      |                  |
| LEVELOFSERVICE                              | С                    | S      |        |              |            |       |              |              |              |      |                  |
| NODELOCATION                                | 0                    | Ø      |        |              |            |       |              |              |              |      |                  |
| Approach Para                               | ameters              |        |        | •            |            |       |              |              |              |      |                  |
| APPLABELS                                   | S                    | B      |        | WB           |            |       | NB           |              |              | EE   | 3                |
| GRADES                                      | 6.                   | 0      |        | .0           |            |       | -6.0         |              |              | . e  | )                |
| PEDLEVELS                                   | LC                   | IW     |        | LOW          |            |       | LOW          | r            |              | LOL  |                  |
| PARKINGSIDES                                | NOM                  | ΙĒ     |        | NONE         |            |       | NONE         |              |              | NONE |                  |
| PARKVOLUMES                                 | 2                    | 0      |        | 20           |            |       | 20           |              |              | 20   |                  |
| BUSVOLUMES                                  |                      | 0      |        | 0            |            |       | 0            |              |              | 6    |                  |
| RIGHTTURNONREDS                             |                      | 1      |        | 52           |            |       | 28           |              |              | 140  |                  |
| Movement Para                               | imeters              |        |        |              |            |       |              |              |              |      |                  |
| MOVLABELS                                   | RT T                 | н ст   | RT     | тн           | ٤T         | RT    | тн           | LT           | RT           | тн   | LT               |
| VOLUMES                                     | 1 68                 | 0 74   | 87     | 36           | 31         | 33    |              | 200          | 218          | 46   |                  |
| JIDTHS                                      | 12.0 12.             | 0 12.0 | 12.0   | 12.0         | .0         | 12.0  |              |              | 12.0         | 12.0 | -                |
| LANES                                       | 1                    | 1 1    | 1      | 1            | 0          | 1     | 1            | 1            | 1            | 12.0 |                  |
| JTILIZATIONS                                |                      | 0 1.00 | -      | 1.00         | -          |       | 1.00         | _            | 1.00         | _    | -                |
| TRUCKPERCENTS                               | 2.0 2.               |        | 2.0    | 2.0          | 2.0        | 2.0   | 2.0          | 2.0          | 2.0          | 2.0  |                  |
| PEAKHOURFACTORS                             | .95 .9               |        | .95    | .95          | .95        | .95   | .95          | .95          |              |      |                  |
| ARRIVALTYPES                                |                      | 3 3    | . 35   | . 53         | . 95       | . 55  | . 55         | .95          | .95          | .95  |                  |
| ACTUATIONS                                  | NO YE                |        | NO     | YES          | YES        | NO    | -            | -            | 3            | 3    | -                |
| REQCLEARANCES                               | 4.0 4.               |        | 4.0    | 4.0          | 4.0        |       | YES          | YES          | NO           | YES  | · — -            |
| INIMUMS                                     | 5.0 5.               |        | 4.0    |              | 4.0        | 4.0   | 4.0          | 4.0          | 4.0          | 4.0  |                  |
| DEALSATFLOWS                                | 1900 190             |        |        | 5.0          |            | 5.0   | 5.0          | 5.0          | 5.0          | 5.0  | 5.0              |
| ACTORS                                      | 1.00 1.0             |        |        | 1900         |            |       | 1900         |              |              |      | 1900             |
| DELAYFACTORS                                | 1.00 1.0             |        |        | 1.00         |            |       | 1.00         |              |              |      | 1.00             |
| ISTOPFACTORS                                |                      |        |        |              | 1.00       |       |              | 1.00         |              |      | 1.00             |
| ROUPTYPES                                   | 1.00 1.0             |        |        | 1.00         |            |       |              | 1.00         |              |      | 1.00             |
| SATURATIONFLOWS                             | NORM NOR<br>1493 180 |        |        | NORM<br>1676 | NURM<br>Ø  |       | NDRM<br>1919 | NORM<br>1823 | NORM<br>1539 |      | NORM<br>Ø        |
| Phasing Param                               | eters                |        |        |              |            |       |              |              |              |      | -                |
| EQUENCES                                    | 31                   | ALL    |        |              |            |       |              |              |              |      |                  |
| ERMISSIVES                                  | YES                  | YES    | YES    | YE           | s          |       | LEAD         | 465          | N 7          | NE   | NONE             |
| VERLAPS                                     | YES                  | YES    | YES    | YE           |            |       | OFFSE        |              |              | NE   | NONE             |
| YCLES                                       | 50                   | 120    |        | 1 5          | <u>ت</u> . |       |              |              | •            | 00   | 1                |
| REENTIMES                                   |                      |        | 10     |              |            |       | PEDTI        | 1716         |              | .0   | 0                |
|                                             |                      | 32.76  | 7.62   |              |            |       |              |              |              |      |                  |
| ELLOWTIMES                                  | 4.00                 | 4.00   | 4.00   |              |            |       |              |              |              |      |                  |
| RITICALS                                    | 9                    | 2      | 5      |              |            |       |              |              |              |      |                  |
| XCESS                                       | 0                    |        |        |              |            |       |              |              |              |      |                  |

and the second

|                                                                                | п                                                                                                                                          |                                                                              |                                                                                                                    |                                                                                                                        |                                                                                                                |                                                                                                    |                                                                                                 |                                                                                                      |                                                                                       | 03/27                                                                 | /97 🛏                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                | BASE W/MIT<br>( HOUR                                                                                                                       |                                                                              |                                                                                                                    |                                                                                                                        |                                                                                                                |                                                                                                    |                                                                                                 |                                                                                                      |                                                                                       | 18:27                                                                 | .01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                                |                                                                                                                                            |                                                                              |                                                                                                                    |                                                                                                                        |                                                                                                                |                                                                                                    |                                                                                                 |                                                                                                      |                                                                                       |                                                                       | No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| GNALS                                                                          | 94/TEAPAC[V:                                                                                                                               | L L1.4                                                                       | ] - Cap                                                                                                            | acity A                                                                                                                | nalysis                                                                                                        | Summary                                                                                            | ,                                                                                               |                                                                                                      |                                                                                       |                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| terse                                                                          | ection Avera                                                                                                                               | ages fo                                                                      | or Int                                                                                                             | # Ø –                                                                                                                  | BYPASS                                                                                                         | /KULA HW                                                                                           | IAH & YI                                                                                        | EAKALA                                                                                               | нү                                                                                    |                                                                       | 64                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| (                                                                              | Degree of Sa                                                                                                                               | sturati                                                                      | ion (v/                                                                                                            | c) .48                                                                                                                 | Vehic.                                                                                                         | le Delay                                                                                           | 5.8                                                                                             | Level                                                                                                | of Se                                                                                 | ervice                                                                | е <b>В+</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| -                                                                              |                                                                                                                                            |                                                                              |                                                                                                                    |                                                                                                                        |                                                                                                                |                                                                                                    |                                                                                                 |                                                                                                      |                                                                                       |                                                                       | 87 <b>0</b> ,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 31  <br>/** -                                                                  | Phase 1<br>                                                                                                                                | 1 Pha                                                                        | 95e 2<br>                                                                                                          | Phase                                                                                                                  | e 3  <br>                                                                                                      |                                                                                                    |                                                                                                 |                                                                                                      |                                                                                       |                                                                       | · .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                                |                                                                                                                                            | + *<br>  ± *                                                                 | +                                                                                                                  |                                                                                                                        | ^  <br>++++                                                                                                    |                                                                                                    |                                                                                                 |                                                                                                      |                                                                                       |                                                                       | <i>c</i> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| iv I                                                                           | 1                                                                                                                                          | <del>+</del> "<br>  <b>(+</b> *                                              | +<br>+>                                                                                                            | <br> <br>                                                                                                              | <****                                                                                                          |                                                                                                    |                                                                                                 |                                                                                                      |                                                                                       |                                                                       | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                |                                                                                                                                            | ~                                                                            | ^                                                                                                                  |                                                                                                                        | ****                                                                                                           |                                                                                                    |                                                                                                 |                                                                                                      |                                                                                       |                                                                       | _                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| l<br>rth                                                                       | <br>  <b>(</b> *  +  +)                                                                                                                    |                                                                              | (+ + +)                                                                                                            | ++++>                                                                                                                  | ·                                                                                                              |                                                                                                    |                                                                                                 |                                                                                                      |                                                                                       |                                                                       | í                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 1                                                                              | ++++ * + +<br>V * + +                                                                                                                      | 1                                                                            | + + +<br>+ + +                                                                                                     | ++++<br>  V                                                                                                            |                                                                                                                |                                                                                                    |                                                                                                 |                                                                                                      |                                                                                       |                                                                       | •                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| -                                                                              |                                                                                                                                            |                                                                              |                                                                                                                    |                                                                                                                        |                                                                                                                |                                                                                                    |                                                                                                 |                                                                                                      |                                                                                       |                                                                       | ····                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                | G/C= .127                                                                                                                                  |                                                                              | = .546<br>32.8"                                                                                                    |                                                                                                                        | .127  <br>7.6"                                                                                                 |                                                                                                    |                                                                                                 |                                                                                                      |                                                                                       |                                                                       | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                | Y+R= 4.0"                                                                                                                                  | Y+R•                                                                         | = 4.0"                                                                                                             | Y+R≓                                                                                                                   | 1                                                                                                              |                                                                                                    |                                                                                                 |                                                                                                      |                                                                                       |                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| -                                                                              | OFF≖ .0%<br>                                                                                                                               |                                                                              | =19.4%                                                                                                             | 0FF=8                                                                                                                  |                                                                                                                |                                                                                                    |                                                                                                 | <b>.</b> .                                                                                           | _                                                                                     |                                                                       | ·                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| C                                                                              | C= 60 sec                                                                                                                                  | G= 48                                                                        | .0 sec 🗉                                                                                                           | ≈ 80.0%                                                                                                                | V - 1 2                                                                                                        |                                                                                                    |                                                                                                 |                                                                                                      |                                                                                       |                                                                       | 14 T                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                |                                                                                                                                            |                                                                              |                                                                                                                    |                                                                                                                        | ₹ <b>=</b> ±2•                                                                                                 | 0 Sec =                                                                                            | 20.0%                                                                                           | Ped≖ .                                                                                               | 0 sec                                                                                 | ; =                                                                   | .0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                                |                                                                                                                                            |                                                                              |                                                                                                                    |                                                                                                                        |                                                                                                                |                                                                                                    |                                                                                                 |                                                                                                      |                                                                                       | -<br>                                                                 | ·                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| _                                                                              | Width/ <br>up   Lanes                                                                                                                      | g,<br>Reqd                                                                   | /C<br>Used                                                                                                         | Servi                                                                                                                  | ce Rate                                                                                                        |                                                                                                    |                                                                                                 | НСМ                                                                                                  |                                                                                       | 90% M<br>Queu                                                         | lax                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Lane<br>Grou                                                                   | i                                                                                                                                          |                                                                              | ·                                                                                                                  | Servi                                                                                                                  | ce Rate                                                                                                        | Adj                                                                                                |                                                                                                 | НСМ                                                                                                  |                                                                                       | 90% M                                                                 | lax  <br>le                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Grou<br>Appi                                                                   | up   Lanes <br><br>roach                                                                                                                   | Reqd                                                                         | Used                                                                                                               | Servi<br>  @C (v                                                                                                       | ce Rate<br>ph) @E                                                                                              | Adj  <br> Volume                                                                                   |                                                                                                 | НСМ                                                                                                  | L<br>  S                                                                              | 90% M                                                                 | lax   ···                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Grou<br>App                                                                    | up   Lanes <br>                                                                                                                            | Reqd                                                                         | Used                                                                                                               | Servi<br>  @C (v                                                                                                       | ce Rate<br>ph) @E                                                                                              | Adj  <br> Volume <br>  1                                                                           | v/c<br>.001                                                                                     | HCM<br>  Delay<br>6.9<br>  3.4                                                                       | L  <br>  S  <br>  B+                                                                  | 90% M<br>Queu<br>  25                                                 | lax  <br>le  <br>ft                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Appi<br>RT<br>TH                                                               | up   Lanes <br>roach<br>  12/1  <br>  12/1                                                                                                 | Reqd<br>.002<br>.421                                                         | Used<br>                                                                                                           | Servi<br>  @C (v<br>  838<br>  1025                                                                                    | ce Rate<br>ph) @E<br><br>  865<br>  1047                                                                       | Adj  <br> Volume <br>  1  <br>  716                                                                | ∨/c<br>.001<br>.684                                                                             | HCM<br>  Delay<br>6.9<br>  3.4<br>7.0                                                                | L  <br>  S  <br>  B+<br>  A<br>  *B+                                                  | 90% M<br>Queu<br>25                                                   | ft                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Grou<br>Appu<br>RT                                                             | up   Lanes <br>roach<br>  12/1  <br>  12/1                                                                                                 | Reqd<br>.002<br>.421                                                         | Used<br>                                                                                                           | Servi<br>  @C (v<br>  838<br>  1025                                                                                    | ce Rate<br>ph) @E<br><br>  865<br>  1047                                                                       | Adj  <br> Volume <br>  1  <br>  716  <br>  78                                                      | √/c<br>.001<br>.684<br>.448                                                                     | HCM<br>  Delay<br>6.9<br>  3.4<br>7.0                                                                | L<br>  S<br>  A<br> *B+<br>  B+                                                       | 90% M<br>Queu<br>25<br>254<br>28                                      | lax  <br>le  <br>ft  <br>ft  <br>ft                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Grou<br>Apps<br>RT<br>TH<br>LT                                                 | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1                                                                                     | Reqd<br>.002<br>.421                                                         | Used<br>                                                                                                           | Servi<br>  @C (v<br>  838<br>  1025                                                                                    | ce Rate<br>ph) @E<br><br>  865<br>  1047                                                                       | Adj  <br> Volume <br>  1  <br>  716  <br>  78                                                      | √/c<br>.001<br>.684<br>.448                                                                     | HCM<br>Delay<br>6.9<br>3.4<br>7.0<br>5.9                                                             | L<br>  S<br>  A<br> *B+<br>  B+                                                       | 90% M<br>Queu<br>25<br>254<br>28                                      | 1ax                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Grou<br>Appr<br>RT<br>TH<br>LT<br>App                                          | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                                                         | Reqd<br>.002<br>.421<br>.086                                                 | Used<br>  .579<br>  .579<br>  .579<br>  .579                                                                       | Servi<br>  @C (v<br>  838<br>  1025<br>  145                                                                           | ce Rate<br>ph) @E<br>  865<br>  1047<br>  174                                                                  | Adj  <br> Volume <br>  1  <br>  716  <br>  78                                                      | √/c .001 .684 .448                                                                              | HCM<br>Delay<br>6.9<br>3.4<br>7.0<br>5.9<br>2.6                                                      | L<br>  S<br>  A<br> *B+<br>  B+                                                       | 90% M<br>Queu<br>254<br>28                                            | ft <br>ft                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Grou<br>Apps<br>RT<br>TH<br>LT<br>Apps                                         | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                                                         | Reqd<br>.002<br>.421<br>.086<br>.009                                         | Used<br>.579<br>.579<br>.579<br>.579                                                                               | Servi<br>  @C (v<br>  838<br>  1025<br>  145<br>  1225                                                                 | ce Rate<br>ph) @E<br>  865<br>  1047<br>  174<br>  1225                                                        | Adj  <br> Volume <br>  1  <br>  716  <br>  78  <br>  5                                             | √/c .001 .684 .448 .004                                                                         | HCM<br>Delay<br>6.9<br>3.4<br>7.0<br>5.9<br>2.6<br>1.0                                               | L<br>  S<br>  A<br>  * B+<br>  B+<br>  B+                                             | 90% M<br>Queu<br>254<br>28                                            | Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax   </td |
| Grou<br>Apps<br>RT<br>TH<br>LT<br>Apps                                         | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                                 | Reqd<br>.002<br>.421<br>.086<br>.009<br>.297                                 | Used<br>  .579<br>  .579<br>  .579<br>  .579<br>  .579<br>  .773<br>  .773                                         | Servi<br>  @C (v<br>  838<br>  1025<br>  145<br>  1225<br>  1483<br>  378                                              | ce Rate<br>ph) @E<br>  865<br>  1047<br>  174<br>  1225<br>  1483<br>  420                                     | Adj  <br> Volume <br>  1  <br>  716  <br>  78  <br>  5  <br>  511  <br>  211                       | <pre> √ / c<br/>. 0 0 1<br/>. 6 B 4<br/>. 4 4 8<br/>. 0 0 4<br/>. 3 4 5<br/>. 5 0 2</pre>       | HCM<br>Delay<br>6.9<br>3.4<br>7.0<br>5.9<br>2.6<br>1.0<br>1.4                                        | L<br>  S<br>  A<br>  * B+<br>  B+<br>  B+                                             | 90% M<br>Queu<br>254<br>254<br>28                                     | Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax        |
| Groi<br>App:<br>RT<br>TH<br>LT<br>Appi<br>RT<br>RT                             | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                                             | Reqd<br>.002<br>.421<br>.086<br>.009<br>.297                                 | Used<br>  .579<br>  .579<br>  .579<br>  .579<br>  .579<br>  .773<br>  .773                                         | Servi<br>  @C (v<br>  838<br>  1025<br>  145<br>  1225<br>  1483<br>  378                                              | ce Rate<br>ph) @E<br>  865<br>  1047<br>  174<br>  1225<br>  1483<br>  420                                     | Adj  <br> Volume <br>  1  <br>  716  <br>  78  <br>  5  <br>  511                                  | <pre> √ / c<br/>. 0 0 1<br/>. 6 B 4<br/>. 4 4 8<br/>. 0 0 4<br/>. 3 4 5<br/>. 5 0 2</pre>       | HCM<br>Delay<br>6.9<br>3.4<br>7.0<br>5.9<br>2.6<br>1.0<br>1.4<br>5.4                                 | L<br>  S<br>  A<br>  * B+<br>  B+<br>  A<br>  A<br>  A<br>  * B+                      | 90% M<br>Queu<br>254<br>254<br>28                                     | Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax        |
| App:<br>RT<br>TH<br>LT<br>Appi<br>RT<br>TH<br>LT                               | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                     | Reqd<br>.002<br>.421<br>.086<br>.009<br>.297<br>.062                         | Used<br>  .579<br>  .579<br>  .579<br>  .579<br>  .579<br>  .773<br>  .773<br>  .160                               | Servi<br>  @C (v<br>  838<br>  1025<br>  145<br>  1225<br>  1483<br>  378                                              | ce Rate<br>ph) @E<br>  865<br>  1047<br>  174<br>  1225<br>  1483<br>  420                                     | Adj  <br> Volume <br>  1  <br>  716  <br>  78  <br>  5  <br>  511  <br>  211                       | <pre>∨/c .001 .684 .448 .004 .345 .502</pre>                                                    | HCM<br>Delay<br>6.9<br>3.4<br>7.0<br>5.9<br>2.6<br>1.0<br>1.4<br>5.4                                 | L<br>  S<br>  A<br>  * B+<br>  B+<br>  A<br>  A<br>  A<br>  * B+                      | 90% M<br>Queu<br>254<br>254<br>28<br>28                               | Iax         Iax         Ie         Ift         ft         ft         ft         ft         ft         ft         ft         ft         ft         ft                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Groi<br>App:<br>RT<br>TH<br>LT<br>App:<br>RT<br>TH<br>LT<br>CTH                | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                     | Reqd<br>.002<br>.421<br>.086<br>.009<br>.297<br>.062                         | Used<br>  .579<br>  .579<br>  .579<br>  .579<br>  .773<br>  .773<br>  .160                                         | Servi<br>  @C (v<br>  838<br>  1025<br>  145<br>  1225<br>  1483<br>  378<br>  191                                     | ce Rate<br>ph) @E<br>  865<br>  1047<br>  174<br>  1225<br>  1483<br>  420<br>  247                            | Adj  <br> Volume <br>  1  <br>  716  <br>  78  <br>  511  <br>  211  <br>  211                     | √/c .001 .684 .448 .004 .345 .502 .150                                                          | HCM<br>Delay<br>6.9<br>3.4<br>7.0<br>5.9<br>2.6<br>1.0<br>1.4<br>5.4<br>14.3                         | L<br>  S<br>  A<br>  * B +<br>  B +<br>  A<br>  A<br>  * B +<br>  A<br>  * B +<br>  B | 90% M<br>Queu<br>254<br>254<br>28<br>28<br>28<br>49<br>49             | Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax         Iax   <t< td=""></t<>                                                                                                                      |
| App:<br>RT<br>TH<br>LT<br>Appi<br>RT<br>TH<br>LT<br>App:<br>RT                 | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                         | Reqd<br>.002<br>.421<br>.086<br>.009<br>.297<br>.062                         | Used<br>  .579<br>  .579<br>  .579<br>  .579<br>  .773<br>  .773<br>  .160                                         | Servi<br>  @C (v<br>  838<br>  1025<br>  145<br>  1225<br>  1483<br>  378<br>  191                                     | ce Rate<br>ph) @E<br>  865<br>  1047<br>  174<br>  1225<br>  1483<br>  420<br>  247                            | Adj  <br> Volume <br>  1  <br>  716  <br>  78  <br>  511  <br>  211  <br>  211                     | √/c .001 .684 .448 .004 .345 .502 .150                                                          | HCM<br>Delay<br>6.9<br>3.4<br>7.0<br>5.9<br>2.6<br>1.0<br>1.4<br>5.4<br>14.3                         | L<br>  S<br>  A<br>  * B +<br>  B +<br>  A<br>  A<br>  * B +<br>  A<br>  * B +<br>  B | 90% M<br>Queu<br>254<br>254<br>28<br>28<br>28<br>49<br>49             | Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax   </td |
| Groi<br>App:<br>RT<br>TH<br>LT<br>App:<br>RT<br>TH<br>LT<br>TH<br>TH<br>TH     | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1             | Reqd<br>.002<br>.421<br>.086<br>.009<br>.297<br>.062                         | Used<br>  .579<br>  .579<br>  .579<br>  .579<br>  .773<br>  .773<br>  .160                                         | Servi<br>  @C (v<br>  838<br>  1025<br>  145<br>  1225<br>  1483<br>  378<br>  191                                     | ce Rate<br>ph) @E<br>  865<br>  1047<br>  174<br>  1225<br>  1483<br>  420<br>  247                            | Adj  <br> Volume <br>  1  <br>  716  <br>  78  <br>  511  <br>  211  <br>  211                     | √/c .001 .684 .448 .004 .345 .502 .150                                                          | HCM<br>Delay<br>6.9<br>3.4<br>7.0<br>5.9<br>2.6<br>1.0<br>1.4<br>5.4<br>14.3<br>14.0<br>14.4         | L<br>  S<br>  +<br>  +<br>  +<br>  +<br>  +<br>  +<br>  +<br>  +<br>  +<br>  +        | 90% M<br>Queu<br>254<br>254<br>28<br>28<br>28<br>49<br>49             | Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax       Iax         Iax   </td |
| Grou<br>App:<br>RT<br>TH<br>LT<br>Appi<br>RT<br>TH<br>LT<br>App:<br>RT<br>T+TH | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1 | Reqd<br>.002<br>.421<br>.086<br>.009<br>.297<br>.062<br>.043<br>.067         | Used<br>  .579<br>  .579<br>  .579<br>  .579<br>  .773<br>  .773<br>  .160<br>  .160<br>  .160                     | Servi<br>  @C (v<br>  838<br>  1025<br>  145<br>  1225<br>  1483<br>  378<br>  191<br>  211                            | ce Rate<br>ph) @E<br>  865<br>  1047<br>  174<br>  1225<br>  1483<br>  420<br>  247<br>  269                   | Adj  <br> Volume <br>  1  <br>  716  <br>  78  <br>  511  <br>  211  <br>  211  <br>  37  <br>  71 | √/c .001 .684 .448 .004 .345 .502 .150 .264                                                     | HCM<br>Delay<br>6.9<br>3.4<br>7.0<br>5.9<br>2.6<br>1.0<br>1.4<br>5.4<br>14.3<br>14.0<br>14.4<br>10.6 | L<br>  S<br>  +<br>  +<br>  +<br>  +<br>  +<br>  +<br>  +<br>  +<br>  +<br>  +        | 90% M<br>Queu<br>254<br>254<br>28<br>28<br>38<br>49                   | Iax                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Groi<br>App:<br>RT<br>TH<br>LT<br>Appi<br>RT<br>TH<br>LT<br>TH<br>TH<br>LT     | <pre>up   Lanes  roach</pre>                                                                                                               | Reqd<br>.002<br>.421<br>.086<br>.009<br>.297<br>.062<br>.043<br>.067<br>.082 | Used<br>  .579<br>  .579<br>  .579<br>  .579<br>  .579<br>  .773<br>  .773<br>  .160<br>  .160<br>  .160<br>  .160 | Servi<br>  @C (v<br>  838<br>  1025<br>  145<br>  145<br>  1225<br>  1483<br>  378<br>  191<br>  211<br>  211<br>  211 | ce Rate<br>ph) @E<br>  865<br>  1047<br>  174<br>  174<br>  1225<br>  1483<br>  420<br>  247<br>  269<br>  545 | Adj  <br> Volume <br>  1  <br>  716  <br>  78  <br>  511  <br>  211  <br>  37  <br>  71            | <pre> / c<br/>. 001<br/>. 684<br/>. 448<br/>. 004<br/>. 345<br/>. 502<br/>. 150<br/>. 264</pre> | HCM<br>Delay<br>6.9<br>3.4<br>7.0<br>5.9<br>2.6<br>1.0<br>1.4<br>5.4<br>14.3<br>14.0<br>14.4<br>10.6 | L<br>  S<br>  * B<br>  * B<br>  A<br>  * B<br>  * B<br>  * B<br>  * B<br>  * B        | 90% M<br>Queu<br>254<br>254<br>28<br>28<br>38<br>49<br>25<br>98<br>49 | Iax                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

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| AM PEAK HOUR     |                         |          |                       |                  |                                |
|------------------|-------------------------|----------|-----------------------|------------------|--------------------------------|
| SIGNAL94/TEAPAC[ | [V1 L1.4] - Sur         | nmary of | Parameter             | • Values         |                                |
| Intersection     | Parameters for          | Int #    | 0 - HALE              | AKALA HWY & PUKA | LANI ST                        |
| METROAREA        | NONCBD                  |          |                       |                  |                                |
| LOSTTIME         | 2.0                     |          |                       |                  |                                |
| LEVELOFSERVICE   | C S                     |          |                       |                  |                                |
| NODELOCATION     | 0 0                     |          |                       |                  |                                |
| Approach Para    | ameters                 |          |                       |                  |                                |
| APPLABELS        | ев<br>- <del>58</del> - |          | 58<br>-# <del>8</del> | ·\\ B<br>-\\     | NB<br><del>E</del> B-          |
| GRADES           | 8.0                     |          | .0                    | -8.0             | 2.0                            |
| PEDLEVELS        | MODER                   |          | MODER                 | MODER            | MODER                          |
| PARKINGSIDES     | NONE                    |          | NONE                  | NONE             | NONE                           |
| PARKINGSIDES     | 20                      |          | 20                    | 20               | 20                             |
| BUSVOLUMES       | 20                      |          | 6                     | 0                | 0                              |
| RIGHTTURNONREDS  | 141                     |          | ø                     | 0                | 135                            |
|                  |                         |          |                       |                  |                                |
| Movement Para    | meters                  |          |                       |                  |                                |
| MOVLABELS        | RT TH L                 | T RT     | TH LT                 |                  | RT TH L                        |
| VOLUMES          | 141 40                  | 0 0      | 0 0                   | 0 249 193        | 151 0 60                       |
| WIDTHS           | 12.0 12.0 .             | 0.0      | .0 .0                 | .0 12.0 12.0     | 12.0 .0 12.                    |
| LANES            | 1 1                     | 0 0      | 00                    | 0 1 1            | 1 0                            |
| UTILIZATIONS     | 1.00 1.00 1.0           |          | 1.00 1.00             | 1.00 1.00 1.00   | 1.00 1.00 1.0                  |
| TRUCKPERCENTS    | 2.0 2.0 2.              |          | 2.0 2.0               | 2.0 2.0 2.0      | 2.0 2.0 2.                     |
| PEAKHOURFACTORS  | .95 .95 .9              |          | .95 .95               | .95 .95 .95      | .95 .95 .9                     |
| ARRIVALTYPES     | 3 3                     | 3 3      | 3 3                   | 3 3 3            | 3 3                            |
| ACTUATIONS       | NO YES YE               |          | YES YES               | NO YES YES       | NO YES YE                      |
| REQCLEARANCES    | 4.0 4.0 4.              |          | 4.0 4.0               | 4.0 4.0 4.0      | 4.0 4.0 4.                     |
| MINIMUMS         | 5.0 5.0 5.              |          | 5.0 5.0               | 5.0 5.0 5.0      | 5.0 5.0 5.                     |
| IDEALSATFLOWS    | 1900 1900 190           |          | 1900 1900             | 1900 1900 1900   | 1900 1900 190                  |
| FACTORS          | 1.00 1.00 1.0           |          | 1.00 1.00             |                  | 1.00 1.00 1.0                  |
| DELAYFACTORS     | 1.00 1.00 1.0           |          | 1.00 1.00             |                  | 1.00 1.00 1.0<br>1.00 1.00 1.0 |
| NSTOPFACTORS     | 1.00 1.00 1.0           |          | 1.00 1.00             |                  | NORM NORM NOR                  |
| GROUPTYPES       | NORM NORM NOR           |          | NORM NORM<br>0 0      |                  | 1392 0 139                     |
| SATURATIONFLOWS  | 1350 1788               | 0 0      | 0 0                   | 0 1919 1017      | 1352 0135                      |
| Phasing Param    | eters                   |          |                       | · •              |                                |
| SEQUENCES        | 11 ALL                  |          |                       |                  |                                |
| PERMISSIVES      | YES YES                 | YES      | YES                   | LEADLAGS         | NONE NON                       |
| DVERLAPS         | NO NO                   | NO       | NO                    | OFFSET           | .00                            |
| CYCLES           | 60 120                  | 10       |                       | PEDTIME          | - 0                            |
| GREENTIMES       | 12.41 39.59             |          |                       |                  |                                |
| YELLOWTIMES      | 4.00 4.00               |          |                       |                  |                                |
| CRITICALS        | 8 12                    |          |                       |                  |                                |
| EXCESS           | 0                       |          |                       |                  |                                |

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|                                                                                                                                                                         |                                                                                                                                                         |                                                    |                                             |                                                       |                                             |                                                                     |                                                                  |                                                        |                                                | <u> </u>        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------|-------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------|-----------------|
|                                                                                                                                                                         |                                                                                                                                                         |                                                    |                                             |                                                       |                                             |                                                                     |                                                                  |                                                        |                                                | •               |
| LAMALU<br>TURE BASE W/MIT                                                                                                                                               |                                                                                                                                                         |                                                    |                                             |                                                       |                                             |                                                                     |                                                                  | •                                                      | 27/97<br>00:07                                 |                 |
| PEAK HOUR                                                                                                                                                               |                                                                                                                                                         |                                                    |                                             |                                                       |                                             |                                                                     |                                                                  |                                                        |                                                |                 |
| GNAL94/TEAPAC[V1                                                                                                                                                        | L1.47 — Capa                                                                                                                                            | acity An                                           | alysis                                      | Summary                                               | у                                           |                                                                     |                                                                  |                                                        |                                                | :               |
| tersection Avera                                                                                                                                                        |                                                                                                                                                         |                                                    |                                             | ALA HWY                                               |                                             | LANI ST                                                             |                                                                  |                                                        |                                                | , <b>19</b> 00. |
| Degree of Sa                                                                                                                                                            | turation (v/o                                                                                                                                           |                                                    |                                             |                                                       |                                             | Level                                                               | of S                                                             | Gervic                                                 | e B+                                           |                 |
|                                                                                                                                                                         | <br>  Phase 2                                                                                                                                           | -                                                  |                                             |                                                       |                                             |                                                                     |                                                                  |                                                        |                                                | يعتمو           |
| 11   Phase 1<br>/**                                                                                                                                                     |                                                                                                                                                         | -                                                  |                                             |                                                       |                                             |                                                                     |                                                                  |                                                        |                                                |                 |
| .   + +                                                                                                                                                                 |                                                                                                                                                         |                                                    |                                             |                                                       |                                             |                                                                     |                                                                  |                                                        |                                                | ***             |
|                                                                                                                                                                         | ~                                                                                                                                                       |                                                    |                                             |                                                       |                                             |                                                                     |                                                                  |                                                        |                                                | 1               |
| ist   ^<br>rth   <+ *                                                                                                                                                   | **** [<br>]                                                                                                                                             |                                                    |                                             |                                                       |                                             |                                                                     |                                                                  |                                                        |                                                | 18 Mari         |
| ) + *<br>  + *                                                                                                                                                          | j++++ j                                                                                                                                                 |                                                    |                                             |                                                       |                                             |                                                                     |                                                                  |                                                        |                                                | : ار<br>س       |
| 1 + -                                                                                                                                                                   | 1 ¥ 1                                                                                                                                                   |                                                    |                                             |                                                       |                                             |                                                                     |                                                                  |                                                        |                                                |                 |
|                                                                                                                                                                         |                                                                                                                                                         | -                                                  |                                             |                                                       |                                             |                                                                     |                                                                  |                                                        |                                                |                 |
| <br>  G/C= .207<br>  G= 12.4"                                                                                                                                           | G/C= .660  <br>  G= 39.6"                                                                                                                               | •                                                  |                                             |                                                       |                                             |                                                                     |                                                                  |                                                        |                                                |                 |
| G= 12.4"<br>Y+R= 4.0"                                                                                                                                                   | G= 39.6"  <br>  Y+R= 4.0"                                                                                                                               | •                                                  |                                             |                                                       |                                             |                                                                     |                                                                  |                                                        |                                                | <b>1</b>        |
| G≕ 12.4"<br>  Y+R≕ 4.0"<br>  OFF≕ .0%                                                                                                                                   | G≕ 39.6"  <br>  Y+R≕ 4.0"  <br>  OFF=27.3%                                                                                                              |                                                    | V 8                                         | 6 coo -                                               | 12 29                                       | Pode                                                                | 0 60                                                             | ~ -                                                    | <b>A 9</b>                                     |                 |
| G== 12.4"<br>  Y+R== 4.0"<br>  OFF== .0%                                                                                                                                | G= 39.6"  <br>  Y+R= 4.0"                                                                                                                               | * 86.7%                                            | Yn≅ 8.                                      | 0 sec =                                               | 13.3%                                       | Ped=                                                                | .0 se                                                            | c =                                                    | . 0 %                                          | , .             |
| G= 12.4"<br>  Y+R= 4.0"<br>  OFF= .0%<br>C= 60 sec                                                                                                                      | G= 39.6"  <br>  Y+R≕ 4.0"  <br>  OFF=27.3%  <br><br>G= 52.0 sec =                                                                                       | Servic                                             | e Rate                                      | Adj                                                   | <br>I                                       |                                                                     | L                                                                | c =<br> 90%                                            |                                                |                 |
| G≕ 12.4"<br>  Y+R≕ 4.0"<br>  OFF≕ .0%<br><br>C= 60 sec                                                                                                                  | G= 39.6"  <br>  Y+R= 4.0"  <br>  OFF=27.3%  <br>G= 52.0 sec =<br>g/C                                                                                    | Servic                                             | e Rate                                      |                                                       | <br>I                                       |                                                                     | L                                                                |                                                        | Max                                            |                 |
| G= 12.4"<br>  Y+R= 4.0"<br>  OFF= .0%<br>C= 60 sec<br>Lane  Width/ <br>Group   Lanes                                                                                    | G= 39.6"  <br>  Y+R= 4.0"  <br>  OFF=27.3%  <br>G= 52.0 sec =<br>g/C                                                                                    | Servic                                             | e Rate                                      | Adj                                                   | <br>I                                       | HCM<br>Delay                                                        | L<br>  S                                                         | 90%                                                    | Max                                            |                 |
| G= 12.4"<br>  Y+R= 4.0"<br>  OFF= .0%<br>C= 60 sec<br>Lane  Width/ <br>Group   Lanes <br>Approach                                                                       | G= 39.6"  <br>  Y+R= 4.0"  <br>  OFF=27.3%  <br>G= 52.0 sec =<br>g/C  <br>Reqd Used                                                                     | Servic<br>@C (vpl                                  | e Rate<br>h) @E                             | Adj<br> Volume                                        | <br>  v/c                                   | HCM<br>Delay<br>11.5                                                | L<br>  S<br>                                                     | 90%<br>  Que                                           | Max  <br>ue                                    |                 |
| G= 12.4"<br>  Y+R= 4.0"<br>  OFF= .0%<br>C= 60 sec<br>Lane  Width/ <br>Group   Lanes <br>Approach<br>RT   12/1  <br>TH   12/1                                           | G= 39.6"  <br>  Y+R= 4.0"  <br>  OFF=27.3%  <br>G= 52.0 sec =<br>g/C  <br>Reqd Used  <br>.002   .240  <br>.042   .240                                   | Servic<br>@C (vpl<br>269  <br>368                  | e Rate<br>h) @E<br>                         | Adj<br> Volume<br>  1. <br>  42                       | <br>  v/c<br>  .003<br>  .098               | HCM<br>Delay<br>11.5<br>11.2<br>11.2                                | L<br>  S<br>  B<br>  B                                           | 90%<br>  Que<br>  25<br>  27                           | Max <br>ue  <br><br>ft <br>ft                  |                 |
| G= 12.4"<br>  Y+R= 4.0"<br>  OFF= .0%<br>C= 60 sec<br>Lane  Width/ <br>Group   Lanes <br>Approach<br>RT   12/1  <br>TH   12/1                                           | G= 39.6"  <br>  Y+R= 4.0"  <br>  OFF=27.3%  <br>G= 52.0 sec =<br>g/C  <br>Reqd Used  <br>.003   .240                                                    | Servic<br>@C (vpl<br>269  <br>368                  | e Rate<br>h) @E<br>                         | Adj<br> Volume<br>  1. <br>  42                       | <br>  v/c<br>  .003<br>  .098               | HCM<br>Delay<br>11.5<br>11.2<br>11.2                                | L<br>  S<br>  B<br>  B                                           | 90%<br>  Que<br>  25<br>  27                           | Max <br>ue  <br><br>ft <br>ft                  |                 |
| G= 12.4"<br>  Y+R= 4.0"<br>  OFF= .0%<br>C= 60 sec<br>Lane  Width/ <br>Group   Lanes <br>Approach<br>RT   12/1  <br>TH   12/1  <br>TH   12/1                            | G= 39.6"  <br>  Y+R= 4.0"  <br>  OFF=27.3%  <br>G= 52.0 sec =<br>g/C  <br>Reqd Used  <br>.002   .240  <br>.042   .240                                   | Servic<br>@C (vpl<br>269  <br>368                  | e Rate<br>h) @E<br>324<br>429               | Adj<br> Volume<br>  1.  <br>  42                      | <br>  ∨/c<br>  .003<br>  .098               | HCM<br>Delay<br>11.5<br>11.2<br>11.5<br>14.0                        | L<br>  S<br>  B<br>  B<br>  B                                    | 90%<br>  Que<br>  25<br>  27                           | Max <br>ue  <br>ft <br>ft                      |                 |
| G= 12.4"<br>  Y+R= 4.0"<br>  OFF= .0%<br>C= 60 sec<br>Lane  Width/ <br>Group   Lanes <br>Approach<br>RT   12/1  <br>TH   12/1  <br>Approach                             | G= 39.6"  <br>  Y+R= 4.0"  <br>  OFF=27.3%  <br>G= 52.0 sec =<br>g/C  <br>Reqd Used  <br>.002   .240  <br>.042   .240                                   | Servic<br>@C (vp<br>269  <br>368  <br>399          | e Rate<br>h) @E<br>324<br>429<br>461        | Adj  <br> Volume <br>  1  <br>  42  <br>  262         | ∨/c<br>  .003<br> .098                      | HCM<br>Delay<br>11.5<br>11.2<br>11.5<br>14.0                        | L<br>  S<br>  B<br>  B<br>  B<br>  B                             | 90%<br>  Que<br>  25<br>  27<br>  27                   | Max!<br>ue  <br><br>ft <br>ft <br><br>ft       |                 |
| G= 12.4"<br>  Y+R= 4.0"<br>  OFF= .0%<br>C= 60 sec<br>Lane  Width/ <br>Group   Lanes <br>Approach<br>RT   12/1  <br>TH   12/1  <br>Approach<br>TH   12/1  <br>LT   12/1 | G= 39.6"  <br>  Y+R= 4.0"  <br>  OFF=27.3%  <br>G= 52.0 sec =<br>g/C  <br>Reqd Used  <br>.003   .240  <br>.042   .240  <br>.169   .240  <br>.161   .240 | Servic<br>@C (vp<br>269  <br>368  <br>399  <br>329 | e Rate<br>h) @E<br>324<br>429<br>461<br>388 | Adj<br> Volume<br>  1  <br>  42  <br>  262  <br>  262 | ∨/c<br>  .003<br>  .098<br>  .568<br>  .523 | HCM<br>Delay<br>11.5<br>11.2<br>11.5<br>14.0<br>14.2<br>13.8        | L<br>  S<br>  B<br>  B<br>  B<br>  B<br>  *8<br>  B              | 90%<br>  Que<br>  25<br>  27<br>  27<br>  168<br>  130 | Max <br>ue  <br>ft <br>ft <br>ft <br>ft <br>ft |                 |
| G= 12.4"<br>  Y+R= 4.0"<br>  OFF= .0%<br>C= 60 sec<br>Lane  Width/ <br>Group   Lanes <br>Approach<br>RT   12/1  <br>TH   12/1  <br>TH   12/1  <br>LT   12/1             | G= 39.6"  <br>  Y+R= 4.0"  <br>  OFF=27.3%  <br>G= 52.0 sec =<br>g/C  <br>Reqd Used  <br>.003   .240  <br>.042   .240  <br>.169   .240  <br>.161   .240 | Servic<br>@C (vp<br>269  <br>368  <br>399  <br>329 | e Rate<br>h) @E<br>324<br>429<br>461<br>388 | Adj<br> Volume<br>  1  <br>  42  <br>  262  <br>  262 | ∨/c<br>  .003<br>  .098<br>  .568<br>  .523 | HCM<br>Delay<br>11.5<br>11.2<br>11.5<br>14.0<br>14.2<br>13.8        | L<br>  S<br>  B<br>  B<br>  B<br>  B<br>  B                      | 90%<br>  Que<br>  25<br>  27<br>  27<br>  168<br>  130 | Max <br>ue  <br>ft <br>ft <br>ft <br>ft <br>ft |                 |
| G= 12.4"<br>  Y+R= 4.0"<br>  OFF= .0%<br>C= 60 sec<br>Lane  Width/ <br>Group   Lanes <br>Approach<br>RT   12/1  <br>TH   12/1  <br>Approach<br>TH   12/1                | G= 39.6"  <br>  Y+R= 4.0"  <br>  OFF=27.3%  <br>G= 52.0 sec =<br>g/C  <br>Reqd Used  <br>.002   .240  <br>.042   .240  <br>.169   .240  <br>.161   .240 | Servic<br>@C (vp<br>269  <br>368  <br>399  <br>329 | e Rate<br>h) @E<br>324<br>429<br>461<br>388 | Adj<br> Volume<br>  1  <br>  42  <br>  262  <br>  203 | ∨/c<br>  .003<br> .098<br> .568<br> .523    | HCM<br>Delay<br>11.5<br>11.2<br>11.5<br>14.0<br>14.2<br>13.8<br>4.5 | L<br>  S<br>  B<br>  B<br>  B<br>  B<br>  B<br>  B<br>  B<br>  A | 90%<br>  Que<br>  25<br>  27<br>  168<br>  130         | Max <br>ue  <br>ft <br>ft <br>ft <br>ft        |                 |

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KULAMALU Future base W/MIT PM peak hour

# SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int # 0 - HALEAKALA HWY & PUKALANI ST

03/27/97

18:45:21

| METROAREA      | NON | ICBD |
|----------------|-----|------|
| LOSTTIME       |     | 2.0  |
| LEVELOFSERVICE | С   | S    |
| NODELOCATION   | 0   | 0    |

Approach Parameters

|                               | EB                     | SE                      | wB                    | NB<br>-EB-    |
|-------------------------------|------------------------|-------------------------|-----------------------|---------------|
| APPLABELS<br>Grades           | <del>50</del> -<br>8.0 | - <del>645</del><br>- 0 | <del>NB</del><br>-8.0 | 2.0           |
| PEDLEVELS                     | MODER                  | MODER<br>None           | MODER<br>None         | MODER<br>None |
| PARKINGSIDES<br>Parkvolumes   | N D N E<br>20          | 20                      | 20<br>0               | 20<br>0       |
| BUSVOLUMES<br>Rightturnonreds | 0<br>134               | 0<br>0                  | ø                     | 196           |
|                               | •                      |                         |                       |               |

### Movement Parameters

|                 | RT   | тн   | LT    | RT    | тн   | LT   | RT   | тн    | LT    | RT    | тн    | LT       |
|-----------------|------|------|-------|-------|------|------|------|-------|-------|-------|-------|----------|
| MOVLABELS       |      |      | - i   | Ö     | Ø    | Ø    | Ø    | 168   | 280   | 315   | 0     | 191      |
| VOLUMES         | 497  | 220  |       | -     | -    | -    | .0   | 12.0  | 12.0  | 12.0  | .0    | 12.0     |
| WIDTHS          | 12.0 | 12.0 | .0    | .0    | .0   | .0   |      | 12.0  | -     | 10.00 |       | 1        |
|                 |      | 1    | 0     | 0     | 0    | Ø    | 0    | l     | 1     | 1     | 0     | <b>_</b> |
| LANES           |      |      |       | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00     |
| UTILIZATIONS    | 1.00 | 1.00 | 1.00  |       |      |      |      | 2.0   | 2.0   | 2.0   | 2.0   | 2.0      |
| TRUCKPERCENTS   | 2.0  | 2.0  | 2.0   | 2.0   | 2.0  | 2.0  | 2.0  |       |       | _     |       |          |
|                 | .95  | . 95 | .95   | .95   | .95  | .95  | .95  | .95   | .95   | .95   | .95   | .95      |
| PEAKHOURFACTORS |      |      | • • - | • • • | 3    | 3    | 3    | 3     | 3     | 3     | 3     | 3        |
| ARRIVALTYPES    | 3    | 3    | 3     | 3     | -    | -    | -    | YES   | YES   | NO    | YES   | YES      |
| ACTUATIONS      | NO   | YES  | YES   | NO    | YES  | YES  | NO   | • = - | . – - | • • = | . – . |          |
|                 | 4.0  | 4.0  | 4.0   | 4.0   | 4.0  | 4.0  | 4.0  | 4.0   | 4.0   | 4.0   | 4.0   | 4.0      |
| REQCLEARANCES   |      |      |       |       | 5.0  | 5.0  | 5.0  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0      |
| MINIMUMS        | 5.0  | 5.0  | 5.0   | 5.0   |      |      |      | 1900  | 1900  | 1900  | 1900  | 1900     |
| IDEALSATFLOWS   | 1900 | 1900 | 1900  | 1900  | 1900 | 1900 | 1900 |       |       |       |       |          |
|                 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00     |
| FACTORS         |      |      |       |       |      | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00     |
| DELAYFACTORS    | 1.00 | 1.00 | 1.00  | 1.00  |      |      |      |       |       | 1.00  | 1.00  | 1.00     |
| NSTOPFACTORS    | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  |       |       |          |
|                 |      |      |       | NORM  | NORM | NORM | NORM | NORM  | NORM  | NORM  | NORM  | NORM     |
| GROUPTYPES      | NORM | NORM | _     |       |      |      | Ø    | 1919  | 998   | 1392  | Ø     | 1392     |
| SATURATIONFLOWS | 1350 | 1788 | Ø     | Ø     | 0    | Ø    | Ø    | 1313  | 550   |       | -     |          |

### Phasing Parameters

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| SEQUENCES<br>PERMISSIVES<br>OVERLAPS<br>CYCLES<br>GREENTIMES<br>YELLOWTIMES<br>CRITICALS<br>EXCESS | YES<br>NO<br>60<br>34.47<br>4.00<br>9 | YES<br>NO<br>120<br>17.53<br>4.00<br>12 | YES<br>NO<br>10 | YES<br>No | OFFSET<br>PEDTIME | .00<br>.0 | 1<br>Ø |
|----------------------------------------------------------------------------------------------------|---------------------------------------|-----------------------------------------|-----------------|-----------|-------------------|-----------|--------|
|----------------------------------------------------------------------------------------------------|---------------------------------------|-----------------------------------------|-----------------|-----------|-------------------|-----------|--------|

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ستو<br>18:45:52   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| EAK HOUR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>مىرۇ</b>       |
| AL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ٩٣٩               |
| rsection Averages for Int # 0 - HALEAKALA HWY & PUKALANI ST<br>Degree of Saturation (v/c) .37 Vehicle Delay 5.6 Level of Ser                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |
| Phase 1   Phase 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>∀</b> a1       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 5 1<br>8.2        |
| + +<br><+ +                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | • 1               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2+4               |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <u> </u>          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>\$</b> 24.     |
| $\begin{vmatrix} G_{22} & 34.5 \\ G_{23} & 34.5 \\ Y + R_{23} & 4.0 \end{vmatrix} \begin{vmatrix} G_{23} & 17.5 \\ Y + R_{23} & 4.0 \\ Y + R_{23} & 4.0 \end{vmatrix}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>P</b>          |
| OFF= .0%   OFF=64.1%  <br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |
| C= 60 sec   G= 52.0 sec ≈ 86.7%  Y= 8.0 sec ≈ 13.3%  Ped≃  .0 sec                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |
| ne  Width/  g/C   Service Rate  Adj     HCM   L  <br>oup   Lanes  Reqd Used   @C (vph) @E  Volume  v/c   Delay   S                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 90% Max <br>Queue |
| oproach 4.1 A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1                 |
| RT   12/1   .323   .608   795   820   382   .466   4.5   A  <br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | · · · · · -       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                   |
| oproach<br>TH   12/1   .123   .608   1151   1166   177   .152   3.3   A  <br>TH   12/1   .123   .608   1151   1166   205   406   47   *A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 59 11             |
| TH   12/1   .123   .608   1151   1166   1/7   1166   4.7  *A  <br>T   12/1   .344   .608   577   607   295   .486   4.7  *A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>22</b> · - (   |
| oproach 10.4 B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | i                 |
| RT   12/1   .125   .325   400   453   125   .276   9.0   54                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 114 ftl           |
| LT   12/1   .184   .325   400   400   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500   500 |                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ; •               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 8** 1             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | · · ·             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | £1                |

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03/27/97 KULAMALU 18:03:07 FUTURE BASE W/MIT AM PEAK HOUR SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values Intersection Parameters for Int # 0 - HALEAKALA HWY & MAKAWAO AV NONCBD METROAREA 2.0 LOSTTIME LEVELOFSERVICE C S Ø 0 NODELOCATION Approach Parameters NB WB SB EB -68 -118--148--88-APPLABELS .0 -8.0 .0 8.0 GRADES MODER MODER MODER MODER PEDLEVELS NONE NONE NONE NONE PARKINGSIDES 20 20 20 20 PARKVOLUMES 0 0 0 0 BUSVOLUMES 0 60 0 0 RIGHTTURNONREDS Movement Parameters тΗ LT LT RT ТΗ RT TH LT RT тн LT RT MOVLABELS 26 195 25 45 67 31 24 203 52 127 85 6 VOLUMES .0 .0 12.0 .0 12.0 .0 .0 12.0 12.0 .0 12.0 12.0 WIDTHS 0 0 1 0 1 ø 0 1 - 1 1 1 LANES 0 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 UTILIZATIONS 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 TRUCKPERCENTS 2.0 .95 .95 .95 .95 .95 .95 .95 .95 .95 .95 .95 .95 PEAKHOURFACTORS 3 3 3 3 3 3 3 3 3 3 3 3 ARRIVALTYPES YES YES YES YES YES YES YES YES YES YES YES YES ACTUATIONS 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 REQCLEARANCES 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 MINIMUMS 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 IDEALSATFLOWS 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 FACTORS 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 DELAYFACTORS 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 NSTOPFACTORS NORM NORM NORM NORM NORM NORM NORM NORM NORM NORM NORM NORM GROUPTYPES 0 1476 0 0 0 1617 0 0 1769 888 1406 1683 SATURATIONFLOWS Phasing Parameters ALL 11 SEQUENCES NONE NONE LEADLAGS YES YES YES YES PERMISSIVES 1 .00 OFFSET NO NO NO NO OVERLAPS 0 .0 PEDTIME 180 10 60 CYCLES 21.51 30.49 GREENTIMES 4.00 4.00 YELLOWTIMES 8 4 CRITICALS ø EXCESS

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| 1 A L U                                                        | 03/27/97                                                                                                                                                |
|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| RE BASE W/MIT                                                  | 18:03:37                                                                                                                                                |
| EAK HOUR                                                       |                                                                                                                                                         |
|                                                                |                                                                                                                                                         |
| AL94/TEAPAC[V1 L1.4] - Capac                                   | city Analysis Summary                                                                                                                                   |
| rsection Averages for Int #                                    | 0 - HALEAKALA HWY & MAKAWAO AV<br>1 .23 Vehicle Delay  6.1 Level of Service B+                                                                          |
| Degree of Saturation (v/c)                                     | 23 Venicie beilgy 0.1 Level of beilgebeilg                                                                                                              |
| L   Phase 1   Phase 2                                          |                                                                                                                                                         |
| 1 + + + 1                                                      |                                                                                                                                                         |
|                                                                |                                                                                                                                                         |
|                                                                |                                                                                                                                                         |
| · · · · · · · · · · · · · · · · · · ·                          |                                                                                                                                                         |
| + )                                                            |                                                                                                                                                         |
| ***  v                                                         |                                                                                                                                                         |
| G/C= .508   G/C= .359                                          |                                                                                                                                                         |
| G= 30.5"   G= 21.5"  <br>Y+R= 4.0"   Y+R= 4.0"                 |                                                                                                                                                         |
| OFF= .0%   OFF=57.5%                                           |                                                                                                                                                         |
|                                                                | 86.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%                                                                                                              |
| C≖ 60 sec   G≖ 52.0 sec =                                      |                                                                                                                                                         |
| ne  Width/  g/C                                                | Service Rate! Adj     HCM   L  90% Max                                                                                                                  |
| roup   Lanes] Reqd Used                                        | @C (vph) @E  Volume  v/c   Delay   S   Queue                                                                                                            |
|                                                                |                                                                                                                                                         |
| proach                                                         | 4.5 A                                                                                                                                                   |
|                                                                | 930   958   140   .146   4.4   A   54 ft                                                                                                                |
| T   12/1   .146   .541                                         | 444   481   89   .185   4.6   A   34 ft                                                                                                                 |
|                                                                |                                                                                                                                                         |
| proach .                                                       | 4.9 A                                                                                                                                                   |
| neecaatascatascatascatascatascatascatasca                      | 846   876   264   .301   4.9  *A   102 ft                                                                                                               |
|                                                                |                                                                                                                                                         |
| proach                                                         | 7.9 B+                                                                                                                                                  |
| 。<br>2. 金金 医 五 云 脸 云 三 之 过 过 过 过 过 过 过 过 过 二 过 二 二 二 二 二 二 二 二 |                                                                                                                                                         |
| RT   12/1   .145   .392  <br>TH   12/1   .073   .392           | 503       551       151       .274       8.1       *B+       77       ft         611       660       80       .121       7.5       B+       41       ft |
|                                                                |                                                                                                                                                         |
| proach                                                         | 8.0 B+                                                                                                                                                  |
|                                                                | 529   578   145   .251   8.0   B+  74 ft                                                                                                                |
|                                                                |                                                                                                                                                         |

and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se

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| (ULAMALU<br>Future base w/mi<br>Pm peak hour | т              |                   |                   | 03/27/97<br>18:36:59 |
|----------------------------------------------|----------------|-------------------|-------------------|----------------------|
|                                              | V1 11 47 - Sug | mary of Parameter | Values            |                      |
|                                              | Parameters for |                   | AKALA HWY & MAKAW | IAO AV               |
|                                              |                |                   |                   |                      |
| METROAREA                                    | NONCBD         |                   |                   |                      |
| LOSTTIME                                     | 2.0            |                   |                   |                      |
| LEVELOFSERVICE                               | C S            |                   |                   | •                    |
| NODELOCATION                                 | 0 0            |                   |                   |                      |
| Approach Para                                | meters         |                   |                   | _                    |
|                                              | EB             | SB                | WB<br>WB          | NB                   |
| APPLABELS                                    |                | -#8               | <del>NB-</del>    | - <del>-EB</del>     |
| GRADES                                       | 8.0            | .0                | -8.0              | .0                   |
| PEDLEVELS                                    | MODER          | MODER             | MODER             | MODER                |
| PARKINGSIDES                                 | NONE           | NONE              | NONE              | NONE<br>20           |
| PARKVOLUMES                                  | 20             | 20                | 20                | 20                   |
| BUSVOLUMES                                   | 0              | 0                 | 0                 | Ø                    |
| RIGHTTURNONREDS                              | 0              | 205               | Ø                 | Ø                    |
| Movement Para                                | meters         |                   |                   |                      |
| MOVLABELS                                    | RT TH L        | T RT TH LT        | RT TH LT          | RT TH LT             |
| VOLUMES                                      | 33 209 28      | 7 269 66 49       | 29 187 26         | 31 57 19             |
| JIDTHS                                       | .0 12.0 12.    | 0 12.0 12.0 .0    | .0 12.0 .0        | .0 12.0 .0           |
| LANES                                        | 0 1            | 1 1 1 0           | 0 1 0             | 0 1 0                |
| UTILIZATIONS                                 | 1.00 1.00 1.0  |                   | 1.00 1.00 1.00    | 1.00 1.00 1.00       |
| TRUCKPERCENTS                                | 2.0 2.0 2.     |                   | 2.0 2.0 2.0       | 2.0 2.0 2.0          |
| PEAKHOURFACTORS                              | .95 .95 .9     |                   | .95 .95 .95       | .95 .95 .95          |
| ARRIVALTYPES                                 | 3 3            | 3 3 3 3           | 3 3 3             | 3 3 3                |
| ACTUATIONS                                   | YES YES YE     |                   | YES YES YES       | YES YES YES          |
| REQCLEARANCES                                | 4.0 4.0 4.     |                   | 4.0 4.0 4.0       | 4.0 4.0 4.0          |
| MINIMUMS                                     | 5.0 5.0 5.     |                   | 5.0 5.0 5.0       | 5.0 5.0 5.0          |
| IDEALSATFLOWS                                | 1900 1900 190  |                   | 1900 1900 1900    | 1900 1900 1900       |
| FACTORS                                      | 1.00 1.00 1.0  |                   | 1.00 1.00 1.00    | 1.00 1.00 1.00       |
| DELAYFACTORS                                 | 1.00 1.00 1.0  |                   |                   | 1.00 1.00 1.00       |
| NSTOPFACTORS                                 | 1.00 1.00 1.0  |                   | 1.00 1.00 1.00    | 1.00 1.00 1.00       |
| GROUPTYPES                                   | NORM NORM NOR  |                   | NORM NORM NORM    | NORM NORM NORM       |
| SATURATIONFLOWS                              | 0 1728 169     | 9 1406 1578 0     | 0 1528 0          | 0 1446 0             |
| Phasing Param                                | ieters         |                   |                   |                      |
| SEQUENCES                                    | 21 ALL         |                   |                   |                      |
| PERMISSIVES                                  | YES YES        |                   | LEADLAGS          | NONE NONE            |
| OVERLAPS                                     | YES YES        |                   | OFFSET            | .00 1                |
| CYCLES                                       | 60 180         |                   | PEDTIME           | .0 0                 |
| GREENTIMES                                   | 12.37 23.26    |                   |                   |                      |
| YELLOWTIMES                                  | 4.00 4.00      |                   |                   |                      |
| CRITICALS                                    | 3 8            | 5                 |                   |                      |
| EXCESS                                       | 0              |                   |                   |                      |

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| TUTURE BASE W/MIT 18:3<br>M PEAK HOUR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 7/97 <u>-</u><br>7:30                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| IGNAL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ÷.                                           |
| Intersection Averages for Int # 0 - HALEAKALA HWY & MAKAWAO AV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ٦<br>سم                                      |
| Degree of Saturation (v/c) .32 Vehicle Delay 6.0 Level of Servic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | e B+                                         |
| q 21   Phase 1   Phase 2   Phase 3  <br>*/**                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ***                                          |
| $\begin{vmatrix} + + * ^{-} \\ + + * \\ + + * \\ + + + + + + + \\ + + + +$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                              |
| $/   \langle + + * \rangle   \langle + + + \rangle   \langle * * * * *   \rangle $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                              |
| rul st $++++ vrul st$ $(* * *) ++++ v$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | - 1<br>- 1                                   |
| G/C= .206   G/C= .388   G/C= .206                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Tist.                                        |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | .4                                           |
| OFF= .0%   OFF=27.3%   OFF=72.7%  <br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                              |
| C= 60 sec   G= 48.0 sec = 80.0%  Y=12.0 sec = 20.0%  Ped= .0 sec =                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | .0*                                          |
| Lane  Width/  g/C   Service Rate  Adj     HCM   L  90% M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ax  …                                        |
| Group   Lanes  Reqd Used   @C (vph) @E  Volume  v/c   Delay   S   Queu<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | e  <br>                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | و همیا                                       |
| B Approach 2.6 A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                              |
| B Approach<br>TH+RT  12/1   .183   .694   1195   1199   255   .213   2.1   A   66                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ftl ""                                       |
| B Approach<br>TH+RT  12/1   .183   .694   1195   1199   255   .213   2.1   A   66<br>LT   12/1   .014   .239   717   733   302   .412   3.0  *A   78                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ft <br>ft                                    |
| B Approach<br>TH+RT  12/1   .183   .694   1195   1199   255   .213   2.1   A   66<br>LT   12/1   .014   .239   717   733   302   .412   3.0  *A   78<br>19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ft  <sup>int</sup><br>ft                     |
| B Approach<br>TH+RT  12/1   .183   .694   1195   1199   255   .213   2.1   A   66<br>LT   12/1   .014   .239   717   733   302   .412   3.0  *A   78<br>B Approach<br>B.0 B+                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ft  ""<br>ft <br><br>ft                      |
| B Approach       2.6 A         TH+RT        12/1       183       .694       1195       1199       255       .213       2.1       A       66         LT       12/1       .014       .239       717       733       302       .412       3.0       *A       78         13       B       Approach       8.0 B+       8.0 B+         LT+TH+RT       12/1       .205       .421       598       644       255       .396       8.0       *B+       125         3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       4       7       8       3       8       8       9       8       8       8       9       8       4       4       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1 | ft  1-7<br>ft  2-7<br><br>P                  |
| B Approach       2.6 A         TH+RT        12/1       183       .694       1195       1199       255       .213       2.1       A       66         LT       12/1       .014       .239       717       733       302       .412       3.0       *A       78         8       Approach       8.0       B+         LT+TH+RT       12/1       .205       .421       598       644       255       .396       8.0       *B+       125         3       Approach       9.7       B+       9.7       B+                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ft                                           |
| B Approach       2.6       A         TH+RT       12/1       .183       .694       1195       1199       255       .213       2.1       A       66         LT       12/1       .014       .239       717       733       302       .412       3.0       *A       78         B       Approach       8.0       B+         LT+TH+RT       12/1       .205       .421       598       644       255       .396       8.0       *B+       125         B       Approach       9.7       B+       125       .396       8.0       *B+       125         B       Approach       9.7       B+       121       .076       .512       684       720       67       .093       4.8       A       28         CT+TH       12/1       .109       .239       319       378       121       .320       12.3       *B       78                                                                                                                                                                                                  | ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft |
| B Approach       2.6       A         TH+RT       12/1       .183       .694       1195       1199       255       .213       2.1       A       66         LT       12/1       .014       .239       717       733       302       .412       3.0       *A       78         B       Approach       8.0       B+         LT+TH+RT       12/1       .205       .421       598       644       255       .396       8.0        *B+        125         B       Approach       9.7       B+       8.0       P       12/1       .076       .512       684       720       67       .093       4.8       A       28                                                                                                                                                                                                                                                                                                                                                                                                 | ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft |

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### SIGRAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

### Intersection Parameters for Int # 0 - HALBAXALA HWY & HAWA HWY

HETROAREA EOECED LOSTTIME 2.0 LEVELOFSERVICE C S RODELOCATION 0 0

### Approach Parameters

| APPLABELS       | 68<br>- <del>51</del> - | 58<br># | - <del>111</del> - | NB<br>       |
|-----------------|-------------------------|---------|--------------------|--------------|
| GRADES          | .0                      | .0      | .0                 | .0           |
| PEDLEVELS       | LOW                     | LOW     | LOW                | LOW          |
| PARKINGSIDES    | NORE                    | NORE    | NONE               | ROBE         |
| PARKVOLUNES     | 20                      | 20      | 20                 | 28           |
| BUSVOLUMES      | 9                       | 0       | 0                  | <del>0</del> |
| RIGHTTURNONREDS | 9                       | 8       | 9                  | 9            |

### **Hovement** Parameters

| HOVLABELS       | RT   | TE   | LT   | RT   | TH   | LT   | RT   | TH   | LT   | RT   | TH   | LT   |
|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| VOLUMES         | 5    | 39   | 17   | 49   | 748  | 83   | 54   | 156  | 2728 | 931  | 266  | 41   |
| VIDTES          | 12.0 | 12.0 | .0   | 12.0 | 24.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 24.0 | 12.0 |
| LANES           | 1    | 1    | 0    | -1   | 2    | 1    | 1    | 1    | 1    | 1    | 2    | 1    |
| UTILIZATIONS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| TRUCKPERCENTS   | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  |
| PEAKHOURFACTORS | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  |
| ARRIVALTYPES    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| ACTUATIONS      | 10   | YES  | YES  | 20   | YES  | TES  | NO   | TES  | TES  | 10   | YES  | TES  |
| REQCLEARANCES   | 4.0  | 4.0  | 4.8  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  |
| NININUNS        | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  |
| IDEALSATFLOWS   | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| FACTORS         | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.69 | 1.00 | 1.00 |
| DELATFACTORS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| ISTOPFACTORS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| GROUPTYPES      | NORN | RORM | ROBR | HORM | RORM | NORM | TELK | RORN | DOPT | TTLW | RORX | HORK |
| SATURATIONFLOWS | 1539 | 1835 | 0    | 1539 | 3725 | 1770 | 0    | 1783 | 1770 | 0    | 3725 | 1779 |

### Phasing Parameters

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| SEQUENCES   | 76    |       |      |      |       |          |      |      |  |
|-------------|-------|-------|------|------|-------|----------|------|------|--|
| PERMISSIVES | JÛ    | RO    | IO.  | RO   |       | LEADLAGS | ROBE | RORE |  |
| OVERLAPS    | 10    | NO    | RO   | NO   |       | OFFSET   | . 66 | 1    |  |
| CYCLES      | 68    | 180   | 10   |      |       | PEDTINE  | .0   | 8    |  |
| GREENTINES  | 19.00 | 25.00 | 5.00 | 3.00 | 22.00 |          |      |      |  |
| TELLONTINES | 4.00  | 4.00  | 4.00 | 4.00 | .80   |          |      |      |  |
| CRITICALS   | 2     | 9     | 5    | 5    | 5     |          |      |      |  |
| BICESS      | 0     |       |      |      |       |          |      |      |  |

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|        |                                                  | Degree of                                                    | Saturati                 | loa (v/                  | c) 2.20 ¥                        | LEAKALA EWY &<br>ebicle Delay<br>eme v/c's (se                                   | 55.14 Level                                                     | of Service                                                                                           |
|--------|--------------------------------------------------|--------------------------------------------------------------|--------------------------|--------------------------|----------------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
|        | q 76                                             |                                                              | ] Pha                    | nse 2                    | Phase 3                          | j Phase 4                                                                        | Phase 5                                                         | -                                                                                                    |
|        |                                                  | + * *<br>  + * *<br> <+ * *>                                 |                          |                          | <br> <br>                        |                                                                                  | *  <br> <br> <br> <br> <br> <br>                                | •                                                                                                    |
|        | ।<br>नन्म<br>सम्म                                |                                                              |                          | * +                      | * +++<br> ++++ V                 | ++++                                                                             | <br> <br> ++++>                                                 |                                                                                                      |
| -      | 1                                                |                                                              |                          | • +<br>• +               |                                  |                                                                                  |                                                                 |                                                                                                      |
|        |                                                  | G= 19.8<br>  Y+R= 4.0                                        | '   G=<br>'   Y+R=       | 25.0                     | G= 5.0'<br>Y+R= 4.0'             | G/C= .033<br>G= 3.0°<br>Y+R= 4.0°                                                | G= 22.0"<br>T+R= .0"                                            | 1                                                                                                    |
|        |                                                  |                                                              |                          |                          |                                  | 16.0 sec = 17                                                                    |                                                                 |                                                                                                      |
| -      | <br>3                                            | oacb                                                         | Reqd                     | Used                     | #C (vpb)                         | EK (Volume)                                                                      | v/c   Delay  <br>17.6                                           |                                                                                                      |
|        |                                                  |                                                              |                          |                          |                                  | 59   5   .<br>28   59   .                                                        |                                                                 |                                                                                                      |
|        |                                                  |                                                              |                          |                          |                                  |                                                                                  |                                                                 |                                                                                                      |
| ,<br>, | B<br>Appr                                        | oach                                                         |                          |                          |                                  |                                                                                  | 66.9 <b>(</b>                                                   | I                                                                                                    |
| ן<br>1 | Appr<br>TH                                       | 12/1-                                                        | .861  <br>.829           | .300  <br>.300           | 433   5<br>429   5:              | 35   1557  2.9<br>31   1479  2.9                                                 | 910   65.98                                                     | ¥  1379 f                                                                                            |
|        | Appr<br>TH                                       | 12/1- <br>  12/1+                                            | .861  <br>.829           | .300  <br>.300           | 433   5<br>429   5:              | 35   1557  2.3<br>31   1479  2.3                                                 | 910   65.98                                                     | Y  1379 f<br>Y  1310 ft                                                                              |
|        | Appr<br>TH<br>LT<br>Appro<br>RT<br>TH            | 12/1- <br>  12/1+ <br>pach<br>  12/1  <br>  24/2             | .829  <br>.098  <br>.254 | .300  <br>.222  <br>.222 | 429   5;<br>239   34<br>656   8; | 35   1557  2.3<br>31   1479  2.3<br>12   52   .1<br>28   787   .5<br>5   87   .6 | 910   65.98<br>785   66.08<br>35.6<br>52   18.2  <br>750   37.1 | <pre>Y  1379 f<br/>Y  1310 f1<br/>D<br/>C+  51 f1<br/>'D   387 f1</pre>                              |
|        | Appr<br>TH<br>LT<br>B<br>Appro<br>RT<br>TH<br>LT | 12/1- <br>  12/1+ <br>pach<br>  12/1  <br>  24/2  <br>  12/1 | .829  <br>.098  <br>.254 | .300  <br>.222  <br>.222 | 429   5;<br>239   34<br>656   8; | 11   1479  2.7<br>12   52   .1<br>18   787   .5                                  | 910   65.98<br>785   66.08<br>35.6<br>52   18.2  <br>750   37.1 | <pre>r  1379 f<br/>r  1310 ft<br/>D<br/>C+  51 ft<br/>r   387 ft<br/>D   387 ft<br/>D+  101 ft</pre> |

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KULANALU MASTER PLAN W/O MIT PH PEAK HOUR

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#### SIGHALS4/TEAPAC[V1 L1.4] - Summary of Parameter Values

# Intersection Parameters for Int 6 9 - HALEAKALA HWY & HANA HWY

| NETROAREA      | KOI | ICBD |
|----------------|-----|------|
| LOSTTINE       |     | 2.0  |
| LEVELOFSERVICE | ¢   | \$   |
| NODELOCATION   |     | ŧ    |

#### Approach Parameters

| APPLABELS       | eb<br>-# | 58<br>-#5 | WB   | NB<br>-{{} |
|-----------------|----------|-----------|------|------------|
| GRADES          | .1       | .1        | .1   |            |
| PEOLEVELS       | LOW      | LOW       | LOW  | LOW        |
| PARKINGSIDES    | NONE     | NGNE      | NONE | NONE       |
| PARKVOLUKES     | 28       | 28        | 28   | 28         |
| BUSVOLUNES      | Ŧ        | I         | •    | l I        |
| RIGHTTURNONREDS | 1        | •         | ŧ    | 1          |

#### Novement Parameters

| ROVLABELS       | RT   | TH   | ιſ   | RT   | TH   | LT   | RT   | TH   | 17    | RT   | TH   | LT   |
|-----------------|------|------|------|------|------|------|------|------|-------|------|------|------|
| VOLUMES         | 25   | 274  | 161  | - 41 | 586  | 85   | 63   | - 54 | 1213  | 1956 | 607  | 2    |
| WIDTHS          | 12.1 | 12.4 | .1   | 12.  | 24.0 | 12.8 | 12.4 | 12.1 | 12.9  | 12.0 | 24.0 | 12.4 |
| LANES           | 1    | 1    | ŧ    | 1    | 2    | 1    | 1    | 1    | 1     | 1    | 2    | 1    |
| UTILIZATIONS    | 1.00 | 1.44 | 1.00 | 1.0  | 1.44 | 1.10 | 1.00 | 1.44 | 1.11  | 1.44 | 1.00 | 1.11 |
| TRUCKPERCENTS   | 2.1  | 2.8  | 2.1  | 2.1  | 2.1  | 2.1  | 2.1  | 2.1  | 2.1   | 2.1  | 2.1  | 2.1  |
| PEAKHOURFACTORS | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95   | .95  | .95  | .95  |
| ARRIVALTYPES    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3     | 3    | 3    | 3    |
| ACTUATIONS      | NG   | YES  | YES  | XO   | YES  | YES  | XO   | YES  | YES   | NG   | TES  | YES  |
| REQCLEARANCES   | 4.1  | 4.4  | 1.1  | 4.1  | 4.1  | 4.1  | 1.1  | 4.1  | - Ł.I | 4.4  | 4.1  | 4.6  |
| AININUNS        | 5.1  | 5.1  | 5.1  | 5.0  | 5.4  | 5.1  | 5.1  | 5.0  | 5.1   | 5.0  | 5.0  | 5.1  |
| IDEALSATFLOWS   | 1948 | 1988 | 1988 | 1948 | 1944 | 1988 | 1988 | 1944 | 19##  | 1988 | 1988 | 1988 |
| FACTORS         | 1.00 | 1.0  | 1.0  | 1.44 | 1.00 | 1.## | 1.8  | 1.00 | 1.00  | 1.00 | 1.88 | 1.11 |
| DELAYFACTORS    | 1.44 | 1.11 | 1.00 | 1.0  | 1.00 | 1.11 | 1.11 | 1.11 | 1.88  | 1.00 | 1.11 | 1.0  |
| RSTOPFACTORS    | 1.40 | 1.11 | 1.11 | 1.00 | 1.0  | 1.## | 1.00 | 1.#  | 1.44  | 1.00 | 1.44 | 1.#  |
| GROUPTYPES      | NORN | NORX | NORN | NORN | NORM | KORK | FFLW | NORN | DOPT  | FFLW | NORK | HORK |
| SATURATIONFLOWS | 1539 | 1829 | 1    | 1539 | 3725 | 1774 | 1    | 1781 | 1770  | 1    | 3725 | 1774 |

#### Phasing Parameters

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| SEQUENCES   | 76    |       |      |      |       |          |      |      |
|-------------|-------|-------|------|------|-------|----------|------|------|
| PERMISSIVES | XO    | KO    | XO   | NO   |       | LEADLAGS | NONE | KONE |
| OVERLAPS    | NO    | XO    | MO   | KÓ   |       | OFFSEI   | .11  | 1    |
| CYCLES      | 61    | 180   | 10   |      |       | PEDTINE  | .1   | •    |
| GREENTIKES  | 19.00 | 25.00 | 5.00 | 3.00 | 22.44 |          |      |      |
| YELLOWTINES | 4.41  | 4.44  | 4.44 | 4.88 | . 11  |          |      |      |
| CRITICALS   | 2     | 8     | 11   | 5    | 5     |          |      |      |
| EXCESS      | 1     |       |      |      |       |          |      |      |

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KULANALU NASTER PLAK W/O HIT PM PEAK HOUR

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### SIGNAL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary

Intersection Averages for Int # 0 - HALEAKAIA HWY E HAWA HWY Degree of Saturation (v/c) .94 Vehicle Delay 47.48 Level of Service E+ @ expect more delay due to extreme v/c's (see EVALUATE)

| q 76  <br>•/•• - | Phase 1   | Phase 2   | Phase 3  <br> | Phase 4   |                   |
|------------------|-----------|-----------|---------------|-----------|-------------------|
| •                | + * *     | Ì         | 1             |           | - 1               |
|                  |           |           |               | 1         | į ++++            |
| л́м -            | (+ * *)   |           | i             | ĺ         | j (****           |
| 1                | v         |           | · ++++        | -         | İ                 |
| clst             |           | •         | ++++ v        | ++++      | J                 |
| aeth-            | Í         | (+ '      | Í             | ++++>     | ++++ <b>}</b>     |
|                  |           | ÷ *       | 1             |           |                   |
| •                |           | + •       | Ì             |           | 1                 |
|                  |           |           |               |           | <br>  ele++       |
|                  | 6/C= .211 | 6/C= .278 | 6/C= .456     | 6/0= .833 | 0/1= .244         |
|                  | 6= 19.4"  | 6= 25.8"  | 6= 5.0"       | 6= 3.0"   | 6= 22.1*          |
|                  | Y+R= 4.8" | Y+R= 4.4" | ¥+R= 4.0"     | Y+R= 4.9" | Y+R= . <b>0</b> " |
|                  | 0FF= .4%  | OFF=25.6% | OFF=57.8%     | 0FF=67.8% | 0FF=75.63         |

## C= 98 sec = 74.8 sec = 82.2% Y=16.8 sec = 17.8% Ped= .8 sec = .8%

|           | lane<br>Group  | Width,<br>  Lane:        | /  <br>5   R( | eqd | a/C | Used  |   | Serv<br>EC (     | ice<br>vph | Rati<br>) 82      | • <br> V | Adj<br>olume |         | v/c                  |           | NCX<br>Delay |           | L<br>S   | 91<br>  0 | \$ }<br>Uet | ax <br> e |
|-----------|----------------|--------------------------|---------------|-----|-----|-------|---|------------------|------------|-------------------|----------|--------------|---------|----------------------|-----------|--------------|-----------|----------|-----------|-------------|-----------|
| ee<br>Se  | 5<br>Approx    | ech                      |               |     |     |       |   |                  |            |                   |          |              |         |                      |           | 68.8         | 2         | F        |           |             |           |
| <br>      |                | 12/1<br>  12/1           |               |     |     |       |   |                  |            |                   |          | 26<br>457    |         |                      |           | 17.4<br>71.8 | <br> <br> | ¢.       |           | 25<br>43    | ft <br>ft |
| WE<br>-#8 | 3<br>Approi    | ach                      |               |     |     |       |   |                  |            |                   |          |              |         | ****                 |           | 65.4         | }         | F        |           |             |           |
|           |                | 12/1<br>  12/1           |               |     |     |       |   |                  |            | 534<br>531        |          | 684<br>650   | 1<br> 1 | .281                 |           | 65.9<br>66.0 |           |          |           |             |           |
| 5e<br>48  |                | ach .                    |               |     |     |       |   |                  |            |                   |          |              |         |                      |           | 23.4         |           | C        |           |             |           |
|           | RT<br>TH<br>LT | 12/1<br>  24/2<br>  12/1 | j.,           | 193 | İ   | . 222 | İ | 239<br>656<br>18 | i          | 342<br>828<br>125 | Ì        | 533          | 1       | .123<br>.644<br>.645 | ļ         |              |           | •0       | 2         | 62          | ft        |
| NE<br>EB  | »<br>Appro     | ach                      |               |     |     |       |   |                  |            |                   |          | -            |         |                      |           | 17.7         |           | C        |           |             |           |
|           | TK<br>LT       | 24/2<br>  12/1           |               |     |     |       |   |                  |            | 1118<br>269       |          | 639<br>2     |         | .572<br>. <b>817</b> | <br> <br> | 17.7         | <br> <br> | •0•<br>C | 1         | 83<br>25    | ft <br>ft |

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| Major Street: PUKALAHI BYPA<br>Minor Street: HALBAKALA HWY<br>Peak Hour: PM<br>Scenario: MASTER PLAN W, | O HIT    |                        |              |         |         |         |         |                       | yst:<br>lane: | 27-Jul<br>BC<br>HALBYP-P |
|---------------------------------------------------------------------------------------------------------|----------|------------------------|--------------|---------|---------|---------|---------|-----------------------|---------------|--------------------------|
| Peak Hour Factor: 1.00                                                                                  | 1        |                        |              |         |         | ******  |         | ********              |               |                          |
| Jun of Lanes - V2: 2                                                                                    |          | 1236                   |              |         |         | ۲       |         | 883                   | ¥5            |                          |
| BICL ET - V3 (Y/E): Y                                                                                   |          | 927                    |              |         |         |         |         | •                     |               |                          |
| Stop/Tield - V3 (Y/R): H                                                                                |          |                        | ١            |         |         | ,       |         | 4                     | V4            |                          |
| 3 Grade - V2.V3: 3                                                                                      | i        |                        | ٧            |         |         | ۲.      |         | HAJOR STR<br>PUKALANI |               |                          |
| Nom of Lanes - V5: 1                                                                                    | •        |                        | ۲            |         | >       |         |         | . VANDADI             | SILAJJ        |                          |
| Ezcl LT - V4 (T/H): H                                                                                   | !        |                        | ١.           |         | 1       |         |         |                       |               |                          |
| 1 Grade - V4,V5: -3                                                                                     | ļ        |                        | [            |         | ļ       |         |         |                       | Ŷ             |                          |
| AILOR STREET                                                                                            | i<br>I   |                        | 1            | ¢       |         |         |         | 1.4.                  | •             |                          |
| Num of Lanes - V7, V9: 1                                                                                | 1        |                        | 42           | U       | 0       |         |         | (can                  | RORTH         |                          |
| Sbared Lane (Y/N): N                                                                                    | Í        |                        | ¥7           |         | ¥9      |         |         |                       |               |                          |
| 1 Grade - ¥76¥9: 0                                                                                      | 1        | l                      | KINOR STREET | : BALE. | KALA B  | ¥Y      |         |                       |               |                          |
| OLUKE ADJUSTNENTS                                                                                       |          |                        |              |         |         |         |         |                       |               |                          |
| HOVENERT NO.                                                                                            |          | 2 3                    |              | 1       |         | 5       |         | 7                     | ٥             |                          |
| VOLUME, V (vph)                                                                                         | 123      | s 927                  | (            |         |         | 883     |         | 426                   | 9             |                          |
| OLUKE, V (pcpb)                                                                                         | 123      | 6 927                  | (            | )       |         | 883     |         | 469                   | 0             |                          |
| EP 1: RT FROM MINOR STREET                                                                              | - 79     |                        |              |         |         |         |         |                       |               |                          |
| Conflicting Flows:                                                                                      |          | 1/2*¥3+¥7 =            | 6            | + +     | 1726    |         | _       |                       |               |                          |
| Potential Capacity:                                                                                     | 0.9 =    |                        | G            | •       | 1230    |         |         | 1236                  |               |                          |
|                                                                                                         | 1.p = (  | Cp,9 =                 |              |         |         |         |         |                       | pcph<br>pcph  |                          |
|                                                                                                         |          |                        |              |         |         |         |         |                       |               |                          |
| 'EP 2: LT FROM MAJOR STREET<br>Conflicting Flows:                                                       |          | No. 4 - 111-113        |              |         |         |         |         |                       |               |                          |
| Potential Capacity:                                                                                     |          | Vc.4 = V3+V2<br>Cp.4 = | *            | 0       | +       | 1236    | *       |                       | vph           |                          |
| Novement Capacity:                                                                                      |          | Ca,4 = Cp,4 =          |              |         |         |         |         |                       | pcpb          |                          |
| Prob. of Queue-free State:                                                                              |          | po,4 = 1-v4/C          | 2.6 .        |         |         |         |         |                       | çcph          |                          |
| Najor Left Shared Lane                                                                                  | i        |                        | -,           |         |         |         |         | 1.00                  |               |                          |
| Prob. of Queue-free State:                                                                              | İ        | p*0,4 =                |              |         |         |         |         | 1.00                  |               |                          |
| BP 3: LT FROM MINOR STREET -                                                                            | - 17     |                        |              |         |         |         |         |                       |               |                          |
| Conflicting Flows:                                                                                      | 1        | ¥c,7 = 1/2¥3+¥         | 2+75+74 -    |         |         |         |         | 2119                  | vph           |                          |
| Potential Capacity:                                                                                     | ļ        | Cp.7 =                 |              |         |         |         |         |                       | pcph          |                          |
| Capacity Adjustment Factor                                                                              | ļ        |                        |              |         |         |         |         |                       | •••           |                          |
| Due To Impeding Novements:<br>Novement Capacity:                                                        |          | £7=p0,4=               |              |         |         |         |         | 1.00                  |               |                          |
| wencus capacity:                                                                                        |          | Cz,7 = Cp,7 =          |              |         |         |         |         | 63                    | bcby          |                          |
| AT AND LEVEL OF SERVICE SUM                                                                             | HARY     |                        |              | csh     | AVG 1   |         |         |                       |               |                          |
| Xovenent                                                                                                | v(vcpl   | -                      |              | (pcpb)  | ĩ       | ELAY    | I       | 05                    |               |                          |
| INCR LEFT TURN (7)                                                                                      | 469      |                        |              | <br>#1  |         |         |         |                       |               |                          |
| INOR RIGHT TURE (9)                                                                                     | 20F<br>0 |                        |              |         | 38      |         |         | 1                     |               |                          |
| AJOR LEFT TURE (4)                                                                                      | e        |                        |              | #4      |         | 9.7     |         | C                     |               |                          |
|                                                                                                         |          |                        |              |         |         | 7./<br> |         | B                     |               |                          |
| AVERAGE MINOR APPROACE DEL                                                                              | LAT =    | 3031.2 sec/veb         | 1 1780       | AGE TOT | AT. THY | ERSECTI | ION DEL | 17 . /                | \$4.1 sec     |                          |

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| Major Street: PUKALABI<br>Mimor Street: MAKANI ST<br>Scenario: MASTER PL<br>Peak Hour: AM |             | T<br>  |            |           |         |                  |              | lyst:<br>Name:  | 26-Jul-96<br>BC<br>PUKKAK-A |
|-------------------------------------------------------------------------------------------|-------------|--------|------------|-----------|---------|------------------|--------------|-----------------|-----------------------------|
| Peak Hour Factors                                                                         | <br>1.00    |        |            | ¥12       | ¥11     | VIO              |              | <br>^<br>I      |                             |
|                                                                                           | ĺ           |        |            | 275       | 58      | 13               |              | JORTH           |                             |
| NAJOR STREET                                                                              |             |        |            | 1         | 1       | 1                |              |                 |                             |
| Hum of Lanes - V2:                                                                        | 2           |        |            | 1         | 1       | l l              |              |                 |                             |
| Ezcl LT - V1 (Y/K):                                                                       | Ĩ           |        |            | 1         | 1       | ١                |              |                 |                             |
| Excl RT - V3 (Y/E);                                                                       | N I         |        |            | <         | ۷       | >                |              |                 |                             |
| Stop/Yield - V3 (Y/H);                                                                    | R           |        |            |           |         |                  |              |                 |                             |
| Grade - V1,V2,V3:                                                                         | 2           |        |            |           |         |                  | *            |                 |                             |
| Rum of Lanes - V5:                                                                        | 1 1 111     | ٨      | 1          |           |         |                  | 1            |                 |                             |
| Excl LT - V4 (Y/H):                                                                       | 1   VI<br>Y | ų.     |            |           |         |                  | 1            | 2 76            |                             |
| Excl RT - V6 (T/E):                                                                       | N 72        | 5      |            |           |         |                  |              |                 |                             |
| Stop/Yield - V6 (Y/K):                                                                    |             | 3.     | >          |           |         |                  | < 136        | 5 75            |                             |
| Grade - V4, V5, V6;                                                                       | -2 1 13     | 9.     |            |           |         |                  |              |                 |                             |
|                                                                                           | 1           | -      | ١          |           |         |                  | /            | 9 ¥£            |                             |
| HINOR STREET                                                                              | [           |        | T          |           |         |                  | V NAJOR      | STREET          |                             |
| Num of Lanes - V8:                                                                        | 1           |        |            |           |         |                  |              | LAI BYPA        | ¢¢                          |
| Grade - V7, V8, V9:                                                                       | 0           |        |            | <         | ۸       | >                |              |                 |                             |
| Shared Lane-V7,8,9:                                                                       | 3           |        |            | 1         | 1       | 1                |              |                 |                             |
| (0=X,1=LT,2=TR,3=LTR)                                                                     | ĺ           |        |            | 1         | Í       | 1                |              |                 |                             |
| Enn of Lance Mts                                                                          |             |        |            | 1         | 1       | Ì                |              |                 |                             |
| Num of Lanes - Vil:<br>Grade - Vi0,Vi1,Vi2;                                               | 1           |        |            | 14        | 76      | 51               |              |                 |                             |
| Shared Lane-V10,11,12:                                                                    | 0  <br>3    |        |            |           |         |                  |              |                 |                             |
| (0=H,1=LT,2=TR,3=LTR)                                                                     | 3 I         |        |            | ¥7        | 78      | <b>V</b> 9       |              |                 |                             |
|                                                                                           |             |        |            | NINOR STR | EET - K | ARANI ST         |              |                 |                             |
| ······································                                                    | •••••••••   |        |            |           |         | *                |              |                 |                             |
| OLUKE ADJUSINEETS<br>HOVENEET EO.                                                         | ļ           |        |            |           |         |                  |              |                 |                             |
| HOURLY FLOW RATE, V(vpb)                                                                  | -           | 1      | 2 3        | 4 5       | 6       | 7 8 9            | •••          | 12              |                             |
| VOLUKE, V (pcph)                                                                          | ł           | U<br>A | 50         | 9 1365    |         | 14 76 51         | 13 58        | 275             |                             |
|                                                                                           | <br>        |        | 50         | 9 1365    | 12      | 15 84 56         | 14 64        | 303             |                             |
| TEP 1: RT FROM MINOR STREET                                                               | 1           |        |            |           |         | ·<br>            | ************ |                 | ********                    |
| Conflicting Flows:                                                                        | Vc9 =       | 1/2 1  | 13 + 172 - | • 3       | vhp     | 1<br>1 Ve12 = 17 | 2 76 + 75 +  | 1171 -          | <b>k</b> -                  |
| Potential Capacity:                                                                       | Cp.9        |        |            |           | peph    | Cp.12 =          | • 10 • 13 *  | 1371 v<br>280 p |                             |
| Novement Capacity:                                                                        | Cz,9=       |        |            |           | pcph    | Ca,12-Cp,        | 12+          | 280 p           |                             |
| Prb. of Queu-free State:                                                                  | p0,9=       | 1-v9/C | 3,9=       | 0.96      | • • •   | po,12=1-v        |              | -0.08           | 45n                         |
| 20 5. TE EDAY MITAA CHARGE                                                                | ••          |        | ••••••     |           |         | ***********      |              | ****            |                             |
| EP 2: LT FROM MAJOR STREET<br>Conflicting Flows:                                          | 1           |        |            |           |         | ł                |              |                 |                             |
| Potential Capacity:                                                                       | ¥c,4        |        | ¥3 •       |           | vbp     | Vc,1 = V5        | + 75 =       | 1377 1          | bp                          |
| Novement Capacity:                                                                        | Cp,4 =      |        |            | 1704      |         | Cp,1 =           |              | 313 pc          |                             |
| Prb. of Queu-free State:                                                                  | Ca,4=1      |        |            | 1764      | рсрь    | Cm,1=Cp,1-       |              | 313 pc          |                             |
| Major Left Shared Lane                                                                    | po,4=1      |        | 143        | 0.99      | 1       | 20,1=1-V1/       | C11+         | 1.00            |                             |
| Prob. of Queue-free State                                                                 | p*0,4+      |        |            | ۶Y        | İ       | p*o,1=           |              |                 |                             |

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| Najor Street: PUKALANI BYPA<br>Nimor Street: NAKANI ST<br>Scenario: MASTER PLAN W<br>Peak Rour: AM |              |            |             |                  | In               | tesection (                | Analy<br>File Ma | Bć:          | 26-Jul-96<br>BC<br>PUKKAK-A |
|----------------------------------------------------------------------------------------------------|--------------|------------|-------------|------------------|------------------|----------------------------|------------------|--------------|-----------------------------|
| STEP 3: TH FROM MINOR STREET                                                                       | 1            |            |             |                  |                  |                            | ***              |              |                             |
| Conflicting Flows:                                                                                 | Yc.,8        | = 1/2¥3+¥2 | +¥1+¥6+     | ·¥5+¥4           | 1                | ¥c.,11 = 1/                | /286+85+84+      | 73+72+1      | 71                          |
|                                                                                                    | 1            |            |             | 1391 vph         | 1                | 1                          |                  | 1385         |                             |
| Potential Capacity:                                                                                |              |            |             | 167 pcph         | !                | Cp,11 =                    |                  | 169          | peph                        |
| Capacity Adj Factor:<br>Kovement Capacity:                                                         | 10 = 0       | 0,4°p0,1 = |             | 0.99<br>167 pcph | 1                | f11 = p0,4*                |                  |              |                             |
| Prob. of Queue-free State:                                                                         |              |            |             | 0.50             | ł                | Cm,11 = Cp,<br>po,11 = 1-v |                  |              | рсра                        |
| STEP 4: LT FROM HINOR STREET                                                                       |              |            |             |                  |                  |                            |                  |              |                             |
| Conflicting Flows:                                                                                 | ]¥c,7 =      | 1/2¥3+¥2+3 | /1+1/27     | 5+V5+V4+         | 1                | ¥c,10 = 1/2                | ¥6+¥5+¥4+1.      | /2¥3+¥2      | +V1+                        |
|                                                                                                    |              | 1/2(V11+V1 |             |                  | 1                |                            | ¥8+¥9] =         | 1423         | 4bp                         |
| Potential Capacity:                                                                                | Cp7 =        |            |             | 108 poph         | ļ                | Cp10 =                     |                  | 130          | pcph                        |
| Najor Left, Ninor Through<br>Impedance Factor:                                                     | ]            |            |             |                  | Į.               |                            |                  |              |                             |
| Major Left, Minor Through                                                                          | jr /≖po<br>I | ,11°f11 =  |             | 0.62             | !                | 2°'10-po,8"                | 18 •             | 0.49         |                             |
| Adjusted Impedance Pactor:                                                                         | 10'7 •       |            |             | 8.70             | 1                | p'10 •                     |                  | a ca         |                             |
| Capacity Adjustment Factor:                                                                        |              | 7°po.12 =  |             | ****             | Ł                | f10 = p'10*                | no. 9 x          | 0.60<br>0.58 |                             |
| Novement Capacity:                                                                                 |              |            |             | -6 pcph          |                  | Cm,10 = f10                | •                | 75           | ocoh                        |
| BLAY AND LEVEL OF SERVICE SUMM                                                                     | v(pcpb)      | cs(popb)   |             | 70<br>ph) DE     | VG<br>TAL<br>LAY | LOS                        |                  |              |                             |
| KINOR LEFT TURE (7)                                                                                | 15           | -6         | SHRD        |                  | RD               |                            | LEVEL OF         | SERVICE      | CRITERIA                    |
| NINOR THROUGH (8)                                                                                  | 84           | 167        | -84         | -1               | 5.6              | X                          |                  |              |                             |
| KINOR RIGHT TURE (9)                                                                               | 56           | 1381       | SHRD        | SH               | RD               |                            |                  |              | AVG                         |
| UTHAD TONE PREV (14)                                                                               |              |            |             |                  |                  |                            | LEVEL            |              | TOTAL                       |
| HINOR LEFT TURN (10)<br>HINOR THROUGH (11)                                                         | 14           | 75         | SERD        |                  | RD               |                            | 07               |              | DELAY                       |
| NINOR THROUGH (11)<br>Hinor Right Ture (12)                                                        | 54<br>303    |            | 231<br>Shrd |                  | 3.8<br>RD        | I  <br>1                   | SERVICE          |              | (SEC/VEH)                   |
|                                                                                                    |              | 204        | JEAU        | 54.              | A.U              |                            | ۰۰۰۰۰۰<br>ا      |              | •5                          |
| HAJOR LEFT (1)                                                                                     | 0            | 313        | #1          | 1                | 1.5              | c                          | B                |              | -J<br>5&<=10                |
| HAJOR LEFT (4)                                                                                     | 9            |            | **          |                  | 2.1              | Ā                          | č                |              | 10&<=20                     |
|                                                                                                    |              |            |             |                  |                  | -                          | D                |              | 20£<=38                     |
| MINOR APPROACE (7) (8) (9)                                                                         | •            | -          | •           |                  | 5.6              | A j                        | E                |              | 38&<=45                     |
| HINOR APPROACH (10)(11)(12)                                                                        | -            | -          | -           | 343              | .8               | I                          | T                |              | 15                          |
| HAJOR APPROACE (1)(2)(3)                                                                           |              | -          | -           | c                | .0               |                            |                  |              |                             |
| MAJOR APPROACE (4)(5)(6)                                                                           | -            | -          | -           |                  | .0               | λ [                        |                  |              |                             |
|                                                                                                    |              |            |             |                  |                  | 1                          |                  |              |                             |

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| Hajor Street: PUKALAHI H<br>Hidor Street: HAKAHI ST<br>Scenario: HASTER PLA<br>Peak Hour: PH |              | (IY         |           |         |                  |          |              |       |                           |          | 1         | loa<br>Zile | Date:<br>Lyst:<br>Name:<br>Lon #: | B           | 27-Jul-96<br>IC<br>PUKHAK-P |
|----------------------------------------------------------------------------------------------|--------------|-------------|-----------|---------|------------------|----------|--------------|-------|---------------------------|----------|-----------|-------------|-----------------------------------|-------------|-----------------------------|
| Peak Bour Factor:                                                                            | <br>1.90     |             |           |         | V12              | 2        | ¥1)          | l     | V                         | 19       |           |             |                                   |             |                             |
|                                                                                              |              |             |           |         | 35               | 9        | 37           | 1     |                           | 4        |           |             | ROH                               | <br>        |                             |
| NAJOR STREET                                                                                 |              |             |           |         | 1                | 1        | Ĩ            |       | ł                         | •        |           |             | avt                               | a1 <i>4</i> |                             |
| Ins of Lanes - V2:                                                                           | 2            |             |           |         | į                |          | i            |       | i                         |          |           |             |                                   |             |                             |
| Excl LT - VI (Y/H):                                                                          | T            |             |           |         | 1                |          | Í            |       | •                         | 1        |           |             |                                   |             |                             |
| Ezcl RT - V3 (Y/H):                                                                          | II.          |             |           |         | <                |          | T            |       |                           | >        |           |             |                                   |             |                             |
| Stop/Tield - V3 (Y/R):                                                                       | R            |             |           |         |                  |          |              |       |                           |          |           |             |                                   |             |                             |
| Grade - V1,V2,V3:                                                                            | 2            |             |           | A       |                  |          |              |       |                           |          | •         |             |                                   |             |                             |
| Ins of lands we                                                                              | . ! .        |             |           | 1       |                  |          |              |       |                           |          | ١         |             |                                   |             |                             |
| Hum of Lanes - VS;<br>Excl IF - VA (V/V).                                                    |              | 1 19        | 5         |         |                  |          |              |       |                           |          | ****      | 2           | 5 76                              |             |                             |
| Ezcl LT - V4 (Y/H);<br>Ezcl RT - V6 (Y/H);                                                   | Y  <br>N   T | 9 64        |           |         |                  |          |              |       |                           |          |           |             |                                   |             |                             |
| Stop/Tield - V6 (T/N):                                                                       | אן א<br>או   | 2 994       |           | >       |                  |          |              |       |                           |          | ۰         | 89          | 9 VS                              |             |                             |
| Grade - V6, V5, V6;                                                                          | -2   7       | 1 10        |           |         |                  |          |              |       |                           |          |           |             |                                   |             |                             |
|                                                                                              | -4   1<br>   | J Z3        | ,         | ,       |                  |          |              |       |                           |          |           | 1           | 8 V4                              |             |                             |
| KINOR STREET                                                                                 |              |             |           | ۱.<br>۲ |                  |          |              |       |                           |          | _/        |             |                                   |             |                             |
| Num of Lanes - V8:                                                                           | 11           |             |           | •       |                  |          |              |       |                           |          |           |             | STREE                             |             |                             |
| Grade - ¥7,¥8,¥9;                                                                            | 01           |             |           |         | ¢                |          |              |       |                           |          | r         | UKAL        | ANI BI                            | TPASS       |                             |
| Shared Lane-V7,8,9:                                                                          | зj           |             |           |         | Ì                |          | 1            |       |                           | ì        |           |             |                                   |             |                             |
| ( <b>9=X</b> , 1=LT, 2=TR, 3=LTR)                                                            | i            |             |           |         | I                |          | i            |       | 1                         | 1        |           |             |                                   |             |                             |
|                                                                                              | Í            |             |           |         | i                |          |              |       | ļ                         |          |           |             |                                   |             |                             |
| Num of Lanes - VII:                                                                          | 1            |             |           |         | 2                |          | 60           |       | 25                        |          |           |             |                                   |             |                             |
| Grade - V10,V11,V12;                                                                         | 0            |             |           |         |                  |          |              |       |                           |          |           |             |                                   |             |                             |
| Shared Lane-V10,11,12:                                                                       | 3            |             |           |         | 77               |          | 78           |       | ¥9                        |          |           |             |                                   |             |                             |
| {0=#,1=lt,2=tr,3=ltr}                                                                        |              |             |           |         | HINOR            | STR      | IBBT - 1     | (AKAR | I ST                      |          |           |             |                                   |             |                             |
| VOLUKE ADJUSTMENTS                                                                           | <br>1        |             |           |         |                  |          |              |       |                           |          |           |             |                                   |             |                             |
| KOVENENT NO.                                                                                 | ł            | 1           | 2         | 1       | 1                |          |              | -     |                           |          |           |             |                                   |             |                             |
| HOURLY FLOW RATE, V(vph)                                                                     |              |             | 994       |         | - <b>4</b><br>18 | 5<br>908 |              | 1     |                           | 9        |           | 11          | 17                                | 2           |                             |
| VOLUME, v (poph)                                                                             | 1            |             | 994       |         | 18               | 809      | 25           | 2     |                           | 20<br>30 | 4         |             |                                   |             |                             |
|                                                                                              |              |             |           |         |                  |          | ••<br>•••••• |       | •••                       | •••••    | ۹<br>     | 41          | 43                                | 1           |                             |
| STEP 1: RT FROM MINOR STREET                                                                 | Į            |             |           |         |                  |          |              | 1     |                           |          |           |             |                                   | -24         |                             |
| Conflicting Flows:                                                                           |              | = 1/2       | ¥3 +      | ¥2 •    | r                | 510      | vbp          | Ì     | Vc12                      | = 1/3    | 2 V6 + V. | 5 .         | 822                               | t vàp       |                             |
| Potential Capacity:                                                                          | Cp, 9        |             |           |         |                  |          | peph         |       | Cp,12                     |          | -         |             |                                   | pepà        |                             |
| Hovement Capacity:                                                                           |              | =Cp,9       |           |         |                  |          | pcpb         |       | Cu,12                     |          |           |             |                                   | pcph        |                             |
| Prb. of Queu-free State:                                                                     | 160*2        | =1-79,      | /Ca,9     | 8       | 0.               | .96      |              |       |                           |          | 2/Cz,12-  | :           | 0.92                              |             |                             |
| TEP 2: LT TRON MAJOR STREET                                                                  |              |             | *****     | *****   |                  | ••••     |              | <br>1 |                           | ****     |           |             |                                   |             |                             |
| Conflicting Flows:                                                                           | Ve.A         | = 7Z        | + T1      |         | 10               | 310      | wh-          | Į,    |                           |          |           |             |                                   |             |                             |
| Potential Capacity:                                                                          | [Cp.4        |             | т та<br>, |         |                  |          | bcbp<br>Apb  |       |                           |          | + ¥6 =    |             |                                   | τδρ         |                             |
| Kovement Capacity:                                                                           |              | -<br>-Cp,4- |           |         |                  |          | նշնը<br>հշնո |       | Cp,1 +                    |          |           |             |                                   | pcph        |                             |
| Prb. of Queu-free State:                                                                     |              | 1-74/       |           |         |                  | 96       | 2089         |       | C <b>1</b> ,1=C<br>20,1=1 |          |           |             |                                   | poph        |                             |
| Najor Left Shared Lane                                                                       | Ì            |             |           |         |                  |          |              |       |                           | -411     | -#1"      |             | 0.55                              |             |                             |
| Prob. of Queue-free State                                                                    | 10.0         | =           |           |         |                  | E.L.     |              | í.    | ••,1=                     |          |           |             | ¥1                                |             |                             |

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| lajor Street: PUKALANI BYPASS<br>Linor Street: MAKANI SY<br>Scenario: MASTER PLAN W/O                                                                                                                                                  |                                  |                                    |                                        |                                             |                                           | Analyst:<br>File Hame:                          | PUKHAK-P                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------------------------|----------------------------------------|---------------------------------------------|-------------------------------------------|-------------------------------------------------|----------------------------------------------------------------------------------|
| Peak Hour: PM                                                                                                                                                                                                                          |                                  |                                    |                                        |                                             | section                                   | Intesection #:                                  |                                                                                  |
| TEP 3: TH FROM MINOR STREET                                                                                                                                                                                                            | <br>!                            |                                    |                                        |                                             |                                           |                                                 |                                                                                  |
|                                                                                                                                                                                                                                        | <br> Yc8 =                       | 1/2¥3+¥2+                          | ·¥1+¥6+¥5+¥4                           | i v                                         | c11 = 1                                   | /2¥6+¥5+¥4+¥3+                                  | ¥2+¥1                                                                            |
| -                                                                                                                                                                                                                                      | 1 =                              |                                    | 2855 70                                | ъí                                          |                                           | 2                                               | 855 vph                                                                          |
| Potential Capacity:                                                                                                                                                                                                                    | Cp.8 =                           |                                    | 69 pcp                                 | ъјс                                         | p,11 =                                    | *po,1 = 0                                       | 69 pcph                                                                          |
| Capacity Adj Factor:                                                                                                                                                                                                                   | ]f8 = po,                        | 4*p0,1 =                           | 0.53                                   | ĺĺ                                          | 11 = po,4                                 | *po,1 = 9                                       | .53                                                                              |
| Novement Capacity:                                                                                                                                                                                                                     | C1.8 = (                         | - 81*8,q                           | 36 pcp                                 | 6   C                                       | 1,11 = Cp                                 | ,11*f11 =                                       | 36 pcph                                                                          |
| Potential Capacity:<br>Capacity Adj Tactor:<br>Novement Capacity:<br>Prob. of Queue-free State:                                                                                                                                        | po,8 = 1                         | -v8/CE,8                           | - 0.01                                 | [ P                                         | 0,11 = 1-                                 | v11/Cz,11 = 0                                   | .01                                                                              |
| TEP 4: LT FROM MINOR STREET                                                                                                                                                                                                            | <br>                             |                                    |                                        |                                             |                                           |                                                 |                                                                                  |
|                                                                                                                                                                                                                                        | Vc.7 = 1                         | /2¥3+¥2+¥                          | 1+1/286+85+84+                         | V V                                         | c,10 = 1/                                 | 2¥6+¥5+¥4+1/2¥                                  | 3+V2+V1+                                                                         |
|                                                                                                                                                                                                                                        |                                  |                                    | 2} - 2080 Vp                           |                                             | 1/2                                       | <b>(∀8+¥9) = 2</b>                              | 969 vph                                                                          |
| Potential Capacity:                                                                                                                                                                                                                    | Cp7 =                            | -                                  | 50 pcp                                 | b į C                                       | p10 =                                     |                                                 | 51 peph                                                                          |
| Najor Left, Minor Through                                                                                                                                                                                                              | 1                                |                                    |                                        | I                                           |                                           |                                                 |                                                                                  |
| Impedance Factor:                                                                                                                                                                                                                      | P''7=po,                         | 11*fII =                           | 0.01                                   | P                                           | ''10=po,8                                 | *£8 = 0                                         | .01                                                                              |
| Hajor Left, Hinor Through                                                                                                                                                                                                              | 1                                |                                    |                                        | ļ                                           |                                           | _                                               |                                                                                  |
| Adjusted Impedance Factor:<br>Capacity Adjustment Factor:                                                                                                                                                                              | [p'7 =                           |                                    | 0.85                                   | P                                           | 19 =                                      | 0                                               | .05                                                                              |
| Capacity Adjustment Factor:                                                                                                                                                                                                            | f7 = p'7                         | *po,12 +                           | 0.04                                   | 1                                           | 10 = p'10                                 | "po,9 = 9                                       | .04                                                                              |
| Kovement Capacity:                                                                                                                                                                                                                     | [Ca,7 = 1                        | [7°Cp,7 =                          | 2 pcp                                  | 6   C                                       | <b>1</b> ,10 = 11                         | 0°Cp,10 =                                       | 2 рерь                                                                           |
| BLAY AND LEVEL OF SERVICE SUMM                                                                                                                                                                                                         | ARY                              |                                    |                                        | AYG                                         |                                           |                                                 |                                                                                  |
|                                                                                                                                                                                                                                        |                                  |                                    |                                        | TOTAL                                       |                                           | 1                                               |                                                                                  |
| HOVENERT                                                                                                                                                                                                                               | v(pcph)                          | cm(bcbp)                           | csb(pcpb)                              | DELAY                                       |                                           |                                                 |                                                                                  |
|                                                                                                                                                                                                                                        |                                  |                                    |                                        |                                             |                                           |                                                 |                                                                                  |
|                                                                                                                                                                                                                                        | 2                                | 2                                  | SHRD                                   | sard                                        |                                           | LEVEL OF SE                                     | RVICE CRITERI                                                                    |
| KINOR LEFT FURE (7)                                                                                                                                                                                                                    |                                  |                                    | SERD<br>34                             |                                             | ••                                        | <br>  LEVEL OF SE<br>                           | RVICE CRITERI                                                                    |
| NINOR LEFT TURE (7)<br>MINOR THROUGH (8)                                                                                                                                                                                               | 66                               |                                    | 34                                     | SHRD                                        | <br>1                                     | <br>  LEVEL OF SE<br> <br>                      | AVG                                                                              |
| HINOR LEFT TURN (7)<br>MINOR TEROUGE (8)<br>MINOR RIGHT TURA (9)                                                                                                                                                                       | 66<br>29                         | 36<br>764                          | 34                                     | SHRD<br>SHRD                                | <br>1                                     | i<br> <br>  level                               | AYG<br>Total                                                                     |
| HINOR LEFT TURN (7)<br>MINOR THROUGH (8)<br>MINOR RIGHT TURN (9)<br>MINOR LEFT TURN (18)                                                                                                                                               | 66<br>29<br>4                    | 36<br>764<br>2                     | 34<br>Serd<br>Serd                     | SHRD<br>SHRD<br>SHRD                        | <br>1<br>                                 | <br>  LEVEL<br>  OF                             | AYG<br>Total<br>Delay                                                            |
| HINOR LEFT TURN (7)<br>MINOR THROUGH (8)<br>MINOR RIGHT TURN (9)<br>MINOR LEFT TURN (16)<br>MINOR THROUGH (11)                                                                                                                         | 66<br>29<br>4<br>41              | 36<br>764<br>2<br>36               | 34<br>SHRD<br>SBRD<br>29               | SHRD<br>SHRD<br>SHRD                        | <br>                                      | LEVEL<br>OF<br>SERVICE                          | AVG<br>Total<br>Delay<br>(Sec/Vee)                                               |
| HINOR LEFT TURN (7)<br>MINOR THROUGH (8)<br>MINOR RIGHT TURN (9)<br>MINOR LEFT TURN (18)                                                                                                                                               | 66<br>29<br>4<br>41              | 36<br>764<br>2                     | 34<br>SHRD<br>SBRD<br>29               | SHRD<br>SHRD<br>SHRD                        | <br>                                      | LEVEL<br>OF<br>SERVICE                          | AVG<br>TOTAL<br>DELAY<br>{SEC/VEE                                                |
| HINOR LEFT TURE (7)<br>MINOR THROUGH (8)<br>MINOR RIGHT TURE (9)<br>MINOR LEFT TURE (10)<br>MINOR THROUGH (11)<br>MINOR RIGHT TORM (12)                                                                                                | 66<br>29<br>4<br>41<br>43        | 36<br>764<br>2<br>36<br>531        | 34<br>SHRD<br>SBRD<br>29<br>SHRD       | SHRD<br>SHRD<br>SHRD<br>SHRD                | 1<br><br>7<br>                            | LEVEL<br>OF<br>SERVICE                          | AYG<br>TOTAL<br>DELAY<br>{SEC/VEE<br><=5                                         |
| HINOR LEFT TURN (7)<br>HINOR TEROUGE (8)<br>HINOR RIGHT TURR (9)<br>MINOR LEFT TURN (10)<br>HINOR TEROUGE (11)<br>HINOR RIGET TURN (12)<br>HAJOR LEFT (1)                                                                              | 66<br>29<br>4<br>41<br>43<br>274 | 36<br>764<br>2<br>36<br>531<br>611 | 34<br>SHRD<br>SBRD<br>29<br>SHRD<br>NA | SHRD<br>SHRD<br>SHRD<br>SHRD<br>10.6        | <br>7<br><br>7<br><br>0                   | LEVEL<br>OF<br>SERVICE<br>A<br>B                | AYG<br>TOTAL<br>DELAY<br>{SEC/VEE<br><br><=5<br>>5&<=10                          |
| HINOR LEFT TURE (7)<br>MINOR THROUGH (8)<br>MINOR RIGHT TURE (9)<br>MINOR LEFT TURE (10)<br>MINOR THROUGH (11)<br>MINOR RIGHT TORM (12)                                                                                                | 66<br>29<br>4<br>41<br>43        | 36<br>764<br>2<br>36<br>531        | 34<br>SHRD<br>SBRD<br>29<br>SHRD       | SHRD<br>SHRD<br>SHRD<br>SHRD                | 1<br><br>7<br>                            | LEVEL<br>OF<br>SERVICE<br>A<br>B<br>C           | AYG<br>TOTAL<br>DELAY<br>{SEC/VEE<br>                                            |
| HINOR LEFT TURN (7)<br>HINOR THROUGH (8)<br>HINOR RIGHT TURN (9)<br>HINOR LEFT TURN (14)<br>HINOR THROUGH (11)<br>HINOR RIGHT TURN (12)<br>HAJOR LEFT (1)<br>HAJOR LEFT (4)                                                            | 66<br>29<br>4<br>41<br>43<br>274 | 36<br>764<br>2<br>36<br>531<br>611 | 34<br>SHRD<br>SBRD<br>29<br>SHRD<br>NA | SHRD<br>SHRD<br>SHRD<br>SHRD<br>10.6        | 7<br>7<br>7<br>7<br>7<br>8                | LEVEL<br>OF<br>SERVICE<br>A<br>B<br>C<br>D      | AYG<br>TOTAL<br>DELAY<br>{SEC/VEE<br>                                            |
| HINOR LEFT TURN (7)<br>HINOR THROUGH (8)<br>HINOR RIGHT TURN (9)<br>MINOR LEFT TURN (14)<br>HINOR THROUGH (11)<br>HINOR RIGHT TURN (12)<br>HAJOR LEFT (1)<br>HAJOR LEFT (4)<br>MINOR APPROACE (7)(8)(9)                                | 66<br>29<br>4<br>41<br>43<br>274 | 36<br>764<br>2<br>36<br>531<br>611 | 34<br>SHRD<br>SBRD<br>29<br>SHRD<br>NA | SHRD<br>SHRD<br>SHRD<br>SHRD<br>10.6<br>7.7 | <br>7<br><br>7<br><br>0                   | LEVEL<br>OF<br>SERVICE<br>A<br>B<br>C           | AYG<br>TOTAL<br>DELAY<br>{SEC/VHE<br>>5&<=10<br>>10&<=20<br>>20&<=30<br>>30&<=45 |
| HINOR LEFT TURN (7)<br>HINOR THROUGH (8)<br>HINOR RIGHT TURN (9)<br>HINOR LEFT TURN (14)<br>HINOR THROUGH (11)<br>HINOR RIGHT TURN (12)<br>HAJOR LEFT (1)<br>HAJOR LEFT (4)                                                            | 66<br>29<br>4<br>41<br>43<br>274 | 36<br>764<br>2<br>36<br>531<br>611 | 34<br>SHRD<br>SBRD<br>29<br>SHRD<br>NA | SHRD<br>SHRD<br>SHRD<br>SHRD<br>10.6<br>7.7 | <br>7<br><br>7<br><br>6<br>8<br>7         | LEVEL<br>OF<br>SERVICE<br>A<br>B<br>C<br>D<br>E | AYG<br>TOTAL<br>DELAY<br>{SEC/VEE<br><=5<br>>5&<=10<br>>10&<=20<br>>20&<=30      |
| HINOR LEFT TURN (7)<br>MINOR THROUGH (8)<br>MINOR RIGHT TURN (9)<br>MINOR LEFT TURN (16)<br>MINOR THROUGH (11)<br>HINOR RIGHT TURN (12)<br>HAJOR LEFT (1)<br>MAJOR LEFT (4)<br>MINOR APPROACE (7)(8)(9)<br>MINOR APPROACE (10)(11)(12) | 66<br>29<br>4<br>41<br>43<br>274 | 36<br>764<br>2<br>36<br>531<br>611 | 34<br>SHRD<br>SBRD<br>29<br>SHRD<br>NA | SHRD<br>SHRD<br>SHRD<br>SHRD<br>10.6<br>7.7 | <br>7<br><br>7<br><br>6<br>8<br>7         | LEVEL<br>OF<br>SERVICE<br>A<br>B<br>C<br>D<br>E | AYG<br>TOTAL<br>DELAY<br>{SEC/VHE<br>                                            |
| HINOR LEFT TURN (7)<br>HINOR THROUGH (8)<br>HINOR RIGHT TURN (9)<br>MINOR LEFT TURN (14)<br>HINOR THROUGH (11)<br>HINOR RIGHT TURN (12)<br>HAJOR LEFT (1)<br>HAJOR LEFT (4)<br>MINOR APPROACE (7)(8)(9)                                | 66<br>29<br>4<br>41<br>43<br>274 | 36<br>764<br>2<br>36<br>531<br>611 | 34<br>SHRD<br>SBRD<br>29<br>SHRD<br>NA | SHRD<br>SHRD<br>SHRD<br>10.6<br>7.7         | 7<br>7<br>7<br>7<br>7<br>8<br>7<br>7<br>7 | LEVEL<br>OF<br>SERVICE<br>A<br>B<br>C<br>D<br>E | AYG<br>TOTAL<br>DELAY<br>{SEC/VHE<br>>5&<=10<br>>10&<=20<br>>20&<=30<br>>30&<=45 |

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KOLAKALO HASTER PLAE W/O HIT AN PEAK BOUR

#### 07/26/96 14:35:02

#### SIGHAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

### Intersection Parameters for Int # 0 - FUTALARI BYPASS & MATAWAO AV

| HETROAREA      | XOI | ICBD |  |
|----------------|-----|------|--|
| LOSTTINE       |     | 2.0  |  |
| LEVELOPSERVICE | C   | S    |  |
| NODELOCATION   | 0   | 0    |  |

#### Approach Parameters

|                 | EB   | <b>≾</b> B | WB   | NB   |
|-----------------|------|------------|------|------|
| APPLABELS       | -68- |            | -#8  |      |
| GRADES          | 5.0  | .0         | -6.0 | . 4  |
| PEDLEVELS       | LOW  | LOF        | LOY  | LOT  |
| PARKINGSIDES    | NORE | RONE       | RORE | RORE |
| PARKVOLUKES     | 20   | 29         | 20   | 29   |
| BUSVOLUMES      | 0    | 9          | Ð    | 0    |
| RIGHTTURHOKREDS | 12   | 35         | 247  | 1    |

#### **Hovement Parameters**

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| KOVLABELS       | RT   | TB   | LT   | RT   | TE   | LT   | RT   | TE   | LT   | RT         | TH   | LT   |
|-----------------|------|------|------|------|------|------|------|------|------|------------|------|------|
| volukes         | 12   | 33   | 50   | 376  | 308  | 403  | 237  | 919  | 2    | 21         | 247  | 22   |
| WIDTES          | 12.0 | 24.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0       | 12.0 | 12.0 |
| LANES           | 1    | 2    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1          | 1    | 1    |
| UTILIZATIONS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00       | 1.00 | 1.00 |
| TRUCKPERCENTS   | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.8        | 2.8  | 2.0  |
| PEAKEOURFACTORS | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95        | .95  | .95  |
| ARRIVALTIPES    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3          | 3    | 3    |
| ACTUATIONS      | RO   | YES  | YES  | RO   | YES  | TES  | NO   | YES  | TES  | <b>F</b> O | TE S | YES  |
| REQCLEARANCES   | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0        | 4.0  | έ.θ  |
| HINIKUKS        | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0        | 5.0  | 5.0  |
| IDEALSATILOVS   | 1900 | 1900 | 1900 | 1900 | 1999 | 1900 | 1900 | 1900 | 1900 | 1906       | 1902 | 1900 |
| FACTORS         | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00       | 1.00 | 1.00 |
| DELAYFACTORS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.09 | 1.00 | 1.00 | 1.00 | 1.00 | 1.02       | 1.00 | 1.00 |
| RSTOPPACTORS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00       | 1.00 | 1.00 |
| GROUPTYPES      | NORK | RORK | KORH | NORK | NORK | IORX |      | NORH |      |            | RORX |      |
| SATURATIONFLOWS | 1493 | 3614 |      | 1539 |      | 687  |      | 1919 |      | 1539       |      | 514  |

#### Phasing Parameters

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| SEQUERCES          | 41   |       |       |     |          |      |      |
|--------------------|------|-------|-------|-----|----------|------|------|
| PERMISSIVES        | NO   | TES   | RO    | TES | LEADLAGS | EORE | NONE |
| OVERLAPS           | RO   | NO    | RO    | I0  | OFFSET   | .00  | 1    |
| CYCLES             | 69   | 180   | 10    |     | PEDTIKE  | .0   | 0    |
| GREEKTIKES         | 8.00 | 25.00 | 25.00 |     |          |      |      |
| <b>YELLOVTIKES</b> | .00  | .09   | .00   |     |          |      |      |
| CRITICALS          | 8    | 6     | 11    |     |          |      |      |
| EICESS             | Ø    |       |       |     |          |      |      |

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KULANALU HASTER PLAN V/O MIT AM PEAK EOUR

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07/26/96 14:35:06

SIGNAL94/TEAPAC[VI L1.4] - Capacity Analysis Summary

Intersection Averages for Int # 0 - PUKALAWI BYPASS & KAKAWAO AV Degree of Saturation (v/c) .95 Vebicle Delay 35.20 Level of Service D # expect more delay due to extreme v/c's (see EVALUATE)

|          |            |                         |                          | •                           |                                        |
|----------|------------|-------------------------|--------------------------|-----------------------------|----------------------------------------|
| Sq 41    | Phase 1    | Phase 2                 | Phase 3                  |                             |                                        |
|          | +          | + +                     | ř • 1                    |                             |                                        |
|          | +          | ++                      | ++++                     |                             |                                        |
| - //     | +>         | <+ +<br>  ▼             | <++++ <br>  ^ ++++       |                             |                                        |
| Weist    |            | •                       | <br> ++++ v              |                             |                                        |
| Horth    |            | j + +>                  |                          |                             |                                        |
| 1        | 1 +        | <b>1</b> ++             | ++++                     |                             |                                        |
|          | +          | J + +                   | ļ v [                    |                             |                                        |
|          |            | G/C= .431               |                          |                             |                                        |
|          |            | G= 25.0                 |                          |                             |                                        |
| 1        |            | T+R= .0"<br>  OFF=13_85 | 077=56.98                |                             |                                        |
|          |            |                         |                          |                             |                                        |
|          | C= 58 sec  | G= 58.0 sec             | =100.0% T= .             | 0 sec = .03                 | Ped= .0 sec = .01                      |
|          |            |                         |                          |                             |                                        |
| Lane     | -  Width/  | g/C                     | Service Rate             | Adj                         | HCK   L [90% Hax]                      |
| GIO      | up   Lanes | Reqd Used               | EC (vph) EE              | Volume  V/c                 | Delay   S   Queue                      |
| ЕB       |            |                         |                          |                             |                                        |
| -88 App: | roach      |                         |                          |                             | 12.2 B                                 |
|          |            |                         | *************            | ***********                 |                                        |
| RT       |            | .002   .397             | 546 592                  | 1 25 1 824                  | 6.8   B+1 25 ft                        |
| TH LT    | 1 12/1     | .010   .397             |                          | 53 .298                     | 6.9   B+  25 ft<br>  15.8   C+  39 ft  |
|          |            |                         |                          |                             |                                        |
| WB       | 4          |                         |                          |                             | 51.58 E                                |
| XB-App:  | reach      |                         |                          | *************               |                                        |
| l RT     | 12/1       | .002   .397             | 563   629                | 1 .002                      | [ 6.8   B+] 25 ft]                     |
| ET       | 12/1       | .519   .397             | 715 761                  | 967 1.271                   | 51.68 *E   476 ft                      |
| ] LT     | 12/1       | .004   .103             | 138 185                  | 2 .011                      | 15.1   C+  25 ft                       |
| 5B       |            |                         | *******                  | **********                  |                                        |
| -it App  | roach      |                         |                          |                             | 32.68 D                                |
|          |            |                         |                          |                             |                                        |
|          | 12/1       | .269   .397             | 564   610<br>  600   730 | 359   .589                  | 10.0   B+  177 ft                      |
| I TH     |            | .206   .397             | 033 033                  | 324   1430<br>  474   1.553 | 8.5   B+  159 ft <br>70.18 °F   209 ft |
|          |            |                         |                          |                             |                                        |
| NB       |            |                         |                          |                             |                                        |
| -88 App: | roach      |                         |                          |                             | 7.9 B+                                 |
| RT       | 12/1       | .628   .397             | 564 610                  | 21 .034                     | 6.9   B+  25 ft                        |
| 1 18     | 12/1       | .172   .397             | 693 739                  | 260 .352                    | 8.1  *B+  128 ft <br>  7.2   B+  25 ft |
| ្រា      | 12/1       | .000   .397             | 167   204                | 23 .113                     | 7.2   B+  25 ft                        |
| •••••    |            |                         |                          |                             |                                        |

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#7/27/96 #8:30:38

## SIGHAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

#### Intersection Parameters for Int # . # - PUKALAWI BYPASS & MAKAWAO AV

| NETROAREA      | X0) | (C80 |
|----------------|-----|------|
| LOSTTIRE       |     | 2.1  |
| LEVELOFSERVICE | C   | S    |
| NODELOCATION   | •   | ŧ.   |

#### Approach Parameters

KULANALU Naster plan w/o kit PN peak hour

|                 | EB             | 513  | wB   | NB   |
|-----------------|----------------|------|------|------|
| APPLABELS       | -58            | -#8- | -#8  |      |
| GRADES          | 6.0            | .1   | -6.0 | .1   |
| PEDLEVELS       | LOW            | LOW  | LOW  | LOW  |
| PARXINGSIDES    | NONE           | NONE | NONE | NONE |
| PARKVOLUKES     | 28             | 21   | 20   | 21   |
| BUSVOLUNES      | ■ <sup>1</sup> | I    | ł.   | 1    |
| RIGHTTURNONREDS | 14             | 183  | 138  | 1    |

#### Novement Parameters

| NOVLABELS       | RT   | 18   | LT   | RT   | TH   | LT   | RT   | TH   | LT   | RT   | TH   | LT   |
|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| VOLUKES         | - 44 | 682  | 275  | 183  | 313  | 239  | 317  | 698  | 2    | 9    | 316  | 21   |
| WIDTHS          | 12.0 | 24.4 | 12.4 | 12.1 | 12.1 | 12.  | 12.0 | 12.0 | 12.1 | 12.0 | 12.4 | 12.  |
| LANES           | 1    | 2    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    |
| UTILIZATIONS    | 1.00 | 1.00 | 1.11 | 1.#  | 1.88 | 1.00 | 1.00 | 1.88 | 1.08 | 1.00 | 1.0  | 1.0  |
| TRUCKPERCENTS   | 2.1  | 2.9  | 2.0  | 2.1  | 2.1  | 2.1  | 2.8  | 2.8  | 2.1  | 2.1  | 2.0  | 2.1  |
| PEAKHOURFACTORS | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  |
| ARRIVALTYPES    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| ACTUATIONS      | NO   | YES  | YES  | XO   | YES  | YES  | NO   | YES  | YES  | NO   | YES  | YES  |
| REQCLEARANCES   | 4.1  | 4.1  | 1.1  | 4.1  | 4.1  | 4.1  | 4.1  | 1.1  | (.)  | 4.1  | (.)  | 1.1  |
| NININUNS        | 5.1  | 5.0  | 5.8  | 5.1  | 5.1  | 5.4  | 5.1  | 5.4  | 5.1  | 5.1  | 5.0  | 5.4  |
| IDEALSATFLOWS   | 1988 | 1988 | 1968 | 1968 | 1988 | 1988 | 1988 | 1988 | 1948 | 1988 | 1988 | 1944 |
| FACTORS         | 1.88 | 1.00 | 1.11 | 1.00 | 1.11 | 1.11 | 1.00 | 1.11 | 1.44 | 1.11 | 1.00 | 1.11 |
| DELAYFACTORS    | 1.88 | 1.10 | 1.00 | 1.44 | 1.11 | 1.44 | 1.00 | 1.88 | 1.11 | 1.84 | 1.00 | 1.44 |
| RSTOPFACTORS    | 1.00 | 1.11 | 1.44 | 1.41 | 1.11 | 1.44 | 1.14 | 1.00 | 1.00 | 1.11 | 1.00 | 1.11 |
| SROUPTYPES      | KORM | NORN | NORX | XORK | NORN | XORX | KORN | NORN | KORK | NORK | NORN | NORN |
| SATURATIONFLOWS | 1493 | 3614 | 1717 | 1539 | 1863 | 448  | 1585 | 1919 | 1623 | 1539 | 1863 | 457  |
|                 |      |      |      |      |      |      |      |      |      |      |      |      |

#### Phasing Parameters

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| SEQUENCES · | 41    |       |       |     |          |      |      |
|-------------|-------|-------|-------|-----|----------|------|------|
| PERMISSIVES | KO    | YES   | X O N | YES | LEADLAGS | NONE | NONE |
| OVERLAPS    | NO    | NO    | X0    | K0  | OFFSET   | . 11 | 1    |
| CYCLES      | 64    | 188   | 11    |     | PEDTINE  | .1   | ð    |
| GREENTINES  | 15.85 | 25.00 | 25.88 |     |          |      |      |
| YELLOWTIMES | . 11  | .11   | .11   |     |          |      |      |
| CRITICALS   | 3     | 1     | 8     |     |          |      |      |
| EXCESS      | 1     |       |       |     |          |      |      |

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KULAHALU MASTER PLAN W/O MIT PM PEAK HOUR

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## SIGNAL94/TEAPAC[VI L1.4] - Capacity Analysis Summary Intersection Averages for Int B B - PUKALANI BYPASS & MAKAWAD AV Degree of Saturation (v/c) .77 Vehicle Delay 34.68 Level of Service D+ & expect more delay due to extreme v/c's (see EVALUATE) So A1 L Phase 1 L Phase 2 L Phase 2 L

| •         | + +                  |             |
|-----------|----------------------|-------------|
|           | i • •                | ••••        |
| •>        | (+ +                 | (++++)      |
|           | l v                  | • • • • • • |
|           | · ·                  | ++++ v      |
| (+        |                      | ++++}       |
| +         | ++                   |             |
| +         | ++                   | V           |
| 6/0= .231 | 6/C= .385            | 6/C= .385   |
| 6= 15.8"  | 6= 25.4* j           | 6 25.4      |
|           |                      |             |
| OFF= .81  | OFF=23.1%            | 0FF=61.5%   |
|           | 6= 15.8"<br>Y+R= .8" | (+ + +)     |

C= 65 sec 6= 65.8 sec =188.8% Y= .8 sec = .8% Ped= .8 sec = .8%

|                  | Lane<br>Grou   | ip j | 114  <br>                   | dth<br>Ene | 5 | ĥ  | eq | 9<br>d | /¢ | Vs  | ed  | <br> | Si<br>E( | erv<br>C ( | vic<br>(vp | :e<br>:b} | Rai<br>El | te <br>E | <br> Vo | Ad,<br>Iui | j<br>Re | <br> | v/  | Ċ | <br>  ( | H(<br>Dej | :X<br>ay |       | t<br>S    |      | 901<br>Qu | Na<br>eue                |
|------------------|----------------|------|-----------------------------|------------|---|----|----|--------|----|-----|-----|------|----------|------------|------------|-----------|-----------|----------|---------|------------|---------|------|-----|---|---------|-----------|----------|-------|-----------|------|-----------|--------------------------|
| е<br>-я          | B<br>- Appr    | .090 | h                           |            |   |    |    |        |    |     |     |      |          |            |            |           |           |          |         |            |         |      |     | - |         | 15        | .1       |       | <br>6 (   | •    |           |                          |
|                  | RT<br>Th<br>Lt |      | 24                          | 12         |   | •  | 22 | 2      |    | .3  | 54  |      | 12       | 24         | 11         | 17        | 279       |          |         | 718        |         |      | 56  | 1 | 1       | 11        | .4       |       | B         | Ł    | 21        | ===<br>5 f<br>2 f<br>3 f |
| WE<br>-KB<br>*** | 3<br>Appr      | 04C  | <br>h<br>===                | 8.81       |   |    |    |        |    |     |     |      |          |            |            |           |           | ••       |         |            |         |      | ~-  |   |         | 45        | . 21     | <br>? | Ę+        |      |           |                          |
| <br> <br>        | RT<br>TH<br>LT | 1    | 12<br>12<br>12              | /1         | 1 | .( | 11 |        |    | 35  | ił. | Ì.   | 6        | 28         | Ì          | 6         | 79        | Ì        | 1       | 35         | 1       | 1.   | 182 | 1 |         | 55.       | . 58     | 1     | E         | L    | 434       | ft<br>ft                 |
| 5E<br>118-       | 3<br>Appro     | act  | 1                           |            |   |    |    | -      |    | •   |     |      |          |            |            |           |           |          |         | -          |         | •    |     |   |         |           |          |       | ==-<br>E+ | • •• |           |                          |
|                  | RT<br>Th<br>LT |      | 12/<br>12/<br>12/           | 1          |   | .2 | 14 |        | •  | 35  | ł   | L    | 61       | 11         | Ì          | 69        | 59        | ł        | 3       | 29         | 1       | . (  | 99  |   | 1       | 1.        | 2        | İ     | B         | 1    | 94        | ===<br>ft<br>ft<br>ft    |
| NB<br>Ið I       | l<br>Ippro     | ach  |                             |            | • |    |    | •••    | •  | *=- | ••  |      | • = =    |            |            |           | •==       |          |         |            |         | -    |     |   | 1       | 1.        |          | <br>! | •<br>ł    |      |           |                          |
|                  | RT<br>TH<br>LT | 1.   | ===<br>L2/:<br>L2/:<br>L2/: | 1          | . | 2  | 6  |        | .3 | 54  | Ιį  |      |          | i          | 1          | 65        | 9         | l        | 33      | 33         | L       | . 5  | 15  | 1 | 1       | 1.        | 2        | 8     | 1         | 1    | 97        | ft<br>ft<br>ft           |

KULAMALU MASTER PLAN W/O MIT AM PEAK HOUR

# SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int # 0 - BYPASS/KULA HWY & HALEAKALA HY

03/27/97

17:00:41

| METROAREA      | NON | C80 |
|----------------|-----|-----|
| LOSTTIME       |     | 2.0 |
| LEVELOFSERVICE | С   | S   |
| NODELOCATION   | Ø   | Ø   |

Approach Parameters

| APPLABELS       | SB   | WВ   | NB   | EB   |
|-----------------|------|------|------|------|
| GRADES          | 6.0  | .0   | -6.0 | .0   |
| PEDLEVELS       | LOW  | LOW  | LOW  | LOW  |
| PARKINGSIDES    | NONE | NONE | NONE | NONE |
| PARKVOLUMES     | 20   | 20   | 20   | 20   |
| BUSVOLUMES      | 0    | Ø    | 0    | 0    |
| RIGHTTURNONREDS | 1    | 37   | 44   | 127  |

Movement Parameters

| MOVLABELS       | RT   | тн   | LT   | RT   | тн   | LT   | RT   | тн   | ٤T   | RŤ   | тн   | เา   |  |
|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| VOLUMES         | 1    | 418  | 53   | 109  | 35   | 64   | 92   | 1104 | 182  | 707  | 81   | t    |  |
| WIDTHS          | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | .0   | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | . 4  |  |
| LANES           | 1    | 1    | 1    | 1    | 1    | 0    | 1    | 1    | 1    | 1    | 1    | 6    |  |
| UTILIZATIONS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |
| TRUCKPERCENTS   | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.4  |  |
| PEAKHOURFACTORS | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  |  |
| ARRIVALTYPES    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |  |
| ACTUATIONS      | NO   | YES  | YES  | NO   | YES  | YES  | NO   | YES  | YES  | NO   | YES  | YES  |  |
| REQCLEARANCES   | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.4  |  |
| MINIMUMS        | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.4  |  |
| , IDEALSATFLOWS | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |  |
| FACTORS         | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.04 |  |
| DELAYFACTORS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.04 |  |
| NSTOPFACTORS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.0( |  |
| GROUPTYPES      | NORM | NORM | NORM | NORM | NORM | NORM | NORM | NORM | NORM | NORM | NORM | NOR  |  |
| SATURATIONFLOWS | 1493 | 1807 | 246  | 1539 | 1456 | 0    | 1585 | 1919 | 1823 | 1539 | 1858 | ¢    |  |

Phasing Parameters

•

| SEQUENCES   | 31    | ALL   |       |     |          |      |      |
|-------------|-------|-------|-------|-----|----------|------|------|
| PERMISSIVES | YES   | YES   | YES   | YES | LEADLAGS | NONE | NONE |
| OVERLAPS    | YES   | YES   | YES   | YES | OFFSET   | .00  | )    |
| CYCLES      | 60    | 120   | 10    |     | PEDTIME  | .0   | f    |
| GREENTIMES  | 10.32 | 27.35 | 10.32 |     |          |      |      |
| YELLOWTIMES | 4.00  | 4.00  | 4.00  |     |          |      |      |
| CRITICALS   | 10    | 8     | 10    |     |          |      |      |
| EXCESS      | 0     |       |       |     |          |      |      |

المستني المتعالي والمتعاد المعر

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| LAMALU<br>STER F<br>PEAK                                                 | PLAN W/O M                                                                                                                                                       | IT                                                                |                                                                                              |                                                                                             |                                                                                               |                                                                                               |                                                               |                                                                                                      |                                                                                                                                             | 03/27/<br>17:01:                                                          |              |
|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|--------------|
| PEAK                                                                     | AUUR                                                                                                                                                             |                                                                   |                                                                                              |                                                                                             |                                                                                               |                                                                                               |                                                               |                                                                                                      |                                                                                                                                             |                                                                           |              |
| GNAL94                                                                   | 4/TEAPAC[V                                                                                                                                                       | 1 L1.4                                                            | ] - Cap                                                                                      | acity /                                                                                     | Analysis                                                                                      | s Summar                                                                                      | У                                                             |                                                                                                      |                                                                                                                                             |                                                                           |              |
| tersed                                                                   | tion Aver                                                                                                                                                        | ages f                                                            | or Int                                                                                       | # 0-                                                                                        | - BYPASS                                                                                      | S/KULA H                                                                                      | WY & HA                                                       | LEAKALA                                                                                              | НҮ                                                                                                                                          |                                                                           |              |
| 0 e                                                                      | egree of S                                                                                                                                                       | aturat                                                            | ion (v/                                                                                      | c) .69                                                                                      | 9 Vehic                                                                                       | le Dela                                                                                       | y 10.0                                                        | Level                                                                                                | of                                                                                                                                          | Service                                                                   | E            |
| <br>31  <br>/**                                                          | Phase 1                                                                                                                                                          | Ph                                                                | ase 2                                                                                        | Phae                                                                                        | se 3                                                                                          |                                                                                               |                                                               |                                                                                                      |                                                                                                                                             |                                                                           |              |
| ′<br>                                                                    |                                                                                                                                                                  | + +                                                               | +                                                                                            | 1                                                                                           | ~ [                                                                                           |                                                                                               |                                                               |                                                                                                      |                                                                                                                                             |                                                                           |              |
| .  <br> \                                                                |                                                                                                                                                                  | + +<br> (+ +                                                      | +                                                                                            |                                                                                             | ++++ <br> ++++>                                                                               |                                                                                               |                                                               |                                                                                                      |                                                                                                                                             |                                                                           |              |
|                                                                          |                                                                                                                                                                  |                                                                   | +/                                                                                           | -                                                                                           | ++++                                                                                          |                                                                                               |                                                               |                                                                                                      |                                                                                                                                             |                                                                           |              |
|                                                                          | <b>^</b>                                                                                                                                                         |                                                                   | ~                                                                                            | ++++                                                                                        | v                                                                                             |                                                                                               |                                                               |                                                                                                      |                                                                                                                                             |                                                                           |              |
| rth  <br>   *                                                            | + + +)<br>+ + + ***                                                                                                                                              |                                                                   | (+ " +)<br>+ * +                                                                             | [++++><br>[****                                                                             | l<br>Í                                                                                        |                                                                                               |                                                               |                                                                                                      |                                                                                                                                             |                                                                           |              |
| · i                                                                      | V + + +                                                                                                                                                          | i                                                                 | + * +                                                                                        | l v                                                                                         | İ                                                                                             |                                                                                               |                                                               |                                                                                                      |                                                                                                                                             |                                                                           |              |
|                                                                          | G/C= .172                                                                                                                                                        |                                                                   | <br>= .456                                                                                   | <br>  G/C=                                                                                  | .172                                                                                          |                                                                                               |                                                               |                                                                                                      |                                                                                                                                             |                                                                           |              |
| Ì                                                                        | G= 10.3"                                                                                                                                                         | G=                                                                | 27.4"                                                                                        | G= 1                                                                                        | 10.3"                                                                                         |                                                                                               |                                                               |                                                                                                      |                                                                                                                                             |                                                                           |              |
| 4                                                                        | Y+R= 4.0"<br>OFF=0%                                                                                                                                              |                                                                   |                                                                                              | Y+R=<br>  OFF=7                                                                             |                                                                                               |                                                                                               |                                                               |                                                                                                      |                                                                                                                                             |                                                                           |              |
|                                                                          |                                                                                                                                                                  |                                                                   |                                                                                              |                                                                                             |                                                                                               |                                                                                               |                                                               |                                                                                                      |                                                                                                                                             |                                                                           |              |
|                                                                          |                                                                                                                                                                  |                                                                   |                                                                                              |                                                                                             |                                                                                               |                                                                                               |                                                               |                                                                                                      | _                                                                                                                                           |                                                                           |              |
| C=                                                                       | • 60 sec                                                                                                                                                         | G= 48                                                             | .0 sec                                                                                       | = 80.09                                                                                     | s Y=12.                                                                                       | 0 sec =                                                                                       | 20.0%                                                         | Ped≖ .                                                                                               | 0 se                                                                                                                                        | C = .º                                                                    | Ø \$         |
| C=                                                                       |                                                                                                                                                                  |                                                                   |                                                                                              |                                                                                             |                                                                                               |                                                                                               |                                                               |                                                                                                      | 0 se                                                                                                                                        | c = .:                                                                    | Ø\$<br>      |
| <br>ane                                                                  | Width/                                                                                                                                                           | g                                                                 | <br>/c                                                                                       | Servi                                                                                       | <br>Lce Rate                                                                                  | Adj                                                                                           |                                                               | <br>  нсм                                                                                            |                                                                                                                                             | 90% Ma                                                                    | <br>×!       |
|                                                                          | Width/                                                                                                                                                           | g                                                                 | <br>/c                                                                                       | Servi                                                                                       | <br>Lce Rate                                                                                  | Adj                                                                                           |                                                               |                                                                                                      |                                                                                                                                             |                                                                           | <br>×!       |
| ane<br>Group                                                             | Width/ <br>  Lanes                                                                                                                                               | g                                                                 | <br>/c                                                                                       | Servi                                                                                       | <br>Lce Rate                                                                                  | Adj                                                                                           |                                                               | <br>  нсм                                                                                            |                                                                                                                                             | 90% Ma                                                                    | <br>×!       |
| ane<br>Group<br>Appro                                                    | Width/ <br>  Lanes <br>ach                                                                                                                                       | g<br>Reqd                                                         | /C<br>Used                                                                                   | Servi                                                                                       | ice Rate<br>/ph) @E                                                                           | Adj<br> Volume                                                                                | <br>  v/c                                                     | HCM<br>  Delay<br>7.2                                                                                | <br>  L<br>  S<br>                                                                                                                          | 90% Ma<br>  Queue                                                         | ×  <br> <br> |
| Appro<br>RT<br>TH                                                        | Width/ <br>  Lanes <br>  ach<br>  12/1  <br>  12/1                                                                                                               | g<br>Reqd<br>.002<br>.276                                         | /C<br>Used<br>.489<br>.489                                                                   | Servi<br>  @C (\<br>  692<br>  848                                                          | ice Rate<br>/ph) @E<br>  730<br>  884                                                         | Adj<br> Volume<br>  1<br>  440                                                                | <br>  v/c<br>  .001<br>  .498                                 | HCM<br>  Delay<br>7.2<br>  5.1<br>  7.1                                                              | <br>  L<br>  S<br><br>B+<br>  B+<br>  B+                                                                                                    | 90% Ma<br>  Queue<br>  25 f<br>  190 f                                    | <br>×!<br>   |
| ane<br>Group<br>Appro<br>RT                                              | Width/ <br>  Lanes <br>  ach                                                                                                                                     | g<br>Reqd<br>.002<br>.276                                         | /C<br>Used<br>.489<br>.489                                                                   | Servi<br>  @C (\<br>  692<br>  848                                                          | ice Rate<br>/ph) @E<br>  730<br>  884                                                         | Adj<br> Volume<br>  1<br>  440                                                                | <br>  v/c<br>  .001                                           | HCM<br>  Delay<br>7.2<br>  5.1<br>  7.1                                                              | <br>  L<br>  S<br><br>B+<br>  B+<br>  B+                                                                                                    | 90% Ma<br>  Queue<br>  25 f                                               | <br>×!<br>   |
| Appro<br>RT<br>TH<br>LT<br>Appro                                         | Width/ <br>  Lanes <br>  ach<br>  12/1  <br>  12/1  <br>  12/1                                                                                                   | g<br>Reqd<br>.002<br>.276<br>.000                                 | /C<br>Used<br>.489<br>.489<br>.489<br>.489                                                   | Servi<br>  @C (\<br>  692<br>  848<br>  93                                                  | Lce Rate<br>/ph) @E<br>  730<br>  884<br>  115                                                | Adj<br> Volume<br>  1<br>  440<br>  56                                                        | v/c<br>  .001<br>  .498<br>  .467                             | HCM<br>  Delay<br>7.2<br>  5.1<br>  7.1<br>  8.6<br>  6.1                                            | L<br>  S<br>  S<br>  B+<br>  B+<br>  B+<br>  B+<br>  B+                                                                                     | 90% Ma<br>  Queue<br>  25 f<br>  190 f<br>  25 f                          |              |
| Appro<br>RT<br>TH<br>LT<br>Appro                                         | Width/ <br>  Lanes <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                                                                                | g<br>Reqd<br>.002<br>.276<br>.000                                 | /C<br>Used<br>.489<br>.489<br>.489<br>.489                                                   | Servi<br>  @C (\<br>  692<br>  848<br>  93                                                  | Lce Rate<br>/ph) @E<br>  730<br>  884<br>  115                                                | Adj<br> Volume<br>  1<br>  440<br>  56                                                        | v/c<br>  .001<br>  .498<br>  .467                             | HCM<br>  Delay<br>7.2<br>  5.1<br>  7.1<br>  8.6<br>  6.1                                            | L<br>  S<br>  S<br>  B+<br>  B+<br>  B+<br>  B+<br>  B+                                                                                     | 90% Ma<br>  Queue<br>  25 f<br>  190 f<br>  25 f                          |              |
| Appro<br>RT<br>TH<br>LT<br>Appro<br>RT                                   | Width/ <br>  Lanes <br>  12/1  <br>  12/1  <br>  12/1  <br>  ach                                                                                                 | g<br>Reqd<br>.002<br>.276<br>.000                                 | /C<br>Used<br>.489<br>.489<br>.489<br>.489<br>.489                                           | Servi<br>  @C (\<br>  692<br>  848<br>  93<br>  1151                                        | Lce Rate<br>/ph) @E<br>/ 730<br>/ 884<br>  115<br>  1154                                      | Adj<br> Volume<br>  1<br>  440<br>  56                                                        | ∨/c<br>  .001<br> .498<br> .467                               | HCM<br>  Delay<br>7.2<br>  5.1<br>  7.1<br>  8.6<br>  6.1<br>  1.5                                   | L<br>  S<br>  B+<br>  B+<br>  B+<br>  B+<br>  B+                                                                                            | 90% Ma<br>  Queue<br>  25 f<br>  190 f<br>  25 f                          |              |
| Appro<br>RT<br>TH<br>LT<br>Appro<br>RT                                   | Width/ <br>  Lanes <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                                                                                | 9<br>Reqd<br>.002<br>.276<br>.000<br>.055<br>.613                 | / C<br>Used<br>. 489<br>. 489<br>. 489<br>. 489<br>. 489<br>. 728                            | Servi<br>  @C (v<br>  692<br>  848<br>  93<br>  1151<br>  1151<br>  1396                    | Lce Rate<br>(ph) @E<br>730<br>884<br>115<br>1154<br>1396                                      | Adj<br> Volume<br>  1<br>  440<br>  56<br>  51<br>  1162                                      | ∨/c<br>  .001<br> .498<br> .467<br> .044<br> .832             | HCM<br>  Delay<br>7.2<br>  5.1<br>  7.1<br>  8.6<br>  6.1<br>  1.5<br>  6.8                          | L<br>  S<br>  S<br>  B+<br>  B+<br>  B+<br>  B+<br>  B+<br>  A<br>  *B+                                                                     | 90% Ma<br>Queue<br>25 f<br>190 f<br>25 f<br>25 f                          |              |
| Appro<br>RT<br>TH<br>LT<br>Appro<br>RT<br>TH                             | Width/ <br>  Lanes <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                                                        | 9<br>Reqd<br>.002<br>.276<br>.000<br>.055<br>.613                 | / C<br>Used<br>. 489<br>. 489<br>. 489<br>. 489<br>. 489<br>. 728                            | Servi<br>  @C (v<br>  692<br>  848<br>  93<br>  1151<br>  1151<br>  1396                    | Lce Rate<br>(ph) @E<br>730<br>884<br>115<br>1154<br>1396                                      | Adj<br> Volume<br>  1<br>  440<br>  56<br>  51<br>  1162                                      | ∨/c<br>  .001<br> .498<br> .467<br> .044<br> .832             | HCM<br>  Delay<br>7.2<br>  5.1<br>  7.1<br>  8.6<br>  6.1<br>  1.5<br>  6.8                          | L<br>  S<br>  S<br>  B+<br>  B+<br>  B+<br>  B+<br>  B+<br>  A<br>  *B+                                                                     | 90% Ma<br>Queue<br>25 f<br>190 f<br>25 f<br>25 f                          |              |
| Appro<br>RT<br>TH<br>LT<br>Appro<br>RT<br>TH<br>LT                       | Width/ <br>o   Lanes <br>oach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                                              | g<br>Reqd<br>.002<br>.276<br>.000<br>.055<br>.613<br>.035         | / C<br>Used<br>. 489<br>. 489<br>. 489<br>. 489<br>. 489<br>. 728<br>. 728<br>. 728<br>. 205 | Servi<br>  @C (\<br>  692<br>  848<br>  93<br>  1151<br>  1396<br>  498                     | Lce Rate<br>/ph) @E<br>  730<br>  884<br>  115<br>  1154<br>  1396<br>  534                   | Adj<br> Volume<br>  1<br>  440<br>  56<br>  51<br>  1162<br>  192                             | ∨/c<br>  .001<br>  .498<br>  .467<br>  .044<br>.832<br>  .360 | HCM<br>Delay<br>7.2<br>5.1<br>7.1<br>8.6<br>6.1<br>1.5<br>6.8<br>2.7<br>13.3                         | L<br>  S<br>  S<br>  B+<br>  B+<br>  B+<br>  B+<br>  B+<br>  A<br>  *B+<br>  A                                                              | 90% Ma<br>Queue<br>25 f<br>190 f<br>25 f<br>25 f                          |              |
| Appro<br>RT<br>TH<br>LT<br>Appro<br>RT<br>TH<br>LT<br>Appro<br>RT        | Width/ <br>b   Lanes <br>b ach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                     | g<br>Reqd<br>.002<br>.276<br>.000<br>.055<br>.613<br>.035         | / C<br>Used<br>. 489<br>. 489<br>. 489<br>. 489<br>. 489<br>. 205                            | Servi<br>  @C (\<br>  692<br>  848<br>  93<br>  1151<br>  1396<br>  498<br>  258            | <pre>ce Rate /ph) @E / 730 / 884 / 115 / 1154 / 1396 / 534 / 316</pre>                        | Adj<br> Volume<br>  1<br>  440<br>  56<br>  51<br>  1162<br>  192<br>  92                     | ∨/c<br>  .001<br> .498<br> .467<br> .044<br>.832<br> .360     | HCM<br>Delay<br>7.2<br>5.1<br>7.1<br>8.6<br>6.1<br>1.5<br>6.8<br>2.7<br>13.3                         | L<br>  S<br>  B+<br>  B+<br>  B+<br>  B+<br>  B+<br>  A<br> *B+<br>  A<br>  *B+<br>  A                                                      | 90% Ma<br>Queue<br>25 f<br>190 f<br>25 f<br>267 f<br>44 f                 |              |
| Appro<br>RT<br>TH<br>LT<br>Appro<br>RT<br>TH<br>LT                       | Width/ <br>  Lanes <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                                | g<br>Reqd<br>.002<br>.276<br>.000<br>.055<br>.613<br>.035         | / C<br>Used<br>. 489<br>. 489<br>. 489<br>. 489<br>. 489<br>. 205                            | Servi<br>  @C (\<br>  692<br>  848<br>  93<br>  1151<br>  1396<br>  498<br>  258            | <pre>ce Rate /ph) @E / 730 / 884 / 115 / 1154 / 1396 / 534 / 316</pre>                        | Adj<br> Volume<br>  1<br>  440<br>  56<br>  51<br>  1162<br>  192<br>  92                     | ∨/c<br>  .001<br> .498<br> .467<br> .044<br>.832<br> .360     | HCM<br>Delay<br>7.2<br>5.1<br>7.1<br>8.6<br>6.1<br>1.5<br>6.8<br>2.7<br>13.3                         | L<br>  S<br>  B+<br>  B+<br>  B+<br>  B+<br>  B+<br>  A<br> *B+<br>  A<br>  *B+<br>  A                                                      | 90% Ma<br>Queue<br>25 f<br>190 f<br>25 f<br>267 f<br>44 f                 |              |
| Appro<br>RT<br>TH<br>LT<br>Appro<br>RT<br>TH<br>LT<br>Appro<br>RT<br>+TH | Width/ <br>b   Lanes <br>b ach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1 | 9<br>Reqd<br>.002<br>.276<br>.000<br>.055<br>.613<br>.035<br>.035 | / C<br>Used<br>. 489<br>. 489<br>. 489<br>. 489<br>. 489<br>. 285<br>. 205<br>. 205          | Servi<br>  @C (\<br>  @C (\<br>  848<br>  93<br>  1151<br>  1396<br>  498<br>  258<br>  242 | Lce Rate<br>(ph) @E<br>  730<br>  884<br>  115<br>  1154<br>  1396<br>  534<br>  316<br>  299 | Adj<br> Volume<br>  1<br>  440<br>  56<br>  51<br>  1162<br>  192<br>  192                    | .001<br>.498<br>.467<br>.044<br>.832<br>.360<br>.241<br>.348  | HCM<br>Delay<br>7.2<br>5.1<br>7.1<br>8.6<br>6.1<br>1.5<br>6.8<br>2.7<br>13.3<br>13.0<br>13.5<br>19.2 | L<br>  S<br>  B+<br>  B+<br>  B+<br>  B+<br>  B+<br>  B+<br>  A<br>  *B+<br>  A<br>  *B+<br>  A<br>  B<br>  B<br>  B<br>  B<br>  B          | 90% Ma<br>Queue<br>25 f<br>190 f<br>25 f<br>267 f<br>44 f<br>51 f<br>70 f |              |
| Appro<br>RT<br>TH<br>LT<br>Appro<br>RT<br>TH<br>LT<br>Appro<br>RT<br>+TH | Width/ <br>b   Lanes <br>b ach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                         | 9<br>Reqd<br>.002<br>.276<br>.000<br>.055<br>.613<br>.035<br>.035 | / C<br>Used<br>. 489<br>. 489<br>. 489<br>. 489<br>. 489<br>. 205<br>. 205<br>. 205          | Servi<br>  @C (\<br>  692<br>  848<br>  93<br>  1151<br>  1396<br>  498<br>  258<br>  242   | <pre>ce Rate /ph) @E /</pre>                                                                  | Adj<br> Volume<br>  1<br>  440<br>  56<br>  51<br>  1162<br>  192<br>  192<br>  76  <br>  104 | .001<br>.498<br>.467<br>.044<br>.832<br>.360<br>.241<br>.348  | HCM<br>Delay<br>7.2<br>5.1<br>7.1<br>8.6<br>6.1<br>1.5<br>6.8<br>2.7<br>13.3<br>13.0<br>13.5<br>19.2 | L<br>  S<br>  B+<br>  B+<br>  B+<br>  B+<br>  B+<br>  B+<br>  B+<br>  A<br>  *B+<br>  A<br>  *B+<br>  A<br>  B<br>  B<br>  B<br>  B<br>  C+ | 90% Ma<br>Queue<br>25 f<br>190 f<br>25 f<br>267 f<br>44 f<br>51 f<br>70 f |              |

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KULAMALU MASTER PLAN W/O MIT PM PEAK HOUR

# SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int # 0 - BYPASS/KULA HWY & HALEAKALA HY

| METROAREA      | NON | ICBD |
|----------------|-----|------|
| LOSTTIME       |     | 2.0  |
| LEVELOFSERVICE | С   | S    |
| NODELOCATION   | 0   | 0    |

Approach Parameters

| APPLABELS<br>GRADES<br>PEDLEVELS<br>PARKINGSIDES<br>PARKVOLUMES<br>BUSVOLUMES | SB<br>6.0<br>Low<br>None<br>20<br>0 | WB<br>.0<br>LOW<br>NONE<br>20<br>0 | NB<br>-6.0<br>Low<br>None<br>20<br>0<br>28 | EB<br>.0<br>LOW<br>NONE<br>20<br>0<br>140 |
|-------------------------------------------------------------------------------|-------------------------------------|------------------------------------|--------------------------------------------|-------------------------------------------|
| BUSVOLUMES<br>Rightturnonreds                                                 | 9<br>1                              | 52                                 | 28                                         | 140                                       |

Movement Parameters

| Novement rura                                                                                                                                                           |                                                                              | •                                    |                                      |                                                                       |                                      |                                                                            |                                                                              |                                                                |                                                                |                                                                       |                                     |                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------|--------------------------------------|-----------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------|---------------------------------------------|
| MOVLABELS<br>VOLUMES<br>WIDTHS<br>LANES<br>UTILIZATIONS<br>TRUCKPERCENTS                                                                                                | RT<br>12.0<br>1.00<br>2.0                                                    | TH<br>969<br>12.0<br>1.00<br>2.0     | LT<br>74<br>12.0<br>1<br>1.00<br>2.0 | RT<br>87<br>12.0<br>1.00<br>2.0                                       | TH<br>39<br>12.0<br>1.00<br>2.0      | LT<br>39<br>.0<br>0<br>1.00<br>2.0                                         | RT<br>42<br>12.0<br>1<br>1.00<br>2.0<br>.95                                  | TH<br>892<br>12.0<br>1.00<br>2.0<br>.95                        | LT<br>200<br>12.0<br>1.00<br>2.0<br>.95                        | RT<br>332<br>12.0<br>1.00<br>2.0<br>.95                               | TH<br>49<br>12.0<br>1<br>2.0<br>.95 | LT<br>@<br>.@<br>1.0@<br>2.@<br>.9!         |
| PEAKHOURFACTORS<br>ARRIVALTYPES<br>ACTUATIONS<br>REQCLEARANCES<br>MINIMUMS<br>IDEALSATFLOWS<br>FACTORS<br>DELAYFACTORS<br>NSTOPFACTORS<br>GROUPTYPES<br>SATURATIONFLOWS | .95<br>3<br>NO<br>4.0<br>5.0<br>1900<br>1.00<br>1.00<br>1.00<br>NORM<br>1493 | 1900<br>1.00<br>1.00<br>1.00<br>NORM | 1900<br>1.00<br>1.00<br>1.00<br>NORM | .95<br>3<br>NO<br>5.0<br>1900<br>1.00<br>1.00<br>1.00<br>NORM<br>1539 | 1900<br>1.00<br>1.00<br>1.00<br>NORM | .95<br>3<br>YES<br>4.0<br>5.0<br>1900<br>1.00<br>1.00<br>1.00<br>NORM<br>0 | .95<br>3<br>NO<br>4.0<br>5.0<br>1900<br>1.00<br>1.00<br>1.00<br>NORM<br>1585 | 3<br>YES<br>4.0<br>5.0<br>1.00<br>1.00<br>1.00<br>NORM<br>1919 | 3<br>YES<br>4.0<br>5.0<br>1900<br>1.00<br>1.00<br>1.00<br>NORM | 3<br>NO<br>4.0<br>5.0<br>1900<br>1.00<br>1.00<br>1.00<br>NORM<br>1539 | 1.00<br>Norm                        | 5.(<br>190(<br>1.0(<br>1.0(<br>1.0(<br>NOR) |

Phasing Parameters

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| SEQUENCES<br>PERMISSIVES<br>OVERLAPS<br>CYCLES<br>GREENTIMES<br>YELLOWTIMES<br>CRITICALS<br>EXCESS | 31<br>YES<br>60<br>5.77<br>4.00<br>9<br>0 | ALL<br>YES<br>YES<br>120<br>36.45<br>4.00<br>2 | YES<br>YES<br>10<br>5.77<br>4.00<br>5 | YES<br>YES | LEADLAGS<br>Offset<br>Pedtime | NONE<br>.00<br>.0 | N O N E<br>3<br>6 |
|----------------------------------------------------------------------------------------------------|-------------------------------------------|------------------------------------------------|---------------------------------------|------------|-------------------------------|-------------------|-------------------|
|----------------------------------------------------------------------------------------------------|-------------------------------------------|------------------------------------------------|---------------------------------------|------------|-------------------------------|-------------------|-------------------|

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|                                                                            | ALU<br>1 plan w/o m:                                                                                                                       | CT .                                                                                         |                                                                      |                                                                                           |                                                                                            |                                                                                                  |                                                                                        |                                                                                                |                                                                                                                                                                                                                      | 03/27<br>17:04                                          |                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PEA                                                                        | K HOUR                                                                                                                                     |                                                                                              |                                                                      |                                                                                           |                                                                                            |                                                                                                  |                                                                                        |                                                                                                |                                                                                                                                                                                                                      |                                                         |                                                                                                                                                                                                                                                           |
| GNAL                                                                       | .94/TEAPAC[V:                                                                                                                              | L L1.4)                                                                                      | ] — Cap                                                              | acity A                                                                                   | nalysis                                                                                    | Summary                                                                                          | ,                                                                                      |                                                                                                |                                                                                                                                                                                                                      |                                                         |                                                                                                                                                                                                                                                           |
|                                                                            |                                                                                                                                            |                                                                                              |                                                                      |                                                                                           |                                                                                            |                                                                                                  |                                                                                        | EAKALA                                                                                         | цv                                                                                                                                                                                                                   |                                                         | <b>F</b> cut                                                                                                                                                                                                                                              |
| ters                                                                       | ection Avera<br>Degree of Sa                                                                                                               | ages to<br>aturat:                                                                           | ion (v/                                                              | # 0<br>c) .67                                                                             | Vehic                                                                                      | le Delay                                                                                         | / 8.1                                                                                  | Level                                                                                          | of S                                                                                                                                                                                                                 | ervice                                                  | 9 8≁                                                                                                                                                                                                                                                      |
| • •                                                                        |                                                                                                                                            |                                                                                              |                                                                      |                                                                                           |                                                                                            |                                                                                                  |                                                                                        |                                                                                                |                                                                                                                                                                                                                      |                                                         | <b>2</b> 11-1                                                                                                                                                                                                                                             |
| 31<br>/**                                                                  | •                                                                                                                                          | Pha                                                                                          |                                                                      |                                                                                           |                                                                                            |                                                                                                  |                                                                                        |                                                                                                |                                                                                                                                                                                                                      |                                                         |                                                                                                                                                                                                                                                           |
|                                                                            |                                                                                                                                            | + *<br>  + *                                                                                 | +                                                                    | 1                                                                                         | ~  <br>++++ <br><****                                                                      |                                                                                                  |                                                                                        |                                                                                                |                                                                                                                                                                                                                      |                                                         | •م <u>د</u> و                                                                                                                                                                                                                                             |
| 1                                                                          | į                                                                                                                                          | <pre> *</pre>                                                                                | •                                                                    | ļ                                                                                         | <****                                                                                      |                                                                                                  |                                                                                        |                                                                                                |                                                                                                                                                                                                                      |                                                         |                                                                                                                                                                                                                                                           |
|                                                                            | -                                                                                                                                          |                                                                                              | ^                                                                    | ť<br>                                                                                     |                                                                                            |                                                                                                  |                                                                                        |                                                                                                |                                                                                                                                                                                                                      |                                                         | ر معامل الم                                                                                                                                                                                                                                               |
| rth<br>I                                                                   | i (* + +)<br>i++++ * + +                                                                                                                   |                                                                                              | (+ + +)<br>+ + +                                                     | ++++><br> ++++                                                                            |                                                                                            |                                                                                                  |                                                                                        |                                                                                                |                                                                                                                                                                                                                      |                                                         |                                                                                                                                                                                                                                                           |
| •                                                                          | i v*++                                                                                                                                     | i                                                                                            | + + +                                                                | l v                                                                                       | <u>i</u>                                                                                   |                                                                                                  |                                                                                        |                                                                                                |                                                                                                                                                                                                                      |                                                         | tar.                                                                                                                                                                                                                                                      |
| •                                                                          | G/C= .096                                                                                                                                  | G/C=                                                                                         | = .608                                                               | <br>  G/C=                                                                                | .096                                                                                       |                                                                                                  |                                                                                        |                                                                                                |                                                                                                                                                                                                                      |                                                         | · · ·                                                                                                                                                                                                                                                     |
|                                                                            | G= 5.8"<br>  Y+R= 4.0"                                                                                                                     | •                                                                                            | 36.5"                                                                | •                                                                                         | 5.8"                                                                                       |                                                                                                  |                                                                                        |                                                                                                |                                                                                                                                                                                                                      |                                                         |                                                                                                                                                                                                                                                           |
|                                                                            | OFF=0%                                                                                                                                     | •                                                                                            |                                                                      | •                                                                                         | -                                                                                          |                                                                                                  |                                                                                        |                                                                                                |                                                                                                                                                                                                                      |                                                         |                                                                                                                                                                                                                                                           |
|                                                                            | <br>C= 60 sec                                                                                                                              | G= 48.                                                                                       | . 0 sec :                                                            |                                                                                           | <br>Y=12.                                                                                  | 0 sec =                                                                                          | 20.0%                                                                                  | Ped= .                                                                                         | 0 sec                                                                                                                                                                                                                | 2 =                                                     | .01                                                                                                                                                                                                                                                       |
|                                                                            | 0- 00 300                                                                                                                                  |                                                                                              |                                                                      |                                                                                           |                                                                                            |                                                                                                  |                                                                                        |                                                                                                |                                                                                                                                                                                                                      |                                                         |                                                                                                                                                                                                                                                           |
|                                                                            |                                                                                                                                            |                                                                                              |                                                                      |                                                                                           |                                                                                            |                                                                                                  |                                                                                        |                                                                                                |                                                                                                                                                                                                                      |                                                         | يعتمو                                                                                                                                                                                                                                                     |
| Lane                                                                       | <br> Width/                                                                                                                                |                                                                                              | /c                                                                   | Servi                                                                                     | ce Rate                                                                                    |                                                                                                  |                                                                                        | HCM                                                                                            |                                                                                                                                                                                                                      | 90% M                                                   |                                                                                                                                                                                                                                                           |
| Lane<br>Gro                                                                | Width/ <br>up   Lanes                                                                                                                      | g,<br>Reqd                                                                                   | /C<br>Used                                                           | Servi<br>  @C (v                                                                          | ce Rate<br>ph) @E                                                                          | Adj<br> Volume                                                                                   | v/c                                                                                    | HCM<br>Delay                                                                                   | L<br>  S                                                                                                                                                                                                             | 90% M<br>Quel                                           | tax                                                                                                                                                                                                                                                       |
| Gro<br>                                                                    | up   Lanes <br>                                                                                                                            | g,<br>Reqd                                                                                   | /C<br>Used                                                           | Servi<br>  @C (v                                                                          | ce Rate<br>ph) @E                                                                          | Adj<br> Volume                                                                                   | v/c                                                                                    | Delay                                                                                          | S<br>                                                                                                                                                                                                                |                                                         | tax                                                                                                                                                                                                                                                       |
| Gro<br>                                                                    | Width/ <br>up   Lanes <br>roach                                                                                                            | g,<br>Reqd                                                                                   | /C<br>Used                                                           | Servi<br>  @C (v                                                                          | ce Rate<br>ph) @E                                                                          | Adj  <br> Volume                                                                                 | \<br>∨/c                                                                               | HCM<br>Delay<br>11.3                                                                           | L<br>  S<br>  B                                                                                                                                                                                                      |                                                         | lax                                                                                                                                                                                                                                                       |
| Gro<br>App<br>RT                                                           | up   Lanes <br>                                                                                                                            | Reqd<br>                                                                                     | Used<br>                                                             | @C (v<br><br>  939                                                                        | ph) @E                                                                                     | Volume <br>                                                                                      | .001                                                                                   | Delay<br>11.3<br>2.5                                                                           | S<br>  B<br>  A                                                                                                                                                                                                      | Queu<br><br>  25                                        | ft                                                                                                                                                                                                                                                        |
| Gro<br>App<br>RT<br>TH                                                     | up   Lanes <br>roach<br>  12/1  <br>  12/1                                                                                                 | Reqd<br>.002                                                                                 | Used<br>                                                             | @C (v<br>  939<br>  1147                                                                  | ph)@E                                                                                      | Volume <br>                                                                                      | .001  <br>.881                                                                         | 11.3<br>2.5<br>11.5                                                                            | S<br>  B<br>  A<br> *B                                                                                                                                                                                               | Q цец<br><br>25<br>309                                  | ft                                                                                                                                                                                                                                                        |
| Gro<br><br>App<br>RT                                                       | up   Lanes <br>roach<br>  12/1  <br>  12/1                                                                                                 | Reqd<br>.002                                                                                 | Used<br>                                                             | @C (v<br>  939<br>  1147                                                                  | ph)@E                                                                                      | Volume <br>                                                                                      | .001  <br>.881                                                                         | 11.3<br>2.5<br>11.5                                                                            | S<br>  B<br>  A<br> *B                                                                                                                                                                                               | Q цец<br><br>25<br>309                                  | ft                                                                                                                                                                                                                                                        |
| Gro<br>App<br>RT<br>TH<br>LT<br>App                                        | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>roach                                                                          | Reqd<br>.002  <br>.577  <br>.086                                                             | Used<br>.641<br>.641<br>.641                                         | @C (v<br>  939<br>  1147<br>  112                                                         | ph)@E<br>  957<br>  1158<br>  135                                                          | Volume <br>  1  <br>  1020  <br>  78                                                             | .001  <br>.881  <br>.569                                                               | 11.3<br>2.5<br>11.5<br>7.9<br>3.3                                                              | B<br>  A<br>  *B<br>  B+<br> <br>A                                                                                                                                                                                   | Qиел<br>25<br>309<br>25                                 | ft <br>ft                                                                                                                                                                                                                                                 |
| Gro<br>App<br>RT<br>TH<br>LT                                               | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>roach                                                                          | Reqd<br>.002  <br>.577  <br>.086                                                             | Used<br>.641<br>.641<br>.641                                         | @C (v<br>  939<br>  1147<br>  112                                                         | ph) @E                                                                                     | Volume <br>  1  <br>  1020  <br>  78                                                             | .001  <br>.881  <br>.569                                                               | Delay<br>11.3<br>2.5<br>11.5<br>7.9<br>3.3                                                     | 8<br>  A<br> *B<br>  B+ <br>A                                                                                                                                                                                        | Quet<br>25<br>309<br>25                                 | ft <br>ft                                                                                                                                                                                                                                                 |
| Gro<br>App<br>RT<br>TH<br>LT<br>App<br>RT<br>TH                            | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>roach<br>  12/1  <br>  12/1                                                    | Reqd<br>.002  <br>.577  <br>.086  <br>.021  <br>.506                                         | Used<br>.641<br>.641<br>.641<br>.641<br>.804<br>.804                 | @C (v<br>  939<br>  1147<br>  112<br>  1274<br>  1542                                     | ph) @E<br>  957<br>  1158<br>  135<br>  1274<br>  1542                                     | Volume<br>  1  <br>  1020  <br>  78  <br>  15  <br>  939                                         | .001  <br>.881  <br>.569  <br>.012  <br>.609                                           | Delay<br>11.3<br>2.5<br>11.5<br>7.9<br>3.3<br>.8<br>2.0                                        | B<br>  A<br>  *B<br>  B+<br>  A<br>  A                                                                                                                                                                               | Qиел<br>25<br>309<br>25<br>25<br>25<br>155              | iax                                                                                                                                                                                                                                                       |
| Gro<br>App<br>RT<br>TH<br>LT<br>App<br>RT                                  | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>roach<br>  12/1  <br>  12/1                                                    | Reqd<br>.002  <br>.577  <br>.086  <br>.021  <br>.506                                         | Used<br>.641<br>.641<br>.641<br>.641<br>.804<br>.804                 | @C (v<br>  939<br>  1147<br>  112<br>  1274                                               | ph) @E<br>  957<br>  1158<br>  135<br>  1274<br>  1542                                     | Volume<br>  1  <br>  1020  <br>  78  <br>  15  <br>  939                                         | / v/c  <br>.001  <br>.881  <br>.569  <br>.012                                          | Delay<br>11.3<br>2.5<br>11.5<br>7.9<br>3.3<br>.8<br>2.0                                        | B<br>  A<br>  *B<br>  B+<br>  A<br>  A                                                                                                                                                                               | Quel<br>25<br>309<br>25<br>25                           | iax                                                                                                                                                                                                                                                       |
| Gro<br>App<br>RT<br>TH<br>LT<br>App<br>RT<br>TH<br>LT                      | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                            | Reqd<br>.002  <br>.577  <br>.086  <br>.021  <br>.506  <br>.066                               | Used<br>.641<br>.641<br>.641<br>.804<br>.804<br>.130                 | @C (v<br>  939<br>  1147<br>  112<br>  1274<br>  1542<br>  318                            | ph) @E<br>  957<br>  1158<br>  135<br>  1274<br>  1542<br>  364                            | Volume<br>  1<br>  1020<br>  78  <br>  15  <br>  939  <br>  211                                  | .001<br>.881<br>.569<br>.012<br>.609<br>.580                                           | 11.3<br>2.5<br>11.5<br>7.9<br>3.3<br>8<br>2.0<br>9.5                                           | B<br>  A<br>  *B<br>  B+<br>  A<br>  A<br>  A<br>  A<br>  *B+                                                                                                                                                        | Qиел<br>25<br>309<br>25<br>25<br>25<br>155              | ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft                                                                                                                                                                                                              |
| Gro<br>App<br>RT<br>TH<br>LT<br>App<br>RT<br>TH<br>LT                      | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                         | Reqd<br>.002  <br>.577  <br>.086  <br>.021  <br>.506  <br>.066                               | Used<br>.641<br>.641<br>.641<br>.804<br>.804<br>.130                 | @C (v<br>  939<br>  1147<br>  112<br>  1274<br>  1542<br>  318                            | ph) @E<br>  957<br>  1158<br>  135<br>  1274<br>  1542<br>  364                            | Volume<br>  1<br>  1020<br>  78  <br>  15  <br>  939  <br>  211                                  | .001  <br>.881  <br>.569  <br>.609  <br>.580                                           | 11.3<br>2.5<br>11.5<br>7.9<br>3.3<br>8<br>2.0<br>9.5                                           | B<br>  A<br>  * B<br>  B+ <br>  A<br>  A<br>  A<br>  A<br>  * B+ <br>  * B+                                                                                                                                          | Quel<br>25<br>309<br>25<br>155<br>84                    | ax                                                                                                                                                                                                                                                        |
| Gro<br>App<br>RT<br>TH<br>LT<br>App<br>RT<br>TH<br>LT<br>App<br>RT         | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                     | Reqd<br>.002  <br>.577  <br>.086  <br>.021  <br>.506  <br>.066                               | Used<br>.641<br>.641<br>.641<br>.804<br>.804<br>.130                 | @C (v<br>  939<br>  1147<br>  112<br>  1274<br>  1542<br>  318<br>  147                   | ph) @E<br>  957<br>  1158<br>  135<br>  1274<br>  1542<br>  364<br>  195                   | Volume<br>  1  <br>  1020  <br>  78  <br>  15  <br>  939  <br>  211  <br>  37                    | .001  <br>.881  <br>.569  <br>.609  <br>.580                                           | Delay<br>11.3<br>2.5<br>11.5<br>7.9<br>3.3<br>.8<br>2.0<br>9.5<br>15.8<br>15.8                 | B<br>  A<br>  * B<br>  B+ <br>A<br>  A<br>  A<br>  A<br>  A<br>  C+                                                                                                                                                  | Quel<br>25<br>309<br>25<br>155<br>84<br>27              | ax                                                                                                                                                                                                                                                        |
| Gro<br>App<br>RT<br>TH<br>LT<br>App<br>RT<br>H<br>LT<br>RT                 | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                     | Reqd<br>.002  <br>.577  <br>.086  <br>.021  <br>.506  <br>.066                               | Used<br>.641<br>.641<br>.641<br>.804<br>.804<br>.130                 | @C (v<br>  939<br>  1147<br>  112<br>  1274<br>  1542<br>  318<br>  147                   | ph) @E<br>  957<br>  1158<br>  135<br>  1274<br>  1542<br>  364<br>  195                   | Volume<br>  1  <br>  1020  <br>  78  <br>  15  <br>  939  <br>  211  <br>  37                    | .001  <br>.881  <br>.569  <br>.609  <br>.580                                           | Delay<br>11.3<br>2.5<br>11.5<br>7.9<br>3.3<br>.8<br>2.0<br>9.5<br>15.8<br>15.8                 | B<br>  A<br>  * B<br>  B+ <br>A<br>  A<br>  A<br>  A<br>  A<br>  C+                                                                                                                                                  | Quel<br>25<br>309<br>25<br>155<br>84<br>27              | iax      iax        iax      iax        iax      iax        iax      iax        ft      iax        ft      iax        ft      iax        ft      iax        ft      iax        ft      iax        ft      iax        ft      iax        ft      iax       |
| Gro<br>App<br>RT<br>TH<br>LT<br>App<br>RT<br>TH<br>LT<br>App<br>RT<br>T+TH | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1 | Reqd<br>.002  <br>.577  <br>.086  <br>.066  <br>.066  <br>.066  <br>.043  <br>.077           | Used<br>.641<br>.641<br>.641<br>.804<br>.130<br>.130<br>.130         | @C (v<br>  939<br>  1147<br>  112<br>  1274<br>  1542<br>  318<br>  147<br>  156          | ph) @E<br>  957<br>  1158<br>  135<br>  1274<br>  1542<br>  364<br>  364<br>  195<br>  207 | Volume<br>  1<br> 1020<br> 78<br> 37<br> 211<br> 37<br> 82                                       | <pre> /c<br/>.001<br/>.881<br/>.569<br/>.609<br/>.580<br/>.580<br/>.186<br/>.390</pre> | Delay<br>11.3<br>2.5<br>11.5<br>7.9<br>3.3<br>.8<br>2.0<br>9.5<br>15.8<br>15.1<br>16.1<br>12.4 | 8<br>  A<br>  * B<br>  B+<br>  A<br>  A<br>  A<br>  A<br>  A<br>  A<br>  A<br>  C+<br>  C+<br>  C+<br>  C+                                                                                                           | Quel<br>25<br>309<br>25<br>155<br>84<br>27<br>60        | iax      iax       iax      iax       iax      iax       iax      iax       ft      iax       ft      iax       ft      iax       ft      iax       ft      iax       ft      iax       ft      iax       ft      iax       ft      iax       iax     iax |
| Gro<br>RT<br>TH<br>LT<br>App<br>RT<br>TH<br>LT<br>App<br>RT<br>T+TH        | up   Lanes <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1 | Reqd<br>.002  <br>.577  <br>.086  <br>.021  <br>.506  <br>.066  <br>.043  <br>.077  <br>.168 | Used<br>.641<br>.641<br>.641<br>.804<br>.804<br>.130<br>.130<br>.130 | @C (v<br>  939<br>  1147<br>  112<br>  1274<br>  1542<br>  318<br>  147<br>  156<br>  394 | ph) @E<br>  957<br>  1158<br>  135<br>  1274<br>  1542<br>  364<br>  195<br>  207<br>  450 | Volume<br>  1  <br>  1020  <br>  78  <br>  15  <br>939  <br>  211  <br>  211  <br>  37  <br>  82 | <pre>. 0 / c . 0 0 1 . 881 . 569 . 0 12 . 0 12 . 609 . 580 . 186 . 390 186 . 390</pre> | 11.3<br>2.5<br>11.5<br>7.9<br>3.3<br>.8<br>2.0<br>9.5<br>15.8<br>15.1<br>16.1<br>12.4<br>11.7  | B<br>  A<br>  * B<br>  B +<br>  A<br>  A<br>  A<br>  A<br>  A<br>  A<br>  A<br>  A<br>  C<br>+<br>  C<br>+<br>  C<br>+<br>  C<br>+<br>  C<br>+<br>  B<br>  B<br>  B<br>  B<br>  B<br>  B<br>  B<br>  B<br>  B<br>  B | Quel<br>25<br>309<br>25<br>155<br>84<br>27<br>60<br>121 | iax                                                                                                                                                                                                                                                       |

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# SIGRAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

## Intersection Parameters for Int # 0 - HALBAKALA HWY & PUKALAWI ST

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| HETROAREA      | 101 | ICBD |
|----------------|-----|------|
| LOSTTINE       |     | 2.0  |
| LEVELOFSERVICE | С   | S    |
| RODELOCATION   | 0   | θ    |

#### Approach Parameters

|                 | EB    | SB    | WB    | NB    |
|-----------------|-------|-------|-------|-------|
| APPLABELS       | -89   | -#8   | -##   | -88   |
| GRADES          | 8.0   | .0    | -8.6  | 2.0   |
| PEDLEVELS       | KODER | NODER | NODER | KODER |
| PARKINGSIDES    | RORE  | ROHE  | NORE  | NORE  |
| PARKVOLUKES     | 20    | 20    | 28    | 20    |
| BUSVOLUMES      | 0     | 0     | 0     | 0     |
| RIGHTTURNONREDS | 252   | 0     | ŧ     | 141   |

#### Kovement Parameters

| KOVLABELS            | RT         | TH   | LT   | RT   | TH   | LT   | RT   | TE   | LT   | RT   | TH   | LT   |
|----------------------|------------|------|------|------|------|------|------|------|------|------|------|------|
| volumes              | 257        | 693  | Ø    | 0    | 0    | 0    | 0    | 243  | 218  | 171  | 0    | 701  |
| VIDTES               | 12.0       | 12.0 | .0   | .0   | .0   | .0   | .0   | 12.0 | 12.0 | 12.0 | .0   | 12.0 |
| LANES                | 1          | I    | 0    | 0    | 0    | 9    | 0    | 1    | 1    | 1    | 9    | 1    |
| UTILIZATIONS         | 1.00       | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.03 | 1.00 | 1.00 | 1.00 | 1.00 |
| TRUCKPERCENTS        | 2.0        | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  |
| PEAKHOURFACTORS      | .95        | .95  | .95  | .95  | .95  | . 95 | .95  | .95  | . 95 | .95  | .95  | .95  |
| ARRIVALTIPES         | 3          | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 1    | 3    | 3    |
| ACTUATIONS           | <b>F</b> 0 | TES  | TES  | RO   | TES  | YES  | RO   | YES  | YES  | xo   | YES  | YES  |
| REQCLEARAICES        | 4.0        | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.3  | 4.0  | 4.0  | 4.0  | 4.0  |
| KININUNS             | 5.0        | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  |
| <b>IDEALSATFLOWS</b> | 1900       | 1900 | 1900 | 1900 | 1900 | 1900 | 1908 | 1960 |      |      | 1988 | 1980 |
| FACTORS              | 1.00       | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |      | 1.00 |      | 1.00 |
| DELAYFACTORS         | 1.00       | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |      | 1.93 |      |      | 1.00 |      |
| <b>ISTOPFACTORS</b>  | 1.00       | 1.00 | 1.00 | 1.08 | 1.00 | 1.00 |      | 1.00 |      | 1.00 |      | 1.00 |
| GROUPTTPES           | NORM       | NORM | NORM | RORM | NORM | NORM | RORM |      |      | NORM |      |      |
| SATURATIORFLOWS      | 1350       | 1788 | 0    | 0    | 0    | 0    |      |      | 1823 | 1392 |      | 1392 |

#### Phasing Parameters

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| SEQUENCES   | 31   |       |       |     |          |      |      |  |
|-------------|------|-------|-------|-----|----------|------|------|--|
| PERMISSIVES | TES  | YES   | YES   | YES | LEADLAGS | NORE | ROBE |  |
| OVERLAPS    | X0   | NO    | NO    | NO  | OFFSET   | .00  | 1    |  |
| CYCLES      | 60   | 180   | 10    |     | PEDTIKE  | .0   | 0    |  |
| GREBETIKES  | 5.00 | 15.00 | 30.00 |     |          |      | •    |  |
| TELLOWTINES | 4.00 | 4.00  | .00   |     |          |      |      |  |
| CRITICALS   | 9    | 2     | 12    |     |          |      |      |  |
| BICESS      | C    |       |       |     |          |      |      |  |

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## SIGBAL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary

## Intersection Averages for Int # 0 - BALEAKALA HWY & PUKALAWI ST Degree of Saturation (v/c) 1.03 Vehicle Delay 43.00 Level of Service B+ E expect more delay due to extreme v/c's {see EVALUATE}

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| Sq 31    | Phase 1     | Phase 2                      | Phase 3   |
|----------|-------------|------------------------------|-----------|
| , -      | <br>        | +'                           |           |
| :        |             | + *                          | 1 1       |
| - 41 - 1 |             | <t 1<="" td=""><td></td></t> |           |
|          |             | . ₹                          |           |
| welst    | *           | 1 ^                          | 1 ****    |
| Lorth    | <b>c*</b> + | <+ +                         | 1         |
|          | * +         | ++                           | ++++      |
| 1        | • +         | ++                           | 1 7       |
| -        |             |                              |           |
| ŀ        |             |                              | G/C= .517 |
|          | G= 5.0"     | G= 15.0°                     | G= 30.0"  |
|          | Y+R= 4.0"   | Y+R= 4.0"                    | Y+R= ,0"  |
| 1        | 07701       | 077=15.51                    | 077=48.31 |
| -        |             |                              |           |

#### C= 58 sec G= 50.0 sec = 86.23 Y= 8.0 sec = 13.83 Ped= .0 sec = .03

|                     |              |     |     |      |      |      |      |      |      |      |      |       |   | HCH<br>Delay |   |    |   |  |
|---------------------|--------------|-----|-----|------|------|------|------|------|------|------|------|-------|---|--------------|---|----|---|--|
| ei<br><del>88</del> | њ<br>- Аррг( | ac  | h   | <br> | <br> | <br> | <br> |      |      | <br> | <br> |       |   | 58.8         | Į | B  |   |  |
| <br>                |              |     |     |      |      |      |      |      |      |      |      |       |   | 9.4<br>59.1  |   |    |   |  |
| •                   | ø<br>Appro   | )ac | ե   |      | <br> | <br> | <br> | <br> |      | <br> | <br> | • • • | - | 8.6          |   | Bt | , |  |
|                     |              |     |     |      |      |      |      |      |      |      |      |       |   | 6.7<br>10.9  |   |    |   |  |
|                     | B<br>Appro   | aci | ••• | <br> | <br> | <br> | <br> | <br> | •••• | <br> | <br> | •     | - | 49.8         | · | 5+ |   |  |
|                     | RT<br>LT     |     |     |      |      |      |      |      |      |      |      |       |   | 5.1<br>51.8  |   |    |   |  |

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# SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

# Intersection Parameters for Int 8 8 - HALEAKALA HWY & PURALANI ST

| KETROAREA      | NOP | 680 |
|----------------|-----|-----|
| LOSTTINE       |     | 2.0 |
| LEVELOFSERVICE | C   | \$  |
| NODELOCATION   | 1   | ł   |

#### Approach Parameters

|                 | ЕB    | 5B    | WB    | NB<br>tt |
|-----------------|-------|-------|-------|----------|
| APPLABELS       | -58-  | -#8-  | -#8-  |          |
| GRADES          | 8.0   | .1    | -8.4  | 2.0      |
| PEDLEVELS       | MODER | RODER | NODER | XODER    |
|                 | NONE  | NONE  | NONE  | NONE     |
| PARKINGSIDES    | 21    | 24    | 21    | 21       |
| PARKVOLUNES     | 4     |       |       |          |
| BUSVOLUNES      | 1     |       |       | 283      |
| RIGHTTURNONREOS | 223   | •     | •     | 283      |

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#### Novement Parameters

| KOVLABELS       | RT   | ТН   | 17   | 8T   | TH   | LT   | RT    | TH   | 17   | RT   | TH   | LT   |
|-----------------|------|------|------|------|------|------|-------|------|------|------|------|------|
| VOLUKES         | 519  | 334  | 1    |      |      |      |       | 171  | 315  | 340  | ŧ    | 384  |
| WIOTHS          |      | 12.0 |      |      | .1   | .ŧ   | . 1   | 12.0 | 12.1 | 12.0 | .+   | 12.0 |
| LANES           | 1    | 1    | 1    | 1    |      | 4    |       | 1    | 1    | 1    | E F  | 1    |
| UTILIZATIONS    | 1.10 | 1.11 | 1.11 | 1.00 | 1.00 | 1.89 | 1.11  | 1.41 | 1.#  | 1.#  | 1.00 | 1.88 |
| TRUCKPERCENTS   | 2.1  | 2.1  | 2.1  | 2.1  | 2.1  | 2.0  | 2.0   | 2.1  | 2.1  | 2.1  | 2.4  | 2.1  |
| PEAKHOURFACTORS | .95  | .95  | .95  | .95  | .95  | .95  | .95   | .95  | .95  | .95  | .95  | .95  |
| ARRIVALTYPES    | 3    | 3    | 3    | 3    | 3    | 3    | 3     | 3    | 3    | 3    | 3    | 3    |
| ACTUATIONS      | NO   | YES  | YES  | NO   | YES  | YES  | X O N | YES  | YES  | KO   | YES  | YES  |
| REQCLEARANCES   | 4.1  | 4.4  | 4.1  | 4.8  | 1.1  | 4.4  | 6.0   | 4.6  | 4.1  | 4.8  | 4.4  | 6.8  |
| AININUNS        | 5.4  | 5.1  | 5.4  | 5.4  | 5.1  | 5.0  | 5.0   | 5.0  | 5.4  | 5.6  | 5.0  | 5.0  |
| IDEALSATFLOWS   | 1948 |      |      | 1988 | 1988 | 1988 | 1988  | 1944 | 1988 | 1988 | 1900 | 1944 |
| FACTORS         |      | 1.00 |      | 1.0  | 1.44 | 1.00 | 1.11  | 1.44 | 1.88 | 1.#  | 1.44 | 1.00 |
| DELAYFACTORS    |      | 1.44 |      | 1.44 | 1.11 | 1.00 | 1.11  | 1.00 | 1.11 | 1.11 | 1.00 | 1.00 |
| NSTOPFACTORS    |      | 1.00 |      | 1.00 | 1.00 | 1.44 | 1.44  | 1.11 | 1.11 | 1.00 | 1.00 | 1.00 |
| GROUPTYPES      |      | XORM |      | NORM | NORM | NORM | NORM  | NORM | ROER | NORX | NORN | NORM |
| SATURATIONFLOWS | 1351 |      |      | ŧ    | I    | •    | 1     | 1919 | 1823 | 1392 | 1    | 1392 |

#### Phasing Parameters

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| SEQUENCES<br>PERNISSIVES<br>OVERLAPS<br>CYCLES<br>GREENTINES<br>YELLOWTINES | 31<br>YES<br>NO<br>60<br>5.00<br>4.00 | YES<br>NO<br>180<br>15.02<br>4.00 |    | YES<br>Ko | LEADLAG3<br>OFFSET<br>PEDTINE | NONE<br>.00<br>.0 | NOXE<br>1<br>0 |
|-----------------------------------------------------------------------------|---------------------------------------|-----------------------------------|----|-----------|-------------------------------|-------------------|----------------|
| CRITICALS                                                                   | 9                                     | 2                                 | 12 |           |                               |                   |                |
| EXCESS                                                                      | •                                     |                                   |    |           |                               |                   |                |

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# SIGRAL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary

# Intersection Averages for Int 8 9 - HALEAKALA HWY & PUKALAWI ST Degree of Saturation (v/c) .68 Vehicle Delay 23.3 Level of Service C

| **/**              |                    |           | Phase 3   |    |
|--------------------|--------------------|-----------|-----------|----|
|                    |                    | + *       | 1         |    |
| in E               |                    |           | !         | ļ  |
|                    |                    | (+ •      |           | 1  |
| uler               | •                  | · ·       |           | 1  |
| Neist-i<br>Horth i | (* +               | (+ +      |           | {  |
| 1 i                | · • •              | · · ·     | 1         | {  |
| Ì                  | • •                | 1 + +     | v         | 1  |
|                    |                    |           |           |    |
| 6                  | /C= .086           | 6/0= .259 | 6/C= .517 | 1  |
|                    | 5.4*               | 6= 15.8"  | 6= 30.0"  | 1  |
| -   T-             | FR≣ <b>4.8</b> * j | Y+R= 4.8* | I Y+R=    | Ĵ. |

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# C= 58 sec G= 58.8 sec = 86.2% Y= 8.8 sec = 13.8% Ped= .8 sec = .8%

| EI<br>-58      | B<br>Tappi | road           | h          |          |                    |            |      |      |          |                   |            |           |                    |           |                 |        |                           |                  |   | 36        | .1     |          | <br>D   |            |            |
|----------------|------------|----------------|------------|----------|--------------------|------------|------|------|----------|-------------------|------------|-----------|--------------------|-----------|-----------------|--------|---------------------------|------------------|---|-----------|--------|----------|---------|------------|------------|
|                | RT<br>TH   | <br> <br> <br> | 12,<br>12, | 1        | ***<br>  .<br>  .: | 338<br>230 | •••• | . 29 | 3        | •••<br> <br> <br> | 343<br>468 |           | 39(<br>524         | 5         | <b>40</b><br>35 | 6<br>2 | <b>**</b> *<br> 1.<br>  . | •25<br>672       | 1 | 55<br>14  |        |          |         | 234<br>283 | f <br>  ft |
| 10<br>#5       | B<br>Appr  | oac.           | b          |          |                    |            |      |      |          |                   |            |           |                    |           |                 |        |                           |                  |   | 19.       | 6      | 3        | •       |            | •          |
|                |            |                |            |          |                    |            |      |      |          |                   |            |           |                    | 22.       |                 |        |                           |                  |   |           |        |          |         |            |            |
| <br> <br>      | TH<br>Lt   | <br>           | 12/<br>12/ | 1  <br>1 | .1<br>.1           | 23<br>24   | <br> | . 44 | 8  <br>1 |                   | 821<br>316 |           | 86 <b>)</b><br>352 |           | 180<br>321      |        | . 2                       | <b>1</b> 9<br>12 |   | 6.<br>27. | 3<br>1 | 8<br>• D | • <br>• | 81<br>144  | ft<br>ft   |
| <br> <br> <br> |            |                |            | i  <br>i | .1<br>.1           | 23<br>24   |      | . 44 | 8  <br>L |                   | 821<br>316 | <br> <br> | 861                | <br> <br> | 181             |        | . 2                       | 12               |   | 27.       | 1      | 8+       | •       | 81<br>144  | ft<br>ft   |

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## SIGHAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

### Intersection Parameters for Int # 0 - HALBAKALA HWY & MARAWAO AV

| NETROAREA      | HO | ICBD |
|----------------|----|------|
| LOSTTINE       |    | 2.0  |
| LEVELOFSERVICE | C  | S    |
| RODELOCATION   | 0  | 0    |

Approach Parameters

|                 | EB<br>- <del>ST</del> | 5в<br>-₩ | WB            | NB    |
|-----------------|-----------------------|----------|---------------|-------|
| APPLABELS       | 58                    | -#9      | <del>RB</del> | -88-  |
| GRADES          | 8.0                   | .0       | -8.0          | .0    |
| PEDLEVELS       | KODER                 | KODER    | KODER         | KODER |
| PARKINGSIDES    | NORE                  | NONE     | RORE          | RORE  |
| PARKVOLUNES     | 29                    | 29       | 20            | 20    |
| BUSVOLUNES      | 0                     | 9        | 0             | 0     |
| RIGHTTURNONREDS | 0                     | 123      | 0             | 8     |

#### Hovement Parameters

| NOVLABELS              | RT   | TH   | LT   | RT   | TH   | LT   | RT   | TB   | LT   | RT   | TH   | LT   |  |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| VOLUKES                | 6    | 698  | 187  | 225  | 52   | 24   | 31   | 198  | 25   | (5   | 67   | 26   |  |
| VIDTES                 | .0   | 12.0 | 12.0 | 12.0 | 12.0 | .0   | .0   | 12.0 | .0   | .0   | 12.9 | .0   |  |
| LANES                  | 9    | 1    | 1    | 1    | 1    | 0    | 0    | 1    | 6    | Ð    | 1    | 0    |  |
| UTILIZATIONS           | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |
| TRUCKPERCENTS          | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.9  | 2.0  | 2.0  | 2.0  | 2.0  |  |
| <b>PEAKEOURFACTORS</b> | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  |  |
| ARRIVALTYPES           | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |  |
| ACTUATIONS             | YES  | YES  | YES  | YES  | YES  | YES  | YES  | TES  | YES  | YES  | TES  | YES  |  |
| REQCLEARANCES          | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  |  |
| KINIKUNS               | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  |  |
| IDEALSATFLOWS          | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |  |
| FACTORS                | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |
| DELAYFACTORS           | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |
| <b>NSTOPFACTORS</b>    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |  |
| GROUPTYPES             | IORK | RORM | NORN | NORM | ROBE | RORK | NORM | JORH | AORK | NORN | RORN | RORX |  |
| SATURATIONTLOWS        | 0    | 1785 | 777  | 1406 | 1705 | 0    | 9    | 1672 | 0    | 9    | 1481 | 9    |  |

#### Phasing Parameters

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| SEQUERCES     | 31    |       |       |     |          |      |      |  |
|---------------|-------|-------|-------|-----|----------|------|------|--|
| PERKISSIVES   | TES   | YES   | YES   | TES | LEADLAGS | RONE | NONE |  |
| OVERLAPS      | RO    | NO    | 80    | 10  | OFFSET   | .00  | 1    |  |
| CICLES        | 60    | 189   | 10    |     | PEDTINE  | .0   | 0    |  |
| GREENTINES    | 15.00 | 15.00 | 25.00 |     |          |      |      |  |
| YELLOWTINES   | .00   | .00   | .00   |     |          |      |      |  |
| CRITICALS     | 2     | 11    | C     |     |          |      |      |  |
| <b>BICESS</b> | 0     |       |       |     |          |      |      |  |

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## SIGHAL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary

## Intersection Averages for Int # 0 - HALBAKALA HWY & KAKAWAO AV Degree of Saturation {v/c} 1.08 Vebicle Delay 43.40 Level cf Service E+ @ expect more delay due to extreme v/c's {see EVALUATE}

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| iq 31  <br>+/++ | Phase 1                | Phase 2                                        | Phase 3 |
|-----------------|------------------------|------------------------------------------------|---------|
| 1               |                        | + + +                                          | 1 1     |
| . i             | 1                      | +++                                            | ++++    |
| л́і і           |                        | <+ + +>                                        | (++++)  |
| 11              |                        | V                                              | * ++++  |
| List 1          | A                      |                                                | ++++ 7  |
| erth            | <+ + +>                | <+ + +>                                        | ++++>   |
| ΤÌ              | + + +                  | +++                                            | [++++ ] |
| i i             | +++                    | +++                                            | V       |
| Ì               | G= 15.0*<br>T+R= .0* ( | G/C= .273<br>G= 15.0°<br>T+R= .0°<br>OTF=27.33 | Y+R= .9 |

C= 55 sec G= 55.0 sec =100.0% Y= .0 sec = .0% Ped= .3 sec = .0%

| EB             |              |              |      |              |      |              |  | ••••       |          |          | • • •    |          |          |         |    |          |   |            |     |   |             |            | ••         |          |
|----------------|--------------|--------------|------|--------------|------|--------------|--|------------|----------|----------|----------|----------|----------|---------|----|----------|---|------------|-----|---|-------------|------------|------------|----------|
| SB Appro       | oach         |              |      |              |      |              |  |            |          |          |          |          |          |         |    |          |   | 67.        | 36  |   | !           |            |            |          |
| TH+1<br>  LT   | RT <br> <br> | 12/1<br>12/1 |      | .437<br>.308 | 1    | .236<br>.236 |  | 360<br>143 | 5  <br>3 | 42<br>18 | 2        | 7<br>  1 | 41<br>97 | 1<br> 1 | .7 | 56<br>71 |   | 63.<br>82. | 31  |   | 1<br>1<br>1 | 43<br>  11 | 7 1<br>6 1 | ft<br>ft |
| WB<br>Hd Appr  | oach         |              |      |              |      |              |  |            |          |          |          |          |          |         |    | •••      |   | 5.         | . 2 |   | B+          |            |            |          |
| LT+TH+)        | RTĮ          | 12/1         |      | .193         | 1    | .509         |  | 821        |          | 85       | 1        | 2        | 67       |         | .3 | 14       | 1 | 5.         | 2   |   | B+          | 10         | 1 :        | ft       |
| SB<br>#8 Appro | oach         |              |      |              |      |              |  |            |          | ***      |          |          |          |         |    |          |   | б.         | 4   | * | B+          |            |            | 121      |
| RT<br> LT+TH   |              | 12/1<br>12/1 | <br> | .107<br>.070 | <br> | .418<br>.418 |  | 541<br>672 | 5  <br>2 | 58<br>71 | 8  <br>3 | 1        | 07<br>80 |         | .1 | 82<br>12 | 1 | 6.<br>6.   | 5   |   | B+ <br>B+   | 4          | 8 1<br>6 1 | Et<br>Et |
|                |              |              |      |              |      |              |  |            |          |          |          |          |          |         |    |          |   | ۶.         | 1   |   | B+          |            |            |          |
| NG<br>89 Pbbic | bach         |              |      |              |      |              |  |            |          |          |          |          |          |         |    |          |   |            |     |   |             |            |            |          |

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## SIGHAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

## Intersection Parameters for Int # . # - HALEAKALA HWY & MAKAWAG AV

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| METROAREA      | KO | (C8D) |
|----------------|----|-------|
| LOSTTIKE       |    | 2.1   |
| LEVELOFSERVICE | C  | S     |
| NODELOCATION   |    | •     |

#### Approach Parameters

|                 | EB    | SB    | WB    | NB    |
|-----------------|-------|-------|-------|-------|
| APPLABELS       | -58   |       |       |       |
| GRADES          | 8.0   | .1    | -8.1  | .1    |
| PEOLEVELS       | NODER | NODER | NODER | NODER |
| PARKINGSIDES    | NOXE  | NONE  | NDKE  | NONE  |
| PARKVOLUKES     | 28    | 28    | 21    | 21    |
| BUSVOLUMES      | ÷     | t i   | 1     | ŧ.    |
| RIGHTTURNONREDS | ŧ     | 285   | 1     | ł.    |

#### Novement Parameters

| NOVEABELS       | RT   | TH   | LT   | RT   | TX       | LT   | RT   | KT   | 11   | RT   | TH   | ιT   |
|-----------------|------|------|------|------|----------|------|------|------|------|------|------|------|
| VOLUKES         | 33   | 325  | 389  | 291  | 66       | 49   | 29   | 194  | 26   | 31   | 57   | 19   |
| WIDTHS          | . t  | 12.4 | 12.0 | 12.0 | 12.      | .1   | . I  | 12.1 | .1   |      | 12.1 | .1   |
| LANES           | ŀ    | 1    | 1    | 1    | 1        | 1    | ŧ    | 1    | - 1  | •    | 1    | E F  |
| UTILIZATIONS    | 1.11 | 1.84 | 1.00 | 1.00 | 1.0      | 1.00 | 1.00 | 1.0  | 1.0  | 1.44 | 1.11 | 1.44 |
| TRUCKPERCENTS   | 2.4  | 2.1  | 2.1  | 2.1  | 2.1      | 2.0  | 2.1  | 2.1  | 2.\$ | 2.1  | 2.1  | 2.1  |
| PEAKHOURFACTORS | .95  | .95  | .95  | .95  | .95      | .95  | .95  | . 95 | .95  | .95  | .95  | .95  |
| ARRIVALTYPES    | 3    | 3    | 3    | 3    | 3        | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| ACTUATIONS      | YES  | YES  | YES  | YES  | YES      | YES  | YES  | YES  | YES  | YES  | YES  | YES  |
| REQCLEARANCES   | 4.1  | 4.1  | 4.4  | 4.1  | <b>.</b> | 4.1  | 4.1  | 4.1  | 4.1  | 4.4  | 4.1  | 4.1  |
| MININUNS        | 5.0  | 5.1  | 5.0  | 5.1  | 5.1      | 5.4  | 5.1  | 5.#  | 5.1  | 5.1  | 5.1  | 5.1  |
| IDEALSATFLOWS   | 1988 | 1988 | 1988 | 1984 | 1988     | 19## | 1908 | 1944 | 1988 | 1988 | 19## | 1988 |
| FACTORS         | 1.00 | 1.48 | 1.00 | 1.00 | 1.##     | 1.88 | 1.00 | 1.11 | 1.#  | 1.11 | 1.11 | 1.#  |
| DELAYFACTORS    | 1.0  | 1.#  | 1.86 | 1.00 | 1.11     | 1.11 | 1.#  | 1.0  | 1.00 | 1.80 | 1.0  | 1.11 |
| RSTOPFACTORS    | 1.00 | 1.00 | 1.11 | 1.00 | 1.00     | 1.11 | 1.00 | 1.00 | 1.00 | 1.00 | 1.41 | 1.## |
| GROUPTYPES      | NORM | NORN | NORN | RORN | NORN     | NORM | NORN | NORM | NORX | NORN | NORM | NORX |
| SATURATIONFLOWS | - 1  | 1748 | 888  | 1486 | 1689     | 1    | - +  | 1674 | 1    | 1    | 1483 | •    |

#### Phasing Parameters

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| SEQUENCES.  | 31    |       |       |     |          |      |      |
|-------------|-------|-------|-------|-----|----------|------|------|
| PERMISSIVES | YES   | YES   | YES   | YES | LEADLAGS | NONE | NONE |
| OVERLAPS    | NO    | KO    | KO    | KO  | OFFSET   | . ## | 1    |
| CYCLES      | 68    | 180   | 10    |     | PEDTINE  | .1   | ŧ    |
| GREENTINES  | 15.44 | 15.00 | 39.00 |     |          |      |      |
| YELLOWTINES | .11   | .11   |       |     |          |      |      |
| CRITICALS   | 2     | 5     | 1     |     |          |      |      |
| EXCESS      | 1     |       |       |     |          |      |      |

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#### SIGNAL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary

## Intersection Averages for Int 8 0 - HALEAKALA HWY & MAKAWAO AV Degree of Saturation (v/c) .87 Vehicle Delay 39.30 Level of Service D Q expect more delay due to extreme v/c's (see EVALUATE)

| Sq 31            | Phase 1  | ] Phase 2        | Phase 3                 |
|------------------|----------|------------------|-------------------------|
|                  |          | · · · ·          | · · · ·                 |
| • 1              |          |                  | ++++                    |
| — //\_i          |          | (+ + +)          | (++++                   |
| - 'i' i          |          | i v i            | · · · · · · · · · · · · |
| Welst            | •        | •                | ++++ v                  |
| Welst  <br>Horth | (+ + +)  | (+ + +)          | (++++) j                |
|                  | * * *    |                  |                         |
| ·i               | + + +    |                  |                         |
| -                |          |                  | Letes can l             |
|                  |          |                  | 6/C= .580               |
|                  | 6= 15.0* | 8= 15. <b>0"</b> | 6= 30.0"                |
|                  | Y+R= .8" | Y+R= .8"         | Y+R= .♥"                |
| i                | OFF= .81 | 0FF=25.0%        | 0FF=50.8%               |

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#### C= 68 sec 6= 68.8 sec =188.8% Y= .8 sec = .8% Ped= .8 sec = .8%

|           | lan<br>6r                | e<br>oup                | 1<br> | IEd<br>La  | th<br>ne       | / <br>\$} | R    | eqd | 9/<br>       | ר<br>נ | ls e     | d                 | <br> | Sei<br>EC | ( v.   | ice<br>/ph | R /      | E       | <br> v        | A<br>0 1 0 | dj<br>UM | <br> <br> |   | v/( |   | H<br>De | C M<br>1 a  | y           | <br> <br> | t<br>S   | 5<br> <br> | 988<br>Qui | N<br>E U<br> | s j       |
|-----------|--------------------------|-------------------------|-------|------------|----------------|-----------|------|-----|--------------|--------|----------|-------------------|------|-----------|--------|------------|----------|---------|---------------|------------|----------|-----------|---|-----|---|---------|-------------|-------------|-----------|----------|------------|------------|--------------|-----------|
| e<br>58   | _                        | proa                    | ch    |            | -              |           |      |     |              |        |          |                   |      |           |        |            |          |         |               |            |          |           |   |     |   | 6       | 5.          | 68          |           | F        |            |            |              |           |
|           |                          | = = = =<br>H + R T<br>T |       |            |                |           |      |     |              |        |          |                   |      |           |        |            |          |         |               |            |          |           |   |     |   |         |             |             |           |          |            |            |              |           |
| ₩<br>#8   | -                        | proa                    | ch    |            |                |           |      |     |              |        |          |                   |      |           |        |            |          |         |               |            |          |           |   |     |   |         | 6.          | 6           |           | 8+       |            |            |              |           |
| <b>1</b>  | ===:<br>T+T              | H+RT                    | 1     | 12         | /1             | ]         | . 1  | 191 | **           |        | 46       | ==<br>7           |      | 74        | 1      | 1          | 78       | 1       | ]             | 2!         | 58       |           | • | 331 |   |         | 6.4         | 5           |           | B+       |            | 11(        | 6 :<br>5     | ft        |
| 51<br>Wð  |                          | proa                    | ch    |            |                |           |      |     |              |        |          |                   |      |           |        |            |          |         |               |            |          |           |   |     |   |         | 5.9         | 9           |           | 8+       |            |            |              |           |
|           | R == 1<br>R 1<br>T + T 1 | :===<br>[<br>{          |       | 12,<br>12, | 1<br> 1        |           | <br> | 96  | •••<br> <br> | ••     | 46<br>46 | ==<br>7<br>7<br>7 |      | 61<br>71  | 5<br>1 |            | 65<br>75 | 6<br>1  | ****<br> <br> | 12         | )1<br> 1 |           | • | 139 | 1 |         | 5.9         | 9<br>}<br>} |           | 8+<br>8+ |            | 41         |              | ft <br>ft |
| NE<br>E   | -                        | )roa                    | ch    |            |                |           | •••  |     |              |        |          |                   | - 4  |           |        |            |          |         |               |            |          |           |   |     |   |         | 6.(         | •           |           | B+       |            |            |              |           |
| ••<br>  L | ****<br>T+Ti             | :===<br>{+RT            | ==    | ***<br>12; | · • · · · · /1 |           | . 1  |     | **           | R 2    | **<br>46 | ==<br>7           | ••   | 65        | 1      |            | 69       | **<br>2 | ***           | 11         | 3        |           |   | 163 |   |         | <b>6.</b> ( |             |           | ##<br>8+ | **         | 51         |              | •••<br>ft |

| Najor Street: PUKALAHI ST<br>Minor Street: IOLAHI ST<br>Scenario: MASTER PLAN W<br>Peak Hour: AM | /0 HIT     |         |        |            |      |                 |        |            |       |          | nt Da<br>Analy:<br>le Na<br>ction | it:<br>Lē: | 29-Jul-96<br>BC<br>PUKIOL-A |
|--------------------------------------------------------------------------------------------------|------------|---------|--------|------------|------|-----------------|--------|------------|-------|----------|-----------------------------------|------------|-----------------------------|
|                                                                                                  |            |         | *      | ¥12        |      | ¥11             |        | ¥18        |       |          |                                   |            |                             |
| Peak Hour Factor: 1.0                                                                            | 3          |         |        |            |      |                 |        | •          |       |          |                                   | -          |                             |
| W1 148 486934                                                                                    |            |         |        | 118        |      | 16              |        | 2          |       |          | (                                 | NORTH      |                             |
| Hum of Lanes - V2:                                                                               | -  <br>    |         |        | ł          |      |                 |        |            |       |          |                                   |            |                             |
|                                                                                                  | • I<br>[   |         |        | · /        |      | ľ               |        | <u>'</u> ر |       |          |                                   |            |                             |
|                                                                                                  |            |         |        | ć          |      | ।<br>र          |        | `,         |       |          |                                   |            |                             |
|                                                                                                  | 8          |         |        | •          |      | •               |        |            |       |          |                                   |            |                             |
| •                                                                                                | • [<br>• ] |         |        |            |      |                 |        |            |       |          |                                   |            |                             |
| atanc - itlettiot                                                                                | 1          |         | 1      |            |      |                 |        |            |       | ١        |                                   |            |                             |
| Rum of Lanes - V5:                                                                               | Y1 3       | 3       |        |            |      |                 |        |            |       |          | 5                                 | <b>V</b> 6 |                             |
|                                                                                                  | 8          | -       |        |            |      |                 |        |            |       |          | -                                 | -          |                             |
|                                                                                                  | V2 16      | 0       | >      |            |      |                 |        |            |       | <b>‹</b> | 297                               | <b>V</b> 5 |                             |
|                                                                                                  | ₹          |         |        |            |      |                 |        |            |       |          |                                   |            |                             |
|                                                                                                  |            | 2       |        |            |      |                 |        |            |       | <br>,    | 1                                 | ₩4         |                             |
| NINOR STREET                                                                                     | ]<br>. 1   |         | 1      |            |      |                 |        |            | 4     | ́х       | AJOR S                            | STREET     | ,                           |
|                                                                                                  |            |         | •      |            | •    |                 |        |            | •     |          | UKALA                             |            |                             |
|                                                                                                  |            |         |        | <b>‹</b>   |      |                 |        |            | >     | •        | *******                           |            |                             |
|                                                                                                  | ' 1<br>3   |         |        | <b>`</b> ı |      | t               |        | ,          |       |          |                                   |            |                             |
| 0=1,1=LT,2=TR,3=LTR}                                                                             | '  <br>    |         |        | `r         |      |                 |        | · '        |       |          |                                   |            |                             |
| 0-8°1-01°5-14°2-0141                                                                             |            |         |        | ł          |      |                 |        |            |       |          |                                   |            |                             |
| Num of Lanes - Vil:                                                                              |            |         |        | 251        |      | 17              |        | 1          |       |          |                                   |            |                             |
|                                                                                                  | · · ·      |         |        | ***        |      | ••              |        | •          |       |          |                                   |            |                             |
|                                                                                                  |            |         |        | ¥7         |      | <b>V</b> 8      |        | 79         |       |          |                                   |            |                             |
| (0=#,1=LT,2=TR,3=LTR)                                                                            |            |         |        | ••         |      |                 |        |            |       |          |                                   |            |                             |
|                                                                                                  | i          |         | ł      | HINOR      | STRE | 18 <b>1 -</b> 1 | [OLAN] | ST         |       |          |                                   |            |                             |
| OLUNE ADJUSTNENTS                                                                                |            |         |        |            |      |                 |        |            |       |          |                                   |            |                             |
| HOVENENT NO.                                                                                     | i          | 1 2     | 3      | 4          | 5    | 6               | 1      | 8          | 9     | 10       | 11                                | 12         |                             |
| HOURLY FLOW RATE, V(vph)                                                                         | j 3        | 3 160   | 12     | 1          | 297  | 5               | 251    | 17         | 1     | 2        | 16                                | 118        | 1                           |
| VOLUME, v (peph)                                                                                 | 3          | 6 160   | 12     | 1          | 297  | 5               | 276    | 19         | 1     | 2        | 18                                | 130        |                             |
|                                                                                                  |            |         |        |            |      | *****           |        |            |       |          |                                   |            |                             |
| TEP 1: RT FROM MINOR STREET                                                                      | 1          |         |        |            |      |                 | ļ      | 1-14       |       |          |                                   | 100        |                             |
| Conflicting Flows:                                                                               | ¥c9 = 1    | 12 45 4 | • ¥Z 1 |            |      | Tàp             | •      |            |       | T6 + '   | ¥3 =                              |            | vbp                         |
| Potential Capacity:                                                                              | Cp.9 =     | 0-      |        |            |      | pcph            |        | Cp, 12     |       | ۹.       |                                   |            | peph                        |
| Novement Capacity:                                                                               | C1,9=Cp    |         | -      |            |      | pcpb            |        | CE,12      |       |          | 1-                                |            | рсрь                        |
| Prb. of Queu-free State:                                                                         | po,9=1-    | ¥3/68,3 | -      | •••••      |      |                 | <br>   |            | .1-41 | 2/01,12  | <u>.</u>                          | 9.87       |                             |
| TEP 2: LT FROM HAJOR STREET                                                                      | 1          |         |        |            |      |                 | 1      |            |       |          |                                   |            |                             |
| Conflicting Flows:                                                                               | ¥c,4 =     | ¥2 + ¥3 | E      |            | 172  | vbp             | i      | Yc.1       | 75    | + 76 =   |                                   | 302        | vàp                         |
| Potential Capacity:                                                                              | Cp,4 =     |         |        |            | 419  |                 |        | Cp,1 -     |       | ••       |                                   |            | peph                        |
| Kovement Capacity:                                                                               | [Ca,4=Cp   | .4=     |        |            | 419  |                 |        | C1,1=(     |       |          |                                   |            | peph                        |
| Prb. of Queu-free State:                                                                         | po,4=1-    | •       |        |            | . 99 | • • • •         |        | po,1=1     |       |          |                                   | 0.97       |                             |
| Kajor Left Shared Lane                                                                           | 1          |         |        | -          |      |                 | i      | • •        |       |          |                                   |            |                             |
| Prob. of Queue-free State                                                                        | p'o,4=     |         |        | t          | .00  |                 | i      | p'0,1=     |       |          |                                   | 88         |                             |

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| Najor Street: PUIALANI ST<br>Ninor Street: IOLANI ST<br>Scenario: MASTER PLAN W/O<br>Peak Hour: AM           |                    |                           |                                            | Intes                 | section In                         | DATE<br>Analyst<br>File Name<br>tesection # | BC<br>POKIOL-A                   |
|--------------------------------------------------------------------------------------------------------------|--------------------|---------------------------|--------------------------------------------|-----------------------|------------------------------------|---------------------------------------------|----------------------------------|
|                                                                                                              |                    | = 1/2V3+V2+V<br>=         | /1+V6+V5+V4<br>496 vpb<br>599 pcpb         | i                     | c.,11 = 1/2<br>=<br>p,11 =         |                                             | +¥2+¥1<br>491 ¥ph<br>603 pcph    |
| Canacity Idi Tartory                                                                                         | 18 = p:<br> Ca.8 = | c,4"p0,1 #<br>Co.8"f8 #   | 0.97<br>581 pcph                           | f<br>C                | 11 = po,4*p<br>m,11 = Cp,1         | 00,1 =<br>11*f11 =<br>11/Cm,11 =            | 585 pcph                         |
|                                                                                                              | İ                  | 1/2¥3+¥2+¥<br>1/2(¥11+¥12 | 1+1/2V6+V5+V4+<br>2) = 561 vpb<br>501 pcpb | j                     | 1/2(                               | V6+V5+V4+1/2<br>/8+V9] =                    | 583 vph                          |
| Major Left, Minor Through<br>Impedance Factor:                                                               | <br> P''7=P        | 0,11°f11 =                | 0.94                                       | <br>  P               | ''10=po,8*                         | f8 = .                                      | 0.94                             |
| Major Left, Minor Through<br>Adjusted Impedance Pactor:<br>Capacity Adjustment Factor:<br>Kovement Capacity: |                    |                           |                                            |                       | '10 =<br>10 = p'10" <br>1,10 = f10 | po,9 =<br>*Cp,10 =                          | 0.95<br>0.95<br>516 pcpb         |
| DELAY AND LEVEL OF SERVICE SUMM                                                                              | ARY<br>T(DCD)      | h} cm(pcph)               | csh(pcph)                                  | AVG<br>TOTAL<br>DELAY | LOS                                | 1                                           |                                  |
| KINOR LEFT TURE (7)<br>MINOR THROUGH (8)                                                                     | 276<br>19          | 415<br>581                | 5BRD<br>423                                | SHRD<br>26.0          | <br>D                              | LEVEL OF                                    | SERVICE CRITERIA                 |
| MINOR RIGHT TORE (9)                                                                                         | 1                  | 1149                      | SHRD<br>SHRD                               | SHRD<br>SHRD          | ••••                               | <br>  LEVEL<br>  OF                         | AVG<br>Total<br>Delay            |
| KINOR LEFT TURN (10)<br>NINOR THROUGH (11)<br>NINOR RIGHT TURN (12)                                          | 2<br>18<br>130     | 516<br>585<br>976         | 577<br>NA                                  | 6.5<br>4.3            | B<br>A                             | SERVICE                                     | (SEC/VEB                         |
| MAJOR LEFT (1)                                                                                               | 36                 | 1231                      | #1                                         | 3.0                   | λ                                  | Å<br>  B                                    | <=5<br>>5&<=10                   |
| HAJOR LEFT (4)                                                                                               | 1                  | 1419                      | KY                                         | 2.5                   | λ                                  |                                             | >10&<=20<br>>20&<=30<br>>30&<=45 |
| NINOR APPROACH (7)(8)(9)<br>HINOR APPROACH (10)(11)(12)                                                      | -                  | -                         | -                                          | 26.0<br>4.5           | D<br>A                             |                                             | >45                              |
| MAJOR APPROACH (1}(2)(3)<br>Major Approach (4)(5)(6)                                                         | -<br>-             | -                         | :                                          | 0.5<br>0.0            | ¥<br>&                             |                                             |                                  |
| TOTAL INTERSECTION (1-12)                                                                                    |                    | · _                       | -                                          | 9.3                   | В                                  |                                             |                                  |

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| Hinor Street: 10                        | JKALANI ST<br>DLANI ST<br>ASTER PLAN<br>PH | ¥/0 | XIT            |        |       |     |       |      |         |        |          |       | Inte   | )<br>Fíl | nalj<br>e Na | Ate:<br>ISt:<br>Me:<br>I #: | 29-Jal-<br>BC<br>PUKIOI |
|-----------------------------------------|--------------------------------------------|-----|----------------|--------|-------|-----|-------|------|---------|--------|----------|-------|--------|----------|--------------|-----------------------------|-------------------------|
|                                         |                                            |     |                |        |       |     | ¥12   | 2    | ¥11     |        | ¥10      |       | *****  |          |              |                             |                         |
| Peak Hour Fac                           | tor: 1.                                    | 00  |                |        |       |     |       |      |         |        |          |       |        |          |              |                             |                         |
|                                         |                                            | .   | 1              |        |       |     | 53    |      | 10      |        | ,7       |       |        |          | <            | NORT                        | E                       |
| NAJOR STR<br>Rum of Lanes -             |                                            |     |                |        |       |     |       |      | ł       |        |          |       |        |          |              |                             |                         |
| Brcl LT - VI (Y                         |                                            | II  |                |        |       |     | , i   |      |         |        | 1        |       |        |          |              |                             |                         |
| BICI RT - V3 (Y                         |                                            | T I |                |        |       |     |       |      | ļ       |        |          |       |        |          |              |                             |                         |
| Stop/Tield - V3 (T                      |                                            | i i |                |        |       |     | •     |      | v       |        |          | •     |        |          |              |                             |                         |
| Grade - VI,V2                           |                                            | 6   |                |        |       | ٠   |       |      |         |        |          |       |        |          |              |                             |                         |
| Num of Lanes -                          | WE.                                        | Ì   |                |        |       | 7   |       |      |         |        |          |       | ١      |          |              |                             |                         |
|                                         |                                            | 1   | ¥1 1           | 137    |       | -   |       |      |         |        |          |       |        | -        | 0            | ¥6                          |                         |
| Excl LT - V4 (Y)                        | •                                          | N I |                |        |       |     |       |      |         |        |          |       |        |          |              |                             |                         |
| Excl RT - V6 (Y)<br>Stop/Yield - V6 (Y) |                                            |     | V2 2           | (80    |       | >   |       |      |         |        |          |       | (      | •        | 206          | ¥5                          |                         |
| Grade - V4.V5,                          |                                            | N   | <b>v</b> 2 4   |        |       |     |       |      |         |        |          |       |        |          | -            |                             |                         |
| VIGUE - 14,43,                          | , ¥01                                      | 1 1 | ¥3 2           | 98     |       | -   |       |      |         |        |          |       | ,      | -        | 1            | ¥4                          |                         |
| KINOR STRE                              | ST                                         |     |                |        |       | ŗ   |       |      |         |        |          |       | v í    | XXJ      | OR 1         | STREET                      |                         |
| Num of Lanes -                          |                                            | 11  |                |        |       |     |       |      |         |        |          |       | •      |          |              | II ST                       |                         |
| Grade - V7, V8                          |                                            | e j |                |        |       |     | <     |      |         |        |          | >     |        |          |              |                             |                         |
| Shared Lane-V7,                         |                                            | 3 j |                |        |       |     | ١     |      | 1       |        | 1        | -     |        |          |              |                             |                         |
| (0=R,1=LT,2=TR,3=L1                     | (R)                                        | j   |                |        |       |     | 1     |      | Í       |        | l.       |       |        |          |              |                             |                         |
|                                         |                                            |     |                |        |       |     |       |      |         |        | 1        |       |        |          |              |                             |                         |
| Hum of Lanes - W                        |                                            | 1   |                |        |       |     | 160   |      | 25      |        | 5        |       |        |          |              |                             |                         |
| Grade - V10,V11,V                       |                                            | 9   |                |        |       |     |       |      |         |        |          |       |        |          |              |                             |                         |
| Shared Lane-V10,11,                     |                                            | 1   |                |        |       |     | ¥7    |      | V8      |        | ¥9       |       |        |          |              |                             |                         |
| {0=A,1=LT,2=TR,3=L1                     | к) –                                       | - { |                |        |       |     |       |      |         |        |          |       |        |          |              |                             |                         |
|                                         |                                            |     |                |        |       |     | AIROR | 51k  | BET -   | 1054¥. | 1 ST<br> |       |        |          |              |                             |                         |
| VOLUKE ADJUSTKENTS                      |                                            | ļ   |                |        |       |     |       |      |         |        |          |       |        |          |              |                             |                         |
| NOVENERT RO.                            |                                            |     |                | 1      | 2     | 3   | 4     | 5    | 6       | 1      | 8        | 9     | 19     |          | 11           | 12                          |                         |
| HOURLY FLOW RATE                        | , V(vpb)                                   | 1   |                |        | 285   |     | 7     |      |         | 168    |          | 5     | 7      |          | 10           | 53                          |                         |
| VOLUKE, V (PCPh)                        |                                            |     | 1              | 51<br> | 285   | 298 | 8     | 205  | 0       | 176    | 28       | 6     | 8      |          | 11           | 58                          |                         |
| STEP 1: RT FROM MIN                     | OR STREET                                  | 1   |                |        |       |     |       |      |         | 1      |          |       |        |          |              |                             |                         |
| Conflicting Flow                        |                                            | 1   | 'c9 =          | 172    | ¥3 +  | 72  | T     | 285  | vbp     | Ì      | Vc12 -   | - 1/2 | 2 V6 + | ¥5       |              | 206                         | vbp                     |
| Potential Capaci                        |                                            | 10  | p,9 =          |        |       |     |       | 993  | pcph    | Í      | Cp,12    |       |        |          |              |                             | pcph                    |
| Hovement Capacit                        |                                            | įC  | <b>n</b> ,9=C; | P,9    | •     |     |       | 993  | pcpb    | Ì      | Cz,12    |       | 2=     |          |              |                             | pcph                    |
| Prb. of Queu-fre                        | e State:                                   | 10  | 0,9=1-         | -79,   | /Cz,9 |     | (     | 0.99 |         | Ì      | po,12-   | 1-71  | 2/Ca,  | 12=      |              | 0.95                        | •••                     |
| TEP 2: LT FROM MAJ                      | DR STREET                                  |     | ••••••         |        |       |     |       |      |         | ·      |          |       |        |          |              |                             |                         |
| Conflicting Flow                        | 6:                                         | ١v  | c,4 =          | 52     | + V3  |     |       | 583  | vhp     | i      | Vc.1 -   | 75    | + ¥6   |          |              | 205                         | vho                     |
| Potential Capacit                       | .yı                                        |     | p.4 =          |        |       |     |       |      | peph    |        | Cp,1 =   |       |        |          |              | 1367                        |                         |
| Kovement Capacity                       | 71                                         |     | 1,4=Cp         | .4     | •     |     |       |      | pcpb    |        | Cm,1=C   |       |        |          |              | 1367                        |                         |
| Prb. of Queu-free                       |                                            |     | 0,4=1-         |        |       |     | 6     | 3.99 | • - • - |        | pa.1=1   |       |        |          |              | 6.89                        |                         |
| Major Left Shared                       |                                            | 1   |                |        |       |     |       |      |         | Ì      |          |       | _      |          |              |                             |                         |
| Prob. of Queue-f                        | ree State                                  | p   | 0,4=           |        |       |     | 6     | 9.99 |         | i      | p*0,1=   |       |        |          |              | NA                          |                         |

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| (ajor Street: FUKALANI ST<br>(inor Street: IOLANI ST<br>Scenario: MASTER FLAN V/O<br>Peak Hour: PM | HIT         |            |                | Int          |             | DATE<br>Analyst:<br>File Name<br>ntesection #: | BC<br>PUKIOL-P       |
|----------------------------------------------------------------------------------------------------|-------------|------------|----------------|--------------|-------------|------------------------------------------------|----------------------|
| STEP 3: TH FROM MINOR STREET                                                                       |             |            |                | ļ            |             |                                                |                      |
| Conflicting Flows:                                                                                 | Yc.,8 =     |            | 1+76+72+74     | •            | •           | 286+85+84+83                                   |                      |
|                                                                                                    | 1 -         |            | 635 VP         |              |             |                                                | 635 vph              |
| Potential Capacity:                                                                                | Cp.8 =      |            | 506 pcp        |              | Cp,11 =     | po,1 = (                                       | 506 pcph             |
| Capacity Adj Tactor:                                                                               | f8 = p0.    | 4*po,I =   | 0.88           |              | f11 = po,4* | po,1 = 0                                       | 1.88                 |
| Novement Capacity:                                                                                 | [Cm.8 = C   | p,8*f8 =   | 446 pcp        | b            | Cm,11 = Cp, | 11°f11 =                                       | 446 pcph             |
| Prob. of Queue-free State:                                                                         | po,8 = 1    | -v8/C1,8 · | 0.94           |              | po,11 = 1-v | 11/CB,11 = (                                   | ),98<br>             |
| STEP 4: LT FROM HINOR STREET                                                                       | }           |            |                | 1            |             |                                                |                      |
| Conflicting Flows:                                                                                 | Yc.7 = 1    | /2\3+\2+\1 | L+1/2V6+V5+V4+ |              |             | ¥6+¥5+¥4+1/2                                   |                      |
| ······································                                                             | 1 1         | /2(\11+\17 | :) = 667 vp    | b ]          | 1/2(        | V8+V9) =                                       | 650 vpb              |
| Potential Capacity:                                                                                | Cp7 -       |            | 435 pcp        | b            | Cp10 =      |                                                | 445 popb             |
| Major Left, Minor Through                                                                          | Í           |            |                |              |             |                                                |                      |
| Impedance Factor:                                                                                  | P''7=p0,    | 11°f11 =   | 0.86           |              | P''10=po.8* | f8 =                                           | 8.83                 |
| Hajor Left, Hinor Through                                                                          | 1           |            |                | Í            |             |                                                |                      |
| Adjusted Impedance Factor:                                                                         | p'7 =       |            | 0.89           | i            | p'10 +      |                                                | 8.87                 |
| Conseity Idjustment Pactory                                                                        | If7 = 0'7   | *po_12 *   | 8.84           | i            | f10 = p'10* | po,9 = 1                                       | ð.86                 |
| Kovement Capacity:                                                                                 | ICa.7 = f   | 7*Cp.7 -   | 368 pcp        | ьi           | Cz,10 = f10 | *Cp,10 =                                       | 383 pcph             |
|                                                                                                    |             |            |                |              |             |                                                |                      |
| DELAY AND LEVEL OF SERVICE SUMM                                                                    | IARY        |            |                | AVG<br>TOTAL |             | 1                                              |                      |
| Kovenent                                                                                           |             | cæ(popb)   | csb(pcpb)      | DELAT        | LOS         |                                                |                      |
| NINOR LEFT TUEN (7)                                                                                |             |            | SHRD           | SERD         |             | LEVEL OF S                                     | ERVICE CRITERIA      |
| MINOR THROUGH (8)                                                                                  | 28          | 446        | 384            | 20.2         | D           | i                                              |                      |
|                                                                                                    | 6           |            |                | SERD         |             | 1                                              | AVG                  |
|                                                                                                    |             |            |                |              |             | LEVEL                                          | TOTAL                |
| HINOR LEFT TURE (10)                                                                               | 8           | 383        |                | SHRD         |             | 07                                             | DELAY                |
| HINOR THROUGH (11)                                                                                 | 11          | 446        | 417            | 9.0          |             | SERVICE                                        | (SEC/VEH)            |
| HINOR RIGHT TURE (12)                                                                              | 58          | 1089       | #1             | 3.5          | Å           |                                                |                      |
|                                                                                                    |             |            |                | <u> </u>     |             | Į λ                                            | <=5<br>+5510         |
| HAJOR LEFT (1)                                                                                     | 151         | 1367       | 11             | 3.0          |             | ∣ B                                            | >5&<=10              |
| NAJOR LEFT (4)                                                                                     | 8           | 904        | #1             | 4.0          | Å           | I C                                            | >10&<=20<br>>20&<=30 |
| •••                                                                                                |             | -          | -              | 20.2         | D           | l B                                            | >30&<=45             |
|                                                                                                    | -           |            |                | 4.9          | Å           | Ī                                              | >45                  |
| MINOR APPROACE (7)(8)(9)                                                                           | -           | -          | •              |              |             |                                                | -                    |
|                                                                                                    | •           | -          | •              | 1.7          |             | [                                              |                      |
| MINOR APPROACE (7)(8)(9)                                                                           | -           | -<br>-     | •              | 8.6          |             |                                                |                      |
| MINOR APPROACE (7)(8)(9)<br>HINOR APPROACE (18)(11)(12)                                            | -<br>-<br>- | -<br>-     |                |              |             |                                                |                      |

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## SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int # 0 - KULA HWY & ROAD "A"

| METROAREA      | NOM | 1CBD |
|----------------|-----|------|
| LOSTTIME       |     | 2.0  |
| LEVELOFSERVICE | С   | S    |
| NODELOCATION   | Ø   | 0    |

Approach Parameters

| APPLABELS       | SB    | W8    | NB    | EB    |
|-----------------|-------|-------|-------|-------|
| GRADES          | 8.0   | .0    | -8.0  | 2.0   |
| PEDLEVELS       | MODER | MODER | MODER | MODER |
| PARKINGSIDES    | NONE  | NONE  | NONE  | NONE  |
| PARKVOLUMES     | 20    | 20    | 20    | 20    |
| BUSVOLUMES      | 0     | Ø     | Ø     | 0     |
| RIGHTTURNONREDS | 300   | 27    | 0     | 0     |

Movement Parameters

CRITICALS

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| MOVLABELS       | RT    | тн   | ር ፓ  | RT    | тн   | LT   | RT   | тн    | LT   | RT   | тн   | LI   |  |
|-----------------|-------|------|------|-------|------|------|------|-------|------|------|------|------|--|
| VOLUMES         | 437   | 437  | 0    | 0     | 0    | 0    | Ø    | 899   | 47   | 33   | 0    | 359  |  |
| WIDTHS          | 12.0  | 12.0 | .0   | .0    | .0   | .0   | .0   | 12.0  | 12.0 | 12.0 | .0   | 12.6 |  |
| LANES           | 1     | 1    | ø    | 6     | 0    | 0    | 0    | 1     | 1    | 1    | ø    | 3    |  |
| UTILIZATIONS    | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| TRUCKPERCENTS   | 2.0   | 2.0  | 2.0  | 2.0   | 2.0  | 2.0  | 2.0  | 2.0   | 2.0  | 2.0  | 2.0  | 2.6  |  |
| PEAKHOURFACTORS | .95   | .95  | .95  | .95   | .95  | .95  | .95  | .95   | .95  | .95  | .95  | .98  |  |
| ARRIVALTYPES    | 3     | 3    | 3    | 3     | 3    | 3    | 3    | 3     | 3    | 3    | 3    | 3    |  |
| ACTUATIONS      | NO    | YES  | YES  | NO    | YES  | YES  | NO   | YES   | YES  | NO   | YES  | YES  |  |
| REQCLEARANCES   | 4.0   | 4.0  | 4.0  | 4.0   | 4.0  | 4.0  | 4.0  | 4.0   | 4.0  | 4.0  | 4.0  | 4.4  |  |
| MINIMUMS        | 5.0   | 5.0  | 5.0  | 5.0   | 5.0  | 5.0  | 5.0  | 5.0   | 5.0  | 5.0  | 5.0  | 5.4  |  |
| IDEALSATFLOWS   | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 | 1900 | 1900  | 1900 | 1900 | 1900 | 1900 |  |
| FACTORS         | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.04 |  |
| DELAYFACTORS    | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| NSTOPFACTORS    | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |  |
| GROUPTYPES      | NORM  | NORM | NORM | NORM  | NORM | NORM | NORM | NORM  | NORM | NORM | NORM | NORF |  |
| SATURATIONFLOWS | 1350  | 1788 | 0    | 0     | 0    | 0    | ø    | 1919  | 1823 | 1392 | 0    | 139; |  |
| Phasing Param   | eters |      |      |       |      |      |      |       |      |      |      |      |  |
| SEQUENCES       | 3     | 31   | ALL  |       |      |      |      |       |      |      |      |      |  |
| PERMISSIVES     | YE    | S    | YES  | YES   | ΥE   | S    |      | LEADL | AGS  | NC   | INE  | NONE |  |
| OVERLAPS        | YE    | S    | YES  | YES   | YE   | S    |      | OFFSE | т    |      | 00   | 3    |  |
| CYCLES          | 6     | 0    | 180  | 10    |      |      |      | PEDTI | ME   |      | .0   | ę    |  |
| GREENTIMES      | 5.3   | 0 21 | . 47 | 21.23 |      |      |      |       |      |      |      |      |  |
| YELLOWTIMES     | 4.0   | 0 4  | .00  | 4.00  |      |      |      |       |      |      |      |      |  |
| <b></b>         |       | -    | -    |       |      |      |      |       |      |      |      |      |  |

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| Intersec               | /TEAPAC[V                 | 1 L1.4]              | - Cap           | acity Ar                | alysis            | Summary              | ,                |              |             |                  |
|------------------------|---------------------------|----------------------|-----------------|-------------------------|-------------------|----------------------|------------------|--------------|-------------|------------------|
| De                     | tion Aver<br>gree of S    | ages for<br>aturatic | · Int<br>on (v/ | # 0<br>c) .72           | KULA HU<br>Vehic] | JY & RO#<br>.e Delay | AD "A"<br>/ 12.6 | Level        | ofs         | Service (        |
| <br>Sq 31  <br>**/**   | Phase 1                   | Phae                 | se 2            | Phase                   | 3                 |                      |                  |              |             |                  |
| .                      |                           | + *<br>  + *         |                 | +<br>  +                |                   |                      |                  |              |             |                  |
|                        | •                         | <+ *<br>  ~ ~        | ~               | < +<br>  ^<br>  * * * * |                   |                      |                  |              |             |                  |
| North 1                | <* +<br>+++ * +           |                      | ⊦ +<br>⊦ +      | <br> <br> ++++          | ļ                 |                      |                  |              |             |                  |
|                        | v * +                     |                      | + +             | i v                     | j<br>             |                      |                  |              |             |                  |
| i                      | G/C= .088<br>G= 5.3"      | G = 2                | 21.5"           | G== 21                  | 2"                |                      |                  |              |             |                  |
| •                      | Y+R≕ 4.0"<br>OFF≕ .0%     |                      | 4.0"<br>15.5%   | Y+R= 4<br>  OFF=57      |                   |                      |                  |              |             |                  |
| <br>C=                 | 60 sec                    | G= 48.0              | ) sec           | <br>≕ 80.0%             | Y=12.6            | sec =                | 20.0%            | Ped= .       | 0 sec       | c = .09          |
| Lane<br>  Group        | Width/ <br>  Lanes        | g/(<br>Reqd          | Used            | Servic<br>  @C (vp      | e Rate<br>b) @E   | Adj<br>Volume        | v/c              | HCM<br>Delay |             | 90% Max<br>Queue |
| SB Appro               | ach                       |                      |                 |                         |                   |                      |                  | 8.8          | B+          |                  |
| EEEEEE<br>  RT<br>  TH | 12/1  <br>  12/1          | .145  <br>.290       | .812            | 1095  <br>  650         | 1095<br>699       |                      | .132             |              |             |                  |
| •                      |                           |                      |                 |                         |                   |                      |                  | 15.1         | C +         |                  |
|                        | ach                       |                      |                 |                         |                   |                      | .903             | 15.6         | C+ <br> *B+ | 362 ft<br>25 ft  |
|                        | ach<br>  12/1  <br>  12/1 | .509                 | .546            | 316                     |                   |                      | .140             | 5.0<br>      | ,           |                  |
| NB Appro               | 12/1  <br>  12/1  <br>ach | .509  <br>.000       | .122            | 316                     | 350               | 49                   | .140             | 12.1         | в           |                  |
| NB Appro               | 12/1  <br>  12/1  <br>ach | .509  <br>.000  <br> | .122            | 316  <br><br>  722      | 350<br>           | 49<br>               | .046             | 12.1         | B           | 25 ft<br>195 ft  |

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KULAMALU FUTURE WITH PROJECT W/O MIT PM PEAK HOUR

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# SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int # 0 - KULA HWY & ROAD "A"

| METROAREA      | NON | 1080 |
|----------------|-----|------|
| LOSTTIME       |     | 2.0  |
| LEVELOFSERVICE | С   | S    |
| NODELOCATION   | 0   | 0    |

Approach Parameters

| APPLABELS       | SB    | WВ    | NB    | EB    |
|-----------------|-------|-------|-------|-------|
| GRADES          | 8.0   | . 0   | -8.0  | 2.0   |
| PEDLEVELS       | MODER | MODER | MODER | MODER |
| PARKINGSIDES    | NONE  | NONE  | NONE  | NONE  |
| PARKVOLUMES     | 20    | 20    | 20    | 20    |
| BUSVOLUMES      | 0     | Ø     | Ø     | Ø     |
| RIGHTTURNONREDS | 300   | 65    | 0     | Ø     |

#### Movement Parameters

| MOVLABELS       | RT   | тн   | LT   | RT   | тн   | LT   | RT   | тн   | LT   | RT   | тн   | LT   |
|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| VOLUMES         | 499  | 590  | 0    | 0    | 0    | 0    | 0    | 557  | 89   | 117  | 0    | 476  |
| WIDTHS          | 12.0 | 12.0 | .0   | .0   | .0   | .0   | .0   | 12.0 | 12.0 | 12.0 | .0   | 12.4 |
| LANES           | 1    | 1    | 0    | 0    | 0    | 0    | 0    | 1    | 1    | 1    | 0    | 1    |
| UTILIZATIONS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| TRUCKPERCENTS   | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.%  |
| PEAKHOURFACTORS | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  |
| ARRIVALTYPES    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | Э    | 3    | 3    | 3    | :    |
| ACTUATIONS      | NO   | YES  | YËS  | NO   | YES  | YES  | NO   | YES  | YES  | NO   | YES  | YES  |
| REOCLEARANCES   | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.4  |
| MINIMUMS        | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.(  |
| IDEALSATFLOWS   | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1904 |
| FACTORS         | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| DELAYFACTORS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| NSTOPFACTORS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| GROUPTYPES      | NORM | NORM | NORM | NORM | NORM | NORM | NORM | NORM | NORM | NORM | NORM | NORM |
| SATURATIONFLOWS | 1350 | 1788 | 0    | 0    | 0    | 0    | Ø    | 1919 | 246  | 1392 | 0    | 139: |

#### Phasing Parameters

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| SEQUENCES<br>Permissives<br>overlaps | 11<br>Yes<br>Yes | ALL<br>Yes<br>Yes | YES<br>YES | YES<br>YES | LEADLAGS<br>Offset | NONE<br>.00 | N O N E<br>1 |
|--------------------------------------|------------------|-------------------|------------|------------|--------------------|-------------|--------------|
| CYCLES                               | 60               | 180               | 10         |            | PEDTIME            | .0          | ç            |
| GREENTIMES                           | 29.14            | 22.86             |            |            |                    |             |              |
| YELLOWTIMES                          | 4.00             | 4.00              |            |            |                    |             |              |
| CRITICALS                            | 9                | 12                |            |            |                    |             |              |
| EXCESS                               | 0                |                   |            |            |                    |             |              |

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| AMALU<br>URE WI<br>PEAK H                             | TH PROJEC                                                                | т w/o міт                                                         |                                                             |                                              |                                          |                                     |                                                  | 03/27,<br>17:11                                                                                     |                                 |
|-------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------|------------------------------------------|-------------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------|
| NAL94/                                                | TEAPAC[V1                                                                | L1.4] — Capad                                                     | city Ana                                                    | lysis                                        | Summary                                  |                                     |                                                  |                                                                                                     |                                 |
| tersect                                               | cion Avera                                                               | ges for Int #<br>turation (v/c                                    | 0 – K                                                       | ULA HW                                       | Y & ROA<br>e Delay                       | D "A"<br>10.3                       | Level                                            | of Servic                                                                                           | e E                             |
| <br>11                                                | Phase 1                                                                  | Phase 2                                                           |                                                             |                                              |                                          |                                     |                                                  |                                                                                                     |                                 |
| /**<br>  4<br>.   4                                   | <br>+ +<br>+ +                                                           | +  <br>  +                                                        |                                                             |                                              |                                          |                                     |                                                  |                                                                                                     |                                 |
|                                                       | + +<br>V ~                                                               | <pre></pre>                                                       |                                                             |                                              |                                          |                                     |                                                  |                                                                                                     |                                 |
| rth                                                   | <* +<br>* +<br>* +                                                       | ++++<br>                                                          |                                                             |                                              |                                          |                                     |                                                  |                                                                                                     |                                 |
|                                                       | G/C= .486<br>G= 29.1"                                                    | G/C= .381  <br>  G= 22.9"                                         |                                                             |                                              |                                          |                                     |                                                  |                                                                                                     |                                 |
| 1                                                     | G= 29.1"<br>Y+R= 4.0"<br>OFF= .0%                                        | Y+R= 4.0"                                                         |                                                             |                                              |                                          |                                     |                                                  |                                                                                                     |                                 |
|                                                       |                                                                          |                                                                   |                                                             |                                              |                                          |                                     |                                                  |                                                                                                     |                                 |
| Ç=                                                    | 60 sec                                                                   | G≖ 52.0 sec ≂                                                     | 86.7%                                                       | Y= 8.0                                       | ) sec =                                  | 13.3%                               | Ped= .                                           | 0 sec =                                                                                             | .0%                             |
| C=<br>Lane<br>Group                                   | Width/                                                                   | g/C                                                               | Servic                                                      | e Rate                                       |                                          |                                     | нсм                                              | 0 sec =<br>  L  90% M<br>  S   Quer                                                                 | <br>Max                         |
| Lane<br>Group<br>                                     | Width/ <br>  Lanes <br>ach                                               | g/C<br>Reqd Used                                                  | Servic<br>@C (vp                                            | e Rate<br>h) @E                              | Adj  <br> Volume                         | v/c                                 | HCM<br>Delay<br>6.1                              | L  90% M<br>  S   Queu<br>B+                                                                        | Max I<br>ue 1                   |
| Lane<br>Group<br>                                     | Width/ <br>  Lanes <br>ach<br>  12/1                                     | g/C  <br>Reqd Used  <br>.196   1.000                              | Servic<br>@C (vp<br>  1350  <br>  897                       | e Rate<br>h) @E<br>1350<br>928               | Adj<br>Volume<br>209<br>621              | v/c<br>.155<br>.669                 | HCM<br>Delay<br>6.1<br>.0<br>B.2                 | L  90% M<br>  S   Queu<br>B+<br>  A   25<br>  B+  252                                               | ft                              |
| Lane<br>Group<br>3 Appro<br>RT<br>TH                  | Width/ <br>  Lanes <br>ach<br>  12/1  <br>  12/1                         | g/C<br>Reqd Used<br>.196  1.000<br>.376   .519                    | Servic<br>@C (vp<br>  1350  <br>  897                       | e Rate<br>h) @E<br>1350<br>928               | Adj<br>Volume<br>209<br>621              | v/c<br>.155<br>.669                 | HCM<br>Delay<br>6.1<br>.0<br>8.2<br>8.9          | L  90% M<br>  S   Queu<br>B+<br>  A   25<br>  B+  252<br>  B+                                       | ft!                             |
| Lane<br>Group<br>3 Appro<br>RT<br>TH<br>B Appro<br>TH | Width/ <br>  Lanes <br>ach<br>  12/1  <br>  12/1  <br>ach<br>  12/1      | g/C  <br>Reqd Used  <br>.196  1.000<br>.376   .519<br>.334   .519 | Servic<br>@C (vp<br>  1350  <br>  897  <br>  966  <br>  101 | e Rate<br>h) @E<br>1350<br>928<br>996        | Adj<br>Volume<br>209<br>621<br>586       | v/c<br>.155<br>.669<br>588          | HCM<br>Delay<br>6.1<br>8.2<br>8.9<br>7.1<br>20.1 | L  90% M<br>  S   Queu<br>  B+<br>  A   25<br>  8+  252<br>  B+<br>  238<br>  B+   238<br>  *C   38 | ft:<br>ft:<br>ft:<br>ft:<br>ft: |
| Lane<br>Group<br>B Appro<br>RT<br>TH<br>B Appro<br>TH | Width/ <br>  Lanes <br>ach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1 | g/C  <br>Reqd Used  <br>.196  1.000<br>.376   .519                | Servic<br>@C (vp<br>  1350  <br>  897  <br>  966  <br>  101 | e Rate<br>h) @E<br>1350<br>928<br>996<br>124 | Adj<br>Volume<br>209<br>621<br>586<br>94 | v/c<br>.155<br>.669<br>.588<br>.734 | HCM<br>Delay<br>6.1<br>.0<br>8.9<br>7.1<br>20.1  | L  90% M<br>  S   Queu<br>B+<br>  A   25<br>  B+  252<br>  B+  238<br>  B+  238<br> *C   38         | ft <br>ft <br>ft                |

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| Kajor Street: KULA HVY<br>Minor Street: OHAWA ST<br>Peak Hour: AK<br>Scenario: MASTER PLAN |            |                   |                                         |             | Åoa                            | Date: 26-Jul<br>lyst: BC<br>Name: KULOHA-<br>tion: |
|--------------------------------------------------------------------------------------------|------------|-------------------|-----------------------------------------|-------------|--------------------------------|----------------------------------------------------|
| Peak Hour Factor: 1.0                                                                      | 9          |                   |                                         |             |                                |                                                    |
| HAJOR STREET                                                                               | •          | 929;              |                                         | (           | 460                            | ¥5                                                 |
| Hum of Lanes - V2:                                                                         | •          |                   |                                         |             | _                              |                                                    |
| BIC1 RT - V3 (Y/H):                                                                        |            | 4                 |                                         | -           | 9                              | V4                                                 |
| Stop/Yield - V3 (T/R):                                                                     |            | 1                 |                                         | 1           |                                |                                                    |
| 1 Grade - V2,V3:                                                                           | 3          | v                 |                                         | ¥           | KAJOR STI<br>Kula R <b>f</b> f |                                                    |
| Num of Lanes - V5:                                                                         |            |                   | <                                       | >           | TANG HAT                       |                                                    |
|                                                                                            | RĮ         |                   | ١                                       | 1           |                                |                                                    |
| 1 Grade - V4, V5: -:                                                                       | 3 j        |                   | 1                                       | 1           |                                |                                                    |
|                                                                                            | Ì          |                   | İ                                       |             |                                |                                                    |
| NINOR STREET                                                                               | j          |                   | 3                                       | 17          |                                | NORTE>                                             |
| Rum of Lanes - V7,V9:                                                                      | 1          |                   |                                         |             |                                |                                                    |
|                                                                                            | 7 <b> </b> |                   | ¥7                                      | ¥9          |                                |                                                    |
| 1 Grade - V76V9:                                                                           | 9          | MINOR S           | TREET: OHANA                            | ST          |                                |                                                    |
| VOLUKE ADJUSTKENTS                                                                         |            |                   |                                         |             |                                |                                                    |
| NOVERENT NO.                                                                               | 2          | 3                 | 4                                       | 5           | 7                              | 9                                                  |
| VOLUME, V (vph)                                                                            | 929        | 4                 | 9                                       | 468         | 3                              | 17                                                 |
| VOLUME, v (peph)                                                                           | 929        | 4                 | 8                                       | 469         | 3                              | 19                                                 |
|                                                                                            |            |                   |                                         |             |                                |                                                    |
| STEP 1: RT FROM MINOR STREE                                                                |            |                   | <b>.</b> .                              | 0.20        |                                | 11k                                                |
| Conflicting Flows:                                                                         |            | 13+12 =           | 2 +                                     | 929         |                                | 31 vph                                             |
| Potential Capacity:                                                                        |            | _                 |                                         |             |                                | 57 pcph                                            |
| Kovement Capacity:                                                                         |            | •                 |                                         |             | •••••••••••                    | 57 pcpb                                            |
| STEP 2: LT FROM MAJOR STREE                                                                | IT - V4    |                   |                                         |             |                                |                                                    |
| Conflicting Flows:                                                                         |            | 4 = V3+V2 =       | 4                                       | + 929       | • 93                           | 13 vph                                             |
| Potential Capacity:                                                                        | į Cp       | ,4 ×              |                                         |             |                                | l6 peph                                            |
| Novement Capacity:                                                                         | C.a.,      | 4 = Cp,4 =        |                                         |             | 61                             | .6 peph                                            |
| Prob. of Queue-free State                                                                  | is   po,   | 4 = 1-v4/Cx,4 =   | •                                       |             | 0.9                            | 19                                                 |
| Kajor Left Shared Lane                                                                     | I          |                   |                                         |             |                                |                                                    |
| Prob. of Queue-free Stat                                                                   | e:   p*o   | ,4 *              |                                         |             | 9.9                            | 8                                                  |
| STRP 3: LT FROM MINOR STREE                                                                | T - ¥7     |                   |                                         |             |                                |                                                    |
| Conflicting Flows:                                                                         | Į Vc.      | 7 = 1/2V3+V2+V5+V | 74. +                                   |             | 140                            | ð vpb                                              |
| Potential Capacity:                                                                        | ļ Cp,      | 7 •               |                                         |             | 16                             | 4 pcph                                             |
| Capacity Adjustment Facto                                                                  | r ļ        |                   |                                         |             |                                |                                                    |
| Due To Impeding Novement                                                                   | 51   £7=   | po,4=             |                                         |             | 0.9                            | 8                                                  |
| Kovement Capacity:                                                                         | C1,        | 7 = Cp,7 =        |                                         |             | 16                             | 1 peph                                             |
| BLAY AND LEVEL OF SERVICE                                                                  | SUKNARY    |                   | csh                                     | AVG TOTAL   |                                |                                                    |
| Kovement                                                                                   | v(vcpb)    | cm(popb)          | (pcph)                                  | DELAT       | LOS                            |                                                    |
|                                                                                            |            |                   |                                         |             |                                |                                                    |
| MINOR LEFT TURE (7)                                                                        | 3          | 161               | SHRD                                    | SERD        | SURD                           |                                                    |
| MINOR RIGHT TURN (9)                                                                       | 19         | 467<br>616        | 363                                     | 10.5<br>5.9 | C<br>B                         |                                                    |
| HAJOR LEFT TURE (4)                                                                        | 8          |                   | ••••••••••••••••••••••••••••••••••••••• | J.J         | B<br>                          |                                                    |
| AVERAGE MINOR AFFROACH<br>LEVEL OF S                                                       |            | •                 | AVERAGE TOT                             |             | ON DELAY =<br>SERVICE =        | 0.2 sec/veh                                        |

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| iajor Street: KULA HWY<br>Linor Street: OHARA ST<br>Peak Bour: PK<br>Scenario: MASTER PLAN W/                                                                                      | O HIT                                        |                   |                         |                           | Print Dat<br>Analys<br>File Mam<br>Intersectio | t: BC<br>e: KULOHA-P<br>a: |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------|-------------------------|---------------------------|------------------------------------------------|----------------------------|
| Peak Hour Factor: 1.00                                                                                                                                                             | V2 629                                       | >                 |                         |                           |                                                | 75                         |
| Hum of Lanes - V2: 1<br>BICL RT - V3 (Y/N): H<br>Stop/Tield - V3 (Y/N): H<br>& Grade - V2,V3: 3                                                                                    | ¥3 0<br>                                     | <br>\<br>¥        |                         | ,                         | 17<br>HAJOR STREE<br>KULA HWY                  | ¥4<br>T:                   |
| Hum of Lanes - V5: 1<br>Ezcl LT - V4 (V/H}: H<br>l Grade - V4.V5: -3                                                                                                               | 1                                            | C                 | \<br> <br>              | ><br> <br>                |                                                |                            |
| Mum of Lanes - V7.V3: 1<br>Shared Lane (Y/H): Y<br>& Grade - V7EV9: 0                                                                                                              |                                              |                   | 2<br>17<br>SET: OHANA S | 17<br>/9<br>ľ             |                                                | RORTH>                     |
| TOLUME ADJUSTMENTS<br>Novement No.<br>Volume, V (VPD)<br>Volume, V (PCPD)                                                                                                          | 2<br>629<br>629                              | 3<br>0<br>0       | 4<br>17<br>15           | 5<br>689<br>689           | 7<br>2<br>2                                    | 9<br>17<br>19              |
| TEP 1: RT ZROM KINOR STREET<br>Conflicting Flows:<br>Potential Capacity:<br>Novement Capacity:                                                                                     | ¥c,9 = 1/2*¥3+¥2                             | •                 | 9 ÷ 4                   | 529                       | 665                                            | ₹ph<br>pcph<br>pcph        |
| BP 2: LT FROM MAJOR STREAT<br>Conflicting Flows:<br>Potential Capacity:<br>Novement Capacity:<br>Prob. of Queue-free State:<br>Major Left Shared Lane<br>Prob. of Queue-free State | ↓ Vc.4 =<br>  Cp.4 =<br>  Cπ.4 =<br>  po.4 = | 1-v4/C1,4 =       | 8                       | 629                       | 859<br>869<br>9.98<br>4.97                     | ¥րհ<br>բշրհ<br>₽շրհ        |
| TRP 3: LT FROM MINOR STREAT<br>Conflicting Flows:<br>Potential Capacity:<br>Capacity Adjustment Factor                                                                             | ¥c,7 =<br>  Cp.7 =                           | 1/2¥3+¥2+¥5+¥4    |                         |                           |                                                | ₹ph<br>pcph                |
| Due To Impeding Novements<br>Novement Capacity:                                                                                                                                    | : [ f7=po.4<br>] Cm.7 =                      |                   |                         |                           | 0.97<br>173                                    | bcbp                       |
| ELAY AND LEVEL OF SERVICE S<br>Kovenent                                                                                                                                            | UKNART<br>V (VCPL)                           | cm(pcph)          | csb<br>(pcpb)           | AVG TOTAL<br>Delay        | LOS                                            |                            |
| HINOR LEFT TURN (7)<br>MINOR RIGHT TURN (9)<br>MAJOR LEFT TURN (4)                                                                                                                 | 2<br>19<br>15                                | 173<br>665<br>860 | 512                     | SERD<br>7.3<br>4.3        | SERD<br>B<br>A                                 |                            |
| AVERAGE MINOR APPROACH<br>LEVEL OF SE                                                                                                                                              |                                              |                   | AVERAGE TOT             | AL INTERSECTI<br>LEVEL OF | ON DELAY =<br>SERVICE =                        | 0.2 sec/veb                |

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## SIGHAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int 8 8 - HALEAKALA HWY & HANA HWY

NETROAREA NONCBO LOSTTINE 2.8 LEVELOFSERVICE C S NODELOCATION 6

#### Approach Parameters

| APPLABELS       | ЕВ<br>_\$ <del>8</del> - | 58<br>- <del>110</del> - | WB<br>-#8 | NB<br>- 58- |
|-----------------|--------------------------|--------------------------|-----------|-------------|
| GRADES          | .1                       | .+                       | .1        | .1          |
| PEDLEVELS       | LOW                      | LOW                      | LOW       | LOW         |
| PARKINGSIDES    | KONE                     | NOKE                     | NOKE      | NONE        |
| PARKVOLUMES     | 21                       | 29                       | 24        | 24          |
| BUSVOLUMES      |                          | •                        | 1         | 4           |
| RIGHTTURKONREDS | •                        | 1                        | 1         | I I         |

### Novement Parameters

| NOVLABELS       | RT   | TH   | ١T   | RT   | TH   | LT   | RT    | TK   | 11   | RT   | TH   | LT   |
|-----------------|------|------|------|------|------|------|-------|------|------|------|------|------|
| VOLUMES         | 5    | 39   | 17   | 49   | 748  | 83   | 54    | 156  | 2728 | 931  | 266  | 41   |
| WIDTHS          | 12.0 | 12.4 | .1   | 12.0 | 24.8 | 12.1 | 12.   | 12.8 | 12.8 | 12.8 | 24.1 | 12.0 |
| LANES           | 1    | 1    |      | 1    | 2    | 1    | 1     | 1    | 1    | 1    | 2    | 1    |
| UTILIZATIONS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.0  | 1.00 | 1.H   | 1.0  | 1.80 | 1.0  | 1.0  | 1.88 |
| TRUCKPERCENTS   | 2.1  | 2.8  | 2.1  | 2.0  | 2.4  | 2.1  | 2.8   | 2.1  | 2.9  | 2.1  | 2.1  | 2.1  |
| PEAKHOURFACTORS | .95  | .95  | .95  | .95  | .95  | . 95 | .95   | .95  | .95  | .95  | .95  | .95  |
| ARRIVALTYPES    | 3    | 3    | 3    | 3    | 3    | 3    | 3     | 3    | 3    | 3    | 3    | 3    |
| ACTUATIONS      | N O  | YES  | YES  | X0   | YES  | YES  | XO    | YES  | YES  | NO   | YES  | YES  |
| REQCLEARANCES   | 4.1  | 4.4  | 1.1  | 4.1  | 4.1  | 4.1  | - t.t | 4.4  | 4.0  | 4.1  | 4.4  | 4.0  |
| MININUNS        | 5.0  | 5.6  | 5.0  | 5.1  | 5.0  | 5.1  | 5.1   | 5.1  | 5.4  | 5.1  | 5.4  | 5.8  |
| IDEALSATFLOWS   | 1988 | 1988 | 1984 | 1988 | 1944 | 1900 | 1988  | 1948 | 1988 | 1900 | 1988 | 1944 |
| FACTORS         | 1.00 | 1.00 | 1.11 | 1.00 | 1.0  | 1.00 | 1.44  | 1.0  | 1.11 | 1.0  | 1.8  | 1.00 |
| DELAYFACTORS    | 1.00 | 1.11 | 1.00 | 1.14 | 1.44 | 1.10 | 1.11  | 1.8  | 1.88 | 1.11 | 1.## | 1.80 |
| NSTOPFACTORS    | 1.#  | 1.00 | 1.11 | 1.00 | 1.0  | 1.0  | 1.00  | 1.11 | 1.11 | 1.11 | 1.8  | 1.44 |
| GROUPTYPES      | NORN | NORK | XORM | NORX | NORM | NORM | FFLW  | XORX | DOPT | FFLW | KORX | NGRN |
| SATURATIONFLOWS | 1539 | 1835 | 9    | 1539 | 3725 | 832  |       | 1783 | 1770 | 1    | 3725 | 486  |

#### Phasing Parameters

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| SEQUENCES - | 71   | ALL   |       |    |          |      |      |  |
|-------------|------|-------|-------|----|----------|------|------|--|
| PERRISSIVES | NO   | XO    | KO    | NO | LEADLAGS | KONE | NONE |  |
| OVERLAPS    | KO   | ¥0    | NO    | KO | OFFSET   | .11  | 1    |  |
| CYCLES      | 68   | 188   | 1     |    | PEDTINE  | .1   | I    |  |
| GREENTIKES  | 9.49 | 25.59 | 13.32 |    |          |      |      |  |
| YELLOWTINES | 4.88 | 4.11  | 4.80  |    |          |      |      |  |
| CRITICALS   | 2    | 9     | 5     |    |          |      |      |  |
| EXCESS      | 1    |       |       |    |          |      |      |  |

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KULANALU HASTER PLAN W/NIT AN PEAK HOUR

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#### SIGNAL94/TEAPAC[V1 11.4] - Cepacity Analysis Summary

## Intersection Averages for Int | 0 - HALEAKALA HWY & HANA HWY Degree of Saturation (v/c) 1.48 Vehicle Delay 39.58 Level of Service D & expect more delay due to extreme v/c's (see EVALUATE)

| Sq 71 | Phase 1   | Phase 2   | Phase 3   |
|-------|-----------|-----------|-----------|
| 1     | 1 + * *   | <br>      | · · · ·   |
| •     | j         | İ         | i ++++i   |
| IN    | i(+ * *)  |           | į (•••••į |
| 1     | l v       |           | i - ++++  |
| Nelst | 1         | -         | 1++++ v 1 |
| lorth | 1         | <* +      | ++++)     |
| I     | ]         | * +       |           |
|       |           | • +       |           |
|       | 6/0= .152 | 6/C= .426 | 6/C= .222 |
|       | 6. 9.1    | 6= 25.6"  | 6= 13.3"  |
|       | Y+R= 4.0" | ¥+R= 4.8* | Y+R= 4.8" |
|       | 0FF= .#1  | OFF=21.8% | 0FF=71.13 |

C= 68 sec 6= 48.8 sec = 88.8% Y=12.8 sec = 28.8% Ped= .8 sec = .8%

|                       | ane<br>Grou    |      |           |    |   |    |    |   |    |    |       |    |    |                       |    |   |   |    |   |   |     |    |       |    |     |    |     |     |     |               |   |
|-----------------------|----------------|------|-----------|----|---|----|----|---|----|----|-------|----|----|-----------------------|----|---|---|----|---|---|-----|----|-------|----|-----|----|-----|-----|-----|---------------|---|
| eb<br>Si              | Appr           | 010  | h         |    |   |    |    |   |    |    |       |    |    |                       |    |   |   |    |   |   |     |    |       | 1  | 3.3 | ١. | 8   |     |     |               |   |
| ====<br> <br> LT      | RT<br>'+TH     |      |           |    |   |    |    |   |    |    |       |    |    |                       |    |   |   |    |   |   |     |    |       |    |     |    |     |     |     |               |   |
| ₩E<br>#∂              | 5<br>Appri     | paci | h         |    |   |    |    |   |    |    |       |    |    |                       |    |   |   |    |   |   |     |    |       | 4  | 1.9 | ŧ  | E   | •   |     |               | - |
| <br> <br>             | TH<br>LT       |      |           |    |   |    |    |   |    |    |       |    |    |                       |    |   |   |    |   |   |     |    |       |    |     |    |     |     |     |               |   |
| 5B<br>118             | Appro          | act  | •         |    |   |    |    |   |    |    |       |    |    |                       |    |   |   |    |   |   |     |    |       | 17 | ·   |    | C + |     |     |               | - |
| # 4 1)<br> <br> <br>  | RT<br>Th<br>LT | İ    | 24        | 12 | Í | .2 | 31 | İ | .2 | 55 | Ì     | 8  | 84 |                       | 95 | 1 | ĺ | 78 | 1 | Ĺ | . 8 | 28 | Ì     | 17 | .9  | Ì  | •0+ | ł.  | 247 | f             | t |
| NG<br>F               | Appro          | ach  | • <b></b> |    |   |    |    |   |    |    | • - • | ~- |    |                       |    |   |   |    |   |   |     |    | • • • | 11 |     |    | 8   | ••• |     |               | - |
| = = = :<br> <br> <br> | TH<br>TH       |      |           |    |   |    |    |   |    |    |       |    |    | • • • •<br> <br> <br> |    |   |   |    |   |   |     |    |       |    |     |    |     |     |     | :≞≖<br>F<br>f |   |

KULAKALU MASTER PLAN W/MIT PN PEAK HOUR

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# SIGNAL94/TEAPAC[VI L1.4] - Summary of Parameter Values

# Intersection Parameters for Int 8 - HALEAKALA HWY & HAWA HWY

| NETROAREA      | XOX | ICBD |
|----------------|-----|------|
| LOSTTIKE       |     | 2.1  |
| LEVELOFSERVICE | C   | \$   |
| NODELOCATION   | 1   | 1    |

#### Approach Parameters

| APPLABELS       | EB<br>-\$8- | 5B<br>#1 | ₩B<br><del>-118</del> - | NB<br><del>-{}</del> |
|-----------------|-------------|----------|-------------------------|----------------------|
| GRADES          | .1          | .1       | .1                      | .1                   |
| PEOLEVELS       | LOW         | LOW      | LOW                     | LOW                  |
| PARKINGSIDES    | NONE        | NONE     | NOME                    | NONE                 |
| PARKVOLUXES     | 24          | 28       | 21                      | 20                   |
| BUSVOLUKES      | 4           | •        | l                       | ŧ.                   |
| RIGHTTURKONREDS | ŧ           | 9        | 1                       | ł                    |

#### Novement Parameters

| NOVLABELS       | RT   | TB   | LT   | RT   | TH   | ١T   | RT   | TX   | LT   | RT   | TH   | LT   |
|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| VOLUNES         | 25   | 274  | 161  | - 48 | 515  | 85   | 63   | 54   | 1213 | 1956 | 647  | 2    |
| WIDTHS          | 12.0 | 12.4 | .1   | 12.# | 24.4 | 12.  | 12.0 | 12.0 | 12.  | 12.8 | 24.4 | 12.  |
| LARES           | 1    | 1    | - 1  | 1    | 2    | 1    | 1    | 1    | 1    | 1    | 2    | 1    |
| UTILIZATIONS    | 1.00 | 1.11 | 1.00 | 1.66 | 1.00 | 1.88 | 1.00 | 1.11 | 1.88 | 1.11 | 1.00 | 1.44 |
| TRUCKPERCENTS   | 2.0  | 2.1  | 2.1  | 2.1  | 2.1  | 2.1  | Z.   | 2.1  | 2.1  | 2.4  | 2.1  | 2.1  |
| PEAKHOURFACTORS | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  |
| ARRIVALTYPES    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| ACTUATIONS      | XO   | YES  | YES  | KO   | YES  | YES  | NO   | YES  | YES  | NO   | YES  | YES  |
| REQCLEARANCES   | 4.4  | 4.4  | 4.1  | 1.1  | 4.4  | 4.1  | 4.0  | 1.1  | 1.1  | 4.4  | 4.1  | 4.4  |
| NININUKS        | 5.0  | 5.0  | 5.1  | 5.4  | 5.4  | 5.1  | 5.0  | 5.1  | 5.4  | 5.0  | 5.4  | 5.1  |
| IDEALSATFLOWS   | 1988 | 1900 | 1980 | 1999 | 1900 | 19## | 1908 | 1900 | 1918 |      | 19## |      |
| FACTORS         | 1.88 | 1.00 | 1.44 | 1.00 | 1.11 | 1.00 | 1.00 | 1.0  | 1.0  |      | 1.40 |      |
| DELAYFACTORS    | 1.11 | 1.44 | 1.11 | 1.00 | 1.00 | 1.88 | 1.00 | 1.0  | 1.0  |      | 1.11 | •••• |
| NSTOPFACTORS    | 1.48 | 1.00 | 1.88 | 1.00 | 1.86 | 1.00 | 1.00 | 1.11 | 1.80 |      | 1.00 |      |
| GROUPTYPES      | KORK | NORN | NORN | KORM | NORN | NORK |      | NORM |      |      | XORN |      |
| SATURATIONFLOWS | 1539 | 1829 | •    | 1539 | 3725 | 645  | ŧ    | 1781 | 1774 | ł    | 3725 | 645  |

## Phasing Parameters

| SEQUENCES   | 71    | ALL   |      |     |          |      |      |
|-------------|-------|-------|------|-----|----------|------|------|
| PERMISSIVES | YES   | YES   | YES  | YES | LEADLAGS | KONE | NOKE |
| OVERLAPS    | X O   | KO    | NO   | K O | OFFSET   | .11  | 1    |
| CYCLES      | 61    | 120   | 18   |     | PEDTINE  | .1   | 1    |
| GREENTINES  | 15.47 | 23.37 | 9.56 |     |          |      |      |
| YELLOWTIKES | 4.44  | 4.40  | 4.08 |     |          |      |      |
| CRITICALS   | 2     | 8     | 11   |     |          |      |      |
| EXCESS      | ł     |       |      |     |          |      |      |

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KULANALU HASTER PLAN W/NIT PN PEAK HOUR

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## SIGHAL94/TEAPAC[V1 11.4] - Capacity Analysis Summary

Intersection Averages for Int 8 Ø - HALEAKALA HWY & HAWA HWY Degree of Saturation (v/c) .84 Vehicle Delay 21.0 Level of Service C

| Sq 71 | Phase 1         | Phase 2    | Phase 3    |
|-------|-----------------|------------|------------|
| /     | + 1 1           |            | •          |
|       | i + + +         | i          | j ++++     |
| /N    | (+ • •)         | ĺ          | j (++++    |
| · ; ; | Î v             | i          | 1 * ++++   |
| Welst | j               | j -        | Ĵ++++ v    |
| Horth | i               | (+ *       | ·····>     |
| 1     | j               | <b>*</b> * | j i        |
| •     | İ               | j ++-      |            |
|       | <br>  G/C= .251 | 6/C= .390  | \$/C= .159 |
|       |                 |            | 6= 9.6"    |
|       |                 |            | Y+R= 4.8"  |
|       |                 |            | OFF=77.4%  |

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C= 60 sec 6= 48.0 sec = 80.03 Y=12.0 sec = 20.03 Ped= .0 sec = .03

| ee       |                |         |            |            |          |                    |       |                |     |            |          |          |     |  |            |      |                      |                 |        |            |        |           |                 |          |
|----------|----------------|---------|------------|------------|----------|--------------------|-------|----------------|-----|------------|----------|----------|-----|--|------------|------|----------------------|-----------------|--------|------------|--------|-----------|-----------------|----------|
|          | Appro.         | act     | 1          |            |          |                    |       |                |     |            |          |          |     |  |            |      |                      |                 | 2      | 3.6        |        | 0         |                 |          |
| <br> L1  | RT<br>I+TH     |         | 12<br>12   | 1  <br> 1  | .1<br>.2 | 33<br>82           | .     | . 285<br>. 285 |     | 38:<br>46: | 1        | 43<br>52 | 8   |  | 26<br>457  |      | . <b>8</b> 5<br>. 87 | 9  <br>9  <br>9 | 1<br>2 | 1.1        | <br> ' | 8<br>  2' | 21              | ;<br>;   |
| √5<br>#8 | 3<br>Approi    | ach     |            |            |          |                    |       |                |     |            |          |          | *** |  |            |      | ***                  | ***             | 13     | 3.5        |        | C+        |                 |          |
|          | TH<br>LT       | 1       | 12/<br>12/ | 1- <br> 1+ | .4<br>.3 | 1 <b>0</b>  <br>95 | .     | 423<br>423     |     | 788<br>783 | 3  <br>3 | 75<br>74 | 3   |  | 684<br>650 | <br> | .91                  | 8  <br>9        | 2:     | 1.2<br>7.8 | •<br>  | C  <br>C+ | 333<br>316      | 1<br>  1 |
| 58<br>#9 | Approi         | ıch     |            |            |          |                    |       |                |     |            |          |          |     |  |            |      |                      |                 | 1      | 3.5        |        | C+        |                 |          |
|          | RT<br>TH<br>LT | İ       | 24         | 2          | .1       | 54 j               | .     | 193            | İ   |            | ١        | 71       | 8   |  | 533        | İ    | .74                  | 2               | 12     | 1.6        | I      | C+        | 29<br>181<br>61 | , f      |
| NE<br>EB | }<br>Approi    | I ch    |            |            |          |                    | . – . |                |     |            |          |          |     |  |            |      |                      |                 | 2      | 1.6        |        | C         |                 |          |
|          | TK             | •**<br> | ===<br>24/ | 2          | .1       | 92                 | ·==   | 193            | *** | 547        | 2        | 71       | 8   |  | 639        | 1    | .89                  | • •             | 2      | (.)        | ļ      | C         | 218<br>25       |          |

KULAMALU FUTURE W/PROJ & MIT AM PEAK HOUR

# SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int # 0 - BYPASS & HALEAKALA HY

| Intersection    |        | 56673         | 101 1 |      | -                 |      |      |                 |      |      |                    |      |
|-----------------|--------|---------------|-------|------|-------------------|------|------|-----------------|------|------|--------------------|------|
| METROAREA       |        | NONCI         |       |      |                   |      |      |                 |      |      |                    |      |
| LOSTTIME        |        | 2             | .0    |      |                   |      |      |                 |      |      |                    |      |
| LEVELOFSERVICE  | (      | 0             | S     |      |                   |      |      |                 |      |      |                    |      |
| NODELOCATION    | (      | 9             | Ø     |      |                   |      |      |                 |      |      | •                  |      |
| Approach Para   | meter  | 5             |       |      |                   |      |      |                 |      |      |                    |      |
|                 |        | EB            |       |      | S₿                |      |      | MB              |      |      | NB                 |      |
| APPLABELS       |        | <del>58</del> |       |      | - <del>WB</del> - |      |      | - <del>NB</del> |      |      | - <del>E-B</del> - |      |
| GRADES          |        | 6.0           |       |      | .0                |      |      | -6.0            |      |      | . 0                |      |
| PEDLEVELS       |        | LOW           |       |      | LOW               |      |      | LOW             |      |      | LOW                |      |
| PARKINGSIDES    | NONE   |               |       |      | NONE              |      |      | NONE            |      |      | NONE               |      |
| PARKVOLUMES     |        | 20            |       |      | 20                |      |      | 20              |      |      | 20                 |      |
| BUSVOLUMES      |        | Ø             |       |      | ø                 |      |      | Ø               |      |      | 0                  |      |
| RIGHTTURNONREDS |        | 0             |       |      | 0                 |      |      | 0               |      |      | 0                  |      |
| Movement Para   | meter  | 5             |       |      | •                 |      |      |                 |      |      |                    |      |
| MOVLABELS       | RT     | тн            | LT    | RT   | тн                | LT   | RT   | тн              | LT   | RT   | тн                 | LI   |
| VOLUMES         | 413    | 536           | 0     | 0    | Ø                 | Ø    | . 0  | 1713            | 0    | 0    | Ø                  | 110: |
| WIDTHS          | 12.0   | 24.0          | .0    | .0   | .0                | .0   | .0   | 24.0            | .0   | .0   | .0                 | 24.0 |
| LANES           | 1      | 2             | Ø     | 0    | ø                 | 0    | Ø    | 2               | 0    | 0    | Ø                  | 2    |
| UTILIZATIONS    | 1.00   | 1.00          | 1.00  | 1.00 | 1.00              | 1.00 | 1.00 | 1.00            | 1.00 | 1.00 | 1.00               | 1.00 |
| TRUCKPERCENTS   | 2.0    | 2.0           | 2.0   | 2.0  | 2.0               | 2.0  | 2.0  | 2.0             | 2.0  | 2.0  | 2.0                | 2.9  |
| PEAKHOURFACTORS | .95    | .95           | .95   | .95  | .95               | .95  | .95  | .95             | .95  | .95  | .95                | .95  |
| ARRIVALTYPES    | 3      | 3             | 3     | 3    | 3                 | 3    | 3    | 3               | 3    | 3    | 3                  | 3    |
| ACTUATIONS      | NO     | YES           | YES   | NO   | YES               | YES  | NO   | YES             | YES  | NO   | YES                | YES  |
| REQCLEARANCES   | 4.0    | 4.0           | 4.0   | 4.0  | 4.0               | 4.0  | 4.0  | 4.0             | 4.0  | 4.0  | 4.0                | 4.9  |
| MINIMUMS        | 5.0    | 5.0           | 5.0   | 5.0  | 5.0               | 5.0  | 5.0  | 5.0             | 5.0  | 5.0  | 5.0                | 5.0  |
| IDEALSATFLOWS   | 1900   | 1900          | 1900  | 1900 | 1900              | 1900 | 1900 | 1900            | 1900 | 1900 | 1900               | 1906 |
| FACTORS         | 1.00   | 1.00          | 1.00  | 1.00 | 1.00              | 1.00 | 1.00 | 1.00            | 1.00 | 1.00 | 1.00               | 1.00 |
| DELAYFACTORS    | 1.00   | 1.00          | 1.00  | 1.00 | 1.00              | 1.00 | 1.00 | 1.00            | 1.00 | 1.00 | 1.00               | 1.00 |
| NSTOPFACTORS    | 1.00   | 1.00          | 1.00  | 1.00 | 1.00              | 1.00 | 1.00 | 1.00            | 1.00 | 1.00 | 1.00               | 1.00 |
| GROUPTYPES      | FFLW   | NORM          | NORM  | NORM | NORM              | NORM | NORM | NORM            | NORM | NORM | NORM               |      |
| SATURATIONFLOWS | 0      | 3614          | 0     | 0    | 0                 | 0    | .0   | 3837            | 0    | 0    | 0                  | 3078 |
| Phasing Param   | neters |               |       |      |                   |      |      |                 |      |      |                    |      |
| SEQUENCES       | :      | 11            | ALL   |      |                   |      |      |                 |      |      |                    |      |
| PERMISSIVES     | YI     | ES            | YES   | YES  |                   | ES   |      | LEAD            |      |      | DNE                | NONE |
| OVERLARS        | Y      | ES            | YES   | YES  | Y                 | ES   |      | OFFS            | ET   | ,    | .00                | 1    |

| SEQUENCES   |       | n     |     |     |          |      |
|-------------|-------|-------|-----|-----|----------|------|
| PERMISSIVES | YES   | YES   | YES | YES | LEADLAGS | NONE |
| OVERLAPS    | YES   | YES   | YES | YES | OFFSET   | .00  |
| CYCLES      | 60    | 120   | 10  |     | PEDTIME  | .0   |
| GREENTIMES  | 28.64 | 23.36 |     |     |          |      |
| YELLOWTIMES | 4.00  | 4.00  |     |     |          |      |
| CRITICALS   | 8     | 12    |     |     |          |      |

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|----------------------------------------|----------------------------------------------------------------|-----------------------------|----------------|--|--|--|--|
| TURE W/PROJ & MIT                      |                                                                | 17:14:28                    |                |  |  |  |  |
|                                        |                                                                |                             |                |  |  |  |  |
| GNAL94/TEAPAC[V1 L1                    | .4] - Capacity Analysis Summary                                |                             | 1              |  |  |  |  |
|                                        | for Tot # 0 - BYPASS & HALEAKALA                               | HY                          | يستن           |  |  |  |  |
| Degree of Satur                        | ation (v/c) .81 Vehicle Delay 13.                              | .6 Level of Service P       |                |  |  |  |  |
|                                        |                                                                |                             | -              |  |  |  |  |
| · ···································· | Phase 2                                                        |                             | 1.1            |  |  |  |  |
|                                        |                                                                |                             | <b>p</b> in    |  |  |  |  |
|                                        |                                                                |                             |                |  |  |  |  |
| LIST - 1**                             | e ver etc.                                                     |                             | <b></b>        |  |  |  |  |
|                                        |                                                                |                             | • .            |  |  |  |  |
| * 1                                    | j                                                              |                             | 5.000          |  |  |  |  |
| G/C= .477   G                          | s/C≖ .389                                                      |                             | ۰ ۲            |  |  |  |  |
|                                        |                                                                | •                           | <b></b>        |  |  |  |  |
|                                        |                                                                |                             | <b>T</b> · · · |  |  |  |  |
| C= 60 sec G=                           | 52.0 sec = 86.7% Y= 8.0 sec = 13.3                             | % Ped≂ .0 sec ≖ .0%         | -              |  |  |  |  |
| Lane  Width/                           | g/C   Service Rate  Adj                                        |                             | ••             |  |  |  |  |
| Group   Lanes   Rec                    | d Used   @C (vph) @E  Volume  v/@                              | c   Delay   S   Queue  <br> | <b></b>        |  |  |  |  |
|                                        |                                                                | 5.5 B+                      | •••            |  |  |  |  |
|                                        | 77   .511   1841   1845   564   .30                            | 5   5.5   B+  116 ft        | <b>*</b> ***   |  |  |  |  |
|                                        |                                                                |                             | ę              |  |  |  |  |
| JB<br>B Approach                       | 마카 안다 또 해 같은 김 대 박 강 과 해 같은 것 같은 것 같은 것 같은 것 같은 것 같은 것 같은 것 같은 | 14.3 B                      | •••            |  |  |  |  |
| TH   24/2   .47                        | 73   .511   1959   1960   1803   .92                           | 0   14.3  *B   372 ft       | 8 m.           |  |  |  |  |
| B<br>B<br>Approach                     |                                                                | 16.3 C+                     | <b>n</b>       |  |  |  |  |
|                                        | 92   .423   1266   1301   1163   .89                           |                             | <b>6</b>       |  |  |  |  |

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| KULAMALU<br>Master plan W/M.<br>PM peak hour                                                                                                                                                                                                        | IT                                                                                                                                                                                         |                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                         |                                                                                                               |                                             | ·            |                                     |                                     | 27/97<br>15:32 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------|-------------------------------------|-------------------------------------|----------------|
| SIGNAL94/TEAPAC                                                                                                                                                                                                                                     | [V1 L1.4] -                                                                                                                                                                                | Summary                                                                                  | of Para                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | meter                                                                   | Value                                                                                                         | 5                                           |              |                                     |                                     |                |
| Intersection                                                                                                                                                                                                                                        | Parameters                                                                                                                                                                                 | for Int                                                                                  | # 0 -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | BYPAS                                                                   | 65 & H                                                                                                        | ALEAK                                       | ALA HY       | 1                                   |                                     |                |
| METROAREA<br>Losttime<br>Levelofservice<br>Nodelocation                                                                                                                                                                                             | NONC<br>2<br>C<br>0                                                                                                                                                                        | BD<br>.0<br>S<br>0                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                         |                                                                                                               |                                             |              |                                     |                                     |                |
|                                                                                                                                                                                                                                                     | -                                                                                                                                                                                          | U                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                         |                                                                                                               |                                             |              |                                     |                                     |                |
| Approach Para                                                                                                                                                                                                                                       |                                                                                                                                                                                            | 1                                                                                        | ·~~                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                         |                                                                                                               |                                             |              |                                     | NE                                  |                |
| APPLABELS<br>GRADES<br>PEDLEVELS<br>PARKINGSIDES<br>PARKVOLUMES<br>BUSVOLUMES<br>RIGHTTURNONREDS                                                                                                                                                    | ビュ<br>-38<br>6.0<br>LOW<br>NONE<br>20<br>の<br>の                                                                                                                                            |                                                                                          | 55<br>10<br>10<br>10<br>10<br>10<br>10<br>10<br>10<br>10<br>10<br>10<br>10<br>10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                         |                                                                                                               | WE<br>-N8<br>-6.0<br>Low<br>None<br>20<br>0 |              |                                     | -EB<br>.0<br>LOW<br>NONE<br>20<br>0 | -              |
| Movement Para                                                                                                                                                                                                                                       | meters                                                                                                                                                                                     |                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                         |                                                                                                               |                                             |              |                                     |                                     |                |
| MOVLABELS<br>VOLUMES<br>WIDTHS<br>LANES<br>UTILIZATIONS<br>TRUCKPERCENTS<br>PEAKHOURFACTORS<br>ARRIVALTYPES<br>ACTUATIONS<br>REQCLEARANCES<br>MINIMUMS<br>IDEALSATFLOWS<br>FACTORS<br>DELAYFACTORS<br>NSTOPFACTORS<br>GROUPTYPES<br>SATURATIONFLOWS | RT TH<br>927 1236<br>12.0 24.0<br>1 2<br>1.00 1.00<br>2.0 2.0<br>.95 .95<br>3 3<br>NO YES<br>4.0 4.0<br>5.0 5.0<br>1900 1900<br>1.00 1.00<br>1.00 1.00<br>1.00 1.00<br>FFLW NORM<br>0 3614 | 2.0 2<br>.95 .<br>3<br>YES<br>4.0 4<br>5.0 5<br>1900 19<br>1.00 1.<br>1.00 1.<br>1.00 1. | RT TH<br>0 0<br>0 .0<br>0 1.00<br>0 2.0<br>95 .95<br>3 3<br>NO YES<br>0 4.0<br>0 1.00<br>0 1.00<br>0 1.00<br>0 1.00<br>0 0 1.00<br>0 0 1.00<br>0 0 1.00<br>0 0 0<br>0 0 0<br>0 0 0<br>0 0<br>0 0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0 0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0 | 0<br>.0<br>2.0<br>.95<br>3<br>YES<br>4.0<br>5.0<br>1900<br>1.00<br>1.00 | RT<br>0<br>0<br>2.0<br>2.0<br>.95<br>3<br>NO<br>4.0<br>1900<br>1.00<br>1.00<br>1.00<br>1.00<br>0<br>NORM<br>0 | 1.00<br>1.00                                | 1.00<br>1.00 | 2.0<br>.95<br>3<br>NO<br>4.0<br>5.0 | 1.00<br>1.00<br>Norm                | 1.0F<br>1.0F   |
| SEQUENCES<br>PERMISSIVES<br>OVERLAPS<br>CYCLES<br>GREENTIMES<br>YELLOWTIMES<br>CRITICALS<br>EXCESS                                                                                                                                                  |                                                                                                                                                                                            | YES Y                                                                                    | ES YE<br>ES YE<br>10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                         |                                                                                                               | LEADL<br>OFFSE<br>PEDTI                     | т            |                                     | V E<br>3 0<br>. 0                   | NONE<br>1<br>P |

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| PEAK HOUR                                                                                                                             | <b>8</b>            |
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| NAL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary                                                                                     | · · ·               |
| ersection Averages for Int # 0 - BYPASS & HALEAKALA HY                                                                                |                     |
| Degree of Saturation (v/c) .49 Vehicle Delay 5.1 Level of Service B+                                                                  |                     |
|                                                                                                                                       | بعليت               |
|                                                                                                                                       |                     |
|                                                                                                                                       | Baaks               |
|                                                                                                                                       |                     |
|                                                                                                                                       |                     |
|                                                                                                                                       | •                   |
|                                                                                                                                       | -                   |
| G/C≕ .608   G/C= .259  <br>  G≖ 36.5"   G= 15.6"                                                                                      | • •                 |
| Y+R= 4.0"   Y+R= 4.0"  <br>  OFF= .0%   OFF=67.4%                                                                                     | -                   |
| C= 60 sec G= 52.0 sec = 86.7% Y= 8.0 sec = 13.3% Ped= .0 sec = .0%                                                                    | •                   |
| ane  Width/  g/C   Service Rate  Adj     HCM   L  90% Max <br>Group   Lanes  Reqd Used   @C (vph) @E  Volume  v/c   Delay   S   Queue |                     |
| Approach 4.1 A                                                                                                                        | 1                   |
| TH   24/2   .372   .641   2316   2316   1301   .562   4.1  *A   197 ft                                                                | pi galan            |
|                                                                                                                                       | •                   |
|                                                                                                                                       | Barder<br>1944 -    |
| TH   24/2   .259   .641   2459   2459   929   .378   3.3   A   141 ft                                                                 | · • •               |
| Approach 11.7 B                                                                                                                       | <b>1</b>            |
| ·FF··································                                                                                                 | <b>ا</b> م <b>ا</b> |
| LT   24/2   .170   .292   839   900   448   .498   11.7  *B   134 ft                                                                  | ,                   |
|                                                                                                                                       |                     |
|                                                                                                                                       | 2.1                 |

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SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int H = 0 - PIKALANT RVP & MAKANT ST

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| Intersection    | Paran   | ieters                 | for  | Int # | ø –  | PUKA | LANI B             | YP &  | MAKAN | I ST |      |      |  |
|-----------------|---------|------------------------|------|-------|------|------|--------------------|-------|-------|------|------|------|--|
| METROAREA       |         | NONC                   | 8D   |       |      |      |                    |       |       |      |      |      |  |
| LOSTTIME        |         | 2                      | .0   |       |      |      |                    |       |       |      |      |      |  |
| LEVELOFSERVICE  |         | С                      | S    |       |      |      |                    |       |       |      |      |      |  |
| NODELOCATION    |         | 0                      | 0    |       |      |      |                    |       |       |      | •    |      |  |
| Approach Para   | emeter  | S                      |      |       |      |      |                    |       |       |      |      |      |  |
| APPLABELS       |         | EB                     |      |       | 5B   |      |                    | WB    |       |      | NE   |      |  |
| GRADES          |         | - <del>58</del><br>2.0 |      |       | -₩8  | •    |                    | -NB   |       |      | -6-6 |      |  |
| PEDLEVELS       |         | •                      |      |       | .0   |      |                    | -2.0  |       |      | . e  |      |  |
| PARKINGSIDES    |         | LOW<br>None            |      |       | LOW  |      |                    | LOW   |       |      | LOW  |      |  |
| PARKVOLUMES     |         | 20                     |      |       | NONE |      |                    | NONE  |       |      | NONE |      |  |
|                 |         |                        |      |       | 20   |      |                    | 20    |       |      | 20   | )    |  |
| BUSVOLUMES      |         | 0                      |      |       | Ø    |      |                    | 0     |       |      | Ø    |      |  |
| RIGHTTURNONREDS |         | 0                      |      |       | Ø    |      |                    | Ø     |       |      | ø    |      |  |
| Movement Para   | meter   | S                      |      |       |      |      |                    |       |       |      |      |      |  |
| MOVLABELS       | RT      | тн                     | LT   | RT    | тн   | LT   | RT                 | тн    | LT    | RT   | тн   | LT   |  |
| VOLUMES         | ø       | 541                    | 1    | 275   | 58   | 13   | 12                 | 1365  | 9     | 51   | 76   |      |  |
| WIDTHS          | .0      | 24.0                   | 12.0 | 12.0  | 12.0 | 12.0 | . 0                | 24.0  | 12.0  | 12.0 | 12.0 |      |  |
| LANES           | 0       | 2                      | 1    | 1     | 1    | 1    | Ø                  | 2     | 1     | 1    | 1    | 1    |  |
| UTILIZATIONS    | 1.00    | 1.00                   | 1.00 | 1.00  | 1.00 | 1.00 | 1.00               | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 |  |
| TRUCKPERCENTS   | 2.0     | 2.0                    | 2.0  | 2.0   | 2.0  | 2.0  | 2.0                | 2.0   | 2.0   | 2.0  | 2.0  | 2.0  |  |
| PEAKHOURFACTORS | .95     | .95                    | .95  | .95   | .95  | .95  | .95                | .95   | .95   | .95  | .95  | .95  |  |
| ARRIVALTYPES    | 3       | 3                      | 3    | 3     | 3    | 3    | 3                  | 3     | 3     | 3    | 3    |      |  |
| ACTUATIONS      | YES     | YES                    | YES  | YES   | YES  | YES  | YES                | YES   | YES   | YES  | YES  | YES  |  |
| REQCLEARANCES   | 4.0     | 4.0                    | 4.0  | 4.0   | 4.0  | 4.0  | 4.0                | 4.0   | 4.0   | 4.0  | 4.0  | 4.0  |  |
| MINIMUMS        | 5.0     | 5.0                    | 5.0  | 5.0   | 5.0  | 5.0  | 5.0                | 5.0   | 5.0   | 5.0  | 5.0  | 5.0  |  |
| IDEALSATFLOWS   | 1900    | 1900                   | 1900 | 1900  | 1900 | 1900 | 1900               | 1900  | 1900  | 1900 | 1900 | 1900 |  |
| FACTORS         | 1.00    | 1.00                   | 1.00 | 1.00  | 1.00 | 1.00 | 1.00               | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 |  |
| DELAYFACTORS    | 1.00    | 1.00                   | 1.00 | 1.00  | 1.00 | 1.00 | 1.00               | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 |  |
| NSTOPFACTORS    | 1.00    | 1.00                   | 1.00 | 1.00  | 1.00 | 1.00 | 1.00               | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 |  |
| GROUPTYPES      | NORM    | NORM                   | NORM | NORM  | NORM | NORM | NORM               | NORM  | NORM  | NORM | NORM | NORM |  |
| SATURATIONFLOWS | Ø       | 3688                   | 207  | 1539  | 1863 | 1422 | 0                  | 3757  | 625   | 1539 | 1863 | 1492 |  |
| Phasing Param   | eters   |                        |      |       |      |      |                    |       |       |      |      |      |  |
| SEQUENCES       | 1       | 1                      | ALL  |       |      |      |                    |       |       |      |      |      |  |
| PERMISSIVES     | YE      |                        | YES  | YES   | YE   | s    |                    | LEADI | 465   | Nr   | DNE  | NÖNE |  |
| OVERLAPS        | YE      |                        | YES  | YES   | YE   |      | LEADLAGS<br>OFFSET |       |       |      | .00  |      |  |
|                 | TES TES |                        |      |       |      |      | UFFSEI             |       |       | •    |      | 1    |  |

NE 1 CYCLES . 60 120 10 PEDTIME .0 0 GREENTIMES 33.64 18.36 YELLOWTIMES 4.00 4.00 CRITICALS 8 4 EXCESS 0

|                                                |                                                                                |                                                                         |                                         |                                    |                            |                                    |                                           |                                                | 03/27/                         | /97 -            |
|------------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------|------------------------------------|----------------------------|------------------------------------|-------------------------------------------|------------------------------------------------|--------------------------------|------------------|
|                                                | U<br>Plan W/MIT                                                                |                                                                         |                                         |                                    |                            |                                    |                                           |                                                | 17:22:                         |                  |
|                                                | HOUR                                                                           |                                                                         |                                         |                                    |                            |                                    |                                           |                                                |                                | -                |
|                                                |                                                                                |                                                                         |                                         |                                    |                            |                                    |                                           |                                                |                                |                  |
| AL 9                                           | 4/TEAPAC[V1                                                                    | L1.4] - Capa                                                            | city An                                 | alysis                             | Summary                    |                                    |                                           |                                                |                                |                  |
| rse                                            | ction Avera                                                                    | ges for Int #                                                           |                                         | PUKALAN                            | I BYP &                    | MAKANI                             | ST<br>Level d                             | F Se                                           | rvice                          |                  |
| 0                                              | egree of Sa                                                                    | turation (v/c                                                           | :) .50                                  | Vehicl                             | e Oelay                    | 6.2                                | Level (                                   | Ji 36                                          | er vice                        | 0- ;             |
| -                                              |                                                                                |                                                                         | -                                       |                                    |                            |                                    |                                           |                                                |                                | ,                |
| 1                                              | Phase 1                                                                        | Phase 2  <br>                                                           | •                                       |                                    |                            |                                    |                                           |                                                |                                |                  |
| ļ                                              | + +                                                                            |                                                                         |                                         |                                    |                            |                                    |                                           |                                                |                                |                  |
|                                                | + +<br>  + +>                                                                  | <pre></pre>                                                             |                                         |                                    |                            |                                    |                                           |                                                |                                |                  |
|                                                | v                                                                              | <b>^</b> ++++                                                           |                                         |                                    |                            |                                    |                                           |                                                |                                |                  |
| ት  <br>"ኴ                                      | <br>                                                                           | ++++ ∨  <br> ++++>                                                      |                                         |                                    |                            |                                    |                                           |                                                |                                |                  |
|                                                | + * *                                                                          | ++++                                                                    | Į                                       |                                    |                            |                                    |                                           |                                                |                                |                  |
|                                                |                                                                                |                                                                         | )<br><del>-</del>                       |                                    |                            |                                    |                                           |                                                |                                |                  |
| -                                              | G/C= .561                                                                      | G/C= .306                                                               | 1                                       |                                    |                            |                                    |                                           |                                                |                                |                  |
|                                                | G= 33.6"                                                                       | G≖ 18.4"  <br>  Y+R= 4.0"                                               | 1                                       |                                    |                            |                                    |                                           |                                                |                                |                  |
|                                                | Y+R= 4.0"<br>  OFF= .0%                                                        | 0FF=62.7%                                                               | ľ                                       |                                    |                            |                                    |                                           |                                                |                                |                  |
| ane<br>Gro                                     | Width/ <br>up   Lanes                                                          | g/C<br>Reqd Used                                                        | Servio<br>  @C (vp                      |                                    | Adj  <br> Volume           |                                    | HCM<br>Delay                              |                                                | 90% M<br>  Queu                |                  |
|                                                |                                                                                |                                                                         |                                         |                                    |                            |                                    | 3.8                                       | A                                              |                                |                  |
| APP<br>===                                     | roach<br>====================================                                  |                                                                         | ******                                  |                                    |                            |                                    |                                           |                                                |                                | ft               |
|                                                | 24/2                                                                           | .175   .594<br>.000   .594                                              | 2191                                    | 2191  <br>  120                    |                            | .260<br>.008                       |                                           |                                                | •                              | ft               |
| тн                                             | 12/1                                                                           | .000 [ .554                                                             |                                         |                                    |                            |                                    |                                           |                                                |                                |                  |
| TH<br>LT<br>                                   |                                                                                |                                                                         |                                         |                                    |                            |                                    | 5.7                                       | B+                                             |                                |                  |
| LT<br>                                         | roach                                                                          |                                                                         |                                         |                                    |                            |                                    |                                           |                                                |                                |                  |
| ιт<br><br>Арр                                  | roach                                                                          |                                                                         |                                         |                                    |                            | .650                               |                                           |                                                | 248                            |                  |
| ιт<br><br>Арр                                  | 一番目前の日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本                                    | 205   594                                                               | 2232<br>338                             | 2232<br>  371                      | 1450  <br>  9              | .650                               | 5.7                                       | *B+                                            | 248                            | ft               |
| LT<br><br>App<br>TH                            | 一番目前の日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本                                    | .395   .594<br>.000   .594                                              | 2232<br>  338                           | 2232<br>  371                      | 1450  <br>  9              | .650<br>.024                       | 5.7                                       | *B+                                            | 248                            | ft               |
| LT<br>APP<br>TH<br>LT                          | 一番目前の日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本日本                                    | .395   .594<br>.000   .594<br>                                          | 338                                     |                                    |                            |                                    | 5.7<br>3.2<br>10.8                        | *B+<br>  A<br>                                 |                                |                  |
|                                                | +RT  24/2  <br>  12/1  <br>roach                                               | .395   .594<br>.000   .594<br>                                          | 338<br>                                 |                                    |                            | .554                               | 5.7<br>  3.2<br>10.8<br>  11.4            | * B +<br>  A<br>  B<br>  * B                   | 161                            | ft               |
|                                                | +RT  24/2  <br>  12/1  <br>roach<br>  12/1  <br>  12/1  <br>  12/1             | .395   .594<br>.000   .594<br>.226   .339<br>.054   .339                | 338<br>                                 | 3/1<br>  522<br>  632              | 289                        | .554                               | 5.7<br>3.2<br>10.8<br>11.4<br>8.7         | * B +<br>  A<br>  B<br>  * B<br>  B+           | 161                            | ft <br>ft        |
|                                                | +RT  24/2  <br>  12/1  <br>roach<br>  12/1  <br>  12/1  <br>  12/1             | .395   .594<br>.000   .594<br>                                          | 338<br>                                 | 3/1<br>  522<br>  632              | 289                        | .554                               | 5.7<br>  3.2<br>10.8<br>  11.4            | * B +<br>  A<br>  B<br>  * B<br>  B+           | 161                            | ft               |
| LT<br>APP<br>TH<br>LT<br>APP<br>RT<br>TH       | +RT  24/2  <br>  12/1  <br>roach<br>  12/1  <br>  12/1  <br>  12/1             | .395   .594<br>.000   .594<br>.226   .339<br>.054   .339                | 338<br>                                 | 3/1<br>  522<br>  632              | 289                        | .554                               | 5.7<br>3.2<br>10.8<br>11.4<br>8.7<br>8.5  | *B+<br>  A<br>  B<br> *B<br>  B+<br>  B+       | 161<br>-  34<br>-  25          | ft <br>ft        |
| LT<br>APP<br>TH<br>LT<br>APP<br>RT<br>TH<br>LT | +RT  24/2  <br>  12/1  <br>roach<br>  12/1  <br>  12/1  <br>  12/1             | .395   .594<br>.000   .594<br>.226   .339<br>.054   .339<br>.000   .339 | 338<br>  469<br>  578<br>  430          | 371<br>  522<br>  632<br>  483     | 9<br>  289<br>  61<br>  14 | .554<br>.097<br>.029               | 10.8<br>11.4<br>8.7<br>8.8                | * B +<br>  A<br>  B<br>  * B<br>  B +<br>  B + | 161<br>-  34<br>-  25          | ft <br>ft <br>ft |
| LT<br>App<br>TH<br>LT<br>App<br>RT<br>TH<br>LT | +RT  24/2  <br>  12/1  <br>roach<br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1 | .395   .594<br>.000   .594<br>.226   .339<br>.054   .339                | 338<br>  469<br>  578<br>  430<br>  469 | 371<br>  522<br>  632<br>  483<br> | 289<br>  61<br>  14        | .554<br>  .097<br>  .029<br>  .029 | 10.8<br>10.8<br>11.4<br>8.7<br>8.8<br>8.8 | * B +<br>  A<br>  B<br>  * B<br>  B +<br>  B + | 161<br>-  34<br>-  25<br>-  30 | ft <br>ft <br>ft |

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| KULAMALU<br>Master plan w/mi<br>PM peak hour | т      |       |       |        |                  |       |        |                  |        |      |      | 27/97<br>23:34 |  |
|----------------------------------------------|--------|-------|-------|--------|------------------|-------|--------|------------------|--------|------|------|----------------|--|
| SIGNAL94/TEAPAC[                             | V1 L1. | .4] - | ៜ៶៲៳៳ | ary of | Para             | meter | Values | 5                |        |      |      |                |  |
| Intersection                                 | Parame | eters | for   | Int #  | 0 -              | PUKAL | ANI B' | 45 <u>6</u> 1    | MAKANI | ST   |      |                |  |
| 1ETROAREA                                    |        | NONCI | 8 D   |        |                  |       |        |                  |        |      |      |                |  |
| LOSTTIME                                     |        | 2     | .0    |        |                  |       |        |                  |        |      |      |                |  |
| LEVELOFSERVICE                               | (      | 2     | S     |        |                  |       |        |                  |        |      |      |                |  |
| NODELOCATION                                 | (      | 9     | 0     |        |                  |       |        |                  |        |      |      |                |  |
| Approach Para                                | meters |       |       |        |                  |       |        |                  |        |      |      |                |  |
|                                              |        | EB    |       |        | 50               |       |        | WB               |        |      | NB   |                |  |
| APPLABELS                                    |        | -68-  |       |        | - <del>WB-</del> |       |        | - <del>NB-</del> | -      |      |      |                |  |
| GRADES                                       |        | 2.0   |       |        | .0               |       |        | -2.0             |        |      | .0   |                |  |
| PEDLEVELS                                    |        | LOW   |       |        | LOW              |       |        | LOW              |        |      | LOW  |                |  |
| PARKINGSIDES                                 |        | NONE  |       |        | NONE             |       |        | NONE             |        |      | NONE |                |  |
| PARKVOLUMES                                  |        | 20    |       |        | 20               |       |        | 20               |        |      | 20   |                |  |
| BUSVOLUMES                                   |        | 20    |       |        | 0                |       |        | 0                |        |      | 0    |                |  |
| RIGHTTURNONREDS                              |        | ø     |       |        | 0                |       |        | 0                |        |      | 0    |                |  |
| Movement Para                                | meters | 5     |       |        |                  |       |        |                  |        |      |      |                |  |
| MOVLABELS                                    | RT     | тн    | LΤ    | RT     | тн               | LT    | RT     | тн               | LT     | RT   | тн   | LT             |  |
| VOLUMES                                      | 25     | 994   | 196   | 39     | 37               | 4     | 25     | 809              | 18     | . 26 | 60   | 2              |  |
| JIDTHS                                       | .0     | 24.0  | 12.0  | 12.0   | 12.0             | 12.0  | .0     | 24.0             | 12.0   | 12.0 | 12.0 | 12.0           |  |
| LANES                                        | 0      | 2     | 1     | 1      | 1                | 1     | 0      | 2                | 1      | 1    | 1    | 1              |  |
| UTILIZATIONS                                 | 1.00   | 1.00  | 1.00  | 1.00   | 1.00             | 1.00  | 1.00   | 1.00             | 1.00   | 1.00 | 1.00 | 1.00           |  |
| TRUCKPERCENTS                                | 2.0    | 2.0   | 2.0   | 2.0    | 2.0              | 2.0   | 2.0    | 2.0              | 2.0    | 2.0  | 2.0  | 2.0            |  |
| PEAKHOURFACTORS                              | .95    | .95   | .95   | .95    | .95              | .95   | .95    | .95              | .95    | .95  | .95  | .95            |  |
| ARRIVALTYPES                                 | 3      | 3     | 3     | 3      | 3                | З     | 3      | 3                | 3      | 3    | 3    | 3              |  |
| ACTUATIONS                                   | YES    | YES   | YES   | YES    | YES              | YES   | YES    | YES              | YES    | YES  | YES  | YE۶            |  |
| REQCLEARANCES                                | 4.0    | 4.0   | 4.0   | 4.0    | 4.0              | 4.0   | 4.0    | 4.0              | 4.0    | 4.0  | 4.0  | 4 <b>.</b> E   |  |
| MINIMUMS                                     | 5.0    | 5.0   | 5.0   | 5.0    | 5.0              | 5.0   | 5.0    | 5.0              | 5.0    | 5.0  | 5.0  | 5.0            |  |
| IDEALSATFLOWS                                | 1900   | 1900  | 1900  | 1900   | 1900             | 1900  | 1900   | 1900             | 1900   |      | 1900 |                |  |
| FACTORS                                      | 1.00   | 1.00  | 1.00  | 1.00   | 1.00             | 1.00  | 1.00   | 1.00             | 1.00   | 1.00 | 1.00 | 1.00           |  |
| DELAYFACTORS                                 | 1.00   | 1.00  | 1.00  | 1.00   | 1.00             | 1.00  |        |                  | 1.00   |      | 1.00 |                |  |
| NSTOPFACTORS                                 |        | 1.00  |       |        | 1.00             | 1.00  | 1.00   | 1.00             | 1.00   |      | 1.00 |                |  |
| GROUPTYPES                                   |        | NORM  |       |        |                  | NORM  | NORM   | NORM             | NORM   | NORM | NORM | NORM           |  |
| SATURATIONFLOWS                              | 0      | 3673  | 1752  | 1539   | 1863             | 1448  | Ø      | 3743             | 342    | 1539 | 1863 | 1557           |  |
| Phasing Param                                | eters  |       |       |        |                  |       |        |                  |        |      |      |                |  |
| SEQUENCES                                    |        | 21    |       |        |                  |       |        |                  |        |      |      |                |  |
| PERMISSIVES                                  | YE     |       | YES   | YES    |                  | ES    |        | LEAD             |        |      | DNE  | NONE           |  |
| DVERLAPS                                     | YE     | ES    | YES   | YES    | YI               | ES    |        | OFFSI            |        |      | .00  | 1              |  |
| CYCLES                                       |        | 50    | 120   | 10     |                  |       |        | PEDTI            | EME    |      | .0   | ę              |  |
| GREENTIMES                                   | 14.6   | 00 20 | 00.00 | 14.00  |                  |       |        |                  |        |      |      |                |  |
| YELLOWTIMES                                  | 4.0    | 90 A  | 1.00  | 4.00   |                  |       |        |                  |        |      |      |                |  |
| CRITICALS                                    |        | 3     | 8     | 5      |                  |       |        |                  |        |      |      |                |  |
|                                              |        | 0     |       |        |                  |       |        |                  |        |      |      |                |  |

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|                                                                                                                                     | U<br>Plan W/MI                                                                                                                  | т                                                                                                   |                                                                                              |                                                                                                                                        |                                                                                                       |                                                                                                                                                         |                                                                                       |                                                                                                                                  |                                                                                        | 03/2<br>17:2                                                      | •                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------|
| PM PEAK                                                                                                                             | HOUR                                                                                                                            |                                                                                                     |                                                                                              |                                                                                                                                        |                                                                                                       |                                                                                                                                                         |                                                                                       |                                                                                                                                  |                                                                                        |                                                                   |                                                            |
| SIGNALS                                                                                                                             | 4/TEAPAC[                                                                                                                       | V1 L1.4                                                                                             | ] — Cap                                                                                      | acity /                                                                                                                                | Analysi                                                                                               | s Summar                                                                                                                                                | ·y                                                                                    |                                                                                                                                  |                                                                                        |                                                                   |                                                            |
|                                                                                                                                     | ction Ave                                                                                                                       |                                                                                                     |                                                                                              |                                                                                                                                        | -                                                                                                     |                                                                                                                                                         | •                                                                                     |                                                                                                                                  |                                                                                        |                                                                   |                                                            |
|                                                                                                                                     | egree of                                                                                                                        |                                                                                                     |                                                                                              |                                                                                                                                        |                                                                                                       |                                                                                                                                                         |                                                                                       | 5 Level                                                                                                                          | of S                                                                                   | Servic                                                            | e B.                                                       |
| Sq 21                                                                                                                               | Phase 1                                                                                                                         | <br>  Ph                                                                                            | ase 2                                                                                        | Phas                                                                                                                                   | se 3                                                                                                  |                                                                                                                                                         |                                                                                       |                                                                                                                                  |                                                                                        |                                                                   |                                                            |
| **/**                                                                                                                               |                                                                                                                                 | <br>+ + +                                                                                           | • • • • • • • • • • • • • • • • • • •                                                        | <b></b>                                                                                                                                | ~ 1                                                                                                   |                                                                                                                                                         |                                                                                       |                                                                                                                                  |                                                                                        |                                                                   |                                                            |
|                                                                                                                                     | + + * ++                                                                                                                        |                                                                                                     | +                                                                                            | İ                                                                                                                                      | ++++                                                                                                  |                                                                                                                                                         |                                                                                       |                                                                                                                                  |                                                                                        |                                                                   |                                                            |
|                                                                                                                                     | (+ + *)<br>v                                                                                                                    | <pre></pre>                                                                                         |                                                                                              | -                                                                                                                                      | <**** <br>++++                                                                                        |                                                                                                                                                         |                                                                                       |                                                                                                                                  |                                                                                        |                                                                   |                                                            |
| Welst                                                                                                                               |                                                                                                                                 |                                                                                                     | ^                                                                                            | ++++                                                                                                                                   | V                                                                                                     |                                                                                                                                                         |                                                                                       |                                                                                                                                  |                                                                                        |                                                                   |                                                            |
| North                                                                                                                               |                                                                                                                                 |                                                                                                     | <+ * *><br>+ * *                                                                             | ++++><br> ++++                                                                                                                         |                                                                                                       |                                                                                                                                                         |                                                                                       |                                                                                                                                  |                                                                                        |                                                                   |                                                            |
|                                                                                                                                     |                                                                                                                                 | ì                                                                                                   | + * *                                                                                        | V V                                                                                                                                    | {                                                                                                     |                                                                                                                                                         |                                                                                       |                                                                                                                                  |                                                                                        |                                                                   |                                                            |
|                                                                                                                                     | G/C- 22                                                                                                                         | 2 1 0 / 0                                                                                           |                                                                                              |                                                                                                                                        |                                                                                                       |                                                                                                                                                         |                                                                                       |                                                                                                                                  |                                                                                        |                                                                   |                                                            |
|                                                                                                                                     | G/C= .23:<br>G= 14.0                                                                                                            |                                                                                                     |                                                                                              | G = 1                                                                                                                                  |                                                                                                       |                                                                                                                                                         |                                                                                       |                                                                                                                                  |                                                                                        |                                                                   |                                                            |
| Í                                                                                                                                   | Y+R= 4.0                                                                                                                        | •                                                                                                   | = 4.0"                                                                                       | Y+R=                                                                                                                                   | 4.0"                                                                                                  |                                                                                                                                                         |                                                                                       |                                                                                                                                  |                                                                                        |                                                                   |                                                            |
| [<br>                                                                                                                               | OFF= .0                                                                                                                         | 8   OFF                                                                                             | =30.0%                                                                                       | OFF=7                                                                                                                                  | 0.0%                                                                                                  |                                                                                                                                                         |                                                                                       |                                                                                                                                  |                                                                                        |                                                                   |                                                            |
| -                                                                                                                                   | • 60 sec                                                                                                                        | 6≖ 48                                                                                               | .0 sec                                                                                       | = 80.0%                                                                                                                                | s Y=12.                                                                                               | 0 sec =                                                                                                                                                 | 20.0%                                                                                 | Ped=                                                                                                                             | .0 se                                                                                  | C =                                                               | .09                                                        |
| <br>  Lane                                                                                                                          | Width/                                                                                                                          | g                                                                                                   | <br>/c                                                                                       | <br>  Servi                                                                                                                            | .ce Rate                                                                                              | Ø sec ≖<br>  Adj<br> Volume                                                                                                                             | <br>                                                                                  | Ped⊨<br>  HCM<br>  Delay                                                                                                         | <br>1 L                                                                                | c =<br> 90%  <br>  Quei                                           |                                                            |
| Lane<br>  Group                                                                                                                     | Width/                                                                                                                          | g                                                                                                   | <br>/c                                                                                       | <br>  Servi                                                                                                                            | ce Rate                                                                                               |                                                                                                                                                         | <br>!                                                                                 | нсм                                                                                                                              | <br>1 L                                                                                | 90%                                                               |                                                            |
| Lane<br>  Group                                                                                                                     | Width/<br>  Lanes                                                                                                               | g                                                                                                   | <br>/c                                                                                       | <br>  Servi                                                                                                                            | ce Rate                                                                                               |                                                                                                                                                         | <br>!                                                                                 | нсм                                                                                                                              | <br>1 L                                                                                | 90%                                                               |                                                            |
| Lane<br>  Group<br>CB<br>GB- Appro                                                                                                  | Width/<br>  Lanes                                                                                                               | Reqd                                                                                                | /C<br>Used                                                                                   | Servi<br>  @C (v                                                                                                                       | ce Rate<br>(ph) @E                                                                                    | Adj<br> Volume                                                                                                                                          | <br>  v/c                                                                             | HCM<br>  Delay<br>3.2                                                                                                            | L<br>  S<br>A                                                                          | 90%  <br>  Quet                                                   | lax <br>ue                                                 |
| Lane<br>  Group<br>CB<br>CB- Appro                                                                                                  | Width/<br>  Lanes                                                                                                               | , 307                                                                                               | /C<br>Used<br>                                                                               | Servi<br>  @C (v                                                                                                                       | ce Rate<br>(ph) @E                                                                                    | Adj<br> Volume                                                                                                                                          | <br>  v/c                                                                             | HCM<br>  Delay<br>3.2<br>  3.1                                                                                                   | L<br>  S                                                                               | 90%  <br>  Queu<br>  151                                          | lax <br>ue                                                 |
| Lane<br>  Group<br>CB<br>GB-Appro<br>  TH+R<br>  LT                                                                                 | Width/<br>  Lanes<br>ach<br>T  24/2<br>  12/1                                                                                   | , 307                                                                                               | /C<br>Used<br>                                                                               | Servi<br>  @C (v                                                                                                                       | ce Rate<br>(ph) @E                                                                                    | Adj<br> Volume                                                                                                                                          | <br>  v/c                                                                             | HCM<br>  Delay<br>3.2<br>  3.1                                                                                                   | L<br>  S<br>  A                                                                        | 90%  <br>  Queu<br>  151                                          | ft                                                         |
| Lane<br>  Group<br>&B<br>&B-Appro<br>  TH+R<br>  LT<br>WB<br>NB Appro<br>TH+R                                                       | Width/<br>  Lanes<br>ach<br>T  24/2  <br>  12/1  <br>ach<br>T  24/2                                                             | 9<br>Reqd<br>.307<br>.067                                                                           | /C<br>Used<br>  .667<br>  .267<br>  .367                                                     | Servi<br>  @C (v<br>  2448<br>  551<br>  1331                                                                                          | ce Rate<br>(ph) @E<br>  2448<br>  590<br>  1373                                                       | Adj<br> Volume<br>  1072<br>  206                                                                                                                       | <br>  v/c<br>  .438<br>  .349                                                         | HCM<br>  Delay<br>3.2<br>  3.1<br>  3.8<br>10.8                                                                                  | L<br>  S<br>  A<br> *A<br> B                                                           | 90%  <br>  Quet<br>  151<br>  58                                  | ft                                                         |
| Lane<br>  Group<br>SB-Appro<br>  TH+R<br>  LT<br>+B Appro<br>TH+R                                                                   | Width/<br>  Lanes<br>ach<br>T  24/2  <br>  12/1  <br>ach                                                                        | 9<br>Reqd<br>.307<br>.067                                                                           | /C<br>Used<br>  .667<br>  .267<br>  .367                                                     | Servi<br>  @C (v<br>  2448<br>  551<br>  1331                                                                                          | ce Rate<br>(ph) @E<br>  2448<br>  590<br>  1373                                                       | Adj<br> Volume<br>  1072<br>  206<br>  878                                                                                                              | <br>  v/c                                                                             | HCM<br>  Delay<br>3.2<br>  3.1<br>  3.8<br>  0.8<br>  10.9                                                                       | L<br>  S<br>  A<br> *A<br> *B                                                          | 90%  <br>  Quet<br>  151<br>  58<br>  234                         | ft                                                         |
| Lane<br>  Group<br>SB-Appro<br>  TH+R<br>  LT<br>WB Appro<br>TH+R<br>LT                                                             | Width/<br>  Lanes<br>ach<br>T  24/2  <br>  12/1  <br>ach<br>T  24/2  <br>  12/1                                                 | 9<br>Reqd<br>.307<br>.067                                                                           | /C<br>Used<br>  .667<br>  .267<br>  .367                                                     | Servi<br>  @C (v<br>  2448<br>  551<br>  1331                                                                                          | ce Rate<br>(ph) @E<br>  2448<br>  590<br>  1373                                                       | Adj<br> Volume<br>  1072<br>  206<br>  878                                                                                                              | <br>  v/c<br>  .438<br>  .349<br>  .639                                               | HCM<br>  Delay<br>3.2<br>  3.1<br>  3.8<br>10.8<br>  10.9<br>  8.3                                                               | L<br>  S<br>  A<br> *A<br> *A<br>  *B<br>  8+                                          | 90%  <br>  Quet<br>  151<br>  58<br>  234                         | ft <br>ft                                                  |
| Lane<br>  Group<br>GB-Appro<br>  TH+R<br>  LT<br>WB<br>NB Appro<br>  TH+R<br>  LT                                                   | Width/<br>  Lanes<br>ach<br>T  24/2  <br>  12/1  <br>ach<br>T  24/2  <br>  12/1                                                 | 9<br>Reqd<br>. 307<br>. 067<br>. 253<br>. 000                                                       | / C<br>Used<br>. 667<br>. 267<br>. 367<br>. 367                                              | Servi<br>  @C (v<br>  2448<br>  551<br>  1331<br>  94                                                                                  | ce Rate<br>(ph) @E<br>  2448<br>  590<br>  1373<br>  120                                              | Adj<br> Volume<br>  1072<br>  206<br>  878<br>  19                                                                                                      | <br>  v/c<br>  .438<br>  .349<br>  .639<br>  .152                                     | HCM<br>  Delay<br>3.2<br>  3.1<br>  3.8<br>  10.8<br>  10.9<br>  8.3<br>7.3                                                      | L<br>  S<br>  A<br>  * A<br>  * B                                                      | 90%  <br>  Quet<br>  151<br>  58<br>  234<br>  25                 | ft <br>ft                                                  |
| Lane<br>  Group<br>SB-Appro<br>  TH+R<br>  LT<br>/B<br>HB Appro<br>TH+R<br>LT<br>B<br>B<br>Appro<br>RT                              | Width/<br>  Lanes<br>ach<br>T  24/2  <br>  12/1  <br>ach<br>I 2/1  <br>ach                                                      | 9<br>Reqd<br>. 307<br>. 067<br>. 253<br>. 000                                                       | / C<br>Used<br>. 667<br>. 267<br>. 367<br>. 367<br>. 367                                     | Servi<br>  @C (v<br>  2448<br>  551<br>  1331<br>  94<br>  844                                                                         | ce Rate<br>(ph) @E<br>  2448<br>  590<br>  1373<br>  120<br>  872                                     | Adj<br> Volume<br>  1072<br>  206<br>  878<br>  19                                                                                                      | <br>  v/c<br>  .438<br>  .349<br>  .639<br>  .152<br>  .152                           | HCM<br>  Delay<br>3.2<br>  3.1<br>  3.8<br>  10.8<br>  10.9<br>  8.3<br>  7.3<br>  3.7                                           | L<br>  S<br>  A<br>  * A<br>  * A<br>  * B<br>  8+<br>  8+                             | 90%  <br>  Quet<br>  151<br>  58<br>  234<br>  25                 | ft <br>ft <br>ft <br>ft                                    |
| Lane<br>  Group<br>SB-Appro<br>  TH+R<br>  LT<br>WB<br>APPro<br>TH+R<br>LT                                                          | Width/<br>  Lanes<br>ach<br>T  24/2  <br>  12/1  <br>ach<br>I 2/1  <br>ach                                                      | 9<br>Reqd<br>.307<br>.067<br>.253<br>.000                                                           | / C<br>Used<br>. 667<br>. 267<br>. 367<br>. 367<br>. 367<br>. 367<br>. 267                   | Servi<br>  @C (v<br>  2448<br>  551<br>  1331<br>  94<br>  844<br>  437                                                                | ce Rate<br>(ph) @E<br>  2448<br>  590<br>  1373<br>  120<br>  872<br>  872<br>  497                   | Adj<br> Volume<br>  1072<br>  206<br>  878<br>  19                                                                                                      | <br>  v/c<br>  .438<br>  .349<br>  .639<br>  .152                                     | HCM<br>  Delay<br>3.2<br>  3.1<br>  3.8<br>  10.8<br>  10.9<br>  8.3<br>  7.3<br>  3.7<br>  10.6                                 | L<br>  S<br>  A<br>  * A<br>  * A<br>  * B<br>  8+<br>  8+                             | 90%  <br>  Quet<br>  151<br>  58<br>  234<br>  25                 | ft <br>ft <br>ft <br>ft                                    |
| Lane<br>  Group<br>SB-Appro<br>  TH+R<br>LT<br>/B<br>/B<br>Appro<br>TH+R<br>LT<br>RT<br>TH<br>LT                                    | Width/<br>  Lanes<br>ach<br>T  24/2  <br>  12/1  <br>ach<br>T  24/2  <br>  12/1  <br>ach<br>  12/1  <br>  12/1                  | 9<br>Reqd<br>.307<br>.067<br>.253<br>.000                                                           | / C<br>Used<br>. 667<br>. 267<br>. 367<br>. 367<br>. 367<br>. 367<br>. 267                   | Servi<br>  @C (v<br>  2448<br>  551<br>  1331<br>  94<br>  844<br>  437                                                                | ce Rate<br>(ph) @E<br>  2448<br>  590<br>  1373<br>  120<br>  872<br>  872<br>  497                   | Adj<br> Volume<br>  1072<br>  206<br>  878<br>  19<br>  19                                                                                              | ∨/c<br>  .438<br>  .349<br>  .639<br>  .152<br>  .047<br>.078                         | HCM<br>  Delay<br>3.2<br>  3.1<br>  3.8<br>  10.8<br>  10.9<br>  8.3<br>  7.3<br>  3.7<br>  10.6                                 | L<br>  S<br>  A<br>  * A<br>  * A<br>  * B<br>  8+<br>  8+<br>  8+                     | 90%  <br>  Quet<br>  151<br>  58<br>  234<br>  25<br>  25<br>  25 | ft <br>ft <br>ft <br>ft                                    |
| Lane<br>  Group<br>SB-Appro<br>  TH+R<br>  LT<br>  LT<br>  LT<br>  LT<br>  B<br>B<br>Appro<br>  RT<br>  TH<br>  LT<br>  J<br>B      | Width/<br>  Lanes<br>ach<br>T  24/2  <br>  12/1  <br>ach<br>T  24/2  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1 | 9<br>Reqd<br>. 307<br>. 067<br>. 067<br>. 000<br>. 047<br>. 038<br>. 000                            | / C<br>Used<br>. 667<br>. 267<br>. 367<br>. 367<br>. 367<br>. 367<br>. 267<br>. 267<br>. 267 | Servi<br>  @C (v<br>  2448<br>  551<br>  1331<br>  94<br>  1331<br>  94<br>  437<br>  330                                              | ce Rate<br>(ph) @E<br>  2448<br>  590<br>  1373<br>  120<br>  872<br>  497<br>  386                   | Adj<br> Volume<br>  1072<br>  206<br>  878<br>  19<br>  41<br>  39<br>  4                                                                               | v/c<br>  .438<br>  .349<br>  .639<br>  .152<br>  .047<br>.078<br>  .010               | <pre>  HCM<br/>  Delay<br/>3.2<br/>  3.1<br/>  3.8<br/>  0.8<br/>  10.8<br/>  10.9<br/>  8.3<br/>7.3<br/>  10.6<br/>  10.5</pre> | L<br>  S<br>  A<br>  * A<br>  * A<br>  * B<br>  B+<br>  * B<br>  * B<br>  * B<br>  * B | 90%  <br>  Quet<br>  151<br>  58<br>  234<br>  25<br>  25<br>  25 | ft <br>ft <br>ft <br>ft                                    |
| Lane<br>  Group<br>SB-Appro<br>  TH+R<br>LT<br>  LT<br>  LT<br>  LT<br>  B<br>B<br>Appro<br>  RT<br>TH<br>LT<br>  LT                | Width/<br>  Lanes<br>ach<br>T  24/2  <br>  12/1  <br>ach<br>T  24/2  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1 | 9<br>Reqd<br>.307<br>.067<br>.067<br>.0253<br>.000                                                  | / C<br>Used<br>. 667<br>. 267<br>. 367<br>. 367<br>. 367<br>. 367<br>. 267<br>. 267<br>. 267 | Servi<br>  @C (v<br>  2448<br>  551<br>  1331<br>  94<br>  1331<br>  94<br>  844<br>  437<br>  330                                     | ce Rate<br>(ph) @E<br>  2448<br>  590<br>  1373<br>  120<br>  872<br>  497<br>  386                   | Adj<br> Volume<br>  1072<br>  206<br>  878<br>  19<br>  41<br>  39<br>  4                                                                               | ∨/c<br>  438<br>  .349<br>  .639<br>  .152<br>  .047<br>.078<br>  .010                | HCM<br>  Delay<br>3.2<br>  3.1<br>  3.8<br>  3.8<br>  10.8<br>  10.9<br>  8.3<br>  10.9<br>  8.3<br>  10.6<br>  10.5<br>  10.7   | L<br>  S<br>  A<br>  * A<br>  * A<br>  * B<br>  B+<br>  * B<br>  B<br>  * B<br>  B     | 90%  <br>Quei<br>151<br>58<br>234<br>25<br>25<br>25<br>25<br>25   | ft <br>ft <br>ft <br>ft <br>ft                             |
| Lane<br>  Group<br>SB-Appro<br>  TH+R<br>  LT<br>WB Appro<br>TH+R<br>LT<br>BB<br>RT<br>TH<br>LT<br>SB<br>BC<br>Appro<br>BC<br>Appro | Width/<br>  Lanes<br>ach<br>T  24/2  <br>  12/1  <br>ach<br>T  24/2  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1 | 9<br>Reqd<br>. 307<br>. 067<br>. 067<br>. 253<br>. 000<br>. 047<br>. 038<br>. 000<br>. 038<br>. 000 | / C<br>Used<br>. 667<br>. 267<br>. 367<br>. 367<br>. 367<br>. 367<br>. 267<br>. 267<br>. 267 | Servi<br>  @C (v<br>  2448<br>  551<br>  1331<br>  94<br>  1331<br>  94<br>  1331<br>  94<br>  1331<br>  34<br>  330<br>  353<br>  437 | ce Rate<br>(ph) @E<br>  2448<br>  590<br>  1373<br>  120<br>  872<br>  497<br>  386<br>  410<br>  497 | Adj<br> Volume<br>  1072<br>  206<br>  878<br>  19<br>  878<br>  19<br>  41<br>  39<br>  4<br>  41<br>  39<br>  4<br>  41<br>  39<br>  4<br>  39<br>  4 | <pre>/ v/c / .438 / .349 / .639 / .152 / .047 .078 .010 / .078 .010 / .066 .127</pre> | HCM<br>  Delay<br>3.2<br>  3.1<br>  3.8<br>  3.8<br>  10.8<br>  10.9<br>  8.3<br>7.3<br>  10.6<br>  10.5<br>  10.7<br>  10.6     | L<br>  S<br>  A<br>  * A<br>  * A<br>  * B<br>  B+<br>  * B<br>  B<br>  B<br>  B       | 90%  <br>Quei<br>151<br>58<br>234<br>25<br>25<br>25<br>25         | ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft <br>ft |

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# SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int 8 0 - PUKALAHI BYPASS & MAKAWAO AV

NETROAREA Losttine NONCOD 2.1 LEVELOFSERVICE C 5 NODELOCATION I .

Approach Parameters

|                 | EB   | 58   | WB   | NB   |
|-----------------|------|------|------|------|
| APPLABELS       | -58- | -#8  | -#8  | -63  |
| GRADES          | 6.1  | .1   | -6.1 | .1   |
| PEOLEVELS       | LOW  | LOW  | LOW  | LOW  |
| PARKINGSIDES    | NONE | NONE | NOXE | NONE |
| PARKVOLUKES     | 21   | 21   | 21   | 20   |
| BUSVOLUNES      |      | 4    | 1    | ŧ    |
| RIGHTTURNONREDS | 12   | 94   | 236  | 1    |

#### Novement Parameters

| KOVLABELS       | RT   | TH   | LT   | RT    | TH   | LT   | RT   | TH   | LT   | RT   | TH   | LT          |
|-----------------|------|------|------|-------|------|------|------|------|------|------|------|-------------|
| VOLUNES         | 12   | 485  | 134  | 375   | 388  | 483  | 273  | 919  | 2    | 21   | 163  | 22          |
| WIDTHS          | 12.4 | 24.8 | 12.4 | 12.1  | 12.0 | 12.0 | 12.0 | 24.1 | 12.4 | 12.4 | 12.0 | 12.4        |
| LANES           | 1    | 2    | 1    | 1     | 1    | 1    | 1    | 2    | 1    | 1    | 1    | 1           |
| UTILIZATIONS    | 1.00 | 1.0  | 1.11 | 1.11  | 1.80 | 1.44 | 1.11 | 1.#  | 1.00 | 1.00 | 1.11 | 1.00        |
| TRUCKPERCENTS   | 2.0  | 2.1  | 2.0  | 2.1   | 2.1  | 2.1  | 2.1  | 2.1  | 2.1  | 2.1  | 2.1  | 2.4         |
| PEAKHOURFACTORS | .95  | .95  | . 95 | .95   | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95         |
| ARRIVALTYPES    | 3    | 3    | 3    | 3     | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3           |
| ACTUATIONS      | NO   | YES  | YES  | NO    | YES  | YES  | NO   | YES  | YES  | NO   | YES  | YES         |
| REQCLEARANCES   | 4.4  | 4.1  | 4.1  | - 4.4 | 1.1  | 4.1  | 4.4  | 4.4  | 4.1  | 4.1  | 4.4  | <b>{.</b> ] |
| MINIMUNS        | 5.1  | 5.1  | 5.1  | 5.1   | 5.1  | 5.1  | 5.1  | 5.ł  | \$.I | 5.1  | 5.\$ | 5.4         |
| IDEALSATFLOWS   | 1988 | 1988 | 1988 | 1986  | 1986 | 1940 | 1944 | 1988 | 1900 |      | 1988 |             |
| FACTORS         | 1.00 | 1.11 | 1.80 | 1.00  | 1.88 | 1.10 | 1.0  | 1.11 | 1.11 |      | 1.11 |             |
| DELAYFACTORS    | 1.00 | 1.44 | 1.00 | 1.11  | 1.40 | 1.88 | 1.44 | 1.11 | 1.11 |      | 1.00 |             |
| NSTOPFACTORS    | 1.11 | 1.11 | 1.11 | 1.11  | 1.#  | 1.10 | 1.0  | 1.8  | 1.11 |      | 1.11 |             |
| GROUPTYPES      | NORN | NORN | KORN | NORN  | NORN | NORK | HORN | NORN | NORN | NORN | NORK | NORN        |
| SATURATIONFLOWS | 1493 | 3614 | 1717 | 1539  | 1853 | 1771 | 1585 | 3837 | 676  | 1539 | 1863 | 819         |

## Phasing Parameters

| SEQUENCES   | 22   | ALL   |       |      |          |      |      |  |
|-------------|------|-------|-------|------|----------|------|------|--|
| PERNISSIVES | YES  | YES   | YES   | YES  | LEADLAGS | NONE | NONE |  |
| OVERLAPS    | YES  | YES   | YES   | YES  | OFFSET   | .11  | 1    |  |
| CYCLES      | 61   | 180   | 11    |      | PEDTIKE  | . •  | 1    |  |
| GREENTINES  | 6.63 | 17.87 | 12.39 | 7.11 |          |      |      |  |
| YELLOWTIKES | 4.48 | 4.41  | 4.8   | 4.14 |          |      |      |  |
| CRITICALS   | 3    | 8     | 6     | 11   |          |      |      |  |
| EXCESS      |      |       |       |      |          |      |      |  |

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## SIEWAL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary

# Intersection Averages for Int # # - PUKALANI BYPASS & MAKAWAO AV Degree of Saturation (v/c) .55 Vehicle Delay 10.3 Level of Service B

| q 22 | Phase 1     | Phase 2     | Phase 3   | Phase 4   |
|------|-------------|-------------|-----------|-----------|
| -1   | + + • *     | ] + + +     | ^         |           |
|      | j + + + ++· |             | ++++      | j. ++++   |
| /IV  | (+ + +)     | (+ + +)     | (++++     | (+++4     |
| 1    | V V         | v l         | ****      | * ++++    |
| ulst | 1           | 1 1         | v         | ++++ v    |
| orth | 1           | · (+ • +)   | +>        | ****>     |
|      | 1           | + • • •     | +         | ++++      |
|      | 1           | ·   + * +   | •         | v         |
|      | 6/C= .110   | 6/2= .298   | 6/C= .207 | G/C= .118 |
|      |             | 6- 17.9"    |           |           |
|      | Y+R= 4.8*   | Y+R= 4.0" [ | Y+R= 4.0" | Y+R= 4.8" |
|      | 0FF= .#3    | 0FF=17.7%   | 0FF=54.2% | OFF=81.51 |

| ei<br>H     | 3<br>'Appr | aac            | h |         |   |    |           |        |           |        |     |           |          |             |   |    |          |   |            |     | 5.8         |   | 8+ |     |              |
|-------------|------------|----------------|---|---------|---|----|-----------|--------|-----------|--------|-----|-----------|----------|-------------|---|----|----------|---|------------|-----|-------------|---|----|-----|--------------|
| •==<br>{    | 8 T        | ***            |   | <br>2/1 | - | ** | <br>    2 | ==<br> | <br><br>  | **<br> | *** | ===<br>23 | •••      | 759         |   |    | ==:<br>1 | . | <br>       | ••• | •••••       |   |    | 2   | ••••<br>5 ft |
|             | TH<br>LT   |                |   | •       | • |    |           |        |           |        |     |           | •        | 1837<br>367 |   |    |          |   | 278<br>384 | •   | 5.5         | İ | 8+ | 100 | i ft         |
| VE<br>He    | s<br>Appr  |                | h |         |   |    |           |        | <br>      |        |     |           |          |             |   |    |          |   |            |     | 13.1        |   | B  |     | •===         |
|             | RT<br>TK   |                |   | · ·     | - |    |           |        |           |        |     |           |          | 958         |   | 3  |          |   |            |     |             |   |    |     | ft           |
|             | LT         |                |   | •       |   |    |           |        |           | •      |     |           |          | 1271<br>207 | • | 96 |          |   |            | •   | 13.5<br>8.7 |   | •  |     |              |
| ю<br>В<br>В | Appri      |                | ) |         |   |    |           |        | <br>      |        |     |           |          |             |   |    |          |   |            |     | 9.1         |   | B+ |     |              |
|             | RT         |                |   | · ·     |   |    |           |        | 12        |        | 91  |           | <u>.</u> |             |   |    |          |   |            |     | 3.9         |   |    |     |              |
|             | TH<br>Lt   |                |   | •.      |   |    |           | •      | 25<br>4 B |        |     | 8         | •        | 792<br>548  |   |    |          |   |            |     | 8.4<br>13.4 | • |    |     |              |
| B           | <b>-</b> · |                |   |         |   |    |           |        | <br>      |        |     |           |          |             |   |    |          |   |            |     |             |   |    |     |              |
| Б.          | Appro      | ) <b>a</b> c i |   |         |   |    |           |        |           |        |     |           |          |             |   |    |          |   |            |     | 17.3        |   | £+ |     |              |

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KULANALU MASTER PLAN W/NIT PR PEAK HOUR

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# SIGHAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

# Intersection Parameters for Int 8 0 - PUKALAKI BYPASS & MAKAWAO AV

| NETROAREA      | NO | 0831 |
|----------------|----|------|
| LOSTTINE       |    | 2.1  |
| LEVELOFSERVICE | c  | S    |
| NODELOCATION   | 8  | 1    |

#### Approach Parameters

| EB   | 5B                                           | WB               | NB                                                                             |
|------|----------------------------------------------|------------------|--------------------------------------------------------------------------------|
| -82- | -#5                                          | -#5              | -83-                                                                           |
| 6.0  | .1                                           | -5.8             | .1                                                                             |
| LOW  | LOW                                          | LOW              | LOW                                                                            |
| NONE | NONE                                         | NONE             | NONE                                                                           |
| 24   | 28                                           | 21               | 20                                                                             |
| •    | 1                                            | 1                |                                                                                |
| 14   | 183                                          | 138              | 1                                                                              |
|      | - <del>50-</del><br>6.0<br>Low<br>Kone<br>20 | - <del>50-</del> | -5048 -88<br>6.0 .0 -6.0<br>LOW LOW LOW<br>NONE NONE NONE<br>20 20 20<br>0 0 0 |

#### Novement Parameters

| ROVLABELS         | RT   | TH   | LT   | RT   | TH   | LT   | RT   | 78   | LT   | RT   | TH   | Ľ    |
|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| VOLUMES           | - 44 | 682  | 278  | 183  | 313  | 239  | 317  | 698  | 2    | 9    | 316  | 21   |
| WIDTHS            | 12.8 | 24.8 | 12.0 | 12.0 | 12.4 | 12.8 | 12.8 | 24.8 | 12.  | 12.1 | 12.4 |      |
| LAXES             | 1    | 2    | 1    | 1    | 1    | 1    | 1    | 2    | 1    | 1    | 1    | 1    |
| UTILIZATIONS      | 1.80 | 1.44 | 1.44 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.11 | 1.88 | 1.11 |
| TRUCKPERCENTS     | 2.1  | 2.1  | 2.4  | 2.0  | 2.1  | 2.1  | 2.0  | 2.1  | 2.1  | 2.1  | 2.1  | 2.4  |
| PEAKHOURFACTORS   | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  | .95  |
| ARRIVALTYPES      | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| ACTUATIONS        | NO   | YES  | YES  | NO   | YES  | YES  | NO   | YES  | YES  | NO   | YES  | YES  |
| REQCLEARANCES     | 4.8  | 4.1  | 4.1  | 4.1  | 4.1  | 4.1  | 1.1  | 4.1  | 4.1  | 1.1  | 4.4  | 4.1  |
| NININUNS          | 5.1  | 5.0  | 5.4  | 5.1  | 5.8  | 5.1  | 5.1  | 5.4  | 5.1  | 5.4  | 5.8  | 5.4  |
| IDEALSATFLOWS     | 1944 | 1988 | 1948 | 1908 | 1988 | 1900 | 1988 | 1988 | 1988 | 1984 | 1988 |      |
| FACTORS           | 1.66 | 1.0  | 1.88 | 1.88 | 1.00 | 1.11 | 1.49 | 1.41 | 1.04 | 1.84 |      |      |
| DELAYFACTORS      | 1.8  | 1.00 | 1.11 | 1.88 | 1.60 | 1.88 |      | 1.11 |      | 1.00 |      |      |
| NSTOPFACTORS      | 1.00 | 1.88 | 1.11 | 1.88 | 1.88 | 1.44 |      | 1.11 |      | 1.80 |      | 1.10 |
| <b>GROUPTYPES</b> | NORN | NORN | NORM | NORM | NORN | NORX |      | NORM |      | NORM |      |      |
| SATURATIONFLOWS   | 1493 | 3614 | 1717 | 1539 | 1863 | 1778 |      | 3837 | 464  | 1539 |      |      |

#### Phasing Parameters

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| SEQUENCES   | 24   | ALL   |      |       |          |      |      |
|-------------|------|-------|------|-------|----------|------|------|
| PERMISSIVES | YES  | YES   | YES  | YES   | LEADLAGS | NOKE | NONE |
| OVERLAPS    | YES  | YES   | YES  | YES   | OFFSET   | . 11 | 1    |
| CYCLES      | 60   | 129   | 10   |       | PEDTIME  |      |      |
| GREENTINES  | 7.64 | 14.55 | 7.15 | 14.56 |          |      | •    |
| YELLOWTINES | 4.00 | 4.40  | 4.44 | 4.48  |          |      |      |
| CRITICALS   | 3    | 8     | 6    | 11    |          |      |      |
| EXCESS      | 1    |       |      |       |          |      |      |

KULAHALU RASTER PLAN W/NIT PH PEAK HOUR

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# SIGNAL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary

# Intersection Averages for Int # # - PUKALAHI BYPASS & WAKAWAD AV Degree of Saturation (v/c) .57 Vehicle Delay 11.1 Level of Service B

| Phase 1    | Phase 2                                                | Phase 3                                                                                                                                                                                                                                    | Phase t                                               |
|------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| •          | <br>  + + +                                            | <b></b> -<br>  +                                                                                                                                                                                                                           | -                                                     |
| + + * ++++ | + + +                                                  | 1+                                                                                                                                                                                                                                         | Í ++++                                                |
| (+ + +)    | (+ + +)                                                | İ(+                                                                                                                                                                                                                                        | i (++++                                               |
| l v        | v                                                      | - ++++                                                                                                                                                                                                                                     | ++++                                                  |
| 1          | ^                                                      | ++++ v                                                                                                                                                                                                                                     |                                                       |
|            | (+ * +)                                                | +}                                                                                                                                                                                                                                         | ••••                                                  |
|            | + + +                                                  |                                                                                                                                                                                                                                            | ****                                                  |
| 1 1        | • • • •                                                | +                                                                                                                                                                                                                                          | v j                                                   |
|            |                                                        |                                                                                                                                                                                                                                            |                                                       |
| 6/C= .127  | 6/C= .243                                              | 6/C= .119                                                                                                                                                                                                                                  | 6/C= .244 j                                           |
| 6= 7.6*    | 6= 14.6*                                               | 6= 7.2*                                                                                                                                                                                                                                    | 6= 14.7"                                              |
| Y+R= 4.8"  | Y+R= 4.8*                                              | Y+R= 4.8"                                                                                                                                                                                                                                  | Y+R= 4.4" j                                           |
|            |                                                        | 0FF=58.31                                                                                                                                                                                                                                  |                                                       |
|            | + + + -<br>  + + * ++++<br>  (+ + *)<br>  V<br>  V<br> | + + * -   + + +<br>  + + * ++++   + + +<br>  (+ + *)   (+ + +)<br>  v   v<br>  (+ * +)<br>  (+ * +)<br>  (+ * +)<br>  + * +<br>  + * +<br>  + * +<br>  + * +<br>  + * + +<br>  + * + +<br>  + + + +<br>  + + + +<br>  + + + +<br>  + + + + | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ |

# C= 68 sec 6= 44.8 sec = 73.3% Y=16.8 sec = 26.7% Ped= .8 sec = .8%

| •       | Lane<br>Grou   |       |    |    |   |     |     | Rec | łq | 9/ | (<br>เ | se  | d | <br> | S:<br>Qi         | erv<br>C (   | vic<br>(vp | :e<br>:h} | Ra<br>Bi         | te<br>E | V       | Ad<br>1u         | j<br>ne | <br> | v              | /¢  |       | H<br>De | CH<br>1a | y . |       | L<br>5 | 90<br> 90           | 1<br>1 | Na:<br>Ue |
|---------|----------------|-------|----|----|---|-----|-----|-----|----|----|--------|-----|---|------|------------------|--------------|------------|-----------|------------------|---------|---------|------------------|---------|------|----------------|-----|-------|---------|----------|-----|-------|--------|---------------------|--------|-----------|
| E       | B<br>Mppri     | ) & C | h  |    |   |     |     |     | -  |    |        |     |   |      |                  | •••          |            |           |                  |         |         |                  | •       |      | •••            |     | •     | ** •    | 8.3      | 3   |       | ]+     |                     |        |           |
|         | RT<br>TH<br>LT | 1     | Z  | 4/ | Z |     | ٠   | 21  | 9  | L  | •      | 47  | ł | Ł    | 16               | 82           | 1          | 1         | 698              |         |         | 32<br>718<br>293 | 3       | Ι.   | 42             | 3   | 1     | ł       | 6.9      | )   | 8     | +      | 10<br>11            | 1      | f         |
| W<br>Ж  | B<br>Appro     | acl   | 1  |    |   |     |     |     |    |    | ••••   | •   |   |      |                  |              | ••         |           |                  |         |         |                  | •       |      |                |     |       | 12      | 2.4      |     | 8     |        |                     |        |           |
|         | RT<br>Th<br>LT | L     | 24 | ų  | 2 | Ł   | •   | 211 | L  |    | .2     | 76  | 1 |      | 9                | 98           |            | 11        | 32<br>59<br>22   | 1       | 1       |                  | 1       | •    | 69             | • ] | 1     | 14      |          | Ì   | • 8   | Ì      | ***<br>8<br>22<br>2 |        | ft        |
| 5B<br>H | Approa         | ch    |    |    |   |     |     |     |    | •- |        |     |   |      |                  |              | •          |           |                  | •••     |         |                  |         |      |                |     | •     |         | <br>. 2  |     | 8     |        |                     |        | •••       |
|         | TH             |       | 12 | /1 |   |     | . 2 | 10  | 1  |    | 2      | 78  | 1 |      | (5               | 16<br>7<br>8 | Ì          | 5         | 26<br>17<br>74   |         | 3       | 29               | 1       | .(   | 538            | ; [ |       | 14      | .1       | Ì   | 8     | Ì      | 24<br>24<br>11 (    | 1      | İt        |
| VB<br>X | Ipproa         | ch    | •  |    |   | ••• |     |     |    |    | •      | ••• |   |      |                  |              |            |           |                  |         | <b></b> |                  |         |      | •••            |     | <br>1 |         |          |     | <br>B |        |                     |        | -         |
|         | TK             |       | 2, | 1  | I | ٠   | 21  | 12  | 1  | •  | 21     | 8   | Ĺ | 1    | 37<br>15.<br>35: | 7            | İ          | 51        | 7<br>7<br>7<br>4 | İ       | 33      | 8                | İ       | .6   | ==<br>19<br>44 | i   | 1     | ł.      | 3        | ŀ   | 8     | Į.     | 25<br>243<br>25     | f      | ŧİ        |

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# SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int # 0 - BYPASS/KULA HWY & HALEAKALA HY

| METROAREA      | NOM | ICBD |
|----------------|-----|------|
| LOSTTIME       |     | 2.0  |
| LEVELOFSERVICE | С   | S    |
| NODELOCATION   | Ø   | ø    |

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#### Approach Parameters

| APPLABELS       | SB   | WB   | NB   | EB   |
|-----------------|------|------|------|------|
| GRADES          | 6.0  | .0   | -6.0 | .0   |
| PEDLEVELS       | LOW  | LOW  | LOW  | LOW  |
| PARKINGSIDES    | NONE | NONE | NONE | NONE |
| PARKVOLUMES     | 20   | 20   | 20   | 20   |
| BUSVOLUMES      | 0    | 0    | 0    | 0    |
| RIGHTTURNONREDS | 1    | 65   | 44   | 127  |

#### Movement Parameters

| VOLUMES       1       830       93       109       35       64       92       1104       182       295       41       1         WIDTHS       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0                                                                                                                                                                                                  | MOVLABELS       | ŔŢ   | тн   | LT   | RT   | тн   | LT   | RT   | тн   | LΤ   | вт   | тн   | LI    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------|------|------|------|------|------|------|------|------|------|------|-------|
| WIDTHS       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0       12.0                                                                                                                                                                                   | VOLUMES         | 1    | 830  | 93   | 109  | 35   |      |      |      |      |      |      | 1     |
| LANES       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1 <td>WIDTHS</td> <td>12.0</td> <td>12.0</td> <td>12.0</td> <td>12.0</td> <td>12.0</td> <td>.0</td> <td>12.0</td> <td>12.0</td> <td>12.0</td> <td>12 0</td> <td></td> <td>i</td>                                                                                                                                                                 | WIDTHS          | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | .0   | 12.0 | 12.0 | 12.0 | 12 0 |      | i     |
| UTILIZATIONS       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00 <td>LANES</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td></td> <td>1</td> <td></td> <td></td> <td>1</td> <td>12.0</td> <td>· · ·</td>                      | LANES           | 1    | 1    | 1    | 1    | 1    |      | 1    |      |      | 1    | 12.0 | · · · |
| TRUCKPERCENTS       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0                                                                                                                                                                                                                              | UTILIZATIONS    | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | . –  | 1.00 | 1.00 | 1.00  |
| PEAKHOURFACTORS       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95       .95                                                                                                                                                                                                                            | TRUCKPERCENTS   | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  |      |      |      |      |       |
| ARRIVALTYPES       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3 <t< td=""><td>PEAKHOURFACTORS</td><td>.95</td><td>.95</td><td>.95</td><td>.95</td><td>.95</td><td>.95</td><td>. 95</td><td>. 95</td><td>. 95</td><td></td><td></td><td></td></t<>                                                                                                                                                               | PEAKHOURFACTORS | .95  | .95  | .95  | .95  | .95  | .95  | . 95 | . 95 | . 95 |      |      |       |
| REQCLEARANCES       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0       4.0                                                                                                                                                                                                                              | ARRIVALTYPES    | 3    | 3    | 3    | 3    | 3    | 3    |      |      |      |      |      |       |
| MINIMUMS       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0       5.0                                                                                                                                                                                                                                   |                 | NO   | YES  | YES  | NO   | YES  | YES  | NO   | YES  | YES  | NO   | -    | YES   |
| IDEALSATFLOWS       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1900       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00 </td <td></td> <td>4.0</td> <td>4.0</td> <td>4.0</td> <td>4.0</td> <td>4.0</td> <td>4.0</td> <td>4.0</td> <td>4.0</td> <td>4.0</td> <td>4.0</td> <td>4.0</td> <td>4.9</td> |                 | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.0  | 4.9   |
| FACTORS       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00                                                                                                                                                                                  |                 | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.4   |
| DELAYFACTORS         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00                                                                                          |                 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1904  |
| NSTOPFACTORS         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00         1.00                                                                                          |                 |      | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| GROUPTYPES NORM NORM NORM NORM NORM NORM NORM NORM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| SATURATIONELOUS 1402 1907 1717 4500 4500 ANNA NORA NORA NORA NORA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                 |      |      | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |
| SATURATIONFLOWS 1493 1807 1717 1539 1562 A 1595 1010 1000 1500 4047                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                 |      |      | NORM | NORM | NORM | NORM | NORM | NORM | NORM | NORM | NORM | NORM  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | SATURATIONFLOWS | 1493 | 1807 | 1717 | 1539 | 1562 | Ø    | 1585 | 1919 | 1823 | 1539 | 1847 | ç     |

## Phasing Parameters

•

| SEQUENCES   | 41   | ALL   |      |       |          |      |      |
|-------------|------|-------|------|-------|----------|------|------|
| PERMISSIVES | YES  | YES   | YES  | YES   | LEADLAGS | NONE | NONE |
| OVERLAPS    | YES  | YES   | YES  | · YES | OFFSET   | .00  | 1    |
| CYCLES      | 60   | 120   | 10   |       | PEDTIME  | .0   | ç    |
| GREENTIMES  | 5.44 | 37.12 | 5.44 |       |          |      | , t  |
| YELLOWTIMES | 4.00 | 4.00  | 4.00 |       |          |      |      |
| CRITICALS   | 3    | 8     | 5    |       |          |      |      |
| EXCESS      | 0    |       |      |       |          |      |      |

and the second second second second second second second second second second second second second second second

|                                                                                        | LU<br>W/PROJ & I<br>K HOUR                                                                                                  | MIT                                                                        |                                                      |                                                                       |                                                  |                                                                                            |                                                              |                                                                          |                                                                                                  | 03/27/9<br>17:26:0                                            |
|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| SIGNAL                                                                                 | 94/TEAPAC[                                                                                                                  | V1 L1.4                                                                    | ] — Cap                                              | acity A                                                               | nalysis                                          | s Summar                                                                                   | У                                                            |                                                                          |                                                                                                  |                                                               |
|                                                                                        | ection Ave<br>Degree of S                                                                                                   |                                                                            |                                                      |                                                                       |                                                  | S/KULA H<br>le Dela                                                                        |                                                              |                                                                          |                                                                                                  | Service                                                       |
| Sq 41                                                                                  | Phase 1                                                                                                                     | Ph                                                                         | ase 2                                                | Phas                                                                  | e 3                                              |                                                                                            |                                                              |                                                                          |                                                                                                  |                                                               |
| **/**                                                                                  | <br>  * ^                                                                                                                   |                                                                            | +                                                    |                                                                       |                                                  |                                                                                            |                                                              |                                                                          |                                                                                                  |                                                               |
|                                                                                        | j * ++-                                                                                                                     | ++ + + +                                                                   | +                                                    | Ì                                                                     | ++++                                             |                                                                                            |                                                              |                                                                          |                                                                                                  |                                                               |
|                                                                                        | · *>                                                                                                                        | (+ +                                                                       | +>                                                   | <b>^</b>                                                              | <                                                |                                                                                            |                                                              |                                                                          |                                                                                                  |                                                               |
| İ                                                                                      | İ .                                                                                                                         | ļ                                                                          | ~                                                    | ++++                                                                  | v                                                |                                                                                            |                                                              |                                                                          |                                                                                                  |                                                               |
| North<br>1                                                                             | <b>(+</b><br> ++++ +                                                                                                        |                                                                            | <+ * +><br>+ * ±                                     | ++++>                                                                 | ł                                                |                                                                                            |                                                              |                                                                          |                                                                                                  |                                                               |
| ,                                                                                      | V +                                                                                                                         | j                                                                          | + * +                                                |                                                                       | 1                                                |                                                                                            |                                                              |                                                                          |                                                                                                  |                                                               |
|                                                                                        |                                                                                                                             |                                                                            |                                                      |                                                                       |                                                  |                                                                                            |                                                              |                                                                          |                                                                                                  |                                                               |
|                                                                                        | G/C= .091<br>  G=   5.4"                                                                                                    | •                                                                          | = .619<br>37.1"                                      |                                                                       | .051  <br>5.4"                                   |                                                                                            |                                                              |                                                                          |                                                                                                  |                                                               |
|                                                                                        | Y+R= 4.0"                                                                                                                   |                                                                            | = 4.0"                                               | Y+R=                                                                  |                                                  |                                                                                            |                                                              |                                                                          |                                                                                                  |                                                               |
|                                                                                        | OFF= .0%                                                                                                                    |                                                                            | =15.7%<br>                                           | OFF=8                                                                 | 4.3%  <br>                                       |                                                                                            | н.<br>С                                                      |                                                                          |                                                                                                  |                                                               |
| I                                                                                      | C= 60 sec                                                                                                                   | G≕ 48.                                                                     | .0 sec                                               | = 80.0%                                                               | Y=12.                                            | 0 sec =                                                                                    | 20.0%                                                        | Ped=                                                                     | .0 se                                                                                            | c = .0                                                        |
|                                                                                        |                                                                                                                             |                                                                            |                                                      |                                                                       |                                                  |                                                                                            | <b></b>                                                      |                                                                          |                                                                                                  |                                                               |
| Lane                                                                                   | Width/                                                                                                                      |                                                                            |                                                      | Servi                                                                 |                                                  |                                                                                            |                                                              | нсм                                                                      |                                                                                                  | 90% Max                                                       |
| Grot                                                                                   | up   Lanes                                                                                                                  | Reqa                                                                       | Used                                                 | @C (v                                                                 | ph) @E<br>                                       | Volume                                                                                     | / v/c                                                        | Delay                                                                    | S                                                                                                | Опепе                                                         |
|                                                                                        |                                                                                                                             |                                                                            |                                                      |                                                                       |                                                  |                                                                                            |                                                              |                                                                          |                                                                                                  |                                                               |
| SB Appi                                                                                | oacn                                                                                                                        |                                                                            |                                                      |                                                                       | *******                                          |                                                                                            |                                                              | 6.6<br>=======                                                           | 8+<br>=====                                                                                      |                                                               |
|                                                                                        |                                                                                                                             |                                                                            |                                                      | 1 050                                                                 |                                                  |                                                                                            |                                                              |                                                                          |                                                                                                  |                                                               |
| RT                                                                                     |                                                                                                                             | .002                                                                       | .652                                                 |                                                                       |                                                  | 1                                                                                          | .001                                                         |                                                                          | A                                                                                                | 25 ft                                                         |
| і тн                                                                                   | 12/1                                                                                                                        | .503                                                                       | .652                                                 | 1169                                                                  | 1178                                             | 1<br>  874                                                                                 | .742                                                         | 6.3                                                                      | B+                                                                                               | 257 ft                                                        |
| •                                                                                      |                                                                                                                             | .503                                                                       | .652                                                 | 1169                                                                  | 1178                                             | 1<br>  874                                                                                 | .742                                                         | 6.3                                                                      | B+                                                                                               | 257 ft                                                        |
| TH<br>  LT<br><br>NB Appr                                                              | 12/1  <br>  12/1  <br>  0ach                                                                                                | .503  <br>.009  <br>                                                       | .652<br>.124                                         | 1169<br>  285                                                         | 1178<br>  333<br>                                | 1<br>  874  <br>  98                                                                       | .742<br>.294                                                 | 6.3<br>8.7<br>13.2                                                       | B+ <br> *B+ <br>                                                                                 | 257 ft<br>51 ft                                               |
| TH<br>  LT<br><br>NB Appr                                                              | 12/1  <br>  12/1  <br>  0ach                                                                                                | .503  <br>.009  <br>                                                       | .652<br>.124                                         | 1169<br>  285                                                         | 1178                                             | 1  <br>  874  <br>  98                                                                     | .742                                                         | 6.3<br>8.7<br>13.2                                                       | B+ <br> *B+ <br> *B+ <br>                                                                        | 257 ft<br>51 ft                                               |
| I TH<br>LT<br>NB Appr<br>RT<br>TH                                                      | 12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                                                        | .503  <br>.009  <br>.0055  <br>.613                                        | .652<br>.124<br>.652<br>.652                         | 1169<br>  285<br>  1019<br>  1244                                     | 1178<br>333<br>1034<br>1251                      | 1  <br>  874  <br>  98  <br>  51  <br>  1162                                               | .742<br>.294<br>.049<br>.049                                 | 6.3<br>8.7<br>13.2<br>2.4<br>14.8                                        | B+ <br> *B+ <br> <br> *B <br>  A  <br> *B                                                        | 257 ft<br>51 ft<br>25 ft<br>25 ft<br>341 ft                   |
| TH<br>  LT<br>NB Appr<br>  RT                                                          | 12/1  <br>  12/1  <br>oach                                                                                                  | .503  <br>.009  <br>.0055  <br>.613                                        | .652<br>.124<br>.652<br>.652                         | 1169<br>  285<br>  1019<br>  1244                                     | 1178<br>333<br>1034<br>1251                      | 1  <br>  874  <br>  98  <br>  51  <br>  1162                                               | .742<br>.294<br>.049<br>.049                                 | 6.3<br>8.7<br>13.2<br>2.4<br>14.8                                        | B+ <br> *B+ <br> <br> *B <br>  A  <br> *B                                                        | 257 ft<br>51 ft<br>25 ft<br>25 ft<br>341 ft                   |
| I TH<br>LT<br>NB Appr<br>I RT<br>I TH<br>LT                                            | 12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                                | .503  <br>.009  <br>.055  <br>.613  <br>.052                               | .652<br>.124<br>.652<br>.652<br>.124                 | 1169<br>  285<br>  1019<br>  1244<br>  312                            | 1178<br>333<br>1034<br>1251<br>354               | 1<br>  874<br>  98<br>  51<br>  1162<br>  192                                              | .742<br>.294<br>.049<br>.929<br>.542                         | 6.3<br>8.7<br>13.2<br>2.4<br>14.8<br>6.8                                 | B+<br> *B+ <br>B<br> A <br> *B <br> B+                                                           | 257 ft<br>51 ft<br>25 ft<br>341 ft<br>53 ft                   |
| I TH<br>LT<br>NB Appr<br>RT<br>TH<br>LT<br>WB Appr                                     | 12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                                | .503  <br>.009  <br>.055  <br>.613  <br>.052                               | .652<br>.124<br>.652<br>.652<br>.124                 | 1169<br>  285<br>  1019<br>  1244<br>  312                            | 1178<br>333<br>1034<br>1251<br>354               | 1  <br>  874  <br>  98  <br>  51  <br>  1162  <br>  192                                    | .742<br>.294<br>.049  <br>.929  <br>.542                     | 6.3<br>8.7<br>13.2<br>2.4<br>14.8<br>6.8<br>15.8                         | B+ <br> *B+ <br> *B+ <br> A <br> *B <br> B+ <br>C+                                               | 257 ft<br>51 ft<br>25 ft<br>341 ft<br>53 ft                   |
| TH<br>  LT<br>NB Appr<br>  RT<br>  TH<br>  LT<br>WB Appr<br>  RT                       | 12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                                                | .503  <br>.009  <br>.055  <br>.613  <br>.052  <br>.052                     | .652<br>.124<br>.652<br>.652<br>.124                 | 1169<br>  285<br>  1019<br>  1244<br>  312<br>  376                   | 1178<br>333<br>1034<br>1251<br>354<br>433        | 1<br>  874<br>  98<br>  51<br>  1162<br>  192  <br>  46                                    | .742<br>.294<br>.049  <br>.929  <br>.542                     | 6.3<br>8.7<br>13.2<br>2.4<br>14.8<br>6.8<br>15.8                         | B+ <br> *B+ <br> *B<br> A <br> *B <br> B+ <br>C+                                                 | 257 ft<br>51 ft<br>25 ft<br>341 ft<br>53 ft                   |
| I TH<br>LT<br>NB Appr<br>RT<br>TH<br>LT<br>WB Appr                                     | 12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  0ach                                                | .503  <br>.009  <br>.055  <br>.613  <br>.052  <br>.052                     | .652<br>.124<br>.652<br>.652<br>.124                 | 1169<br>  285<br>  1019<br>  1244<br>  312<br>  376                   | 1178<br>333<br>1034<br>1251<br>354<br>433        | 1<br>  874<br>  98<br>  51<br>  1162<br>  192  <br>  46                                    | .742<br>.294<br>.049  <br>.929  <br>.542                     | 6.3<br>8.7<br>13.2<br>2.4<br>14.8<br>6.8<br>15.8                         | B+ <br> *B+ <br> *B<br> A <br> *B <br> B+ <br>C+                                                 | 257 ft<br>51 ft<br>25 ft<br>341 ft<br>53 ft<br>28 ft          |
| I TH<br>I LT<br>NB Appr<br>I RT<br>I TH<br>I LT<br>WB Appr<br>I RT<br>I LT+TH          | 12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                        | .503  <br>.009  <br>.055  <br>.613  <br>.052  <br>.052  <br>.097           | .652<br>.124<br>.652<br>.652<br>.124<br>.281<br>.124 | 1169<br>  285<br>  1019<br>  1244<br>  312<br>  376<br>  142          | 1178<br>333<br>1034<br>1251<br>354<br>433<br>190 | 1<br>  874<br>  98<br>  51<br>  1162<br>  192<br>  192<br>  46<br>  104                    | .742<br>.294<br>.049<br>.929<br>.542<br>.106<br>.536         | 6.3<br>8.7<br>13.2<br>2.4<br>14.8<br>6.8<br>15.8<br>10.3<br>18.2<br>12.4 | B+ <br> *B+ <br> *B+ <br> *B<br> B+ <br> B+ <br> C+<br> C+<br> C+                                | 257 ft<br>51 ft<br>25 ft<br>341 ft<br>53 ft<br>28 ft<br>77 ft |
| I TH<br>LT<br>NB Appr<br>I RT<br>I TH<br>LT<br>WB Appr<br>I RT<br>LT+TH<br>EB Appr     | <pre>  12/1  <br/>  12/1  <br/>  12/1  <br/>  12/1  <br/>  12/1  <br/>  12/1  <br/>  12/1  <br/>  12/1  <br/>  12/1  </pre> | .503  <br>.009  <br>.055  <br>.613  <br>.052  <br>.052  <br>.097           | .652<br>.124<br>.652<br>.652<br>.124<br>.281<br>.124 | 1169<br>  285<br>  1019<br>  1244<br>  312<br>  376<br>  142          | 1178<br>333<br>1034<br>1251<br>354<br>433<br>190 | 1<br>  874<br>  98<br>  51<br>  1162<br>  192<br>  192<br>  192<br>  104                   | .742<br>.294<br>.049<br>.929<br>.542<br>.542                 | 6.3<br>8.7<br>13.2<br>2.4<br>14.8<br>6.8<br>15.8<br>10.3<br>18.2<br>12.4 | B<br>B<br>B<br>A<br>B<br>B<br>B<br>C+<br>B<br>B<br>B                                             | 257 ft<br>51 ft<br>25 ft<br>341 ft<br>53 ft<br>28 ft<br>77 ft |
| I TH<br>I LT<br>NB Appr<br>I RT<br>I TH<br>LT<br>WB Appr<br>I RT<br>I LT+TH<br>EB Appr | 12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1  <br>  12/1                        | .503  <br>.009  <br>.055  <br>.613  <br>.052  <br>.052  <br>.097  <br>.151 | .652<br>.124<br>.652<br>.652<br>.124<br>.281<br>.124 | 1169<br>  285<br>  1019<br>  1244<br>  312<br>  376<br>  142<br>  142 | 1178<br>333<br>1034<br>1251<br>354<br>433<br>190 | 1<br>  874<br>  98<br>  98<br>  1162<br>  192<br>  192<br>  192<br>  104<br>  104<br>  104 | .742<br>.294<br>.049<br>.929<br>.542<br>.542<br>.106<br>.536 | 6.3<br>8.7<br>13.2<br>2.4<br>14.8<br>6.8<br>15.8<br>10.3<br>18.2<br>12.4 | B<br>B<br>B<br>A<br>B<br>B<br>B<br>C<br>C<br>C<br>C<br>C<br>C<br>C<br>C<br>C<br>C<br>C<br>C<br>C | 257 ft<br>51 ft<br>25 ft<br>341 ft<br>53 ft<br>28 ft<br>77 ft |

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| SIGNAL94/TEAPAC                | [V1 L1 | 4] -         | - Summ | ary of | f Para       | ameter | Value  | 95           |        |        |              |    |
|--------------------------------|--------|--------------|--------|--------|--------------|--------|--------|--------------|--------|--------|--------------|----|
| Intersection                   | Paran  | netere       | s for  | Int #  | 0 -          | - BYPA | ss/kui | А НШУ        | / & HA | LEAKAI | LA HY        |    |
| METROAREA                      |        | NON          |        |        |              |        |        |              |        |        |              |    |
| LOSTTIME                       |        |              | 2.0    |        |              |        |        |              |        |        |              |    |
| LEVELOFSERVICE<br>Nodelocation |        | C<br>Ø       | S<br>Ø |        |              |        |        |              |        |        |              |    |
|                                |        | -            | U      |        |              |        |        |              |        |        |              |    |
| Approach Para                  | emeter | 5            |        |        |              |        |        |              |        |        |              |    |
| APPLABELS                      |        | SB           | 1      |        | សម           |        |        | NB           |        |        | E            | 3  |
| GRADES                         |        | 6.0          | I.     |        | .0           |        |        | -6.0         |        |        | . 6          |    |
| PEDLEVELS                      |        | LOW          | t      |        | LOW          |        |        | LOW          |        |        | LOV          |    |
| PARKINGSIDES                   |        | NONE         |        |        | NONE         |        |        | NONE         |        |        | NONE         |    |
| PARKVOLUMES                    |        | 20           |        |        | 20           |        |        | 20           |        |        | 20           |    |
| BUSVOLUMES                     |        | Ø            |        |        | 0            |        |        | Ø            |        |        | 20           |    |
| RIGHTTURNONREDS                |        | 1            |        |        | 52           |        |        | 28           |        |        | 140          | -  |
| Movement Para                  | meter  | 5            |        |        |              |        |        |              |        |        |              |    |
| MOVLABELS                      | RT     | тн           | LT     | RT     | тн           | LT     | RT     | тн           | LT     | RT     | тн           | 1  |
| VOLUMES                        | 1      | 969          | 74     | 87     | 39           | 39     | 42     | 892          | 200    | 332    |              |    |
| WIDTHS                         |        | 12.0         |        | 12.0   | 12.0         | .0     | 12.0   | 12.0         | 12.0   |        | 12.0         |    |
| LANES                          | 1      | 1            | 1      | 1      | 1            | 0      | 1      | 1            | 1      | 1      | 1            |    |
| UTILIZATIONS                   |        | 1.00         |        | 1.00   |              | 1.00   | 1.00   |              | 1.00   | 1.00   | 1.00         | 1  |
| TRUCKPERCENTS                  | 2.0    | 2.0          | 2.0    | 2.0    | 2.0          | 2.0    | 2.0    | 2.0          | 2.0    | 2.0    | 2.0          |    |
| PEAKHOURFACTORS                | .95    | .95          | .95    | .95    | .95          | .95    | .95    | .95          | .95    | .95    | .95          |    |
| ARRIVALTYPES                   | 3      | 3            | 3      | 3      | 3            | 3      | 3      | 3            | 3      | 3      | 3            |    |
| ACTUATIONS                     | NO     | YES          | YES    | NO     | YES          | YES    | NO     | YES          | YES    | NO     | YES          | •  |
| REQCLEARANCES                  | 4.0    | 4.0          | 4.0    | 4.0    | 4.0          | 4.0    | 4.0    |              | 4.0    | 4.0    |              |    |
| MINIMUMS<br>IDEALSATFLOWS      | 5.0    | 5.0          | 5.0    | 5.0    | 5.0          | 5.0    | 5.0    | 5.0          | 5.0    | 5.0    | 5.0          |    |
| FACTORS                        |        | 1900<br>1.00 |        |        | 1900         |        |        | 1900         |        |        | 1900         |    |
| DELAYFACTORS                   |        | 1.00         |        |        | 1.00<br>1.00 |        |        | 1.00         |        |        | 1.00         |    |
| NSTOPFACTORS                   |        | 1.00         |        |        | 1.00         |        |        | 1.00         |        |        | 1.00         |    |
| GROUPTYPES                     | NORM   |              |        |        | NORM         |        |        | 1.00         |        |        | 1.00         |    |
| SATURATIONFLOWS                | 1493   |              | 214    | 1539   |              | 0<br>0 |        | NORM<br>1919 |        |        | NORM<br>1863 | Nt |
| Phasing Paramo                 | eters  |              |        |        |              |        |        |              |        |        |              |    |
| SEQUENCES                      | 3      | 1            | ALL    |        |              |        |        |              |        |        |              |    |
| PERMISSIVES                    | YE     |              | YES    | YES    | YE           |        |        | LEADL        | AGS    | NC     | )NE          | NO |
| OVERLAPS                       | YE     |              | YES    | YES    | ΥE           | S      |        | OFFSE        |        |        | 00           |    |
| CYCLES                         |        | 0            | 120    | 10     |              |        |        | PEDTI        | ME     |        | .0           |    |
| GREENTIMES                     | 5.7    |              | .45    | 5.77   |              |        |        |              |        |        |              |    |
| YELLOWTIMES<br>CRITICALS       | 4.0    |              | .00    | 4.00   |              |        |        |              |        |        |              |    |
| EXCESS                         |        | 9<br>Ø       | 2      | 5      |              |        |        |              |        |        |              |    |
| 574633                         |        | U            |        |        |              |        |        |              |        |        |              |    |
|                                |        |              |        |        |              |        |        |              |        |        |              |    |

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| KULAMALU               |                      |                               |                  |                |              |       |                |          | 03/27/97           |
|------------------------|----------------------|-------------------------------|------------------|----------------|--------------|-------|----------------|----------|--------------------|
| FUTURE W,<br>PM PEAK H | /PROJ & MI<br>IOUR   | Т                             |                  |                |              |       |                |          | 17:27:45           |
|                        | · · · · · · · ·      |                               | <b>.</b> .       | • -            | _            |       |                |          |                    |
| SIGNAL94,              | TEAPAC [V1           | . L1.4] - Cap                 | pacity A         | nalysis        | Summar       | У     |                |          |                    |
|                        |                      | iges for Int<br>ituration (v, |                  |                |              |       |                |          | er∨ice B⊣          |
| <br>Sq 31              | Phase 1              | Phase 2                       | Phas             | e 3            |              |       |                |          |                    |
| **/**                  | .~~~~~~~~            | · <b></b>                     |                  |                |              |       |                |          |                    |
|                        |                      | + * +<br> {+ * +>             | Ì                | ++++ <br><**** |              |       |                |          |                    |
|                        |                      |                               |                  | ****           |              |       |                |          |                    |
| <br>North              | ~<br>(* + +)         | ^<br>                         | <br>> ++++>      |                |              |       |                |          |                    |
| ++                     | ·++ * + +            | +++                           | ++++             | ļ              |              |       |                |          |                    |
|                        | ·                    | ·                             |                  |                |              |       |                |          |                    |
|                        | G/C= .096<br>G= 5.8" | G/C= .608<br>G= 36.5"         |                  | .096  <br>5.8" |              |       |                |          |                    |
|                        |                      | Y+R= 4.0"                     |                  |                |              |       |                |          |                    |
| C<br>                  | )FF≕0%<br>           | OFF≂16.3%                     | OFF=8<br>        | 3.7%           |              |       |                |          |                    |
| C=                     | 60 sec               | G= 48.0 sec                   | = 80.0%          | Y=12.          | 0 sec =      | 20.0% | Ped≠ .         | 0 se     | C ≕ .0%            |
|                        |                      |                               |                  |                |              |       |                |          |                    |
| Lane<br>Group          | Width/ <br>  Lanes   | g/C<br>Read Used              | Șervi<br>  @C (v |                |              |       | HCM<br>  Delay |          | 90% Max<br>Oueue   |
|                        |                      |                               |                  |                |              |       |                |          |                    |
| SB Approa              |                      |                               |                  |                |              |       | 11.3           | В        |                    |
| RT                     | 12/1                 | .002   .641                   | 939              | 957            | 1            | .001  | 2.5            | 1 A      | 25 ft              |
| ТН                     | 12/1                 | .577   .641                   | 1147             | 1158           | 1020         | .881  |                | *B       | 309 ft <br>  25 ft |
|                        |                      |                               |                  |                |              |       |                |          |                    |
| IB Approa              |                      |                               |                  |                |              |       | 3.3            |          |                    |
| RT                     | 12/1                 | .021   .804                   | 1274             | 1274           | 15           | .012  | .8             | A        | 25 ft]             |
| ТН                     | 12/1                 | .506   .804<br>.066   .130    | 1542             | 1542           | 939<br>  211 | .609  | 2.0            | A        | 155 ft <br>84 ft   |
|                        | •                    |                               |                  |                |              |       |                |          |                    |
| IB Approa              | ch                   | FF = F = 4 = 2 - 1 = 1        |                  |                |              |       | 15.8           |          |                    |
|                        | 12/1                 | .043   .130                   | 147              | 195            | 37           | .186  | 15.1           | C+       | 27 ft              |
| RT                     | 1 12/1 1             | .077   .130                   | 156              | 207            | 82           | .390  | 16.1           | *C+ <br> | 60 ft              |
| RT                     |                      |                               |                  |                |              |       |                |          |                    |
| RТ<br>↓Т+ТН<br>        |                      |                               |                  |                |              |       | 12.4           |          |                    |

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KULANALU Naster plan W/HIT An peak hour

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# SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int # . # - HALEAKALA HWY & PUKALANI ST

| NETROAREA      | KOI | 1080 |
|----------------|-----|------|
| LOSTTINE       |     | 2.8  |
| LEVELOFSERVICE | C   | S    |
| NODELOCATION   | 9   | •    |

| Approach Paramu                                                                                  |                                                              | _                                                       | . B                                                            | NB                                       |
|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------|------------------------------------------|
| APPLABELS<br>GRADES<br>PEDLEVELS<br>PARKINGSIDES<br>PARKVOLUKES<br>BUSVOLUKES<br>RIGHTTURHOKREDS | EB<br><u>- 58-</u><br>8.0<br>Noder<br>Nohe<br>20<br>0<br>252 | - <del>18-</del><br>.•<br>NODER<br>NONE<br>24<br>0<br>0 | WB<br>_ <del>NB</del><br>-8.0<br>NODER<br>XOKE<br>29<br>0<br>1 | 2.0<br>2.0<br>Noder<br>Nohe<br>20<br>141 |

# Novement Parameters

|                 |      | TU   | 17     | RT   | TH     | LT     | RT   | TH   | LT     | RT   | TH    | LT     |
|-----------------|------|------|--------|------|--------|--------|------|------|--------|------|-------|--------|
| KOVLABELS       | RT   | TR   | • ·    | •    | 4      | 1      | 1    | 249  | 218    | 171  | 1     | 791    |
| VOLUNES         | 257  | 157  | 1      |      | -      | -      |      | 12.4 | 12.4   | 12.1 | .1    | 12.    |
| WIDTHS          | 12.4 | 12.4 | .•     |      | 1,     |        |      | 1    |        | 1    | 1     | 1      |
| LANES           | 1    | 1    | 1      | 1    | 4      | •      |      | •    | 1.11   | 1.1  | 1 11  | 1.90   |
| UTILIZATIONS    | 1.11 | 1.44 | 1.11   | 1.11 | 1.11   |        | 1.11 | •    |        | •••• | 2.1   |        |
| TRUCKPERCENTS   | 2.1  | 2.8  | 2.1    | 2.1  | 2.4    | 2.0    | 2.1  | 2.4  | 2.1    | 2.1  |       |        |
| PEAKHOURFACTORS | .95  | .95  | .95    | .95  | .95    | .95    | .95  | .95  | .95    | .95  | .95   |        |
|                 |      | 3    | 3      | 3    | 3      | 3      | 3    | 3    | 3      | 3    | 3     |        |
| ARRIVALTYPES    | -    | YES  | -      | NO   | YES    | YES    | XÖ   | YES  | YES    | Ņ O  | YES   | YES    |
| ACTUATIONS      | ¥0   |      |        | 4.1  |        | 1.1    | 1.1  | 4.1  | 4.1    | 4.1  | - 4.1 | 4.0    |
| REQCLEARANCES   | 4.4  |      |        | 5.1  | 5.4    | 5.0    | 5.1  |      | 5.1    | 5.1  | 5.1   | 5.4    |
| MINIKUNS        | 5.8  |      | • •    | •••• |        | 1900   |      |      | 1948   | 1988 | 1981  | 1988   |
| IDEALSATFLOWS   |      |      | 1947   | 1943 |        |        |      |      | 1.1    |      |       | 1.00   |
| FACTORS         | 1.8  | 1.11 | 1.00   |      | 1.44   |        |      |      |        |      |       | 1.11   |
| DELAYFACTORS    | 1.44 | 1.4  | 1.47   | 1.11 | 1.11   | 1.86   |      |      | 1.4    |      |       | 1.11   |
| NSTOPFACTORS    | 1.0  | 1.01 | 1.88   | 1.0  |        | 1.44   |      |      | 1.44   |      |       |        |
| GROUPTYPES      |      |      | I NORK | NORI | L NORP | I NORN |      |      | f KORN |      |       | N NORN |
|                 |      | 178  |        |      |        | -      | l    | 191  | 9 1061 | 1397 |       | 1392   |
| SATURATIONFLOWS | 7331 |      |        |      | -      |        |      |      |        |      |       |        |

# Phasing Parameters

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| SEQUENCES<br>PERNISSIVES<br>OVERLAPS<br>CYCLES<br>GREENTINES<br>YELLOWTINES<br>CRITICALS<br>EXCESS | 11<br>YES<br>NO<br>60<br>16.11<br>4.00<br>9 | ALL<br>YES<br>NO<br>180<br>35.89<br>4.00<br>12 | YES<br>KJ<br>19 | YES<br>XO | LEADLAGS<br>OFFSET<br>PEDTINE | KONE<br>.04<br>.0 | KOKE<br>1<br>0 |  |
|----------------------------------------------------------------------------------------------------|---------------------------------------------|------------------------------------------------|-----------------|-----------|-------------------------------|-------------------|----------------|--|
|----------------------------------------------------------------------------------------------------|---------------------------------------------|------------------------------------------------|-----------------|-----------|-------------------------------|-------------------|----------------|--|

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# SIGNAL94/TEAPAC[VI 11.4] - Capacity Analysis Summary

Intersection Averages for Int # 0 - HALEAKALA HWY & PUKALAMI ST Degree of Saturation (v/c) .67 Vehicle Delay 11.7 Level of Service B

| Sq 11                   | Phase 1               | Phase 2                                               |
|-------------------------|-----------------------|-------------------------------------------------------|
| ///<br>I<br>Welst       |                       |                                                       |
| - <del>North</del><br>I | {* +<br>* +<br>* +    | <br> ++++  <br>  V                                    |
|                         | 6= 16.1"<br>Y+R= 4.4" | G/C= .598  <br>G= 35.9"  <br>Y+R= 4.0"  <br>OFF=33.5% |

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# "C= 68 sec G= 52.8 sec = 86.7% Y= 8.8 sec = 13.3% Ped= .8 sec = .8%

|                                                                                             | Lane<br>Group | <br> <br> | 1W<br>L | dti<br>an      | h/ <br>es   |     | Req        | 4           | 1/1         | i<br>Use       | d            |             | Serv<br>EC ( | ic<br>vp  | e Ri<br>h} ( | ate<br>9E       |           | Adj<br>/olum | <br> <br> |            | <br>v/c   |              | HCM<br>Delay |               | l<br>S       |           | 982<br>Qu  | Na<br>Ru     | a x  <br>e    |
|---------------------------------------------------------------------------------------------|---------------|-----------|---------|----------------|-------------|-----|------------|-------------|-------------|----------------|--------------|-------------|--------------|-----------|--------------|-----------------|-----------|--------------|-----------|------------|-----------|--------------|--------------|---------------|--------------|-----------|------------|--------------|---------------|
| EI<br>-95                                                                                   | 3<br>Appro    | <br>a c   | h       |                |             | ••• |            |             |             | **             |              | -           |              |           | • • • •      | •               | • • •     |              |           |            |           |              | 10.5         |               | 8            |           |            | •            | ***           |
|                                                                                             | RT<br>TH      | 1         | 1       | 2/1<br>2/1     |             |     | ¢1         | <br>(       |             | .31<br>.31     | *=<br>2<br>2 |             | 353<br>483   |           | 41<br>54     | 7               |           | 5<br>165     |           | ····       | 12<br>306 | <br> <br>    | 9.5<br>10.5  |               | ==<br>8<br>8 | •         | 29<br>97   | i 1          | ft <br>[t]    |
| 1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1 | B<br>Approi   |           |         |                |             |     |            |             |             |                | ••           |             |              |           |              |                 |           |              |           |            |           |              | 14.8         |               | 8            |           |            |              |               |
| <br> <br>                                                                                   | TH<br>LT      |           | 12      | :/1<br>:/1     | ""<br> <br> | • • | 169        | •#<br>}<br> | ••<br> <br> | .302<br>.312   | 2            | **<br> <br> | 521<br>27 0  | <br> <br> | 57<br>32     | 9<br>1          | <br> <br> | 252<br>229   |           | .4         | 53<br>16  | •••<br> <br> | 11.3<br>17.1 |               | 8<br>• C (   | i         | 154<br>135 | f            | בי<br>נ       |
| njb<br>Fl                                                                                   | Approa        | c!        | 1       |                | •••         |     |            |             |             |                |              | ••          |              |           |              |                 |           |              | • • •     | •          |           |              | 10.4         | •             | 8            |           | •===       |              |               |
|                                                                                             | RT<br>LT      |           | 12      | /1<br>/1<br>/1 | <br> <br>   | •   | 043<br>554 |             |             | . 632<br>. 632 |              |             | 857<br>857   | 1         | 87<br>87     | 9  <br>9  <br>9 |           | 32<br>738    |           | . 1<br>. 8 | 36<br>48  |              | 2.7<br>10.7  | #1<br> <br> ! | <br>A<br>18  | <br> <br> | 25<br>229  | ==<br>f<br>f | ==<br>t <br>t |

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KULANALU HASTER PLAN W/NIT PM PEAK HOUR

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## SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

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Intersection Parameters for Int # 0 - HALEAKALA HWY & PUKALAHI ST

RETROAREA NONCED LOSTTIKE 2.1 LEVELOFSERVICE C NODELOCATION ł

Approach Parameters

|                 | EB             | SB    | WB    | NB    |
|-----------------|----------------|-------|-------|-------|
| APPLABELS       | <del>58-</del> | -48-  | -#8-  |       |
| GRADES          | 8.1            | .0    | -8.0  | 2.1   |
| PEDLEVELS       | KODER          | NODER | KODER | NODER |
| PARKINGSIDES    | NONE           | NONE  | NONE  | NONE  |
| PARKVOLUKES     | 21             | 20    | 21    | 21    |
| BUSVOLUKES      | •              | 1     | 1     |       |
| RIGHTTURNONREDS | 223            | I     | 9     | 283   |

#### Novement Parameters

| NOVLABELS       | RT   | TH   | 1 11 | RT   | TH   | LT   | RT   | ТЯ   | 17   | RT   | TH   | Ľ    |
|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|
| VOLUKES         | 689  | 334  | 1    | 1    | 6    |      | 1    | 171  | 345  | 340  | 1    | 344  |
| WIDTHS          | 12.6 | 12.0 | . 1  | . I  | . :  | . 0  | . 1  | 12.# | 12.0 | 12.4 |      | 12.6 |
| LANES           | 1    | 1    | 1    | +    |      | 8    | 1    | 1    | 1    | 1    |      | 1    |
| UTILIZATIONS    | 1.0  | 1.0  | 1.00 | 1.44 | 1.00 | 1.00 | 1.6  | 1.00 | 1.0  | 1.0  | 1.94 | 1.00 |
| TRUCKPERCENTS   | 2.1  | 2.0  | 2.1  | 2.   | 2.0  | 2.1  | 2.1  | 2.1  | 2.1  | 2.1  | 2.6  | 2.4  |
| PEAKHOURFACTORS | .95  | .95  | .95  | .95  | . 95 | .95  | . 95 |      | .95  | . 95 | .95  | .95  |
| ARRIVALTYPES    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| ACTUATIONS      | NO   | YES  | YES  | NO   | YES  | YES  | XO   | YES  | YES  | NO   | YES  | YES  |
| REQCLEARANCES   | 4.1  | 4.8  | 4.8  | 4.4  | 4.0  | (.1  | 1.1  | 4.4  | (.)  | 4.1  | 4.4  | (.1  |
| MINIMUNS        | 5.1  | 5.0  | 5.1  | 5.4  | 5.4  | 5.1  | 5.8  | 5.0  | 5.1  | 5.1  | 5.1  | 5.1  |
| IDEALSATFLOWS   | 1988 | 1988 | 1988 | 1900 | 1988 | 1988 | 1944 | 1988 | 1988 |      | 1988 |      |
| FACTORS         | 1.41 | 1.11 | 1.11 | 1.00 | 1.91 | 1.44 |      | 1.48 |      |      | 1.11 |      |
| DELAYFACTORS    | 1.00 | 1.11 | 1.11 | 1.88 |      | 1.00 |      | 1.80 |      |      | 1.60 |      |
| NSTOPFACTORS    | 1.00 | 1.48 | 1.44 | 1.44 | 1.88 |      |      | 1.00 |      |      | 1.40 |      |
| GROUPTYPES      |      | RAGH |      | NORM |      |      | +    |      |      |      | NORK |      |
| SATURATIONFLOWS | 1358 |      | I    | ł    | I    | 0    |      | 1919 |      | 1392 |      | 1392 |

#### **Phasing Parameters**

| SEQUENCES   | 31   | ALL   |       |     |          |      |      |  |
|-------------|------|-------|-------|-----|----------|------|------|--|
| PERNISSIVES | YES  | YES   | YES   | YES | LEADEAGS | KONE | NONE |  |
| OVERLAPS    | YES  | 123   | YES   | YES | OFFSET   | . 41 | t    |  |
| CYCLES      | 60   | 126   | 18    |     | PEDTINE  |      | i    |  |
| GREENTINES  | 8.45 | 18.47 | 21.48 |     |          |      | •    |  |
| YELLOWTINES | 4.47 | 4.41  | 4.44  |     |          |      |      |  |
| CRITICALS   | 3    | :     | 12    |     |          |      |      |  |
| EXCESS      | ł    |       |       |     |          |      |      |  |
|             |      |       |       |     |          |      |      |  |

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KULANALU MASTER PLAN W/NIT PN PEAK HOUR

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SIGNAL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary

Intersection Averages for Int # # - HALEAKALA HWY & PUKALANI ST

Degree of Saturation (v/c) .49 Vehicle Delay 7.3 Level of Service B+

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#### Sg 31 | Phase 1 | Phase 2 | Phase 3 | \*\*/\*\* -----1 1+\* [+ ] j . . 1+ (+ • | (+ v | | • • MV =1 1 • Welst North (\* + | (+ + i | ++++ + + +++ | + | + | +++ | ------| G/C= .141 | G/C= .301 | G/C= .358 | 6= 8.5" 6= 18.1" 6= 21.5" | Y+R= 4.0" | Y+R= 4.0" | Y+R= 4.0" | OFF= .0% | OFF=20.8% | OFF=57.5% | ------C= 6# sec 6= 48.8 sec = 88.8% Y=12.8 sec = 28.8% Ped= .8 sec = .8% | Lane |Width/| g/C | Service Rate| Adj | | HCM | L |90% Max| Group | Lanes | Reqd Used | EC (vph) EE |Volume | v/c | Delay | S | Queue | EB S5 Approach 6.4 B+ RT 12/1 .340 .759 1020 1025 406 .396 1.7 A 82 ft TH 12/1 .231 .335 543 598 352 .589 11.8 \*8 198 ft WB JH Approach 7.7 B+ TH 12/1 .124 .542 1014 1040 180 .173 4.5 A 70 ft LT 12/1 .122 .174 417 452 321 .710 3.5 \*8+ 124 ft NB 🔊 Approach 8.4 8+ | RT | 12/1 | .140 | .599 | 647 | 633 | 144 | .173 | 3.5 | A | 49 ft| | LT | 12/1 | .271 | .391 | 496 | 545 | 324 | .587 | 18.5 |\*8 | 164 ft

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# SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int 8 - HALEAKALA HWY & MAKAWAO AV

KETROAREA NONCBO LOSTTINE 2.1 LEVELOFSERVICE C S KODELOCATION L ł

Approach Parameters

|                 | EB    | 58    | WВ    | NB    |
|-----------------|-------|-------|-------|-------|
| APPLABELS       | 58    |       | -#8-  | -68-  |
| GRADES          | 8.1   | .1    | -8,1  | .1    |
| PEDLEVELS       | NODER | NODER | KODER | XODER |
| PARKINGSIDES    | NONE  | NONE  | NONE  | KONE  |
| PARKVOLUNES     | 21    | 28    | 24    | 21    |
| BUSVOLUKES      | 1     | i     | 1     | 1     |
| RIGHTTURNONREDS | I     | 64    | ŧ     | I     |

# Novement Parameters

| NOVLABELS       | RT   | TH   | LT   | RT   | TH      | LT       | RT   | TH   | LT       | RT   | TR   | LT        |
|-----------------|------|------|------|------|---------|----------|------|------|----------|------|------|-----------|
| VOLUKES         | 6    | 245  | 113  | 225  | 52      | 24       | 31   | 198  | 25       | 45   | 67   | 25        |
| WIDTHS          | .1   | 12.4 | 12.4 | 12.0 | 12.     | .1       | . I  | 12.0 |          | .1   | 12.0 |           |
| LANES           | 1    | 1    | 1    | 1    | 1       | 1        | ł    | 1    | +        |      | 1    |           |
| UTILIZATIONS    | 1.00 | 1.00 | 1.61 | 1.0  | 1.11    | 1.44     | 1.11 | 1.6  | 1.40     | 1.04 | 1.0  | 1.4       |
| TRUCKPERCENTS   | 2.1  | 2.1  | 2.1  | 2.4  | 2.1     | 2.1      | 2.1  | 2.1  | 2.1      | 2.1  | 2.1  | 2.1       |
| PEAKHOURFACTORS | .95  | .95  | .95  | . 95 | .95     | .95      | .95  | .95  | .95      | .95  | .95  | .95       |
| ARRIVALTYPES    | 3    | 3    | 3    | 3    | 3       | 3        | 3    | 3    | 3        | 3    | 3    | 3         |
| ACTUATIONS      | YES  | YES  | YES  | YES  | YES     | YES      | YES  | YES  | YES      | YES  | YES  | YES       |
| REQCLEARANCES   | 4.4  | 4.1  | 4.1  | 4.1  | 4.4     | 4.4      | - 64 | 1.1  | 4.4      | 1.1  | 1.1  | 6.1       |
| AINIAUNS        | 5.4  | 5.1  | 5.1  | 5.0  | 5.1     | 5.1      | 5.4  | 5.8  | 5.8      | 5.1  | 5.0  | 5.0       |
| IDEALSATFLOWS   | 1988 | 1988 | 1988 | 1988 | 1988    |          |      | 1988 | •••      | 1988 | 1988 |           |
| FACTORS         |      | 1.44 |      |      | 1.11    |          |      | 1.00 |          |      | 1.44 |           |
| DELAYFACTORS    |      | 1.## |      |      | 1.00    |          |      | 1.11 |          |      | 1.01 |           |
| NSTOPFACTORS    |      | 1.41 |      | 1.01 | * • • • |          |      | 1.11 |          |      | 1.00 |           |
| GROUPTYPES      |      |      | NORN | •••• | NORN    |          |      | NORK |          |      | NORM |           |
| SATURATIONFLOWS |      | 1778 | 876  |      | 1685    | 1005<br> |      | 1571 | avaa<br> |      | 1476 | 1045<br>1 |

#### Phasing Parameters

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| SEQUENCES   | 11    | ALL   |     |     |          |      |      |
|-------------|-------|-------|-----|-----|----------|------|------|
| PERMISSIVES | YES   | YES   | YES | YES | LEADLAGS | NOKE | NOXE |
| OVERLAPS    | XO    | XO    | NO  | NO  | OFFSET   | .11  | 1    |
| CYCLES      | 61    | 181   | 11  |     | PEDTIKE  |      | i    |
| GREENTINES  | 29.78 | 22.22 |     |     |          |      | Ť    |
| YELLOWTINES | 1.11  | 1.11  |     |     |          |      |      |
| CRITICALS   | 8     | 4     |     |     |          |      |      |
| EXCESS      | 1     |       |     |     |          |      |      |

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KULANALU **WASTER PLAN W/NIT** AN PEAK HOUR

SIGNAL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary

Sq 11 | Phase 1 | Phase 2 |

//\ (+ + +) (++++) v - ++++ v - ++++ v

Horth (\* \* \*) ++++)

| 6/C= .495 | 6/C= .374 |

[ 6= 29.8" ] 6= 22.2" ] | Y+R= 4.8" | Y+R= 4.8" |

0FF= .41 0FF=56.31 

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Intersection Averages for Int 8 9 - HALEAKALA HWY & MAKAWAO AV

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Degree of Saturation (v/c) .27 Vehicle Delay 6.1 Level of Service B+

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[Lane |Width/] g/C | Service Rate| Adj | | HCM | L |90% Hax| | Group | Lanes| Reqd Used | &C (vph) &E |Volume| v/c | Delay | S | Queue | EB 5.0 8+ \_S8\_Approach 

 TH+RT
 12/1
 .184
 .536
 912
 942
 265
 .281
 5.1
 8+
 145
 ft

 LT
 12/1
 .172
 .536
 427
 464
 168
 .233
 4.9
 A
 43
 ft

 WВ 5.2 B+ -HS Approach LT+TH+RT 12/1 | .208 | .530 | 800 | 832 | 267 | .321 | 5.2 [\*B+ 105 ft] 58 7.7 B+ -HB Approach \*\*\*\*\* | RT | 12/1 | .158 | .404 | 520 | 567 | 169 | .298 | 7.9 |\*8+| 85 ft| |LT+TH | 12/1 | .073 | .404 | 633 | 680 | 80 | .118 | 7.2 | 8+| 40 ft| NB 7.7 B+ Approach |LT+TH+RT| 12/1 | .134 | .484 | 548 | 596 | 145 | .243 | 7.7 | B+| 73 ft| 

C= 68 sec G= 52.8 sec = 86.7% Y= 8.8 sec = 13.3% Ped= .8 sec = .8%

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## SIGNAL94/TEAPAC[V1 L1.4] - Summary of Parameter Values

Intersection Parameters for Int B 🛛 🛛 — HALEAKALA HWY & MAKAWAO AV

| KETROAREA      | XOX | (C80 |
|----------------|-----|------|
| LOSTTINE       |     | 2.1  |
| LEVELOFSERVICE | C   | \$   |
| NODELOCATION   | 1   | 1    |

Approach Parameters

| EB<br>-# | 5B<br>                                  | WB                                                                                | NB<br>-ft                                                                                          |
|----------|-----------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| 8.4      | .1                                      | -8.0                                                                              | .1                                                                                                 |
| XODER    | NODER                                   | NODER                                                                             | NODER                                                                                              |
| NOKE     | NONE                                    | NONE                                                                              | NONE                                                                                               |
| 21       | 21                                      | 21                                                                                | 21                                                                                                 |
| 1        | 1                                       | 1                                                                                 | 1                                                                                                  |
| 1        | 285                                     | 1                                                                                 | 1                                                                                                  |
|          | <del>- 50</del><br>8.4<br>Noder<br>Noke | - <del>SO</del> - <u>LD</u><br>8.0 .0<br>Koder Koder<br>Noke Kone<br>29 23<br>9 3 | - <del>50 - 48 48</del><br>8.0 .0 -8.0<br>Koder Noder Noder<br>Noxe Xone Nome<br>20 27 20<br>0 8 0 |

#### Novement Parameters

| NOVLABELS       | RT   | TH   | 11   | RT   | TH   | ٤T   | RT   | <b>T</b> 8 | ٤T   | RT   | TH   | LT   |
|-----------------|------|------|------|------|------|------|------|------------|------|------|------|------|
| VOLUKES         | 33   | 325  | 389  | 291  | 66   | 49   | 29   | 199        | 26   | 31   | 57   | 19   |
| WIDTHS          | . I  | 12.# | 12.0 | 12.4 | 12.8 | .1   | .+   | 12.7       | . I  | . I  | 12.4 | . I  |
| LANES           | 1    | 1    | 1    | 1    | 1    | 1    | 9    | 1          | 1    | ŧ    | 1    | 0    |
| UTILIZATIONS    | 1.00 | 1.44 | 1.88 | 1.00 | 1.11 | 1.00 | 1.04 | 1.68       | 1.00 | 1.00 | 1.11 | 1.88 |
| TRUCEPERCENTS   | 2.1  | 2.1  | 2.1  | 2.0  | 2.7  | 2.1  | 2.1  | 2.0        | 2.1  | 2.0  | 2.1  | 2.1  |
| PEALHOURFACTORS | .95  | .95  | .95  | .95  | .55  | .95  | .95  | .95        | .95  | .95  | .95  | .95  |
| ARRIVALTYPES    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3          | 3    | 3    | 3    | 3    |
| ACTUATIONS      | YES  | YES  | YES  | YES  | YES  | YES  | YES  | YES        | YES  | YES  | YES  | YES  |
| REDCLEARANCES   | 4.4  | 4.1  | 1.1  | 4.4  | 4.1  | 1.1  | 4.4  | 4.1        | 4.1  | 4.1  | 4.1  | 4.4  |
| AININUNS        | 5.4  | 5.4  | 5.1  | 5.1  | 5.4  | 5.0  | 5.1  | 5.4        | 5.8  | 5.4  | 5.1  | 5.0  |
| IDEALSATFLOWS   | 1988 | 1900 | 1988 | 1900 | 1922 | 1988 | 1988 | 1944       | 1900 | 19## | 1988 | 1988 |
| FACTORS         | 1.00 | 1.00 | 1.00 | 1.00 | 1.44 | 1.11 | 1.44 | 1.88       | 1.#  | 1.#  | 1.11 | 1.00 |
| DELAYFACTORS    | 1.44 | 1.00 | 1.88 | 1.00 | 1.11 | 1.11 | 1.00 | 1.00       | 1.11 | 1.11 | 1.11 | 1.44 |
| KSTOPFACTORS    | 1.11 | 1.00 | 1.44 | 1.00 | 1.00 | 1.70 | 1.88 | 1.00       | 1.11 | 1.00 | 1.0  | 1.88 |
| GROUPTYPES      | NORM | NORK | NORK | NORM | NORM | XORX | NORM | NORM       | NORN | KORN | NORN | NORN |
| SATURATIONFLOWS | 1    | 1748 | 1599 | 1486 | 1591 | \$   | 1    | 1458       |      |      | 1445 | 1    |

#### Phasing Parameters

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| SEQUENCES   | 21    | ALL   |       |     |          |      |      |
|-------------|-------|-------|-------|-----|----------|------|------|
| PERMISSIVES | YES   | YES   | YES   | YES | LEADLAGS | KONE | NONE |
| OVEILAPS    | YES   | YES   | YES   | YES | OFFSET   | . 44 | 1    |
| CYCLES      | 50    | 188   | 10    |     | PEDTINE  | .1   | ŧ.   |
| GREENTINES  | 11.97 | 24.85 | 11.97 |     |          |      |      |
| YELLOWTINES | 4.88  | 4.44  | 4.88  |     |          |      |      |
| CRITICALS   | 3     | 8     | 5     |     |          |      |      |
| EXCESS      |       |       |       |     |          |      |      |

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# Intersection Averages for Int 8 8 - HALEAKALA HWY & MAKAWAO AV Degree of Saturation (v/c) .35 Vehicle Delay 5.6 Level of Service 8+

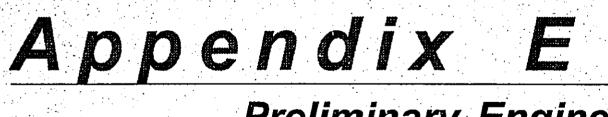
SIGMAL94/TEAPAC[V1 L1.4] - Capacity Analysis Summary

| Sq 21   Phase 1   Phase 2   Phase 3  <br>**/**                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                       |
| 8/C= .199       6/C= .401       6/C= .199         6= 12.0"       6= 24.1"       6= 12.8"         Y+R= 4.8"       Y+R= 4.0"       Y+R= 4.0"         OFF= .0%       OFF=26.6%       OFF=73.4% |
| C= 68 sec 6= 48.8 sec = 88.8% Y=12.8 sec = 28.8% Ped= .8 sec = .8%                                                                                                                          |
| Lane  Width/[ g/C   Service Rate; Adj     HCM   L  98% Hax<br>  Group   Lanes  Reqd Used   EC (vph) EE [Volume] v/c   Delay   S   Queue                                                     |
| EB 2.6 A                                                                                                                                                                                    |
| TH+RT  12/1   .251   .701   1221   1224   378   .309   2.3   A   95 ft<br>  LT   12/1   .021   .233   715   731   325   .445   3.0   A   82 ft                                              |
| WB<br>#B Approach 7.8 B+                                                                                                                                                                    |
| LT+TH+RT  12/1   .218   .434   585   638   258   .418   7.8  *B+  123 ft                                                                                                                    |
| SB<br>HB Approach<br>9.4 B+                                                                                                                                                                 |
| RT   12/1   .096   .499   664   702   91   .130   5.2   8+  38 ft<br> LT+TH   12/1   .108   .233   311   370   121   .327   12.5  *B   78 ft                                                |
| NB 12.6 B                                                                                                                                                                                   |
| LT+TH+RT  12/1   .112   .233   279   336   113   .336   12.6   B   73 ft                                                                                                                    |

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# Preliminary Engineering Report

# PRELIMINARY ENGINEERING REPORT

# FOR THE

# KULAMALU SUBDIVISION - UPPER SECTION

AT

Kula, Maui, Hawaii

TMK: (2) 2-3-08:portion of 5, 38 and 39

Prepared for Kulamalu Limited Partnership

BY

Austin, Tsutsumi & Associates, Inc. Engineers \* Surveyors

> July 1996 February 1997

Revised March 1997

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Preliminary Engineering Report

for the

Kulamalu Subdivision - Upper Section Rezoning

at

Kula, Maui, Hawaii

Tax Map Key: (2) 2-3-08: portion 5, 38 and 39

# I. INTRODUCTION

The purpose of this report is to summarize the preliminary civil engineering design criteria for the Kulamalu Subdivision - Upper Section Rezoning. It evaluates the existing conditions and defines the grading requirements, storm drainage system and the utility provisions for the proposed project.

# II. PROPOSED PROJECT

# <u>A.</u> <u>Location</u>

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The project site is located in Kula, Maui, Hawaii, just south of the town of Pukalani and adjacent to Kula Highway. The Tax Map Key for this site are portions of TMK: 2-3-08:5, 38 and 39. Refer to Exhibit 1.

# B. Project Description

The rezoning of the upper section of the Kulamalu Subdivision will create the following parcels and uses:

Business Halau

19.41 acres 5.03 acres

| Elderly Housing     |       | 4.88 acres  |  |
|---------------------|-------|-------------|--|
| Public/Quasi-Public | 0     | 5.10 acres  |  |
| Park/Public         |       | 14.74 acres |  |
| Single Family       |       | 4.51 acres  |  |
|                     | Total | 53.67 acres |  |

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The lower portion of the Kulamalu Subdivision is zoned for single and multifamily housing, and will also include the proposed Kamehameha Schools/Bishop Estate campus.

# III. EXISTING CONDITIONS

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#### A. Adjacent Land Uses

The northern boundary of the project site abuts Kaluapulani/Haakakai Gulch. The southern boundary abuts existing agricultural lots and an unnamed drainageway (tributary of Kaluapulani Gulch). The eastern boundary of the project site abuts Kula Highway. The western boundary abuts the remainder of the Kulamalu Subdivision. Refer to Exhibit 2.

# B. Topography and Soil Conditions

The site was formerly planted in pineapple and is currently used as pasture land, with ground cover of grasses, low shrubs and weeds. The site has a moderate slope from east to west, ranging from 5 to 20 percent. The elevations on the site range from 1860 to 1750 feet mean sea level (msl).

The soil classification of the site is primarily from the Keahua Series. The specific soil types include Keahua cobbly silty clay (KnhC), Keahua silty clay

loam (KnB) and Keahua cobbly silty clay loam (KnaD), as described by the Soil Survey of the Islands of Kauai, Oahu, Molokai, Maui and Lanai. Runoff is slow to medium and the erosion hazard is slight to moderate.

# <u>C.</u> <u>Roadways</u>

There are no improved roads on the project site; remnants of pineapple field roads traverse the site.

Kula Highway, a State-owned, two-lane arterial highway, runs along the eastern boundary of the site.

# <u>D.</u> <u>Drainage</u>

Runoff sheet flows across the project site and enters Kaluapulani/Haakakai Gulch. There are no underground drainage systems on the site.

Offsite runoff flows through Kaluapulani Gulch and its tributary from mauka lands. The Kaluapulani Gulch crossing at Kula Highway consists of 2 - 10 foot diameter corrugated metal pipe culverts. The tributary crossing at Kula Highway consists of 2 - 5 foot diameter corrugated metal pipe culverts. Flow is contained within the gulch walls.

#### E. Wastewater

The site is currently unoccupied and generates no wastewater flow. There is an offsite gravity system within the Pukalani Terrace, Unit II Subdivision, located west of the project site, that conveys wastewater to a privately-owned treatment plant. There are no County wastewater treatment or transmission facilities in the vicinity.

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The treated effluent is currently used for irrigation of the Pukalani Golf Course.

<u>F.</u><u>Water</u>

1. Source

The Makawao-Haiku Water System is supplied by surface water runoff collected on the eastern slopes of Haleakala. The water is collected and conveyed by the Wailoa Ditch and Tunnel System, which is owned, operated and maintained by the East Maui Irrigation Company (EMI), a subsidiary of A & B Hawaii, Inc. The Wailoa Ditch has a capacity of approximately 190 million gallons per day (mgd). The Department of Water Supply (DWS), County of Maui, has an agreement with EMI to draw up to 12 mgd of water to service the area.

2. Treatment

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The water from Wailoa Ditch is treated at the Kamole Weir Water Treatment Plant, operated by DWS. The plant is capable of treating up to 8 mgd in compliance with the EPA Safe Drinking Water Standards. The plant is located east of the town of Haliimaile, near the intersection of Baldwin Avenue and Haliimaile Road. Refer to Exhibit 3.

3. Storage and Transmission

Treated water is stored in a 300,000 gallon concrete reservoir with a floor elevation of 1114 feet msl, then pumped via high lift pumps to Makawao through a 24-inch force main along Baldwin Avenue and

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Olinda Road. Storage is provided by the 0.3 and 2.0 mg Pookela Reservoirs at elevations 1808 ft. and 1830 ft. msl, respectively. The water is then pumped via an 18-inch force main to the 0.5 mg Maluhia Tank at 2051 ft. msl.

There is a 12-inch main running along Olinda Road, Hanamu Road and Haleakala Highway from the Maluhia Tank to the new King Kekaulike High School. There are no water mains within the Kula Highway right-of-way fronting the project site.

There is a 0.85 mg reservoir on the lower portion of the Kulamalu Subdivision, with a floor elevation of 1416 ft. msl. This reservoir is filled with treated water from the Kamole Plant. There is a 12-inch main that runs through the subdivision along the boundary adjacent to Kalialinui Gulch, from the 0.85 mg reservoir to Liholani Street, where it branches off into the Pukalani Terrace Subdivision, Unit II. Refer to Exhibit 4.

# <u>G.</u> <u>Flood Zone</u>

The project site is in Zone "C", an area of minimal flooding, as designated by the Flood Insurance Rate Map (FEMA; community panel number 150003 0260B).

# IV. GRADING AND DRAINAGE PLAN

#### <u>A.</u> <u>Grading</u>

Grading for the proposed improvements will involve excavation and embankment for the construction of building pads, parking areas and

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roadways. Erosion control measures and best management practices will be implemented during the construction period to minimize soil loss and erosion hazards. A detailed grading and erosion control plan will be prepared and submitted to the County of Maui, Department of Public Works for approval. An application for a National Pollutant Discharge Elimination System (NPDES) permit will be submitted to the State Department of Health for review and approval.

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#### B. Drainage Plan

Onsite runoff will be collected by underground drainage systems and will be conveyed to Kaluapulani/Haakakai Gulch. Detention facilities will be incorporated within the drainage system to release stormwater into Kaluapulani/Haakakai Gulch at predevelopment rates. Offsite runoff will be allowed to flow through Kaluapulani/Haakakai Gulch unimpeded.

All drainage improvements will be designed in accordance with County Standards. A detailed drainage report will be submitted to the County of Maui, Department of Public Works for review and approval.

C. <u>Hydrology</u>

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The onsite drainage system will be sized by using a 50-year recurrence interval based on a one-hour storm. The rate of runoff will be determined by using the Rational Method, as described in the "Rules for the Design of Storm Drainage Facilities in the County of Maui" (11/12/95). See Appendix A for hydrological calculations.

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#### V. UTILITIES

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- <u>A.</u><u>Water</u>
  - 1. Source Improvements

The Kulamalu project, by agreement with DWS, will install a well at Huluhulunui Gulch near Kaupakulua. The well improvements will include the drilling of the well, installation of the well pump, reservoir and associated water lines to connect to the existing system. Refer to Exhibits 6, 7 and 8.

2. Storage Improvements

An offsite storage reservoir of approximately 1,000,000 gallons is proposed on Maui Land & Pineapple Company land at elevation 1975 ft. msl above King Kekaulike High School. This storage is sized for use by Maui Land & Pineapple Company, The Malama Group, King Kekaulike High School and the service area between the 1860 ft. to 1600 ft. elevations (Area 1) of the Kulamalu project. Area 1 of the Kulamalu project includes the Upper Section Rezoning portion of the subdivision. The reservoir size is based on the requirements set forth by the "Water System Standards, Volume I, 1985, Department of Water Supply". The Department of Water Supply has the option of increasing the reservoir size and to participate in the funding for the upsize costs. Refer to Exhibits 4 & 5.

Improvements not within the rezoning area include an onsite storage reservoir of approximately 350,000 gallons, proposed at elevation 1690 ft. msl on the project site to service area 1690 ft. to 1320 ft. (Area 2). This

## ALISTIN, TSUTSUMI & ASSOCIATES, INC.

reservoir is also sized by maximum daily demand plus fire flow. The existing 850,000 gallon reservoir at elevation 1416 ft. msl will service the area below 1320 ft. msl (Area 3). Refer to Exhibit 9.

#### 3. Offsite Water Transmission

The offsite storage reservoir at elevation 1975 ft. msl will be fed via a 12inch inflow main connecting to the existing 12-inch Kekaulike High School main at Haleakala Highway. The outflow main will be a 12-inch main installed along Haleakala Highway to Five Trees, then up along Kula Highway to the project site (see Exhibits 4 & 5).

4. Onsite Water Transmission

The onsite mains along the backbone road within the project between reservoirs will be sized at 12 inch (see Exhibit 9).

#### <u>B.</u><u>Wastewater</u>

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Wastewater from the project site will gravity flow through the subdivision and enter the existing gravity system within the Pukalani Terrace, Unit II Subdivision, located to the west of the project site. The wastewater will then be conveyed to the privately owned and operated treatment plant.

The private wastewater treatment plant will be able to accommodate the project's flow. Refer to Appendix C for calculations. The treated effluent will continue to be used for irrigation by the Pukalani Golf Course.

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#### VI. ROAD IMPROVEMENTS

Access to the project site will be from a divided four-lane parkway, with a raised median for landscaping and turning lanes. The right-of-way for the parkway will be 160 feet. The parkway will connect to Kula Highway and create a T-intersection. Appropriate lengths of left turn and deceleration lanes on Kula Highway will be constructed, and conduits for future traffic signals will be installed.

All improvements will be designed in accordance with State and County Standards. A traffic impact analysis report has been prepared for the project.

#### VII. CONCLUSION

The proposed improvements for the project will be designed to produce no adverse effects to existing facilities or to the surrounding environment. All improvements will be designed in accordance with the applicable regulatory agencies.

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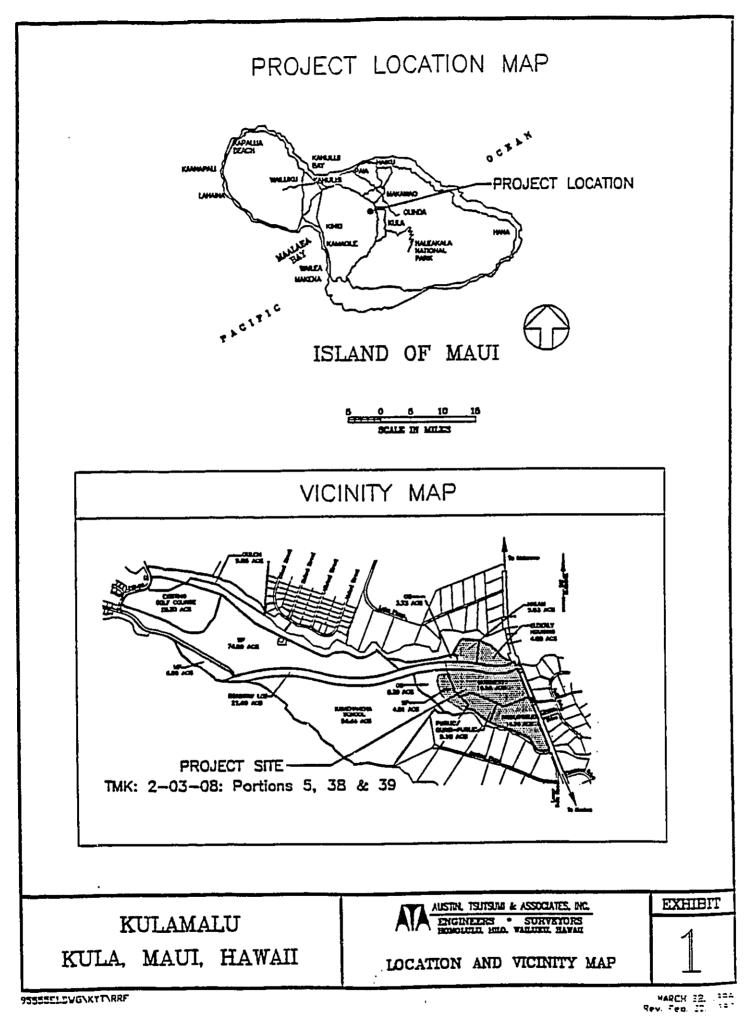
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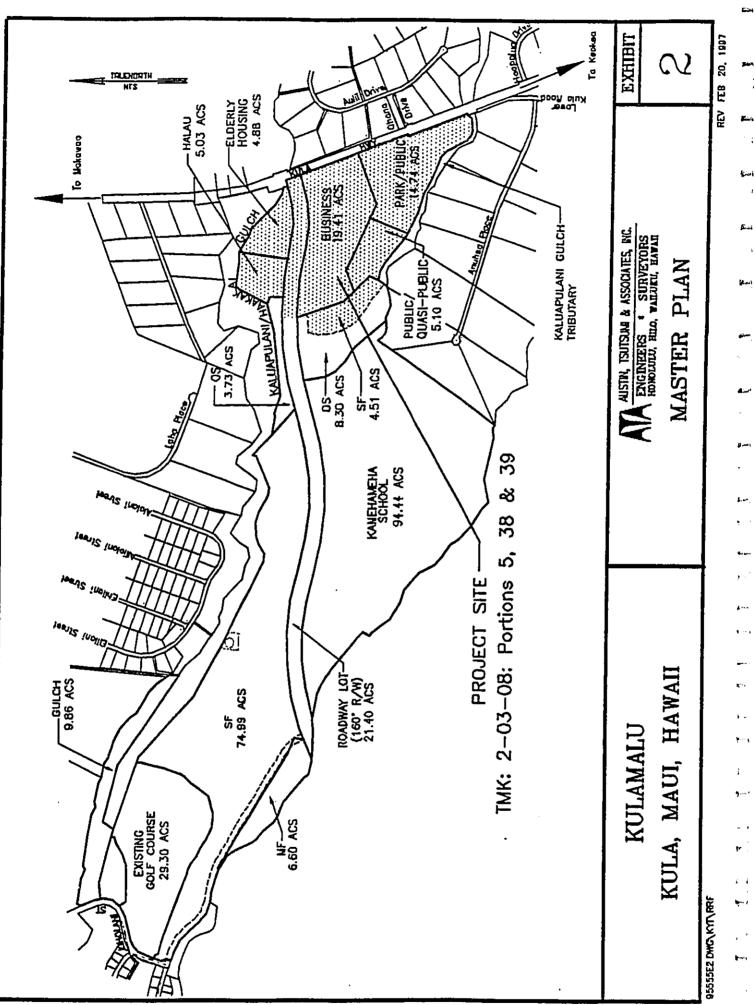


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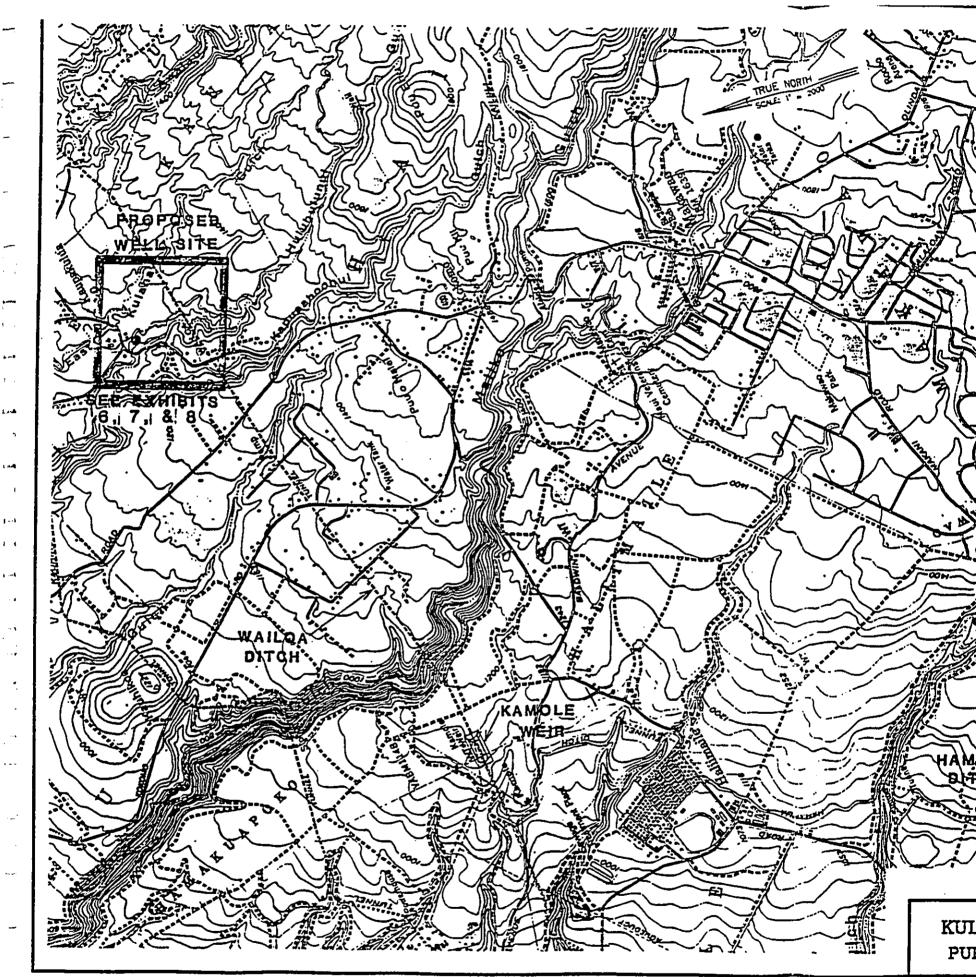
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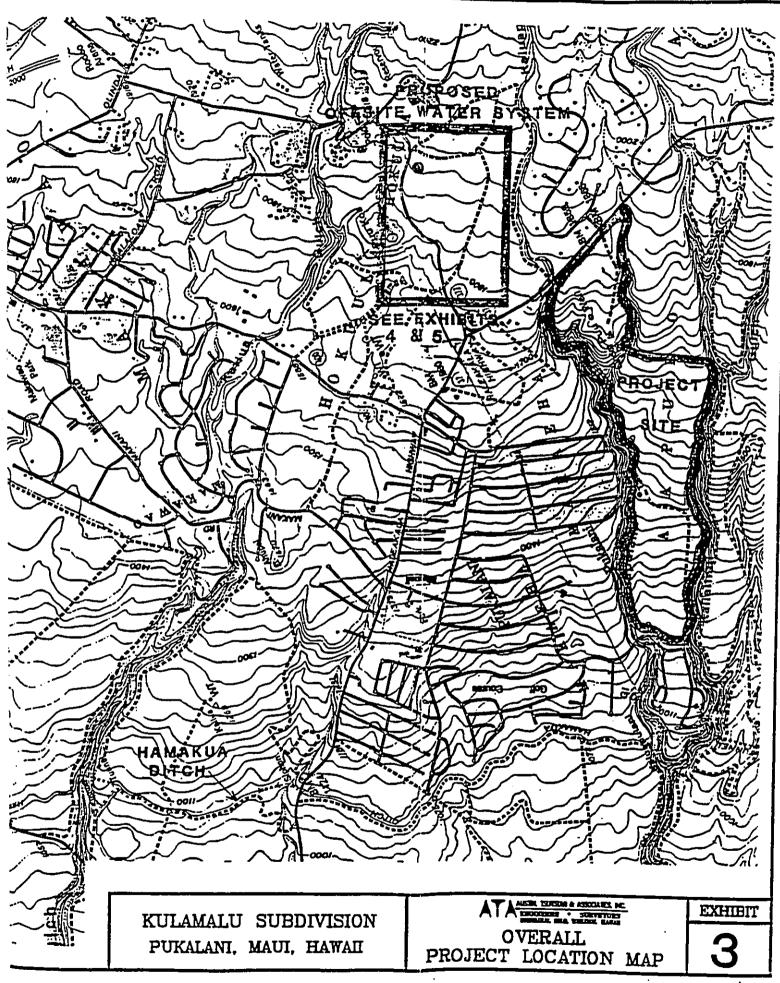
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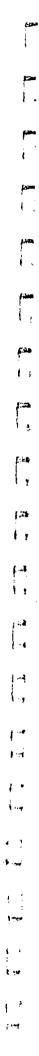
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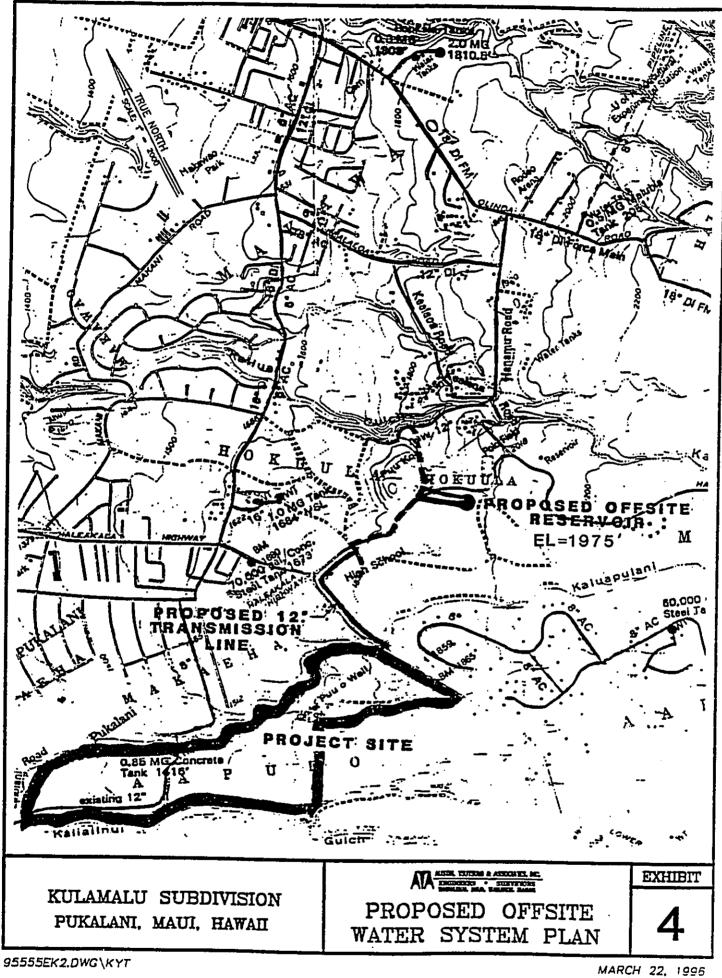
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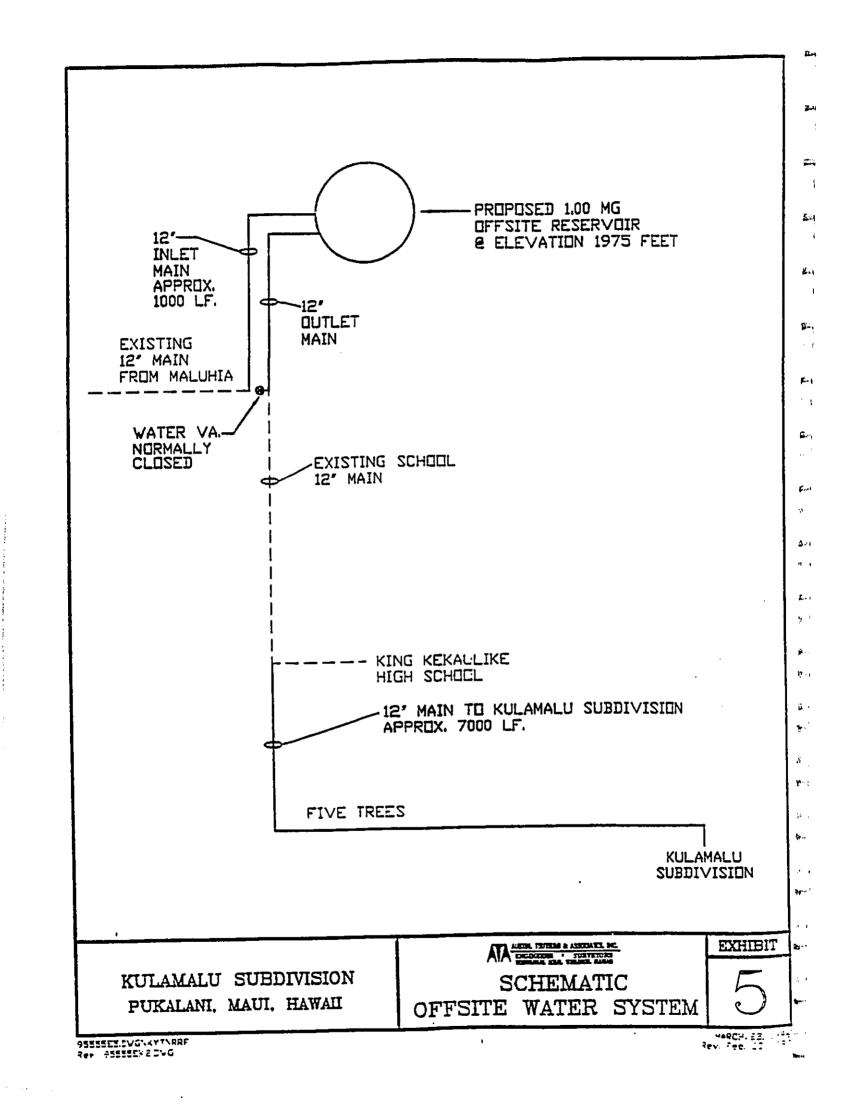


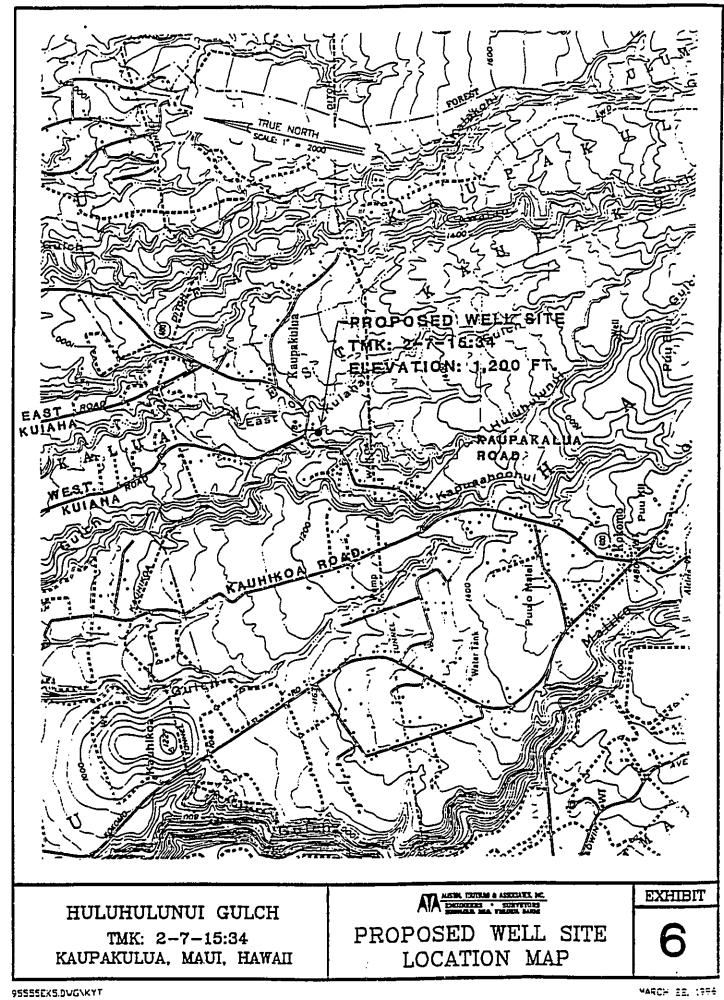
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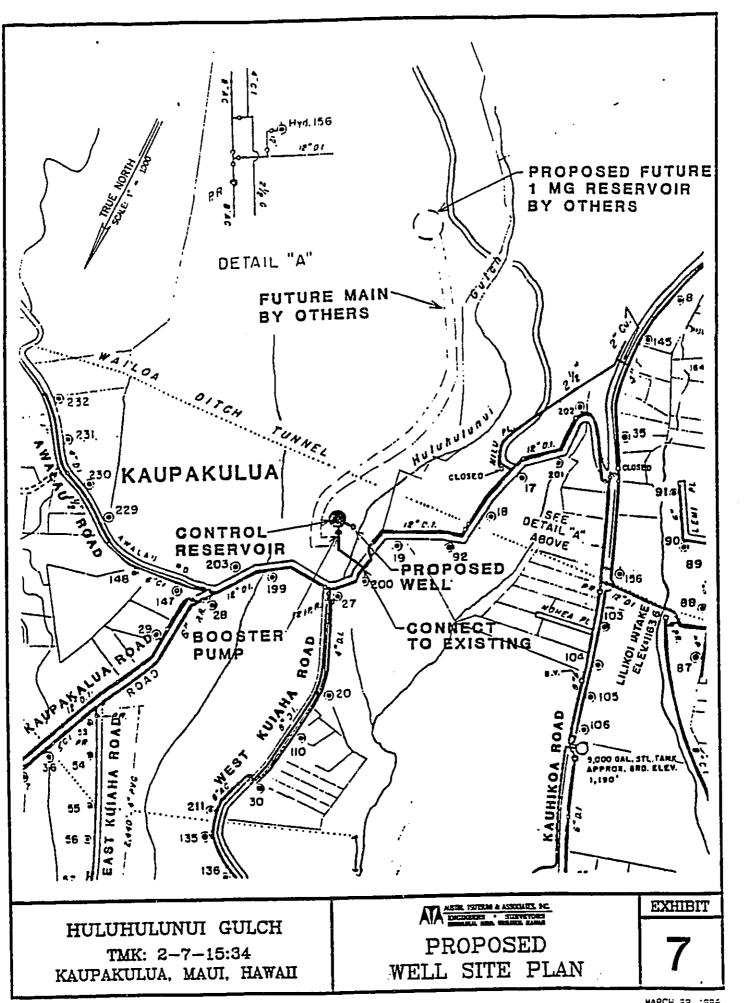
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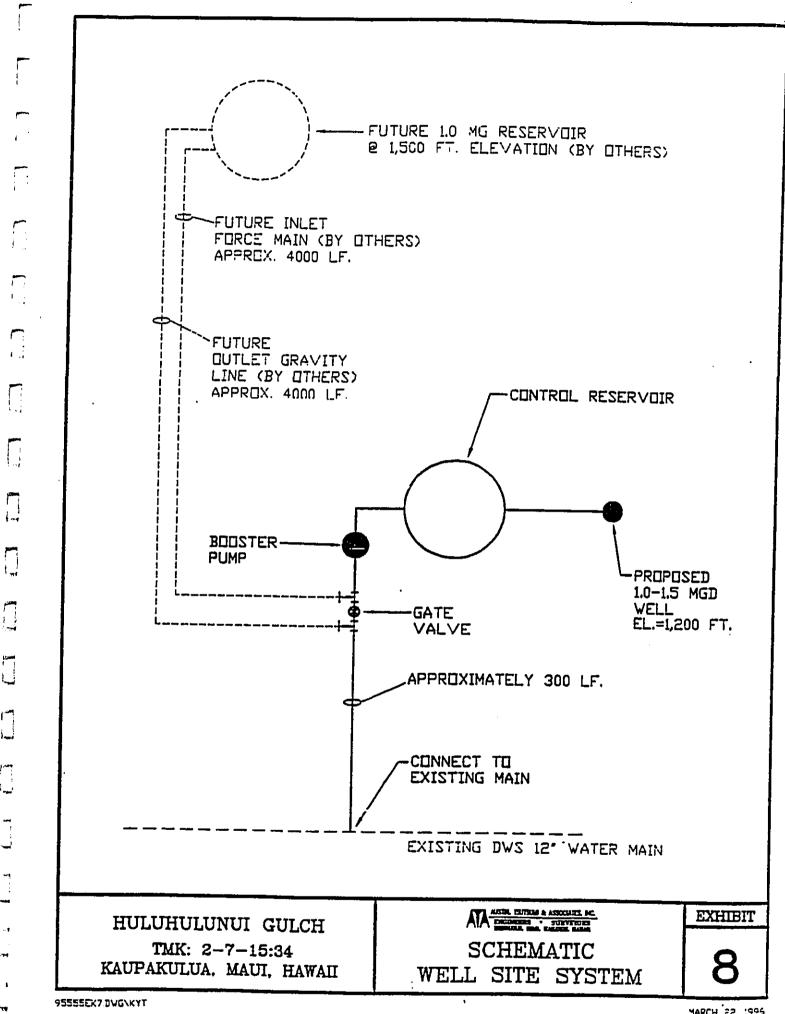
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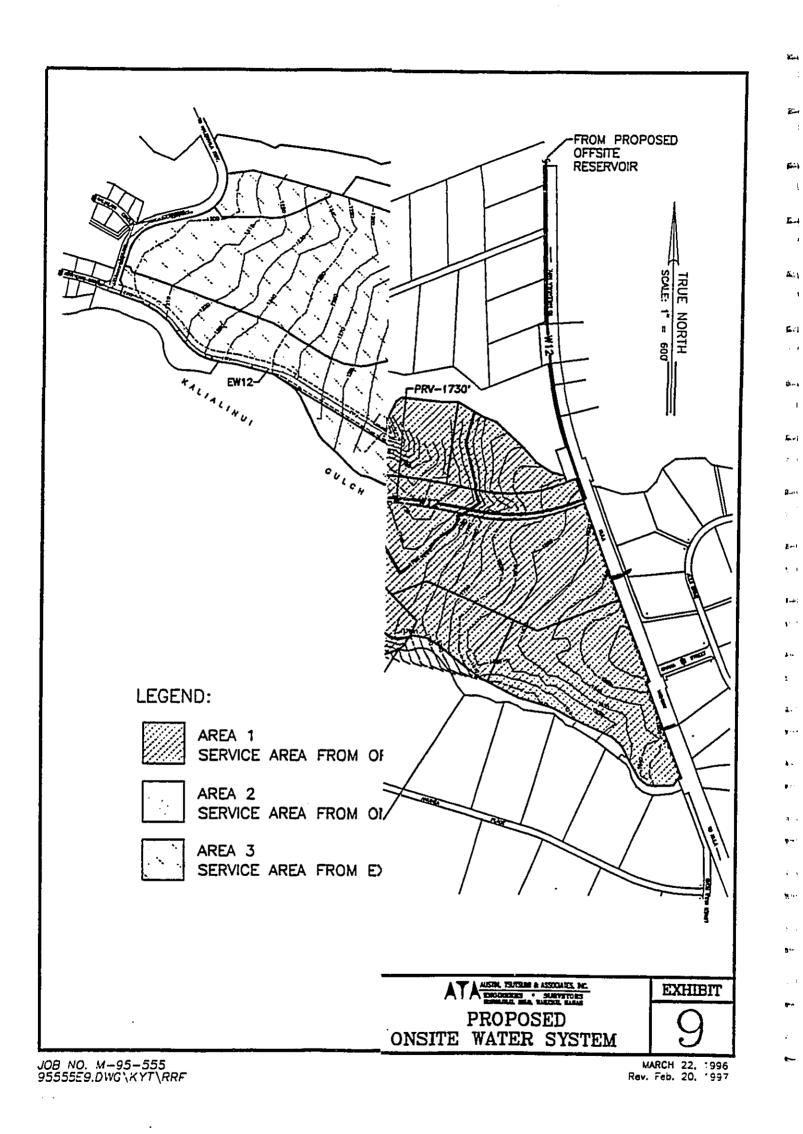
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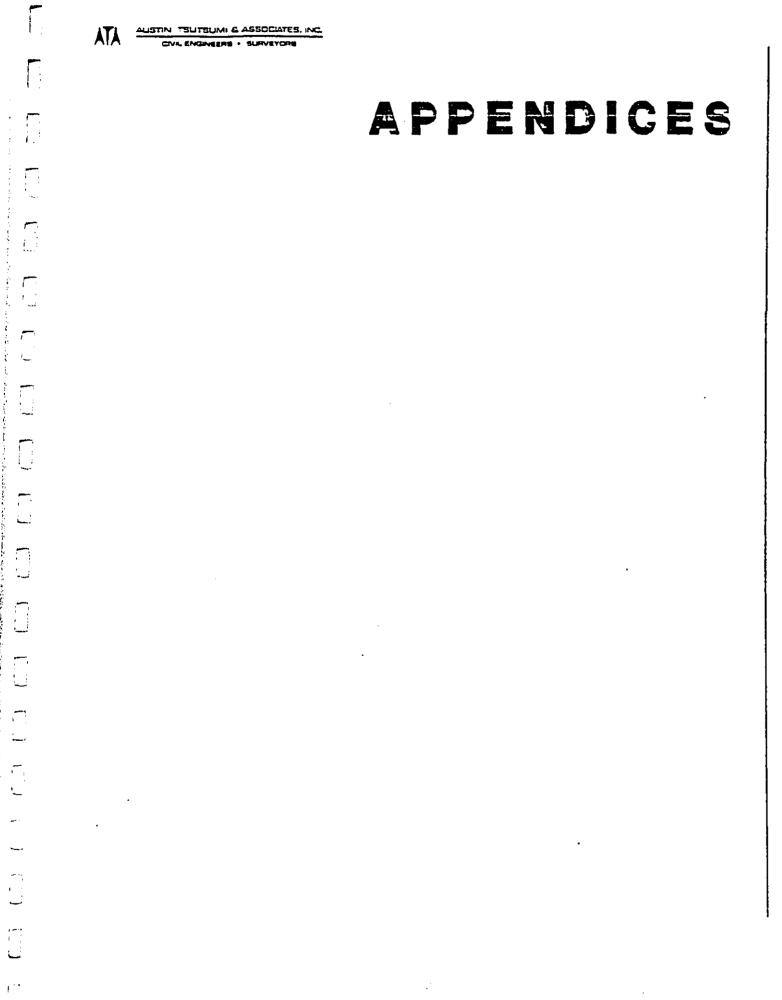
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| APPENDIX A                            | <b>B</b> ±1             |
|                                       | ¥.1                     |
| PRELIMINARY HYDROLOGICAL CALCULATIONS | g2ht                    |
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| KAWAPITANI GULCH (ABOVE KILA HIGHWAY)                                                                                                                                                                                                                                                                      | • • • • • • • • •                                          |                                                      |             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------|-------------|
| DRAINAGE AREA = 1100 ACRES                                                                                                                                                                                                                                                                                 | <br>                                                       |                                                      |             |
|                                                                                                                                                                                                                                                                                                            | ••                                                         |                                                      |             |
| 100 yr-24 HR FOINT RAINFALL = 11 INCHES                                                                                                                                                                                                                                                                    |                                                            | - · · <b>-</b> · · · · ·                             |             |
| HYDROLOGIC SOIL GROUP = B (HAL'IMAILE, PANE)                                                                                                                                                                                                                                                               |                                                            | ••••                                                 |             |
| CURVE NUMBER (TABLE 25)                                                                                                                                                                                                                                                                                    |                                                            |                                                      |             |
| AG.LOT (Sty 100 ac.) = 68                                                                                                                                                                                                                                                                                  |                                                            | • • · · · • • · · •                                  |             |
| PASTURE LAND (SAY 1000 ac)= 61                                                                                                                                                                                                                                                                             |                                                            |                                                      |             |
| WEIGHTED CURVE NUMBER = 68(100) + 61(1000)                                                                                                                                                                                                                                                                 | = 62 <                                                     |                                                      |             |
| 4800 - 1800 - 190                                                                                                                                                                                                                                                                                          | ·······                                                    | •                                                    |             |
| AVE. SLOPE IN FLOWLINE = 26,000' = 11.5%                                                                                                                                                                                                                                                                   | ······································                     |                                                      |             |
| RUNOFF DEPTH (TABLE 24)                                                                                                                                                                                                                                                                                    |                                                            |                                                      |             |
| RAINFALL = 11 IN                                                                                                                                                                                                                                                                                           |                                                            |                                                      |             |
| - CURNE NO. = 62 -                                                                                                                                                                                                                                                                                         | ······································                     |                                                      |             |
|                                                                                                                                                                                                                                                                                                            |                                                            |                                                      |             |
| RUNOFF DEPTH = 6.01 W                                                                                                                                                                                                                                                                                      |                                                            |                                                      |             |
|                                                                                                                                                                                                                                                                                                            | .9)                                                        |                                                      |             |
| PEAK DISCHARGE RATE (CHART 30E3 AND TABLE 2                                                                                                                                                                                                                                                                | .0)                                                        |                                                      |             |
|                                                                                                                                                                                                                                                                                                            | 21N0 FF=                                                   |                                                      | e 4         |
| PEAK DISCHARGE RATE (CHART 30F3 AND TABLE 2<br>DRANNAGE AR EA = 1100 ac.<br>                                                                                                                                                                                                                               | 21N0 FF=                                                   |                                                      | F 🧲         |
| PEAK DISCHARGE RATE (CHART 30F3 AND TAGE Z<br>DRANNAGE AR EA = 1100 ac.<br>————————————————————————————————————                                                                                                                                                                                            | 21N0 FF=                                                   |                                                      | F           |
| PEAK DISCHARGE RATE (CHART 30F3 AND TAGE 2<br>DRANNAGE AR EA = 1100 ac.<br>                                                                                                                                                                                                                                | 21N0 FF=                                                   |                                                      | F           |
| PEAK DISCHARGE RATE (CHART 30F3 AND TAGE 2<br>DRANNAGE AR EA = 1100 ac.<br>————————————————————————————————————                                                                                                                                                                                            | 21N0 FF=                                                   |                                                      | F           |
| PEAK DISCHARGE RATE (CHART 30F3 AND TAGE 2<br>DRANNAGE AR EA = 1100 ac.<br>                                                                                                                                                                                                                                | 21N0 FF=                                                   |                                                      | F           |
| PEAK DISCHARGE RATE (CHART 30F3 AND TAGE 2<br>DRANNAGE AR EA = 1100 ac.<br>————————————————————————————————————                                                                                                                                                                                            | 21N0 FF=                                                   |                                                      | F           |
| PEAK DISCHARGE RATE (CHART 30F3 AND TAGE 2<br>DRANNAGE AR EA = 1100 ac.<br>                                                                                                                                                                                                                                | 21N0 FF=                                                   |                                                      | F           |
| $\frac{PEAK DISCHARGE RATE (CHART 30F3 AND TABLE 2)}{DRANNAGE AR EA = 1100 ac.}$ $$                                                                                                                                                                                                                        | 2010 FF<br>35 CFS/IN                                       | <u>. 0</u> RW0F                                      | F           |
| PEAK DISCHARGE RATE (CHART 30F3 AND TABLE 2<br>DRANNAGE AR EA = 1100 ac.<br>                                                                                                                                                                                                                               | WOFF<br>35 CFS/IN<br>35 CFS/IN<br>10E-FOR H                | <u>. 05</u> RWOF                                     | e           |
| PEAK DISCHARGE RATE (CHART 30F3 AND TABLE 2<br>DRANNAGE AREA = 1100 ac.<br>                                                                                                                                                                                                                                | WOFF<br>35 CFS/IN<br>35 CFS/IN<br>10E-FOR H                | <u>. 05</u> RWOF                                     | F /         |
| PEAK DISCHARGE RATE (CHART 30F3 AND TOPLE 2<br>DRANNAGE AREA = 1100 ac.<br>                                                                                                                                                                                                                                | WOFF<br>35 CFS/IN<br>35 CFS/IN<br>10E-FOR H                | <u>. 05</u> RWOF                                     | F           |
| PEAK DISCHARGE RATE (CHART 30F3 AND TABLE 2 DRANNAGE AR EA = 1100 ac                                                                                                                                                                                                                                       | WOFF<br>35 CFS/IN<br>35 CFS/IN<br>10E-FOR H                | <u>. 05</u> RWOF                                     | F           |
| PEAK DISCHARGE RATE (CHART 30F3 AND TABLE 2         DRANNAGE AREA = 1100 ac.         WRNE ND. = G2         REAK DISCHARGE (16% 20PE) = 210 CFS/inl. OF F         - 11       (11.5% 510PE) = 210 (0.89) × 16         PEAK DISCHARGE         Q = (4.01)(185) × [110 CF5]         PROJECT:         KULAMALU - | UNOFF<br>35 CFS/IN<br>35 CFS/IN<br>10E FOR H<br>TRVICE, M  | <u>о</u> р Runof<br><br>Ашан "<br>алгсн 1961 .       |             |
| $\frac{PEAK DISCHARGE RATE (CHART 30F3 AND TABLE 2)}{DRANNAGE AREA = 1100 ac.}$ $$                                                                                                                                                                                                                         | UNOFF<br>35 CFS/IN<br>35 CFS/IN<br>10E-FOR H<br>HERVICE, M | ор Riwof<br><br>Ашан "<br>Аман "<br>Амасн 1961 .<br> | DATE 7/9/96 |

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UNNAMED GULLH (TRIBUTARY OF KALUAPULANI GULCH) --DRAINAGE AREA = 200 ACRES CURVE NUMBER (TABLE 25) ---- AG. LOT (SAY 100 ac) = 108 ----PASTURE LOND (SAY 100ac.) = 61 ----. ........ - RUNOFF DEPTH (TABLE 24) -RAINEAL - II IN WRVE NO. = 45 - RUNDEF DEPTH = 6.44 IN -- PEAK DISCHARGE RATE (CHART 30E3 AND TABLE 28) DRAWAGE AREA = 200 ac. CURVE NO. = 62 -- PEAK DISCHARGE (16% SLOPE) = 66 CF5/IN. OF RUNOFF (11% SLOPE) = 66 (0.89) = 59 CF5/IN. OF RUNOFF (= PEAK DISCHARGE  $Q = (4.44)(59) \cong 380 \text{ cfs}$ REFERENCE : " ELOSION AND SEDMENT CONTROL - GUIDE FOR HAWAII", ------12 BY PKM DATE 7/9/96 PROJECT: KULAMMLU JOS NO. CHKD. HYDROLOGY - TRIBUTARY GULCH DATE 15-555 FLOW AT KULL LINY WUNDET SHT. NO. OF HONOLULU, HAWAII + HILO, -4 TIN. TEUTSUMI & ASECCIATEE, INC. CIVIL ENGINEERS . SURVEYORS

|             | ,<br>Remarka                                        | Pre-Development Condition |        |           |                   |                   |      |   |  | Post - Development Condition |      |        |          |           | *     |
|-------------|-----------------------------------------------------|---------------------------|--------|-----------|-------------------|-------------------|------|---|--|------------------------------|------|--------|----------|-----------|-------|
| COMPUTATION | ę , (CFS)<br>2 , (CFS)                              | a<br>L                    |        |           |                   |                   |      |   |  | Pas                          |      |        |          |           |       |
| сомРи       | Runoff Discherge<br>Q = CIA , (CFS)                 | 37                        | 13     | 10        | 11                | 28                | 11   |   |  | 76                           | 17   | 61     | 17       | 35        | []    |
| . F         | Correction<br>Factor                                | 17                        | 2.3    | 1.8       | 2,0               | 1.7               | 1.6  |   |  | 2,0                          | 2.0  | 2,0    | 2.0      | 17        | 2,2   |
| НҮВКОLOGY   | Time of Concen-<br>tration, T <sub>o</sub> , (Min.) | 22                        | 6      | 18        | 5                 | 20                | 13   |   |  | 15                           | 15   | 11     | 5        | סד        | =     |
|             | (FL-/FL-)<br>Slode, S.                              | a.08                      | 0.17   | 21.0      | 0.14              | 0.10              | 0.09 |   |  |                              | 1    |        | 1        | ١         | I     |
|             | Length of Reach.<br>L. (FL.)                        | 1500                      | 500    | 600       | 500               | 700               | MD   |   |  | 1                            | 1    | ١      | ١        | ۱         | 1     |
|             | Reintall Intensity.<br>I. (ln./Hr.)                 | 2,8                       | ~      | $\langle$ |                   | $\langle \rangle$ | *    |   |  | 2.3                          |      |        |          | <u>^.</u> | ->    |
|             | Runoll<br>Coefficient, C                            | 0.4                       | $\sim$ |           | $\langle \rangle$ | /                 | Ą    |   |  | 0.7                          | 0.6  | 07     | 0.6      | 0.5       | 0,6   |
|             | Arge, A.<br>(Acto)                                  | 19.41                     | 53     | 4.00      | ط:/o              | 14.74             | 124  |   |  | 19.4/                        | 505  | 4.80   | 4.10     | PT-21     | 451   |
|             | Beth Sgameru                                        | Burness                   | Balan  | y nutry   | Allic/            | RrK               | Shik | - |  | Business                     | Phu. | Electy | Ritter / | ¥         | 21-12 |

PROJECT: Kulamelu - Upper Section Rezoning DATE 3/19/97 BY AW JOB NO. ATA Presiminary Hydrology Calculations U СНКО, DATE 95-===.4 11 SHT. NO\_ OF 1871 WILL PA LCOP SUITE AUSTIN, TEUTSUMI & ASSOCIATES, INC. CMIL ENGINEERS . SURVEYORS

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ATA AUSTIN. TEUTELINI & ABBOCIATES, INC.

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### APPENDIX B

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## PRELIMINARY WATER DEMAND CALCULATIONS

| LAND USE              | AREA (AC.)           | UNITS        | PER UNIT WATER US                               | E AVE. DAILY DEMANI                                            |
|-----------------------|----------------------|--------------|-------------------------------------------------|----------------------------------------------------------------|
| Business              | 19.4/                | 178,000 \$   | 140 9 / 1000 5F<br>+ 1700 9 //cc<br>1700 9 //AC | 50,420 SPD                                                     |
| Halau                 | 5.03                 | +15          | 1700 8 /AC                                      | 8,600                                                          |
| EDERLY HOUSING        | 4.88                 | 50 UNITS     | 560 84/UNIT                                     | 28,000                                                         |
| RUBLIC/QUAGI-PUBLIC   | 5,10                 | ·····        | 1700 8-/AC                                      | 8,700                                                          |
| PARK/PUBLIC           | 14.74                | <u> </u>     | 1700 g-1/AC                                     | 25,100                                                         |
| SINGLE FAMILY         | 4.51                 | 3 UNITS      | 600 84 / UNIT                                   | 1,300                                                          |
| TOTAL                 | 53.67 <sup>AC.</sup> | •            | <u> </u>                                        | 122,620 GPD                                                    |
|                       |                      |              |                                                 |                                                                |
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|                       |                      |              |                                                 |                                                                |
| REPERENCE ! WATER     | e system S           | TANDARDS )   | 10LUME 1 1985 DE                                | рактмент ор Water Supp                                         |
| CUN                   |                      |              | · · ·                                           |                                                                |
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| PRO.                  | IECT: KULAMAL        | R DEMAND     | ECTION REZONING JC<br>CALCULATIONS              | DB NO. $\underline{BY} \underline{AW} \underline{DATE}^{3/29}$ |
| AA <u>Re</u>          | VINITALACI ANALIS    |              | 95                                              | -JJJ, 4 SHT. NO. OF                                            |
|                       |                      |              |                                                 |                                                                |

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## APPENDIX C

## PRELIMINARY WASTEWATER CALCULATIONS

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|                                         | AREA (AC.)                                       | (CAPITA PER ACRE)                      | POPULATION                            | WASTEWATER<br>GENERATION (gpd) | (jrd)<br>Qave |
|-----------------------------------------|--------------------------------------------------|----------------------------------------|---------------------------------------|--------------------------------|---------------|
| BUSINESS                                | 19.71                                            | 140                                    | 2717                                  | 80                             | 217,360       |
| HALAU                                   | 5,03                                             |                                        | - SAY 1000                            |                                | 5,000         |
| ELDERLY HOUSING                         | 4.88                                             |                                        | 1903                                  | <b>8</b> 0 ·                   | 152,240       |
| RUBUL/QUASI-RUSUL                       | 5.10                                             |                                        | ·····                                 | 2000 grd/ac                    | 10,200        |
| PARK / RUBUC                            | 14.74                                            |                                        | SAY 500 _                             | . 5                            | 2,500         |
| SINGLE FAMILY                           | 4.5/ (3""                                        | )                                      | 12                                    | 80                             | 960           |
| TOTAL AREA                              | 53.67                                            | · · · · · · · · · · · · · · · · · · ·  | Тот                                   | ac Ave. Flow                   | .388,260      |
| · · · · · · · · · · · · · · · · · · ·   | •<br>• • • • • • • • • • • • • • • • • • •       |                                        | · · · · · · · · · · · · · · · · · · · | · · · · · · · · · · · ·        |               |
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| ••••••••••••••••••••••••••••••••••••••• | ······································           | ······································ | · · · · · · · · · · · · · · · · · · · | • •<br>•                       |               |
| - u_                                    | · · · ·                                          | · · · · · · · · · · · · · · · · · · ·  | и I.                                  | · · ·                          | Ma.           |
| EFEPENCE: "DEGION<br>Giy A              | NO COUNTY O                                      | P HONOLULU JU                          | UY 1993                               | ENATER MANAGE                  | MENT -VCC     |
|                                         |                                                  |                                        |                                       |                                |               |
|                                         | T: KULAMALU                                      | - Upper Section<br>EWATER CALCULAT     | REZONING .                            |                                | DATE 3/24/97  |

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