Appendix G

Traffic Impact Assessment Report

Traffic Impact Analysis Report 'O'oma Beachside Village

Kaloko, North Kona, Island of Hawai'i, Hawai'i

Tax Map Key Number (3)7-3-009: 004 & 022

MAY 2008

Prepared for:

'O'oma Beachside Village, LLC

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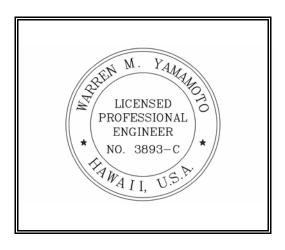
'O'OMA BEACHSIDE VILLAGE

'O'oma, North Kona, Hawai'i

Traffic Impact Analysis Report

TMK: (3)7-3-9: 004 and 022

May 2008



Expiration Date: April 30, 2010

This Traffic Impact Analysis Report has been conducted and prepared by the undersigned professional engineer licensed in the State of Hawai'i in accordance with the best practices of the industry.

Signature
M & E Pacific, Inc.

METCALF&EDDY AECOM

May 7, 2008

Date

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TRAFFIC IMPACT ANALYSIS REPORT for the 'O'OMA BEACHSIDE VILLAGE

'O'oma Beachside Village, a 302.38-acre residential and commercial mixed use community, is being planned at 'O'oma, North Kona, Hawai'i. This report documents a study that was conducted to identify the traffic impacts of the proposed community and to recommend any mitigating measures.

PROJECT DESCRIPTION

'O'oma Beachside Village LLC intends to develop a 302.38-acre property (the Property) at 'O'oma, North Kona, Hawai'i. The Property is comprised of a:

- 217.566-acre parcel identified by TMK (3)7-3-009:004 (Parcel 4);
- 83-acre parcel identified by TMK (3)7-3-009:022 (Parcel 22); and
- 1.814-acre portion of the State-owned Right-of-Way (ROW) located on by TMK (3)7-3-009: (State ROW).

The Property is on the *makai* side of Queen Ka'ahumanu Highway about two miles south of the Kona International Airport at Keahole. Other major cross streets in the vicinity include Ka'iminani Drive and the entrance to the Natural Energy Laboratory of Hawai'i Authority (NELHA) to the north, and Huliko'a Drive (the entrance to the Kohanaiki Business Park) and Hina Lani Street to the south. The Property's location relative to these other roadway facilities is shown on **Figure 1**.

'O'oma Beachside Village is planned to include the following:

- Approximately 950 to 1,200 homes, including:
 - Single family units,
 - o Multi-family units, and
 - "Live-work" units with commercial uses on the ground floor and residential uses above.
- Approximately 200,000 square feet of commercial space, including:
 - Space for a small grocery store,
 - Restaurants, and
 - Retail and office space.
- A private or charter school site.
- A public beach park, including a community pavilion.

Construction of 'O'oma Beachside Village is expected to begin in 2011 (with first occupancy projected in 2012) and will continue through approximately 2029. For the purpose of this analysis 'O'oma Beachside Village is roughly divided into three areas: Area A, Area B, and Area C, as shown on **Figure 2**. The development of each area could overlap into other areas at any one time. For the purpose of this analysis, the projection is to deliver about 20-40 single family residential units, 30-50 multi-family residential units, and 10-25,000 square feet of commercial space per year.

The study analyzed three forecast years to comply with the Concurrency Conditions of County of Hawai'i Ordinance 07-99 which requires analyses for 5, 10, and 20 year forecasts. This study analyzed years 2015, 2020, and 2029 corresponding to 7, 12, and 21 year forecasts. The number of project components which were assumed to be occupied by each analysis year for purposes of conducting the traffic impact analysis is summarized on **Table 1**. The actual development schedule for the 'O'oma Beachside Village could deviate from the schedule shown on **Table 1**.

The State of Hawai'i Department of Transportation (HDOT) is currently preparing for the second phase of widening of the Queen Ka'ahumanu Highway to four lanes from Honokohau Harbor to the Kona International Airport at Keahole, with completion of

construction currently scheduled for 2011. HDOT intends to restrict access to the widened highway and permit fully accessible signalized intersections only at Kealakehe Parkway (the harbor access road), Hina Lani Street, Hulikoʻa Drive (Kohanaiki), Kaʻiminani Drive, and Keahole Airport Road. The developments on the *makai* side of the highway may be permitted right turn in, right turn out movements onto the highway. For this study, it was assumed that 'Oʻoma Beachside Village would have such an access.

'O'oma Beachside Village would also be serviced by a frontage road that would have connections to fully accessible signalized intersections. This frontage road would extend from Huliko'a Drive at Kohanaiki Industrial subdivision (crossing Queen Ka'ahumanu Highway into the Shores of Kohanaiki and resulting in a full, four-way intersection) to the Keahole Airport Road, and would allow vehicles from connecting makai projects direct access to the airport without having to enter the highway. The frontage road alignment has not been determined but it is not expected to be a high speed design roadway. Within 'O'oma Beachside Village there would be urban land uses and several intersecting streets along the roadway as traffic calming measures. 'O'oma Beachside Village would also be served by a transit stop.

EXISTING CONDITIONS

A survey of the existing roadway and traffic conditions was made in September 2006.

Existing Roadways

The main roadways currently in the study area include Queen Ka'ahumanu Highway, Ka'iminani Drive, the NELHA access road, Huliko'a Drive, and Hina Lani Street.

Queen Ka'ahumanu Highway is the primary arterial highway on the west side of the island of Hawai'i. The highway passes through the North Kona and South Kohala districts and connects Kailua Village with the Kona International Airport, the Kohala resort areas, and Kawaihae. It is a two-lane Class I State Highway with limited access and a design speed of 70 miles per hour. Intersections on this highway are fully

channelized and signalized where warranted, including the Ka'iminani Drive and Hina Lani Street intersections.

Ka'iminani Drive is a collector road within a 60-foot right-of-way that provides *mauka-makai* access between Queen Ka'ahumanu Highway and Mamalahoa Highway and provides access to the Kona Palisades subdivision.

The NELHA access road and Huliko'a Drive provide access to two separate industrial parks and their intersections with the highway are channelized but not signalized.

Hina Lani Street is a two-lane County secondary arterial road within an 80-foot right-of-way. It provides *mauka-makai* access between Queen Kaʻahumanu Highway and Mamalahoa Highway and serves the Kaloko Light Industrial Subdivision at its *makai* end.

<u>Traffic Volumes</u>

Traffic turning movement counts were taken at the Hina Lani Street and Ka'iminani Drive intersections on Queen Ka'ahumanu Highway during the morning and afternoon peak periods on September 12 and 14, 2006. Traffic turning movement counts require a traffic surveyor to observe traffic flow and record the movements of each vehicle crossing the intersection as through or turning movements by 15 minute intervals. The worksheets from these traffic counts are included in **Appendix A**.

The resultant morning and afternoon peak hour traffic volumes are shown on **Figure 3**, with volumes for two consecutive morning and afternoon peak hours shown. The volumes are rounded to the nearest five vehicles per hour (vph). The northbound direction of traffic on Queen Kaʻahumanu Highway south of Hina Lani Street is higher in the first hour of the morning peak, then about equal to the southbound flow in the second hour. The northbound volumes north of Kaʻiminani Drive are higher for both peak hours. This reflects the commute of workers from Kona to the Kohala resort area in the early morning, followed by the commute of workers to Kailua later in the morning. During the afternoon peak, the southbound volumes south of Hina Lani Street are about equal to the northbound volumes in the first hour while the northbound volumes are

much higher in the second hour. The southbound volumes north of Ka'iminani Drive are higher during both afternoon peak hours. Long traffic queues in the southbound lane were observed for short periods in the early afternoon period due to backup of traffic from Kailua Village. The existing traffic operations at the study intersections are discussed in the **Level of Service Analysis** section of this report.

The HDOT took metered traffic counts at selected locations on Hawai'i Island roadways in even numbered years. Station T-8-M is located on Queen Ka'ahumanu Highway 850 feet north of the NELHA access roadway. HDOT has converted this station to a telemetry station that provides continuous traffic data. The data from the previous counts and the average weekday daily traffic volumes for 2006 provides the historic trend in daily traffic volumes on the highway over a 14 year period ending in 2006. The biannual change in two way daily traffic volumes on Queen Ka'ahumanu Highway is shown in tabular and graph form on **Figure 4**. Queen Ka'ahumanu Highway shows a 94% increase in traffic volumes over the 14 year period, which corresponds to a 4.8% compounded annual growth rate.

The pattern of hourly traffic volumes on Queen Ka'ahumanu Highway on June 1, 2004, is shown in tabular and graph form on **Figure 5**. Separate curves are shown for the northbound and southbound traffic volumes. The northbound traffic volumes are higher than the southbound volumes for the first two hours of the morning. The southbound traffic volumes are higher for most of the afternoon hours except the last two hours.

PROPOSED ROADWAY IMPROVEMENTS

The HDOT and County of Hawai'i have many roadway improvements planned to meet the expected growth in the area. The "Keahole to Honaunau Regional Circulation Plan County Action Plan" (August 2006) prepared by the County of Hawai'i Planning Department identifies several specific improvements pertinent to this study. Those improvements include the widening of Queen Ka'ahumanu Highway from Henry Street to the airport and the development of an extensive roadway network *mauka* of the highway.

The HDOT is currently widening the highway from two to four lanes from Henry Street to Kealakehe Parkway under Phase 1 of the widening project which is expected to be completed in 2008. The second phase is expected to be completed by 2011 and would extend the four lane design past the airport access roadway. The project would also add a northbound bicycle lane and a southbound bicycle route/paved shoulder lane.

The new roadway network mauka of the highway would create more *mauka-makai* roadways between Queen Ka'ahumanu Highway and Mamalahoa Highway and create more north-south roadways between and parallel to these two existing highways. The three important north-south roadways include the Kealaka'a Street Extension, Ane Keohokalole Highway Extension, and Main Street (Kamanu Street) Extension. Their net effect would be the diversion of trips from the existing highways.

A timetable for the development of these new roadways has not been established but would be tied in to new projects being built along the roadway alignments. The draft Kona Community Development Plan has developed a list of roadway projects in this area:

- Keanalehu Street-Manawale'a Street connection
- Ane Keohokalole Highway Extension (Mid-level road) in stages from Palani Road to Ka'iminani Drive
- Kamanu Street Extension
- Kealakaa Street Extension
- Hienaloli Street Extension
- University Drive
- Frontage Road
- Queen Ka'ahumanu Highway widening, Phase II

TRAFFIC FORECASTS

The three forecast years for the 'O'oma Beachside Village are 2015, 2020, and 2029. During the three periods, the ambient or background traffic on Queen Ka'ahumanu Highway can be expected to increase due to regional growth and new projects in the area. The traffic patterns in the study area would also change as new roadways are placed in operation. The traffic that would be generated from the 'O'oma Beachside Village was added to the ambient traffic forecast to obtain the total with project traffic forecast.

Ambient Traffic Forecast

The results of several traffic impact analysis reports for proposed projects in the area were analyzed to develop ambient traffic forecasts on Queen Ka'ahumanu Highway at Ka'iminani Drive, the NELHA access roadway, Huliko'a Drive, and Hina Lani Street for the three forecast years. The forecast procedures and summary results for each study intersection are described below.

Kaʻiminani Drive - The traffic forecasts prepared by Rowell for UH Center at West Hawaiʻi Main Street Collector Road (June 2006) were used for the 2015 forecast. Other projects included in the forecast were the Makalei Estates, Palamanui and Lokahi Subdivision. Very large traffic increases were forecast for the two intersecting roadways since the mauka network of roadways were not assumed to be well developed by 2015. Also, traffic flows became significantly northbound in the AM and southbound in the PM. For the 2020 ambient traffic forecast, the 2015 traffic volumes at Kaʻiminani Drive were increased by 1.3% for the five year period. This represents a 4.83% annual growth but with 20% of the growth being routed to the by then more defined mauka roadway network. Then for 2029, the 2020 volumes were increased by 5% over the nine year period. This represents a 4.83% annual growth with 28% being routed to the mauka roadways. For each planning year, the through volumes were continued to the NELHA access road intersection. The current and ambient forecast inbound and outbound traffic volumes are summarized as follows.

| YEAR | AM PEAK HOUR | | PM PE | AK HOUR |
|------|--------------|----------|---------|----------|
| ILAK | INBOUND | OUTBOUND | INBOUND | OUTBOUND |
| 2006 | 155 | 720 | 595 | 145 |
| 2015 | 440 | 1,015 | 1,290 | 445 |
| 2020 | 445 | 1,025 | 1,305 | 450 |
| 2029 | 470 | 1,070 | 1,375 | 470 |

NELHA Roadway – Traffic counts were taken on the NELHA access road in 2002 by HDOT. There is a sharp peak inbound peak in the morning and a sharp outbound peak in the afternoon with less than 100 vph in the peak direction. Most of the volumes in the other hours were low. Entering and exiting peak hour volumes were increased by 3% annually as follows:

| YEAR | AM PEAK HOUR | | PM PE | AK HOUR |
|------|--------------|----------|---------|----------|
| ILAK | INBOUND | OUTBOUND | INBOUND | OUTBOUND |
| 2002 | 86 | 28 | 41 | 87 |
| 2006 | 96 | 31 | 46 | 97 |
| 2015 | 120 | 39 | 57 | 121 |
| 2020 | 132 | 43 | 63 | 134 |
| 2029 | 153 | 50 | 73 | 155 |

These volumes were then distributed as shown below reflecting the increasing urbanization of the area north of the Property:

| YEAR | PERCENT DISTRIBUTION BY DIRECTION OF TRAVEL | | |
|------|---|----------|--|
| | INBOUND | OUTBOUND | |
| 2015 | 45% | 55% | |
| 2020 | 48% | 52% | |
| 2029 | 50% | 50% | |

<u>Huliko'a Drive</u> – Two separate projects are planned on the mauka and makai sides of the highway at this intersection. Only inbound and outbound traffic forecasts were made for these two projects.

The existing Kohanaiki Business Park is accessed by Hulikoʻa Drive on the mauka side of the highway. This intersection is currently unsignalized but there are plans to make this a fully accessible signalized intersection with the highway widening project. In lieu of traffic counts, the traffic forecast prepared by Pacific Planning and Engineering, Inc., in 1991 for the Kohanaiki Mauka project was updated for the current land use classifications and trip generation rates. The business park project was assumed to be fully occupied by 2015 and the results of this analysis were assumed to be constant for the three forecast years as follows:

| | AM PEAK HOUR | | | | PM PEA | K HOUR | | |
|------|--------------|-------|-------|-------|--------|--------|-------|-------|
| | INBC | UND | OUTB | OUND | INBC | UND | OUTB | OUND |
| YEAR | North | South | North | South | North | South | North | South |
| 2006 | 65 | 95 | 95 | 65 | 35 | 50 | 90 | 135 |
| 2015 | 125 | 190 | 130 | 195 | 65 | 100 | 180 | 270 |
| 2020 | 125 | 170 | 130 | 175 | 65 | 90 | 170 | 240 |
| 2029 | 125 | 170 | 130 | 175 | 65 | 90 | 170 | 240 |

For the purposes of this study, the existing 2006 volumes were assumed to be half of the 2015 forecasts. The south inbound and outbound volumes were reduced slightly for 2020 and 2029 since the Kamanu Street Extension would intersect the northern terminus of Hulikoʻa Drive and provide an alternate route to the south, thereby diverting some trips.

The Shores of Kohanaiki is planned for the makai side of the highway. Its access road would intersect the highway across from Hulikoʻa Drive and form the west leg of the fully accessible, signalized intersection. The access road would also serve as the southern terminus for the makai frontage road. A letter report prepared by Julian Ng, Inc., in 2003 discussed the trip generation characteristics of the Shores of Kohanaiki project with proposed new land uses (500 dwelling units, an 18-hole golf course, and

120 parking stalls for public beach access). The Shores of Kohanaiki has been approved and is expected to be in place by 2015. Only entering and exiting volumes were forecast for each analysis year:

| PEAK | VEHICLE T | RIPS/HOUR |
|------|-----------|-----------|
| HOUR | INBOUND | OUTBOUND |
| AM | 125 | 290 |
| PM | 465 | 235 |

The trips were distributed north and south on the highway and a small portion of trips was assumed to use the makai frontage road to access the airport. The through volumes on the highway were forecast at the Hina Lani Street intersection and continued to Hulikoʻa Drive.

<u>Hina Lani Street</u> – For 2015, the existing 2006 through and turning volumes were increased by 1.529, which is the 4.83% annual growth rate compounded for 9 years. For 2020, the through volumes were increased by 1.3% similar to Ka'iminani Drive, however turning volumes for 2020 from the TIAR prepared by Fehr & Peers/Kaku Associates for the Kula Nei Residential Development were used. This forecast also included the traffic which would be generated by the proposed Kaloko Heights subdivision. For 2029, the 5% growth factor used at Ka'iminani Drive was also used here. The through traffic forecasts were carried to the Huliko'a Drive intersection. The current and ambient forecast inbound and outbound traffic volumes are summarized below:

| YEAR | AM PEAK HOUR | | PM PEA | K HOUR |
|------|--------------|----------|---------|----------|
| ILAK | INBOUND | OUTBOUND | INBOUND | OUTBOUND |
| 2006 | 490 | 560 | 620 | 580 |
| 2015 | 740 | 860 | 960 | 975 |
| 2020 | 900 | 1,205 | 1,130 | 935 |
| 2029 | 930 | 1,050 | 1,215 | 995 |

The results of the ambient traffic forecasts are shown on **Figure 6** with the frontage road assumed in place. The AM peak hour forecasts for the three forecast years are shown on the first page of the figure, while the PM peak hour forecasts are shown on the second page. The NELHA access road was assumed to provide right turn in, right turn out access to the highway.

Project Generated Traffic

The traditional three-step process of trip generation, trip distribution, and trip assignment was used to forecast future traffic that would be generated by 'O'oma Beachside Village. The trip generation step forecasts the number of new trips that would be produced during each of the two study periods. The trip distribution step allocates these new trips by direction of travel. Finally, the trip assignment step assigns the trips to the specific turning movements at the study intersections.

The trip generation step forecasts the volume of vehicle trips that would be generated by 'O'oma Beachside Village during the morning and afternoon peak periods. The Institute of Transportation Engineers' <u>Trip Generation Report</u> (Seventh Edition, 2003) has rates to calculate the number of morning and afternoon peak hour trips that would be generated by various land uses.

An initial step was to correlate the land uses proposed in 'O'oma Beachside Village with the land uses included in the <u>Trip Generation Report</u> that would have similar trip generation characteristics. The results of this analysis are summarized on Table 1 and are discussed below:

- The single family residential units utilized the equations/rates for single family detached housing (ITE land use 210).
- All multi-family residential units including the mixed use and live-work units were assumed to be low-rise condominiums/town houses (ITE land use 231) that are described as residential units that have at least one other unit located in the same building that has one or two levels.

- The makai mixed use village commercial area was assumed to be retail-oriented and was classified as a shopping center (ITE land use 820). The mauka mixed use/live-work village was assumed to be an office park (ITE land use 750). The ITE report describes the latter as suburban subdivisions or planned unit developments containing general office buildings and support services such as banks, restaurants, and service stations, arranged in a park-like setting. This was the closest land use to the suburban neighborhood commercial center envisioned for this proposed project.
- The charter school was assumed to have the trip generation characteristics of a private school with grades K-8 (ITE land use 534) and having 225 students.
- The grocery store was assumed to be a 15,000 sf supermarket (ITE land use 850).
- The restaurant and private canoe club was assumed to be a 20,000 sf quality restaurant (ITE land use 931) with turnover rates usually of one hour or longer.
- There are no trip generation rates for a public beach use. Based on the previously referenced letter report by Ng, the following number of beach use trips were forecast:

| | HOURLY TRIPS | | | |
|------|--------------|----------|---------|----------|
| YEAR | AM PEA | K HOUR | PM PEA | K HOUR |
| ILAK | INBOUND | OUTBOUND | INBOUND | OUTBOUND |
| 2015 | 50 | 10 | 20 | 50 |
| 2020 | 60 | 15 | 25 | 60 |
| 2029 | 70 | 20 | 25 | 70 |

The trip generation analysis for each land use in each analysis year is detailed on **Table 2**, including the trip generation equations and rates from the ITE report.

The <u>Trip Generation Report</u> also provides the percentage of inbound and outbound trips in each peak hour. The number of generated trips was divided into inbound and outbound trips based on the information from the report, as shown on **Table 2**.

The first forecast year (2015) of 'O'oma Beachside Village is summarized on the first page of **Table 2**, and it would generate 187 outbound and 131 inbound trips in the morning peak hour, and 310 inbound and 243 outbound trips in the afternoon peak hour. The second analysis year (2020) is summarized on the second page and it would generate 445 outbound and 421 inbound trips in the morning peak hour and 656 inbound and 701 outbound trips in the afternoon peak hour. The third analysis year (2029) is summarized on the third and fourth pages and it would generate 884 outbound and 906 inbound trips in the morning peak hour and 1,023 inbound and 1,128 outbound trips in the afternoon peak hour.

The project generated trips were then distributed by three primary direction of travel to and from the Property: north and south of the Property, and internal to the Property. The distribution of external trips was determined from the current distribution of population and employment in West Hawai'i. The districts closer to the Property were weighted higher due to the propensity for shorter trips to be made more frequently. This analysis indicated that the current weighted population and employment distributions are 55% south and 45% north. These proportions were assumed for the employment distribution in all three forecast years. The proportion of population to the north was assumed to be 45% in 2015, 48% in 2020, and 50% in 2029, reflecting the trend of urbanization to the north. The morning outbound residential trips and the afternoon inbound trips were distributed based on the employment distribution. The distribution of population was used for all other trips. The percentage of internal trips were initially calculated for the non-residential land uses, and made to balance the corresponding resident-generated trips. The trip distribution rates also considered that a portion of the trips from the live-work units and to a smaller extent, the mixed use units, would not be

made outside of 'O'oma Beachside Village and the proportion of internal trips were increased accordingly.

The results of the trip distribution analysis are shown on **Table 3** with the 2015 results on the first page, the 2020 results on the second page, and the 2029 results on the third page. The residential land uses were combined into a single land use for this calculation. Similarly, the two mixed-use village commercial uses and the live-work commercial use were combined together.

The project generated traffic volumes were assigned to the highway and frontage road network with movements as permitted. The results of the traffic assignment analysis are shown on **Figure 7** with the volumes not rounded.

A unique aspect of trips attracted by commercial centers is that a number of these trips are pass-by trips. Pass-by trips are attracted from traffic passing the site on an adjacent roadway having direct access to the commercial center. Therefore, these trips do not add to the through volumes on the roadway. They are added to the turning movements but are subtracted from the through movements where they turn off to access the commercial center. The commercial areas of 'O'oma Beachside Village are not expected to draw pass-by trips in the morning peak hour but would attract some pass-by trips in the afternoon peak hour, especially trips stopping for shopping purposes. These trips are shown as negative volumes on the trip assignments (Figure 7).

Total Forecast Volumes

The project generated traffic assignment volumes from **Figure 7** were added to their corresponding ambient traffic forecasts from **Figure 6** to obtain the total with project traffic forecasts shown on **Figure 8** for each forecast year. The traffic volumes are rounded to the nearest five vph.

LEVEL OF SERVICE ANALYSIS

The traffic forecast volumes in themselves do not indicate the quality of traffic operations. The concept of level of service is used to quantify the quality of traffic flow on roadway facilities. The Transportation Research Board (TRB) has developed procedures to calculate level of service value(s) by measuring traffic volumes against the capacities of different types of roadway facilities. Their <u>Highway Capacity Manual 2000</u> (HCM2000) describes the various procedures developed for freeways, highways, signalized and unsignalized intersections, etc.

A variety of methodologies was used to analysis existing and forecast traffic conditions. The methodology for analyzing signalized intersections was used for the Ka'iminani Drive, Huliko'a Drive, and Hina Lani Street intersections. The methodology for analyzing unsignalized intersections was used for the existing NELHA access road and Huliko'a Drive intersections. The methodology for analyzing highway on-ramps was used for the future right turn out movement at the NELHA and 'O'oma Beachside Village access roads. Finally, separate methodologies for analyzing two-lane and multi-lane highways were used for the current and forecast highway conditions fronting the Property.

Signalized Intersection Analysis

The Ka'iminani Drive, Huliko'a Drive and Hina Lani Street study intersections are/will be signalized. The methodology for analyzing signalized intersections calculates the levels of service for individual movements, approaches, and the intersection as a whole based on the average stopped delay per vehicle. The results range from level of service A (best with average delays less than ten seconds) to F (worst with average delays longer than 80 seconds, described as follows.

| LEVEL OF SERVICE | CONTROL DELAY PER VEHICLE (Seconds/Vehicle) |
|---------------------|---|
| А | < 10.0 |
| В | 10.1 to 20.0 |
| С | 20.1 to 35.0 |
| D | 35.1 to 55.0 |
| E | 55.1 to 80.0 |
| F | > 80.1 |

The County of Hawai'i considers levels of service A to D as acceptable by ordinance with levels of service E and F indicating the need for mitigating measures. As a matter of practice, the major streets of signalized intersections can be designed to have a higher level of service than the side streets or turning lanes with the latter having unacceptable levels of service in order to maintain an acceptable level of service on the main road. These unacceptable levels of service are often times caused by long waits for the green traffic signal phase rather than by capacity problems and are indicated by low values of the volume/capacity (V/C) ratio as described below.

The results of the signalized intersection level of service analysis for the Queen Ka'ahumanu Highway intersections with Ka'iminani Drive, Huliko'a Drive, and Hina Lani Street are shown on **Tables 4**, **5**, and **6**, respectively. Each table is for a single intersection and includes the results for the AM (morning) and PM (afternoon) peak hours for the intersection as a whole, each approach of the intersection, and the left turn, through and right turn movements of each approach. The results are shown for the 2006 existing conditions (for Ka'iminani Drive on **Table 4** and for Hina Lani Street on **Table 6**) and the years 2015, 2020, and 2029 forecasts, with ambient without project and total with project results for each forecast year. The specific results data shown for each year includes the level of service (LOS), average stopped delay (DEL) and volume/capacity ratio (V/C), which is a percentage utilization of the traffic signal green time given the entire intersection and each movement. The level of service calculation worksheets are provided in **Appendix B**.

Queen Ka'ahumanu Highway/Ka'iminani Drive — The results of the signalized intersection level of service analysis for the Queen Ka'ahumanu Highway/Ka'iminani Drive intersection are shown on **Table 4**. The intersection is currently operating at an acceptable level of service B in the AM peak hour. With the large increases in traffic volumes forecast for 2015 ambient conditions, the Ka'iminani Drive westbound approach would require two left turn lanes to maintain the acceptable levels of service. The frontage road approach is forecast to operate at level of service F due to the long wait for the green phase and not capacity problems, as evidenced by the low V/C ratio. The additional traffic generated by 'O'oma Beachside Village would cause the Ka'iminani Drive approach to change from level of service D to E, but the intersection would continue to operate at level of service D. Similarly, the intersection levels of service would remain at acceptable levels for the 2020 and 2029 forecast years, although individual and approach levels could be at unacceptable levels.

The intersection is currently operating at an acceptable level of service B in the PM peak hour. As with the AM peak hour, the Ka'iminani Drive westbound approach would require two left turn lanes by 2015 to maintain the acceptable levels of service for the ambient traffic forecast. The large traffic increases forecast for 2020 and 2029 would require additional mitigation in the form of two southbound left turn lanes and two northbound right turn lanes to maintain the intersection level of service D for both ambient and total with project conditions. The AM peak hour forecasts would not require these additional improvements but the AM peak hour results shown on **Table 4** do include these mitigating measures. As with the AM peak hour, several approaches/individual movements may have to operate at unacceptable levels of service to maintain an acceptable intersection level of service.

The analysis for the Queen Ka'ahumanu Highway/Ka'iminani Drive intersection indicates that this intersection could operate at acceptable levels of service with mitigation measures for the ambient traffic forecasts. These include having double left turn lanes on the Ka'iminani Drive westbound approach by 2015, and double left turn lanes on the highway southbound approach and double right turn lanes on the highway northbound approach by 2020. Additional mitigating measures would not be required to

accommodate traffic generated from 'O'oma Beachside Village.

Queen Ka'ahumanu Highway/Huliko'a Drive – The results for the Queen Ka'ahumanu Highway/Huliko'a Drive intersection are shown on **Table 5.** There is no existing analysis since the intersection is not currently signalized. The intersection is forecast to operate at an acceptable level of service C for the three ambient forecast years in the AM peak hour, although several individual movements would be at unacceptable levels. The AM peak hour 2029 ambient traffic forecast shows a double left turn lane for the northbound highway approach since it would be required for the PM peak hour condition.

The AM peak hour 2015 and 2020 total with project traffic forecasts shows a double left turn lane for the northbound highway approach since it would be required for the PM peak hour condition. With the additional traffic generated by 'O'oma Beachside Village in 2020 the intersection level of service would change from C to D, which is considered an acceptable level of service. The additional project generated traffic in 2029 would require a double left turn lane on the northbound highway approach to maintain the intersection level of service D. The long delays on the Huliko'a Drive approaches are due to the long cycle lengths and not capacity problems, as noted by the low V/C ratios.

The PM peak hour has higher volumes and worse levels of service as a result. The intersection is forecast to operate at an acceptable level of service D for the three forecast year ambient conditions, although the 2029 forecast would require a double left turn lane on the northbound highway approach as a mitigating measure to maintain the intersection level of service D. The intersection levels of service for the 2015 and 2020 total with project forecasts could be maintained at D with a double left turn lane on the northbound highway approach. Additional mitigation in the form of double left turn lanes on the Hulikoʻa Drive westbound approach would be needed to accommodate the 2029 total with project forecast.

The analysis for the Queen Ka'ahumanu Highway/Huliko'a Drive intersection indicates that this intersection would be impacted by traffic generated from 'O'oma Beachside

Village and would require mitigation to operate at acceptable levels of service. These measures include having double left turn lanes on the Queen Ka'ahumanu Highway northbound approach by 2015, and double left turn lanes on Huliko'a Drive westbound approach by 2029.

The level of service analysis indicated that the Huliko'a Drive intersection would operate at an acceptable level D for the volumes forecast with the large conflicting volumes of southbound through traffic and northbound left turns. This assumes that sufficient traffic would be diverted to the mauka roadway network. If the highway volumes are higher than forecast due to insufficient traffic being diverted to the mauka roadway network or other unforeseen reasons, then the intersection could operate at unacceptable levels of service. As a contingency measure for this possibility, the "Michigan U-turn" should be considered as a supplemental mitigating measure to divert turning traffic movements from the intersection and reduce the conflicting movements.

The Michigan U-turn requires a U-turn facility in the highway median in concert with a right turn in, right turn out access roadway so that left turns are not made. Exiting left turns from the access roadway would make a right turn onto the highway, merge across highway traffic into the left-most lane, then make a U-turn on the highway median facility, and then proceed in the opposite direction from which they started. Similarly, incoming left turns would proceed on the opposite side of the median past the access road, make a U-turn on the highway median facility, then merge across highway traffic into the right-most lane, and then make a right turn into the access roadway. A Michigan U-turn on Queen Ka'ahumanu Highway for the 'O'oma Beachside Village would eliminate some of the crossing and turning movements at the Ka'iminani Drive and Huliko'a Drive intersections and make them work more efficiently. The two median U-turn facilities would be located between the 'O'oma Beachside Village and NELHA access road. The second facility could be located further north between the NELHA access road and Ka'iminani Drive to include NELHA in the Michigan U-turn.

Queen Ka'ahumanu Highway/Hina Lani Street — The results of the signalized intersection level of service analysis for the Queen Ka'ahumanu Highway/Hina Lani Street intersection are shown on **Table 6**. The intersection is currently operating at an acceptable level of service C in both peak hours, and is forecast to operate at a still acceptable level of service D for the 2015 ambient without project and total with project forecasts. The development of the mauka residential projects would generate the need for a double left turn lane on the westbound approach of Hina Lani Street by 2020. The additional traffic generated by the 'O'oma Beachside Village would not require any additional mitigation. Hence, the 'O'oma Beachside Village is not expected to contribute to adverse traffic impacts at the Hina Lani Street intersection until after 2020. However, the additional project generated traffic would require mitigation in 2029 to maintain acceptable level of service for the intersection. A double left turn lane on the southbound highway approach would improve the intersection level of service to C.

<u>Signalized Intersection Conclusions</u> – The preceding level of service analysis indicated the need for mitigating measures to accommodate the project generated traffic by 2029. This need should be considered as speculative due to the uncertainties associated with such a long forecast period, including regional development projects and *mauka* roadway plans that may or may not be actually accomplished. Contingencies should be made to implement these measures while recognizing that their needs may not actually occur.

Unsignalized Intersection Analysis

The NELHA access road and Hulikoʻa Drive intersections are currently unsignalized. The procedure used for analyzing unsignalized intersections calculates vehicle delays and levels of service based on the distribution of gaps in traffic on the major street and driver judgment in selecting gaps through which to execute turns. For two-way stop intersections where only the minor street traffic is controlled by a stop sign, levels of service are calculated for the critical turning movements, including outbound movements from the stop-controlled approach and left turns from the major street to the minor street. The procedure does not calculate an overall intersection level of service.

The <u>Highway Capacity Manual</u> defines the relationship between level of service and delay (in seconds/vehicle) for unsignalized intersections as shown below:

| LEVEL OF SERVICE | DELAY (Seconds/Vehicle) |
|---------------------|----------------------------|
| А | < 10.0 |
| В | 10.1 to 15.0 |
| С | 15.1 to 25.0 |
| D | 25.1 to 35.0 |
| Е | 35.1 to 50.0 |
| F | > 50.1 |

The County of Hawai'i considers levels of service A to D as acceptable for unsignalized intersections. Level of service F (with average delays longer than 50 seconds) is considered undesirable for unsignalized intersections and indicates the possible need for mitigation at that intersection.

The results of current operations at the two current unsignalized intersections are shown on **Table 7**. The critical movement at each intersection is the outbound left turn. Based on the estimated current volumes at each intersection, this movement at the NELHA access road intersection is at level of service F in the AM and E in the PM peak hour. Similarly, this movement at the Huliko'a Drive intersection is at level of service F in both peak hours. These results indicate the current need for mitigating measures at both intersections. The level of service calculation worksheets are provided in **Appendix C**.

No future study intersections were analyzed as unsignalized intersections since none are expected to operate as unsignalized intersections.

Highway On-Ramp Analysis

The access roadways serving 'O'oma Beachside Village and NELHA are expected to be unsignalized and limited to right turn in, right turn out movements. The methodology for analyzing highway on-ramps was used instead of an unsignalized intersection analysis

since the right turn lane would have adequate acceleration and taper lengths to perform like a highway on-ramp. The methodology for analyzing on-ramps calculates maximum flow rates in passenger cars/hour/lane based on the volumes of highway/roadway and merging traffic, and roadway capacities, and then calculates levels of service based on density as follows:

| LEVEL OF SERVICE | DENSITY (passenger car/mile/lane) | | | |
|---------------------|-----------------------------------|--|--|--|
| А | <u>≤</u> 10 | | | |
| В | > 10 - 20 > 20 - 28 | | | |
| С | | | | |
| D | > 28 - 35 | | | |
| E | > 35 | | | |
| F | Demand > Supply | | | |

The results of the on-ramp analysis are summarized on **Table 8** for the total with project forecasts only. For each of the three forecast years, both access roads (for 'O'oma Beachside Village and NELHA) are calculated to operate at levels of service B in the AM peak hour and C in the PM peak hours, indicating acceptable levels of service in both analysis periods. This indicates that the traffic generated by 'O'oma Beachside Village would not have an adverse traffic impact on this aspect of the highway operations. The level of service calculation worksheets are provided in **Appendix D**.

Highway Analysis

Queen Ka'ahumanu Highway is currently a two-lane highway that the HDOT is currently widening to a four multi-lane highway. Separate methodologies and criteria are used for calculating levels of service for these two distinct highway types.

The ideal (maximum) capacity of a two-way, two-lane highway is 1,700 passenger car equivalents per hour per lane, and 3,200 passenger car equivalents per hour for both directions of travel. This is lower than the capacity of a multi-lane highway that can range from 2,000 to 2,200 passenger car equivalents per hour per lane. The analysis procedure for two-way, two-lane highways takes into account the more restrictive

aspects of its operations relative to wider multi-lane highways. The procedure considers the impact of geometric data: lane width, shoulder width, type of terrain, free flow speed, percent no passing zones; and demand characteristics: volumes, percent of heavy vehicles; as some of the inputs. For Class I highways like Queen Ka'ahumanu Highway where efficient mobility is important and drivers expect to drive at relatively high speeds, level of service is defined in terms of both percent time spent following other vehicles and average travel speeds. The level of service criteria for Class I two-lane highways are shown below:

| LEVEL OF SERVICE | PERCENT TIME SPENT FOLLOWING | AVE. TRAVEL SPEED (Miles/Hour) | | |
|---------------------|------------------------------|--------------------------------|--|--|
| А | < 35 | > 55 | | |
| В | >35 to 50 | >50 to 55 | | |
| С | >50 to 65 | >45 to 50 | | |
| D | >65 to 80 | >40 to 45 | | |
| E | > 80.0 | <40 | | |

The methodology for analyzing multi-lane highways calculates several criteria based on the capacity and design characteristics of the highway and traffic volumes. There are several sets of criteria for levels of service based on the free flow speed of the highway. The criteria for a 55 mph free flow speed (FFS) are summarized as follows.

| | LOS CRITERIA FOR 55 MPH FFS | | | | | |
|---|-----------------------------|------|-------|-------|-------|--|
| CRITERIA | Α | В | С | D | E | |
| Maximum Density (passenger car /mile/lane) | 11 | 18 | 26 | 35 | 41 | |
| Average speed (mph) | 55.0 | 55.0 | 54.9 | 52.9 | 51.2 | |
| Max. Volume/Capacity Ratio (V/C) | 0.29 | 0.47 | 0.68 | 0.88 | 1.00 | |
| Max. Service Volume Flow Rate (passenger car/hour/lane) | 600 | 990 | 1,430 | 1,850 | 2,100 | |

The results of the highway analysis are shown on **Table 9**. The first line shows that the existing two-lane highway is currently operating at level of service E in both peak periods, primarily due to the high percentage of time spent following other cars and the

lack of opportunity to pass slower vehicles. The remaining lines show the results for the ambient without project and total with project forecasts for southbound traffic fronting the Property. With the highway widening, the highway is calculated to operate at levels of service B in the AM peak hours and C in the PM peak hours, indicating acceptable levels of service in both analysis periods. There is no difference between the ambient without project and the total with project results, indicating that the traffic generated by 'O'oma Beachside Village would not have an adverse traffic impact on this aspect of the highway operations. The level of service calculation worksheets are provided in **Appendix E**.

CONCLUSIONS

The widening of Queen Ka'ahumanu Highway and the development of the mauka roadway network would accommodate much of the anticipated growth in the North Kona region. The highway system is expected to operate at acceptable levels of service in the forecast future.

The 'O'oma Beachside Village is not expected to have a fully accessible intersection connection with the widened Queen Ka'ahumanu Highway; however, the right turn in, right turn out access roadway intersection is expected to operate at acceptable levels of service in the forecast future.

The 'O'oma Beachside Village is planned to include a frontage road makai of and parallel to Queen Ka'ahumanu Highway. This frontage road would allow access to fully accessible intersections at Ka'iminani Drive and Huliko'a Drive, where vehicles traveling from and to 'O'oma would be able to make left turns onto and from the highway, respectively. These intersections would require mitigating actions to accommodate the ambient forecast traffic. The additional traffic generated by the 'O'oma Beachside Village would require further mitigating measures to maintain acceptable levels of service at the Huliko'a Drive and Hina Lani Street intersections including the following:

 Hulikoʻa Drive - a double left turn lane on the northbound highway approach by 2015.

- Hulikoʻa Drive a double left turn lane on the westbound approach by 2029.
- Hina Lani Street a double left turn lane on the southbound highway approach by 2029.

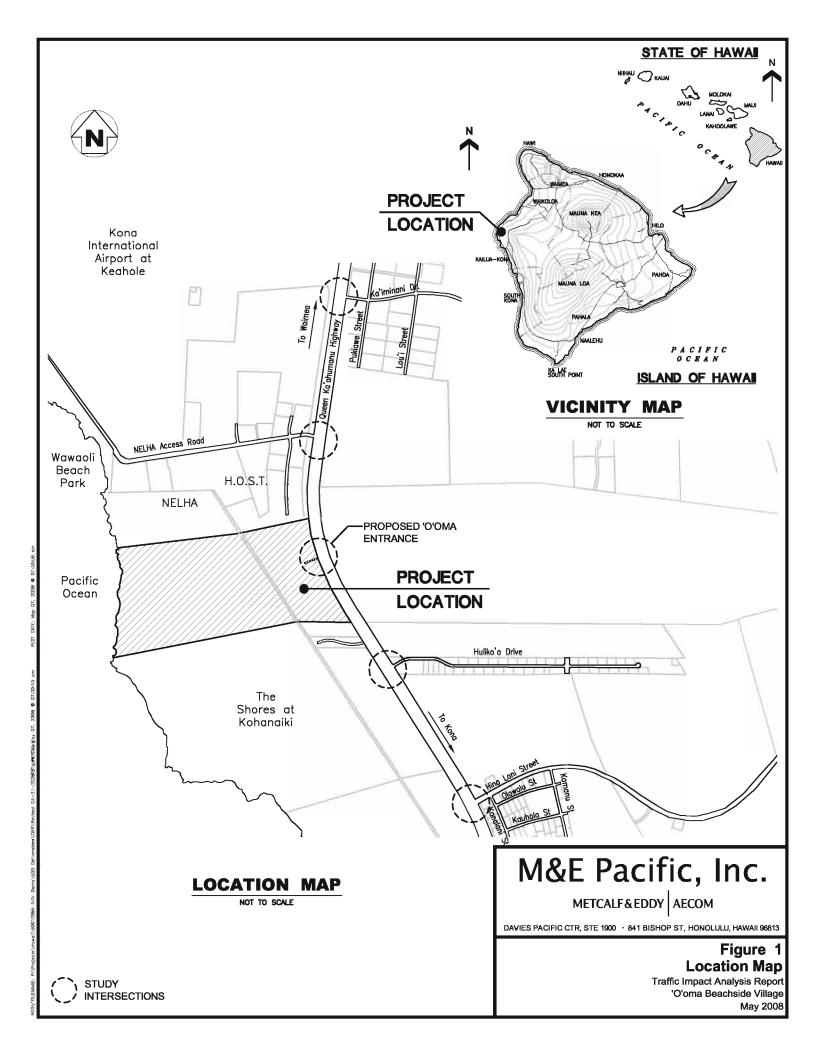
However, the need for mitigating measures to accommodate the project generated traffic by 2029 should be considered as speculative due to the uncertainties associated with such a long forecast period, including: 1) whether or not other development projects in the region are built or are built with as many units as currently anticipated; 2) the implementation of the mauka roadway network as currently planned and how much turning movement traffic is diverted to the mauka roadway system as it is completed; and 3) the level of mitigating measures that would be imposed on other development projects that could mitigate the impact of ambient traffic. Contingencies should be made to implement these measures while recognizing that their needs may not actually occur. The right turn in, right turn out access roadway intersection and highway system are expected to operate at acceptable levels of service in the forecast future.

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Figures





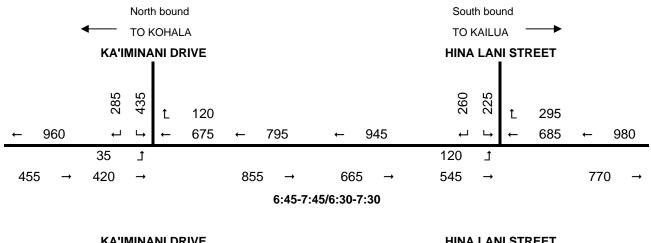
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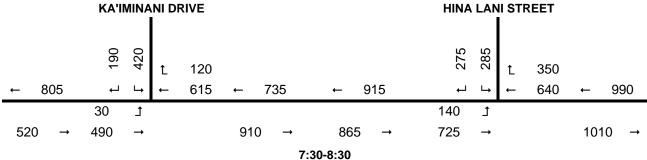
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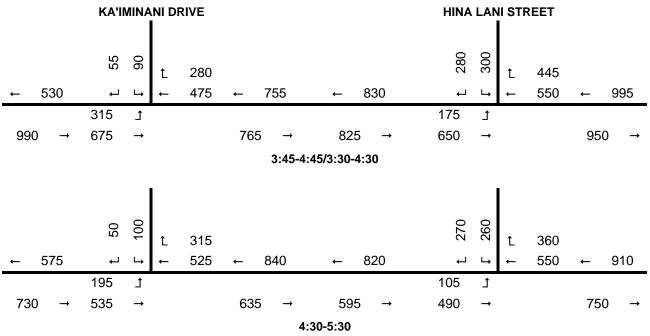
Figure 2 Conceptual Master Plan

Traffic Impact Analysis Report 'O'oma Basahsida Villaga May 2008





AM PEAK HOUR



PM PEAK HOUR

Not to Scale

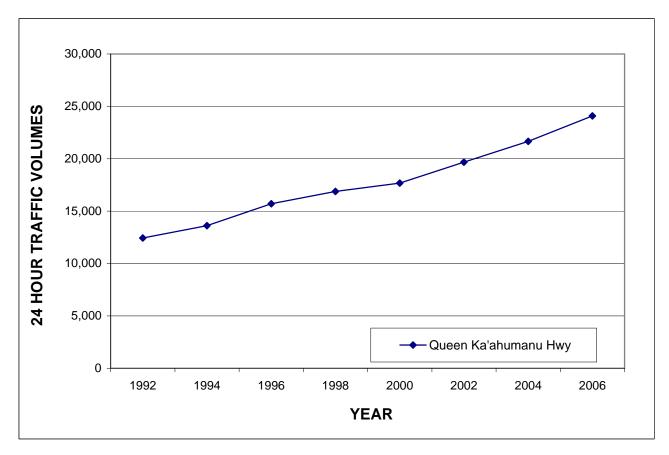
2006 EXISTING TRAFFIC VOLUMES FIGURE 3

| TWO-W | AY DAILY |
|---------|------------|
| TRAFFIC | VOLUMES |
| | QUEEN |
| | KA'AHUMANU |
| YEAR | HWY |
| 1992 | 12,432 |
| 1994 | 13,610 |
| 1996 | 15,709 |
| 1998 | 16,882 |
| 2000 | 17,670 |
| 2002 | 19,678 |
| 2004 | 21,654 |
| 2006 | 24 085 |

*Average Weekday Daily Traffic

Source: State of Hawai'i Department of Transportation

Station T-8-M, June 1, 2004



HISTORICAL TREND IN DAILY TRAFFIC VOLUMES
ON QUEEN KA'AHUMANU HIGHWAY AT NELHA ACCESS ROAD
FIGURE 4

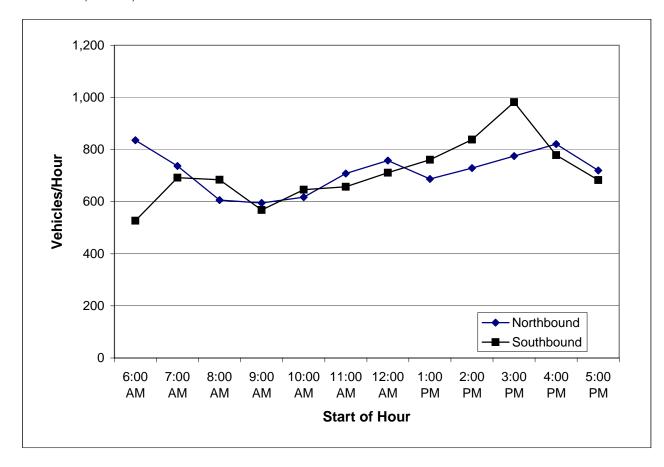
HOURLY TRAFFIC VOLUMES ON QUEEN KA'AHUMANU HIGHWAY

AT STATION T-8-M, North of NELHA access road, June 1, 2004

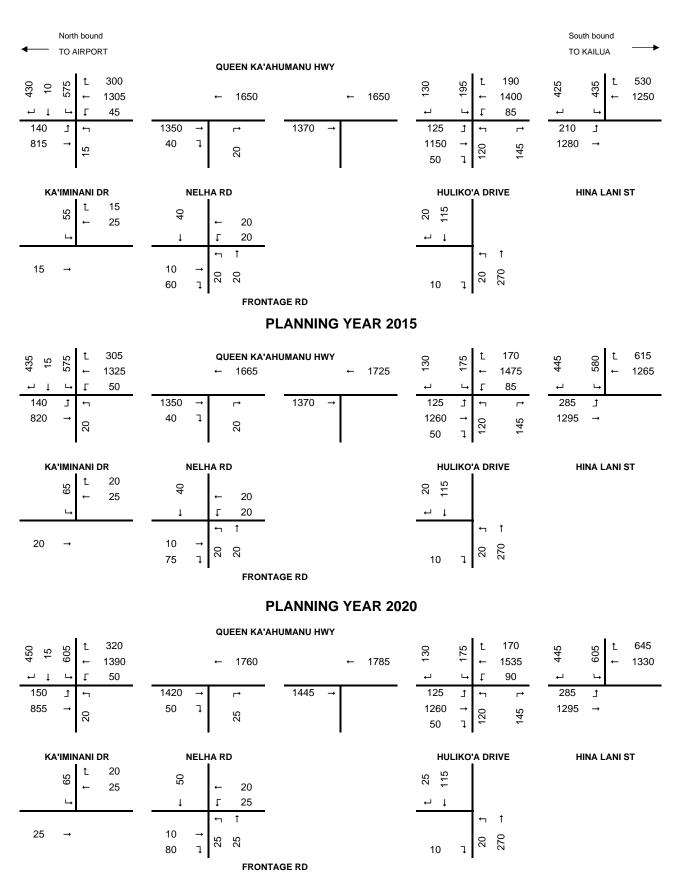
| V | Vehicles/Hou | | | | | | | | | | | |
|----------|--------------|--------|--|--|--|--|--|--|--|--|--|--|
| Start | North- | South- | | | | | | | | | | |
| of Hour | Bound | Bound | | | | | | | | | | |
| 6:00 AM | 836 | 527 | | | | | | | | | | |
| 7:00 AM | 737 | 692 | | | | | | | | | | |
| 8:00 AM | 606 | 684 | | | | | | | | | | |
| 9:00 AM | 595 | 568 | | | | | | | | | | |
| 10:00 AM | 617 | 646 | | | | | | | | | | |
| 11:00 AM | 708 | 657 | | | | | | | | | | |
| 12:00 AM | 758 | 711 | | | | | | | | | | |
| 1:00 PM | 687 | 761 | | | | | | | | | | |
| 2:00 PM | 729 | 838 | | | | | | | | | | |
| 3:00 PM | 775 | 982 | | | | | | | | | | |
| 4:00 PM | 821 | 779 | | | | | | | | | | |
| 5:00 PM | 720 | 683 | | | | | | | | | | |

Source: State of Hawaii

Department of Transportation



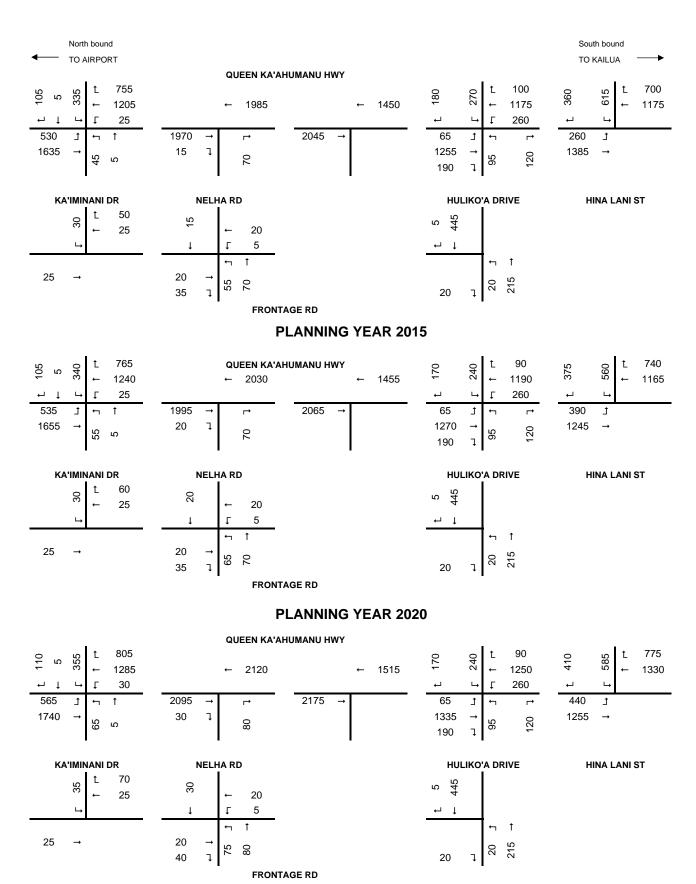
HOURLY TRAFFIC VOLUMES ON QUEEN KA'AHUMANU HIGHWAY AT NELHA ACCESS ROAD FIGURE 5



AM PEAK HOUR

Not To Scale

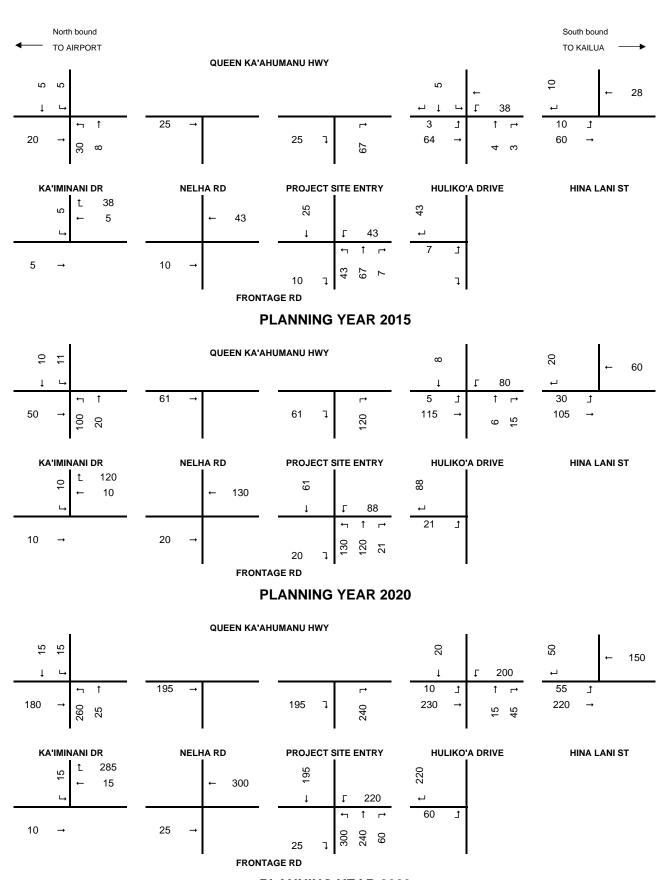
AMBIENT TRAFFIC FORECAST FIGURE 6



PM PEAK HOUR

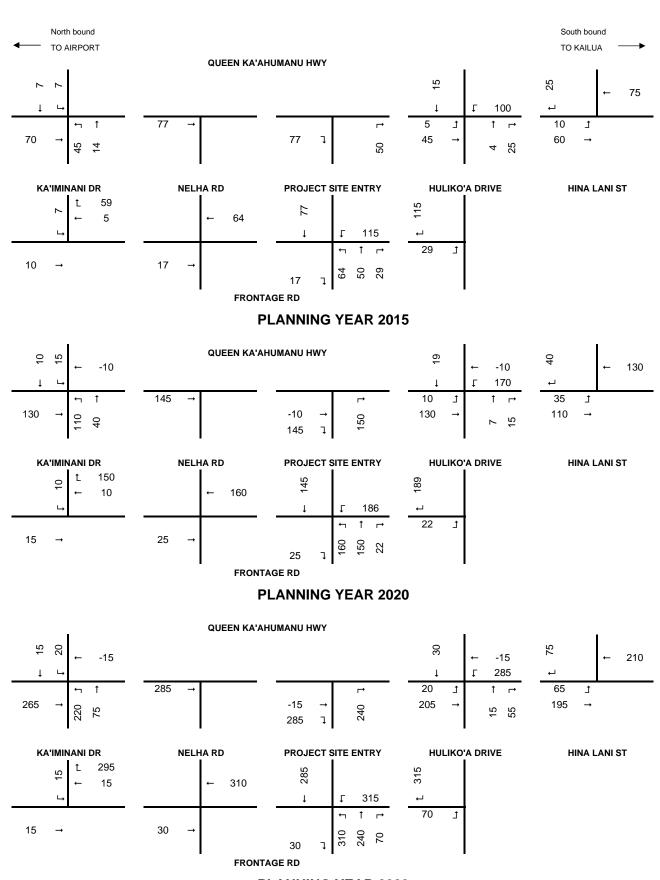
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AMBIENT TRAFFIC FORECAST FIGURE 6



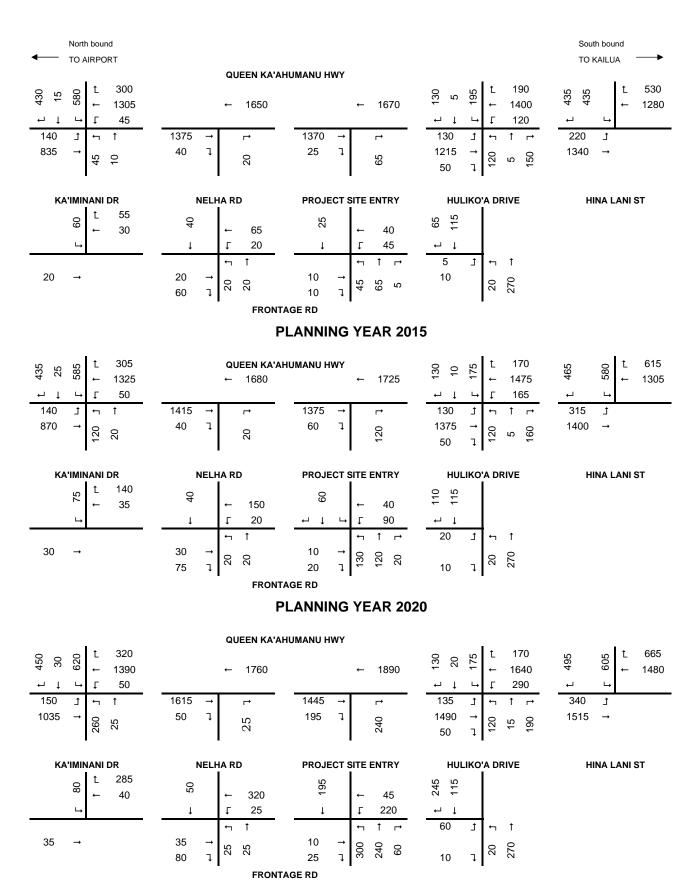
AM PEAK HOUR

Not To Scale



PM PEAK HOUR

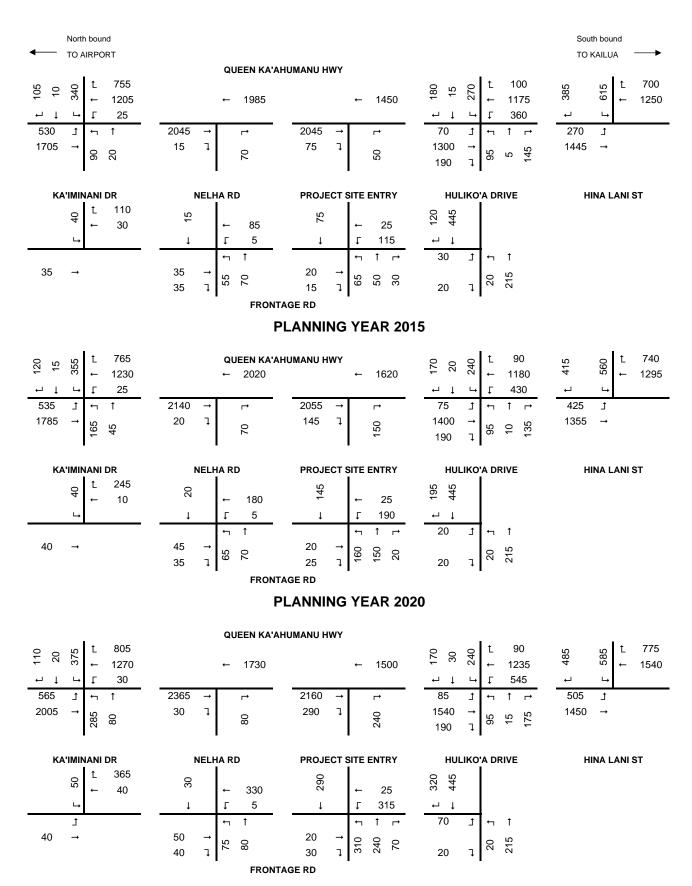
Not To Scale



AM PEAK HOUR

Not To Scale

TOTAL WITH PROJECT FORECAST FIGURE 8



PM PEAK HOUR

Not To Scale

Tables

TABLE 1 PROJECT MILESTONE SCHEDULE

| | PLANNING | G YEAR MIL | ESTONE | TG REPORT |
|---------------------------------------|----------|------------|----------|--------------------------|
| LAND USE | 2015 | 2020 | 2029 | LAND USE |
| | Cumulati | ve Number | of Units | _, |
| O'cole Feedle BU Beedle god | 400 | 075 | 475 | OFDIT (040) |
| Single Family DU Residential | 120 | 275 | 4/5 | SFDU (210) |
| Multi-family DU Residential | 115 | 355 | 715 | Low-rise Townhome (231) |
| TOTAL RESIDENTIAL | 235 | 630 | 1,190 | |
| TOTAL REGIDERTIAL | 200 | 000 | 1,100 | |
| | | | | |
| Makai Village - MU Commercial (sf) | 30,000 | 30,000 | 30,000 | Shopping Center (820) |
| Restaurant & Canoe Club (sf) | 20,000 | 20,000 | 20,000 | Quality Restaurant (931) |
| | | | | |
| TOTAL COMMERCIAL - Area A (sf) | 50,000 | 50,000 | 50,000 | |
| | | | | |
| Mauka Village - MU&LW Commercial (sf) | 0 | 35,000 | 135,000 | Office Park (750) |
| | | 4=000 | 4= 000 | 2 (272) |
| Grocery Store (sf) | | 15000 | 15,000 | Supermarket (850) |
| TOTAL COMMERCIAL - Area B (sf) | 0 | 50,000 | 150,000 | |
| | | | | |
| Charter School (students) | | | 225 | Private School (534) |
| Public Beach Clubhouse (ac) | 1 | 1 | 1 | Constant assumed |
| | | • | · | 222.3 |

Proposed development schedule assumed for forecasting project generated traffic. This schedule does not reflect the actual project development schedule.

TABLE 2
TRIP GENERATION ANALYSIS

| TIME PERIOD | Cumulative | Trip Generation | Ln(T) | T = Number | Direction | Percent | Number |
|---------------------------------|------------|----------------------|--------|------------|-----------|-----------|----------|
| Land Use | Units | Equation | LII(1) | of Trips | of Travel | 1 CICCIII | of Trips |
| PLANNING YEAR 2015 | | | | | | | |
| WEEKDAY AM PEAK HOUR | | | | | | | |
| Single Family Residential | 120 units | T = 0.7(x) + 12.05 | | 96 | Enter | 26% | 25 |
| | | | | | Leave | 74% | 71 |
| MF & Mixed Use Vill Residential | 115 units | T = 0.88(x) - 49.7 | | 115 | Enter | 25% | 29 |
| | | | | | Leave | 75% | 86 |
| Mixed Use Commercial (Area A) | 30 ksf GLA | T = 1.03(X) | | 31 | Enter | 61% | 19 |
| | | | | | Leave | 39% | 12 |
| Restaurant | 20 ksf GLA | T = 0.81(X) | | 16 | Enter | 50% | 8 |
| | | | | | Leave | 50% | 8 |
| Public Beach Clubhouse | | | | | Enter | | 50 |
| | | | | | Leave | | 10 |
| TOTAL | | | | | Enter | | 131 |
| | | | | | Leave | | 187 |
| WEEKDAY PM PEAK HOUR | | | | | | | |
| Single Family Residential | 120 units | Ln(T)=0.89Ln(X)+0.61 | 4.87 | 130 | Enter | 64% | 83 |
| | | | | | Leave | 36% | 47 |
| MF & Mixed Use Vill Residential | 115 units | T = 0.78(X) | | 90 | Enter | 58% | 52 |
| | | | | | Leave | 42% | 38 |
| Mixed Use Commercial (Area A) | 30 ksf GLA | T = 3.75(X) | | 113 | Enter | 48% | 54 |
| | | | | | Leave | 52% | 59 |
| Restaurant | 20 ksf GLA | T = 7.49(X) | | 150 | Enter | 67% | 100 |
| | | | | | Leave | 33% | 49 |
| Public Beach Clubhouse | | | | | Enter | | 20 |
| | | | | | Leave | | 50 |
| TOTAL | | | | | Enter | | 310 |
| | | | | | Leave | | 243 |

TABLE 2 (continued) TRIP GENERATION ANALYSIS

| PLANNING YEAR 2020 WEEKDAY AM PEAK HOUR Single Family Residential MF, M/U, L/W Residential Mixed Use Commercial (Area A) M/U, L/W Commercial (Area B) Grocery Store Restaurant Public Beach Clubhouse | Units 275 units 355 units 30 ksf GLA | Equation $T = 0.7(x) + 12.05$ $T = 0.88(x) - 49.7$ | Ln(T) | of Trips 205 | enter Leave | 26% | of Trips 53 |
|---|---|--|-------|--------------|----------------|------------|------------------|
| WEEKDAY AM PEAK HOUR Single Family Residential MF, M/U, L/W Residential Mixed Use Commercial (Area A) M/U, L/W Commercial (Area B) Grocery Store Restaurant Public Beach Clubhouse | 355 units 30 ksf GLA | T = 0.88(x) - 49.7 | | 205 | | 26% | 53 |
| Single Family Residential MF, M/U, L/W Residential Mixed Use Commercial (Area A) M/U, L/W Commercial (Area B) Grocery Store Restaurant Public Beach Clubhouse | 355 units 30 ksf GLA | T = 0.88(x) - 49.7 | | 205 | | 26% | 53 |
| MF, M/U, L/W Residential Mixed Use Commercial (Area A) M/U, L/W Commercial (Area B) Grocery Store Restaurant Public Beach Clubhouse | 355 units 30 ksf GLA | T = 0.88(x) - 49.7 | | 205 | | 26% | 53 |
| Mixed Use Commercial (Area A) M/U, L/W Commercial (Area B) Grocery Store Restaurant Public Beach Clubhouse | 30 ksf GLA | . , | | | | 740/ | |
| Mixed Use Commercial (Area A) M/U, L/W Commercial (Area B) Grocery Store Restaurant Public Beach Clubhouse | 30 ksf GLA | . , | | 000 | | 74% | 151 |
| M/U, L/W Commercial (Area B) Grocery Store Restaurant Public Beach Clubhouse | | | 1 | 263 | Enter | 25% | 66 |
| M/U, L/W Commercial (Area B) Grocery Store Restaurant Public Beach Clubhouse | | IT 4.00(\\) | | 24 | Leave | 75% | 197 |
| Grocery Store Restaurant Public Beach Clubhouse | | T = 1.03(X) | | 31 | Enter | 61% | 19 |
| Grocery Store Restaurant Public Beach Clubhouse | 05 1:-4 OL 4 | L = /T) 0 04L = /V) . 4 54 | 4.50 | 00 | Leave | 39% | 12 |
| Restaurant Public Beach Clubhouse | 35 ksf GLA | Ln(T)=0.84Ln(X)+1.51 | 4.50 | 90 | Enter | 89% | 80 |
| Restaurant Public Beach Clubhouse | 451-(0)4 | L (T) 04 70L (V) 4 40 | 0.40 | 0.4 | Leave | 11% | 10 |
| Public Beach Clubhouse | 15 ksf GLA | Ln(T)=01.70Ln(X)-1.42 | 3.18 | 24 | Enter | 61% | 15 |
| Public Beach Clubhouse | 00 1 - (0) 4 | T 0.04()() | | 4.0 | Leave | 39% | 9 |
| | 20 ksf GLA | T = 0.81(X) | | 16 | | 50% | 8 |
| | | | | | Leave | 50% | 8 |
| | | | | | Enter | | 60 15 |
| TOTAL | | | | | Leave | | 300 |
| TOTAL | | | | | Enter | | 403 |
| WEEKDAY PM PEAK HOUR | | | | | Leave | | 403 |
| | 275 units | I n/T\ 0.00I n/V\ 0.64 | 5.61 | 273 | Enter | 64% | 175 |
| Single Family Resident | 275 units | Ln(T)=0.89Ln(X)+0.61 | 3.01 | 213 | Leave | 36% | 98 |
| MF, M/U, L/W Residential | 355 units | T = 0.78(X) | | 277 | | 58% | 161 |
| WF, W/O, L/W Residential | 300 units | $\Gamma = 0.70(\Lambda)$ | | 211 | Enter | 42% | 116 |
| Mixed Use Commercial (Area A) | 30 ksf GLA | T = 3.75(X) | | 113 | Leave | 42% 48% | 54 |
| wixed use Commercial (Area A) | 30 KSI GLA | $\Gamma = 3.75(\Lambda)$ | | 113 | Enter Leave | 40% 52% | 54 59 |
| M/U, L/W Commercial (Area B) | 35 ksf GLA | T = 1.21(x) + 106.22 | | 149 | | 14% | 21 |
| W/O, L/W Confinercial (Area B) | 33 KSI GLA | 1 - 1.21(x) + 100.22 | | 149 | Leave | 86% | 128 |
| Grocery Store | 15 ksf GLA | Ln(T)=0.79Ln(X)+3.20 | 5.34 | 208 | | 51% | 106 |
| Crocery diore | 10 KSI OLA | En(1)=0.73En(X)13.20 | 0.04 | 200 | Leave | 49% | 102 |
| Restaurant | 20 ksf GLA | T = 7.49(X) | | 150 | | 67% | 102 |
| Nesiaurani | ZU NOI GLA | 1 - 1.73(A) | | 130 | Leave | 33% | 49 |
| Public Beach Clubhouse | | | | | Enter | JJ /0 | 25 |
| 1 abile beach clabilouse | | | i I | | LIILGI | į l | |
| TOTAL | | | | | Leave | ļ | 60 |
| IOIAE | | | | | Leave Enter | | 60 642 |

TABLE 2 (continued) TRIP GENERATION ANALYSIS

| TIME PERIOD | Cumulative | Trip Generation | Ln/T) | T = Number | Direction | Percent | Number |
|-------------------------------|--------------|-----------------------|-------|------------|-----------|---------|----------|
| Land Use | Units | Equation | Ln(T) | of Trips | of Travel | Percent | of Trips |
| PLANNING YEAR 2029 | | | | | | | |
| WEEKDAY AM PEAK HOUR | | | | | | | |
| Single Family Residential | 475 units | T = 0.7(x) + 12.05 | | 345 | Enter | 26% | 90 |
| | | | | | Leave | 74% | 255 |
| MF, M/U, L/W Residential | 715 units | T = 0.88(x) - 49.7 | | 580 | Enter | 25% | 145 |
| | | | | | Leave | 75% | 435 |
| Mixed Use Commercial (Area A) | 30 ksf GLA | T = 1.03(X) | | 31 | Enter | 61% | 19 |
| | | | | | Leave | 39% | 12 |
| M/U, L/W Commercial (Area B) | 135 ksf GLA | Ln(T)=0.84Ln(X)+1.51 | 5.63 | 279 | Enter | 89% | 248 |
| | | | | | Leave | 11% | 31 |
| Grocery Store | 15 ksf GLA | Ln(T)=01.70Ln(X)-1.42 | 3.18 | 24 | Enter | 61% | 15 |
| | | | | | Leave | 39% | 9 |
| Restaurant | 20 ksf GLA | T = 0.81(X) | | 16 | Enter | 50% | 8 |
| | | | | | Leave | 50% | 8 |
| Charter School (K-8) | 225 students | Ln(T)=Ln(X)-0.13 | 5.29 | 198 | Enter | 55% | 109 |
| | | | | | Leave | 45% | 89 |
| Public Beach Clubhouse | | | | | Enter | | 70 |
| | | | | | Leave | | 20 |
| TOTAL | | | | | Enter | | 703 |
| | | | | | Leave | | 859 |

TABLE 2 (continued) TRIP GENERATION ANALYSIS

| TIME PERIOD | Cumulative | Trip Generation | L n/T\ | T = Number | Direction | Percent | Number |
|-------------------------------|--------------|----------------------|--------|------------|-----------|---------|----------|
| Land Use | Units | Equation | Ln(T) | of Trips | of Travel | Percent | of Trips |
| PLANNING YEAR 2029 | | | | | | | |
| WEEKDAY PM PEAK HOUR | | | | | | | |
| Single Family Residential | 475 units | Ln(T)=0.89Ln(X)+0.61 | 6.10 | 444 | Enter | 64% | 284 |
| | | | | | Leave | 36% | 160 |
| MF, M/U, L/W Residential | 715 units | T = 0.78(X) | | 558 | Enter | 58% | 323 |
| | | | | | Leave | 42% | 234 |
| Mixed Use Commercial (Area A) | 30 ksf GLA | T = 3.75(X) | | 113 | Enter | 48% | 54 |
| | | | | | Leave | 52% | 59 |
| M/U, L/W Commercial (Area B) | 135 ksf GLA | T = 1.21(x) + 106.22 | | 270 | Enter | 14% | 38 |
| | | | | | Leave | 86% | 232 |
| Grocery Store | 15 ksf GLA | Ln(T)=0.79Ln(X)+3.20 | 5.34 | 208 | Enter | 51% | 106 |
| | | | | | Leave | 49% | 102 |
| Restaurant | 20 ksf GLA | T = 7.49(X) | | 150 | Enter | 67% | 100 |
| | | | | | Leave | 33% | 49 |
| Charter School (K-8) | 225 students | T = 0.58(x) + 14.03 | | 145 | Enter | 47% | 68 |
| | | | | | Leave | 53% | 77 |
| Public Beach Clubhouse | | | | | Enter | | 25 |
| | | | | | Leave | | 70 |
| TOTAL | | | | | Enter | | 999 |
| | | | | | Leave | | 982 |

TABLE 3 TRIP DISTRIBUTION ANALYSIS

| | | | NO | RTH | SO | UTH | INTE | RNAL |
|---------------------------------|-----------|--------|-------|--------|-------|--------|-------|----------|
| TIME PERIOD | Direction | No. of | | No. of | | No. of | | No. of |
| Land Use | of Travel | Trips | % | Trips | % | Trips | % | Trips |
| PLANNING YEAR 2015 | | | | | | | | |
| WEEKDAY AM PEAK HOUR | | | | | | | | |
| Single Family Residential | Enter | 25 | | | | | | |
| | Leave | 71 | | | | | | |
| MF & Mixed Use Vill Residential | Enter | 29 | | | | | | |
| | Leave | 86 | | | | | | |
| COMBINED RESIDENTIAL | Enter | 54 | 17% | 9 | 20% | 11 | 61% | 33 |
| | Leave | 157 | 34% | 53 | 41% | 64 | 25% | 40 |
| Mixed Use Commercial (Area A) | Enter | 19 | 32% | 6 | 42% | 8 | 26% | 5 |
| | Leave | 12 | 25% | 3 | 33% | 4 | 42% | 5 |
| Restaurant | Enter | 8 | 25% | 2 | 25% | 2 | 50% | 4 |
| | Leave | 8 | 25% | 2 | 25% | 2 | 50% | 4 |
| Public Beach Clubhouse | Enter | 50 | 36% | 18 | 44% | 22 | 20% | 10 |
| | Leave | 10 | 30% | 3 | 40% | 4 | 30% | 3 |
| TOTAL | Enter | 131 | 27% | 35 | 33% | 43 | 40% | 52 |
| TOTAL | Leave | 187 | 33% | 61 | 40% | 74 | 28% | 52 52 |
| | Leave | 107 | 33 /6 | 01 | 40 /0 | /4 | 20 /0 | 52 |
| WEEKDAY PM PEAK HOUR | | | | | | | | |
| Single Family Residential | Enter | 83 | | | | | | |
| | Leave | 47 | | | | | | |
| MF & Mixed Use Vill Residential | Enter | 52 | | | | | | |
| | Leave | 38 | | | | | | |
| COMBINED RESIDENTIAL | Enter | 135 | 32% | 43 | 39% | 52 | 30% | 40 |
| | Leave | 85 | 18% | 15 | 21% | 18 | 61% | 52 |
| Mixed Use Commercial (Area A) | Enter | 54 | 33% | 18 | 41% | 22 | 26% | 14 |
| | Leave | 59 | 36% | 21 | 42% | 25 | 24% | 14 |
| Restaurant | Enter | 100 | 27% | 27 | 33% | 33 | 40% | 40 |
| | Leave | 49 | 27% | 13 | 33% | 16 | 41% | 20 |
| Public Beach Clubhouse | Enter | 20 | 30% | 6 | 40% | 8 | 30% | 6 |
| | Leave | 50 | 30% | 15 | 40% | 20 | 30% | 15 |
| TOTAL | | 200 | 200/ | 0.4 | 270/ | 445 | 200/ | 400 |
| TOTAL | Enter | 309 | 30% | 94 | 37% | 115 | 32% | 100 |
| | Leave | 243 | 26% | 64 | 33% | 79 | 42% | 101 |
| | | | | | | | | |

TABLE 3 (continued) TRIP DISTRIBUTION ANALYSIS

| | | | NO | RTH | SO | UTH | INTE | RNAL |
|---------------------------------|----------------|------------|-------|---------|-------|---------|-------|---------|
| TIME PERIOD | Direction | No. of | | No. of | | No. of | | No. of |
| Land Use | of Travel | Trips | % | Trips | % | Trips | % | Trips |
| PLANNING YEAR 2020 | | | | | | | | |
| WEEKDAY AM PEAK HOUR | | | | | | | | |
| Single Family Residential | Enter | 53 | | | | | | |
| | Leave | 151 | | | | | | |
| MF, M/U, L/W Residential | Enter | 66 | | | | | | |
| | Leave | 197 | | | | | | |
| COMBINED RESIDENTIAL | Enter | 119 | 38% | 45 | 42% | 50 | 20% | 24 |
| | Leave | 348 | 33% | 115 | 36% | 125 | 31% | 108 |
| Mixed Use Commercial (Area A) | Enter | 19 | | | | | | |
| | Leave | 12 | | | | | | |
| M/U, L/W Commercial (Area B) | Enter | 80 | | | | | | |
| | Leave | 10 | | | | | | |
| COMBINED COMMERCIAL | Enter | 99 | 10% | 10 | 11% | 11 | 79% | 78 |
| 0 0 | Leave | 22 | 26% | 6 | 29% | 6 | 45% | 10 |
| Grocery Store | Enter | 15 | 0% | 0 | 0% | 0 | 100% | 15 |
| Destaurant | Leave | 9 | 0% | 0 | 0% | 0 | 100% | 9 |
| Restaurant | Enter | 8 | 48% | 4 | 52% | 4 | 0% | 0 |
| Dublic Booch Clubbours | Leave | 8 | 48% | 4 | 52% | 4 | 0% | 0 |
| Public Beach Clubhouse | Enter | 60 15 | 36% | 22 5 | 39% | 23 5 | 25% | 15 5 |
| | Leave | 15 | 33% | 5 | 33% | 5 | 33% | 5 |
| TOTAL | Enter | 301 | 27% | 81 | 29% | 88 | 44% | 132 |
| | Leave | 402 | 32% | 130 | 35% | 141 | 33% | 132 |
| WEEKDAY DIA DEAK HOUD | | | | | | | | |
| WEEKDAY PM PEAK HOUR | | 475 | | | | | | |
| Single Family Resident | Enter | 175 | | | | | | |
| NAT NAVILLANA Decidential | Leave | 98 | | | | | | |
| MF, M/U, L/W Residential | Enter Leave | 161 116 | | | | | | |
| COMBINED RESIDENTIAL | Enter | 336 | 23% | 77 | 25% | 84 | 52% | 174 |
| COMBINED RESIDENTIAL | Leave | 214 | 24% | 51 | 26% | 56 | 50% | 108 |
| Mixed Use Commercial (Area A) | Enter | 54 | 24 /0 | JI | 20 /0 | 30 | 30 /6 | 100 |
| Winked Ode Commercial (Allea A) | Leave | 59 | | | | | | |
| M/U, L/W Commercial (Area B) | Enter | 21 | | | | | | |
| ivio, by volumerolar (violar) | Leave | 128 | | | | | | |
| COMBINED COMMERCIAL | Enter | 75 | 36% | 27 | 44% | 33 | 20% | 15 |
| | Leave | 187 | 32% | 60 | 34% | 64 | 34% | 64 |
| Grocery Store | Enter | 106 | 28% | 30 | 31% | 33 | 41% | 43 |
| ĺ | Leave | 102 | 15% | 15 | 16% | 16 | 69% | 70 |
| Restaurant | Enter | 100 | 29% | 29 | 31% | 31 | 40% | 40 |
| | Leave | 49 | 29% | 14 | 31% | 15 | 41% | 20 |
| Public Beach Clubhouse | Enter | 25 | 29% | 7 | 31% | 8 | 40% | 10 |
| | Leave | 60 | 32% | 19 | 35% | 21 | 33% | 20 |
| | F | 0.40 | 000/ | 470 | 000/ | 400 | 4.407 | 000 |
| TOTAL | Enter | 642 | 26% | 170 | 29% | 189 | 44% | 282 |
| | Leave | 612 | 26% | 160 | 28% | 172 | 46% | 282 |
| | <u> </u> | | | | | | | |

TABLE 3 (continued) TRIP DISTRIBUTION ANALYSIS

| | | | NO | RTH | SO | UTH | INTERNAL | | |
|------------------------------------|----------------|------------------------|-------|--------|-------|--------|----------|--------|--|
| TIME PERIOD | Direction | No. of | | No. of | | No. of | | No. of | |
| Land Use | of Travel | Trips | % | Trips | % | Trips | % | Trips | |
| PLANNING YEAR 2029 | | | | | | | | | |
| WEEKDAY AM PEAK HOUR | | | | | | | | | |
| Single Family Residential | Enter | 90 | | | | | | | |
| | Leave | 255 | | | | | | | |
| MF, M/U, L/W Residential | Enter | 145 | | | | | | | |
| | Leave | 435 | | | | | | | |
| COMBINED RESIDENTIAL | Enter | 235 | 41% | 96 | 41% | 96 | 18% | 43 | |
| Missad Has Communical (Area A) | Leave | 690 | 34% | 235 | 34% | 235 | 32% | 220 | |
| Mixed Use Commercial (Area A) | Enter | 19 | | | | | | | |
| M/LL L /// Commoraid (Area D) | Leave Enter | 12 248 | | | | | | | |
| M/U, L/W Commercial (Area B) | Leave | 246 31 | | | | | | | |
| COMBINED RESIDENTIAL | Enter | 267 | 18% | 47 | 18% | 47 | 65% | 174 | |
| COMBINED RESIDENTIAL | Leave | 43 | 33% | 14 | 33% | 14 | 35% | 174 | |
| Grocery Store | Enter | 43 15 | 0% | 0 | 0% | 0 | 100% | 15 | |
| Grocery Store | Leave | 9 | 0% | 0 | 0% | 0 | 100% | 9 | |
| Restaurant | Enter | 8 | 50% | 4 | 50% | 4 | 0% | 0 | |
| Restaurant | Leave | 8 | 50% | 4 | 50% | 4 | 0% | 0 | |
| Public Beach Clubhouse | Enter | 70 | 36% | 25 | 36% | 25 | 29% | 20 | |
| Fublic Beach Clubilouse | Leave | 20 | 30% | 6 | 30% | 6 | 40% | 8 | |
| Charter School (K-8) | Enter | 109 | 45% | 49 | 45% | 49 | 10% | 11 | |
| Charter School (K-6) | Leave | 89 | 43% | 39 | 43% | 39 | 12% | 11 | |
| | Leave | 09 | 44 /0 | 39 | 44 /0 | 39 | 12/0 | - 11 | |
| TOTAL | Enter | 704 | 31% | 221 | 31% | 221 | 37% | 263 | |
| | Leave | 859 | 35% | 298 | 35% | 298 | 31% | 263 | |
| WEEKDAY DM DEAK HOUD | | | | | | | | | |
| WEEKDAY PM PEAK HOUR | Enter | 284 | | | | | | | |
| Single Family Resident | Leave | 26 4 160 | | | | | | | |
| MF, M/U, L/W Residential | Enter | 323 | | | | | | | |
| IVII , IVI/O, L/VV IXESIGENTIAI | Leave | 234 | | | | | | | |
| COMBINED RESIDENTIAL | Enter | 607 | 30% | 179 | 30% | 179 | 41% | 247 | |
| COMBINED RESIDEIVIAE | Leave | 394 | 35% | 138 | 35% | 138 | 30% | 120 | |
| Mixed Use Commercial (Area A) | Enter | 54 | 0070 | 100 | 0070 | 100 | 0070 | 120 | |
| imixed dee demineralal (vilou / l) | Leave | 59 | | | | | | | |
| M/U, L/W Commercial (Area B) | Enter | 38 | | | | | | | |
| | Leave | 232 | | | | | | | |
| COMBINED COMMERCIAL | Enter | 92 | 39% | 36 | 39% | 36 | 22% | 20 | |
| | Leave | 291 | 28% | 81 | 28% | 81 | 44% | 129 | |
| Grocery Store | Enter | 106 | 30% | 31 | 30% | 31 | 41% | 43 | |
| , | Leave | 102 | 16% | 16 | 16% | 16 | 69% | 70 | |
| Restaurant | Enter | 100 | 30% | 30 | 30% | 30 | 40% | 40 | |
| | Leave | 49 | 30% | 14 | 30% | 15 | 41% | 20 | |
| Public Beach Clubhouse | Enter | 25 | 30% | 8 | 30% | 7 | 40% | 10 | |
| | Leave | 70 | 36% | 25 | 36% | 25 | 29% | 20 | |
| Charter School (K-8) | Enter | 68 | 45% | 30 | 45% | 31 | 10% | 7 | |
| | Leave | 77 | 45% | 34 | 45% | 35 | 10% | 8 | |
| TOTAL | Ente: | 000 | 240/ | 24.4 | 240/ | 24.4 | 270/ | 267 | |
| TOTAL | Enter | 998 | 31% | 314 | 31% | 314 | 37% | 367 | |
| | Leave | 983 | 31% | 308 | 32% | 310 | 37% | 367 | |

TABLE 4
LEVEL OF SERVICE ANALYSIS (SIGNALIZED)
QUEEN KA'AHUMANU HIGHWAY AT KAI'MINANI DRIVE

| | | 2006 | | | | 20 |)15 | | | | | 20 |)20 | | | 2029 | | | | | |
|-------------------------|-----|---------|------|-----|--------|----------------|-----|--------------------|------|-----|--------|----------------|--------------------|-------|------|----------------------|-------|------|-----|--------------------|------|
| | | EXISTIN | G | | AMBIEN | Γ ¹ | | TOTAL ¹ | | | AMBIEN | Γ ² | TOTAL ² | | | AMBIENT ² | | | | TOTAL ² | |
| APPROACH & MOVEMENTS | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C |
| AM PEAK HOUR | В | 17.3 | 0.79 | D | 41.8 | 0.70 | D | 45.2 | 0.72 | D | 40.1 | 0.7 | D | 45.2 | 0.77 | D | 41.6 | 0.74 | D | 41.6 | 0.95 |
| Frontage Rd Eastbound | NA | - | - | F | 86.9 | - | F | 86.8 | 0.57 | Е | 78.7 | - | F | 82.0 | - | F | 88.7 | - | Е | 71.2 | - |
| Left | | - | - | F | 86.9 | 0.34 | F | 87.1 | 0.57 | Е | 78.7 | 0.19 | F | 82.8 | 0.90 | F | 88.7 | 0.46 | Е | 69.9 | 0.99 |
| Through/Right | ı | • | - | F | 86.1 | 0.00 | F | 85.1 | 0.1 | Е | 77.8 | 0 | Е | 77.7 | 0.16 | F | 87.6 | 0 | Е | 77.8 | 0.55 |
| Ka'iminani Dr WB | С | 25.7 | - | D | 54.8 | - | Е | 57.4 | - | Е | 55.4 | - | Е | 59.3 | - | Е | 59.4 | - | Е | 70.5 | - |
| Left | С | 26.8 | 0.98 | Е | 63.9 | 0.75 | Е | 67 | 0.78 | Е | 60.0 | 0.73 | Е | 64.8 | 0.80 | Е | 66.5 | 0.81 | Е | 70.0 | 1.17 |
| Through | NA | - | - | D | 52.6 | 0.02 | Е | 55.2 | 0.04 | D | 49.5 | 0.04 | D | 53.4 | 0.08 | D | 54.2 | 0.04 | Е | 78.3 | 0.64 |
| Right | O | 23.8 | 0.65 | D | 39.8 | 0.57 | D | 41.7 | 0.58 | D | 48.2 | 0.69 | D | 50.5 | 0.69 | D | 47.8 | 0.67 | Е | 70.0 | 1.43 |
| Queen Ka'ahumanu Hwy NB | В | 14.9 | - | D | 42.5 | - | D | 45.6 | - | D | 35.9 | - | D | 40.1 | - | D | 37.4 | - | С | 28.7 | - |
| Left | NA | - | - | F | 86.6 | 0.74 | F | 85.2 | 0.48 | F | 83.2 | 0.77 | F | 84.8 | 0.62 | F | 83.5 | 0.47 | Е | 78.7 | 0.58 |
| Through | В | 16.9 | 0.83 | D | 43.1 | 0.86 | D | 46.4 | 0.88 | D | 36.4 | 0.81 | D | 40.9 | 0.84 | D | 38.1 | 0.83 | С | 28.8 | 0.76 |
| Right | Α | 1.2 | 0.83 | С | 30.9 | 0.35 | С | 33.3 | 0.36 | С | 23.9 | 0.19 | С | 26.8 | 0.20 | С | 24.3 | 0.2 | В | 18.4 | 0.18 |
| Queen Ka'ahumanu Hwy SB | Α | 8.6 | - | С | 27.1 | - | С | 30.7 | - | С | 31.2 | - | С | 34.6 | - | С | 30.3 | - | С | 25.8 | - |
| Left | Α | 8.6 | 0.13 | Е | 71.3 | 0.56 | Е | 73 | 0.56 | Е | 78.5 | 0.6 | F | 80.2 | 0.55 | Е | 76.3 | 0.42 | Е | 74.2 | 0.54 |
| Through | Α | 8.6 | 0.42 | В | 19.5 | 0.42 | С | 23.6 | 0.45 | С | 23.2 | 0.45 | С | 27.5 | 0.52 | С | 22.3 | 0.45 | В | 19.1 | 0.54 |
| Right | NA | - | - | С | 25.9 | 0.00 | С | 27.9 | 0.01 | С | 21.7 | 0.01 | С | 24.3 | 0.01 | С | 21.9 | 0.01 | В | 16.6 | 0.01 |

| | | 2006 | | | | 20 |)15 | | | 2020 | | | | | | 2029 | | | | | |
|-------------------------|-----|---------|------|-----|--------|----------------|-----|--------------------|------|------|--------|----------------|-----|--------------------|------|------|---------|----------------|-----|--------------------|------|
| | | EXISTIN | G | | AMBIEN | Γ ¹ | | TOTAL ¹ | | | AMBIEN | Γ ² | | TOTAL ² | ! | | AMBIENT | Γ ² | | TOTAL ² | 2 |
| APPROACH & MOVEMENTS | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C |
| PM PEAK HOUR | В | 11.5 | 0.67 | D | 38.6 | 0.97 | D | 39.2 | 1.00 | D | 42.7 | 0.71 | D | 42.0 | 0.93 | D | 48.2 | 0.75 | D | 51.5 | 1.00 |
| Frontage Rd Eastbound | NA | - | - | Е | 73.6 | - | Е | 75.5 | - | F | 82.2 | 0.71 | F | 115 | - | F | 100 | - | F | 84.4 | - |
| Left | - | - | - | Е | 73.8 | 0.44 | Е | 76 | 0.89 | F | 82.5 | 0.46 | F | 123 | 0.92 | F | 101 | 0.63 | F | 82.9 | 0.79 |
| Through/Right | • | - | - | Е | 72 | 0.05 | Е | 72.4 | 0.13 | Е | 78.2 | 0.04 | F | 87.0 | 0.48 | F | 87.2 | 0.05 | F | 89.8 | 0.57 |
| Ka'iminani Dr WB | С | 26 | - | Е | 62.9 | - | Е | 63 | - | Е | 75.5 | - | F | 91.8 | - | Е | 78.6 | - | F | 85.0 | - |
| Left | С | 26.3 | 0.24 | Е | 65.3 | 0.69 | Е | 65.5 | 0.71 | F | 83.4 | 0.78 | F | 98.7 | 0.89 | F | 86.6 | 0.75 | F | 84.3 | 0.77 |
| Through | NA | - | - | Е | 58.6 | 0.02 | Е | 58.8 | 0.05 | Е | 67.4 | 0.02 | Е | 76.7 | 0.10 | Е | 72.0 | 0.02 | F | 96.60 | 0.67 |
| Right | C | 25.5 | 0.12 | С | 31.1 | 0.04 | С | 31.1 | 0.04 | D | 40.5 | 0.15 | Е | 67.3 | 0.37 | D | 43.5 | 0.16 | F | 85.7 | 0.54 |
| Queen Ka'ahumanu Hwy NB | В | 12 | - | D | 40.5 | - | D | 40.5 | - | D | 36.9 | - | С | 30.4 | - | D | 41.6 | - | D | 36.1 | - |
| Left | NA | - | - | Е | 75.9 | 0.37 | Е | 75.9 | 0.37 | F | 87.1 | 0.43 | F | 83.9 | 0.34 | F | 156 | 0.78 | F | 90.8 | 0.42 |
| Through | В | 16.4 | 0.59 | D | 37.7 | 0.80 | D | 37.7 | 0.8 | D | 39.0 | 0.76 | D | 37.9 | 0.75 | D | 42.9 | 0.78 | D | 46.2 | 0.82 |
| Right | Α | 2.5 | 0.20 | D | 44 | 1.04 | D | 44 | 1.04 | С | 31.0 | 0.51 | В | 14.0 | 0.38 | С | 34.1 | 0.54 | В | 14.9 | 0.41 |
| Queen Ka'ahumanu Hwy SB | Α | 9.2 | - | С | 32.1 | - | С | 32.5 | - | D | 40.5 | - | D | 35.2 | - | D | 46.4 | - | D | 52.6 | - |
| Left | Α | 8.9 | 0.67 | Е | 65 | 0.20 | Е | 65 | 1.61 | F | 93.7 | 0.93 | Е | 76.3 | 0.82 | F | 114 | 0.99 | F | 91.1 | 0.9 |
| Through | Α | 9.3 | 0.62 | С | 21.4 | 0.79 | С | 22.4 | 0.82 | С | 23.3 | 0.77 | С | 22.9 | 0.81 | С | 24.6 | 0.79 | D | 41.9 | 0.95 |
| Right | NA | - | - | С | 23.8 | 0.01 | С | 23.8 | 0.01 | С | 22.9 | 0.01 | Α | 3.0 | 0.01 | С | 24.7 | 0.01 | Α | 1.2 | 0.01 |

¹ With 2 left turn lanes on westbound approach

² With 2 northbound right turn, 2 southbound left turn lanes and 2 westbound left turn lanes

TABLE 5
LEVEL OF SERVICE ANALYSIS (SIGNALIZED)
QUEEN KA'AHUMANU HIGHWAY AT HULIKO'A DRIVE

| | | 2006 | | | | 20 |)15 | | | | | 20 | 20 | | | | | 20 | 29 | | |
|--------------------------|-----|----------|-----|-----|--------|------|-----|--------------------|------|-----|--------|------|-----|--------------------|------|-----|---------|----------------|-----|-------|------|
| | | EXISTING | 3 | | AMBIEN | Т | | TOTAL ¹ | | | AMBIEN | Т | | TOTAL ¹ | | | AMBIEN1 | Γ ¹ | | TOTAL | |
| APPROACH & MOVEMENTS | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C |
| AM PEAK HOUR | | | | С | 29.2 | 0.74 | С | 29.7 | 0.71 | С | 29.6 | 0.72 | D | 37.0 | 0.72 | С | 30.2 | 0.74 | D | 46.4 | 0.77 |
| Frontage Road Eastbound | | | | D | 47.7 | - | D | 47.7 | - | D | 47.7 | - | D | 45.0 | - | D | 47.7 | - | Е | 59.7 | - |
| Left | | | | D | 48.3 | 0.44 | D | 48.3 | 0.44 | D | 48.3 | 0.44 | D | 45.1 | 0.36 | D | 48.3 | 0.44 | Е | 59.3 | 0.40 |
| Through | | | | D | 43.2 | 0.01 | D | 43.3 | 0.01 | D | 43.2 | 0.01 | D | 40.8 | 0.01 | D | 43.2 | 0.01 | D | 54.0 | 0.04 |
| Right | | | | D | 47.1 | 0.38 | D | 47.2 | 0.38 | D | 47.1 | 0.38 | D | 45.0 | 0.36 | D | 47.1 | 0.38 | Е | 60.6 | 0.45 |
| Huliko'a Drive Westbound | | | | D | 54.6 | - | D | 54.7 | - | D | 51.6 | - | D | 46.6 | - | D | 51.6 | - | Е | 61.5 | - |
| Left | | | | Е | 59.0 | 0.72 | Е | 59.3 | 0.72 | D | 54.8 | 0.64 | D | 48.6 | 0.52 | D | 54.8 | 0.64 | Е | 64.6 | 0.58 |
| Through | | | | D | 43.3 | 0.01 | D | 43.3 | 0.01 | D | 43.3 | 0.04 | D | 41.2 | 0.04 | D | 43.3 | 0.01 | D | 54.1 | 0.05 |
| Right | | | | D | 46.5 | 0.33 | D | 46.5 | 0.33 | D | 46.5 | 0.33 | D | 43.9 | 0.26 | D | 46.5 | 0.33 | Е | 57.5 | 0.29 |
| Queen Ka'ahumanu Hwy NB | | | | С | 25.0 | - | С | 25.7 | - | С | 26.4 | - | D | 36.8 | - | С | 27.7 | - | D | 38.9 | - |
| Left | | | | Е | 60.5 | 0.48 | Е | 58.0 | 0.36 | Е | 60.5 | 0.48 | Е | 62.7 | 0.55 | Е | 57.4 | 0.26 | Е | 72.2 | 0.55 |
| Through | | | | С | 24.1 | 0.75 | С | 24.1 | 0.75 | С | 25.7 | 0.79 | С | 34.5 | 0.85 | С | 27.2 | 0.82 | С | 34.8 | 0.85 |
| Right | | | | В | 14.4 | 0.19 | В | 14.4 | 0.19 | В | 14.2 | 0.17 | В | 18.5 | 0.18 | В | 14.2 | 0.17 | В | 17.2 | 0.16 |
| Queen Ka'ahumanu Hwy SB | | | | С | 25.3 | - | С | 26.0 | - | С | 26.1 | - | С | 34.2 | - | С | 26.1 | - | D | 50.7 | - |
| Left | | | | Е | 73.2 | 0.72 | Е | 74.9 | 0.74 | Е | 73.2 | 0.72 | Е | 67.4 | 0.63 | Е | 73.2 | 0.72 | F | 98.3 | 0.77 |
| Through | | | | С | 20.5 | 0.62 | С | 21.3 | 0.65 | С | 21.9 | 0.68 | С | 31.4 | 0.80 | С | 21.9 | 0.68 | D | 47.2 | 0.89 |
| Right | | | | В | 13.2 | 0.05 | В | 13.2 | 0.05 | В | 13.2 | 0.05 | В | 17.2 | 0.05 | В | 13.2 | 0.05 | С | 22.9 | 0.05 |

| | | 2006 | | | | 20 |)15 | | | | | 20 | 20 | | | | | 20 | 29 | | |
|--------------------------|-----|----------|-----|-----|--------|------|-----|--------------------|------|-----|--------|------|-----|--------------------|------|-----|---------|------|-----|--------------------|------|
| | | EXISTING | 3 | | AMBIEN | Т | | TOTAL ¹ | | | AMBIEN | Т | | TOTAL ¹ | | | AMBIEN1 | -1 | | TOTAL ² | |
| APPROACH & MOVEMENTS | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C |
| PM PEAK HOUR | | | | D | 45.3 | 0.80 | D | 43.6 | 0.77 | D | 41.6 | 0.78 | D | 50.3 | 0.79 | D | 36.1 | 0.73 | D | 45.7 | 0.85 |
| Frontage Road Eastbound | | | | D | 53.4 | - | D | 53.5 | - | D | 51.3 | - | Е | 63.7 | - | D | 45.5 | - | Е | 75.9 | - |
| Left | | | | D | 53.6 | 0.27 | D | 53.3 | 0.28 | D | 51.6 | 0.28 | Е | 64.3 | 0.29 | D | 46.1 | 0.27 | F | 105.0 | 0.74 |
| Through | | | | D | 49.7 | 0.01 | D | 49.4 | 0.01 | D | 47.8 | 0.01 | Е | 59.7 | 0.01 | D | 42.7 | 0.01 | F | 86.5 | 0.17 |
| Right | | | | D | 53.2 | 0.24 | D | 53.7 | 0.31 | D | 51.1 | 0.25 | Е | 63.2 | 0.23 | D | 44.8 | 0.17 | D | 52.2 | 0.29 |
| Huliko'a Drive Westbound | | | | Е | 67.6 | - | Е | 67.7 | - | Е | 61.8 | - | Е | 75.6 | - | D | 54.2 | - | Е | 77.0 | - |
| Left | | | | Е | 74.2 | 0.79 | Е | 75.6 | 0.81 | Е | 66.9 | 0.74 | F | 82.1 | 0.75 | Е | 58.1 | 0.69 | F | 82.0 | 0.62 |
| Through | | | | D | 49.8 | 0.01 | D | 49.8 | 0.03 | D | 47.8 | 0.01 | Е | 60.3 | 0.05 | D | 42.7 | 0.01 | Е | 78.9 | 0.18 |
| Right | | | | Е | 55.7 | 0.39 | Е | 55.3 | 0.40 | D | 53.2 | 0.38 | Е | 65.1 | 0.33 | D | 46.7 | 0.31 | Е | 66.5 | 0.42 |
| Queen Ka'ahumanu Hwy NB | | | | D | 35.1 | - | С | 34.4 | - | D | 35.8 | - | D | 44.2 | - | С | 32.4 | - | С | 33.7 | - |
| Left | | | | F | 87.1 | 0.83 | Е | 72.2 | 0.65 | F | 113 | 0.96 | F | 97.8 | 0.84 | Е | 78.1 | 0.75 | Е | 77.6 | 0.8 |
| Through | | | | С | 24.8 | 0.61 | С | 24 | 0.61 | С | 20.1 | 0.59 | С | 26.1 | 0.59 | С | 23.8 | 0.66 | В | 16.0 | 0.56 |
| Right | | | | В | 16.3 | 0.09 | В | 15.8 | 0.08 | В | 13.1 | 0.07 | В | 17.2 | 0.07 | В | 14.8 | 0.07 | Α | 2.8 | 0.05 |
| Queen Ka'ahumanu Hwy SB | - | | | D | 48.4 | - | D | 44.9 | - | D | 41.1 | - | D | 49.2 | - | С | 34.6 | - | D | 47.4 | - |
| Left | | | | F | 84.7 | 0.50 | F | 83.7 | 0.53 | F | 100 | 0.71 | F | 99.3 | 0.56 | Е | 77.8 | 0.55 | F | 97.6 | 0.67 |
| Through | | | | D | 48.8 | 0.84 | D | 44.9 | 0.83 | D | 40.0 | 0.8 | D | 48.6 | 0.84 | С | 33.9 | 0.79 | D | 47.6 | 0.9 |
| Right | | | | С | 30.8 | 0.24 | С | 27.9 | 0.23 | С | 25.6 | 0.23 | С | 28.4 | 0.19 | С | 20.6 | 0.18 | В | 14.8 | 0.15 |

¹ With 2 left turn lanes on northbound approach

² With 2 left turn lanes on westbound approach

TABLE 6
LEVEL OF SERVICE ANALYSIS (SIGNALIZED)
QUEEN KA'AHUMANU HIGHWAY AT HINA LANI STREET

| | | 2006 | | | | 20 | 015 | | | | | 20 | 20 | | | | | 20 | 29 | | |
|-------------------------|-----|----------|------|-----|---------|------|-----|-------|------|-----|--------|----------------|-----|--------------------|------|-----|--------|----------------|-----|--------------------|------|
| | | EXISTING | 3 | | AMBIEN' | Т | | TOTAL | | | AMBIEN | Γ ¹ | | TOTAL ¹ | | | AMBIEN | Γ ¹ | | TOTAL ² | ! |
| APPROACH & MOVEMENTS | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C |
| AM PEAK HOUR | С | 27.5 | 0.75 | D | 36.9 | 0.92 | D | 36.9 | 0.93 | С | 33.2 | 1.04 | D | 38.4 | 1.06 | D | 35.5 | 1.09 | С | 30.9 | 1.07 |
| Hina Lani St WB | С | 29.5 | - | D | 38.6 | - | D | 41.1 | - | D | 46.1 | - | D | 52.1 | - | D | 47.4 | - | D | 52.1 | - |
| Left | С | 29.0 | 0.47 | D | 50.0 | 0.77 | D | 53.5 | 0.8 | Е | 57.6 | 0.74 | Е | 65.9 | 0.75 | Е | 59.2 | 0.78 | Е | 62.8 | 0.84 |
| Right | С | 30.0 | 0.52 | С | 24.1 | 0.47 | С | 25.9 | 0.49 | С | 27.7 | 0.52 | С | 31.5 | 0.54 | С | 27.7 | 0.52 | D | 36.5 | 0.67 |
| Queen Ka'ahumanu Hwy NB | D | 37.3 | - | D | 41.2 | - | D | 39.6 | - | D | 36.6 | - | D | 43.3 | - | D | 40.7 | - | С | 33.9 | - |
| Through | D | 43.2 | 0.93 | D | 54.0 | 0.93 | D | 51.7 | 0.93 | D | 47.7 | 0.89 | Е | 56.1 | 0.92 | D | 53.5 | 0.94 | D | 44.0 | 0.93 |
| Right | В | 18.5 | 0.34 | Α | 3.9 | 0.37 | Α | 3.9 | 0.37 | Α | 9.1 | 0.459 | В | 10.8 | 0.50 | Α | 9.5 | 0.52 | Α | 6.6 | 0.50 |
| Queen Ka'ahumanu Hwy SB | В | 13.0 | - | С | 31.1 | - | С | 31.7 | - | С | 21.8 | - | С | 25.5 | - | С | 21.8 | - | В | 15.9 | - |
| Left | В | 13.0 | 0.38 | Е | 71.1 | 0.85 | Е | 78.9 | 0.89 | Е | 56.1 | 0.76 | Е | 67.5 | 0.81 | Е | 56.5 | 0.76 | С | 23.6 | 0.21 |
| Through | В | 13.0 | 0.55 | С | 24.5 | 0.70 | С | 23.9 | 0.71 | В | 14.2 | 0.60 | В | 16.1 | 0.64 | В | 14.2 | 0.60 | В | 14.2 | 0.68 |

| | | 2006 | | | | 20 |)15 | | | | | 20 |)20 | | | | | 20 | 29 | | |
|-------------------------|-----|---------|------|-----|--------|------|-----|-------|------|-----|--------|----------------|-----|--------------------|------|-----|---------|----------------|-----|--------------------|------|
| | | EXISTIN | G | | AMBIEN | | | TOTAL | | | AMBIEN | Γ ¹ | | TOTAL ¹ | | | AMBIENT | Γ ¹ | | TOTAL ² | |
| APPROACH & MOVEMENTS | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C | LOS | Delay | V/C |
| PM PEAK HOUR | С | 27.9 | 0.69 | D | 49.3 | 0.60 | D | 53.5 | 1.11 | С | 33.8 | 0.74 | D | 39.7 | 0.76 | D | 41.3 | 0.77 | С | 33.0 | 1.16 |
| Hina Lani St WB | D | 42.6 | - | Е | 76.4 | - | Е | 75.1 | - | D | 52.7 | - | D | 54.6 | - | D | 54.8 | - | Е | 60.8 | - |
| Left | D | 44.1 | 0.74 | F | 100.8 | 1.04 | F | 100.8 | 1.04 | Е | 67.2 | 0.83 | Е | 72.1 | 0.85 | Е | 70.9 | 0.87 | Е | 66.5 | 0.72 |
| Right | D | 40.8 | 0.66 | С | 22.7 | 0.36 | С | 23.3 | 0.39 | С | 25.2 | 0.41 | С | 25.6 | 0.46 | С | 26.3 | 0.46 | D | 52.7 | 0.72 |
| Queen Ka'ahumanu Hwy NB | С | 33.6 | - | D | 41.6 | - | D | 49.7 | - | С | 33.7 | - | D | 46.2 | - | D | 42.9 | - | С | 30.3 | - |
| Through | D | 36.8 | 0.82 | Е | 59.7 | 0.92 | Е | 70.5 | 0.98 | D | 44.0 | 0.83 | Е | 60.2 | 0.96 | Е | 56.4 | 0.95 | D | 41.4 | 0.87 |
| Right | С | 28.8 | 0.64 | Α | 6.2 | 0.52 | Α | 6.2 | 0.52 | В | 15.0 | 0.65 | В | 17.7 | 0.67 | В | 16.2 | 0.69 | Α | 4.8 | 0.56 |
| Queen Ka'ahumanu Hwy SB | В | 11.9 | - | D | 42.9 | - | D | 46.0 | - | С | 24.0 | - | С | 25.2 | - | С | 32.3 | - | С | 21.8 | - |
| Left | В | 11.3 | 0.36 | F | 107.3 | 0.98 | F | 118.6 | 1.02 | Е | 65.2 | 0.88 | Е | 68.8 | 0.89 | F | 92.8 | 0.99 | С | 31.1 | 0.34 |
| Through | В | 12 | 0.60 | С | 30.8 | 0.77 | С | 32.4 | 0.80 | В | 11.1 | 0.55 | В | 11.5 | 0.59 | В | 11.2 | 0.55 | В | 18.6 | 0.67 |

¹ With 2 left turn lanes on westbound approach

² With 2 southbound left turn lanes and 2 westbound left turn lanes

TABLE 7 LEVEL OF SERVICE ANALYSIS (UNSIGNALIZED) QUEEN KA'AHUMANU HIGHWAY AT EXISTING (2006) INTERSECTIONS

| | | AM PEA | K HOUR | PM PEA | K HOUR |
|----------------------------|-------------|--------|--------|--------|--------|
| | | LOS | DELAY | LOS | DELAY |
| NELHA ACCESS RD INTERSE | CTION | | | | |
| NELHA Access Rd | EB Approach | D | 34.9 | D | 35 |
| | EB RT | С | 17.6 | В | 14.4 |
| | EB LT | F | 64.2 | Е | 47.3 |
| Queen Ka'ahumanu Hwy | NB LT | В | 10.6 | Α | 9.1 |
| HULIKOA DRIVE INTERSECTION | DN | | | | |
| Hulikoa Drive | WB Approach | F | 107.3 | F | 104 |
| | WB RT | С | 21.1 | С | 19 |
| | WB LT | F | 237 | F | 161 |
| Queen Ka'ahumanu Hwy | SB LT | В | 10.9 | Α | 9.8 |

TABLE 8 LEVEL OF SERVICE ANALYSIS (ON-RAMP) QUEEN KA'AHUMANU HIGHWAY AT 'O'OMA BEACHSIDE VILLAGE AND NELHA ACCESS ROADS

| PEAK | 20 | 15 | 20 | 20 | 20 | 29 |
|-------------|-------------|--------------|---------|---------|-----|---------|
| HOUR | LOS | DENSITY | LOS | DENSITY | LOS | DENSITY |
| At 'O'oma I | Beachside \ | /illage Acce | ss Road | | | |
| AM | В | 17.3 | В | 17.9 | В | 19.5 |
| PM | С | 23.2 | С | 24.1 | С | 25.8 |
| | | | | | | |
| At NELHA | Access Roa | ad | | | | |
| AM | В | 16.9 | В | 17.3 | В | 19.2 |
| PM | С | 23.3 | С | 24.2 | С | 26.3 |

Legend:

LOS = Level of Service for vehicles entering Queen Ka'ahumanu Highway from access road

DENSITY = Passenger Cars/Mile/Lane

TABLE 9
LEVEL OF SERVICE ANALYSIS (HIGHWAY)
QUEEN KA'AHUMANU HIGHWAY SOUTHBOUND AT
'O'OMA BEACHSIDE VILLAGE ACCESS ROAD

| | | AN | I PEAK HO | UR | PN | I PEAK HO | UR |
|------|------------|-----------|-----------|--------|-----|-----------|--------|
| 2-L | ANE HIGH | WAY ANAL | YSIS | | | | |
| | | LOS | % PASS | ATS | LOS | % PASS | ATS |
| | 2006 | Е | 91.4 | 46 | Е | 91.1 | 47.2 |
| l | Existing | | | | | | |
| | | LOS | DENSITY | VOLUME | LOS | DENSITY | VOLUME |
| MU | LTI-LANE I | HIGHWAY A | ANALYSIS | | | | |
| 15 | Ambient | В | 14.24 | 783 | С | 21.26 | 1,169 |
| 201 | Total | В | 14.5 | 797 | С | 22.04 | 1,212 |
| 2020 | Ambient | В | 14.24 | 783 | С | 21.46 | 1,180 |
| 20 | Total | В | 14.92 | 820 | С | 22.87 | 1,258 |
| 29 | Ambient | В | 15.02 | 826 | С | 22.61 | 1,243 |
| 203 | Total | В | 17.05 | 938 | С | 25.47 | 1,401 |

Legend:

LOS = Level of Service

% PASS = Percent Time Spent Following

ATS = Average Travel Speed (mi/hr)

DENSITY = Passenger Cars/Mile/Lane

VOLUME = Hourly Passenger Cars/Hour/Lane

Appendix A

Traffic Turning Movement Counts

TRAFFIC TURNING MOVEMENT COUNT O'OMA TIAR

To Waimea

2

Queen K'aahumanu Highway/

LOCATION: Hina Lani Street

DATE: September 14, 2006

TIME: 6:30a-8:30a / 11:00a-1:00p / 3:30p-5:30p

WEATHER: Clear
RECORDER: C. Darby

QUEEN KA'AHUMANU HIGHWAY

To Kailua-Kona

£ 5

6

| TIME | | МС | VEMENT | NUME | BER | | |
|---------------|------|-----|--------|------|------|------|-------|
| PERIOD | 1 | 2 | 3 | 4 | 5 | 6 | TOTAL |
| 6:30-6:45a | 120 | 17 | 79 | 58 | 50 | 207 | 531 |
| 6:45-7:00a | 130 | 35 | 68 | 72 | 90 | 177 | 572 |
| 7:00-7:15a | 134 | 24 | 49 | 44 | 70 | 154 | 475 |
| 7:15-7:30a | 162 | 42 | 64 | 53 | 86 | 147 | 554 |
| 7:30-7:45a | 184 | 36 | 65 | 62 | 106 | 180 | 633 |
| 7:45-8:00a | 171 | 34 | 88 | 82 | 72 | 133 | 580 |
| 8:00-8:15a | 182 | 33 | 63 | 66 | 88 | 170 | 602 |
| 8:15-8:30a | 186 | 35 | 61 | 74 | 82 | 156 | 594 |
| 6:30-8:30a | 1269 | 256 | 537 | 511 | 644 | 1324 | 4541 |
| 7:30-8:30a | 723 | 138 | 277 | 284 | 348 | 639 | 2409 |
| PHF | 0.98 | | | | 0.86 | | |
| 11:00-11:15a | 149 | 33 | 47 | 109 | 116 | 139 | 593 |
| 11:15-11:30a | 173 | 49 | 59 | 97 | 126 | 138 | 642 |
| 11:30-11:45a | 147 | 43 | 64 | 89 | 94 | 105 | 542 |
| 11:45-12:00n | 174 | 45 | 65 | 107 | 121 | 124 | 636 |
| 12:00n-12:15p | 130 | 31 | 58 | 91 | 113 | 133 | 556 |
| 12:15-12:30p | 109 | 32 | 58 | 110 | 104 | 113 | 526 |
| 12:30-12:45p | 144 | 28 | 58 | 85 | 123 | 147 | 585 |
| 12:45-1:00p | 145 | 15 | 67 | 96 | 141 | 136 | 600 |
| 11:00a-1:00p | 1171 | 276 | 476 | 784 | 938 | 1035 | 4680 |
| 11:00a-12:00p | 643 | 170 | 235 | 402 | 457 | 506 | 2413 |
| 3:30-3:45p | 150 | 33 | 65 | 64 | 118 | 141 | 571 |
| 3:45-4:00p | 193 | 60 | 90 | 89 | 138 | 155 | 725 |
| 4:00-4:15p | 210 | 52 | 89 | 106 | 128 | 175 | 760 |
| 4:15-4:30p | 95 | 31 | 36 | 42 | 61 | 79 | 344 |
| 4:30-4:45p | 150 | 30 | 63 | 57 | 114 | 141 | 555 |
| 4:45-5:00p | 137 | 36 | 63 | 82 | 119 | 146 | 583 |
| 5:00-5:15p | 122 | 26 | 58 | 73 | 65 | 151 | 495 |
| 5:15-5:30p | 80 | 14 | 84 | 50 | 63 | 110 | 401 |
| 3:30-5:30p | 1137 | 282 | 548 | 563 | 806 | 1098 | 4434 |
| 3:30-4:30p | 648 | 176 | 280 | 301 | 445 | 550 | 2400 |
| PHF | 0.79 | | | | 0.82 | | |

Traffic accident from 5:15-5:30 pm, affected movements 1 & 6 Long traffic queues on movements 1 & 4 from 3:35 to 4:10 pm

TRAFFIC TURNING MOVEMENT COUNT O'OMA TIAR

Queen Ka'ahumanu Highway/

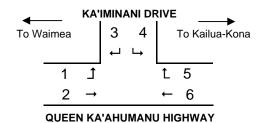
LOCATION: Ka'iminani Drive

DATE: September 12, 2006

TIME: 6:30a-8:30a / 11:00a-1:00p / 3:30p-5:30p

WEATHER: Clear

RECORDER: C. Darby, R. Miguel



| TIME | | MO | VEMEN | T NUMB | BER | | |
|---------------|------|------|-------|--------|------|------|-------|
| PERIOD | 1 | 2 | 3 | 4 | 5 | 6 | TOTAL |
| 6:30-6:45a | 7 | 54 | 92 | 86 | 29 | 184 | 452 |
| 6:45-7:00a | 7 | 89 | 83 | 95 | 36 | 180 | 490 |
| 7:00-7:15a | 13 | 92 | 84 | 114 | 37 | 181 | 521 |
| 7:15-7:30a | 9 | 113 | 73 | 96 | 22 | 152 | 465 |
| 7:30-7:45a | 6 | 124 | 46 | 130 | 26 | 162 | 494 |
| 7:45-8:00a | 6 | 100 | 62 | 126 | 34 | 144 | 472 |
| 8:00-8:15a | 7 | 129 | 37 | 89 | 37 | 135 | 434 |
| 8:15-8:30a | 12 | 139 | 44 | 74 | 23 | 176 | 468 |
| 6:30-8:30a | 67 | 840 | 521 | 810 | 244 | 1314 | 3796 |
| 6:45-7:45a | 35 | 418 | 286 | 435 | 121 | 675 | 1970 |
| PHF | 0.87 | | | | 0.91 | | |
| 11:00-11:15a | 13 | 141 | 21 | 42 | 34 | 141 | 392 |
| 11:15-11:30a | 16 | 147 | 27 | 39 | 35 | 117 | 381 |
| 11:30-11:45a | 13 | 157 | 13 | 26 | 22 | 123 | 354 |
| 11:45-12:00n | 12 | 124 | 20 | 35 | 33 | 143 | 367 |
| 12:00n-12:15p | 26 | 154 | 16 | 39 | 37 | 141 | 413 |
| 12:15-12:30p | 12 | 130 | 11 | 17 | 35 | 126 | 331 |
| 12:30-12:45p | 9 | 130 | 25 | 32 | 32 | 125 | 353 |
| 12:45-1:00p | 29 | 136 | 17 | 28 | 41 | 143 | 394 |
| 11:00a-1:00p | 130 | 1119 | 150 | 258 | 269 | 1059 | 2985 |
| 11:15a-12:15p | 67 | 582 | 76 | 139 | 127 | 524 | 1515 |
| 3:30-3:45p | 49 | 133 | 15 | 33 | 59 | 122 | 411 |
| 3:45-4:00p | 102 | 171 | 13 | 21 | 69 | 128 | 504 |
| 4:00-4:15p | 99 | 197 | 10 | 21 | 70 | 101 | 498 |
| 4:15-4:30p | 64 | 153 | 19 | 23 | 73 | 115 | 447 |
| 4:30-4:45p | 48 | 155 | 14 | 24 | 69 | 133 | 443 |
| 4:45-5:00p | 44 | 115 | 13 | 25 | 80 | 134 | 411 |
| 5:00-5:15p | 52 | 147 | 13 | 17 | 72 | 122 | 423 |
| 5:15-5:30p | 51 | 117 | 12 | 33 | 92 | 134 | 439 |
| 3:30-5:30p | 509 | 1188 | 109 | 197 | 584 | 989 | 3576 |
| 3:45-4:45p | 313 | 676 | 56 | 89 | 281 | 477 | 1892 |
| PHF | 0.84 | | | | 0.96 | | |

Appendix B

Signalized Intersection
Level of Service (LOS) Calculations

| Analyst | | | | | | 5 | one imormation | Hon | | | | | |
|----------------------------------|--|-----------------|--|-------------------------|---------|-----------|-------------------|---|------------|--------------------|---|------|-----------|
| | WY | | | | | Jurisd | Jurisdiction/Date | an an | WAR. | | - Lange | 3/26 | 3/26/2008 |
| Agency or Company | M&E PAC | | | | | EB/WE | EB/WB Street | | KAIMINANI | NANI | | | |
| Analysis Period/Year | od/Year EX AM #1 2006 EXISTING 6:30-7:30 AM | 30-7:30 | AM MA | 2006 | 1 | NB/SE | NB/SB Street | 01 | QUEEN KAAH | KAA | = | | |
| ' I : | | | | | | | | | | | | | H |
| Intersection Data | | | | | | | | | | | ļ | | |
| Area type Other | An | Analysis period | riod | .25 | = | Sign | Signal type | Actuated-Field | d-Field | % | Back of queue | 1 | 95 |
| | To the same of the | | 83 | | nau, | WB | | | 8 | | | SB | |
| | | 5 | Ŧ | E. | 5 | 프 | æ | 5 | Æ | ₩. | 5 | ¥ | R |
| Volume (veh/h) | | | | Ì | 435 | | 285 | | 675 | 120 | 35 | 420 | |
| RTOR volume (veh/h) | | | | | | | 30 | | | 20 | | | 0 |
| Peak-hour factor | | | | | .92 | | .92 | | .92 | .92 | .92 | .92 | |
| Heavy vehicles (%) | | | | | 7 | | 7 | | C1 | 7 | 7 | 2 | |
| Start-up lost time, I1 (s) | (1) | 1 | | | 7 | | 7 | | C1 | 7 | 2 | ۲3 | |
| Extension of effective green, | reen, e (s) | | | | 7 | | 7 | | 7 | 2 | 2 | 2 | |
| Arrival type, AT | | | | | 3 | | 3 | | 3 | ٣ | 3 | m | |
| Approach pedestrian volume (p/h) | olume (p/h) | | | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | ne (bic/h) | | | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | (N | | _ | | z | - | z | z | - | z | z | - | Z |
| Signal Phasing Plan | lan | | | | | | | | | | | | |
| LU TH | R: RT P: P | Peds | | | | ١. | | | | | | | |
| | Phase 1 | <u>a.</u> | Phase 2 | Pha | Phase 3 | Phase 4 | + | Phase 5 | Phase | 9 9 | Phase 7 | + | Phase 8 |
| | = | _ | ALL PARTY OF THE P | | Ì | | t | *************************************** | | Ì | | + | |
| NB NB | Z Z | 1 | | 1 | TP | | | | | | *************************************** | + | |
| 3 | 4 | | E | - | 4 6 | | t | | 1 | 1 | | + | |
| Sp. Groon (c) | 6 | + | - | 7, | L1 | | + | | | | | 1 | |
| - 15 | 707 | + | 4 | 3 | 25 | | t | - | | 1 | | - | Ì |
| (c) na | 73.9 | 100 | time n | loct time ner curle (c) | 5.8 | 8 6 | - | | riting | Critical ule Datio | | 787 | |
| your (a) | | ros | 2 | a cycle | 2 | | | | CHECAL | W.C. Kallo | | | |
| mersection remormance | ormance | | 9 | | | 9 | | | 9 | E | | 5 | |
| | | - | 9 | | , | a a | - | ļ | 2 | | | 200 | |
| Laire group corniguration | | + | 1 | 1 | . اد | | ∠ . | | - | × | 7 | - | |
| No. of lanes | | + | 1 | | - | - monteur | - | | - | - | - | - | |
| Flow rate (veh/h) | | - | İ | Ì | 473 | | 277 | | 734 | 62 | 38 | 457 | |
| Capacity (veh/h) | | | - | | 479 | | 429 | | 882 | 1303 | 301 | 1084 | |
| Adjusted saturation flow (veh/h) | " (veh/h) | - | | | 1770 | | 1583 | | 1863 | 1583 | 1770 | 1863 | |
| v/c ratio | | | | | 786 | | .647 | | .832 | .083 | .126 | .421 | |
| g/C ratio | | | | | .271 | | .271 | | .474 | .823 | 909. | .582 | |
| Average back of queue (veh) | (veh) | | | | 14.1 | | 5.7 | | 15.6 | 2. | 4. | 5.7 | |
| Uniform delay (s) | | | | | 26.8 | | 23.8 | | 6.91 | 1.2 | 9.8 | 9.8 | |
| Incremental delay (s) | | | | | | | | | | | | | |
| Initial queue delay (s) | | | | | 0 | | 0 | | 0 | 0 | 0 | 0 | |
| Delay (s) | | | | | 26.8 | | 23.8 | | 16.9 | 1.2 | 9.8 | 8,6 | |
| 507 | | | | | ၁ | | C | | В | A | А | Ą | |
| Approach delay (s)/LOS | | | , | | 25.7 | ' | ပ | 14.9 | _ | В | 8.6 | _ | ∢ |
| Intersection delay (s)/ LOS | 30 | | | 173 | | | | , | | | 2 | | |

| WY Company M&E PAC 2006 EXISTING 2006 EXISTING cition Data Other Other Stitine (veluh) factor | | | | | | | | | | |
|--|-----------------|-----------|---------|-----------------------------------|----------------|-----------|--------------------|-----------------|-------------|---------|
| Agenry or Company M&E PAC Agenry or Company M&E PAC Comment 2006 EXISTING 7:30-8 Intersection Data Area type Other Analysis RIOR volume (veh/h) RIOR volume (veh/h) RIOR volume (veh/h) Arrival type, Af Arrival type, Af Approach pedestrian volume (ph) | 1 1 : 11 | | f. dad | 9 | | | | | 3/76/2008 | 8000 |
| Analysis Periodical EX AM #2 Comment 2006 EXISTING 7:30-8 Intersection Data Area type Other Analysis RTOR volume (verhit) RTOR volume (verhit) RTOR volume (verhit) Analysis (%6) Start-up station (effective green, e (s) Anrival type, Aff Approach pedestrian volume (ph) | 1 :1 . | | Jurisdi | Jurisdiction/Date FR/MR Strael | | KAIMINANI | YANI | | 2/70/ | 000 |
| Area type Other Analysis renouned 2006 EXISTING 7:30-8 [Intersection Data Area type Other Analysis It always volume (veh/h) [Intersection Data Analysis Peak-hour factor Heavy vehicles (%) [Sast-up lost time, 1, (s) Exact-up lost time, 1, (s) [Sast-up lost time, 1, | : | 2000 | EB/WB | EB/WB Sireet | دا د | MODIL | OHEEN VAL | | | |
| Arrived type. AT Approach pedestrian volume (p/h) | 18 00 25 | | GC/GM | Silver | 7 | | 2 | | | |
| other Other one (behh) me (behh) me (behh) cles (%) stime, 1, (s) of effective green, e (s) e, AT pedestrian volume (ph) | | | asw. | | - | WWW. | | | | |
| Other eth) me (teith) me (teith) fictor fictor for effective green, e (s) e, AT pedestrian volume (p/h) | | - | | | | | | | | |
| | Analysis period | .25 | h Sign | Signal type | Actuated-Field | d-Field | | % Back of queue | 95 ue 95 | |
| | 83 | | WB | | | B | | | æ | |
| Volume (veh/h) RTOR volume (veh/h) RTOR volume (veh/h) Heavy vehicles (%) REAL-up lost time, 1, (\$) | E | RT | E | RI | 5 | Z | RI | 5 | 픋 | ₽ |
| RTOR volume (veh/h) Peak-hour factor Heavy vehicles (%) Estar-up lost lime, 1, (\$) Estar-sion of effective green, e (\$) Arrival type, AT Approach pedestrian volume (p/h) | | 420 | | 130 | | 615 | 120 | 30 | 490 | |
| Peak-hour factor Heavy vehicles (%) Start-up tost time, 1, (s) Start-up tost time, 1, (s) Arrival type, AT Approach pedestrian volume (p/h) | | | | 30 | | | 20 | | | 0 |
| Heavy vehicles (%) Start-up lost time, I, (s) Extension of effective green, e (s) Arrival type, AT Approach pedestrian volume (p/h) | | .92 | | .92 | | .92 | .92 | .92 | .92 | |
| Start-up lost time, I ₁ (s) Extension of effective green, e (s) Arrival type, AT Approach pedestrian volume (p/h) | | 2 | | 2 | | C1 | 2 | 2 | 2 | |
| xiension of effective green, e (s) Virival type, AT Approach pedestrian volume (p/h) | | 2 | | 7 | | 2 | 2 | 2 | 2 | |
| Arrival type, AT Approach pedestrian volume (p/h) | L | 2 | | 2 | | 2 | 2 | 2 | 2 | |
| Approach pedestrian volume (p/h) | | 2 | | 3 | | 3 | 3 | 3 | 3 | |
| A STATE OF THE PERSON NAMED IN COLUMN NAMED IN | - | | 0 | | | 0 | - | | 0 | |
| Approach bicycle volume (bic/h) | | | 0 | | | 0 | | | 0 | |
| Lett/right parking (Y or N) | _ | Z | - | z | z | - | z | z | - | z |
| Signal Phasing Plan | | | | | | | - | | | |
| F. IT T. TH P. DT P. Pade | | | | | | | | | | |
| Pha | Phase 2 | Phase 3 | Phase 4 | 4 P | Phase 5 | Phase | 9 a | Phase 7 | Pha | Phase 8 |
| EB | | | | | | | | | | |
| 1 | | | | - | | | 1 | | | |
| NB R | | TR | | - | | | | | | - |
| | 7 | LT | | | | | | | | |
| | 4 | 35 | | - | | | | | | |
| All red (s) 5.1 | 4 | 5.8 | | - | | | | | - 1 | |
| Cycle (s) /3.9 | Lost time per | cycle (s) | 8.6 | | | Critical | Critical v/c Ratio | | 727 | |
| | Œ | | WB | | | NB | | | 87 | |
| Lane group configuration | | 1 | | 2 | | F | ~ | 7 | Ę | |
| No. of lanes | | - | | - | | - | - | - | - | |
| Flow rate (veh/h) | | 457 | | 174 | | 899 | 601 | 33 | 533 | |
| Capacity (veh/h) | | 479 | | 429 | | 882 | 1303 | 328 | 1084 | |
| Adjusted saturation flow (veh/h) | | 1770 | | 1583 | | 1863 | 1583 | 1770 | 1863 | |
| v/c ratio | | .953 | | .406 | | .758 | .083 | -: | .491 | |
| q/C ratio | | .271 | | .271 | | 474 | .823 | 909. | .582 | |
| Average back of queue (veh) | | 12.8 | | 3.2 | | 12.9 | s. | L. | - | |
| Uniform delay (s) | | 26.5 | | 22.1 | | 16 | 1.2 | 8.2 | 6 | |
| incremental delay (s) | | | | | | | | | | ĺ |
| Initial queue delay (s) | | 0 | | 0 | | 0 | 0 | 0 | 0 | |
| Delay (s) | | 26.5 | | 22.1 | | 91 | 1.2 | 8.2 | 6 | |
| TOS | | C | | ၁ | | В | 4 | A | < | |
| Approach detay (s)/LOS | _ | 25.3 | 3 / | C | 13.9 | _ | В | 6 | _ | 4 |
| Intersection delay (s)/ LOS | | 16.1 | | | | | | m | | |

| Contraction of the contraction o | | | | | | | | | | | | |
|--|--|-------------------------|-----------|------------------|---------|-------------------|----------|----------------|---------------------------------------|------------------|------|-----------|
| Analyst WY | | | | Name of the last | Jurisdi | Jurisdiction/Date | 45 | | | | 3/26 | 3/26/2008 |
| or Company | | | ŧ | | EBAWE | EB/WB Street | | KAIMINANI | NAN | Name of the last | | |
| Annius Dariod/Nasr AMB AM | AM | | 2015 | ĺ | MD/CD | MB/CB Ctroot | | HEEN | OHEEN KAAH | | | |
| ₹ | NT AM | | | | dC/dM | 2000 | | | | | | |
| Intersection Data | ALL THE PARTY AND ADDRESS OF THE PARTY AND ADD | | | | | | | | | | | |
| Area type Other | Analysis | Analysis period | .25 | _ | Sign | Signal type | Actuate | Actuated-Field | % | Back of queue | | 95 |
| 1 | | 89 | | | 88 | | | R | | | SB | |
| | 5 | = | E | בי | Ŧ | RI | Ħ | 프 | RT | ы | ¥ | RI |
| Volume (veh/h) | 15 | 0 | 0 | 575 | 01 | 430 | 46 | 1307 | 300 | 140 | 815 | 3 |
| RTOR volume (veh/h) | | | 0 | | | 80 | | | 09 | | | 0 |
| Peak-hour factor | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| Heavy vehicles (%) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Start-up lost time, I ₁ (s) | 2 | 2 | 2 | 2 | 2 | 7 | 2 | 2 | 7 | 7 | 2 | 2 |
| Extension of effective green, e (s) | | 2 | 2 | 2 | 7 | 2 | 2 | 2 | 2 | 7 | 61 | 2 |
| Arrival type, AT | m | 3 | ~ | 3 | 3 | 6 | 3 | 3 | 3 | 3 | т. | 3 |
| Approach pedestrian volume (p/h) | £ | 0 | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | z | - | Z | z | - | z | z | - | z | z | - | z |
| Signal Phasing Plan | | | | | | | | | | | | |
| L: LT T: TH R: RT | P: Peds | 71 171 171 | | - | | | | | - Annual Control | - | | |
| FR | Phase 1 | Phase 2 | + | Phase 3 | Phase | 4 | Phase 5 | Phase | 9 95 | Phase 7 | + | Phase 8 |
| | | LTR | | 2 | R | - | | | | | - | |
| NB | | | | l l | | | TR | | | | | |
| SB | | | | J | L | | TR | | | | _ | |
| Green (s) | 5 | 44 | | 7 | 20 | | 85 | | | | | |
| Yellow + All red (s) | 5.1 | 5.1 | | _ | 4 | | 5.8 | | | | | |
| Cycle (s) 182 | | Lost time per cycle (s) | per cycle | (s) | 5.8 | | | Critical | Critical v/c Ratio | | .7 | 1 |
| Intersection Performance | 9 | | | | | | | | AND DESCRIPTION OF PERSONS ASSESSMENT | | | |
| *************************************** | | 83 | | | WB | 1000 | 100 | 89 | | | SB | |
| Lane group configuration | ٦ | TR | | Γ | Τ | 2 | J | - | 2 | Г | Τ | ~ |
| No. of lanes | | - | | 7 | - | - | - | 2 | - | 1 | 2 | - |
| Flow rate (veh/h) | 16 | 0 | | 625 | = | 380 | 20 | 1421 | 261 | 152 | 988 | Э |
| Capacity (veh/h) | 49 | 52 | | 831 | 450 | 671 | 89 | 1656 | 739 | 272 | 2124 | 739 |
| Adjusted saturation flow (veh/h) | 1770 | 1885 | | 3437 | 1863 | 1583 | 1770 | 3547 | 1583 | 1770 | 3547 | 1583 |
| v/c ratio | .335 | 0 | | .752 | .024 | .567 | .735 | .858 | .353 | .559 | .417 | .004 |
| g/C ratio | .027 | .027 | | .242 | .242 | .424 | .038 | .467 | .467 | .154 | .599 | .467 |
| Average back of queue (veh) | 6: | | | 16.8 | 4. | 15.6 | 3 | 38.1 | 8.9 | 7.7 | 13.4 | -: |
| Uniform delay (s) | 86.9 | 86.1 | | 63.9 | 52.6 | 39.8 | 9.98 | 43.1 | 30.9 | 71.3 | 19.5 | 25.9 |
| Incremental delay (s) | | | | | | | | | | | | |
| Initial queue delay (s) | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delay (s) | 86.9 | 86.1 | | 63.9 | 52.6 | 39.8 | 9.98 | 43.1 | 30.9 | 71.3 | 19.5 | 25.9 |
| S07 | Ez. | ш | | Э | Ω | Ω | <u>.</u> | Ω | ၁ | ш | В | ပ |
| Approach delay (s)/LOS | 86.9 | _ | لتا | 54.8 | - | D | 42.5 | _ | D | 27.1 | _ | ပ |
| | | | | | | | | | | ۵ | | |

| Anency or Company | | | | | | 0 | × | VANMAX | | | | |
|-------------------------------------|-----------------|--------------------------|---|---------|--------------|-------------|----------|-----------------|--------------------|---------------|------|---------|
| TOT | | | 2015 | | NB/SB Street | Street | 19 | QUEEN KAAH | KAAI | | | |
| Comment 2015 TOTAL AM | 2 | | | | | | | | | | | |
| Intersection Data | | | A. C. | | | | | | | | | |
| Area type Other | Analysis period | period | .25 | = | Sign | Signal type | Actuate | Actuated-Field | % | Back of queue | ij | 95 |
| | | 8 | | | WB | | | NB R | | | SB | |
| | 5 | Æ | RI | 5 | ¥ | ¥ | 'n | | RT | 5 | Ξ | RT |
| Volume (veh/h) | 45 | 8 | 0 | 580 | 15 | 430 | 46 | 1307 | 300 | 140 | 835 | 3 |
| RTOR volume (veh/h) | | | 0 | | | 80 | | | 09 | | | 0 |
| Peak-hour factor | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| Heavy vehicles (%) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | CI | 7 | 2 | 2 | 7 |
| Start-up lost time, 1, (s) | 2 | 2 | 7 | 2 | 2 | 7 | 7 | 2 | 2 | 5 | 7 | 7 |
| Extension of effective green, e (s) | 2 | 7 | 2 | 2 | 2 | 2 | 2 | 7 | C1 | 63 | 2 | 7 |
| Arrival type, AT | 3 | т | 8 | 6 | 3 | ш | 3 | 3 | .3 | 3 | 3 | 3 |
| Approach pedestrian volume (p/h) | | 0 | | | 0 | | | 0 | | | ٥ | |
| Approach bicycle volume (bic/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | z | - | z | z | - | z | z | _ | z | z | - | z |
| Signal Phasing Plan | | | | | | | | | | | | |
| E | P: Peds | | | | | | | | | | | |
| | L a | Phase 2 | 품 | Phase 3 | Phase 4 | + | Phase 5 | Phase | 9 9 | Phase 7 | + | Phase 8 |
| EB | ~ | | _ | ~ . | ٩ | - | | 1 | | | + | |
| WB | - | Z Z | - | 2 | × | | | 1 | T | | + | |
| NB | 1 | | - | _ | | + | ¥ | 1 | 1 | | + | |
| SB | | | _ | | 드 | | TR | 1 | - | | 1 | Ì |
| | TATAL DE | 44 | 1 | = | -1 | - | 82 | | | | | |
| Yellow + All red (s) 5.1 | | 5.1 | - | _ 3 | 4 | × | 2.8 | Critical | Critical v/c Ratio | | .72 | |
| Cycle (s) | | בחשו ווווים למו הלחם (ש) | אמו האמום | 2 | | | | | | | | |
| Intersection Performance | | | | | | İ | | | | | 1 | |
| | | 83 | | | WB | | | NB | | | 8 | |
| Lane group configuration | _ | TR | | ٦ | ٢ | ~ | اد | ٢ | ~ | -1 | - | ~ |
| No. of lanes | - | - | | 7 | - | - | - | 71 | - | - | 7 | - |
| Flow rate (veh/h) | 49 | 6 | | 630 | 91 | 380 | 20 | 1421 | 261 | 152 | 806 | 3 |
| Capacity (veh/h) | 85 | 68 | | 809 | 438 | 199 | 104 | 1612 | 720 | 274 | 2010 | 720 |
| Adjusted saturation flow (veh/h) | 1770 | 1848 | | 3437 | 1863 | 1583 | 1770 | 3547 | 1583 | 1770 | 3547 | 1583 |
| v/c ratio | .574 | 860 | | .78 | .037 | .575 | .48 | .88 | .362 | .555 | .451 | .005 |
| o/C ratio | .048 | .048 | | .235 | .235 | 418 | 050. | .455 | .455 | .155 | .567 | .455 |
| Average back of queue (veb) | 2.8 | 'n | | 17.7 | 7. | 16.2 | 2.8 | 40.4 | 9.3 | 7.9 | 15.3 | |
| Heiform delay (s) | 87.1 | 85.1 | | 67 | 55.2 | 41.7 | 85.2 | 46.4 | 33.3 | 73 | 23.6 | 27.9 |
| Incremental delay (s) | | <u></u> | | | | | | | | | | |
| loitial mone delay (c) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dolay (c) | 87.1 | 000 | | 19 | 55.2 | 41.7 | 85.2 | 46.4 | 33.3 | 73 | 23.6 | 27.9 |
| (e) Kendy (1) | í. | + | | (II) | ш | ۵ | <u>.</u> | ۵ | ပ | ш | ပ | O |
| Annmach delay (s)/105 | 86.8 | ~ | i. | 57.4 | | ш | 45.6 | - | ۵ | 30.7 | - | S |
| Intersection delay (s) 105 | - | | 45.2 | | | | _ | | | D | | |
| ווובן סברוותוו תפום לאו בכר | | | | | | | - | and the same of | | | | |

CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET mation

General Information

| Concept Information | | A CHARLES OF THE PARTY OF | - | | | - | | AND THE PERSON NAMED AND THE P | CAMPAGA | | | | |
|--|----------|---------------------------|---------|-------------------------|-----------------|----------|-------------------|--|-----------|--------------------|-----------------|----------|--|
| General Information | | | | | | Site I | Site Information | tion | | | | | |
| Analyst | _ | - | | | | Jurisdi | Jurisdiction/Date | e | | | | 4/13 | 4/13/2008 |
| or Company | | | | | | EB/WE | EB/WB Street | , | KAIMINANI | NAN | | 1 | |
| iod/Year | AMB AM 2 | 3 | 7 DOI | 2020 | | | NB/SB Street | , 0, | QUEEN | QUEEN KAAH | _ | | |
| Commen 2020 Airi | T L L | | | OBEE | ONIA | | | | | | | | NAME OF THE PERSON OF THE PERS |
| Intersection Data | | j | ĺ | | | | | | | La Properties | | | |
| Area type Other | Ana | Analysis period | eriod | .25 | ء | Sign | Signal type | Actuated-Field | ed-Fiel | | % Back of queue | | 95 |
| | | | EB | | | WB | | | NB | | | SB | |
| | _ | - | Ξ | ₽ | בי | Œ | ₩ | 5 | ፷ | 2 | 5 | ¥ | Z |
| Volume (veh/h) | | 18 | 0 | 0 | 577 | 15 | 435 | 20 | 1324 | 305 | 140 | 820 | т |
| RTOR volume (veh/h) | | | | 0 | | | 80 | | | 09 | | | 0 |
| Peak-hour factor | •; | 92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| Heavy vehicles (%) | | 2 | 2 | 7 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 7 | 2 |
| Start-up lost time, I ₁ (s) | `` | 2 | 2 | 2 | 2 | 7 | 7 | 2 | 2 | 2 | 2 | 7 | 2 |
| Extension of effective green, e (s) | - | 2 | 63 | 7 | 2 | 7 | 2 | 2 | 2 | 7 | 2 | 2 | 2 |
| Arrival type, AT | | | 3 | m | 3 | т | ~ | С | 3 | 3 | c | 3 | 3 |
| Approach pedestrian volume (p/h) | e (h/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | ic/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | | z | - | z | z | - | z | z | - | z | z | - | z |
| Signal Phasing Plan | | | | | | | | | | | | | |
| LU TH RR | | 1 1 | | | | | | | | | | | |
| | Phase 1 | _ | Phase 2 | 4 | Phase 3 | Phase | _ | Phase 5 | Phase | se 6 | Phase 7 | + | Phase 8 |
| MID | LIK | 1 | C.T. I | | × 6 | F | - | | | | | | |
| W.S. | | - | 212 | | 4 _ | 4 | + | TR | | 1 | 10000 | 1 | |
| 28 | | | | - | | 1 | H | TR | | | | - | |
| Green (s) | 10 | 1 | 44 | | 7 | 0 | - | 88 | | | | - | |
| Vellow + All red (s) | 5 | L | | | - | 4 | - | × | | | | <u> </u> | |
| Cycle (s) 175 | | 2 | st time | Lost time per cycle (s) | (s) | 10.9 | 6 | 9 | Critical | Critical v/c Ratio | | .704 | |
| Intersection Performance | ance | | | | | | | | | | | | |
| - | | · · | 89 | | | WB | | | 图 | | | SS | |
| Lane group configuration | | T. | TR | | Г | <u>-</u> | ~ | L | Т | R | Ţ | ۳ | ~ |
| No. of lanes | | | - | | 2 | - | - | - | 2 | 7 | 2 | 2 | - |
| Flow rate (veh/h) | 2 | 20 | 0 | | 627 | 16 | 386 | 54 | 1439 | 266 | 152 | 891 | ω. |
| Capacity (veh/h) | = | 101 | 108 | | 864 | 468 | 562 | 71 | 1783 | 1409 | 255 | 1966 | 796 |
| Adjusted saturation flow (veh/h) | | 1770 | 1885 | | 3437 | 1863 | 1583 | 1770 | 3547 | 2803 | 3437 | 3547 | 1583 |
| v/c ratio | : | .193 | 0 | | .726 | .035 | .687 | .768 | 807 | .189 | .596 | .453 | .004 |
| g/C ratio | 0. | .057 | .057 | | .251 | .251 | .355 | 90. | .503 | .503 | .074 | .554 | .503 |
| Average back of queue (veh) | | | | | 15.9 | 9. | 17.5 | 3.2 | 34,3 | 4.2 | 4.1 | 14.4 | -: |
| Uniform delay (s) | | 78.7 | 77.8 | | 09 | 49.5 | 48.2 | 83.2 | 36.4 | 23.9 | 78.5 | 23.2 | 21.7 |
| Incremental delay (s) | | | | | | | | | | | | | |
| Initial queue delay (s) | _ | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delay (s) | 78 | 78.7 | 77.8 | | 09 | 49.5 | 48.2 | 83.2 | 36.4 | 23.9 | 78.5 | 23.2 | 21.7 |
| SOT | | ш | (1) | | Ξ | ۵ | ۵ | ī | ۵ | ၁ | m | ပ | ပ |
| Approach delay (s)/LOS | | 78.7 | _ | III | 55.4 | _ | ш | 35.9 | _ | ۵ | 31.2 | - | ပ |
| Intersection delay (s)/ LOS | - | | | 40.1 | | | - | _ | | | ۵ | | |
| /-\ f | _ | | | | and the same of | - | | | | | | | |

| Analysi Agency or Company Analysis Period/Year TOT AM 2 Comment 2020 TOTAL AM | | | | | Site | Site Information | ition | | | | | |
|---|--|---------------------------------|-----------|---------|---------|--|----------|----------------|--------------------|-----------------|----------|-----------|
| or Company S Period/Year TOT A nt 2020 TOTAL | | | | - A | Jurisd | Jurisdiction/Date | <u>a</u> | | | | 4/13 | 4/13/2008 |
| TOTAL | | | | | EB/W | EB/WB Street | ' | KAIMINANI | NAN | | | |
| Lanco | 2 M W/3 | M 2 2020 AM W/3 DOUBLE TURNS | LE TUI | RNS | NB/SE | NB/SB Street | | QUEEN KAAH | KAA | <u> </u> | | |
| Intersection Data | - Name of the last | | | | | - MANAGEMENT | | | | | | |
| Area type Other | Analysis period | period | .25 | - | | Signal type | Actuat | Actuated-Field | | % Back of queue | | 95 |
| | | 8 | | | WB | The second secon | | NB | | | SS | |
| | 5 | ₽ | EZ. | ב | ₽ | ₽ | 5 | ₽ | 2 | 5 | Ŧ | R |
| Volume (veh/h) | 121 | 23 | 0 | 610 | 35 | 435 | 20 | 1324 | 305 | 142 | 910 | Э |
| RTOR volume (veh/h) | | | 0 | | | 80 | | | 09 | | | 0 |
| Peak-hour factor | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| Heavy vehicles (%) | 2 | 2 | 2 | 7 | 2 | 2 | 2 | 2 | 7 | 2 | 7 | 2 |
| Start-up lost time, 1 ₁ (s) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 7 | 2 | 7 |
| Extension of effective green, e (s) | 6 | 2 | 2 | 7 | 7 | 2 | 2 | 7 | 2 | 7 | 2 | 7 |
| Arrival type, AT | т | 3 | ۳ | ٣ | 3 | 3 | 3 | 3 | ٣ | m | ж | 3 |
| Approach pedestrian volume (p/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | z | 1 | z | z | - | z | z | - | z | z | _ | z |
| Signal Phasing Plan | | | | | | | | | | | | |
| L. LT T. TH R. RT P. | Peds | | 1 | | | | | | | | | |
| Phase 1 | - | Phase 2 | - | Phase 3 | Phase 4 | + | Phase 5 | Phase | ge 6 | Phase 7 | + | Phase 8 |
| WR | <u>ا</u> | I TR | L | ۷ | 2 | 1 | | | | | - AAA | |
| NB | 1 | | | | | - | TR | | - | | - | |
| SB | _ | | | | LT | | i i | | ĺ | | <u> </u> | |
| Green (s) 15 | Í | 44 | | 6 | S | | 88 | | | | _ | |
| Yellow + All red (s) 5.1 | | 5.1 | | | 4 | | 5.8 | | | | | |
| 182 | | Lost time per cycle (s) | oer cycle | (S) | 10.9 | 6 | | Critical | Critical v/c Ratio | | .77 | |
| Intersection Performance | | | | | | | | | | | | |
| | | 83 | | | WB | | | NB | | | SB | |
| Lane group configuration | L | TR | | -1 | Т | × | T | Ή | ~ | L | Ţ | × |
| No. of lanes | - | - | | 2 | - | - | | 7 | 2 | 2 | 2 | |
| Flow rate (veh/h) | 132 | 25 | | 663 | 38 | 386 | 54 | 1439 | 266 | 154 | 686 | т |
| Capacity (veh/h) | 146 | 152 | | 831 | 450 | 558 | 88 | 1715 | 1355 | 283 | 1890 | 992 |
| Adjusted saturation flow (veh/h) | 1770 | 1848 | | 3437 | 1863 | 1583 | 1770 | 3547 | 2803 | 3437 | 3547 | 1583 |
| v/c ratio | .902 | .164 | | .798 | .084 | .692 | .621 | .839 | .197 | .545 | .523 | .004 |
| g/C ratio | .082 | .082 | | .242 | .242 | .352 | .049 | .484 | .484 | .082 | .533 | .484 |
| Average back of queue (veh) | 8.2 | 1.2 | | 18.3 | 1.5 | 18.3 | 3.1 | 37.4 | 4.6 | 4.2 | 18.1 | : |
| Uniform delay (s) | 82.8 | 77.7 | | 64.8 | 53.4 | 50.5 | 84.8 | 40.9 | 26.8 | 80.2 | 27.5 | 24.3 |
| Incremental delay (s) | THE REAL PROPERTY. | | | | | | | | | | | |
| Initial queue delay (s) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delay (s) | 82.8 | 77.7 | | 64.8 | 53.4 | 50.5 | 84.8 | 40.9 | 26.8 | 80.2 | 27.5 | 24.3 |
| 501 | CT. | ш | | ш | Q | D | 드 | Ω | ပ | Ľ. | ၁ | ပ |
| Approach delay (s)/LOS | 82 | _ | ъ | 59.3 | _ | Щ | 40.1 | ` | Ω | 34.6 | _ | ပ |
| Intersection delay (s)/ LOS | | | 45.2 | | | | _ | | | D | | |

| General Information | | | | | Site | Site Information | tion | | | | | |
|--|-----------------|--|--------------------------|--|--------|------------------|----------------|--------------------|--------------------|-----------------|-----------|-----------|
| Analyst WY | | | | The same of the sa | hrisd | hrisdiction/Date | 9 | THE REAL PROPERTY. | Ĺ | | 4/13 | 4/13/2008 |
| or Company | | İ | | | FRAME | FRAME Chaot | ' | KAIMINANI | NAN | | | |
| Application Company Application AMB AM 2 | M 2 | | 2029 | | NR/SR | NR/SR Straot | ., _ | OUEEN KAAH | KAA | - | | |
| '₹ | W/3 D | OUBLE | TUR | S | ac /an | מונפו | 1 | | | | | |
| | 1000 | | | | | | | | | | | |
| Intersection Data | | | | | | | | Ì | | | | |
| Area type Other | Analysis period | period | .25 | - | Sign | Signal type | Actuated-Field | d-Field | | % Back of queue | I | 95 |
| | | 89 | | | WB | | | NB | | | SB | |
| | נו | 丰 | RI | 17 | Ħ | R | 11 | Ħ | RT | יי | Ξ | R |
| Volume (veh/h) | 20 | 0 | 0 | 209 | 15 | 450 | 20 | 1390 | 320 | 150 | 855 | 3 |
| RTOR volume (veh/h) | | | 0 | | | 80 | | | 09 | | | 0 |
| Peak-hour factor | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| Heavy vehicles (%) | 2 | 2 | 2 | 7 | 21 | 2 | 61 | 2 | 2 | 2 | 2 | 7 |
| Start-up lost time, I ₁ (s) | 2 | 2 | 2 | 2 | 2 | 61 | 21 | 2 | 2 | 2 | ~1 | 7 |
| Extension of effective green, e (s) | 2 | 2 | 2 | 2 | 2 | 2 | 7 | 2 | 2 | 2 | C1 | 2 |
| Arrival type, AT | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Approach pedestrian volume (p/h) | _ | 0 | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | z | _ | z | z | - | z | z | - | z | z | - | z |
| Signal Phasing Plan | | | | | | | | | | | | |
| L: LT T: TH R: RT | P: Peds | | ╟ | | | | | | | | | |
| Phr | Phase 1 | Phase 2 | - | Phase 3 | Phase | 4 | Phase 5 | Phase | 9 9 | Phase 7 | + | Phase 8 |
| | Y. | TTR | | | ~ | | - | | İ | | - | |
| WB | T | | | | : | 1 | TR | | | | _ | |
| SB | | | | | LT | | TR | | | | | |
| Green (s) | 5 | 44 | | 12 | ∞ | _ | 95 | | - | | | |
| Yellow + All red (s) 5 | 5.1 | 5.1 | | 1 | 4 | | 5.8 | | | | 1 | |
| Cycle (s) 185 | | Lost time per cycle (s) | per cycle | (s) | 10.9 | 6 | | Critical | Critical v/c Ratio | | .736 | |
| Intersection Performance | • | | | | | | | | | | | |
| | | æ | | | WB | | | NB B | | | SB | |
| Lane group configuration | T | TR | | | Т | ~ | 7 | [| ~ | 7 | Т | 2 |
| No. of lanes | - | - | | 2 | _ | - | - | 2 | 2 | 7 | 7 | - |
| Flow rate (veh/h) | 22 | 0 | | 099 | 91 | 402 | 54 | 1511 | 283 | 163 | 929 | т |
| Capacity (veh/h) | 48 | 51 | | 817 | 443 | 009 | 115 | 1821 | 1439 | 390 | 2051 | 813 |
| Adjusted saturation flow (veh/h) | 1770 | 1885 | | 3437 | 1863 | 1583 | 1770 | 3547 | 2803 | 3437 | 3547 | 1583 |
| v/c ratio | .455 | 0 | | .807 | .037 | .67 | .473 | .83 | .196 | .418 | .453 | .004 |
| g/C ratio | .027 | .027 | - | .238 | .238 | 379 | 990. | .514 | .514 | .114 | .578 | .514 |
| Average back of queue (veh) | 1.2 | | | 18.6 | 7. | 18.7 | 2.9 | 38.7 | 4.7 | 4.3 | 15.2 | : |
| Uniform delay (s) | 88.7 | 9.78 | | 66.5 | 54.2 | 47.8 | 83.5 | 38.1 | 24.3 | 76.3 | 22.3 | 21.9 |
| Incremental delay (s) | | | | | | | | | | | | |
| Initial queue delay (s) | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delay (s) | 88.7 | 87.6 | | 66.5 | 54.2 | 47.8 | 83.5 | 38.1 | 24.3 | 76.3 | 22.3 | 21.9 |
| T0S | ſĽ | ഥ | | ш | Ω | Ω | ۲. | Ω | ၁ | ы | ၁ | Ö |
| Approach delay (s)/LOS | 88.7 | - | П | 59.4 | - | Э | 37.4 | _ | D | 30.3 | _ | ပ |
| Intersection delay (s)/ LOS | | | 41.6 | | | | _ | | | D | | |
| The state of the s | | Contract of the last of the la | The second second second | | - | | | And the same | | | | |

| WANTED THE PARTY OF THE PARTY O | | | | | | | | | | | | |
|--|-----------------|-------------------------|-----------|---------|-------|---------------------------------|---------|----------------|--------------------|-----------------|------|---|
| Analyst | | | | | haird | hiriediotion/Date | 2 | | | | 4/13 | 4/13/2008 |
| or Company | | | | | EB/Wi | Jurisolction/Da EB/WB Street | | KAIMINANI | NANI | | | 57 |
| Analysis Period/Year TOT AM 2 | 12 | | 2029 | | NB/SE | NB/SB Street | , -, | QUEEN KAAH | KAA | н | | |
| Comment 2029 TOTAL A | M W/3 | AM W/3 DOUBLE TURN LANE | LE TU | RN LA | NE | | | | | | | |
| Intersection Data | | | | | | | | | | | | |
| Area type Other | Analysis period | period | .25 | _ | Sig | Signal type | Actuat | Actuated-Field | | % Back of queue | | 95 |
| | | EB | | | WB | | | 99 | | | SB | |
| | ij | Ħ | RI | 17 | ₽ | RI | 5 | Œ | Ħ | Ħ | 픋 | ≥ |
| Volume (veh/h) | 285 | 55 | 0 | 655 | 65 | 450 | 20 | 1390 | 320 | 150 | 1075 | w |
| RTOR volume (veh/h) | | | 0 | | | 80 | | | 09 | | | 0 |
| Peak-hour factor | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| Heavy vehicles (%) | 7 | 2 | 2 | 7 | 7 | 2 | 2 | 2 | 2 | 2 | 2 | 63 |
| Start-up lost time, I ₁ (s) | 2 | 7 | 7 | 2 | 7 | 7 | 2 | 2 | 2 | 2 | 7 | 2 |
| Extension of effective green, e (s) | 2 | 2 | 7 | 7 | 7 | 7 | 2 | 7 | 2 | 7 | 64 | 121 |
| Arrival type, AT | m | 3 | 3 | 3 | 3 | 3 | m | 3 | 3 | 3 | 3 | 3 |
| Approach pedestrian volume (p/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | z | ~ | z | z | _ | z | z | _ | z | z | - | z |
| Signal Phasing Plan | | | | | | | | | | | | |
| _ | P: Peds | | | | | | | | | | | |
| Phase 1 | - | Phase 2 | £ | Phase 3 | Phase | 4 | Phase 5 | Phase | 9 95 | Phase 7 | - | Phase 8 |
| | + | 2 | | 2 | 1 | + | | | Ť | | - | |
| MR MR | | ĭ | | ₹. | ~ | | dur | | | | + | |
| ND CB | - | | ļ. | | E | + | A G | | Ì | | | |
| Green (c) | - | 91 | | 1 0 | 7 | 1 | 7 2 | | | | | *************************************** |
| All and (a) | + | 2 ; | - | , | | + | 5 | 1 | t | | 1 | İ |
| Cycle (s) 170 | ١. | Lost time per cycle (s) | per cycle | (s) | 10.9 | 6 | 2.8 | Critical | Critical v/c Ratio | | .948 | |
| Intersection Performance | | | | | | | | | | | | |
| | | 88 | | | WB | | No. | NB | | | SB | |
| Lane group configuration | ب. | TR | | П | ₽ | ~ | _1 | Ţ | ~ | Г | Н | ~ |
| No. of lanes | - | - | | 2 | - | _ | _ | 2 | 2 | 2 | 7 | - |
| Flow rate (veh/h) | 310 | 09 | | 712 | 71 | 402 | 54 | 1511 | 283 | 163 | 1168 | 3 |
| Capacity (veh/h) | 312 | 109 | | 909 | 110 | 280 | 94 | 1982 | 1566 | 303 | 2170 | 885 |
| Adjusted saturation flow (veh/h) | 1770 | 1848 | | 3437 | 1863 | 1583 | 1770 | 3547 | 2803 | 3437 | 3547 | 1583 |
| v/c ratio | .992 | .55 | | 1.174 | .645 | 1.435 | .58 | .762 | .18 | .538 | .539 | .004 |
| g/C ratio | 176 | .059 | | .176 | 050. | .177 | .053 | .559 | .559 | 880. | .612 | .559 |
| Average back of queue (veh) | 18.9 | 3.1 | | 26.6 | 3.7 | 35.6 | 2.8 | 31.8 | 3.9 | 4.2 | 18 | = |
| Uniform delay (s) | 6.69 | 77.8 | | 70 | 78.3 | 2 | 78.7 | 28.8 | 18.4 | 74.2 | 19.1 | 16.6 |
| Incremental delay (s) | | | | | | | | | | | | |
| Initial queue delay (s) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delay (s) | 6.69 | 77.8 | | 70 | 78.3 | 70 | 78.7 | 28.8 | 18.4 | 74.2 | 19.1 | 16.6 |
| TOS | п | ш | | (II) | ш | E | ш | 0 | В | Э | В | В |
| Approach delay (s)/LOS | 71.2 | _ | E | 70.5 | - | ш | 28.7 | _ | ၁ | 25.8 | _ | C |
| | | | | | | - Anne | | | | | | |

| Analyst W Y | | | | | Jurisdie | Jurisdiction/Date | | | | | 3/26/2008 | 2008 |
|--|-----------------|---|-------------------------|---------|--------------|-------------------|-------------------|-------------------|--------------------|-----------------|-----------|---------|
| or Company | Ç | | | | EB/WB Street | Street | | KAIMINANI | ANI | | | |
| | #1 | | 2006 | | NB/SB Street | Street | J | QUEEN KAAH | KAAI | _ | | |
| Comment 2006 EXISTING 3:30-4:30 PM | 3:30-4:3 | 30 PM | | | | | | | | | | |
| Intersection Data | | | | | | | | | | | | |
| Area type Other | Analysis period | eriod | .25 | - | Sign | Signal type | Actuated-Field | d-Field | | % Back of queue | | 95 |
| | | 83 | | | WB | | | 88 | - | | SB | |
| | 5 | Ξ | R | 15 | Ξ | R | 17 | Ħ | RI | П | Ξ | 2 |
| Volume (veh/h) | | | | 06 | | 55 | | 475 | 280 | 315 | 675 | |
| RTOR volume (veh/h) | | | | | | 15 | | | 09 | | | 0 |
| Peak-hour factor | | | | .92 | | .92 | | .92 | .92 | .92 | .92 | |
| Heavy vehicles (%) | | | | 2 | | 7 | | 2 | 2 | 2 | 2 | |
| Start-up lost time, I ₁ (s) | | | | 2 | | 7 | | 2 | 2 | 7 | 2 | |
| Extension of effective green, e (s) | | *************************************** | | 7 | | ۲3 | | 2 | 7 | 2 | 7 | |
| Arrival type, AT | | | | 3 | | 3 | | 3 | 3 | 3 | m | |
| Approach pedestrian volume (p/h) | | | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | | | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | | _ | | z | ' | z | z | _ | z | z | - | z |
| Signal Phasing Plan | | | | | | | | | | | | |
| L. LT T. TH R. RT F | sg | | | | | | | | | | | |
| Phas | Phase 1 | Phase 2 | Pha | Phase 3 | Phase | 4 | Phase 5 | Phase 6 | 9 9 | Phase / | + | Phase 8 |
| G I | | | _ | | | - | | | | | - | |
| | | | T | TR | | 1 | | <u> </u> | | | - | |
| SB | | 5 | | LT | | | | | | | | |
| Green (s) 20 | 0 | 10 | 4 | 40 | | | | | | | | |
| | | 4 | 5. | 5.8 | | | | | | | - | |
| Cycle (s) 84.9 | , r | ost time p | Lost time per cycle (s) | (s) | 15 | 5.6 | 1 | Critical | Critical v/c Ratio | | .669 | I |
| Intersection Performance | | | | | | | | | | | | |
| | | EB | | | WB | | | B | | | SS | |
| Lane group configuration | | | | ٦ | | ~ | | ۳ | ~ | L | ۳ | |
| No. of lanes | | | | - | | | | | - | - | - | |
| Flow rate (veh/h) | | | | 86 | | 43 | | 516 | 239 | 342 | 734 | |
| Capacity (veh/h) | | | | 417 | | 373 | | 878 | 1227 | 208 | 1185 | |
| Adjusted saturation flow (veh/h) | | | | 1770 | | 1583 | | 1863 | 1583 | 1770 | 1863 | |
| v/c ratio | | | | .235 | | .117 | Annual Management | .588 | .195 | .673 | 619. | |
| g/C ratio | | | | .236 | | .236 | | .471 | .775 | .657 | .636 | |
| Average back of queue (veh) | | | | 2 | | 6. | | 8.6 | 1.7 | 5.5 | 11.6 | |
| Uniform delay (s) | | | | 26.3 | | 25.5 | | 16.4 | 2.5 | 8.9 | 9.3 | |
| Incremental delay (s) | | | | | | | | | | | | |
| Initial queue delay (s) | | | | 0 | | 0 | | 0 | 0 | 0 | 0 | |
| Delay (s) | | - | | 26.3 | | 25.5 | | 16.4 | 2.5 | 8.9 | 9.3 | |
| 507 | | | 110 | ပ | | ပ | - | m | < | < | ∢ | |
| Approach delay (s)/LOS | | - | | 26 | - | ပ | 17 | - | ш | 9.5 | - | 4 |
| | | | | | | | | | | d | | |

Phase 2 Phase 3 Phase 4 Phase 5 Phase 6 Phase 7 Phase 8

P: Peds Phase 1

T: TH R: RT

L: []

Signal Phasing Plan

Leturight parking (Y or N)

z

z

z

z

Z.

0

9/9.

Critical v/c Ratio

15.6

5 40 4 5.8 Lost time per cycle (s)

5.1

6.67

Yellow + All red (s)

Cycle (s)

Green (s)

Intersection Performance

T.T.

L

H H

8 8 8 SS WB

3/26/2008

KAIMINANI QUEEN KAAH

2006

Analysis Period/Year EX PM #2
Comment 2006 EXISTING 4:30-5:30 PM

CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

Site Information Jurisdiction/Date EB/WB Street NB/SB Street

General Information

몺 0

=

NB TH 525

=

RI

h

2

=

Volume (veh/h) RTOR volume (veh/h)

001

8 폰 195

26

92

3 2 2 2 2 3

2 2 2 2

Extension of effective green, e (s) Approach pedestrian volume (p/h) Approach bicycle volume (bic/h)

Arrival type, AT

Start-up lost time, I₁ (s)

Heavy vehicles (%)

E SB 535

95

% Back of queue

Signal type Actuated-Field

.25

Analysis period 田戸

Intersection Data

Area type Other

1 of 1 1142 1863 .613 582 0 8.7 8.7 ٧ 1770 < 8.6 .636 419 2.7 1.5 8.3 1583 .824 1304 1.5 277 < 0 В 10.1 1863 .612 0 14.4 933 .501 m 571 원 10.2 .096 .25 38 23 0 23 0 ပ 23.7 443 1770 .245 .25 2.1 0 23.9 109 ပ 10.6 83 Adjusted saturation flow (veh/h) HICAP 2000 TM ©Catalina Engineering, Inc. Average back of queue (veh) Intersection delay (s)/ LOS Lane group configuration Approach delay (s)/LOS Initial queue delay (s) Incremental delay (s) Uniform delay (s) Flow rate (veh/h) Capacity (veh/h) No. of lanes g/C ratio Delay (s) v/c ratio

| Agency or Company Analysis Period/Year AMB PM Comment 2015 AMBIENT PM Intersection Data Area type Other Analy | | | | | Site | Site Information | tion | | | | | |
|---|--|-------------------------|----------|---------|---------|-------------------|----------------------------|-----------|--------------------|-----------------|----------|---|
| Company 2015 AMBIENT tion Data Other | | | | - | hried | lurisdiction/Date | ٥ | | | | 3/26 | 3/26/2008 |
| eriod/fear AMB PM 2015 AMBIENT tion Data Other | | | | | EB/WE | EB/WB Street | ' | KAIMINANI | NAN | | 1 | |
| Other | Σ | | 2015 | | NB/SB | NB/SB Street | • | OUEEN | QUEEN KAAH | | | |
| Other | | | | | | | | | | | | |
| | Analysis period | period | .25 | - | Sign | al type | Signal type Actuated-Field | ed-Field | 1 | % Back of queue | | 95 |
| | and the same of th | 83 | | | WB | | | R | | | 88 | |
| | 5 | ₽ | RI | בו | 표 | II | 5 | £ | E | = | Æ | R |
| Volume (veh/h) | 44 | 5 | 0 | 335 | S | 105 | 26 | 1205 | 755 | 530 | 1635 | т |
| RTOR volume (veh/h) | | | 0 | | | 80 | | | 09 | | | 0 |
| | 92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| | 2 | 2 | 7 | 2 | 7 | Cŧ | 7 | 2 | 2 | 2 | 2 | 2 |
| - | 2 | 2 | 21 | 2 | 2 | ۲, | 2 | 2 | 2 | 2 | 2 | 7 |
| ective green, e (s) | 21 | C1 | 7 | 2 | CI | C1 | 7 | 7 | 5 | 7 | 7 | 7 |
| 4 | 3 | 3 | m | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Approach pedestrian volume (p/h) | | 0 | | | 0 | | | 0 | 900 | | 0 | |
| Approach bicycle volume (bic/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Lett/right parking (Y or N) | z | _ | z | z | _ | z | z | - | z | z | - | z |
| al Phasing Plan | 1 | A LONG | | | | | | | | | | |
| E. LI I: IN K: KI F: Peds | - | Phace 2 | 4 | Phace 3 | Phace | - | Phase 5 | Phase | Sp 6 | Phase 7 | \vdash | Phace 8 |
| EB LTR | 4 | | | ~ | | H | | | | | + | |
| WB | _ | LTR | | ~ | ~ | | | | | 100 | _ | |
| NB | L | | | | | _ | TR | | | | | |
| SB | | | | ٦ | 7.7 | | TR | | | | _ | |
| Green (s) 10 | | 25 | _ | 7 | 25 | | 75 | | | | | |
| All red (s) | | 5.1 | | | 4 | | 5.8 | | | | H | |
| Cycle (s) 163 | 3 | Lost time per cycle (s) | er cycle | (s) | 5.8 | ~ | - | Critical | Critical v/c Ratio | | 76: | |
| Intersection Performance | | | | | | | | | | | | |
| - | Ì | æ | | | WB | | | 9 | | | SB | *************************************** |
| configuration | | 2 | | اد | <u></u> | ~ | اد | - | ~ | ٦ | F | ~ |
| | - | - | | 2 | - | - | - | 2 | - | - | 2 | - |
| Flow rate (veh/h) | 48 | 2 | | 364 | 5 | 27 | 28 | 1310 | 755 | 576 | 1777 | 3 |
| Capacity (veh/h) | 109 | 13 | | 527 | 286 | 613 | 9/ | 1632 | 729 | 358 | 2263 | 729 |
| Adjusted saturation flow (veh/h) | 1770 | 1848 | | 3437 | 1863 | 1583 | 1770 | 3547 | 1583 | 1770 | 3547 | 1583 |
| v/c ratio | 441 | .048 | | 169. | 610' | .044 | .372 | .803 | 1.037 | 1.608 | .785 | ,004 |
| g/C ratio | 190 | 190. | | .153 | .153 | .387 | .043 | .46 | .46 | .202 | .638 | .46 |
| Average back of queue (veh) | 2.3 | .2 | | 6 | .2 | 8. | 1.4 | 29.8 | 44.8 | 54.7 | 34.3 | |
| Uniform delay (s) | 73.8 | 72 | | 65.3 | 58.6 | 31.1 | 75.9 | 37.7 | 44 | 65 | 21.4 | 23.8 |
| Incremental delay (s) | | | | | | | | | | | | |
| ue delay (s) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delay (s) 7: | 73.8 | 72 | | 65.3 | 9.85 | 31.1 | 75.9 | 37.7 | 44 | 65 | 21.4 | 23.8 |
| | Э | ш | | Ξ | ш | ပ | ш | Ω | ۵ | Э | ၁ | ပ |
| Approach delay (s)/LOS | 73.6 | _ | ш | 62.9 | _ | ш | 40.5 | _ | Ω | 32.1 | - | ပ |
| Intersection delay (s)/ LOS | | | 38.6 | | | | , | | | D | | |

| General Information | | | | | Site Ir | Site Information | tion | | | | | |
|--|----------|-------------------------|-----------|----------|--------------|------------------|----------------|------------|----------------|-----------------|-------|-----------|
| Analyst | | | 44 | | hrisdi | hrisdiction/Date | | men. | | | 3/26/ | 3/26/2008 |
| or Company | | | | | EB/WB | EB/WB Street | ' | KAIMINANI | ANI | | | |
| Analysis Period/Year TOT PM Comment 2015 TOTAL PM | PM PM | | 2015 | | NB/SB Street | Street | 9 | QUEEN KAAH | KAA | | | - |
| Intersection Data | | | | | | | | | | | | |
| | | | ; | | | | | 1 | | . | | , |
| Area type Other | Analysi | Analysis period | .25 | - | Sign | Signal type | Actuated-Field | d-Field | | % Back of queue | | 8 |
| | | 8 | | | WB | | | 9 | | | 8 | 1 |
| | 5 | ₽ | ĭ≅ | 5 | E | 2 | 5 | E | ₽ | - | = | ₹ |
| Volume (veh/h) | 89 | 14 | 0 | 342 | 12 | 105 | 26 | 1205 | 755 | 530 | 1705 | 3 |
| RTOR volume (veh/h) | | | 0 | | | 80 | | | 09 | | | 0 |
| Peak-hour factor | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| Heavy vehicles (%) | 2 | 2 | 2 | 2 | 7 | 2 | 2 | 2 | 2 | 2 | 2 | 7 |
| Start-up lost time, I ₁ (s) | 2 | 2 | 7 | 2 | 7 | ۲, | 2 | 2 | 2 | 2 | 2 | 7 |
| Extension of effective green, e (s) | | 2 | 7 | 2 | 7 | 7 | 2 | 2 | 7 | C1 | 7 | 7 |
| Arrival type, AT | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Approach pedestrian volume (p/h) | 2 | 0 | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Lett/right parking (Y or N) | Z | - | z | z | - | z | z | - | z | z | - | z |
| Signal Phasing Plan | | | | | | | | | | | | |
| L LT T. TH R. RT | P: Peds | | | | | | | | | | | li |
| | Phase 1 | Phase 2 | + | Phase 3 | Phase 4 | + | Phase 5 | Phase 6 | 9 9 | Phase 7 | + | Phase 8 |
| | 2 | | + | ء ح | 6 | | | | t | | _ | |
| AWB MD | t | LIK | | <u>.</u> | 4 | - | T.D | | t | | ļ | |
| G. 65 | | | - | , | - | + | 4 | | t | | | |
| 90 | | | | 7 | 3 8 | | ¥ 1 | | † | | - | |
| | 0 | 25 | | 7 | 25 | + | 75 | | 1 | | - | |
| All red (s) | 5.1 | 5.1 | | 3 | 4 8 8 | _ | 5.8 | - Juniora | Office Indiana | | _0 | |
| Cycle (s) | | Lost time per cycle (s) | per cycle | 6 | | | | Cillia | //C Mail | | | |
| Intersection Performance | çe | | | | | | | | | | | |
| | | 8 | | | WB | | | NB | | | 88 | |
| Lane group configuration | -1 | TR | | 7 | £- | ~ | ٦ | - | ~ | ر | -1 | 2 |
| No. of lanes | - | - | | 2 | - | - | - | 2 | - | - | 7 | - |
| Flow rate (veh/h) | 6 | 15 | | 372 | 13 | 27 | 28 | 1310 | 755 | 576 | 1853 | 6 |
| Capacity (veh/h) | 109 | 113 | | 527 | 286 | 613 | 9/ | 1632 | 729 | 358 | 2263 | 729 |
| Adjusted saturation flow (veh/h) | 1770 | 1848 | | 3437 | 1863 | 1583 | 1770 | 3547 | 1583 | 1770 | 3547 | 1583 |
| v/c ratio | 168. | .134 | | .705 | .046 | .04 | .372 | .803 | 1.037 | 1.608 | 618. | .004 |
| g/C ratio | .061 | 190. | | .153 | .153 | .387 | .043 | .46 | .46 | .202 | .638 | .46 |
| Average back of queue (veh) | 5.5 | 7. | | 9.2 | S. | ∞. | 1.4 | 29.8 | 44.8 | 54.7 | 37.7 | -: |
| Uniform delay (s) | 76 | 72.4 | | 65.5 | 58.8 | 31.1 | 75.9 | 37.7 | 44 | 65 | 22.4 | 23.8 |
| Incremental delay (s) | | | | | | | | | | | | |
| Initial queue delay (s) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delay (s) | 76 | 72.4 | | 65.5 | 58.8 | 31.1 | 75.9 | 37.7 | 44 | 99 | 22.4 | 23.8 |
| TOS | ш | Э | | ធា | ш | ၁ | Œ | D | D | Ξ | C | Ç |
| Approach delay (s)/LOS | 75.5 | - 8 | ы | 63 | _ | យ | 40.5 | _ | Ω | 32.5 | - | O |
| Intersection delay (s)/ LOS | | | 39.2 | | | | _ | | | D | | |
| Hitchesters were July 10- | - | | | | | | | | | | | |

| CHAPT | CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET | PERAT | IONAL | ANA | YSIS | SUM | MARY | WOR | KSHE | ET | | |
|---|---|-----------------|-------------------------|--|---------|-------------------|---------|----------------------------|--------------------|--|------|-----------|
| General Information | | | | | Site I | Site Information | tion | | | | | |
| Analyst WY | | | | | Jurisdi | Jurisdiction/Date | به | 00.00 | | | 3/26 | 3/26/2008 |
| Agency or Company | | | | | EB/WE | EB/WB Street | | KAIMINANI | NAN | | | |
| eriod/Year | 404 | 3 17 10/1 | 2020 | | NB/SB | NB/SB Street | 01 | QUEEN KAAH | KAA | H | | |
| Comment 2020 AMBIENT | | PM W/2LT SB | 8 | | | | | | | | | |
| Intersection Data | | | | | | | | | | | | |
| Area type Other | Analysi | Analysis period | .25 | E | Sigr | al type | Actuat | Signal type Actuated-Field | | % Back of queue | | 95 |
| THE REAL PROPERTY AND ADDRESS OF THE PERSON | | 83 | | | WB | | | NB | | - | SB | |
| | ם | Ħ | RT | Lī | Ħ | R | П | Ŧ | RI | - | ₽ | RT |
| Volume (veh/h) | 54 | 5 | 0 | 340 | 5 | 106 | 27 | 1240 | 765 | 537 | 1656 | m |
| RTOR volume (veh/h) | | | 0 | | | 30 | | | 110 | | | 0 |
| Peak-hour factor | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| Heavy vehicles (%) | 2 | 7 | 2 | 2 | 2 | 2 | 2 | 7 | 2 | 2 | 7 | 7 |
| Start-up lost time, 1, (s) | 2 | 2 | 2 | 2 | 2 | 2 | 7 | 2 | 7 | 2 | 2 | 7 |
| Extension of effective green, e (s) | (s) 2 | 2 | 2 | 2 | 2 | 2 | C1 | 2 | 2 | 2 | 2 | 2 |
| Arrival type, AT | 3 | 3 | 3 | 3 | 3 | ~ | 3 | 3 | 3 | 3 | 3 | 3 |
| Approach pedestrian volume (p/h) | (h/h) | 0 | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | (h) | 0 | | | 0 | | | 0 | | | 0 | AWA |
| Left/right parking (Y or N) | z | ' | z | z | - | z | z | _ | z | z | - | z |
| Signal Phasing Plan | | | | | | | | | | | | |
| L. LT T: TH R: RT | P: Peds | | | COLUMN TO SERVICE SERV | | | | | | | | |
| | Phase 1 | Phase 2 | L | Phase 3 | Phase 4 | _ | Phase 5 | Pha | Phase 6 | Phase 7 | H | Phase 8 |
| EB | LTR | | | ~ | | | | | | THE RESIDENCE OF THE PERSON OF | | |
| WB | | LTR | | ~ | ~ | | | | | | | |
| NB | | | | 7 | | | TR | | | | _ | |
| SB | | | | ı | LT | | TR | | _ | | | |
| Green (s) | 13 | 25 | | 7 | 25 | | 06 | | | | | |
| Yellow + All red (s) | 5.1 | 5.1 | | _ | 4 | | 5.8 | | | | | |
| Cycle (s) 181 | | Lost time | Lost time per cycle (s) | (s) | 5.8 | ~ | | Critical | Critical v/c Ratio | | .713 | |
| Intersection Performance | nce | | | | | | | | | | | |
| | | æ | | | WB | | | MB | , | | SB | |
| Lane group configuration | Т | TR | | 'n | ٦ | × | IJ | Е | ~ | Г | Ţ | ~ |
| No. of lanes | - | - | | CI | - | - | | 2 | 2 | 2 | 7 | |
| Flow rate (veh/h) | 59 | S | | 370 | 5 | 83 | 29 | 1348 | 712 | 584 | 1800 | 3 |
| Capacity (veh/h) | 127 | 133 | | 475 | 257 | 552 | 89 | 1764 | 1394 | 627 | 2332 | 787 |
| Adjusted saturation flow (veh/h) | h) 1770 | 1848 | | 3437 | 1863 | 1583 | 1770 | 3547 | 2803 | 3437 | 3547 | 1583 |
| v/c ratio | .462 | .041 | | 677. | .021 | .15 | .429 | .764 | .511 | .932 | .772 | .004 |
| q/C ratio | .072 | .072 | | .138 | .138 | 349 | .039 | .497 | .497 | .182 | .657 | .497 |

4/13/2008

CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

Site Information Jurisdiction/Date EB/WB Street NB/SB Street

KAIMINANI QUEEN KAAH

2020

Comment 2020 TOTAL PM W/2LT SB

Intersection Data

Area type Other

TOT PM 2

Analysis Period/Year

Agency or Company

⋛

Analyst

General Information

92

92

.92 2 2 2

6 22

.92

25

92 0

92

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2 2 2 2

7

03555

2 2 2 2 2

790

11 537

RT 765

LT 27

TH SI

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RT 0

£ \$

5

RT 120 30

355 .92

164

RTOR volume (veh/h)

Volume (veh/h)

Peak-hour factor

NB TH 1230

몽

95

Signal type Actuated-Field % Back of queue

.25

Analysis period

2 2 2 2 6

Phase 8

Phase 7

Phase 6

Phase 5

Phase 4

Phase 3

Phase 2

Phase 1

P. Peds

R: RT

<u>=</u>

1: 11

Signal Phasing Plan

Left/right parking (Y or N)

TR

LTR

8 8 B

925

5.8 Critical v/c Ratio

2 10 4 5.8 Lost time per cycle (s)

182.6

Yellow + All red (s)

2 2

SB Green (s)

TH 22

LTR 28

z

Z

z

z

z

z

z.

z

Approach pedestrian volume (p/h)

Approach bicycle volume (bic/h)

Extension of effective green, e (s)

Arrival type, AT

Start-up lost time, 1, (s)

Heavy vehicles (%)

1299 1946 2408 22.9 3547 629. 41.3 2.1 U 35.2 D 76.3 16.6 584 .208 7.3 0 .662 712 1787 1854 2803 .384 9.9 7 0 æ 83.9 37.9 1337 3547 .504 36.1 1.8 0 30.4 .049 1770 83.9 29 9.1 0 87 0 1583 67.3 366 169 67.3 267 4.7 86 0 0 (I) ۲., 76.7 7.97 880. 1863 16 163 0 8.16 2 386 433 3437 .126 78.6 20.1 98.7 F .891 42 Ŀ 1848 .055 EB EY .483 83.8 3.2 87 49 101 0 115.4 / 123.2 11.1 194 42.7 178 Intersection Performance Adjusted saturation flow (veh/h) HICAP 2000 TM ©Catalina Engineering, Inc. Average back of queue (veh) Intersection delay (s)/ LOS Lane group configuration Approach delay (s)/LOS Initial queue delay (s) Incremental delay (s) Uniform delay (s) Flow rate (veh/h) Capacity (veh/h) No. of lanes Delay (s) g/C ratio v/c ratio F0S

1583

.82

0

00 c 10

1 of 1

23.3 22.9 0 0

> 39 0 Ω 36.9 87.1

67.4 40.5 0

78.2 0 0 ш 82.2 82.5 F

> Delay (s) LOS

Ω ш

> 42.7 <u>.</u>

> > HICAP 2000 TM ©Catalina Engineering, Inc.

Intersection delay (s)/ LOS Approach delay (s)/LOS

18.2 36.7 72.9 21.6 2 20.8 1.7 0 ပ 40.5 93.7 0 Ľ

30.7 w. 0 31 ပ Ω

36.9

1.6 0

40.5

67.4 0 0 Ш 75.5 83.4 F

10.6 75.3 8.1 0

78.2

3.1 0.1

Average back of queue (veh)

Incremental delay (s) Initial queue delay (s) Uniform delay (s)

ပ Ω

V D

| Mary Street |
|--|
| Company Comp |
| Continue Children |
| Other |
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| Cuther |
| Image Fig. |
| Intercept Inte |
| tuck (weth h) |
| Lange Catholing Catholin |
| Line Sign |
| State Stat |
| Ordinal Li (s) |
| Principle green, e (§) 2 2 2 2 2 2 2 2 2 |
| Publication volume (ph) |
| Potestrian volume (pth) |
| Pinasing Plant Pinase 1 Pinase 2 Pinase 3 Pinase 5 Pinase 5 Pinase 6 Pin |
| T. T.H. R. RI |
| Fig. Rt Preds Pr |
| T. T.H. R. RT P. Peds |
| Phase 1 Phase 2 Phase 3 Phase 5 Phase 6 |
| LTR R R TR TR TR TR TR |
| Image Imag |
| 13 30 5 30 100 199 5.1 5.1 1 4 5.8 100 199 100 100 100 199 100 100 100 190 190 100 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 190 |
| Hi red (s) 5.1 5.1 1 4 5.8 100 cttlom Per cycle (s) 5.8 30 100 cttlom Per cycle (s) 5.8 Critical Ve Ratio Lost lime per cycle (s) 5.8 Critical Ve Ratio Lost lime per cycle (s) 5.8 Critical Ve Ratio Lost lime per cycle (s) 5.8 NB Critical Ve Ratio Lost lime Cycle (s) 5.8 NB Critical Ve Ratio Lost lime Cycle (s) 73 5 386 5 88 35 1395 753 (eVeb/h) 116 121 518 281 566 44 1782 1408 saturation flow (veh/h) 1770 1848 3437 1863 1583 1770 3547 2803 ack of queue (veh) 4.4 3 0.9 11.8 35 0.5 50.5 50.3 50.3 ack of queue (veh) 4.4 3 11.8 3 3.5 2.4 36.6 17.1 lelay (s) 90.7 87.2 80.8 72 43.5 96.5 40.6 33.7 all clelay (s) 90 7 87.2 80.8 72 43.5 156.2 42.9 34.1 Even Cycle Cyc |
| Aut red (s) 5.1 5.1 1 4 5.8 Critical Vic Ratio Ctdon Performance EB WB WB 35 1395 753 1408 Swelph) 170 1848 3437 1863 1583 170 3547 1869 Swelph (s) 90.7 87.2 80.8 72 43.5 96.5 171 Sub delay (s) 90.7 87.2 80.8 72 43.5 96.5 171 Sub delay (s) 90.7 87.2 80.8 72 43.5 96.5 171 Sub delay (s) 90.7 87.2 80.8 72 43.5 96.5 171 Sub delay (s) 90.7 87.2 80.8 72 43.5 96.5 171 Sub delay (s) 90.7 87.2 80.8 72 43.5 96.5 171 Sub delay (s) 90.7 87.2 80.8 72 43.5 96.5 171 Sub delay (s) 90.7 87.2 80.8 72 43.5 96.5 40.6 33.7 Sub delay (s) 90.7 87.2 80.8 72 43.5 96.5 40.6 33.7 Sub delay (s) 90.7 87.2 80.8 72 43.5 96.5 40.6 33.7 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 34.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 34.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 34.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 34.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 34.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 34.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 34.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 34.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 34.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 34.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 34.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 34.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 34.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 34.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 94.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 94.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 94.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 94.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 94.1 Sub delay (s) 90.7 87.2 80.8 72 43.5 156.2 42.9 94.1 Sub delay (s) 90.7 87.2 80.8 72 80.8 80.8 80.8 80.8 80.8 80.8 80.8 80. |
| tion Performance EB WB NB we be configuration L TR L T R L T R we be configuration L TR L T R L T R we be configuration L TR R L T R we be configuration L TR R L T R we configuration L TR R L T R we configuration low (verlyh) low low (verlyh) low low (verlyh) low low (verlyh) low low configuration flow (verlyh) low low low (verlyh) low low low low low low low low low low |
| titon Performance EB WB NB NB |
| Proofiguration L TR L T R L T R |
| tes pronfiguration L TR L T R L T R R L S R R R R R R R R R R R R R R R R |
| test 1 1 2 1 1 2 3 4 4 3 4 4 3 4 4 3 4 4 3 4 3 3 3 2 2 4 3 4 4 3 4 4 3 4 4 3 4 4 3 4 4 3 4 4 3 4 4 3 4 4 3 4 4 |
| (verlyft) 73 5 386 5 88 35 1395 753 (verlyft) 11 121 518 281 566 44 1782 1408 seaturation flow (verlyft) 1770 1848 3437 1863 1583 1770 3547 2803 ack of queue (verly) 63 045 745 019 156 782 782 535 ack of queue (verly) 4.4 .3 11.8 .3 2.4 36.5 17.1 leiby (s) 90.7 87.2 80.8 72 43.5 96.5 40.6 37.1 leiby (s) 0 0 0 0 59.7 2.3 4.4 ue delay (s) 0 0 0 0 0 0 0 0 r 0 0 0 0 0 0 0 0 0 0 0 r 101.2 87.2 78.4 |
| (veh/h) 116 121 518 281 566 44 1782 1408 sasturation flow (veh/h) 1770 1848 3437 1863 1583 1770 3547 2803 ack of queue (veh/h) 63 045 745 019 156 782 535 ack of queue (veh/h) 44 3 118 3 3.5 2.4 36.6 17.1 leiby (s) 90.7 87.2 80.8 72 43.5 96.5 40.6 37.1 ue delay (s) 10.5 0 5.8 0 0 9.0 0 <t< td=""></t<> |
| sequenciation flow (verbit) 1770 1848 3437 1863 1583 1770 3547 2803 acts of queue (verb) 4.4 3 118 3.5 178 2.3 503 acts of queue (verb) 4.4 3 118 3 3.5 2.4 36.6 17.1 letally (s) 90.7 87.2 80.8 72 43.5 96.5 40.6 37.1 letally (s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0. |
| (63) (045) (745) (156) (156) (782) (382) |
| ack of queue (veh) 4.4 3 11.8 3.5 2.4 36.6 17.1 lelay (s) 90.7 87.2 80.8 72 43.5 96.5 17.1 lelay (s) 90.7 87.2 80.8 72 43.5 96.5 40.6 33.7 lelay (s) 90.7 87.2 80.8 72 43.5 96.5 40.6 33.7 lelay (s) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 |
| act of queue (veh) 4.4 3 11.8 3 3.5 2.4 36.6 17.1 lelay (s) 90.7 87.2 80.8 72 43.5 96.5 40.6 33.7 all cleialy (s) 10.5 0 5.8 0 0 59.7 2.3 .4 use cleialy (s) 0 </td |
| lelay (s) 90.7 87.2 80.8 72 43.5 96.5 40.6 33.7 all delay (s) 10.5 0 5.8 0 0 5.9 2.3 4 use delay (s) 0 0 0 0 0 0 0 0 In 10.2 87.2 86.6 72 43.5 156.2 42.9 34.1 Answering 10.7 F R F D C |
| Lau delay (s) 10.5 0 5.8 0 0 59.7 2.3 .4 August delay (s) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 |
| Lie delay (s) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 |
| 101.2 87.2 86.6 72 43.5 156.2 42.9 34.1 |
| Oct Address (All OC) F F E D F D C D |
| 1002 , F 786 , F 416 , |
| 100:2 F 70:0 E 41:0 |
| Intersection delay (s)/ LOS |
| 48.2 |

| | | | | | 250 | SILE IIIIOIIII AUGI | 5 | | | | | |
|--|---|-----------|---------------|---------|--------------|---------------------|---------|-------------------|--------------------|-----------------|-------|-----------|
| Analyst WY | | | | - | Jurisdi | Jurisdiction/Date | | | | | 4/13/ | 4/13/2008 |
| or Company | | | | | EB/WB | EB/WB Street | | KAIMINANI | ANI | | 1 | |
| Analysis Period/Year TOT PM 2 | 12 | | 2029 | | NB/SB Street | Street | | QUEEN KAAH | KAAF | | | |
| TOTAL | PM W/2LT | TSB | | | | | | | | | | |
| Intersection Data | | | | | | | | - | | | | |
| | | | 30 | | | | | 77.22 | | | | 30 |
| Area type Other | Analysis period | period | 5. | = | Sign | Signal type | Actuate | Actuated-Fleid | | % Back of queue | | |
| | 1 | æ ; | 1 | 1 | 88 | 1 | | 9 ; | 1 | : | æ ; | 1 |
| | 5 | Ŧ | 2 | 5 | Ξ | 2 | 5 | = | RI | 3 | Ξ | 2 |
| Volume (veh/h) | 275 | 80 | 0 | 375 | 20 | Ξ | 32 | 1270 | 803 | 564 | 2005 | ~ |
| RTOR volume (veh/h) | | | 0 | | | 30 | | | 110 | | | 0 |
| Peak-hour factor | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| Heavy vehicles (%) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 7 | 2 | 7 |
| Start-up lost time, I ₁ (s) | 2 | 2 | 2 | 2 | 2 | 7 | 7 | 7 | 2 | 7 | 2 | 7 |
| Extension of effective green, e (s) | 7 | 2 | 5 | 2 | 2 | 2 | 7 | 7 | 2 | 7 | 2 | 7 |
| Arrival type, AT | 3 | 3 | т | 3 | 3 | 3 | 3 | 3 | 3 | 3 | Э | 3 |
| Approach pedestrian volume (p/h) | L | 0 | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | | 0 | | | 0 | ł | | 0 | | | 0 | |
| Left/right parking (Y or N) | z | - | z | z | - | z | z | _ | z | z | - | z |
| Signal Phasing Plan | | | | | | | | | | | | |
| L. LT T: TH R: RI | P: Peds | | | | | - | | 1 | | i | - | |
| | Phase 1 | Phase 2 | Ē, | Phase 3 | ප[| - | rnase 5 | Phase b | 0 | ruase / | + | ruase 8 |
| 200 | | LIK | | ¥ £ | ~ 6 | - | | | | | | 400 |
| MB C | 10 | | 1 | Y. | ¥ - | + | | g.r. | 1 | | - | |
| The state of the s | | , | 1 | Ť | ١. | 1 | 465 | 1 8 | | | | |
| | ~ | ~ | | | 7 | - | LIK | Y. | ~ | | 1 | |
| | 30 | 02 | | 5 | 0 | + | 28 | 92 | 7 | | | |
| All red (s) | | - | ۵, | 5.8 | - | | 4 | 5.8 | | | 700 | |
| Cycle (s) 192.6 | | Lost time | per cycle (s) | (3) | 10.8 | × | | Critical | Critical v/c Ratio | | 1.000 | |
| Intersection Performance | | 5 | | | 9 | | - Aug | g | | | 9 | 0.00 |
| | | 9 | | , | MB | | | Q. | | | 2 | 1 |
| Lane group configuration | J | × | | 7 | _ | ¥ | _ | - | ۷ | 7 | - | ~ |
| No. of lanes | - | - | | 2 | - | - | - | 7 | 7 | 2 | 2 | - |
| Flow rate (veh/h) | 299 | 87 | | 408 | 22 | 88 | 35 | 1380 | 753 | 613 | 2179 | 3 |
| Capacity (veh/h) | 377 | 154 | | 535 | 48 | 163 | 83 | 1694 | 1860 | 879 | 2283 | 1404 |
| Adjusted saturation flow (veh/h) | 1770 | 1848 | | 3437 | 1863 | 1583 | 1770 | 3547 | 2803 | 3437 | 3547 | 1583 |
| v/c ratio | .793 | 995. | | .761 | .45 | .541 | .421 | .815 | .405 | 904 | .954 | .002 |
| g/C ratio | .213 | .083 | | .156 | .026 | .103 | .047 | .478 | .664 | 761. | .644 | 887 |
| Average back of queue (veh) | 17.1 | 4.9 | | 12.1 | 1.3 | 4.9 | 7 | 36.9 | 11.2 | 9.61 | 8.99 | 0 |
| Uniform detay (s) | 71.8 | 85 | | 77.9 | 92.4 | 82.1 | 89.3 | 43 | 14.9 | 75.5 | 31.7 | 1.2 |
| Incremental delay (s) | ======================================= | 4.8 | | 6.4 | 4.2 | 3.6 | 1.5 | 3.2 | 0 | 15.6 | 10.2 | 0 |
| Initial queue delay (s) | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delay (s) | 82.9 | 8.68 | | 84.3 | 9.96 | 85.7 | 8.06 | 46.2 | 14.9 | 91.1 | 41.9 | 1.2 |
| 108 | (Z. | EL. | | ī | ц | Œ, | ഥ | Ω | ш | îΤι | Ω | Ą |
| Approach delay (s)/LOS | 84.4 | - | <u></u> | 85 | ~ | ш | 36.1 | - | D | 52.6 | _ | D |
| Intersection delay (s)/ LOS | | | 515 | | | | _ | | | Q | | |
| Company of the compan | | | | | | | | | | 1 | | |

| | | | | | Site | Site Information | tion | | | | | |
|--|----------------------|---|---|---------|----------------|-------------------|----------------|---|--------------------|-----------------|--------------------|-----------|
| Analyst WY | | | *************************************** | | Jurisdi | Jurisdiction/Date | 9 | | | | 4/13 | 4/13/2008 |
| or Company | M&E PACIFIC | | | | EB/WE | EB/WB Street | | (OHA) | KOHANA IKI | | | |
| Analysis Period/Year AMI Comment 2015 AMBI | AMB AM AMBIENT AM | | 2015 | | NB/SB | NB/SB Street | | QUEEN | QUEEN KAAH | = | | |
| Intersection Data | | G C C C C C C C C C C C C C C C C C C C | | | | | | | | | | 1 |
| Area type Other | Analy | Analysis period | .25 | - | | Signal type | Actuated-Field | d-Field | 1 | % Back of queue | i | 95 |
| | 2 2000 | 82 | | | WB | | | æ | | | SB | |
| | 5 | _ | 2 | 5 | H | RI | 5 | ∓ | RI | = | ≢ | ₽ |
| Volume (veh/h) | 122 | - | 147 | 193 | 5 | 129 | 84 | 1400 | 190 | 126 | 1150 | 20 |
| RTOR volume (veh/h) | | - | 30 | | | 30 | | | 30 | | | 10 |
| Peak-hour factor | .92 | - | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| Heavy vehicles (%) | 2 | 7 | 2 | 5 | S | 5 | 2 | 7 | 2 | 2 | 2 | 7 |
| Start-up lost time, 1 ₁ (s) | 2 | 2 | 7 | 7 | 2 | 2 | СI | 7 | CI | 2 | 7 | 7 |
| Extension of effective green, e | (s) 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | C1 | 2 | 7 |
| Arrival type, AT | m | 3 | 3 | n | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Approach pedestrian volume (p/h) | (u/d) | 0 | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | æ | 0 | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | z | - | z | z | - | z | z | - | z | z | _ | z |
| Signal Phasing Plan | | | | | | | | | | | | |
| LU TH RE | P: Peds | | | | | | | | | | | |
| au au | Phase 1 | Phase 2 | + | Phase 3 | Phase | 4 | Phase 5 | Pha | Phase 6 | Phase 7 | + | Phase 8 |
| a was | | | | 1 70 | - Constitution | | - Indiana | ļ | T | | - | |
| NB NB | | TR | 1 | 4 | | | | | + | | | |
| SB | - | TP | | | | - | | *************************************** | | | <u> </u> | |
| Green (s) | 2 2 | 80 | | 30 | 200 | | | L | - | - | THE REAL PROPERTY. | |
| Yellow + All red (s) | ~ | 8 | | v | | H | | | | | | |
| Cycle (s) 140 | | Lost time | Lost time per cycle (s) | (s) | 10 | | | Critical | Critical v/c Ratio | | 1. | |
| Intersection Performance | nce | | | | | | | | | | | |
| | | 83 | | | WB | | | MB | | | SS | |
| Lane group configuration | L | Η | В | Г | Т | × | Т | Ή | ~ | П | Ţ | × |
| No. of lanes | - | - | - | - | - | - | - | 2 | | - | 2 | - |
| Flow rate (veh/h) | 133 | | 127 | 210 | 5 | 108 | 16 | 1522 | 174 | 137 | 1250 | 43 |
| Capacity (veh/h) | 301 | 399 | 339 | 294 | 388 | 330 | 190 | 2027 | 905 | 190 | 2027 | 905 |
| Adjusted saturation flow (veh/h) | h) 1405 | 5 1863 | 1583 | 1370 | 1810 | 1538 | 1770 | 3547 | 1583 | 1770 | 3547 | 1583 |
| v/c ratio | .441 | .003 | .375 | .715 | .014 | .326 | .482 | .751 | .192 | .722 | .617 | .048 |
| g/C ratio | .214 | 1.214 | 214 | 214 | 214 | .214 | 107 | .571 | .571 | .107 | .571 | .571 |
| Average back of queue (veh) | 4.8 | О | 4.5 | 8.6 | 2 | 3.8 | 3.6 | 25.9 | 3.5 | 5.9 | 18.4 | ∞. |
| Uniform delay (s) | 47.7 | 43.2 | 47 | 51 | 43.3 | 46.5 | 58.8 | 22.5 | 14.4 | 60.5 | 19.9 | 13.2 |
| Incremental delay (s) | 9. | ļ | - | ∞ | 0 | 0 | 1.7 | 1.6 | 0 | 12.7 | 9. | 0 |
| Initial queue delay (s) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delav (s) | 48.3 | 43.2 | 47.1 | 59 | 43.3 | 46.5 | 60.5 | 24.1 | 14.4 | 73.2 | 20.5 | 13.2 |
| 108 | D | ۵ | ۵ | Э | ۵ | D | ш | C | В | Э | C | В |
| Approach delay (s)/LOS | 47.7 | 1 1 | ۵ | 54.6 | - | Q | 25 | _ | ပ | 25.3 | _ | 0 |
| Intersection delay (s)/ LOS | | | 29.2 | | | | | | - | ၁ | | |
| NIT WATER COLUMN TO THE COLUMN | | | | - | | - Annual | - | - PARTITION - | - | | | |

| Agency or Company M&E PACIFIC Analysis Period/Year TOT AM 2 Comment 2015 TOTAL AM W/2LT NB Intersection Data Analysis period Area type Other 4 Area type Other 4 RTOR volume (veh/h) 122 4 Peak-hour factor 92 92 Brand-hour factor 92 2 Brand-hour factor 2 2 Arrival type, AI 3 3 Adproach pedestrian volume (p/h) 0 0 Approach bicycle volume (p/h) N I | | 2015 | | EB/WB Street NB/SB Street | EB/WB Street | | KOHANA IKI | NA IKI | | | |
|--|---|------------|------|------------------------------|--|---------|----------------|--|-----------------|------|---------|
| nalysis Period/Year TOT AM 2 omment 2015 TOTAL AM W/2LT teresection Data rea type Other Analysis pe UT Other (veh/h) 122 TOR volume (veh/h) 22 easy vehicles (%) 2 and-up lost time, 1, (%) 2 dension of effective green, e (\$) 2 dension of effective green, e (\$) 3 pproach pedestrian volume (ph/h) 3 pproach pedestrian volume (ph/h) N pproach bicycle volume (ph/h) N | | 2015 | | NB/SB | Ctroot | Ü | THEF | | | | |
| terrecction real COLY ANA W/2LT terrecction Data rea type Other Analysis pe LI Olume (veb/h) 122 TOR volume (veb/h) 22 and-hour factor | | | | ND/SD | | | | KAA | 3 | | |
| | EB EB C C C C C C C C C C C C C C C C C | | | | 3 | | 7 | | | | |
| | EB EB | | | | | | | | | | |
| | EB 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 | .25 | - | Sign | Signal type | Actuate | Actuated-Field | - | % Back of queue | | 95 |
| | 日 日 日 日 日 日 日 日 日 日 日 日 日 日 日 日 日 日 日 | | | WB | | | 2 | | | æ | |
| | 2 | ET. | 5 | 픋 | RI | 17 | ₽ | RI | 5 | 王 | R |
| | 2 2 2 2 2 2 2 2 2 7 2 9 9 9 9 9 9 9 9 9 | 150 | 193 | 2 | 129 | 122 | 1400 | 190 | 129 | 1214 | 20 |
| | 2 2 2 2 2 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 30 | | | 30 | | | 30 | | | 10 |
| | 7 0 0 3 5 5 5 7 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| | 7 0 0 3 5 5 | 2 | 'n | 5 | 5 | 7 | 7 | 2 | 2 | 2 | 2 |
| | 0 0 3 5 | 2 | 2 | 7 | ۲۱ | 2 | 2 | ۲3 | 2 | 2 | 7 |
| | 0 0 0 | 7 | 7 | 2 | 2 | 2 | 7 | 2 | 2 | 2 | 2 |
| 6 | 0 0 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | 0 | | | 0 | | | 0 | | | 0 | |
| | - | | | 0 | | | 0 | and the same of th | | 0 | |
| | | z | z | _ | z | z | - | z | z | 1 | z |
| Signal Phasing Plan | | | | | | | | | | | |
| L: LT T: TH R: RT P: Peds | | | | | | | | | | | |
| Phase 1 | Phase 2 | Phase 3 | 63 | Phase 4 | + | Phase 5 | Pha | Phase 6 | Phase 7 | + | Phase 8 |
| EB | | EII. | 2 6 | | + | | | t | | | |
| AND AND AND AND AND AND AND AND AND AND | | LIK | 4 | | | | | 1 | | + | |
| | TR | | | | + | | | | A COURSE SPECIA | - | |
| J | TR | | | | + | | | | | 1 | |
| 15 | 80 | 30 | | | + | | | | | 1 | |
| All red (s) 5 | 2 | 5 | 1 | 1 | - | | | | | - | |
| Cycle (s) 140 Los | Lost time per cycle (s) | r cycle (s | | 0 | ************************************** | AMAN, | Critical | Critical v/c Ratio | | 713 | |
| Intersection Performance | | | | | Į | | | | | | |
| | EB | | | WB | | | 88 | | | SB | |
| Lane group configuration | Т | 2 | J | Ţ | × | 7 | <u>-</u> | ~ | ٦ | Ţ | ~ |
| No. of lanes | _ | | | - | - | 2 | 2 | - | - | 2 | - |
| Flow rate (veh/h) 133 | 4 | 130 | 210 | S | 108 | 133 | 1522 | 174 | 140 | 1320 | 43 |
| Capacity (veh/h) 301 | 399 | 339 | 293 | 388 | 330 | 368 | 2027 | 905 | 190 | 2027 | 905 |
| Adjusted saturation flow (veh/h) 1405 | 1863 | 1583 | 1366 | 1810 | 1538 | 3437 | 3547 | 1583 | 1770 | 3547 | 1583 |
| . 441 | 110. | .384 | 717. | .014 | .326 | .36 | .751 | .192 | .74 | 159. | .048 |
| g/C ratio .214 | .214 | 214 | 214 | .214 | .214 | .107 | .571 | .571 | .107 | .571 | .571 |
| Average back of queue (veh) 4.8 | -: | 4.6 | 9.8 | 7. | 3.8 | 2.7 | 25.9 | 3.5 | 6.1 | 20.1 | ∞. |
| 47.7 | 43.3 | 47.1 | 51.1 | 43.3 | 46.5 | 58 | 22.5 | 14.4 | 9.09 | 20.5 | 13.2 |
| (s) | 0 | 1 | 8.2 | 0 | 0 | 0 | 9.1 | 0 | 14.3 | ∞. | 0 |
| Initial queue delay (s) 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 48.3 | 43.3 | 47.2 | 59.3 | 43.3 | 46.5 | 58 | 24.1 | 14.4 | 74.9 | 21.3 | 13.2 |
| TOS D | D | Q | ы | Ω | Ω | ш | ပ | В | ш | ၁ | В |
| Approach delay (s)/LOS 47.7 | _ | Ω | 54.7 | _ | D | 25.7 | _ | ၁ | 26 | _ | ပ |
| Intersection delay (s)/ LOS | | 29.7 | | | | , | | | ပ | | |

CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

Site Information

General Information

| y y y A | WY M&E PACIFIC AMB AM MBIENT AM | | | | | Site Ir | Site Information | 4 | | | | | |
|---|--|-----------------|-----------|-------------------------|---------------|---------|-------------------|---------|----------------------------|--------------------|-----------------|------|-----------|
| Analyst WY Agency or Company M&B Analysis Period/Year AMI Comment 2020 AMIBI Intersection Data Area type Other Volume (veh/h) RTOR volume (veh/h) RTOR volume (veh/h) | B AM ENT AM | | | | | | | 5 | | | | | |
| Agency or Company M&1 Analysis Period/Year AMI Comment 2020 AMBI Intersection Data Area type Other Volume (veh/h) RTOR volume (veh/h) Peak-hour factor | E PACIF B AM ENT AM | | | | To the second | Jurisdi | Jurisdiction/Date | | | | | 4/13 | 4/13/2008 |
| Aralysis Period/Year AMI Comment 2020 AMBI Intersection Data Area type Other Area type Other Wolume (vert/h) RTOR volume (vert/h) Peak-hour factor Teach factor | B AM ENT AM | 2 | | | | EB/WB | EB/WB Street | 1 | KOHANA IKI | AA IKI | | | |
| Comment 2020 AMBII Intersection Data Area type Other Volume (veh/h) RTOR volume (veh/h) Peak-hour factor Teach factor | ENT AM | | | 2020 | | NB/SB | NB/SB Street | • | QUEEN KAAH | KAA | - | | |
| Area type Other Volume (veh/h) RTOR volume (veh/h) Pasi-hour factor | 0000 | | | | | | | | | | | | |
| Area type Other Volume (vet/h) RTOR volume (vet/h) Peak-hour factor | | | | | | | | | | | | | |
| Volume (vet/h) RTOR volume (vet/h) Peak-hour in factor | Anal | Analysis period | riod | .25 | - | Sign | al type | Actuate | Signal type Actuated-Field | | % Back of queue | 1 | 95 |
| Volume (veh/h) RTOR volume (veh/h) Peak-hour factor | | | EB | | | WB | | | NB | | | SB | |
| Volume (veh/h) RTOR volume (veh/h) Peak-hour factor | ב | _ | 丰 | RI | 5 | ¥ | RI | בו | Ξ | RT | ב | Ħ | R |
| RTOR volume (veh/h) Peak-hour factor | | 122 | | 147 | 173 | 5 | 129 | 84 | 1475 | 170 | 126 | 1261 | 50 |
| Peak-hour factor | | <u></u> | | 30 | | | 30 | | | 30 | | | 10 |
| (/0/ soliston /0/) | 6. | 92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| Heavy vehicles (%) | | 7 | 2 | ۲, | 5 | 5 | 5 | 7 | 2 | 2 | 2 | 2 | 2 |
| Start-up lost time, 1, (s) | | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 7 | 2 | 2 | 2 | 2 |
| Extension of effective green, e (s) | e (s) 2 | - | 2 | 2 | 2 | 2 | 2 | 7 | 2 | C1 | 2 | 2 | 7 |
| Arrival type, AT | 3 | _ | 3 | ~ | 3 | ~ | 3 | 3 | 3 | 3 | 3 | | 3 |
| Approach pedestrian volume (p/h) | (h/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | c/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | | z | - | z | z | _ | z | z | - | z | z | - | z |
| Signal Phasing Plan | | | | | | | | | | | | | |
| L. LT T. TH R: RT | P: Peds | ş | | | | 5 | | | | | | | |
| | Phase 1 | <u>a</u> | Phase 2 | Pha | Phase 3 | Phase 4 | _ | Phase 5 | Phase 6 | 9e 6 | Phase 7 | | Phase 8 |
| £8 | | | | 77 | LTR | | | | | | | | |
| WB | | | | Ľ | LTR | | | | | | | | |
| NB | Г | | TR | | | | | | | | | | |
| SB | L | | TR | | | | | | | | | | |
| Green (s) | 15 | | 08 | | 30 | | | | | | | | |
| Yellow + All red (s) | 5 | | S | | 5 | | | | | | | | |
| Cycle (s) 140 | | Los | st time p | Lost time per cycle (s) | (s) | 0 | | | Critical | Critical v/c Ratio | | .718 | |
| Intersection Performance | ince | | | | | | | | | | | | |
| | | | E | | | M/R | | | NB. | | | 5 | |

| | | 89 | | | WB | | | NB | | | æ | |
|----------------------------------|------|------|------|------|------|------|------|------|------|------|------|--------|
| Lane group configuration | L | ш | × | IJ | ۳ | R | Γ | Ţ | ~ | J | H | 2 |
| No. of lanes | - | | _ | - | - | - | _ | 2 | _ | - | 2 | - |
| Flow rate (veh/h) | 133 | _ | 127 | 188 | 5 | 108 | 91 | 1603 | 152 | 137 | 1371 | 43 |
| Capacity (veh/h) | 301 | 399 | 339 | 294 | 388 | 330 | 190 | 2027 | 905 | 190 | 2027 | 905 |
| Adjusted saturation flow (veh/h) | 1405 | 1863 | 1583 | 1370 | 1810 | 1538 | 1770 | 3547 | 1583 | 1770 | 3547 | 1583 |
| v/c ratio | .441 | .003 | 375 | .64 | .014 | .326 | .482 | .791 | .168 | .722 | 9299 | .048 |
| g/C ratio | .214 | .214 | .214 | .214 | .214 | .214 | .107 | .571 | .571 | .107 | .571 | .571 |
| Average back of queue (veh) | 4.8 | 0 | 4.5 | 7.4 | 5. | 3.8 | 3.6 | 28.8 | 3 | 5.9 | 21.4 | 8. |
| Uniform delay (s) | 47.7 | 43.2 | 47 | 50.1 | 43.3 | 46.5 | 58.8 | 23.5 | 14.2 | 60.5 | 21 | 13.2 |
| Incremental delay (s) | 9: | 0 | : | 4.7 | 0 | 0 | 1.7 | 2.2 | 0 | 12.7 | 6' | 0 |
| Initial queue delay (s) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delay (s) | 48.3 | 43.2 | 47.1 | 54.8 | 43.3 | 46.5 | 60.5 | 25.7 | 14.2 | 73.2 | 21.9 | 13.2 |
| 507 | D | D | D | D | Ω | Ω | ш | ပ | В | ш | ပ | В |
| Approach delay (s)/LOS | 47.7 | - | D | 51.6 | _ | D | 26.4 | _ | ပ | 26.1 | - | C |
| intersection delay (s)/ LOS | | | 29.6 | | | | _ | | | ပ | | |
| HICAP 2000 TM | | | | | | | | | | | | 1 of 1 |

HICAP 2000 TM ©Catalina Engineering, Inc.

| Agency or Company M&E PACIFIC | | | | | Site | Site Information | tion | | | | | |
|--|-----------------|-------------|---------------|---------|----------|-------------------|---------|--|--------------------|--|------|-----------|
| or Company | | | | | linicali | Iniscliction/Date | g | | | | 4/13 | 4/13/2008 |
| | CIFIC | | | | EB/WB | EB/WB Street | | KOHANA IKI | VA IKI | | | |
| Ranaysis Period/Year 10.1 AW CLT NB Comment 2020 TOTAL AMW/2 LT NB | MW/2 L | TNBL | 2020 LANES | | NB/SB | NB/SB Street | | QUEEN KAAH | KAA | - | | |
| Intersection Data | | - | | | | | | | - | 000000000000000000000000000000000000000 | | |
| Area type Other | Analysis period | period | .25 | _ | Sign | Signal type | Actuate | Actuated-Field | | % Back of queue | ļ | 95 |
| The state of the s | | 83 | | | WB | | | RB | | | SB | |
| | 17 | ⊭ | RI | 1 | Ħ | RT | п | ĭ | RĬ | ב | Ħ | R |
| Volume (veh/h) | 122 | - | 167 | 173 | 16 | 129 | 230 | 1475 | 170 | 136 | 1376 | 50 |
| RTOR volume (veh/h) | | | 30 | | | 30 | | | 30 | | | 10 |
| Peak-hour factor | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| Heavy vehicles (%) | 2 | 2 | 2 | 5 | S | 5 | 2 | 2 | 2 | 2 | 2 | 2 |
| Start-up lost time, 1, (s) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | CI |
| Extension of effective green, e (s) | 2 | 7 | 2 | 2 | 2 | 7 | 2 | 2 | 7 | 2 | 2 | 7 |
| Arrival type, AT | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Approach pedestrian volume (p/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | z | - | z | z | _ | z | z | - | z | z | _ | z |
| Signal Phasing Plan | | | | | | | | | | | | |
| L. LT T. TH R: RT | P: Peds | | | | | | | | | | | |
| THE PERSON NAMED IN COLUMN NAM | Phase 1 | Phase 2 | 문 | Phase 3 | Phase | - | Phase 5 | Phase | 9 90 | Phase 7 | + | Phase 8 |
| EK IND | | 777 | - | LIK | | | | | | | + | |
| I BN | | TD | 1 | 4 | | + | | ļ | T | | + | |
| The state of the s | + | ar. | _ | Ì | | + | | | ļ | | | |
| (5) 00 | 1 5 | ¥ 5 | | 9 | | + | | - Annual Control of the Control of t | t | | + | - |
| Mil and fel | | 00 | | 2 | | + | | | Ī | The second secon | ŀ | |
| Cycle (s) 151 | | Lost time p | per cycle (s) | (3) | 10 | | | Critical | Critical v/c Ratio | | .721 | |
| Intersection Performance | | | | | | | | | | | | |
| The state of the s | | 8 | | | WB | | | æ | | | SB | |
| Lane group configuration | ٦ | Ħ | ~ | | ⊢ | 2 | _1 | ⊣ | ~ | ٦ | ⊢ | ĸ |
| No. of lanes | - | - | - | - | - | - | 2 | 2 | - | 1 | 7 | - |
| Flow rate (veh/h) | 133 | - | 149 | 188 | 17 | 108 | 250 | 1603 | 152 | 148 | 1496 | 43 |
| Capacity (veh/h) | 368 | 493 | 419 | 363 | 479 | 407 | 455 | 1879 | 839 | 234 | 1879 | 839 |
| Adjusted saturation flow (veh/h) | 1390 | 1863 | 1583 | 1370 | 1810 | 1538 | 3437 | 3547 | 1583 | 1770 | 3547 | 1583 |
| v/c ratio | .36 | .002 | .355 | .518 | .036 | .264 | .549 | .853 | 181 | .631 | .796 | .052 |
| g/C ratio | .265 | .265 | .265 | .265 | .265 | 265 | .132 | .53 | .53 | .132 | .53 | .53 |
| Average back of queue (veh) | 4.8 | 0 | 5.4 | 7.3 | 9. | 3.8 | 5.5 | 34.7 | 3.5 | 6.5 | 30 | 6. |
| Uniform delay (s) | 45.1 | 40.8 | 45 | 47.3 | 41.2 | 43.9 | 61.3 | 30.5 | 18.5 | 62 | 28.9 | 17.2 |
| Incremental delay (s) | 0 | 0 | 0 | 1.3 | 0 | 0 | 4. | 4 | 0 | 5.4 | 2.5 | 0 |
| Initial queue delay (s) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delay (s) | 45.1 | 40.8 | 45 | 48.6 | 41.2 | 43.9 | 62.7 | 34.5 | 18.5 | 67.4 | 31.4 | 17.2 |
| S01 | D | D | D | D | Ω | D | Э | ပ | В | ы | ၁ | В |
| Approach delay (s)/LOS | 45 | | D | 46.6 | _ | D | 36.8 | - | D | 34.2 | _ | ပ |
| Intersection delay (s)/ LOS | | | 37 | | | | 1 | | | D | | |

| Granavi Information | | | | | | Site | forma | 2 | | | | | |
|--|-------------|--|---------|------------|---------|--|-------------------|---|----------------|---------------------|--|------|-----------|
| General Information | | | No. | | | Site | Site information | LOI | | | ALL LANGE TO SERVICE STATES AND ADDRESS AN | | 1 |
| Analyst WY | | | | | | Jurisdic | Jurisdiction/Date | | | ı | | 4/13 | 4/13/2008 |
| Agency or Company M&I | M&E PACIFIC | IFIC | | | | EB/WB Street | Street | 1 | KOHANA IKI | VA IKI | | | |
| Analysis Period/Year AMI | AMB AM 2 | 2 | 9 | 2029 | | NB/SB Street | Street | O | QUEEN KAAH | KAAI | -T | | |
| Comment 2029 AMB AM W/2L I NB | AM. | //21.1 | NB | | | | | | | | | | |
| Intersection Data | | | | | | | | | | | | | |
| Area type Other | | Analysis period | period | .25 | ٩ | Sign | Signal type | Actuate | Actuated-Field | | % Back of queue | | 95 |
| The state of the s | | | 83 | | | WB | | | NB | | | SB | |
| | | 17 | 王 | RI | 11 | ∄ | RT | 1 | Ħ | RT | LI | Ħ | R |
| Volume (veh/h) | | 122 | - | 147 | 173 | S | 129 | 89 | 1535 | 170 | 126 | 1261 | 50 |
| RTOR volume (veh/h) | | | | 30 | | | 30 | | | 30 | | | 10 |
| Peak-hour factor | | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| Heavy vehicles (%) | | 2 | 2 | 2 | S | Š | S | 2 | 2 | C1 | 2 | 2 | CI |
| Start-up lost time, I ₁ (s) | | 2 | 2 | 2 | 2 | 2 | 7 | 2 | 2 | 7 | 2 | 2 | 7 |
| Extension of effective green, e (s) | e (s) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Arrival type, AT | | т | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 3 | 3 | 3 | 3 |
| Approach pedestrian volume (p/h) | (h/d) | | 0 | | | 0 | ĺ | 200000000000000000000000000000000000000 | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | c/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | | z | _ | z | z | 1 | z | z | _ | z | z | _ | z |
| L II T TH R: RI | | P. Peds | | | | | | | | | | | |
| | Pha | - | Phase 2 | Ph. | Phase 3 | Phase 4 | | Phase 5 | Phase 6 | ge 6 | Phase 7 | - | Phase 8 |
| W.B. | | - Language Control | | - | I.T.R | | | - | | | | - | |
| NB | 1 | H | TR | | | | | | | | WATCH WILLIAM | | |
| SB | 7 | _ | TR | <u> </u> | | | 3 | | | - | | | |
| Green (s) | 15 | | 80 | (*) | 30 | The state of the s | | | | | | | |
| Vellow + All red (s) | S | | 5 5 | 1 | 2 | 01 | | | Critical | Critical tyle Datio | | 738 | |
| Updet (3) | 9008 | | DOT THE | and charge | 2 | | | | | | | | |
| | | MANAGE AND AND AND AND AND AND AND AND AND AND | æ | | | WB | | | NB B | | | SB | |
| Lane group configuration | | 7 | Ę | ~ | | Ţ | 2 | | t- | ~ | ٦ | T | × |
| No. of lanes | | - | - | - | _ | - | - | 2 | 2 | - | _ | 2 | _ |
| Flow rate (veh/h) | | 133 | - | 127 | 188 | 5 | 108 | 6 | 1668 | 152 | 137 | 1371 | 43 |
| Capacity (veh/h) | | 301 | 399 | 339 | 294 | 388 | 330 | 368 | 2027 | 905 | 190 | 2027 | 905 |
| Adjusted saturation flow (veh/h) | J/h) | 1405 | 1863 | 1583 | 1370 | 1810 | 1538 | 3437 | 3547 | 1583 | 1770 | 3547 | 1583 |
| v/c ratio | | .441 | .003 | .375 | .64 | .014 | .326 | .263 | .823 | .168 | .722 | 929. | .048 |
| g/C ratio | | .214 | .214 | .214 | .214 | .214 | .214 | .107 | .571 | .571 | .107 | .571 | .571 |
| Average back of queue (veh) | | 4.8 | 0 | 4.5 | 7.4 | .2 | 3.8 | 1.9 | 31.3 | 3 | 5.9 | 21.4 | œ. |
| Uniform delay (s) | | 47.7 | 43.2 | 47 | 50.1 | 43.3 | 46.5 | 57.4 | 24.3 | 14.2 | 60.5 | 21 | 13.2 |
| Incremental delay (s) | | 9. | 0 | Τ. | 4.7 | 0 | 0 | 0 | 2.9 | 0 | 12.7 | 6. | 0 |
| Initial queue delay (s) | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delay (s) | | 48.3 | 43.2 | 47.1 | 54.8 | 43.3 | 46.5 | 57.4 | 27.2 | 14.2 | 73.2 | 21.9 | 13.2 |
| 507 | | ۵ | ۵ | Ω | Ω | ۵ | ۵ | E | ೦ | m | ш | ပ | В |
| Annroach delay (s)/I OS | | 47.7 | _ | Q | 51.6 | - | Ω | 27.7 | 1 | ပ | 26.1 | - | ပ |

| Analyst Agency or Company Analysis Period/Year Comment 2029 TC | WY M&E DACIEIC | | | | | Jurisdi | Jurisdiction/Date | 2 | | | | 4/13/ | 4/13/2008 |
|--|----------------------|-----------------|--|----------|---------|--------------|-------------------|---------|----------------|--------------------|-------------------------------|-------|------------|
| Agency or Company Analysis Period/Year Comment 2029 TC | A P. C. DAC | | | | | | | | | | | | |
| Analysis Period/Year | 72737 | HEIC | | | | EB/WB Street | Street | | KOHANA IKI | IA IKI | | | |
| Common 2029 TC | TOT AM 2 | 2 | | 2029 | | NB/SB Street | Street | 0 | QUEEN KAAH | KAAI | _ | | |
| | 2029 TOTAL AM W/2 LT | W/2 | LT NB | | | | | | | | | | |
| Intersection Data | | | | | | | | | | | | | |
| Area type Other | | Analysis period | period | .25 | ے | Sign | Signal type | Actuate | Actuated-Field | | % Back of queue | | 95 |
| | | | EB | | | WB | | | NB | | | SB | |
| | | 5 | Ħ | E | ב | ≢ | RI | = | 丰 | RI | 5 | ₽ | 2 |
| Volume (veh/h) | | 122 | 17 | 190 | 173 | 20 | 129 | 290 | 1641 | 170 | 135 | 1490 | 50 |
| RTOR volume (veh/h) | | | | 30 | | | 30 | | | 30 | | | 10 |
| Peak-hour factor | | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| Heavy vehicles (%) | | 7 | 7 | 2 | 5 | S | 5 | 2 | 2 | 2 | 2 | 2 | 2 |
| Start-up tost time, 1, (s) | | 7 | 2 | 2 | 7 | 2 | 7 | 2 | 2 | 2 | 2 | 2 | 7 |
| Extension of effective green, e (s) | een, e (s) | 2 | 2 | 2 | 5 | 2 | 7 | 2 | 2 | 2 | 2 | 6 | 2 |
| Arrival type, AT | | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | 3 | 3 | 3 |
| Approach pedestrian volume (p/h) | ume (p/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | e (bic/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | ê | z | - | z | z | - | z | z | - | z | z | - | z |
| Signal Phasing Plan | an | | | | | | | | | | | | |
| L. UT T. TH R | R: RT P: | P: Peds | The second secon | - | | | | | | | | | |
| - Carange - Cara | Phase 1 | _ | Phase 2 | Ph | Phase 3 | Phase 4 | H | Phase 5 | Phase 6 | 9 9 | Phase 7 | H | Phase 8 |
| 89 | | | | | 1 | LTR | + | | | - | | | |
| WB | | + | | | | LTR | + | | | | | - | |
| NB | 7 | - | LTR | | TR | | | | | 1 | ON CONTRACTOR OF THE PARTY OF | | |
| SB | ٦ | - | | | TR | | _ | | | | | | |
| Green (s) | 20 | | 10 | | 95 | 45 | | | | | | | |
| All red (s) | - | | 5 | | 5 | S | _ | | | _ | | _ | |
| Cycle (s) 18 | 981 | | Lost time per cycle (s) | er cycle | (S) | 01 | | | Critical | Critical v/c Ratio | | .766 | |
| Intersection Performance | rmance | | | | | | | | | | | | |
| | | | EB | | | WB | | | æ | | | SB | |
| Lane group configuration | _ | IJ | Т | R | Г | ۴ | ~ | L | H | ~ | 7 | Н | ~ |
| No. of lanes | | _ | - | _ | _ | _ | - | 2 | 2 | - | - | ۲ | - |
| Flow rate (veh/h) | | 133 | 81 | 174 | 188 | 22 | 108 | 315 | 1784 | 152 | 147 | 1620 | 43 |
| Capacity (veh/h) | | 335 | 451 | 383 | 326 | 438 | 372 | 573 | 2097 | 936 | 190 | 1811 | 809 |
| Adjusted saturation flow (veh/h) | (veh/h) | 1384 | 1863 | 1583 | 1349 | 1810 | 1538 | 3437 | 3547 | 1583 | 1770 | 3547 | 1583 |
| v/c ratio | | 396 | .041 | .454 | .576 | .05 | .289 | .55 | .85 | .163 | 177. | .894 | .054 |
| q/C ratio | | .242 | .242 | 242 | .242 | .242 | .242 | .167 | .591 | .591 | .108 | .511 | .511 |
| Average back of queue (veh) | veh) | 6.1 | ∞. | 8.1 | 9.3 | 6: | 8.8 | 8.3 | 44.9 | 3.8 | 8.5 | 45.5 | 1.2 |
| Uniform delay (s) | | 59.1 | 54 | 09 | 62.1 | 54.1 | 57.5 | 71.1 | 31.2 | 17.2 | 80.8 | 41 | 22.9 |
| Incremental delay (s) | | 5 | 0 | 9. | 2.5 | 0 | 0 | = | 3.6 | 0 | 17.5 | 6.2 | 0 |
| Initial queue delav (s) | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detay (s) | | 59.3 | 54 | 9.09 | 64.6 | 54.1 | 57.5 | 72.2 | 34.8 | 17.2 | 98.3 | 47.2 | 22.9 |
| SOT | | ш | Ω | Ξ | E | Ω | ш | Э | U | В | Œ. | D | ၁ |
| Approach delay (s)/LOS | | 59.7 | - | Ξ | 61.5 | - | ш | 38.9 | _ | Ω | 50.7 | - | Δ |
| | | | | - | | | Out-months of | | | | | - | ********** |

CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

| | | | | | Site | Site Information | tion | | | | | |
|--|-----------------|-------------------------|-----------|---------|---------|-------------------|---------|----------------|--------------------|-----------------|---|---|
| Analyst | | | | | hrisdi | Inrisdiction/Date | | i | | | 4/13, | 4/13/2008 |
| or Company | CIFIC | - | | | EB/WB | EB/WB Street | | KOHANA IKI | AA IKI | | | |
| Analysis Period/Year AMB PM Comment 2015 AMBIENT PM | Md . | | 2015 | | NB/SB | NB/SB Street | | QUEEN KAAH | KAAI | _ | | |
| Intersection Data | | | | | | | | | | | | |
| Area type Other | Analysis period | period | .25 | ے | Sign | Signal type | Actuate | Actuated-Field | | % Back of queue | l | 95 |
| | | 89 | | | WB | | | NB | | | SS | |
| | II II | Ξ | RI | 5 | Ŧ | RT | LI | Ŧ | RI | 17 | Ħ | RT |
| Volume (veh/h) | 95 | - | 119 | 268 | _ | 179 | 260 | 1175 | 86 | 99 | 1255 | 190 |
| RTOR volume (veh/h) | | | 25 | | | 30 | | | 25 | | W. COLON | 30 |
| Peak-hour factor | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| Heavy vehicles (%) | 2 | 2 | 2 | 5 | 5 | 5 | 2 | 2 | 2 | 2 | 2 | 7 |
| Start-up fost time, I ₁ (s) | 2 | 2 | 2 | 2 | 2 | 7 | 2 | 2 | 2 | 2 | 7 | 2 |
| Extension of effective green, e (s) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Arrival type, AT | m | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | e. |
| Approach pedestrian volume (p/h) | | 0 | | | 0 | | | 0 | | | 0 | *************************************** |
| Approach bicycle volume (bic/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | z | , | z | Z | ' | z | z | ' | z | z | 1 | z |
| Signal Phasing Plan | | | | | | | | | | | | |
| L: LT T: TH R: RT F | P: Peds | | - | | | | , | | , | | 1 | ľ |
| Phase | Se J | Phase 2 | + | Phase 3 | Phase 4 | + | Phase 5 | Phase 6 | e e | Phase / | + | Phase 8 |
| E E E | | | | - | | 1 | 444 | | | | | |
| WO NA | - | 1 7.12 | - | TP | LIK | _ | | | - | | 1 | |
| | + | | - | 101 | | 1 | | | 1 | | - | |
| Green (s) | | 20 | 1 | N 88 | 50 | + | | | + | | + | |
| | + | 2 | - | | 3 | - | | | - | | | |
| Cycle (s) 186 | | Lost time per cycle (s) | ner cycle | 2 (8) | 201 | | | Critical | Critical v/c Ratio | | _∞; | |
| the state of the s | | | | | | | | | | | THE REAL PROPERTY. | |
| intersection Performance | | | | | 1 | | | 1 | | | 6 | |
| | | EB | | | WB | | | NB | | | Z | |
| Lane group configuration | 괴 | Н | 2 | 7 | - | 2 | 7 | | 2 | ı | T | ~ |
| No. of lanes | - | - | - | - | | - | - | 2 | - | - | 2 | - |
| Flow rate (veh/h) | 103 | - | 102 | 291 | - | 162 | 283 | 1277 | 79 | 72 | 1364 | 174 |
| Capacity (veh/h) | 379 | 501 | 426 | 368 | 486 | 413 | 343 | 2097 | 936 | 143 | 1621 | 724 |
| Adjusted saturation flow (veh/h) | 1410 | 1863 | 1583 | 1370 | 1810 | 1538 | 1770 | 3547 | 1583 | 1770 | 3547 | 1583 |
| v/c ratio | .272 | .002 | .24 | .791 | .002 | 392 | .825 | 609 | .085 | .503 | .842 | .24 |
| g/C ratio | .269 | .269 | .269 | .269 | .269 | .269 | .194 | 165. | .591 | 180. | .457 | .457 |
| Average back of queue (veh) | 4.4 | 0 | 4.3 | 15.8 | 0 | 7.2 | 16.1 | 23.8 | 1.9 | 3.9 | 36.8 | 5.8 |
| Uniform delay (s) | 53.6 | 49.7 | 53.2 | 63.1 | 49.8 | 55.6 | 72 | 24.3 | 16.3 | 81.9 | 44.6 | 30.8 |
| Incremental delay (s) | 0 | 0 | 0 | === | 0 | -: | 15.1 | 5. | 0 | 2.8 | 4.2 | 0 |
| Initial queue delay (s) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delay (s) | 53.6 | 49.7 | 53.2 | 74.2 | 49.8 | 55.7 | 87.1 | 24.8 | 16.3 | 84.7 | 48.8 | 30.8 |
| \$07 | Ω | ۵ | ۵ | 田 | D | ш | Œ. | С | В | Ľ, | Q | ပ |
| Approach delay (s)/LOS | 53.4 | - | ۵ | 67.6 | - | Ш | 35.1 | ~ | Ω | 48.4 | - | Ω |
| Intersection delay (s)/ LOS | | | 45.3 | | | | | | | ۵ | ALCOHOLD STATE OF THE PARTY OF | |
| | | | | | | | | | | | | |

| WYY M&E PACIFIC EB | Actual 360 2 2 2 2 2 2 2 2 2 2 3 3 3 9 NN N N N N N N N N N N N N N N | | Manual Ma | 88 SB 1300 1300 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 95 88 88 190 92 2 2 2 2 2 2 2 2 2 2 2 2 2 |
|--|--|--|--|--|--|
| or Company M&E.PACIFIC EB | Actual 10 | < X | KI AH AH LI LI LI L2 2 2 2 2 2 2 2 2 3 3 N N N Phase 7 | SB SB 1300 92 92 92 92 92 92 94 97 97 97 97 97 98 9 | RI RI RI 190 30 30 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 |
| Continue | Actual 16 | | 8 Back of que b Back of que control | | 2 2 2 2 2 2 2 2 2 3 3 3 888 88 |
| Continuo Data Continuo Dat | Pie Actuated | | 6 Back of qu | | 55 30 30 30 30 30 30 30 30 30 30 30 30 30 |
| Cother | Ppe Actuated | 2 0 7 0 | 8 71 17 2 2 2 2 2 2 2 2 2 3 3 3 3 9 N N | 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 | RT RT 1190 30 30 30 30 2 2 2 2 2 2 2 2 2 2 2 2 2 |
| FB | LIT 11 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | 28 | | 1300 H H H H H H H H H H H H H H H H H H | RI 190 30 30 30 30 N N N N N N N N N N N N N |
| III | 11 1360 360 .92 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | | | 130 130 130 130 130 130 130 130 130 130 | RT 190 330 330 370 N N N N N N N N N N N N N N N N N N N |
| Parame (verhth) | 360 360 370 N N N N N N N N N N N N N N N N N N N | | | 130 | 30 30 30 30 30 30 N N N N N N N N N N N |
| Lange Content Lange La | 0 2 | lasse | | 7 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | 30 30 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 |
| Factor 302 3 | 8 | lase (| | 0 0 0 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | .92 |
| icites (%) 12 | | hase 6 | | 7 | Z 3 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 |
| Cost time, 1, (s) 2 2 2 2 2 2 2 2 2 | | Thase 6 | | 7 0 0 3 15 15 | Z 3 2 2 2 3 3 2 5 2 2 |
| Pedestrie green, e (8) 2 2 2 2 2 2 2 2 2 | | hase 6 | | 7 0 0 3 13 | 3 2 3 3 2 3 2 3 2 3 3 3 3 3 3 3 3 3 3 3 |
| Pedestrian volume (phh) | | hase 6 | | 0 0 7 | E Z Se S |
| Padestrian volume (pth) 0 0 0 | | hase (| N Phase 7 | 0 0 1 | Z 8 8 |
| Phasing (V or N) | | hase (| N Phase 7 | 0 1 | Z 88 |
| Phasing (Y or N) N / N / N / Phasing Plan T. TH R. RT P. Peds T. TH R. RT P. Peds T. TH R. RT P. Peds L. LTR TR L. LTR L. LTR TR TR L. LTR L. TTR RITER (S) S S S S S S S S S S S S S S S S S S | | Phase 6 | N Phase 7 | | Z 88 |
| France Phase Pha | Phase 5 | Phase 6 | Phase 7 | | ase 8 |
| T. TH R. RT P: Peds Phase 2 Phase 3 Phase 4 | Phase 5 | Phase 6 | Phase 7 | | se 8 |
| Phase 1 Phase 2 Phase 3 Phase 4 | Phase 5 | Phase 6 | Phase 7 | | ase 8 |
| L | | | | W | |
| Hired (s) 15 16 87 48 15 16 87 48 16 87 48 17 18 48 17 18 5 5 5 10 10 10 10 10 10 10 10 10 10 10 10 10 1 | | | | - | |
| Hired (s) 15 16 87 48 15 16 87 48 15 16 87 48 16 182 Lost time per cycle (s) 10 ction Performance EB WB peonliguration L T R L T covern (verth) 103 4 129 291 16 (verth) 247 401 119 340 | | | | _ | |
| Hil red (s) 15 16 87 48 Ction Performance EB WB pronfiguration L T R L T es 12 | | | | | |
| Hi red (s) 1 5 5 5 5 6 6 6 9 6 10 6 10 6 10 6 10 6 10 6 10 6 | | | | | |
| Lost time per cycle (s) 10 | | | | | |
| EB WB L T R L T 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | TO THE PARTY OF TH | Critical v/c Ratio | ntio | .768 | |
| EB WB L T R L T 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | | | | |
| 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | NB | | SB | |
| 103 4 129 291 16 | | TR | ı | Т | ~ |
| 103 4 129 291 16 367 401 418 366 477 | 1 2 | 2 | - | 2 | - |
| 367 401 418 360 477 | 391 | 1277 79 | 77 | 1413 | 174 |
| 775 700 471 410 200 477 | 406 604 | 2105 940 | 0 146 | 1695 | 757 |
| Adjusted saturation flow (veh/h) 1391 1863 1583 1366 1810 1538 | 3437 | 3547 1583 | 3 1770 | 3547 | 1583 |
| v/c ratio .31 .809 .31 .809 .35 | .399 .648 | .607 .084 | 4 .529 | .833 | .23 |
| g/C ratio .264 .264 .264 .264 .264 .264 .264 | .264 .176 | .593 .593 | 3 .082 | .478 | .478 |
| Average back of queue (veh) 4.4 ,2 5.5 15.7 .6 7.1 | 10.4 | 23.2 1.8 | 3.4.1 | 36,6 | 5.4 |
| | .1 69.8 | 23.5 15.8 | 8 80.1 | 41.2 | 27.9 |
| Incremental delay (s) 0 0 0 12.9 0 .2 | 2.4 | .5 | 3.6 | 3.7 | 0 |
| 0 0 0 0 0 | 0 0 | 0 0 | 0 | 0 | 0 |
| Delay (s) 53.3 49.4 53.7 75.6 49.8 55.3 | 5.3 72.2 | 24 15.8 | 8 83.7 | 44.9 | 27.9 |
| D D D E D | H | CB | ī. | D | ပ |
| Approach delay (s)/LOS 53.5 / D 67.7 / E | 34.4 |) C | 44.9 | _ | Ω |
| Intersection delay (s)/ LOS 43.6 | , | III III III III III III III III III II | D | | |

| Analyst WY | | | | | Jurisdi | Jurisdiction/Date | , eta | | - | | 4/13/ | 4/13/2008 |
|---|-----------------|---------------|---------------------------------------|---------|--------------|-------------------|---------|----------------|--|-----------------|-------|-----------|
| or Company | CIFIC | | | | EB/WB | EB/WB Street | | KOHANA IKI | IA IKI | | | |
| Analysis Period/Year AMB PM Comment 2020 AMBIENT PM | PM | | 2020 | | NB/SB Street | Street | | QUEEN KAAH | KAAI | _ | | |
| Intersection Data | | | | | | | | | | | | |
| Area type Other | Analysis period | period | .25 | 4 | Sign | Signal type | Actuate | Actuated-Field | | % Back of queue | | 95 |
| | | 89 | | | WB | | | NB B | | | 88 | |
| | П | Ŧ | RI | П | 西 | RT | Ľ | Ξ | RT | 5 | Ŧ | RT |
| Volume (veh/h) | 95 | - | 119 | 240 | - | 170 | 260 | 1190 | 88 | 99 | 1270 | 190 |
| RTOR volume (veh/h) | | | 25 | | | 30 | | | 25 | | | 30 |
| Peak-hour factor | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| Heavy vehicles (%) | 2 | 2 | 2 | 5 | 2 | 5 | 7 | 2 | 2 | 2 | 2 | 2 |
| Start-up lost time, I ₁ (s) | 2 | 7 | 2 | 2 | 2 | 2 | 2 | 7 | 2 | 7 | 7 | 7 |
| Extension of effective green, e (s) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Arrival type, AT | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Approach pedestrian volume (p/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Approach Dicycle Volume (Dicyn) | 2 | | 7 | 2 | | 2 | 7 | | 2 | 2 | | 7 |
| Complete Property (1 of 19) | = | - | - | | | - | 5 | - | : | | - | |
| Ŀ | D. Dode | | | | APPL C | | | | | | | |
| III | 1 2 | Phase 2 | - | Phase 3 | Phase 4 | - | Phase 5 | Phase 6 | 9 9 | Phase 7 | - | Phase 8 |
| EB | | | | | LIR | | | | A A STATE OF THE S | | + | |
| | + | | | 1 | LTR | + | | | - | | 1 | |
| NB L | | LTR | - | TR | | - | | | 1 | | _ | |
| SB | - | | | TR | | | | | + | | _ | |
| Green (s) 10 | 1 | 18 | ~ | 85 | 45 | _ | | | 7 | | | |
| Vellow + All red (s) 1 Cycle (s) 174 | | 5 ost time | S S S S S S S S S S S S S S S S S S S | (s) | 2 01 | | | Critical | Critical v/c Ratio | | .784 | |
| Intersection Performance | | | | | | | | | | | | |
| | | 89 | | | WB | | | NB | | | SB | |
| Lane group configuration | 1 | <u>-</u> - | 2 | ٦ | H | ~ | 7 | £ | ~ | J | 1 | ~ |
| No. of lanes | - | - | - | _ | - | - | - | 2 | - | - | 2 | - |
| Flow rate (veh/h) | 103 | | 102 | 261 | - | 152 | 283 | 1293 | 89 | 72 | 1380 | 174 |
| Capacity (veh/h) | 365 | 482 | 409 | 354 | 468 | 398 | 295 | 2201 | 983 | 102 | 1733 | 773 |
| Adjusted saturation flow (veh/h) | 1410 | 1863 | 1583 | 1370 | 1810 | 1538 | 1770 | 3547 | 1583 | 1770 | 3547 | 1583 |
| v/c ratio | .283 | .002 | .25 | .736 | .002 | .383 | 958 | .588 | .07 | .705 | 767. | .225 |
| g/C ratio | .259 | .259 | .259 | .259 | .259 | .259 | .167 | .621 | .621 | .057 | 489 | .489 |
| Average back of queue (veh) | 4.2 | 0 | 4.1 | 12.9 | 0 | 6.4 | 17 | 21.2 | 1.4 | 3.9 | 32.7 | 5.1 |
| Uniform delay (s) | 51.6 | 47.8 | 51.1 | 59.1 | 47.8 | 53.1 | 71.9 | 19.7 | 13.1 | 9.08 | 37.3 | 25.6 |
| Incremental delay (s) | 0 | 0 | 0 | 7.8 | 0 | -: | 41.1 | 4. | 0 | 19.9 | 2.7 | 0 |
| Initial queue delay (s) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detay (s) | 51.6 | 47.8 | 51.1 | 6.99 | 47.8 | 53.2 | 113 | 20.1 | 13.1 | 100.5 | 40 | 25.6 |
| S07 | Ω | Ω | D | ш | D | D | ī | C | В | <u></u> | D | ၁ |
| Annroach delay (s)/I OS | 513 | | 2 | 819 | , | II. | 35.8 | , | _ | 41.1 | , | Ω |
| things are many things | 7.1. | | 1 | 0.10 | | 1 | | | 1 | | , | |

| Analyst Agency or Company Age E-ACIFIC Analysis Period/Year TOT PM 2 Comment 2020 TOTAL PM W 21 Intersection Data Area type Other Analysis | | | | | one monuation | 5 | HOH | | | | | |
|--|-----------------|---------------|---------------|---------|---------------|-------------------|----------------|------------|--|-------------------|-----------|---------|
| Company veriod/Year 2020 T stion Data | | İ | | | Jurisd | Jurisdiction/Date | يو ا | | | | 4/13/2008 | 720 |
| eriod/Year 2020 T Stion Data Other | CIFIC | | | | FRAME | FR/M/R Ctrant | | KOHANA IKI | VA IKI | | | |
| 1 75 | 2 | | 2020 | | NB/SB | NB/SB Street | 0 | QUEEN | QUEEN KAAH | - | | |
| Intersection Data Area Iype Other | W 2L' | 2LT NB | | | | | | | | | | |
| · ' | | | | | | | | | | | | |
| 1 | Analysis period | period | .25 | ء | Sign | Signal type | Actuated-Field | d-Field | % | Back of queue | | 95 |
| MACAGE OF COTACE OF THE COTACE OF THE COTACE OF THE COTACE OF THE COTACE OF THE COTACE OF THE COTACE OF THE COTACE OF THE COTACE OF THE COTACE OF THE COTACE OF THE COTACE OF THE COTACE OF THE COTACE OF THE COTACE OF THE CO | | 83 | | | WB | | | B | | | SB | |
| | 5 | ¥ | R | ב | ᆂ | F | 5 | Ŧ | RT | 5 | Ħ | 2 |
| Volume (veh/h) | 95 | 4 | 135 | 240 | 20 | 170 | 430 | 1180 | 88 | 76 | 1400 | 2 |
| RTOR volume (veh/h) | | | 20 | | | 20 | | | 25 | | | 20 |
| Peak-hour factor | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| Heavy vehicles (%) | 2 | 2 | 2 | 5 | 5 | 5 | 2 | 2 | 2 | 2 | 2 | 2 |
| Start-up lost time, 1, (s) | 7 | 2 | 7 | 7 | 7 | 7 | 5 | 2 | 2 | 7 | 7 | |
| Extension of effective green, e (s) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Arrival type, AT | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | 3 | 3 |
| Approach pedestrian volume (p/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | | 0 | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | z | _ | z | z | - | z | z | - | z | z | _ | Z |
| Signal Phasing Plan | | | | | | | | | | | | |
| L. LT T. TH R. RT P. | . Peds | | | | | 1 | | | - | - | | |
| Phase | - | Phase 2 | 품 | Phase 3 | Phase 4 | | Phase 5 | Pha | Phase 6 | Phase 7 | + | Phase 8 |
| a second | | | L | | LTR | | | - | | | | |
| NB I | | LTR | | TR | | - | | | Contract of the Contract of th | | | |
| 100 | L | | | TR | | - | | | 1 | - Carrent Control | L | |
| (s) ua | | 91 | - | 110 | 55 | <u> </u> | | | | | | |
| Yellow + All red (s) | | 2 | | 2 | 5 | | | | | | | |
| Cycle (s) 215 | | Lost time per | per cycle (s) | (s) | | 0 | | Critical | Critical v/c Ratio | | .793 | |
| Intersection Performance | | | | | | | | | | | | |
| The Additional Control of the Additional Con | | EB | | | WB | | | NB NB | | | SB | |
| Lane group configuration | L | 1 | ~ | П | Н | ~ | 7 | <u>[</u> | ~ | L | ۲ | ~ |
| No. of lanes | - | - | | - | _ | - | 2 | 2 | - | - | 7 | - |
| Flow rate (veh/h) | 103 | 4 | 92 | 261 | 22 | 130 | 467 | 1283 | 89 | 83 | 1522 | 152 |
| Capacity (veh/h) | 354 | 477 | 405 | 349 | 463 | 393 | 559 | 2161 | 965 | 148 | 1815 | 810 |
| Adjusted saturation flow (veh/h) | 1384 | 1863 | 1583 | 1366 | 1810 | 1538 | 3437 | 3547 | 1583 | 1770 | 3547 | 1583 |
| v/c ratio | .292 | 600. | .228 | .747 | .047 | .332 | .835 | .594 | .07 | .558 | .839 | .188 |
| g/C ratio | .256 | .256 | .256 | .256 | .256 | .256 | .163 | 609. | 609' | .084 | .512 | .512 |
| Average back of queue (veh) | 5.2 | c i | 4.6 | 15.9 | - | 6.7 | 16 | 26.4 | 1.8 | 5.2 | 45.5 | 5.1 |
| Uniform delay (s) | 64.3 | 59.7 | 63.2 | 73.6 | 60.3 | 65.1 | 87.2 | 25.7 | 17.2 | 94.7 | 44.9 | 28.4 |
| Incremental delay (s) | 0 | 0 | 0 | 8.5 | 0 | 0 | 10.6 | 4. | 0 | 4.6 | 3.7 | 0 |
| Initial queue delay (s) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delay (s) | 64.3 | 59.7 | 63.2 | 82.1 | 60.3 | 65.1 | 97.8 | 26.1 | 17.2 | 99.3 | 48.6 | 28.4 |
| 507 | Ε | ш | Э | Œ | ы | ш | <u>r</u> | O | В | (II, | ۵ | 0 |
| Approach delay (s)/LOS | 63.7 | ' | Ξ | 75.6 | 1 | Э | 44.2 | _ | ۵ | 49.2 | - | ۵ |
| Intersection delay (s)/ LOS | | | 50.3 | | | | | | | D | | |

| Marker M | See 3 N N N N N N N N N N N N N N N N N N | Signal type A Sirest NB/SB Street NB/SB Street NB/SB Street TH RT 1 170 50 50 50 50 50 50 00 0 0 0 0 0 0 0 0 | Weet Weet | N I I I I I I I I I I I I I I I I I I I | KAA KAA | AH HE G G Queue 11 | 4/1; HTH HTH 12 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | 3/2008 8/2008 |
|--|---|--|---|--|---|--|--|--|
| Company M&E PACIFIC | Bee 3 N N See 3 | Signal by Sire EBWB Sire NB/SB Sire Signal by | Phase 5 | COUEEN QUEEN COUEEN A. KAA. KAA. KAA. KAA. KAA. KAA. KAA. | H H H C C C C C C C C C C C C C C C C C | | S S S S S S S S S S S S S S S S S S S |
| Color Colo | h h h h | Signal by Signal | | QUEEN ted-Fielt NB 1250 2 2 2 2 2 1 1 1 1 1 1 1 1 | KA/ % % % % N N N N N N N N N N N N N N N | H 11 11 11 11 11 11 11 11 11 11 11 11 11 | SS SS 335 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | S S S S S S S S S S S S S S S S S S S |
| Collect | h h h | Signal by WB R H H R H I I I I I I I I I I I I I I I | | NB NB TH 1250 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | RR RR % N N N N N N N N N N N N N N N N | ack of que 66 66 66 22 2 2 2 2 2 2 2 3 3 N | SSB SSB 335 335 335 335 335 335 335 335 335 33 | 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 |
| Other Analysis period Cuther EB EB IT EB EB IT EB IT EB IT EB IT EB IT EB IT EB IT EB IT EB IT EB IT EB EB EB EB EB EB EB E | h h h h h h h h h h h h h h h h h h h | Signal by WBB TH R TH 11.1 11.1 11.1 11.1 11.1 11.1 11.1 1 | | NB NB 12509292929292929290 . | % RIT RIT 88 88 88 88 88 88 88 88 88 88 88 88 88 | 2 2 2 2 2 2 2 3 3 N | SB SB 335 335 335 335 335 335 335 335 335 33 | 55 50 50 N N N N N N N N N N N N N N N N |
| Other Analysis period EB LT TH RT | LT LT 240 0 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 | Signal by WB WB TH R R 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | NB NB NB 1250 1250 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | % RI 88 88 88 88 88 88 88 88 88 88 88 88 88 | 2 2 2 2 2 3 3 N | SB SB 335 335 335 335 335 335 335 335 335 33 | 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 |
| LT TH RT | | | .92 2 2 2 2 2 2 2 3 3 N | N T 12 2. | RI 88 88 25 25 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 | 11 66 66 66 29 2 2 2 2 2 2 2 2 3 3 3 N | SB TH TH 1335 .92 2 2 2 2 2 2 2 3 3 3 3 9 0 0 | RT 190 50 50 50 80 N N N N N N N N N N N N N N N N N N |
| LT TH RT | | | 2 2 2 2 2 2 2 2 2 2 2 N N N | 5. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. | RH 88 88 25 .92 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 | 11 66 66 N | 1335 1335 2 2 2 2 2 2 2 3 3 3 | RT 190 190 20 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 |
| 111 112 113 114 115 | | | 2 2 2 2 2 2 2 2 2 N N N | 21 8 | 88 25 25 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 | 66 66 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 | .92 .92 .2 .2 .2 .3 | .92 2 2 2 2 2 2 2 N N N N N N N N N N N N |
| Section Sect | | | 2 2 2 2 2 2 2 2 2 2 N N N Phase | 5,1111111111111111111111111111111111111 | 25 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | 3 2 2 2 2 2 N | 2 2 2 2 3 3 0 0 | 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 |
| 1,000 1,00 | | | 2 2 2 2 2 2 2 2 N N N N N N N N N N N N | | .92 2 2 2 2 2 2 2 3 3 3 3 3 3 4 3 4 3 4 3 4 | .92 2 2 2 3 3 N | 3 2 2 2 0 | .92 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 |
| incies (%) 2 2 2 2 2 2 2 2 2 2 2 2 2 3 3 3 3 4 3 3 3 4 3 3 3 4 3 3 4 4 4 4 | | | 3 3 3 N N | | Z 2 2 8 Z | N 3 2 2 2 | 0 3 7 7 8 0 | Z 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 | | | Phase | | Z Z E Z | N 3 2 2 | 11 11 m 0 | 2 Z 3 2 2 3 3 3 3 8 8 8 |
| De, AT De, AT De, AT Dedestrian volume (p/h) Descripte volume (pin | | | 3 N N | | Z 2 2 | 3 S | 0 m | 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 |
| De Af 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 | | | S Nase | | Z Z | e z | m 0 | 3 3 8 8 8 |
| bicycle volume (p/h) 0 bicycle volume (p/h) N / N Phasing (Y or N) N / N Phasing Plan T. TH R RT P: Peds T. TH R RT P: Peds T. TH R RT P: Peds T. TH R RT P: Peds T. TH R RT P: Peds T. TH R RT P: Peds T. TH R RT Phase 2 T. TH R RT Phase 2 T. TH R RT Phase 2 T. TH R RT Phase 2 T. TH R RT Phase 2 T. TH R RT Phase 2 T. TH R RT Phase 2 T. TH R RT Phase 2 T. TH R RT Phase 2 T. TH R RT Phase 3 | | | Phase | | z | z | 0 | Z 88 |
| bicycle volume (bic/h) | | | Phase | | z | z | 4 | Z 8 98 |
| Phasing (Y or M) N / N Phasing Plan T: TH R: RT P: Peds T: TH R: RT Phase 1 L LTR | | | Phase | | z | z | 0 | Z se 8 |
| T: TH R: RT P: Peds T: TH | | Phase 4 LTR LTR | Phase 5 | | | | - | 3Se 8 |
| T: TH R RT P: Peds Phase 1 Phase 2 L LTTR L LTTR L S All red (s) 1 S 163 Lost linne per cy | | Phase 4 LTR LTR | Phase 5 | | | | | 3Se 8 |
| Phase 1 Phase 2 L LTTR L LTR L S All red (s) 1 S Lost linne per cy | | Phase 4 LTR LTR | Phase 5 | | | | | 3Se 8 |
| L LTR L LTR L LS 112 5 112 5 112 5 113 163 Lost time per cycl | | LIR | | | Phase 6 | Phase 7 | 1 | |
| L LTR L LTR L S 112 S All red (s) 1 S 103 Lost time per cycl | | LIK | | | Ť | | + | |
| L | | | | | | | - | |
| HI red (s) 12 5 1 5 1 1 5 1 1 1 5 1 1 1 1 1 1 1 1 | × | | | 1 | 1 | | | |
| All red (s) 12 | ~ | : | Ì | - | + | | | and the same of |
| All red (s) 1 | 2 | 45 | COMPANIE IN | | | | - | 1 |
| 001 | 2 | 2 | | linitian | Orition to Datio | | 706 | Ì |
| Doubles Doubles | (c) | | | 5 | A Maria | | | |
| mersecuon remoniance | | divi | | gw | | | 9 | |
| - | - | | - | £ | a | - | e E | ٥ |
| 1 - | 1 - | - | + | - (| 4 - | 4 - | - | 4 - |
| No. of talks | 196 | | 1 | 1350 | . 89 | 7.7 | 1451 | - 5 |
| L COL | + | 1 | + | + | 200 | 27 | 1040 | 200 |
| $^{+}$ | 1370 | 1 | 1620 2427 | | 1502 | 021 | 2547 | 1502 |
| Saturation flow (veryn) 1410 1803 | + | + | | | 074 | 551 | 785 | 184 |
| 200: 200: | + | - | ÷ | + | 502 | 720 | 103 | 5 |
| . 0/2. 0/2. | - 1 | + | - | + | 500. | 1/0 | 125. | 2. |
| ueue (veh) 3.9 0 | - [| + | + | 1 | 1.4 | 5,5 | 21.1 | 3.8 |
| Uniform delay (s) 46.1 42.7 44.8 | 52.8 | 7 | 7 | `` | 14.8 | 72.9 | 31.6 | 20.6 |
| Incremental delay (s) 0 0 0 | 5.3 | - | 0 7.8 | _ | 0 | 4.9 | 2.3 | 0 |
| Initial queue delay (s) 0 0 0 | 0 | 0 | 0 0 | 0 | 0 | 0 | 0 | 0 |
| Delay (s) 46.1 42.7 44.8 | 58.1 | 42.7 46 | 46.7 78.1 | 23.8 | 14.8 | 77.8 | 33.9 | 20.6 |
| LOS D D D | ш | D | D E | ၁ | М | ы | ပ | ပ |
| Approach delay (s)/LOS / D | 54.2 | / D | 32.4 | 4 / | ၁ | 34.6 | _ | ပ |
| Intersection delay (s)/ LOS 36.1 | | | _ | | | D | | |

| WY | PH SIG PH | 2029 2029 175 80 50 20 20 20 20 20 20 20 20 20 2 | h h l l l l l l l l l l l l l l l l l l | Signal type | | 1 | KOHANA IKI QUEEN KAAH | NA IKI N KAA | | 4/13 | 4/13/2008 |
|---|---|--|--|--|---------------|--|--------------------------|--------------------|-----------------|--|-----------|
| NAEE PACIFIC | PH SIG PH | 2029 .25 .25 .92 .92 .92 .3 .3 | h h LI LI 240 .92 .52 .52 .52 .52 .52 .52 .52 .52 .52 .5 | Signa WB WB WB TH TH 30 30 52 5 5 | Street Street | | QUEEN | NA IKI | _ = | | |
| NAZE I TOT PM 8PH | PH SIG PH | 2029 2029 30 50 50 50 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 | h h 11 12 240 .92 5 5 5 2 2 | Signa | | | QUEEN | NA IK | = | | |
| sis Period/Year TOT PM 8PH ment 2029 TOTAL PM W 8 F gpe Other Analysis ype Other 1 te (veh/h) 95 volume (veh/h) 95 volume (veh/h) 2 volume (veh/h) 3 z year (sk) 2 type, AT 3 ach pedestrian volume (p/h) 3 ach bedestrian volume (p/h) N ath blickle volume (p/h) N ath blickle volume (p/h) N ath blickle volume (p/h) N ath blickle volume (p/h) N ath blickle volume (p/h) N ath blickle volume (p/h) N Ath R: RT P: Peds T: TH R: RT P: Peds T: TH R: RT P: Peds | PH SIG PH | 2029 25 2020 2020 2020 2020 2020 2020 20 | h h LI 240 .92 5 5 5 2 | Sign: Sign: 30 30 30 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 | | | QUEEN | KAA | H | | |
| The continuous of the contin | PH SIG PH SIG S period S period S S S S S S S S S | 25 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | h LT 240 .92 5 | Signic WB WB TH TH 30 30 55 5 5 | | | AAA AA AH HARAA | | | | |
| Treection Data Analysis | E B TH TH TH TH TH TH TH TH TH TH TH TH TH | 25 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | 11 LT 240 .92 5 | Signa WB TH 30 .92 .5 | | | | | | | |
| 1 | S period | .25 50 50 50 50 50 50 50 50 50 50 50 50 50 | h LT 240 .92 .92 5 | Signa WB TH TH 30 | | | | | | | |
| LT | EB 15 15 17 17 17 17 17 17 17 17 17 17 17 17 17 | RI RI 175 50 50 20 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | LT 240 .92 .92 5 | WB TH 30 30 52 5 | | Actuate | Actuated-Field | | % Back of queue | | 95 |
| LT | 15 15 15 15 16 17 17 17 17 17 17 17 17 17 17 17 17 17 | RT 175 50 50 20 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | LT 240 .92 .5 | 30 30 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 | | | NB | | | 88 | |
| 10 10 10 10 10 10 10 10 | 15 | 175 50 50 20 20 20 20 20 20 20 20 20 20 20 20 20 | 240 .92 5 2 | 30 .92 .5 | R | 11 | ₽ | R | = | E | E |
| volume (velvh) volunt factor vehicles (%) up lost time, I, (s) z 2 up lost time, I, (s) z 2 z | .92 2 2 2 2 2 2 3 0 0 0 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 | Z 3 2 2 2 2 Z | .92 | 5 5 | 170 | 545 | 1235 | 88 | 98 | 1540 | 190 |
| 192 vehicles (%) 2 up lost time, I, (\$1 2 up lost time, I, (\$1 3 up lost time, I, (\$1 3 up pedestrian volume (p/h) 3 uch pedestrian volume (b/h) N uch bicycle | .92 2 2 2 2 2 2 2 3 3 0 0 0 0 0 1 Hase 2 R | Z 22 22 22 Z | 5 2 | 26. | 50 | A CONTRACTOR OF THE PARTY OF TH | | 25 | | - | 50 |
| vehicles (%) 19 lost lime, I, (s) 2 loss on of effective green, e (s) 2 lype, I lyp | 2 2 2 2 2 3 3 3 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 | 2 3 2 2 Z | 2 | 5 | .92 | .92 | .92 | .92 | .92 | .92 | .92 |
| up lost time, I, (s) 2 sion of effective green, e (s) 2 3 sion of effective green, e (s) 2 ach brodestrian volume (p/h) N ach brodestrian volume (p/h) N ach broycle volume (bit/h) N ach broycle volume (bit/h) N ach brodestrian volume (p/h) N ach br | 2 2 2 3 0 0 0 / | 2 2 E | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| sion of effective green, e (s) 2 Iype, AT 3 och pedestrian volume (p/h) ght parking (Y or N) N al Phasting Plan T. TH R: RT P: Peds R R: R R: R R: R R: R R: R R: R R: R R | 2 3 0 0 / / Phase 2 R | Z 2 2 | - | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 7 |
| 1 type, AT act pedestrian volume (p/h) act bedestrian volume (p/h) N act bedee volume (plc/h) N all Phasting Plan T. TH R. RT P: Peds R. R. R. R. R. R. R. R. R. R. R. R. R. R | 3 0 0 / / / Phase 2 R | e z | 7 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 7 |
| ach bedestrian volume (p/h) ach bicycle volume (bic/h) al Phasting Plan T: TH R: RT P: Peds RR RR RR RR RR RR RR RR RR RR RR RR RR | 0 0 / / / Phase 2 R | z | m | ы | m | 3 | 3 | 3 | 3 | 3 | 5 |
| ach bicycle volume (bic/h) Nat Phasing (Y or N) RT P: Peds T: TH R: RT P: Peds RR R R R | 0 / / | z | | 0 | | | 0 | | | 0 | |
| ght parking (Y or N) N at Phasing Plan T: TH R: RT P: Peds R Phase 1 R R R R | / Phase 2 R | z | | 0 | | | 0 | | | 0 | |
| r: TH R: RT P: Peds T: TH R: RT P: Peds R: RT P: Peds R: RT P: RED Plase 1 R: R: R: R: R: R: R: R: R: R: R: R: R: R | Phase 2 R | | z | _ | z | z | - | z | z | - | z |
| T: TH R: RT P: Peds Phase 1 R R R R L | Phase 2 R | | | DANCE OF THE PARTY | | | | | | | |
| Phase 1 R R L L | Phase 2 R | O STATE OF THE STA | | | | | | | | | |
| | ~ | Phase 3 | e 3 | Phase 4 | H | Phase 5 | Phas | Phase 6 | Phase 7 | | Phase 8 |
| | | | | _ | - | | E. | ~ | | The state of the s | |
| | | | | ٦ | | LTR | TR | ~ | | | |
| | LTR | TR | ~ | × | | 2 | | | | | |
| 7 | | TR | ~ | × | | | | | | | |
| Green (s) 1.5 | 25 | 100 | 0 | 15 | _ | ∞ | - | 10 | | | |
| All red (s) | 2 | 5 | | - | | _ | S | | | | |
| Cycle (s) 191 L | Lost time per cycle (s) | ır cycle (s | | 10 | | | Critical | Critical v/c Ratio | | .853 | |
| Intersection Performance | | | | | | | | | | | |
| | 63 | | | WB | | | BB | | | SS | |
| Lane group configuration | Ţ | × | _1 | E | ~ | L | ٦ | ~ | 1 | £ | 2 |
| No. of lanes | - | - | 2 | _ | - | 7 | 2 | - | - | 2 | - |
| Flow rate (veh/h) 103 | 91 | 136 | 261 | 33 | 130 | 592 | 1342 | 89 | 93 | 1674 | 152 |
| Capacity (veh/h) 139 | 86 | 464 | 419 | 180 | 314 | 738 | 2414 | 1318 | 139 | 1857 | 995 |
| Adjusted saturation flow (veh/h) 1770 | 1863 | 1583 | 3338 | 1810 | 1538 | 3437 | 3547 | 1583 | 1770 | 3547 | 1583 |
| v/c ratio | .167 | .293 | .622 | 181 | .415 | .803 | .556 | .052 | .673 | 106. | .153 |
| g/C ratio .079 | .052 | .293 | .126 | 660. | .204 | .215 | .681 | .832 | 620. | .524 | .628 |
| Average back of queue (veh) 6.2 | 6. | 5.9 | 7.4 | 1.7 | 6.4 | 17.4 | 20.8 | 7. | 5.4 | 48.5 | 3.5 |
| Uniform delay (s) 86.1 | 86.5 | 52.2 | 79.2 | 78.9 | 1.99 | 71.2 | 15.7 | 2.8 | 85.6 | 41.1 | 14.6 |
| Incremental delay (s) | 0 | 0 | 2.8 | 0 | 4. | 6.4 | ъ. | 0 | 12 | 6.5 | 0 |
| Initial queue delay (s) 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delay (s) 105.3 | 86.5 | 52.2 | 82 | 78.9 | 66.5 | 77.6 | 16 | 2.8 | 97.6 | 47.6 | 14.6 |
| LOS F | ᄕ | Ω | <u></u> | Э | ш | ш | В | A | ഥ | Ω | В |
| Approach delay (s)/LOS 75.9 | - | ш | 77 | , | ш | 33.7 | - | ၁ | 47.4 | _ | D |
| Intersection delay (s)/ LOS | | 45.7 | | | _ | | | | D | | |

CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

| Analyst Agency or Company | 111 | | | | | 200 | Site information | tion | | | | | |
|--|--------------|-----------------|----------|-------------------------|---------|---------|-------------------|---------|----------------|--------------------|-----------------|------|-----------|
| Agency or Company | ΑX | | | | | hirisd | Inriediction/Date | ٩ | | | | 3/26 | 3/26/2008 |
| | M&E PAC | | | | | FB/WE | FR/MR Street | ' | HINALANI D | ANID | | | |
| Analysis Period/Year | EX AM #1 | | | 2006 | | NR/SP | MR/SB Street | , • | OUEEN KAAH | KAA | _ | | |
| Comment 2006 EXIST | XIST 6:30 | 6:30-7:30AM | M | | ۱ | | | | | | | | |
| Intersection Data | | | | | | | | | | | | | |
| Area type Other | | Analysis period | period | .25 | ء | Sign | Signal type . | Actuate | Actuated-Field | | % Back of queue | | 95 |
| | | | EB | | | WB | | | NB | - | | SB | |
| | | = | Ξ | RT | П | H | RT | h | ₽ | ₽ | 5 | ₽ | ₹ |
| Volume (veh/h) | | | | | 225 | | 260 | | 685 | 295 | 120 | 545 | |
| RTOR volume (veh/h) | | | | | | | 40 | | | 80 | | | 0 |
| Peak-hour factor | | | | | 6. | 6. | 6. | 6. | 6. | 6. | 6: | 6: | e. |
| Heavy vehicles (%) | | | | | 7 | | 2 | | 2 | 7 | 2 | 2 | |
| Start-up lost time, I ₁ (s) | (S | | | | 2 | | 2 | | 2 | 2 | 2 | 2 | |
| Extension of effective green, e (s) | green, e (s) | | | | C1 | | C\$ | | 7 | 61 | 7 | 2 | |
| Arrival type, AT | | | | | 3 | | 3 | | 3 | 3 | 3 | 3 | |
| Approach pedestrian volume (p/h) | olume (p/h) | | | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | me (bic/h) | | | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | S. | | _ | | z | - | z | z | - | z | z | _ | z |
| Signal Phasing Plan | lan | | | | | | | | | | | | |
| L U T TH | R: RT P: | P: Peds | | | | | | | | | | | |
| 83 | Phase 1 | _ | Phase 2 | + | Phase 3 | Phase 4 | + | Phase 5 | Phase | 9 99 | Phase 7 | + | Phase 8 |
| WB | I W | - | | | | | H | | L | | - Colonia | L | |
| NB | | | | | TR | | | | | | | | |
| SB | | | ב | _ | LT | | <u> </u> | | | | 100 | _ | |
| Green (s) | 30 | | = | , | 44 | | | | | | | | |
| All red (s) | 5.1 | | 4.1 | ٠, | 5.8 | | | - | | | | | ıÌ |
| Cycle (s) | 00 | _ | ost time | Lost time per cycle (s) | (S) | 2 | | ļ | Critical | Critical v/c Ratio | | 25 | |
| Intersection Performance | ormance | | | | | | | | | | | | |
| | | | 83 | | | WB | | | 8 | į | | SB | |
| Lane group configuration | uo | | | | -) | | ~ | | ⊢ | ~ | L | ۲ | |
| No. of lanes | | | | | - | | | | - | - | - | - | |
| Flow rate (veh/h) | | | | | 250 | | 244 | | 761 | 239 | 133 | 909 | |
| Capacity (veh/h) | | | | | 531 | | 475 | | 820 | 269 | 352 | 1011 | |
| Adjusted saturation flow (veh/h) | w (veh/h) | | | | 1770 | | 1583 | | 1863 | 1583 | 1770 | 1863 | |
| v/c ratio | | | | | .471 | | .515 | | 926 | ,343 | .378 | .55 | |
| g/C ratio | | | | | u; | | ĸ: | | .44 | .44 | 809. | .591 | |
| Average back of queue (veh) | (veh) | | | | 6.1 | | 6.1 | | 25 | 4.7 | 2.1 | Ξ | |
| Uniform delay (s) | | | | | 28.5 | | 29 | | 26.5 | 18.5 | 12.9 | 12.4 | |
| incremental delay (s) | | | | | 5: | | - | | 16.7 | 0 | -: | 9. | |
| Initial queue delay (s) | | | | | 0 | | 0 | | 0 | 0 | 0 | 0 | |
| Delay (s) | | | | | 59 | | 30 | | 43.2 | 18.5 | 13 | 13 | |
| T0S | | | | | ၁ | | ၁ | | ۵ | В | В | В | |
| Approach delay (s)/LOS | S | | _ | | 29.5 | _ | С | 37.3 | - | Ω | 13 | - | В |
| Intersection delay (s)/ LOS | TOS | | | 27.5 | | | | | | | ၁ | | |

| Gelleral Illionnation | HOIL | | | | olle | Site information | tion | | | | | |
|--|--|-----------------|-------------------------|---------|--------|-----------------------------------|------------|----------------|--------------------|-----------------|-------|-----------|
| Amphor | WY | | - | | Lucion | fallow (Des | | | - | | 3176 | 8000/90/2 |
| Anency or Company | M&E PAC | | | | FRAME | Jurisdiction/Date FR/WR Street | | HINALANI D | ANI D | | 7776 | 7700 |
| Analysis Period/Year Comment 2006 I | od/Year EX AM #2 2006 EXIST 7:30-8:30AM | 80AM | 2006 | | NB/SB | NB/SB Street | | QUEEN KAAH | KAA | - | | |
| Intersection Data | a | | | | | | | | | | | |
| Area type Other | Analy | Analysis period | .25 | - | Sign | Signal type | Actuate | Actuated-Field | | % Back of queue | | 95 |
| | | - | 1 | : | WB | 1 | ! | NB | 2 | | 8 | 1 |
| 177 | | = | ž | 1 6 | Ξ | 27.5 | = | = | 2 8 | = 3 | Ξ | 2 |
| volume (ven/n) | | | | 782 | | 6/7 | | 040 | 340 | 140 | 3 | • |
| KTOK volume (ven/n) | | | | o | 0 | 9 | c | G | 08 | o | c | 0 |
| Heavy vehicles (%) | | | | , | : | , | 2 | , , | , | ; (| : c | : |
| 1 - | (s) | | | 1 2 | | 1 61 | | 2 | 1 2 | 1 2 | 1 2 | |
| Extension of effective green, e (s) | green, e (s) | | | 2 | | 2 | | 2 | 2 | 7 | 7 | |
| Arrival type, AT | | | | 3 | | 3 | | 3 | 3 | 3 | m | |
| Approach pedestrian volume (p/h) | rotume (p/h) | | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | me (bic/h) | | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | I N) | - | l | z | - | z | Z | - | z | z | - | z |
| Signal Phasing Plan | Plan | | | | | | | | | | | |
| LU TH | R: RT P: Peds | S Ohoro 2 | <u> </u> | Dhaca 3 | Dhaca | | Dhara 6 | Dharaf | 2 | Dhara 7 | | Ohaca 0 |
| 83 | 1 1030 | LIII | + | 200 | 111030 | | 1920 | 110 | 2 | LIGOR | + | 0 260 |
| WB | LR | | | | İ | 1 | | | | | | |
| NB | | | | TR | | L. | | | | | | |
| SB | | LT | | LT | | | | | | | _ | |
| Green (s) | 30 | = | | 44 | | <u> </u> | | | | | | |
| All red (s) | 5.1 | 4.1 | | 5.8 | | | | | | | | |
| Cycle (s) | 100 | Lost tim | Lost time per cycle (s) | (S) | 9.9 | | | Critical | Critical v/c Ratio | | :72 | |
| Intersection Performance | formance | | | | | | | | | | | |
| | | 8 | | | WB | | - Contract | BB | and the second | | SB | Ì |
| Lane group configuration | ion | | | 1 | | ~ | | T | R | L | Ŀ | |
| No. of tanes | | | | - | | - | | - | - | | - | |
| Flow rate (veh/h) | 100 | | | 317 | | 261 | | 711 | 289 | 156 | 908 | |
| Capacity (veh/h) | | | | 531 | | 475 | | 820 | 269 | 370 | 1101 | |
| Adjusted saturation flow (veh/h) | w (veh/h) | | | 1770 | | 1583 | | 1863 | 1583 | 1770 | 1863 | |
| v/c ratio | | | | 965. | | .55 | | 898. | .415 | .42 | .732 | |
| g/C ratio | | | | £. | | ٤. | | .44 | 44. | 809. | .591 | |
| Average back of queue (veh) | (heh) | | | 8.2 | | 9.9 | | 21.3 | 5.9 | 2.5 | 18.1 | |
| Uniform delay (s) | | | | 29.8 | | 29.3 | | 25.4 | 19.2 | 12.7 | 14.7 | |
| Incremental delay (s) | | | | 1.8 | | 1.4 | | 8.6 | .2 | .3 | 2.5 | |
| Initial queue delay (s) | | | | 0 | | 0 | | 0 | 0 | 0 | 0 | |
| Delay (s) | | | | 31.6 | | 30.7 | | 35.2 | 19.4 | 13 | 17.2 | |
| TOS | | | | ၁ | | ၁ | | D | В | В | В | |
| Approach delay (s)/LOS | S | _ | | 31.2 | _ | ၁ | 30.6 | _ | ပ | 16.6 | ' | В |
| | | | 7 30 | | | | | | | ر | | |

| | | | | | 2 | Site Information | llon | | | | | |
|---|-----------------|-----------------|------------------------------------|--------------|--------------|-------------------|----------------------------|------------|--------------------|-----------------|------|-----------|
| Analyst WY | ٨. | | | | Jurisdi | Jurisdiction/Date | | 4 | | | 4/17 | 4/17/2008 |
| ог Сотрапу | M&E PAC | | | | EB/WB Street | Street | | HINALANI D | ANID | | | |
| Analysis Period/Year AMB A Comment 2015 AMB AM | AMB AM MB AM | | 2015 | | NB/SB Street | Street | ٩ | QUEEN KAAH | KAA | | | |
| Intersection Data | | | | | | | | | | | | |
| Area type Other | Ana | Analysis period | .25 | 5 h | Sign | al type | Signal type Actuated-Field | d-Field | | % Back of queue | | 95 |
| | | 89 | | | WB | | | NB | | | SB | |
| | _ | II III | R | 17 | ¥ | RI | Ħ | Ξ | E | רי | Ξ | R |
| Volume (veh/h) | | | | 434 | | 423 | | 1250 | 532 | 211 | 1280 | |
| RTOR volume (veh/h) | | | | | | 80 | | | 100 | | | 0 |
| Peak-hour factor | | | | 6. | 6. | 6: | 6. | 6: | 6: | 6. | 6. | 6: |
| Heavy vehicles (%) | | | | 2 | | 7 | | 2 | 2 | 7 | 7 | |
| Start-up lost time, 1, (s) | | | | 2 | | 7 | | 7 | 2 | 2 | 7 | |
| Extension of effective green, e (s) | ı, e (s) | - | | 2 | | 2 | | 7 | 2 | ۲, | 7 | |
| Arrival type, AT | | | | m | | | | 3 | m | 3 | 3 | |
| Approach pedestrian volume (p/h) | (h/h) | - Aug | | | 0 | | | 0 | | | 0 | - |
| Approach bicycle volume (bic/h) | bic/h) | | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | | - | | z | - | z | z | - | z | z | _ | z |
| L. LT T. TH R. RT | á. | Peds | 1 | | | 1 } | | | | | 1 | |
| | Phase 1 | Phase 2 | - | Phase 3 | Phase 4 | _ | Phase 5 | Phase 6 | 9 | Phase 7 | + | Phase 8 |
| | LR | 2 | | 4 | | | | | | in the second | 1 | |
| | Ж | | | TR | | | | | | | | |
| | | LT | | LT | | | | | | | | |
| Green (s) | 55 | 20 | | 65 | | | | | | | | |
| Vellow + All red (s) Cycle (s) 155 | 5.1 | 4.1 Lost tim | 4.1 5.8 Lost time per cycle (s) | 5.8 e (s) | 15.7 | 7 | | Critical | Critical v/c Ratio | | .917 | |
| Intersection Performance | nance | | | | | | | | | | | |
| | | 83 | | | 9,8 | | | BB. | | | 88 | |
| Lane group configuration | | | | 7 | | 2 | | T | Z | L | T | |
| No. of lanes | | | | - | | - | | 2 | - | - | 2 | 100 |
| Flow rate (veh/h) | | | | 482 | | 381 | | 1389 | 480 | 234 | 1422 | |
| Capacity (veh/h) | _ | | | 628 | | 818 | | 1487 | 1285 | 276 | 2039 | |
| Adjusted saturation flow (veh/h) | eh/h) | | _ | 1770 | | 1583 | | 3547 | 1583 | 1770 | 3547 | |
| v/c ratio | | | | .768 | | .466 | | .934 | .374 | .848 | 869° | |
| g/C ratio | | | | .355 | | .517 | | 419 | .812 | .586 | 575. | |
| Average back of queue (veh) | 5 | | | 20.6 | | 11.2 | | 36 | 6.2 | 10 | 25 | |
| Uniform delay (s) | | | | 44.3 | | 23.8 | | 42.9 | 3.9 | 49.9 | 23.4 | |
| Incremental delay (s) | | | | 5.7 | | e.i | | Ξ | 0 | 21.2 | = | |
| Initial queue delay (s) | | | | 0 | | 0 | | 0 | 0 | 0 | 0 | |
| Delay (s) | | | | 20 | | 24.1 | | 54 | 3.9 | 71.1 | 24.5 | |
| 507 | | | | Ω | | O | | Ω | ∢ | ш | ပ | |
| Annana dalan (c)/! OC | | _ | | 38.6 | - | Ω | 41.2 | - | Ω | 31.1 | - | ပ |
| decar delay (ayred) | - | | | | | | | | | | | |

HICAP 2000 TM

Catalina Engineering, Inc.

| | | | | | | allo | Site Information | tion | | | | | |
|---|---------------------------------------|-----------------|---------|---------|---------|---------|----------------------------------|---------|------------|---|--|---------------|-----------|
| Analyet | WY | | | | | hirited | Indication/Date | | | | | 4/17 | 4/17/2008 |
| Agency or Company | M&E PAC | l o | | | | EB/WE | Jurisdiction/Dat EB/WB Street | | HINALANI D | ANI D | |] | |
| Analysis Period/Year Comment 2015 T | iod/Year TOT AM 2015 TOT W/PROJ AM | OJ AN | | 2015 | | NB/SB | NB/SB Street | 01 | QUEEN KAAH | KAA | = | | |
| . 12 | | | | | West of | | | | .vv | | | | |
| Area type Other | | Analysis period | period | .25 | ٦ | Sign | Signal type Actuated-Field | Actuate | d-Field | 1 | % Back of queue | | 95 |
| | | | EB | | | WB | | 10000 | NB | | The state of the s | 8S | Ì |
| | | 5 | Ξ | RT | П | Ħ | RĬ | П | Ħ | RT | П | Ħ | RĬ |
| Volume (veh/h) | | | | | 434 | | 433 | | 1278 | 532 | 221 | 1340 | |
| RTOR volume (veh/h) | | | | | | | 80 | | | 100 | | in the second | 0 |
| Peak-hour factor | | | | | 6. | 6. | 6. | 6. | 6. | 6. | 6. | 6. | 6. |
| Heavy vehicles (%) | | | | | 7 | | C1 | | 7 | 7 | 2 | 7 | |
| Start-up fost time, 1, (s) | | | | | 61 | | 2 | | 2 | 2 | 2 | 2 | |
| Extension of effective green, e (s) | ireen, e (s) | | | | 2 | | 2 | | 2 | C1 | 7 | 2 | |
| Arrival type, AT | | | - | | ~ | | 3 | J. | m | 3 | | 3 | |
| Approach pedestrian volume (p/h) | olume (p/h) | | i | | | ٥ | | | 0 | | | 0 | |
| Approach Dicycle Volume (Dic/n) | ne (DIC/N) | | | | | 0 | | - | 0 | | | ٥ | |
| Leit/right parking (Y or N) | í s | | - | İ | Z | - | z | z | - | z | z | - | z |
| 5 | , | | - | | | | | | | | | | |
| ======================================= | R: RI P: P | Peds | Phase 2 | - | Phase 3 | Phase 4 | - | Phase 5 | Phase 6 | 9 9 | Phase 7 | - | Phase 8 |
| EB | | | | + | | | - | | | | | | |
| WB | L'E | - Maria | ~ | 1 | | | + | | | | | + | |
| NB | ~ | 1 | | | TR | | | | | 1 | | Lane | |
| SB | - | Ì | L | - | 5 | | - | | | 1 | | + | |
| Green (s) | 53 | 1 | 20 | | 29 | | - | | | 1 | | - | |
| Yellow + All red (s) | 5.1 | | 4,1 5.8 | day red | æ. [3 | 15.7 | 1 | | Critical | Critical w/c Datio | | 926 | |
| Intersection Performance | ormance | | | | | | | | | | | | 1 |
| | | | 83 | | | WB | | | NB BB | THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO | | SB | |
| Lane group configuration | on | | | | 7 | | ~ | | F | ~ | L | ٦ | |
| No. of lanes | | | | | - | | - | | 2 | - | _ | 2 | |
| Flow rate (veh/h) | | | | | 482 | | 392 | | 1420 | 480 | 246 | 1489 | |
| Capacity (veh/h) | | | | | 605 | | 298 | | 1533 | 1285 | 276 | 2085 | |
| Adjusted saturation flow (veh/h) | w (veh/h) | | | | 1770 | | 1583 | | 3547 | 1583 | 1770 | 3547 | |
| v/c ratio | | | | | 767. | | .492 | | .926 | .374 | 888. | .714 | |
| g/C ratio | | | | | .342 | | .504 | | .432 | .812 | .599 | .588 | |
| Average back of queue (veh) | (veh) | | | | 21.2 | | 11.9 | | 36.3 | 6.2 | = | 26.3 | |
| Uniform delay (s) | | | | | 46.1 | | 25.4 | | 41.7 | 3.9 | 51.3 | 22.7 | |
| Incremental delay (s) | | | | | 7.4 | | 5. | | 10 | 0 | 27.6 | 1.2 | |
| Initial queue delay (s) | | | | | 0 | | 0 | | 0 | 0 | 0 | 0 | |
| Delay (s) | | | | | 53.5 | | 25.9 | | 51.7 | 3.9 | 78.9 | 23.9 | |
| TOS | | | | | ۵ | | ပ | | Ω | ٧ | Œ | ပ | |
| Approach delay (s)/LOS | S | | _ | | 4 | ~ | D | 39.6 | - | ۵ | 31.7 | _ | ၁ |
| , , , | | | | | | | | | | | | | |

| | | | | | | | are mornano | | | | | | |
|--|--|-----------------|-------------------------|-----------|--|---|-----------------------------------|---|----------------|--------------------|-----------------|---------------------------------|------------|
| Analyst | WY | | | | | | 4 | | | | | 4/15 | 000 |
| Agency or Company | M&E PAC | | | | | Jurisc EB/W | Jurisdiction/Date FB/WB Street | ale | HINAI | HINALANI D | | 4 | 4/1 //2008 |
| Analysis Period/Year | AMB AM 2 | 2 | | 2020 | | NR/S | NB/SB Street | | OURE | OUEEN KAAH | Ξ | | |
| Comment 2020 / | 2020 AMB AM W/2 LT WB | 2 LT | ИВ | | П | | | | | | | | |
| Intersection Data | · · | | | | | | | | | | | | |
| Area type Other | Ar | Analysis period | eriod | .25 | ٦ | | Signal type | Actua | Actuated-Field | | % Back of queue | | 95 |
| | - | ŀ | æ | | | WB | | | RB | | | 88 | |
| | | 5 | Ŧ | RT | Ħ | 프 | RI | 17 | 프 | RI | בו | ≖ | R |
| Volume (veh/h) | | | | | 578 | | 443 | | 1266 | 613 | 285 | 1296 | |
| RTOR volume (veh/h) | | | | - | A STREET, STRE | *************************************** | 80 | - Anna Control | - | 8 | | | c |
| Peak-hour factor | | | | | 6. | 6. | 6. | 6. | 6. | 6. | 6: | 6 | 6 |
| Heavy vehicles (%) | | | | | 2 | | 2 | | 2 | 2 | 2 | , | |
| Start-up fost time, I ₁ (s) | (6 | | | | 2 | | 2 | | 2 | 2 | 1 61 | 2 2 | |
| Extension of effective green, e (s) | reen, e (s) | | | | 7 | | C1 | | 2 | 2 | 2 | , | |
| Arrival type, AT | | - | | | 3 | | 3 | | 3 | " | " | , " | |
| Approach pedestrian volume (p/h) | olume (p/h) | | | | | 0 | | | 0 | | | , c | |
| Approach bicycle volume (bic/h) | ne (bic/h) | | | | | 0 | | And the second | 0 | | | - | |
| Left/right parking (Y or N) | í í | | _ | | z | ~ | z | z | - | z | z | - | z |
| Signal Phasing Plan | lan | | | | | | | | | | | | : |
| g | Phase 1 | H | Phase 2 | Pha | Phase 3 | Phase 4 | - | Phase 5 | - | Phase 6 | Phase 7 | Н | Phase 8 |
| WB | LE | - | 2 | | | | - | | - | l | | - | |
| NB | ~ | | | F | TR | | H | | L | Ī | | - | |
| SB | | | 17 | | L. | | _ | | | | | + | |
| Green (s) | 40 | | 33 | 7 | 70 | | | | | | - | | |
| All red (s) | 5.1 | _ | 4.1 | 5 | 5.8 | | | | | | | L | |
| Cycle (s) | 28 | Los | Lost time per cycle (s) | r cycle (| (5) | 15.7 | 7 | | Critical | Critical v/c Ratio | | 1.039 | |
| Intersection Performance | ormance | | 8 | | | 9 | | | 4 | | | | |
| 9 | | ŀ | 3 - | | | QM. | | And designation of the least | S | | | 22 | - |
| No of James | = | + | + | T | ٦ , | | ≃ - | | - 0 | ≃ - | ٦. | ۱. | - |
| Flow rate (veh/h) | | + | t | T | 642 | | 403 | | 1407 | 520 | 212 | 71 5 | |
| Capacity (veh/h) | The same of the sa | | <u> </u> | | 870 | | 783 | | 1571 | 1160 | 417 | 2404 | |
| Adjusted saturation flow (veh/h) | (veh/h) | - | T | T | 3437 | | 1583 | | 3547 | 1583 | 1770 | 3547 | |
| v/c ratio | | <u> </u> | | | .738 | | 515 | - A PARAMETER AND A PARAMETER | 895 | 491 | .76 | 590 | |
| g/C ratio | | | | | 253 | | 494 | | .443 | .733 | 689 | 829 | |
| Average back of queue (veh) | (veh) | - | - | | 14.9 | | 12.9 | | 35 | 114 | 10.6 | 10.6 | |
| Uniform delay (s) | | | | | 54.2 | | 27.1 | | 40.6 | 000 | 48.1 | 13.8 | |
| Incremental delay (s) | | | H | | 3.4 | | 9 | | 7.1 | .~ | ∞ | 4 | |
| Initial queue delay (s) | | | | | 0 | | 0 | | 0 | 0 | 0 | : 0 | |
| Delay (s) | | | | | 57.6 | | 27.7 | | 47.7 | 9.1 | 56.1 | 14.2 | |
| T0S | | | | | Э | | ပ | | ۵ | A | ш | m | |
| Approach delay (s)/LOS | | | | | 46.1 | - | Q | 36.6 | | D | 21.8 | - | ပ |
| | | | | | | | | | | - | - | STREET, SQUARE, STREET, SQUARE, | - |

| Manyst | | | | | | | | | | | | |
|--|-----------------|---------------|-------|------|--------------|-------------------|----------------|------------|--------------------|---|----------|-----------|
| or C | | | | Ì | Olice III | one mormanon | | | | 444 | | |
| 0 9 # 1 | , | | | ı | Jurisdic | Jurisdiction/Date | • | | 2 | | 4/17 | 4/17/2008 |
| <u>a</u> # . | O. | | | | EB/WB Street | Street | -1 | HINALANID | ANID | | | |
| # | 12 | | 2020 | | NB/SB Street | Street | <u></u> | QUEEN KAAH | KAA | | | |
| Intersection Data Area type Other | V/2 LT | WB | | | | | | | | | | |
| ' | | | | | | | | | | | | |
| 40.00 | Analysis period | period | .25 | ٩ | Sign | Signal type | Actuated-Field | d-Field | | % Back of queue | | 95 |
| | | EB | | | WB | | | NB | | | SB | |
| | - | ¥ | RI | 5 | ⊭ | RT | 5 | ⊭ | RT | IJ | ∄ | 꾭 |
| Volume (veh/h) | | | | 578 | | 465 | | 1305 | 613 | 315 | 1401 | |
| RTOR volume (veh/h) | | | | | | 80 | | | 001 | | | 0 |
| Peak-hour factor | | | | 6: | 6. | 6: | 6. | 6. | 6: | 6: | 6. | 6: |
| Heavy vehicles (%) | | | | ۲۱ | | 2 | | 2 | 7 | 2 | 7 | |
| Start-up lost time, I ₁ (s) | | | | 2 | | 7 | | 7 | 4 | 2 | 2 | |
| Extension of effective green, e (s) | | - | | 2 | | 2 | | 2 | 7 | 2 | 2 | |
| Arrival type, AT | | | | 3 | | 3 | | 3 | 3 | 3 | 3 | |
| Approach pedestrian volume (p/h) | | | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | | | | | 0 | | | 0 | | 1 | 0 | |
| Left/right parking (Y or N) | | - | - | z | _ | z | z | - | z | z | - | z |
| Signal Phasing Plan | | | | | | | | | | | | |
| _ | P: Peds | | | | | | | | | | | |
| Phase 1 | e 1 | Phase 2 | Phase | 6.3 | Phase 4 | | Phase 5 | Phase | 9 | Phase 7 | + | Phase 8 |
| WR T D | - | a | | 1 | | 1 | | | | | + | |
| | | 4 | TR | ~ | | | | | l | | - | |
| - Const. | | E | - | | | + | | | | 000000000000000000000000000000000000000 | | |
| Green (s) 45 | | 4 | 8 | | Means | H | | | T | | | |
| All red (s) | _ | 4.1 | 8 | | | - | | | T | | <u> </u> | |
| 180 | | Lost time per | cycl | | 15.7 | | | Critical | Critical v/c Ratio | 1: | 1.059 | |
| Intersection Performance | | | | | | | | | | | | |
| The state of the s | | 83 | | | WB | | | æ | | | SS | |
| Lane group configuration | | | | ı | | ~ | | T | ~ | ר | Т | |
| No. of lanes | | | | 62 | | - | | 2 | - | - | 2 | |
| Flow rate (veh/h) | | | | 642 | | 428 | | 1450 | 570 | 350 | 1557 | |
| Capacity (veh/h) | | | | 859 | | 793 | | 1576 | 1151 | 435 | 2445 | |
| Adjusted saturation flow (veh/h) | | | | 3437 | | 1583 | | 3547 | 1583 | 1770 | 3547 | |
| v/c ratio | | | | .748 | | .54 | | .92 | .495 | 805 | .637 | |
| g/C ratio | | | | .25 | | .501 | | .444 | .727 | 669. | 689. | |
| Average back of queue (veh) | | | | 16.9 | | 15.7 | | 41.9 | 13.3 | 14.1 | 24.7 | |
| Uniform delay (s) | | | | 62.3 | | 30.8 | | 47 | 10.5 | 56.9 | 15.5 | |
| Incremental delay (s) | | | - | 3.6 | | 7. | | 9.1 | ε; | 10.6 | 9. | |
| Initial queue delay (s) | | | | 0 | | 0 | | 0 | 0 | 0 | 0 | |
| Delay (s) | | | | 62.9 | | 31.5 | | 56.1 | 10.8 | 67.5 | 191 | |
| \$07 | | | | ш | | ပ | | Ε | В | Ħ | В | |
| Approach delay (s)/LOS | | / | | 52.1 | _ | D | 43.3 | ~ | D | 25.5 | _ | ပ |
| Intersection delay (s)/ LOS | | | 38.4 | | | _ | _ | | | Q | | |

| Marsa PAC EBMB Street HINALANI D EBMB Street HINALANI D EBMB Street HINALANI D Cution Data EBMB AM W/2 LT WB AM W/2 LT WB EBMB AM W/2 LT W | HINALAN HINALAN | 2029 1 |
|--|--|--|
| MB/NB Sireel | Signal type HINALAN | RT LT TN W W C C C C C C C C C C C C C C C C C |
| Cution Data | 2029 NB/SB Street QUEEN K NB/SB Street QUEEN K NB/SB Street QUEEN K NB/SB Street | 2029 N |
| Colter | MB Signal type Actuated-Field WB NB NB NB NB NB NB NB | M N N N N N N N N N N N N N N N N N N N |
| Other | Signal type Actuated-Field WB NB NB NB NB NB NB NB | TH RT LT TH TT TT TT TT TT T |
| Other | Name | TH |
| Fig. 10 Fig. 10 Fig. 11 Fig. | NB NB NB NB NB NB NB NB | TH RT LT TH TH TH TH TH TH T |
| Interest | RT LT RT LT TH 607 443 1330 9 9 9 9 9 2 2 2 2 2 2 2 2 | Peds 1 |
| Miles (%) 130 644 285 185 185 186 | 443 1330 80 .9 .9 .9 2 2 2 2 2 2 2 2 2 3 3 3 | Peds 1 |
| Figure Carb(h) Figure Figure Carb(h) Figure Figure Carb(h) Figure Carb(h) Figure | 9 80 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | 15.7 1.5 |
| Problem Prob | .9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | 9 9 9 9 9 9 9 9 9 9 9 |
| December (New Property of Agencies (New Pr | 3 2 2 2 0 | 2 2 2 2 2 2 2 2 2 2 |
| State Color Colo | 3 2 2 0 0 0 0 | Peds 1 |
| Principle green, e (s) 2 2 2 2 2 2 2 2 2 | 3 2 2 0 0 0 | Peds 1 |
| Problem Prob | 0 0 | 3 0 0 1 1 N 1 N 1 N 1 N 1 N 1 N 1 N 1 N 1 N 1 N 1 N 1 N 1 N 1 N 1 N 1 N 1 N 1 N 1 N N |
| Phasing Plant Phase 1 Phase 2 Phase 3 Phase 4 Phase 5 Phase 7 Phase 7 Phase 1 Phase 1 Phase 1 Phase 2 Phase 3 Phase 4 Phase 5 Phase 7 Phase 7 Phase 7 Phase 6 Phase 7 | 0 | Peds Peds R R R TR LT LT LT LT LT A.1 5.8 Lost time per cycle (s) LS7 LOST time per cycle (s) LS7 LOST time per cycle (s) LS7 LOST time per cycle (s) LS7 LOST time per cycle (s) LS7 |
| Phasing Vor M | | Peds Peds Peds Peds Peds Peds Phase 2 Phase 3 Phase 4 TR LT LT LT A.1 5.8 Lost time per cycle (s) Lost time per cycle (s) LS7 |
| Tr. TH. R. RT. Pr. Perss. Tr. TH. R. RT. Pr. Perss. Tr. TH. R. R. T. R. R. T. R. R. R. R. R. R. R. R. R. R. R. R. R. | | Peds 1 Phase 2 Phase 3 Phase 4 1 R TR 1 LT 1 LT 3 3 70 4.1 5.8 Lost time per cycle (s) 15.7 |
| T: TH R RT P: Peds | z | Peds R |
| F. TH R. RT P. Peds Phase 3 Phase 4 Phase 5 Phase 6 Phase 7 Phase 1 Phase 1 Phase 1 Phase 1 Phase 1 Phase 1 Phase 2 Phase 3 Phase 4 Phase 5 Phase 6 Phase 6 Phase 7 Phase 1 | William Community of the Community of th | Peds Phase 2 |
| Phase 1 Phase 2 Phase 3 Phase 4 Phase 5 Phase 6 Phase 7 | The state of the s | Phrase 2 Phrase 3 Phrase 4 R |
| LR R TR TR TR TR TR TR | Phase 3 Phase 4 Phase 5 | R TR LT LT LT LT LT LT |
| R | | TR |
| R | R | TR LT 70 5.8 15.7 cycle (s) LS.7 LMB |
| Mil red (s) 2.1 LT LT S.8 T.0 T.1 LT LT LT LT LT LT LT L | TR | LT 70 5.8 15.7 cycle (s) LS.7 L WB |
| Mired (s) 5.1 4.1 5.8 15.7 Critical v/c Ratio Critical v/c | | 70 5.8 6ycle (s) 15.7 7 |
| 158 1.05t time per cycle (s) 15.7 Critical v/c Ratio 15.8 | | 5.8 15.7 cycle (s) 15.7 WB |
| 158 Lost time per cycle (s) 15.7 Critical v/c Ratio | 5.8 | Cycle (s) 15.7 WB |
| ton Performance | cycle (s) 15.7 | WB |
| pe configuration L R T R L es 2 1 2 1 | | WB |
| tes becombiguration | WB | |
| test best best best best best best best | R | |
| (verb(h)) 674 403 1478 604 317 (verb(h)) 870 783 1571 1160 417 saturation flow (verb(h)) 3437 1583 3547 1583 1770 ack of queue (verb) 16 123 494 423 177 blay (s) 54.8 27.1 42 9.1 48.5 blay (s) 6 0 0 0 0 0 ue delay (s) 6 0 0 0 0 0 0 e delay (s) 6 27.7 53.5 9.5 56.5 56.5 | - 2 | |
| Verbhb 870 783 1571 1160 417 saturation flow (verbh) 3437 1583 3547 1583 1770 mck of queue (verb) 1775 .515 .94 .521 76 mck of queue (verb) 16 12.9 .443 .733 .689 leby (s) 54.8 27.1 42.9 .1 48.5 at delay (s) 0 0 0 0 0 0 at delay (s) E C D A E E | 403 1478 | |
| seauration flow (verbh) 3437 1583 3547 1583 1770 seauration flow (verbh) .775 .515 .94 .521 .76 ack of queue (verb) 16 12.9 .94 .733 .689 letay (s) 54.8 27.1 .39.1 12.6 10.6 all delay (s) 4.4 .6 11.5 4.8.5 14.8.5 au e delay (s) 0 0 0 0 0 0 au e delay (s) E C D A E E | 783 1571 | |
| letay (s) 253 4.94 .443 .733 .689 and of queuze (verb) 16 12.9 39.1 12.6 10.6 letay (s) 24.8 27.1 42. 91.1 48.5 letay (s) 24.4 6.6 11.5 4.8 letay (s) 20.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0. | 1583 3547 | |
| teck of queue (veh) 16 12.9 39.1 12.6 10.6 leby (s) 27.1 42.9 17.3 .689 leby (s) 24.8 27.1 42. 9.1 48.5 leby (s) 44.4 .6 11.5 4 8 leby (s) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | .515 | |
| ack of queue (vert) 16 12.9 39.1 12.6 10.6 leday (s) 54.8 27.1 42. 9.1 48.5 and delay (s) 4.4 .6 11.5 .4 8 leday (s) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | .494 .443 | |
| letay (s) 54.8 27.1 42 9.1 48.5 ald delay (s) 4.4 6.6 11.5 .4 8 8 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 | 12.9 39.1 | |
| al delay (s) 6 11.5 .4 8 8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 27.1 42 | |
| ue delay (s) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | .6 | |
| 59.2 27.7 53.5 9.5 56.5 E C D A E | 0 | |
| E C D A | 27.7 53.5 | |
| | C D | |
| / D 40.7 / | / 47.4 / D 40.7 / D | , |
| Intersection delay (s)/ LOS 35.5 / D | 35.5 | 35.5 |

| MY | | | | | Site | Site Information | tion | | | | | |
|--|-----------------|---------------|--------------|---------|---------|------------------|------------------|------------|--------------------|-------------------|--|-----------|
| Company eriod/Year 2029 tion Da | | | | | hiriedi | hriediction/Date | | | | | 4/17 | 4/17/2008 |
| 2029 tion Da | 0 | | | | EB/WB | EB/WB Street | | HINALANI D | ANI D | | 1 | |
| 2029 tion Da | 2 | | 2029 | | NB/SB | NB/SB Street | | QUEEN KAAH | KAA | _ | | |
| ction Data | //2 LT V | VB&SB | | | | | | | | | | |
| Other | | | | | | | | | COMME | | | |
| | Analysis pariod | prior | 25 | ء | Sign | Signal Ivno | Actuated-Field | d-Field | į. | % Rach of ottorio | | 95 |
| | cickining | 0 0 | | | WP | | | a a | - | מרע הו אמ | 9 | |
| | ב | E | F | 5 | H | R | 17 | 三三 | RI | 5 | 를 | 2 |
| Volume (veh/h) | | | | 209 | | 495 | | 1480 | 644 | 340 | 1515 | |
| RTOR volume (veh/h) | | | | | | 80 | | | 100 | | | 0 |
| Peak-hour factor | | | | 6. | 6. | 6. | 6. | 6. | 6. | 6. | 6. | 6. |
| Heavy vehicles (%) | | | | 2 | | 2 | - | 2 | 2 | 2 | 7 | |
| Start-up lost time, I ₁ (s) | | | | 2 | | 2 | | 2 | 2 | 2 | 2 | |
| Extension of effective green, e (s) | | | | 7 | | 7 | | 7 | 2 | 2 | 7 | - |
| Arrival type, AT | | | - | 3 | | 3 | | 3 | 3 | 3 | 3 | |
| Approach pedestrian volume (p/h) | | | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | | | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | | _ | | z | - | z | z | - | z | z | _ | z |
| Signal Phasing Plan | | | | | | | | | | | | |
| LUTTH RRT P. | spa | | | | | | | | | | | |
| Phase 1 | + | Phase 2 | E. | Phase 3 | Phase 4 | + | Phase 5 | Phase 6 | 9 9 | Phase 7 | + | Phase 8 |
| WB | | ~ | | | | | | | | | - | |
| | | | - | TR | | | Name of the last | | | | THE PERSON NAMED IN COLUMN NAM | |
| SB | | 7 | 2 | LT | | 1 | | - | | | Mary Care of C | |
| Green (s) 35 | | 25 | 7 | 75 | | 100 | | | | | _ | |
| All red (s) | | 4.1 | 5 | 5.8 | | | | | | | | |
| Cycle (s) 150 | P | Lost time per | er cycle (s) | (s) | 15.7 | 7 | | Critical | Critical v/c Ratio | | 1.067 | |
| Intersection Performance | | | | | | | | | | | | |
| 1000 | | EB | | | WB | | | B | | | SB | |
| Lane group configuration | | | İ | ٦ | | × | | Ţ | ĸ | ٦ | Į- | |
| No. of lanes | Ì | | | 5 | | - | | C1 | - | 2 | 2 | OV. |
| Flow rate (veh/h) | | 1 | | 674 | | 461 | | 1644 | 604 | 378 | 1683 | |
| Capacity (veh/h) | | | | 802 | | 289 | | 1773 | 1222 | 1833 | 2461 | |
| Adjusted saturation flow (veh/h) | | | | 3437 | | 1583 | | 3547 | 1583 | 3437 | 3547 | |
| v/c ratio | | | | .841 | | 179. | | .927 | .495 | .206 | .684 | |
| g/C ratio | | | | .233 | | .434 | | 'n | .772 | .705 | 694 | |
| Average back of queue (veh) | | | | 1.91 | | 16.8 | | 40 | 10.3 | 2.9 | 23.7 | |
| Uniform delay (s) | | | | 54.8 | | 33.9 | | 35 | 6.3 | 23.6 | 13.4 | |
| Incremental delay (s) | | | | 80 | | 2.6 | | 6 | .3 | 0 | ∞. | |
| Initial queue delay (s) | - | | | 0 | | 0 | | 0 | 0 | 0 | 0 | |
| Delay (s) | | | | 62.8 | | 36.5 | | 44 | 9.9 | 23.6 | 14.2 | |
| 507 | | | | ш | | Ω | | ۵ | ٧ | ၁ | В | |
| Approach delay (s)/LOS | | _ | | 52.1 | - | ۵ | 33.9 | - | C | 15.9 | - | В |
| Intersection delay (s)/ LOS | | | 30,9 | | | 7 | , | | | C | | |

| | | | | | ; | ore illomation | 5 | | | | | |
|---|-----------------|----------|-------------------------|---------|----------|-------------------|---------|----------------|--------------------|-----------------|-------|-----------|
| Analyst ANALYST | ST | | | | Jurisdi | Jurisdiction/Date | ļ ' | | | | 3/26/ | 3/26/2008 |
| or Company | 4C | | | | EB/WB | EB/WB Street | , , | HINALANI D | ANI D | | | |
| Analysis Period/Year EX PM #1 Comment 2006 EXIST 3:30-4:30 PM | #1 30-4:30 P | Σ | 2006 | | NB/SB | NB/SB Street | | QUEEN KAAH | KAA | _ | | |
| Intersection Data | | | | | | | | | | | | |
| Area type Other | Analysis period | period | .25 | ء | Sign | Signal type | Actuate | Actuated-Field | | % Back of queue | | 95 |
| | | 83 | | | WB | | | BB BB | | | SS | Ì |
| | 17 | 프 | RI | 5 | ¥ | RI | 5 | 丰 | ₽ | 5 | 픋 | RI |
| Volume (veh/h) | | | | 300 | | 280 | | 550 | 445 | 175 | 650 | |
| RTOR volume (veh/h) | | | | | | 40 | | | 80 | | | 0 |
| Peak-hour factor | | | | 6. | 6. | 6. | 6: | 6. | 6. | 6. | 6. | e: |
| Heavy vehicles (%) | | | | 7 | - Lucian | 2 | | 2 | 2 | 2 | 7 | |
| Start-up lost time, I ₁ (s) | | | | 2 | | 7 | | 2 | 7 | 2 | 7 | 1 |
| Extension of effective green, e (s) | | | | 2 | | 7 | | 2 | 2 | 2 | 2 | |
| Arrival type, AT | | | | 3 | | 3 | | 3 | 3 | 3 | ~ | ĺ |
| Approach pedestrian volume (p/h) | | | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | | | | _ | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | | - | | z | - | z | z | - | z | z | _ | z |
| Signal Phasing Plan | | | | | | | | | | | | |
| L: LT T: TH R: RT P: | P: Peds | Dhaca 7 | - | Dhaca 3 | Phace 4 | - | Phase 5 | Dhace | 9 | Phase 7 | - | Phase 8 |
| | 1 200 | 7 2001 | + | 200 | 2 | ŀ | 2 | | - | | 1 | |
| | LR | | | | | | | | | | | |
| NB | | | _ | TR | | | | | | | | |
| SB | | LT | | LT | | - | | | | | | |
| | 28 | 23.1 | , | 44 | | | | | | | _ | |
| All red (s) | 5.1 | 4 | | 5.8 | 0 | - | | | | | 007 | |
| Cycle (s) 110 | | ost time | Lost time per cycle (s) | (s) | | | | Cutica | Critical V/C Katio | | 000. | |
| Intersection Performance | _ | 83 | | | WB | | | NB | | | SB | |
| l ane oroun configuration | | | | - | | R | | F | ~ | _ | ٤ | |
| No of lanes | | | | - | | - | | - | - | - | - | |
| Flow rate (veh/h) | _ | | | 333 | | 267 | | 611 | 406 | 194 | 722 | |
| Capacity (veh/h) | | | | 450 | | 403 | | 745 | 633 | 541 | 1204 | |
| Adjusted saturation flow (veh/h) | | | | 1770 | | 1583 | | 1863 | 1583 | 1770 | 1863 | |
| v/c ratio | | | | .74 | | .662 | | .82 | .64 | 36 | 9. | |
| q/C ratio | | | | .255 | | .255 | | 4. | 4. | .663 | .646 | |
| Average back of queue (veh) | | | | 10.6 | | 8.1 | | 19.3 | = | 2.9 | 14 | |
| Uniform delay (s) | | | | 37.7 | | 36.8 | | 29.5 | 26.6 | 11.3 | 11.2 | |
| Incremental delay (s) | | | | 6.4 | | 4 | | 7.3 | 2.2 | 0 | œ. | |
| Initial queue delay (s) | | | | 0 | | 0 | | 0 | 0 | 0 | 0 | |
| Delay (s) | | | | 44.1 | | 40.8 | | 36.8 | 28.8 | 11.3 | 12 | |
| S01 | | | | Ω | | Ω | | ۵ | ပ | В | В | |
| Approach delay (s)/LOS | | _ | | 42.6 | _ | ۵ | 33.6 | - | ပ | 11.9 | - | В |
| | | | 0 | | | | - | | | ر | | |

| Analyst ANALYST | ST | | 1,000 | | hrisdi | hrisdiction/Date | 9 | | | | 3/26 | 3/26/2008 |
|-------------------------------------|-----------------|------------|-------------------------|------|--------------|------------------|----------------|------------|--------------------|---------------|------------|-----------|
| or Company | 4C | | | ı | EB/WB Street | Street | ' | HINALANI D | ANID | | | |
| | #2 | | 2006 | | NB/SB Street | Street | 0 | QUEEN KAAH | KAA | = | | |
| Comment 2006 EXIST 4:30-5:30 PM | 10-5:30 PN | | | | | | | | | | | |
| Intersection Data | | | | | | | | | | | | |
| Area type Other | Analysis period | riod | .25 | ء | Sign | Signal type | Actuated-Field | d-Field | % | Back of queue | | 95 |
| | | 89 | | Ī | WB | | | NB | | | SB | |
| | 5 | = | E | 5 | Ĕ | E S | 5 | ∄ 3 | RT | בי | = 3 | ≅ |
| volume (ven/n) | | | | 7007 | | 0/7 | | 220 | 200 | COL | 420 | j. |
| RTOR volume (veh/h) | 1 | 1 | + | 6 | 6 | 40 | c | c | 200 | - | 6 | 9 |
| Heavy vehicles (%) | | | | , , | | ; c | | | ن د | , , | , , | ر |
| Start-un fost time. I. (s) | | T | t | , , | | , | | 2 | , | 2 | , | |
| Extension of effective green, e (s) | | - | | 2 | Ī | 2 | | 7 | 1 21 | 1 2 | 1 2 | |
| Arrival type, AT | | T | | | | m | | m | 3 | 3 | m | |
| Approach pedestrian volume (p/h) | | | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | | | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | | _ | | z | - | z | z | - | z | z | - | z |
| Signal Phasing Plan | | | | | | | | | | | | |
| LUT THER | eds | | | | | | | | | | | |
| Pha | Phase 1 P | Phase 2 | Phase 3 | 33 | Phase 4 | + | Phase 5 | Phase | 9 9 | Phase 7 | + | Phase 8 |
| | <u>~</u> | | | + | | | | | | | - | |
| NB NB | | | TR | | | _ | | _ | | | _ | |
| SB | | LT | LT | | | | | | | | | |
| | | 23.1 | 44 | | | | | | | | | |
| All red (s) | 5.1 | 4 | 5.8 | | 9 | - | | | | | | 1 |
| Cycle (s) 110 | | at time pe | Lost time per cycle (s) | | 7.0 | | | Cutical | Critical v/c Katio | | 710. | |
| | | EB | | | WB | | | 9 | | | SB | |
| Lane group configuration | | | | | | ~ | | L | ~ | | T | |
| No. of lanes | | | | _ | | - | | - | - | - | - | |
| Flow rate (veh/h) | | | | 289 | | 256 | | 119 | 311 | 117 | 544 | |
| Capacity (veh/h) | | | | 450 | | 403 | | 745 | 633 | 541 | 1204 | |
| Adjusted saturation flow (veh/h) | | | | 1770 | | 1583 | | 1863 | 1583 | 1770 | 1863 | |
| v/c ratio | | | - | .641 | | .634 | | .82 | .491 | .216 | .452 | İ |
| g/C ratio | | | - | .255 | | .255 | | 4. | 4. | .663 | .646 | |
| Average back of queue (veh) | | | İ | 8.7 | | 7.7 | | 19.3 | 7.7 | 1.5 | 6 | |
| Uniform delay (s) | | | | 36.5 | | 36.4 | | 29.5 | 24.6 | 10.5 | 9.7 | İ |
| Incremental delay (s) | | | | 3.1 | | 3.3 | | 7.3 | 9. | 0 | .2 | |
| Initial queue delay (s) | | | | 0 | | 0 | | 0 | 0 | 0 | 0 | |
| Delay (s) | | | | 39.6 | | 39.7 | | 36.8 | 25.2 | 10.5 | 6.6 | |
| 507 | | | | Ω | | ۵ | | ۵ | ပ | В | ٧ | |
| Approach delay (s)/LOS | | | | 39.7 | - | ۵ | 32.9 | - | ပ | 2 | - | ¥ |
| | | | 375 | | | | | | | Ü | | |

| | | | | | | 1 | ore mornianon | 5 | | | | | |
|--|---------------|----------|-----------------|---|-------|--------------|-------------------|----------------|------------|--------------------|--|----------|-----------|
| Analyst | WY | | | | | Jurisdi | Jurisdiction/Date | a | | | | 4/17 | 4/17/2008 |
| or Company | M&E PAC | 1 | | | | EB/WB Street | Street | 1 | HINALANI D | ANI D | | | |
| ٠. | AMB PM | | | 2015 | l | NB/SB Street | Street | 0 | OUEEN KAAH | KAA | ļ.,. | | |
| Comment 2015 AN | AMB PM W/ 1LT | ILT | WB LANE | NE | | | | | | | | | |
| Intersection Data | | | | | | | | | | | | | |
| Area type Other | ٠ ا | nalysis | Analysis period | .25 | ٦ | Sign | Signal type | Actuated-Field | d-Field | | % Back of queue | 1 | 95 |
| | | | EB | | | WB | | | 28 | | | SB | li |
| | | 5 | E | RI | 5 | Ħ | RI | 5 | ₽ | RI | = | 프 | R |
| Volume (veh/h) | | | | | 615 | | 360 | | 1174 | 669 | 260 | 1383 | |
| RTOR volume (veh/h) | | | | | | | 80 | | | 100 | | | 0 |
| Peak-hour factor | | | | | 6: | 6: | 6: | 6. | 6: | 6: | 6. | 6. | 6. |
| Heavy vehicles (%) | | | | | 7 | | 2 | | 2 | 7 | 2 | 2 | |
| Start-up lost time, I ₁ (s) | | | | | 2 | | 7 | | 2 | 2 | 2 | 2 | |
| Extension of effective green, e (s) | en, e (s) | | | | 2 | | 2 | | 2 | 2 | 2 | 2 | |
| Arrival type, AT | - | | | | 3 | | 3 | | 3 | 3 | 3 | 3 | |
| Approach pedestrian volume (p/h) | (h/h) amr | | | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | (bic/h) | | | | | 0 | | | 0 | | The same of the sa | 0 | |
| Left/right parking (Y or N) | | | , | | z | - | z | z | - | z | z | - | z |
| Signal Phasing Plan | u. | | | | | | | | | | | | |
| LIT THE R | _ | P. Peds | - | | | | | | | | | | |
| | Pha | | Phase 2 | Phase | se 3 | Phase 4 | 4 | Phase 5 | Phase 6 | 9 9 | Phase 7 | 푼 | Phase 8 |
| WB | LR | H | × | | | | - | | | T | | L | |
| NB | 2 | H | | - | TR | | - | | | | | - | |
| SB | | <u> </u> | LI | | LT | | _ | | | | | | |
| Green (s) | 65 | H | 25 | | 70 | | - | | | | | | |
| Yellow + All red (s) | 5.1 | | 1.4 | 5 | 5.8 | | | | | | | | |
| Cycle (s) 17. | 2 | | Lost time per | cycl | (s) | 6.6 | | | Critical | Critical v/c Ratio | | .597 | , i |
| Intersection Performance | mance | | | | | | | | | | | | 1 |
| | | | 83 | *************************************** | | WB | | | 98 | | | æ | |
| Lane group configuration | | | | | 7 | | ~ | | Т | ~ | IJ | <u>-</u> | |
| No. of lanes | | | | | - | | - | | 2 | - | - | 2 | İ |
| Flow rate (veh/ħ) | _ | | | | 683 | | 311 | | 1304 | 999 | 289 | 1537 | |
| Capacity (veh/h) | | | | | 657 | | 860 | | 1419 | 1274 | 295 | 2008 | |
| Adjusted saturation flow (veh/h) | (veh/h) | | | | 1770 | | 1583 | | 3547 | 1583 | 1770 | 3547 | |
| v/c ratio | | | | | 1.04 | | .362 | | 616. | .522 | 876. | .765 | |
| g/C ratio | | | | | .371 | | .543 | | 4. | 805 | .576 | .566 | |
| Average back of queue (veh) | reh) | | | | 43.3 | | 9.1 | | 37.2 | 12.2 | 17.3 | 33.2 | |
| Uniform delay (s) | | | | | 55 | | 22.7 | | 49.8 | 5.8 | 61.1 | 29 | |
| Incremental delay (s) | | | | | 45.8 | | 0 | | 6.6 | 4. | 46.2 | 8:- | |
| Initial queue delay (s) | | | | | 0 | | 0 | | 0 | 0 | 0 | 0 | |
| Delay (s) | | | | | 100.8 | | 22.7 | | 59.7 | 6.2 | 107.3 | 30.8 | |
| 105 | | | | | Ŀ | | ၁ | | ы | Ą | Œ | ပ | |
| Approach delay (s)/LOS | | | , | | 76.4 | - | ы | 41.6 | - | D | 42.9 | _ | D |
| Intersection delay (s)/ LOS | S | | | 49.3 | | | | | | | D | | |
| | | - | | | | | | | | - Contract | - | | 1 |

| Analyst WY | | - | - | | | | | | | | - |
|--|----------|-------------------------|--------------|--------|---------------------|----------------|------------|--------------------|-----------------|-----------|---------|
| Company | | | | | | | | | | 4117 | 000 |
| | 2 | | | Juris | Jurisdiction/Date | | | | | 4/1//7008 | 3 |
| | M&E PAC | | | EB/W | EB/WB Street | 1 | HINALANID | ANIO | | | |
| Analysis Period/Year TO | TOT PM | | 2015 | NB/S | NB/SB Street | 0 | QUEEN KAAH | IKAA | I | | |
| Comment 2015 TOT PM W/ 1LT WB LANE | PM W/ 1L | WB LA | Ϋ́E | | | | | | | | |
| Intersection Data | | | | | | | | | | | |
| Area type Other | Analy | Analysis period | .25 | h Sic | Signal type | Actuated-Field | ed-Field | | % Back of queue | | 95 |
| | | 83 | | WB | | | NB | | | SB | |
| | ב | Ξ | RT | Ξ | ₽ | בו | Ħ | E | 5 | | R |
| Volume (veh/h) | | | 615 | 5 | 385 | | 1249 | 669 | 270 | 1443 | |
| RTOR volume (veh/h) | | | | | 80 | | | 100 | | | 0 |
| Peak-hour factor | | | 6. | 6. | 6. | 6. | 6. | 6, | 6. | 6: | 6. |
| Heavy vehicles (%) | | | 2 | | 7 | | 2 | 2 | 2 | 2 | |
| Start-up lost time, I ₁ (s) | | | C1 | | 7 | | 2 | 7 | 2 | 21 | |
| Extension of effective green, e (s) | e (s) | | C1 | | 2 | | 2 | 2 | 2 | 2 | |
| Arrival type, AT | | | | | 3 | | 3 | m | 3 | m | |
| Approach pedestrian volume (p/h) | (h/h) | | | 0 | | | 0 | | | 0 | ļ |
| Approach bicycle volume (bic/h) | ic/h) | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | | _ | | ~ z | z | z | - | z | z | - | z |
| Signal Phasing Plan | | | | | | | | | | | |
| LU TH R. RT | | 1 | | | | | | | | | |
| e | Phase 1 | Phase 2 | Phase 3 | Phase | 4 | Phase 5 | Phase 6 | 9 9 | Phase 7 | £ | Phase 8 |
| WB | L, | ~ | | _ | l | | | | | - | |
| NB | ~ | | TR | | | | | İ | | | |
| SB | | LT | 5 | | - Landerson | | | | | | |
| Green (s) | 65 | 25 | 70 | | | | | | | | |
| Vellow + All red (s) | 5.1 | 4.1 | 5.8 | | | | | | | | |
| Cycle (s) 175 | | Lost time per cycle (s) | er cycle (s) | 6 | 6.6 | | Critical | Critical v/c Ratio | | 1.106 | |
| Intersection Performance | ance | | | | | | | | | | |
| | | EB | | WB | | | æ | | | SB | |
| Lane group configuration | | | 7 | | ~ | | Т | ~ | -1 | £- | |
| No. of lanes | | | - | | - | | 2 | - | - | C1 | |
| Flow rate (veh/h) | | | 683 | 3 | 339 | | 1388 | 999 | 300 | 1603 | |
| Capacity (veh/h) | | | 657 | 7 | 860 | | 1419 | 1274 | 295 | 2008 | |
| Adjusted saturation flow (veh/h) | (tl/c | | 1770 | 0, | 1583 | | 3547 | 1583 | 1770 | 3547 | ĺ |
| v/c ratio | | | 1.04 | 4 | 394 | | 876. | .522 | 1.016 | 862. | |
| g/C ratio | | | .371 | - | .543 | | 4. | 805 | .576 | .566 | |
| Average back of queue (veh) | | | 43.3 | 3 | 10.2 | | 42.8 | 12.2 | 19 | 36.1 | |
| Uniform delay (s) | | | 55 | | 23.2 | | 51.7 | 8.8 | 62.2 | 30 | |
| Incremental delay (s) | | | 45.8 | ∞. | -: | | 18.8 | 4. | 56.4 | 2.4 | |
| Initial queue delay (s) | | | 0 | | 0 | | 0 | 0 | 0 | 0 | |
| Delay (s) | | | 100.8 | 8. | 23.3 | | 70.5 | 6.2 | 118.6 | 32.4 | |
| T0S | | | Ŀ | | ပ | | ы | ٧ | Œ | ပ | |
| Approach delay (s)/LOS | | ' | 7: | 75.1 / | Э | 49.7 | 1 | D | 46 | _ | Q |
| | | | | | | | | | 2 | | |

| Analyst Agency or Company | | | | | | | | ore morning | | | | | |
|--|-----------------------|-----------------|-------------------------|-----------|---------|---------|-------------------|----------------|----------|--------------------|-----------------|------|-----------|
| or Company | WY | - | | | | hrisdi | Inrisdiction/Date | ٩ | | | | 4/17 | 4/17/2008 |
| | M&E PAC | | | | | EB/WB | EB/WB Street | | IINAL | HINALANI D | | | |
| Analysis Period/Year | AMB PM | 2 | | 2020 | | NB/SB | NB/SB Street | , 0 |)UEEN | QUEEN KAAH | Ξ | | |
| Comment 2020 A | 2020 AMB PM W/ 2LT WB | // 2L.T | WB L | LANE | | | | | | | | | |
| Intersection Data | | | | | | | | | | | | | |
| Area type Other | | Analysis period | period | .25 | = | Sign | Signal type | Actuated-Field | d-Field | | % Back of queue | | 95 |
| | | | æ | | | WB | | | SN SN | | | SB | |
| | | 5 | 프 | RI | П | Ξ | RT | בו | Ħ | RI | П | Ħ | RT |
| Volume (veh/h) | | | | | 559 | | 374 | | 1165 | 739 | 392 | 1247 | |
| RTOR volume (veh/h) | | | | | | | 80 | | | 100 | | | 0 |
| Peak-hour factor | | | | | 6: | 6: | 6. | 6. | 6. | 6. | 6. | 6: | 6. |
| Heavy vehicles (%) | | | | | 2 | | 2 | | 2 | 7 | 2 | 7 | |
| Start-up lost time, I ₁ (s) | | | | | 2 | | 7 | | CI | 2 | 7 | 7 | |
| Extension of effective green, e (s) | reen, e (s) | | | | 2 | | 2 | | 2 | 2 | 2 | 7 | |
| Arrival type, AT | | | | | 3 | | 3 | | 3 | 3 | 3 | ~ | |
| Approach pedestrian volume (p/h) | lume (p/h) | | | | | 0 | | | 0 | | | 0 | , |
| Approach bicycle volume (bic/h) | ne (bic/h) | | | | | 0 | | | 0 | | | 0 | |
| Lett/right parking (Y or N) | 2 | | - | | z | - | 2 | Z | - | z | z | - | z |
| Signal Phasing Plan | an | YALL ST | | MA . | | | | | | | | | |
| H 1 | _ | P. Perk | | | | | | | | | | | |
| | P. | - | Phase 2 | \vdash | Phase 3 | Phase 4 | Н | Phase 5 | Pha | Phase 6 | Phase 7 | - | Phase 8 |
| | | | | - | | | - | | | + | | - | |
| WB | H. | + | ~ | - | 1 | | + | | | \dagger | | + | |
| D. Carrier | × | | | | ¥ | | | | Ì | 1 | | | |
| - | | 1 | 5 | - | -1 | - | + | | | | | | |
| Green (s) | 35 | 1 | 40 | | 20 | | 1 | | | 1 | | - | |
| All red (s) | 5.1 | - | 4.1 | 4, | 5.8 | Š | - | | | 7 | | | |
| Cycle (s) 160 | 000 | | Lost time per cycle (s) | per cycle | © | y.y. | | | Critical | Critical v/c Ratio | | 4 | |
| TIO I IONIDAGIO | 2 | | 83 | | | WB | | | 8 | | | SB | |
| Lane group configuration | 5 | | | | -7 | | 2 | | į- | × | 7 | Ę., | L |
| No. of lanes | | | | | 2 | | - | | 2 | - | - | 64 | |
| Flow rate (veh/h) | | | | | 621 | | 327 | | 1294 | 710 | 436 | 1386 | |
| Canacity (veh/h) | | | | | 752 | | 793 | | 1552 | 1096 | 495 | 2529 | |
| Adjusted saturation flow (veh/h) | (veh/h) | | | | 3437 | | 1583 | | 3547 | 1583 | 1770 | 3547 | |
| v/c ratio | | | | | .826 | | .412 | | .834 | .648 | 88. | .548 | |
| o/C ratio | | | | | .219 | | .501 | | .438 | .693 | .724 | .713 | |
| Average back of gueue (veh) | (veh) | | | | 15.7 | | 9.7 | | 30.3 | 19.4 | 17.8 | 16.6 | |
| Uniform delay (s) | | | | | 59.6 | | 25.1 | | 39.9 | 13.7 | 48.7 | 10.8 | L |
| Incremental delay (s) | | | | | 7.6 | | - | | 4.1 | 1.3 | 16.5 | 6 | |
| Initial guene delay (s) | | | | | 0 | | 0 | | 0 | 0 | 0 | 0 | |
| Delav (s) | 0.000 | | - | | 67.2 | | 25.2 | | 44 | 15 | 65.2 | Ξ | |
| 105 | | | | | ш | | C | | Q | В | ш | В | |
| Approach delay (s)/LOS | | | - | | 52.7 | - | ۵ | 33.7 | - | ပ | 24 | _ | ပ |
| Polyton dolor (A) 100 | 30 | | | 33.8 | | | | | | | ٥ | | |

| | | | | | | | The second second | | | | | | |
|-------------------------------------|-----------------------|-----------------|-------------------------|-----------|---------|---------|-------------------|---------|----------------|--------------------|-----------------|-------|-----------|
| Analyst | WY | | | | | linisdi | Inrisdiction/Date | | | | | 4/11/ | 4/17/2008 |
| Agency or Company | M&E PAC | | | | | EBAWE | EB/WB Street | | HINALANI D | ANID | | | |
| Analysis Period/Year | TOT PM 2 | | | 2020 | | MB/SB | MB/SB Street | , • | OUEEN KAAH | KAAI | _ | | |
| Comment 2020 | 2020 TOT PM W/ 2LT WB | 2LT | WB LA | LANE | ιÌ | | | ' | | | | | H |
| Intersection Data | a | | | | | 400 | | | | | | | |
| Area type Other | | Analysis period | period | .25 | - | Sign | Signal type | Actuate | Actuated-Field | | % Back of queue | | 95 |
| | | | æ | | | WB | | | NB NB | | | æ | |
| | | 17 | ⊭ | RI | 11 | 프 | RT | - | ž | RI | 5 | H | RT |
| Volume (veh/h) | | | | | 559 | | 417 | | 1295 | 739 | 425 | 1355 | |
| RTOR volume (veh/h) | | | | | | | 08 | | | 100 | | | 0 |
| Peak-hour factor | | | | | 6. | 6. | 6. | 6. | 6. | 6. | 6. | 6. | 6. |
| Heavy vehicles (%) | | | | | 2 | | 2 | | 2 | 7 | 2 | 2 | |
| Start-up lost time, 1, (s) | (s | | | | 7 | | 7 | | 2 | 7 | 2 | C1 | |
| Extension of effective green, e (s) | green, e (s) | | | | 2 | | 2 | | 2 | 2 | 2 | 7 | |
| Arrival type, AT | | | | | 3 | | 3 | | 3 | 3 | 3 | 3 | |
| Approach pedestrian volume (p/h) | (h/d) aunio | | | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | me (bic/h) | | | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | N. | | - | | z | - | z | z | - | z | z | _ | z |
| Signal Phasing Plan | Jan | | | | | | | | | | | | |
| LU TH | R. RT P. | P: Peds | | | | | | | | | | | |
| au | Phase 1 | | Phase 2 | £ | Phase 3 | Phase 4 | 4 | Phase 5 | Phase | 9 99 | Phase 7 | + | Phase 8 |
| WB | L | H | ~ | - | | | \vdash | | | T | | - | Ì |
| NB | ~ | | | | TR | | _ | | | | | | |
| SB | | | IJ | | LT | | | | | | | | |
| Green (s) | 35 | | 45 | | 70 | | | | | | | | |
| Yellow + All red (s) | | | 4.1 | | 5.8 | | | | | | | | |
| Cycle (s) 165 | 165 | _ | Lost time per cycle (s) | per cycle | (S) | 9.6 | | | Critical | Critical v/c Ratio | | .761 | |
| | | | 83 | | | WB | | | 88 | | | SS | |
| Lane group configuration | ion | | | | ٦. | | ~ | | ٦ | ~ | | Ţ | |
| No. of lanes | | | | | 7 | | | | 2 | - | - | 2 | |
| Flow rate (veh/h) | | | | | 621 | | 374 | | 1439 | 710 | 472 | 1506 | |
| Capacity (veh/h) | | | | | 729 | | 817 | | 1505 | 1063 | 528 | 2560 | |
| Adjusted saturation flow (veh/h) | w (veh/h) | | | | 3437 | | 1583 | | 3547 | 1583 | 1770 | 3547 | |
| v/c ratio | | | | | .852 | | .459 | | 926. | 899. | .895 | .588 | |
| g/C ratio | | | | | .212 | | 516 | | .424 | .672 | .732 | .722 | |
| Average back of queue (veh) | (veh) | 10.00 | | | 16.5 | | 11.6 | | 40.7 | 21.4 | 20.4 | 19.2 | |
| Uniform delay (s) | | | | | 62.5 | | 25.3 | | 46 | 16.1 | 51.1 | 1.11 | |
| Incremental delay (s) | | | | | 9.6 | | E. | | 14.2 | 1.6 | 17.7 | 4. | |
| Initial queue detay (s) | | | | | 0 | | 0 | | 0 | 0 | 0 | 0 | |
| Delay (s) | | | | | 72.1 | | 25.6 | | 60.2 | 17.7 | 8.89 | 11.5 | |
| T0S | | | | | Э | | ပ | | EIJ | В | Œ | В | |
| Approach delay (s)/LOS | S | | _ | | 54.6 | - | Ω | 46.2 | - | D | 25.2 | - | ပ |
| Olyton dolay (c) 100 | 201 | | | 30 7 | | | | | | | Q | | |

| U. C. C. C. C. C. C. C. C. C. C. C. C. C. | | | | | | | | | | | | | |
|---|-----------------------|-----------------|--------|---------|------|--------|-----------------------------------|--------|----------------|--------------------|-----------------|-------|-----------|
| | WV | | | | | Ludian | intinu (De | 1 | | | | 4/17/ | 4/17/2008 |
| Analyst Analyst N | M&R PAC | | | | 1 | Jurisd | Jurisdiction/Date EB/MR Straet | | HINALANI D | ANID | | - | 7000 |
| ٦. | AMB PM 2 | | | 2029 | | MB/SF | MR/SR Street | , - | OUEEN KAAH | KAAI | _ | | |
| Comment 2029 AIM | AMB PM W/ 2LT WB LANE | 2LT | WB LA | NE | H | | | ' | | | | | |
| Intersection Data | | | | | | | | | | | | | |
| Area type Other | A | Analysis period | period | .25 | - | Sig | Signal type | Actuat | Actuated-Field | | % Back of queue | ļI | 95 |
| | | | 89 | | | WB | | | BB | | | 83 | |
| | | 5 | Ξ | E | 5 | E | E. | 'n | Ξ | ₩ | = | E | RI |
| Volume (veh/h) | | | | | 587 | | 412 | | 1328 | 776 | 438 | 1256 | |
| RTOR volume (veh/h) | | | | | | | 80 | | | 001 | | | 0 |
| Peak-hour factor | | | | | 6. | 6. | 6. | 6. | 6. | 6. | 6. | 6. | 6. |
| Heavy vehicles (%) | | | | | 2 | | 7 | | 2 | 2 | 7 | 2 | |
| Start-up lost time, 11 (s) | | | | | 2 | | 7 | | 2 | 2 | 2 | 2 | |
| Extension of effective green, | en, e (s) | | | | 2 | | 2 | | 2 | 2 | 2 | 2 | |
| Arrival type, AT | | | | | ю | | 3 | | 3 | 3 | т | 3 | |
| Approach pedestrian volume (p/h) | me (p/h) | | | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | (bic/h) | | | | | 0 | | | 0 | | | 0 | |
| Lett/right parking (Y or N) | | | - | | z | - | z | z | - | z | z | - | z |
| Signal Phasing Plan | _ | | | | | | | | | | | | |
| EB WB | LR | - | ~ | | | | | | | | | - | |
| NB | ~ | | | | TR | | | | | | | | |
| SB | | | LT | | LI | | | | | | | | |
| Green (s) | 35 | | 40 | | 70 | | | | | | | | |
| Vellow + All red (s) Cycle (s) 160 | 5.1 | | 4.1 | 1.1 5.8 | 5.8 | 6.6 | - 6 | | Critical | Critical v/c Ratio | | .772 | |
| Intersection Performance | mance | | | | | | | | | | | | |
| | | | 83 | | | WB | | | 88 | | | SB | |
| Lane group configuration | | | | | 77 | | В | | - | N. | | T | |
| No. of lanes | | | | | 2 | | - | | 2 | - | - | 2 | |
| Flow rate (veh/h) | | | | | 652 | | 369 | | 1476 | 751 | 487 | 1396 | |
| Capacity (veh/h) | | | | | 752 | | 793 | | 1552 | 1096 | 489 | 2529 | |
| Adjusted saturation flow (veh/h) | (veh/h) | | | | 3437 | | 1583 | | 3547 | 1583 | 1770 | 3547 | |
| v/c ratio | | | | | 898. | | .465 | | 156. | .685 | 566. | .552 | |
| g/C ratio | | | | | 219 | | .501 | | .438 | .693 | .724 | .713 | |
| Average back of queue (veh) | eh) | | | | 17 | | 4.1 | | 40.2 | 21.7 | 27.3 | 8.91 | |
| Uniform delay (s) | | | | | 60.3 | | 56 | | 43.3 | 14.4 | 53.4 | 6.01 | |
| Incremental delay (s) | | | | | 9.01 | | ٤, | | 13.1 | -S. | 39.4 | 3 | |
| Initial queue delay (s) | | | | | 0 | | 0 | | 0 | 0 | 0 | 0 | |
| Delay (s) | | | | | 70.9 | | 26.3 | | 56.4 | 16.2 | 92.8 | 11.2 | |
| 507 | | | | | ш | | ၁ | | ы | В | Ŧ | В | |
| Approach delay (s)/LOS | | | _ | | 54.8 | _ | ۵ | 42.9 | _ | ۵ | 32.3 | _ | ပ |
| | | | | | | | | | | | , | | |

| | - THE CO. LEWIS CO. LANSING. | | | | | | | | | | | |
|--|------------------------------|-------------------------|-------------|------|--------------|-------------------|----------------|------------|--------------------|-----------------|-----------|--------------|
| Analyst | WY | | | | Jurisdic | Jurisdiction/Date | | | | | 4/17/2008 | 2008 |
| or Company | M&E PAC | | | i l | EB/WB Street | Street | ' | HINALANI D | O IN | | | |
| Analysis Period/Year T | TOT PM 2 | | 2029 | | NB/SB Street | Street | 9 | UEEN | QUEEN KAAH | _ | | |
| Comment 2029 TO | 2029 TOT PM W/ 2LT WB | LT WB &SE | &SB LANES | S | | | | | | | | |
| Intersection Data | | | | | | | | | | | | |
| Area type Other | Ana Ana | Analysis period | .25 | ٤ | Signi | Signal type | Actuated-Field | d-Field | | % Back of queue | | 95 |
| | _ | 1 | | | WB | | ! | NB | 1 | | SB | 1 |
| Mohima (veh/h) | | = | 2 | 1785 | Ξ | K1 | 3 | 1540 | 776 | 505 | 1450 | 2 |
| PTOP volume (veh/h) | | | | | Ī | 8 | - | | 100 | | | c |
| Peak-hour factor | l | | | 6: | 6: | 6. | 6: | 6. | 6 | 6. | 6: | 6 |
| Heavy vehicles (%) | | | | 2 | | 2 | | 21 | 2 | 2 | 2 | |
| Start-up lost time, I ₁ (s) | | | | 2 | | 2 | | 2 | 2 | 2 | 2 | |
| Extension of effective green, e | in, e (s) | | | 2 | | 2 | | 6 | 7 | 2 | 2 | |
| Arrival type, AT | | | | 3 | | 3 | | 3 | 3 | 3 | 3 | |
| Approach pedestrian volume (p/h) | me (p/h) | | | | 0 | | | 0 | | | 0 | |
| Approach bicycle volume (bic/h) | (bic/h) | | | | 0 | | | 0 | | | 0 | |
| Left/right parking (Y or N) | | 1 | | z | _ | z | z | _ | z | z | _ | z |
| ar Fridasing r | | | | | | | | | | | | |
| | R: RI P: Peds | Phase 2 | Phase | 23 | Phase 4 | - | Phase 5 | Phase | 9 9 | Phase 7 | - | Phase 8 |
| 89 | | | | | | 1 | | | | | - | |
| WB | LR | ~ | | | | | | | | | | |
| NB | ~ | | TR | ~ | | | | | | | | |
| SB | | LT | LT | _ | | | | | | | | |
| Green (s) | 20 | 20 | 105 | 5 | | | | | | | - | N CONTRACTOR |
| All red (s) | 5.1 | 4.1 | 5.8 | ~ | | - | | | - | | | |
| Cycle (s) 190 | | Lost time per cycle (s) | er cycle (s | | 2 | | | Critical | Critical v/c Ratio | | 201.1 | |
| Intersection Performance | mance | | | | | | | | | | | |
| | | æ | | | WB. | | | 2 | | | 8 | - |
| Lane group configuration | | | | _ | | ~ | | - | ~ | -1 | - | |
| No. of lanes | | | - | 7 | | - | | 2 | - | 7 | 2 | 1,1,000 |
| Flow rate (veh/h) | | | 1 | 700 | | 427 | | | 10/ | 100 | 101 | |
| Capacity (veh/h) | | | | 904 | | 626 | | 1960 | 1340 | 2427 | 2410 | |
| Adjusted saturation flow (veh/h) | veh/h) | | | 3437 | | 1383 | | 324/ | 1383 | 7640 | 3547 | |
| v/c ratio | | | | .721 | | .723 | - | .8/3 | .261 | .345 | .009 | |
| g/C ratio | | | | .263 | | .395 | | .553 | .846 | 889. | 629. | |
| Average back of queue (veh) | gh) | | | 17.7 | | 22.2 | | 9.94 | 13.2 | 6.4 | 28.6 | |
| Uniform delay (s) | | | | 63.7 | | 48.6 | | 36.7 | 4.3 | 31.1 | 17.9 | |
| Incremental delay (s) | | | | 2.8 | | 4.1 | | 4.7 | s. | 0 | 7. | |
| Initial queue delay (s) | | | | 0 | | 0 | | 0 | 0 | 0 | 0 | |
| Delay (s) | | | | 66.5 | | 52.7 | | 41.4 | 4.8 | 31.1 | 9.81 | |
| TOS | | | | ы | | ۵ | | Ω | ٧ | ပ | В | |
| Approach delay (s)/LOS | | 1 | | 8.09 | _ | ы | 30.3 | _ | ပ | 21.8 | _ | ပ |
| | | | | | | | | | | C | | |

Appendix C

Unsignalized Intersection Level of Service (LOS) Calculations

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

| General Information | tion | | | | | Site In | Site Information | no | | | | | |
|----------------------------------|---------------|---------|--------|--------|--------|--------------|-------------------|----------|---------------------|---------------|---------|--------------------------------|-----------|
| Analyst | WY | | | | | Jurisdict | Jurisdiction/Date | | | | | 4/1 | 4/16/2008 |
| Agency or Company | M&E PACIFIC | ACIFIC | | | | Major Street | reet | QUEE | QUEEN KAAHUMANU HWY | HUM | ANU F | łWY | |
| Analysis Period/Year | EXIST AM | ΑM | | 2006 | | Minor Street | reet | NELHA RD | A RD | | | | |
| Comment | 2006 EXIST AM | (IST A) | 2 | | | | | | | | | | |
| Input Data | | | | | | | | | - COLOR | | | | |
| Lane Configuration | | | SB | | | NB | | | EB | - Independent | | WB | |
| Lane 1 (curb) | | | ~ | | | ₽ | | | ~ | | | | |
| Lane 2 | | | ₽ | | | - | | | -1 | | | | |
| Lane 3 | | | | | | | | | | | | | |
| and the second | | | SB | | | NB | | | EB | | | WB | |
| Movement | | 1 (LT) | 2 (TH) | 3 (RT) | 4 (LT) | 5 (TH) | 6 (RT) | 7 (LT) | 8 (TH) | 9 (RT) | 10 (LT) | 9 (RT) 10 (LT) 11 (TH) 12 (RT) | 12 (RT) |
| Volume (veh/h) | | | 870 | 40 | 09 | 675 | | 12 | | 20 | | | |
| PHF | | | 6: | 6. | 6. | 6. | | 6. | | 6: | | | |
| Proportion of heavy vehicles, HV | ehicles, HV | | 3 | 3 | 3 | 3 | | 3 | | 3 | | | |
| Flow rate | | | 296 | 44 | 29 | 750 | | 13 | | 22 | | | |
| Flare storage (# of vehs) | (SI | | | | | | | | | 0 | | | |
| Median storage (# of vehs) | rehs) | | | | i | | | 0 | | | | | |
| Signal upstream of Movement 2 | ovement 2 | | = | | Mov | Movement 5 | | | _ | | | | |
| Length of study period (h) | 1 (H) | .25 | | | | | | | | | | | |
| | | | | | | | | | | | | | |

Output Data

|) | 1 | and and and | | | | | | | |
|----|------|---------------|----------------------|---------------------|------|-----------------------|--------------------------------------|-----|---------------------------|
| | Lane | Lane Movement | Flow Rate (veh/h) | Capacity (veh/h) | v/c | Queue Length (veh) | Queue Length Control Delay (veh) (s) | SOT | Approach Detay and LOS |
| | - | 2 | 22 | 307 | .072 | ~ | 17.6 | ပ | 34.9 |
| EB | 7 | L | 13 | 74 | 771. | _ | 64.2 | Œ. | |
| | က | | | | | | | | Ω |
| | - | | | | | | | | |
| WE | WB 2 | | | | | | | | |
| | ო | | | | | | | | |
| | | Θ | | | | | | | |
| | | 9 | 29 | 402 | .094 | 7 | 9.01 | В | |
| 일 | AP 2 | HICAP 2000 TM | | | | | | | 1 of 1 |
| | | | | | | | | | |

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| Analyst | General Information | non | | | | | Site In | Site Information | r. | | | | | |
|-----------|----------------------------------|----------------------|--------|---------------------|--------|--------|-------------------|-----------------------|----------|----------------------|--------|---------|---------------------------|----------------|
| • | 1 25 | WY | | | | | Jurisdiction/Date | on/Date | | | | | 4/16 | 4/16/2008 |
| ř | Agency or Company | M&E PACIFIC | CIFIC | | | | Major Street | eet | QUEE | QUEEN KAAHUMANU HWY | HUM. | AND F | WY | |
| Analy | Analysis Period/Year | EXIST PM | M | | 2006 | | Minor Street | reet | NELHA RD | A RD | | | | l |
| Comment | ment | ZUUG EAIST FIN | 21 21 | | 4.04 | | | | | | | | | |
| ID I | Input Data | | | | | ļ | 9 | | | 8 | | Ì | 925 | |
| Lane | Lane Configuration | | | SB | | c. | SE I | | | EB | | | WB | |
| Lane | Lane 1 (curb) | | | ~ | | | ٢ | | | ~ | | | | |
| Lane 2 | 2 | | | Т | | | J | | | ٦ | | | | |
| Lane 3 | 3 | | | | | | | | | | | | | |
| | | | | SB | | | NB | | Ì | EB | | | WB | Ì |
| Move | Movement | | 1 (LT) | 2 (TH) | 3 (RT) | 4 (LT) | 5 (TH) | 6 (RT) | 7 (LT) | 8 (TH) | 9 (RT) | 10 (LT) | 11 (TH) 12 (RT) | 12 (RT |
| Volui | Volume (veh/h) | | | 615 | 18 | 28 | 840 | | 39 | | 58 | | | |
| 붎 | | | | 6: | 6. | 6. | 6. | | 6. | | 6: | | | |
| Prop | Proportion of heavy vehicles, HV | ehicles, HV | | 3 | 3 | 3 | 3 | | 3 | | м | | | |
| Flow rate | rate | | | 683 | 20 | 31 | 933 | | 43 | | 64 | | | |
| Flare | Flare storage (# of vehs) | hs) | | | | | | | | | 0 | | | |
| Med | Median storage (# of vehs) | vehs) | | | | | | | 0 | | | | | |
| Sign | Signal upstream of Movement 2 | ovement 2 | | = | | Mov | Movement 5 | | = | | | | | |
| Leng | Length of study period (h) | (u) p | .25 | - | | | | | | | | | | |
| Out | Output Data | | | | | | | | | | | | | |
| _ | Lane Movement | Flow Rate (veh/h) | 5 | Capacity (veh/h) | | v/c | Onen | Queue Length (veh) | Contro | Control Delay (s) | 2 | 507 | Approach Delay and LOS | oach nd LOS |
| | 1 R | 64 | | 447 | | .143 | | ⊽ | 4 1 | 14.4 | | B | 33 | 35 |
| EB | 2 L | 107 | | 187 | _ | 572 | | 3 | 47 | 47.3 | | E | Н | Q |
| + | 2 - | | - | | _ | | | | | | | | | |
| WB | 2 | | | | | | | | | | | 1 | | |
| | m | | | | | | | | | | | | | |
| | Θ | | | | | | | | | | | | | |
| | | | | | | | _ | | _ | | | | | |

| Analysis Summary | | | | | | | | | | | | |
|----------------------------------|------------------|--------|--------|-------------------|--------------|-------------------|--------|---------------------|--------|--------------------------------|------|-----------|
| General Information | | | | | Site In | Site Information | on | | | | | |
| Analyst | Y | | | | Jurisdict | Jurisdiction/Date | | | | | 4/16 | 4/16/2008 |
| Agency or Company M. | M&E PACIFIC | U | | | Major Street | reet | QUE | QUEEN KAAHUMANU HWY | UMA | NU HV | Ž | |
| | EXIST AM | | 2006 | | Minor Street | treet | HOLI | HULIKOA DR | | | | |
| | 2006 EXISTING AM | NG AM | | | | | | | | | | |
| Input Data | | | | Liver-constraints | | | | | | | | |
| Lane Configuration | | SB | | | NB | | | EB | | | WB | |
| Lane 1 (curb) | | ı | | | 2 | | | | | | ~ | |
| Lane 2 | | L | | | ь | | | | | | L | |
| Lane 3 | | | | | | | | | | | | |
| | | SB | | | B | No della con | | EB | - | | WB | |
| Movement | 1 (LT) | 2 (TH) | 3 (RT) | 4 (LT) | 5 (TH) | 6 (RT) | 7 (LT) | 8 (TH) 9 | (RT) 1 | 9 (RT) 10 (LT) 11 (TH) 12 (RT) | Œ | (RT) |
| Volume (veh/h) | 63 | 770 | | | 820 | 95 | | | | 65 | | 62 |
| PHF | 6. | 6: | | | 6. | 6. | | | | 6. | | 6. |
| Proportion of heavy vehicles, HV | s, HV 3 | 3 | | | 3 | 3 | | | | 3 | | 3 |
| Flow rate | 70 | 856 | | | 911 | 106 | | | | 72 | | 108 |
| Flare storage (# of vehs) | | | | | | | | | | | | 0 |
| Median storage (# of vehs) | | _ | | | | | | | | 0 | | |

Signal upstream of Movement 2 if Movement 5 ift
Length of study period (h) ...25

Approach Delay and LOS

100

Control Delay (s) 236.8 21.1 10.9 Queue Length (veh) $\overline{\forall}$ 9 .326 .103 a/c Capacity (veh/h) 829 331 Flow Rate (veh/h) 108 70 Lane Movement Θ ~ _ **Output Data** EB 2 WB 2 ,--

107.3

0 1

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| 7 (LT) | 8 (TH) | 9 (RT) | 10 (LT) | 11 (TH) | 12 (RT) | 13 (RT) | 14 | 90 4/16/2008 Approach Delay and LOS 9. 0 0 104 (1, WB QUEEN KAAHUMANU HWY HULIKOA DR 심니 149 6: 'n CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET **10S** O Ĭ. ٧ Control Delay (s) EB 161.1 8.6 19 Site Information Queue Length (veh) Jurisdiction/Date 33 460 NB NB (RT) 5 (TH) 6 (RT) 770 50 6: 99 М Major Street Minor Street $\overline{\vee}$ œ 6 6 Movement 5 856 W ≃ 1.075 .281 .047 **3//**C 2006 511 e: E Capacity (veh/h) 2006 EXISTING PM SB 7 356 780 .25 M&E PACIFIC 37 6: ю EXIST PM Flow Rate (veh/h) Proportion of heavy vehicles, HV 100 Signal upstream of Movement 2 37 Analysis Summary General Information Median storage (# of vehs) Length of study period (h) Flare storage (# of vehs) Output Data Lane Movement Agency or Company Analysis Period/Year Lane Configuration Θ 4 ~ J Volume (veh/h) Input Data Lane 1 (curb) Comment Movement Flow rate Analyst Lane 3 -2 8 -2 Lane 2 꿆 WB EB

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m

1 of 1

Appendix D

On-Ramp
Level of Service (LOS) Calculations

| | | | | | | | | | 0000 |
|------------------------------------|-------------------------------|-----------------------------|--|--------------------------|--|--|--|---|---|
| Analyst Agency or Analysis F | Company eriod/Year | WY M&E PACIFIC TOT AM | | 2029 | Jurisdiction/Date Freeway/Direction Junction | Jurisdiction/Date Freeway/Direction of Travel Junction | | QKH SOUTHBOUND OOMA ACCESS | 4/14/2008 1D |
| Opera | Operational (LOS) | | ☐ Design (L _A , L _D , | or N) | (S) | Planning (LOS) | and the same of th | □ Planning | Planning (L _A , L _D , or N) |
| Inputs | | | | | | | | | |
| | | Freev | Freeway terrain Level | | Ramp terrain | errain Level | | | |
| pstream | Upstream Adjacent Ramp | <u>p</u> | Ramp Type | e. | í | | | Downstream A | Downstream Adjacent Ramp |
| Zd Yes | | 8 | Merge | 63 | | arge | | □ Yes | - - - |
| S S | B | EZ OII | Number of free | Lod Right side | <u> </u> | Left side | | EQ No |)io [] |
| ii | 450 | | Number | Number of ramo lanes | - | | | Ldown = | = |
| | 270 | veh/h | Length of | Length of ramp roadway | 140 | = | | V _D = | veh/h |
| | | | S _{FF} = 70 | mi/h | SFR = | 35 | mi/h | | |
| Conve | ersion to p | c/h Unde | Conversion to pc/h Under Base Conditions | Suc | | | | | ; |
| (hc/h) | (veh/day) | × | 0 | V (veh/h) | 불 | % HV | ΑH | ي . | V = PHF (HV (p |
| VF | 16100 | 60. | - | 1449 | 6. | 5 | 926. | _ | 1650 |
| ν. K | 2700 | 60. | | 243 | 6. | S | 926. | - | 277 |
| V _I J | | 60. | | 270 | 6. | 5 | 976. | - | 307 |
| o, | | | | | | | | - | |
| | | Merge | Merge Areas | | | | Diverge Areas | Areas | |
| Estim | Estimation of v ₁₂ | 2 | | | Estima | Estimation of v ₁₂ | | | |
| | | V12 = VF * PFM | Ъгм | | | V12 | $v_{12} = v_R + (v_F - v_R)P_{FD}$ | чрРго | |
| _E0 = | | (Equation 25-2 or 25-3) | -2 or 25-3) | | Leg = | | (Equation 25-8 or 25-9) | 3 or 25-9) | |
| P _{FM} ≔ | | using Equation | | (Exhibit 25-5) | P _{FD} = | | using Equation | | (Exhibit 25-12) |
| V12 = | 1650 | hc/h | | | V ₁₂ = | | hc/h | | |
| Capac | Capacity Checks | v | | | Capacity | by Checks | | | |
| | Ac | Actual | Maximum | LOS F? | | | Actual | Maximum | L0S F? |
| ΨFO | _ | 1927 | See Exhibit 25-7 | | VFI = VF | | | See Exhibit 25-14 4400: All | -14 |
| | | | 1000 | | VFO = VF - Vp | ٠ ٨٥ | | See Exhibit 25-14 | -14 |
| VR12 | | 1927 | 4000; All | | VR. | | | See Exhibit 25-3 | -3 |
| Level | of-Service | Determin | Level-of-Service Determination (if not F) | | Level-c | f-Service [| Determinat | Level-of-Service Determination (if not F) | |
| | 5.475 + 0.00 | 1734 VR + 0.0 | = 5.475 + 0.00734 v _R + 0.0078 v ₁₂ - 0.00627 L _A | LA | | D _R = 4.252 + | = 4.252 + 0.0086 v ₁₂ - 0.009 L _D | 0.009 L _D | <u>-</u> |
| LOS = | | В | (Exhibit 25-4) | 5-4) | - NR = | | | (Exhib | (Exhibit 25-4) |
| Speed | I Estimation | nc | | | Speed | Speed Estimation | | | |
| Z c | .338 | 8 | (Exhibit 25-19) | a | D.s. | | | (Exhibit 25-19) | 9) |
| , y | 00.3 | | _ mi/h (Exhibil 25-19) mi/h (Evhibir 25-10) | G 6 | 2 | | | mi/h (Exhibit 25-19) | 25-19) |
| -00 | | | - HILLI (CANILLIN 20-1 | וווווו (רעוווחוו לסייוש) | 5 | | | THE CAMBON LO 19 | (5) |

V = PHF IHV P

% H/V

胀 6 Q. 6.

V (veh/h) 2043 50

a

×

AADT (veh/day) 22700 555

(bc/h)

8 8 60

2327

57

976. 976 ₹.

LOS F?

Actual

Capacity Checks

See Exhibit 25-14 See Exhibit 25-14

V12 VFO = VF - VR

VFI = VF

See Exhibit 25-7 Maximum

2384

Actual

Capacity Checks

4600: AII

2384

VR12 VFO

LOS F?

4400: All

See Exhibit 25-3

Level-of-Service Determination (if not F)

 $D_R = 4.252 + 0.0086 \text{ v}_{12} - 0.009 \text{ L}_D$

(Exhibit 25-12)

(Equation 25-8 or 25-9)

using Equation

Lea = _

(Exhibit 25-5)

_(Equation 25-2 or 25-3)

using Equation

PFM =

Leo =

2327 pc/h

V12 = VF " PFM

Estimation of v₁₂

Merge Areas

pc/h

V12 =

Diverge Areas $v_{12}=v_R+(v_F-v_R)P_{FD}$

Estimation of v₁₂

veh/h

mi/h

35

SFR =

mi/h

70

S_{FF} =

Conversion to pc/h Under Base Conditions

Ldown = EZ No

140

ength of ramp roadway

veh/h

Number of ramp lanes

(ed. OKH SOUTHBOUND OOMA ACCESS

Jurisdiction/Date Freeway/Direction of Travel

Junction

2015

M&E PACIFIC TOT PM

Agency or Company Analysis Period/Year

General Information

⋛

Comment 2015 TOTAL PM ON-RAMP

Site Information

CHAPTER 25 - RAMPS AND RAMP JUNCTIONS WORKSHEET

□ Planning (L_A, L_D, or N)

Cd Planning (LOS)

Design (L_A, L_D, or N)

☐ Operational (LOS)

Inputs

Downstream Adjacent Ramp

Ramp terrain Level

<u></u>

□ Yes

Diverge

Number of freeway lanes

ud Right side

ნ |

Ves Ves

Upstream Adjacent Ramp

EQ 011

S O

450 77

Ramp Type

Freeway terrain Level

(Exhibit 25-19) mi/h (Exhibit 25-19) mi/h (Exhibit 25-19) mi/h (Equation 25-15) . So. s. (Exhibit 25-19)
mi/h (Exhibit 25-19)
mi/h (Exhibit 25-19)
mi/h (Equation 25-14) HICAP 2000 TM ©Catalina Engineering, Inc. 60.1

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(Exhibit 25-4)

Speed Estimation

D_R = ___

(Exhibit 25-4)

Speed Estimation

.353

 $D_{R} = 5.475 + 0.00734 v_{R} + 0.0078 v_{12} - 0.00627 L_{A}$ = 23.2 C (Exhibit 25-4)

D_R = 105 =

Level-of-Service Determination (if not F)

pc/mi/ln

| ral Information WY or Company M&E Period/Year TOTP In 2020 TOTAL altional (LOS) s s | | | Site Info | Site Information | | | |
|---|-------------------------------|--|-------------------|---|---------------------------|---|---|
| WY or Company M&E Period/Vear TOT P at 2020 TOTAL ational (LOS) s n Adjacent Ramp | | | | | | | |
| or Company M&E Period/Year TOTP IN 2020 TOTAL altonal (LOS) S n Adjacent Ramp | | | Jurisdiction/Date | //Date | - California | 4 | 4/9/2008 |
| Period/Year TOTP 1 2020 TOTAL attornal (LOS) s n Adjacent Ramp | M&E PACIFIC | | Freeway/Di | Freeway/Direction of Travel | | QKH SOUTHBOUND | |
| alional (LOS) S n Adjacent Ramp | M PM ON-RAMI | 2020 P | Junction | | | OOMA ACCESS | |
| S n Adjacent Ramp |) Design (| Design (1 - 1 or N) | ld M | Planning (LOS) | | Manning (1 v. 1 o or N) | I or N |
| n Adjacent Ramp | | | | | | | |
| Upstream Adjacent Ramp | Freeway terrain Level | evel | Ramp te | Ramp terrain Level | | | |
| | Ram | Ramp Type | | | | Downstream Adjacent Ramp | acent Ramp |
| Nes C | B | Merge | ☐ Diverge | ığe | _ | \ \ \ \ \ | 5 |
| | B | प्जे Right side | ☐ Left side | side | | i : | 3 |
| No DE | Nun | Number of freeway lanes | 2 | ļ | | No No | <u> </u> |
| Lup = 450 R | Nun | Number of ramp lanes | - 5 | ľ | | Ldown == | e |
| V _u = 153 veh/h | l'en | Length of ramp roadway | 140 | = | | V _D = | veh/h |
| and . | SFF = | 70 mi/h | SFR = | 35 8 | mi/h | | |
| Conversion to pc/h Under Base Conditions | nder Base Con | ditions | | | | | |
| (pc/h) AADT K (veh/day) | a | (veh/h) | PHF | % HA | νнј | ď | v = V PHF f _{HV} f _D |
| VF 22850 .09 | 9 | 2057 | 6: | 5 | 976. | - | 2342 |
| v _R 1670 .09 | 6 | 150 | 6. | 5 | 926. | 1 | 171 |
| ν _υ | 6 | 153 | 6. | 5 | 926. | - | 174 |
| ηD | | | | | | - | |
| Me | Merge Areas | | | | Diverge Areas | reas | |
| Estimation of v ₁₂ | | | Estimat | Estimation of v ₁₂ | | | |
| V ₁₂ = V _F | V12 = VF * PFM | NO. | | V ₁₂ = | V12 = VR + (VF - VR)PFD | R)Pro | |
| Leg = (Equation | (Equation 25-2 or 25-3) | | Leg = | (Ec | (Equation 25-8 or 25-9) | or 25-9) | |
| P _{FM} = 1 using Equation | quation | (Exhibit 25-5) | P _{F0} = | Sã | using Equation | | (Exhibit 25-12) |
| v ₁₂ = 2342 pc/h | | | V12 = | h/2d | ų, | | |
| Capacity Checks | | | Capacit | Capacity Checks | | | |
| Actual | Maximum | ım LOS F? | | A | Actual | Maximum | LOS F? |
| VEA 2513 | See Exhibit 25-7 | 25-7 | VFI = VF | | | See Exhibit 25-14 | |
| | | The same of the sa | V12 | | | 4400: All | |
| VR12 2513 | 4600: All | | ٦ ٧ ا | - YR | | See Exhibit 25-14 | |
| | | | NR N | | | See Exhibit 25-3 | |
| Level-of-Service Determination (if not F) | rmination (if n | ot F) | Level-o | f-Service Do | eterminat | Level-of-Service Determination (if not F) | |
| t = 5.475 + 0.0073 | + 0.0078 v ₁₂ 0.00 | 0627 L _A | | $D_R = 4.252 + 0.0086 \text{ v}_{12} - 0.009 \text{ L}_D$ | .0086 v ₁₂ – C | | |
| UR = 24.1 | | pc/mi/ln (Fvbihi) 25_4) | "B" | | | (Exhibit 25-4) | F.4) |

Jurisdiction/Date 4/14/2008
Freeway/Direction of Travel QKH SOUTHBOUND Junction OOMA ACCESS

CHAPTER 25 - RAMPS AND RAMP JUNCTIONS WORKSHEET

Site Information

Planning (L_A, L_D, or N)

Planning (LOS)

Design (L_A, L_D, or N)

☐ Operational (LOS)

2029

Analyst
Agency or Company
M&E PACIFIC
Analysis Period/Year TOT PM
Comment 2029 TOTAL PM ON-RAMP

General Information

Downstream Adjacent Ramp

Ramp terrain Level

Ramp Type

Upstream Adjacent Ramp

Freeway terrain Level

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HICAP 2000 TM ©Catalina Engineering, Inc.

1 of 1

(Exhibit 25-19)
mi/h (Exhibit 25-19)
mi/h (Exhibit 25-19)
mi/h (Equation 25-15)

(Exhibit 25-19) mi/h (Exhibit 25-19) mi/h (Exhibit 25-19) mi/h (Equation 25-14)

.359 59.9 59.9

Speed Estimation

Speed Estimation

| Z Yes | j , | | Self Right side | ide | ☐ Left side | side | | } I ' | j |
|-------------------|-------------------------------|----------------|---|--|---------------------|---|--|---|---|
| 2 [] | EN OIL | = | Number of | Number of freeway lanes | 2 | | | No M | |
| Lup = | 450 ft 288 veh/h | - E | Number of Length of r | Number of ramp lanes Length of ramp roadway | 140 | = | 77.00 | L _{down} = | the veh/h |
| | | | S _{FF} = 70 | mi/h | SFR = | 35 | mi/h | | , |
| Conve | ersion to pc/l | n Unde | Conversion to pc/h Under Base Conditions | ns | | | | | |
| (h/cd) | AADT (veh/day) | × | Q | V (veh/h) | PHF | % HV | ин | ď | V = V PHF f _{HV} f _p |
| ηĖ | 24000 | 60' | | 2160 | 6. | 5 | 976. | - | 2460 |
| ۸× | 2700 | 60: | | 243 | 6. | S | 926. | _ | 277 |
| νU | | 60: | | 288 | 6. | 5 | 926. | _ | 328 |
| ο _Λ | | | | | | | | - | |
| | | Merge | Werge Areas | | | | Diverge Areas | reas | |
| Estim | Estimation of v ₁₂ | | 707-1111 | | Estimat | Estimation of v ₁₂ | LANGE OF THE PARTY | | |
| | N 12 | V12 = VF * PFM | FM | | | V12 | V12 = VR + (VF - VR)PFD | re)Pro | |
| Leo = | (Equ | ation 25 | (Equation 25-2 or 25-3) | | L _{E0} = _ | | (Equation 25-8 or 25-9) | l or 25-9) | |
| P _{EM} = | l usir | using Equation | | (Exhibit 25-5) | P _{FD} = | | using Equation | | (Exhibit 25-12) |
| V12 = | 2460 pc/h | - | | | V ₁₂ = | ١ | pc/h | | |
| Capac | Capacity Checks | | | | Capacit | Capacity Checks | | | |
| | Actual | _ | Maximum | LOS F? | | | Actual | Maximum | LOS F? |
| VFO | 2737 | 7 | See Exhibit 25-7 | | VFI = VF | | | See Exhibit 25-14 | 14 |
| | | | | | V12 | - | | 500 Eulihis 25 14 | |
| VR12 | 2737 | 37 | 4600; All | | VR VR | * | | See Exhibit 25-3 | |
| evel | of-Service Di | etermin | Level-of-Service Determination (if not F) | | Level-o | f-Service D | eterminat | Level-of-Service Determination (if not F) | |
| D _R = | 5.475 + 0.00734 | 1 VR + 0.0 | D _R = 5.475 + 0.00734 v _R + 0.0078 v ₁₂ - 0.00627 L _A | | | $D_R = 4.252 + 0.0086 \text{ v}_{12} - 0.009 \text{ L}_D$ | 0.0086 v ₁₂ - i | 0.009 L _D | |
| D _R == | | 25.8 | pc/mi/In | | D _R = | | | pc/mi/ln | _ |
| F0S = | | ၁ | (Exhibit 25-4) | -4) | = 501 | | | (Exhibit 25-4) | 25-4) |
| Speed | Speed Estimation | | | | Speed E | Speed Estimation | | | |
| n Ž | .371 | | (Exhibit 25-19) | | = °O | | | (Exhibit 25-19) | |
| ີ "ຮ້ | 59.6 | | mi/h (Exhibit 25-19) | | . %. | | | mi/h (Exhibit 25-19) | (2-16) |
| - 00 | | | mi/h (Exhibit 25-19) | | S0 = | | | mi/h (Exhibit 25-19) | 5-19) |
| S= | 9.69 | | mi/h (Equation 25-14) | 4) | S | | | mi/h (Equation 25-15) | 25-15) |

| Gener | - Inform | | | | | | | | |
|------------------|-------------------------------|----------------|---|------------------------|-------------------|-------------------------------|---|--|---|
| | General Information | ation | | | Site Inf | Site Information | | | |
| Analyst | | WY | | | Jurisdiction/Date | n/Date | | | 4/14/2008 |
| årancv or | Anency or Company | M&E PACIFIC | ACIFIC | | Frankayf | Freeway/Direction of Travel | | OKH SOUTHBOUND | 100 |
| Analysis F | Analysis Period/Year | TOT AM | 1 . | 2015 | Junction | | | OOMA ACCESS | |
| Comment | 2015 T | OTAL A | 2015 TOTAL AM ON-RAMP | | | | | | |
| □ Opera | Operational (LOS) | | ☐ Design (L _A , L _D , or N) | or N) | EZ. | Planning (LOS) | | □ Plannin | Planning (L _A , L _D , or N) |
| Inputs | | | | | | | | | |
| | | Free | Freeway terrain Level | *** | Ramp | Ramp terrain Level | | | |
| Upstream | Upstream Adjacent Ramp | du | Ramp Type | d) | | | | Downstream | Downstream Adjacent Ramp |
| ZZ Yes | u | -6 -0 | Merge √ | | ☐ Diverge | erge | | O Yes | 5 |
| 8 | 29 | EZ OII | Right side | side | ☐ Left side | t side | | EQ No |)10 CI |
| L | 450 | | Number of Number of | Number of ramp lanes | 4 - | | | L _{down} = | æ |
| n A | 23 | veh/h | Length of | Length of ramp roadway | 140 | _ | | ν ₀ = | veh/h |
| | | | S _{FF} = 70 | mi/h | SFR = | 35 | mi/h | | |
| Conve | ersion to | oc/h Unde | Conversion to pc/h Under Base Conditions | ns | | | | | |
| (h/pd) | (veh/dav) | × | ۵ | (veh/h) | 븀 | % HA | νн | | V = V |
| VF. | 15200 | 60. | _ | 1368 | 6. | 5 | 926. | - | 1558 |
| A'R | 730 | 60. | | 99 | 6. | 5 | 926. | _ | 75 |
| 3 | | 60. | | 23 | 6. | 5 | 926. | - | 26 |
| ο _ν | | | | | | | | - | |
| | | Merg | Merge Areas | | | | Diverge Areas | Areas | |
| Estim | Estimation of V ₁₂ | 12 | | | Estima | Estimation of v ₁₂ | | | |
| | | V12 = VF * PFM | PFM | | | ۷٦2 | v12 = vR + (vF - vR)PFD | v _R)P _{FD} | |
| Leg = | | (Equation 2 | (Equation 25-2 or 25-3) | | Leo = | | (Equation 25-8 or 25-9) | | |
| PFM= | - | using Equation | | (Exhibit 25-5) | P _{FD} ≈ | | using Equation | | (Exhibit 25-12) |
| V12 = | 1558 | pc/h | | | V ₁₂ = | | hc/h | | |
| Capac | Capacity Checks | s | | | Capaci | Capacity Checks | | | |
| | 4 | Actual | Maximum | L0S F? | | | Actual | Maximum | LOS F? |
| VFO | | 1633 | See Exhibit 25-7 | | VFI = VF | | | See Exhibit 25-14 | -14 |
| : | | | 4600. 411 | | 11 | - VR | | See Exhibit 25-14 | -14 |
| VR12 | | 1633 | 4000; All | | V _R | | | See Exhibit 25-3 | -3 |
| Level | of-Servic | e Determ | Level-of-Service Determination (if not F) | | Level- | of-Service [| Determina | Level-of-Service Determination (if not F) | |
| DR. | 5.475 + 0.0 | 0734 VR + 0. | D _R = 5.475 + 0.00734 v _R + 0.0078 v ₁₂ - 0.00627 L _A | * | | D _R = 4.252 + | $D_R = 4.252 + 0.0086 \text{ v}_{12} - 0.009 \text{ L}_D$ | 0.009 L _D | |
| LOS= | | B | (Exhibit 25-4) | -4) | - 807 - 807 | | | Exhit | (Exhibit 25-4) |
| Speed | Estimation | uo | | | Speed | Speed Estimation | | | |
| M _s = | 331 | - | (Exhibit 25-19) | | D _s = | | | (Exhibit 25-19) | 6 |
| % " " | 200.7 | .7 | mi/h (Exhibit 25-19) | | S _R | | | mi/h (Exhibit 25-19) | 25-19) |
| - 00 | | | | | , | | | THE PARTY OF THE P | 1 - V |

| as Period'Near TOT AM sis Period'Near TOT AM bent 2020 TOAL AM ON-RAMP certifonal (LOS) uts an Adjacent Ramp size of the size of th | Direction of Tavel Tanning (LOS) Tanning (LOS) Tanning (LOS) Tanning (LOS) Tanning (LOS) Tanning (LOS) Tanning (LOS) Tanning (LOS) Tanning (LOS) Tanning (LOS) Tanning (LOS) Tanning (LOS) Tanning (LOS) Tanning (LOS) Tanning (LOS) Tanning (LOS) Tanning (LOS) Tanning (LOS) | OWA ACCESS OWASTERNING (L Downstream Adja | |
|--|--|---|--|
| Tabloral (LOS) Design (L _h , L _D or M) | 1 Level 1 1 Level 1 2 5 5 5 5 5 | Down Labour V _D = | Planning (L _b , L _b , or N) sseam Adjacent Ramp o |
| Freeway terrain Level | 1 Level 1 | | Adjacent Ramp On Wehlfited Vehilt 1568 |
| Freeway terrain Level Sam Adjacent Ramp Ramp Type Sam On | 1 Level 1 | | Adjacent Ramp On We by the first of the fi |
| am Adjacent Ramp S | 11 12 13 15 17 18 18 18 18 18 18 18 18 18 18 18 18 18 | | Adjacent Ramp Off Remp Off Remp Veh/h |
| Second Color Col | 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | L down : | Of Off |
| 117 Veh Wimber of freeway lares 450 Mimber of freeway lares 117 Veh Set = 70 mi/h Set 126 1370 1400 .09 1 1377 1400 .09 1 177 Merge Areas Merge Areas Merge Areas Merge Areas (Equation 25.2 or 25.3) | 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | Ldown - Vo = | ueh/h veh/h |
| 130 | # W # W % # W % S S S S S S S S S S S S S S S S S S | V _D = | veh/h veh/h 1568 1143 |
| 117 webty Sept = 70 mith | % HW % % | . QV ≡ QV | veh/h v = V V V = PHF f ₁₀ V f V V = V V V V V V V V |
| ersion to pc/h Under Base Conditions AADT (vehiday) 15300 0.09 1 1377 1400 0.09 1 126 0.09 1 177 Merge Areas hation of v ₁₂ (Equation 55-2 or 25-3) | 3.5 WH% | | V = V PHF f _{HV} t, 1568 1568 143 |
| AADT K D (vehlay) 15300 .09 1 1377 1400 .09 1177 Merge Areas hation of v ₁₂ (Equation 55-2 or 25-3) | | | V = V PHF f _{IN} f 1568 143 |
| AADT K D (vehh) 15300 .09 1 1377 1400 .09 126 1400 .09 117 Merge Areas hation of v ₁₂ (Equation 55-2 or 25-3) | | | |
| 15300 .09 1 1377 1400 .09 126 .09 1126 .126 .09 117 Merge Areas vation of v ₁₂ v ₁₂ = v ₁ · P _{PM} (Equation 55-2 or 25-3) | | | 1568 |
| 1400 .09 126 .09 .117 | | | 143 |
| Merge Areas Merge Areas viz = vir P P.R. (Equation 25-2 or 25-3) | | | |
| Merge Areas ration of v ₁₂ v ₁₂ = v _i · P _{PM} (Equation 25-2 or 25-3) | Div | 1 976. | 133 |
| Merge Areas ration of v ₁₂ v ₁₂ = v _i · P _{PM} (Equation 25-2 or 25-3) | Div | p=== | |
| nation of v _{1,2} v ₁₂ = v _F · P _{RM} (Equation 25-2 or 25-3) | | Diverge Areas | |
| V ₁₂ = V _F * P _{FM} (Equation 25-2 or 25-3) | Estimation of v ₁₂ | | |
| (Equation 25-2 or 25-3) | V12 = VR | $v_{12} = v_R + (v_F - v_R)P_{FD}$ | |
| | | (Equation 25-8 or 25-9) | |
| P _{FM} = 1 using Equation (Exhibit 25-5) P _{FD} = | | using Equation (E | (Exhibit 25-12) |
| $v_{12} = 1568$ pc/h $v_{12} = 400$ | 2 = pc/h | | |
| Capacity Checks | Capacity Checks | | |
| LOS F? | Actual | Maximum Son Exhibit 25, 14 | LOS F? |
| VFO 1712 See Exhibit 25-7 V ₁₂ | | 4400: All | = |
| VEO = VF | VFO = VF - VR | See Exhibit 25-14 | -14 |
| VR | | See Exhibit 25-3 | e. |
| | Level-of-Service Determination (if not F) | mination (if not F) | |
| $R_{\rm A} = 5.475 + 0.00734 V_{\rm R} + 0.0078 V_{12} - 0.00627 L_{\rm A}$ | $D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ | | |
| DR = 17.9 pc/mi/ln DR = 1.0S = 10S = | II U | pc/mi/ln (Fxhihir | pc/mi/ln (Fxhihi) 25-4) |
| d Estimation | ed Estimation | | |
| (Exhibit 25-19) | | (Fxhihir 25-19) | 6 |
| 60.7 mi/h (Exhibit 25-19) | 1 11 ~ | mi/h (Exhibit 25-19) | 25-19) |
| 2.09 | = 0 | mi/h (Exhibit 25-19) | 25-19) |

| Genera | General Information | ion Site Information | 100 | Charles (in | Site Inf | Site Information | | - Second | |
|--------------------|-------------------------------|--|---|-------------------------|-------------------|-------------------------------|------------------------------------|------------------|--|
| | | | | | 201.00 | - | - | | |
| Analyst | Analyst | WY M&F PACIFIC | UBIC | | Jurisdiction/Date | n/Date | Jurisdiction/Date OKH SB NELHA | NEI HA | 4/19/2008 |
| James D | | TOT AM | | 2015 | Inchion | ווברתסון מו וופ | NELHA | NELHA ACCESS | |
| anysis r imment | 2015 TO | TALAM | Comment 2015 TOTAL AM ON-RAMP | | Julicuon | | | | |
| Operat | Operational (LOS) | | Design (L _A , L _D , or N) | L _D , or N) | P. | Cd Planning (LOS) | | O Plannin | Delanning (L _A , L _D , or N) |
| Inputs | | | | | | | | | |
| | | Freewa | Freeway terrain Level | - | Ramp t | Ramp terrain Level | | | |
| stream | Upstream Adjacent Ramp | | Ramp T | adk | | | | Downstream | Downstream Adjacent Ramp |
| Z Yes | | 5 | ₩ Merge | ЭĞ | Diverge | arge | | Yes | 5 |
| | 7 | | ☑ Right side | nt side | ☐ Left side | side | | ; Y | |
| ŝ | S | ====================================== | Number | Number of freeway lanes | 2 | | | S | 5 |
| - I | 450 | = | Number | Number of ramp lanes | - | | | Ldown = | = |
| \n'' = | 23 W | veh/h | Length | Length of ramp roadway | 140 | = | | V _D = | /heh/h |
| | | S | S _{FF} = 70 | mi/h | SFR = | 35 | mi/h | | |
| onve | rsion to po | /h Under | Conversion to pc/h Under Base Conditions | ions | | | | | |
| (hc/h) | (veh/day) | × | ۵ | V (veh/h) | PHF | м % | μ | ď | v = V PHF f _{HV} f _p |
| VF | 15200 | 60. | | 1368 | 6. | 5 | 926. | - | 1558 |
| NR. | 220 | 60. | | 20 | 6. | 5 | 926. | - | 23 |
| 2 | | 60. | | 23 | 6. | 5 | 976. | - | 26 |
| v _D | | | | | | | | - | |
| | | Merge Areas | Areas | | | | Diverge Areas | reas | |
| stim | Estimation of v ₁₂ | | | | Estima | Estimation of v ₁₂ | | | |
| | | V12 = VF " PFM | M | | | V ₁ | $v_{12} = v_R + (v_F - v_R)P_{FD}$ | JP _{FD} | |
| Leo = . | E. | (Equation 25-2 or 25-3) | or 25-3) | | Leg = | | (Equation 25-8 or 25-9) | or 25-9) | |
| P _{FM} = | - | using Equation | | (Exhibit 25-5) | P _{FD} = | | using Equation | | (Exhibit 25-12) |
| V ₁₂ = | 1558 p | pc/h | | | V12 = | | hc/h | | |
| apac | Capacity Checks | | | | Capaci | Capacity Checks | | | |
| | | | | | | _ | 0-4-0 | Marrian | 100 |

CHAPTER 25 - RAMPS AND RAMP JUNCTIONS WORKSHEET

| Vrg Actual Maximum LOS F? Actual Maximum LOS F? Vrg 1.581 See Exhibit 25-7 Vrg = Vrg 4400. All See Exhibit 25-14 Vrg 2 1.581 4600. All Vrg = Vrg See Exhibit 25-14 See Exhibit 25-14 Level-of-Service Determination (if not F) Level-of-Service Determination (if not F) Level-of-Service Determination (if not F) Level-of-Service Determination (if not F) D _B = 5.475 + 0.0073 Vrg - 0.00527 L _A D _R = 4.252 + 0.0066 Vrg - 0.009 L _D pofmil/In LOS = B (Exhibit 25-4) LOS = (Exhibit 25-4) Speed Estimation Speed Estimation (Exhibit 25-19) M _s = 60.8 mith (Exhibit 25-19) S _R = mith (Exhibit 25-19) S _D = 60.8 mith (Exhibit 25-14) S = mith (Exhibit 25-19) S _D = 60.8 mith (Exhibit 25-14) S = mith (Exhibit 25-19) | Capacity Checks | Checks | | | Capacity Checks | ks | | |
|--|-----------------------|---------------------------------|--|--------|----------------------|-----------------------------|------------------------|-------|
| See Exhibit 25-7 Vr ₁₀ = Vr ₁ See Exhibit 25-7 Vr ₁₀ = Vr ₁ Vr ₁₀ V | | Actual | Maximum | LOS F? | | Actual | Maximum | L0S F |
| S See Exhibit 23-7 V ₁₇₂ V ₁₇₂ 44 | | | The state of the s | | VF1 = Vp | | See Exhibit 25-14 | |
| 1 4600: All 1 1 1 1 1 1 1 1 1 | VFO | 1581 | 7-C7 HOHEN SAC | | V12 | | 4400: All | |
| 1000.741 1000.741 1000 | | 1601 | 4600- All | | VFO = VF - VR | | See Exhibit 25-14 | |
| 16.59 Level-of-Service Determination (if not F) Level-of-Service Determination 16.59 D _R = 4.252 + 0.0096 v ₁₂ - 0.00 16.59 | VR12 | 1381 | 1000. | | VR | | See Exhibit 25-3 | |
| 16.9 D _R = 4.252 + 0.0066 v ₁₂ - 0.00 16.9 Pormi/n D _R = (Exhibit 25-4) D _R = (Exhibit 25-19) S _R = (Exhi | Level-of-5 | Service Determ | ination (if not F) | | Level-of-Servi | ce Determin | ation (if not F) | |
| 16.9 pc/mi/h D _R = | D _R = 5.47 | 75 + 0.00734 v _R + C | 1.0078 v ₁₂ - 0.00627 L _A | | D _R = 4.2 | 52 + 0.0086 v ₁₂ | - 0.009 L _D | |
| Exhibit 25-4 LOS = Speed Estimation | Do = | 16.9 | pc/mi/ln | | D _p = | | pc/mi/ln | |
| (Exhibit 25-19) D ₂ = | = S07 | В | (Exhibit 25-4) | | 10S = | | (Exhibit 25 | ₹ |
| 33 (Exhibit 25-19) D ₃ = | Speed Es | timation | | | Speed Estima | tion | | |
| 60.8 mith (Exhibit 25-19) S _R = mith (Exhibit 25-19) S ₀ = 60.8 mith (Equation 25-14) S = | M. = | .33 | (Exhibit 25-19) | | D, = | | (Exhibit 25-19) | |
| 60.8 mi/h (Equation 25-14) S ₀ = S ₀ = S ₁ | So = | 8.09 | mi/h (Exhibit 25-19) | | S | | mi/h (Exhibit 25-1. | 6 |
| 60.8 mi/h (Equation 25-14) S = | So= | | mi/h (Exhibit 25-19) | | S ₀ = | | mi/h (Exhibit 25-1 | 6 |
| | S=S | 8.09 | mi/h (Equation 25-14) | | S | | mi/h (Equation 25 | -15) |

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S = 00.7 HICAP 2000 TM ©Catalina Engineering, Inc.

| Gene | General Information | ation | | | Site In | Site Information | | | |
|------------------------------------|-------------------------------|-------------------------|---|--|-------------------|--|-------------------------|--|---|
| Analyst | | WY M&E DACIES | CIEIC | | Jurisdiction/Date | on/Date | | OK II SO NET II A | 4/19/2008 |
| Agency or Analysis P Comment | 3 🗟 ' | TOT AM OAL AM | AMP | 2020 | Freeway/I | Freeway/Direction of Travel Junction | | NELHA ACCESS | |
| □ Oper | Operational (LOS) | | Design (L _A , L _D , or N) | , or N) | 23 | Planning (LOS) | | ninnel 🗅 | ☐ Planning (L _A , L _D , or N) |
| Inputs | s | | | | | | | A STATE OF THE STA | |
| | | Free | Freeway terrain Level | | Ramp | Ramp terrain Level | | | |
| Upstrean | Upstream Adjacent Ramp | du | Ramp Type | 43 | | | | Downstream A | Downstream Adjacent Ramp |
| 7 Yes | 0 | 0 | ☑ Merge | _ | C Diverge | erge | | □ Yes | 0 |
| 2 | 12 | | Right side | side | ☐ Left side | side side | |)d | |
| 1 - | 450 | 5 4 | Number of | Number of freeway lanes | 7 | 1 | | <u> </u> | 3 |
| لانه " . لانة ا | | veh/h | Number of Length of | Number of ramp lanes Length of ramp roadway | 140 | e | | V _D = | ft veh/h |
| | | | S _{FF} = 70 | mi/h | SFR = | 35 | mi/h | | |
| Conv | ersion to p | oc/h Unde | Conversion to pc/h Under Base Conditions | us | | | | | |
| (bc/h) | AADT (veh/dav) | ¥ | Q | (veh/h) | 뀲 | % HA | ΛΗ _J | ٩ | v = V |
| Ŋ. | 15700 | 60. | - | 1413 | 6: | 5 | 976. | - | 1609 |
| ^K | 220 | 60. | | 20 | 6: | S | 976. | - | 23 |
| νų | | 60: | | 117 | 6. | 5 | 976. | _ | 133 |
| o'v | | | | | | | | _ | |
| | | Merge | Merge Areas | | | | Diverge Areas | reas | |
| Estim | Estimation of v ₁₂ | 2 | | | Estima | Estimation of v ₁₂ | | | |
| | | V12 = VF * PFM | PFM | | | V12 : | V12 = VR + (VF - VR)PFD | re)Pro | |
| Leo = | | (Equation 25-2 or 25-3) | -2 or 25-3) | | Leo = | | (Equation 25-8 or 25-9) | or 25-9) | |
| ₽₩ | - | using Equation | | (Exhibit 25-5) | Pro = | | using Equation | | (Exhibit 25-12) |
| V ₁₂ = | 1609 | pc/h | | | V12 = | 1 | hc/h | | |
| Capac | Capacity Checks | s | | | Capaci | Capacity Checks | | | |
| | Ac | Actual | Maximum | L0S F? | | | Actual | Maximum | LOS F? |
| VFO | _ | 1632 | See Exhibit 25-7 | | VFI = VF | 1000 | | See Exhibit 25-14 4400: All | 14 |
| 1 | | 000 | 4600- All | | ı Ve | - VR | | See Exhibit 25-14 | 14 |
| VR12 | | 1632 | 4000; All | | VR | 4 | | See Exhibit 25-3 | 3 |
| Level | of-Service | Determin | Level-of-Service Determination (If not F) | | Level-c | f-Service D | eterminat | Level-of-Service Determination (if not F) | |
| D _R = | 5.475 + 0.00 | 734 vR + 0.0 | DR = 5.475 + 0.00734 VR + 0.0078 V12 - 0.00627 LA | e | | D _R = 4.252 + 0.0086 v ₁₂ - 0.009 L ₀ | .0086 v ₁₂ - | 0.009 L ₀ | |
| D _R = | | 17.3 | pc/mi/ln | | D _R ≡ | | | pc/mi/In | |
| F003 | | В | (Exhibit 25-4) | -4) | T0S = | | | (Exhibit 25-4) | 1 25-4) |
| Speed | Speed Estimation | Ë | | | Speed | Speed Estimation | | | |
| M _s = | .331 | | (Exhibit 25-19) | | D' = | | | (Exhibit 25-19) | |
| "" | 2.09 | | mi/h (Exhibit 25-19) | | . S | | | mi/h (Exhibit 25-19) | 25-19) |
| . So. | | | mi/h (Exhibit 25-19) | | So. | | | mi/h (Exhibit 25-19) | 25-19) |
| S= | 60.7 | | mi/h (Equation 25-1 | 4) | S= | | | mi/h (Equation | 1 25-15) |

| Gene | General Information | ion | | | Site Info | Site Information | | | |
|------------------------|--|-------------------------|---|--|-------------------|-------------------------------|-------------------------|--------------------------|---|
| : | | WW | | | | 9 | | | 4/10/2000 |
| Analyst | Analyst American A | M&F PACIFIC | TEIC | | Jurisaiction/Date | /Date | - | OKH SR NFI HA | 17777000 |
| Analysis Pr Comment | eriod/Year T | TOT AM | | 2029 | Junction | Junction | 1 / 1 | NELHA ACCESS | |
| Opera | Operational (LOS) | | Design (L _A , L _D , or N) | or N) | A Pla | Planning (LOS) | | O Planning | Planning (L _A , L _D , or N) |
| Inputs | ur ur | | | | | | | | |
| | | Freewa | Freeway terrain Level | | Ramp te | Ramp terrain Level | | | |
| strearr | Upstream Adjacent Ramp | | Ramp Type | | C | | | Downstream Adjacent Ramp | jacent Ramp |
| od Yes | ю П | On | FA Right side | <u> </u> | D Infliction | egi spis | | □ Yes | <u></u> |
| 8 | EN OIL | Oif | Number of | Number of freeway lanes | 5 | - I | | ed No | JIO 🗆 |
| L _{up} = | 450 ft | ft veh/h | Number of Length of ra | Number of ramp lanes Length of ramp roadway | 140 | = | | L _{down} = | ft veh/h |
| , and | arsion to no | S _F | Spr = 70 1 | mi/h | SFR | 35 | mi/h | | |
| (hc/h) | AADT (veh/day) | × | Q | (veh/h) | PHF | % HV | All-J | _e | V = V PHF l _{ftV} f _p |
| VE | 17950 | 60. | - | 1616 | 6. | S | 976. | - | 1840 |
| Y. | 275 | 60. | | 25 | 6: | 5 | 976. | - | 28 |
| V _i U | The state of the s | 60. | | 270 | 6. | 5 | 976. | - | 307 |
| νD | | | | | | | | 1 | |
| | | Merge Areas | reas | | | | Diverge Areas | Areas | |
| stim | Estimation of v ₁₂ | | | | Estimat | Estimation of v ₁₂ | | | |
| | | V12 = VF * PFM | | | | . V12 = | V12 = VR + (VF - VR)PFD | VR)PFD | |
| Leg = | Ē | (Equation 25-2 or 25-3) | or 25-3) | | Leo = | Œ | (Equation 25-8 or 25-9) | 8 or 25-9) | |
| P _{FM} = | - | using Equation | | (Exhibit 25-5) | P _{FD} = | 3 | using Equation | | (Exhibit 25-12) |
| V ₁₂ = | 1840 pi | pc/h | | | V12 = | ъ | h/h | | |
| apa | Capacity Checks | | | | Capacity | Capacity Checks | | | |
| | Actual | nal | Maximum | 10S F? | | | Actual | Maximum | LOS F? |
| , | | 8781 | See Exhihit 25-7 | | VFI = VF | | | See Exhibit 25-14 | 4 |
| 2 | = | 900 | | | V ₁₂ | | 4.110 | 4400: All | |
| Vo.1.2 | | 8981 | 4600: All | | VFO = VF - VR | VR | | See Exhibit 25-14 | 4 |
| 9 | | | | | | | | | - |

1 of 1 (Exhibit 25-19)
mi/h (Exhibit 25-19)
mi/h (Exhibit 25-19)
mi/h (Equation 25-15) (Exhibit 25-19)
mith (Exhibit 25-19)
mith (Exhibit 25-19)
mith (Equation 25-14) HICAP 2000 TM ©Catalina Engineering, Inc. 9.09 Speed Estimation

M_s = .336

S_R = 60.6

S₀ = 60.6

S = 60.6

(Exhibit 25-4) pc/mi/In

Speed Estimation D_R = _____

 $D_R = 4.252 + 0.0086 \text{ w}_{12} - 0.009 \text{ L}_D$

D_R = 10S =

| Gene | General Information | ition | | | Site In | Site Information | | | |
|-----------------------------------|-------------------------------|----------------------------------|---|------------------------|--|--|-------------------------------------|------------------------------|---|
| 1 | | W.V | | | | | | | 411010000 |
| Analyst Agency o Analysis I | <u> </u> | M&E PACIFIC TOT PM | 11. | 2015 | Jurisdiction/Date Freeway/Direction Junction | Jurisdiction/Date Freeway/Direction of Travel Junction | | QKH SB NELHA NELHA ACCESS | 4/19/2008 |
| Comment | 1 2015 TK | OTAL PA | 2015 TOTAL PM ON-RAMP | | | | | | |
| Opere | Operational (LOS) | | Design (L _A , L _D , or N) | D, or N) | B | Planning (LOS) | | ☐ Planning | Planning (L _A , L _D , or N) |
| Inputs | | | | | | | | | |
| | | Free | Freeway terrain Level | | Ramp | Ramp terrain Level | | | |
| Jpstream | Upstream Adjacent Ramp | dı | Ramp Typ | a | | | | Downstream Adjacent Ramp | djacent Ramp |
| Z Yes | | - 6 - 0 | Cal Merge | es es | C Diverge | rerge | | □ Yes | 5 |
| 8 | R | न्य आ | Right side | Kar Right side | | Left side | | SQ No | 100 |
| - P | 450 | = | Number | Number of ramp lanes | | | | Lionn | == |
| - n | 77 | veh/h | Length of | Length of ramp roadway | 140 | - - | | V _D = | weh/h |
| | | | S _{FF} = 70 | mi/h | SFR = | 35 " | mi/h | | |
| Conve | ersion to p | c/h Unde | Conversion to pc/h Under Base Conditions | suc | | - | | | |
| (h/)d) | AADT (veh/dav) | × | a | V | 뚪 | WH% | Мij | ď | v = V |
| V.E | 22700 | 60. | _ | 2043 | 6: | 5 | 976 | - | 2327 |
| ٧R | 770 | 60. | | 69 | 6. | 5 | 926. | _ | 79 |
| ηn | | 60. | | 77 | 6. | 5 | 926. | - | 87 |
| ν ₀ | | | | | | | | - | |
| | | Merge | Merge Areas | | | _ | Diverge Areas | reas | |
| Estim | Estimation of v ₁₂ | 8 | | | Estima | Estimation of v ₁₂ | | | |
| | | V12 = VF * PFM | FM | | | - N12 = | $v_{12} = v_R + (v_F - v_R)^P_{FD}$ | Pro | - |
| Leg = | اً ا | (Equation 25-2 or 25-3) | -2 or 25-3) | | Leg = | | (Equation 25-8 or 25-9) | or 25-9) | |
| P _{FM} = | | using Equation | | (Exhibit 25-5) | P _{FD} = | | using Equation | | (Exhibit 25-12) |
| V ₁₂ = | 2327 | pc/h | | | V12 = | pd | pc/h | | |
| Capac | Capacity Checks | | | | Capaci | Capacity Checks | | | |
| | Ac | Actual | Maximum | LOS F? | | A | Actual | Maximum | LOS F? |
| VFO | - 2 | 2406 | See Exhibit 25-7 | | VFI = VF | | | See Exhibit 25-14 | 4 |
| | | , 01 | A600. All | - | VPO = VF - | - VR | | See Exhibit 25-14 | 4 |
| VR12 | 7 | 2406 | 4000. All | | VR | | | See Exhibit 25-3 | |
| Level- | of-Service | Determin | Level-of-Service Determination (if not F) | | Level-c | Level-of-Service Determination (if not F) | eterminati | on (if not F) | |
| D _R = | 5.475 + 0.007 | 734 v _R + 0.0 23.3 | $D_R = 5.475 + 0.00734 \text{ V}_R + 0.0078 \text{ V}_{12} - 0.00627 \text{ L}_A$ | ¥. | 2 | $D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ | 0086 v ₁₂ - 0. | .009 L _D | |
| 10S = | | U | (Exhibit 25-4) | 5-4) | - NO. | | | (Exhibit 25-4) | 25-4) |
| Speed | Speed Estimation | _ | | | Speed | Speed Estimation | | | |
| Σ° | .354 | | (Exhibit 25-19) | | D _s = | | | (Exhibit 25-19) | |
| Se : | 90.1 | | mi/h (Exhibit 25-19) | | SR." | | | mi/h (Exhibit 25-19) | 5-19) |
| = 00 | 1 09 | | mi/n (Exhibit 25-19) | | , 0° | | | _ mi/h (Exhibit 25-19) | 5-19) |
| 111 | | | MAIN IPPRINTED A TOTAL | | , | | | | |

S = 60.1 HICAP 2000 TM ©Catalina Engineering, Inc.

| | General Information | tion | | | Site Info | Site Information | | | |
|--------------------|--|-------------------------|--|------------------------|------------------------|---|---|---|---|
| - Indian | | WV | 1000 | | heirologian | Data | | | 4/19/2008 |
| Analyst | | W 1 | Olak | | Jurisquetion/Date | r Date | | OVU CD NIET UA | |
| pency or | Agency or Company Analysis Period/Year T | TOT PM | | 2020 | Freeway/Di Junction | Freeway/Direction of Travel Junction | | NELHA ACCESS | |
| Comment | 2020 TC | 2020 TOTAL PM | ON-RAMP | | | | | | |
| Operati | ☐ Operational (LOS) | | ☐ Design (LA, Lp, or N) | or N) | EZ D | Planning (LOS) | | ☐ Planning | Planning (L _A , L _D , or N) |
| Inputs | | | | | | | | | |
| | | Free | Freeway terrain Level | | Ramp te | Ramp terrain Level | | | |
| stream / | Upstream Adjacent Ramp | g. | Ramp Type | gu | | | | Downstream A | Downstream Adjacent Ramp |
| Ed Yes | 0 | ő | Merge | | □ Diverge | arge | | □ Yes | 0 0 |
| 2 | B | ES OIL | Mumber of fee | Mumber of feeders land | L Left side | side | | ed No | |
| | 450 | = | Number of | Number of ramp lanes | - | | | Ldown = | = |
| V _u = | 153 | veh/h | Length of | Length of ramp roadway | 140 | u | | Vo == | veh/h |
| | | | S _{FF} = 70 | mi/h | SFR = | 35 | mi/h | | |
| Sonve | rsion to p | c/h Under | Conversion to pc/h Under Base Conditions | us | | | | | |
| (hc/h) | AADT (veh/dav) | × | Q | V (veh/h) | 岩 | % HA | | <u>.</u> e | v = V |
| V.F. | 23800 | 60. | | 2142 | 6. | 5 | 976. | - | 2439 |
| V _R | 770 | 60' | | 69 | 6. | 5 | 926. | - | 79 |
| N _U | | 60. | | 153 | 6. | 5 | 976. | - | 174 |
| νo | | | | | | | | - | |
| | | Merge | Merge Areas | | | | Diverge Areas | reas | |
| Estima | Estimation of V ₁₂ | 2 | | | Estima | Estimation of v ₁₂ | | | |
| | | V12 = VF * PFM | FM | | | V ₁₂ | V12 = VR + (VF - VR)PFD | R)PFD | |
| Leg = | | (Equation 25-2 or 25-3) | | | Leg = | | (Equation 25-8 or 25-9) | | |
| P _{FM} = | - | using Equation | | (Exhibit 25-5) | Pro = | | using Equation | | (Exhibit 25-12) |
| V ₁₂ = | 2439 | h/d | 12. | | V ₁₂ = | 1 | pc/h | | |
| Sapac | Capacity Checks | us | | | Capaci | Capacity Checks | | | |
| | Ą | Actual | Maximum | LOS F? | | | Actual | Maximum | 10S F? |
| VFO | | 2518 | See Exhibit 25-7 | | VFI = VF | | | 4400: All | <u> </u> |
| | | | 4500. All | | 3 | - vR | | See Exhibit 25-14 | -14 |
| VR12 | | 2518 | 4000: All | | N _R | | | See Exhibit 25-3 | -3 |
| Level | of-Service | Determin | Level-of-Service Determination (if not F) | | Level- | of-Service I | Determinat | Level-of-Service Determination (if not F) | |
| D _R = | 5.475 + 0.00 | 734 VR + 0.0 | D _R = 5.475 + 0.00734 v _R + 0.0078 v ₁₂ - 0.00627 L _A | LA | ٥ | D _R = 4.252 + | $D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ | 0.009 L _D | |
| DR = LOS = | | C C | (Exhibit 25-4) | 5-4) | LOS = | No section of | | (Exhit | (Exhibit 25-4) |
| Speed | Speed Estimation | uo | TO THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN T | | Speed | Speed Estimation | | | |
| | 36 | , | (Evhihit 25,10) | | - | | | (Exhibit 25-19) | 6 |
| M _s = _ | 59.9 | 6 | mi/h (Exhibit 25-19) | 6 | s, cg | | | mi/h (Exhibit 25-19) | 25-19) |
| S. S. | | | mi/h (Exhibit 25-19) | 6 6 | S ₀ = | | | _ mi/h (Exhibit 25-19) | 25-19) |
| , | | | | | | | | | |

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| Name of the East Conditions Name of the East Conditions Name of the East Conditions | celle | General Information | ıtion | | | Site Inf | Site Information | | | |
|---|---------------------------------|-------------------------|---------------|-------------------------------|-------------------------|-------------------|------------------------------|----------------------------|-------------------|--|
| Very Scropping M&E PACIFIC 2029 | Ambuch | | WY | | - | himinoficatio | nt/Data | | | 4/19/2008 |
| uuts Freeway terrain Level Ramp terrain Ramp terrain Ramp terrain Level Ramp terrain Level Ramp terrain Ramp terrain Ramp terrain Ramp terrain Ramp terrain Level Ramp terrain Level Ramp terrain Ramp terrain Ramp terrain Ramp terrain Ramp terrain Level Ramp terrain Level Ramp terrain Ramp ter | Analyst Agency o Analysis | r Company Period/Year | M&E PACTOT PM | | 029 | Junsdictio | n/Date lirection of Trave | 1 - 1 - 1 | ACCESS | 9007/61/4 |
| Freeway terrain Level Ramp terrain Level Bownstream Adjacent Ramp Type Carbon Level Bownstream Adjacent Ramp Type Carbon Level Bownstream Adjacent Ramp Type Carbon Level Carbon Level Carbon Level Carbon Level Carbon Level Carbon Level Carbon Level Carbon Level Carbon Carb | Opera | ational (LOS) | | Design (Le, Ln | or N) | | lanning (LOS) | | | (La, Lp, or N) |
| Freeway terrain Level Ramp terrain Level Ramp terrain Level Ramp terrain Level Ramp terrain Level Ramp terrain Level Ramp terrain Level Ramp terrain Level Car Merge | Inputs | (4) | | | | | | | | |
| Street Comparison Famp Type Comparison Compar | | | Freew | ay terrain Level | | Ramp | errain Level | | | |
| Second Continue of the conti | Jpstream | Adjacent Ran | | Ramp Typ | e) | | | | Downstream A | djacent Ramp |
| Verificial Ver | ZZ Yes | | o | Merge | | O. | erge | | O Yes | 6 |
| 1 | 8 | ß | | Number o | Side f freeway lanes | 3 | l side | | EZ No | 10 C |
| Nerge Areas Sign = To mith Sign = 3.5 mith No No | = dn | 450 | = | Number o | f ramp lanes | | | | - down | 32 |
| Style | | | veh/h | Length of | ramp roadway | 140 | | | V _D = | veh/h |
| AADT | | | | | mi/h | SFR = | | ni/h | | |
| AADT K D (verlin) V PHF % HV ftp verlings Verl | Conve | ersion to p | c/h Under | Base Conditio | ıns | | | | | |
| 25300 29 1 2367 29 5 976 1 1 1 1 1 1 1 1 1 | (h/)d) | AADT (veh/dav) | × | Q | (veh/h) | PHF | % HIV | t _H v | عي ا | |
| See Exhibit 25-7 See Exhibit 25-19 See E | VF | 26300 | 60. | | 2367 | 6. | 5 | 976. | - | 2696 |
| 109 288 .9 5 .916 1 | VR | 840 | 60. | | 92 | 6. | 5 | 926. | - | 98 |
| Merge Areas Diverge Areas | V _U | | 60. | | 288 | 6. | 5 | 976. | - | 328 |
| Nation of V ₁₂ Estimation of V ₁₂ V ₁₁₂ = V ₁₇ = V ₁₇ = V ₁₇ P _{FM} (Equation 25-2 or 25-3) L _{ED} = (Equation 25-8 or 25-9) (Equation 25-2 or 25-3) L _{ED} = (Equation 25-8 or 25-9) (Equation 25-2 or 25-3) L _{ED} = (Equation 25-8 or 25-9) (Equation 25-2 or 25-3) L _{ED} = D _{FD} (Equation 25-3 or 25-9) P _{FD} = Using Equation (Exhibit 25-5) V ₁₇ = D _{FD} (Exhibit 25-14 V ₁₇ = D _{FD} (Exhibit 25-14 V ₁₇ = D _F = CENHIBI 25-14 (Exhibit 25-14 D _F = 1.252 + 0.0086 V ₁₂ - 0.009 L _D (Exhibit 25-14 CENHIBI 25-19 S _{FD} = (Exhibit 25-19 (Exhibit 25-19 S _{FD} = (Exhibit 25-19 D _F = (Exhibit 25-19 D _F = (Exhibit 25-19 D _F = D _{FD} (Exhibit 25-19 S _{FD} = D _{FD} = (Exhibit 25-19 D _F = D _{FD} (Exhibit 25-19 S _{FD} = D _{FD} = D _{FD} (Exhibit 25-19 S _{FD} = D _{FD} D _{FD} = D _{FD} (Exhibit 25-19 S _{FD} = D _{FD} D _{FD} = D _{FD} (Exhibit 25-19 S _{FD} = D _{FD} D _{FD} = D _{FD} (Exhibit 25-19 S _{FD} = D _{FD} D _{FD} (Exhibit 25-19 S _{FD} = D _{FD} D _{FD} (Exhibit 25-19 S _{FD} = D _{FD} D _{FD} (Exhibit 25-19 S _{FD} = D _{FD} D _{FD} (Exhibit 25-19 S _{FD} = D _{FD} D _{FD} (Exhibit 25-19 S _{FD} = D _{FD} D _{FD} (Exhibit 25-19 S _{FD} = D _{FD} D _{FD} (Exhibit 25-19 S _{FD} = D _{FD} D _{FD} (Exhibit 25-19 S _{FD} = D _{FD} D _{FD} (Exhibit 25-19 S _{FD} = D _{FD} D _{FD} (Exhibit 25-19 S _{FD} = D _{FD} D _{FD} (Exhibit 25-19 D _{FD} = D _{FD} (Exhibit 25-19 D _{FD} = D _{FD} (Exhibit 25-19 D _{FD} = D _{FD} (Exhibit 25-19 D _{FD} = D _{FD} (Exhibit 25-19 D _{FD} = D _{FD} (Exhibit 25-19 D _{FD} = D _{FD} (Exhibit 25-19 D _{FD} = D _{FD} (Exhibit 25-19 D _{FD} = D _{FD} (Exhibit 25-19 D _{FD} = D _{FD} (Exhibit 25-19 D _{FD} = D _{FD} (Exhibit 25-19 D _{FD} = D _{FD} (Exhibit 25-19 D _{FD} = D _{FD} (Exhibit 25-19 D _{FD} = D _{FD} (Exhibit 25-19 D _{FD} = D _{FD} (| νD | | | | | | 5 | | - | |
| Estimation of V ₁₂ V ₁₇ = V ₁₇ + V ₁₉ V ₁₇ = V ₁₇ + V ₁₉ V ₁₇ = V ₁₇ + V ₁₉ V ₁₇ = V ₁₇ + V ₁₉ V ₁₇ = V ₁₇ = V ₁₇ + V ₁₉ V ₁₇ = V ₁₇ = V ₁₉ V ₁₇ = V ₁₉ V ₁₇ = V ₁₉ V ₁₇ = V ₁₉ V ₁₇ = V ₁₉ V ₁₇ = V ₁₉ V ₁₇ = V ₁₉ V ₁₇ = V ₁₉ V ₁₇ = V ₁₉ V ₁₇ = V ₁₇ = V ₁₉ V ₁₇ = V ₁₉ V ₁₇ = V ₁₉ V ₁₇ = V ₁₇ V ₁₇ V ₁₇ V ₁₇ = V ₁₇ V ₁₇ V ₁₇ V ₁₇ = V ₁₇ V ₁₇ | | | Merge | Areas | | | | Diverge Ar | eas | |
| Figure F | Estim | ation of v ₁ | 24 | | | Estima | ition of v ₁₂ | | | |
| City Checks | | | V12 = VF * P | FI | | | ¥12 = | VR + (VF - VR | JP _{FD} | |
| Using Equation | LEQ = | | Equation 25- | .2 or 25-3) | | Leo = | | quation 25-8 (| or 25-9) | |
| Capacity Checks Capacity Checks Actual Maximum 10S F Vi2 = Pic/h | PFM = | | using Equati | | ibit 25-5) | P _{FD} = | | sing Equation | | (Exhibit 25-12) |
| Actual Maximum LOS F7 Actual Maximum LOS F7 Actual Actual Maximum LOS F7 Vra V | V12 = | 2090 | pc/h | | 100 100 100 100 | V12 = | | • | | AAAA AAA AAA AAA AAA AAA AAA AAA AAA A |
| 2782 See Exhibit 25-14 V _{P1} = V _F V _{P2} V _{P2} V _{P2} V _{P2} V _{P3} V | capa | out Cilean | o de la | Mavimim | 100 59 | Capac | | Chiat | Maximum | 10S F? |
| 2782 See Exhibit 25-7 V12 V12 V12 V12 V12 V12 V12 V12 V12 V12 V12 V13 V13 V13 V14 V14 V14 V15 V14 V15 V1 | | | | | | VFI = VF | | | See Exhibit 25- | +- |
| 2782 4600: All v _{RD} = V _F - V _R Service Determination (if not F) Level-of-Service Determination (if not F) Level-of-Service Determination (if not F) Level-of-Service Determination (if not F) Level-of-Service Determination D _R = 26.3 pc/mi/ln D _R = 1.252 + 0.00868 v ₁₂ - 0.0 D _R = 1.0S = C (Exhibit 25-4) LOS = C (Exhibit 25-19) S _R = C (Exhibit 25-19) S _R = C (Exhibit 25-19) S _R = C (Exhibit 25-19) S _R = C (Exhibit 25-19) S _R = C (Exhibit 25-19) S _R = C (Exhibit 25-19) S _R = C (Exhibit 25-19) S _R = C (Exhibit 25-19) S _R = C (Exhibit 25-19) S _R = C (Exhibit 25-19) S _R = C (Exhibit 25-19) C (Ex | VFO | | 2782 | See Exhibit 25-7 | havan. | V ₁₂ | | - | 4400: All | |
| 1-of-Service Determination (if not F) Restrict Determination 1-of-Service Determination 1-of-Se | VR12 | | 2782 | 4600: All | | VFO = VF | - VR | | See Exhibit 25- | ± 67 |
| = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A DR = L_B DC = 4.252 + 0.0066 v_{12} - 0.00 DR = L_B Dc = L_B DC = | Level- | of-Service | Determin | nation (if not F) | | Level | of-Service De | eterminativ | on (if not F) | |
| C | D _R = | 5.475 + 0.00 | 734 vg + 0.0 | 078 v ₁₂ - 0.00627 | Α- | | D _R = 4.252 + 0. | .0086 v ₁₂ - 0. | | |
| Speed Estimation Speed Estimation 374 (Exhibit 25-19) D _s = 59.5 mith (Exhibit 25-19) S _R = mith (Exhibit 25-19) S _R = 50.5 mith | D _R = 1.05 = | | C. C. | Exhibit 2 | 5-4) | _n LOS =_ | | | pc/mi/ (Exhibi | ın ı 25-4) |
| . 374 (Exhibit 25-19) D _s = S95 mi/h (Exhibit 25-19) S _R = mi/h (Exhibit 25-19) S _O = | Speec | 1 Estimatic | ı, | | | Speed | Estimation | | | |
| 59.5 miln (Exhibit 25-19) S _R = | M. = | .37 | 4 | (Exhibit 25-19) | | D, = | - Married | | (Exhibit 25-19 | 6 |
| mi/h (Exhibit 25-19) S ₀ = | S _R = | .65 | 5 | mi/h (Exhibit 25-19 | | 28. | | | mi/h (Exhibit | 25-19) |
| 200 | So= | | | mi/h (Exhibit 25-19 | | | | | mi/h (Exhibit | 25-19) |

Appendix E Highway

Highway
Level of Service (LOS) Calculations

| Signature Information Signature Information Signature Information Signature Value Signature | CHAPTER 20 - DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET | NE HIGHWAY SEGMENT | WORKSHEET |
|--|--|--|--|
| PACIFIC Highway Highway PACIFIC Highway High | ral Informat | Site Information | |
| Figure Comparison Figure Comparison Figure Comparison Figure Comparison Compar | , | on/Date | |
| Comparison Com | M&E PACIFIC EX AM | . | JANI TO KOHANAIKI |
| Comparison (v, p) | EXISTING AM SB | | |
| Sinculator width 12 | nnal (LOS) | ☑ Planning (LOS) | ☐ Planning (v _o) |
| Shoulder width 12 | management of the company of the com | | |
| Strong Lane width 12 R Swarmen Annow Peak-hour factor, PHF 95 % Non-time factor Lane width 12 R Swarmen Annow Peak-hour factor, PHF 95 % Non-time factor Non | Shoulderwidth | Td Class I high | |
| Comparison Lane width 12 | Lane width 12 | lerrain Crade Jensel | |
| Shoulder width Shoulder width Shoulder width Shoulder width Shoulder width See Shoulder width See Shoulder width See Shoulder width See Shoulder width See Shoulder width See Shoulder width See Shoulder width See Shoulder width See Shoulder width See Shoulder width See Shoulder width See Shoulder width | Lane width 12 | | 95 |
| Reagh, L_1 | Shoulder width 6 | | 3 |
| Recess points in a parent parent problem 20 | | % Recreational | les, P _R 0 |
| Secondaria Sec | 2 | % No-passing | 200 |
| Lets, E. (Eschibit 20-9 or 20-15) Lis, E. (Eschibit 20-9 or 20-15) Lis, E. (Eschibit 20-9 or 20-15) Lis, E. (Eschibit 20-9 or 20-17) Lis, I. (Lis, V. (L | 865 | Opposing direction volume, V _o | 915 vei |
| National Color Nati | Average Travel Speed | THE RESIDENCE OF THE PROPERTY | 100 may 100 ma |
| 1.1 | | Analysis Direction (d) | Opposing Direction (o) |
| 1, 1, 1, 1, 1, 1, 1, 1, | Passenger-car equivalent for trucks, E _T (Exhibit 20-9 or 20-15) | _ | 1.1 |
| 15 17 17 17 17 18 18 18 18 | Passenger-car equivalent for RVs, E _R (Exhibit 20-9 or 20-17) | | |
| 1 | Heavy-vehicle adjustment factor, 5 f _{HV} f _{IW} = 1 + P ₁ (E ₂ - 1) + P ₈ (E _R - 1) | 266' | 766. |
| Pietr W_1 Pietr W_1 Pietr W_1 Pietr W_2 Pietr W_2 Pietr W_2 Pietr W_2 Pietr W_2 Pietr W_2 Pietr W_2 Pietr W_2 Pietr W_2 Pietr Webh Adj. for lane width and shoulder width, \$^{1}_{2}\$ (Exhibit 20-5) 0 Pietr Pietr Webh Adj. for lane width and shoulder width, \$^{1}_{2}\$ (Exhibit 20-19) | Grade adjustment factor, ¹ f _G (Exhibit 20-6 or 20-12) | | |
| Base free-flow speed. Estimated Free-Flow Speed | Directional flow rate, $^2 v_1$ (pc/h) $v_1 = \overline{pHF} \cdot V_1$ | 913 | 996 |
| Signature Sign | Free-Flow Speed from Field Measurement | Estimated | |
| \$6.5 verth | 55 | Base free-flow sneed 3 BFFS | |
| 61.7 mi/h (Adj. for access points.) ¹ / ₄ (Exribit 20-6) 5 61.7 free-flow speed, FFS ₄ (Exribit 20-19) 61.7 free-flow speed, FFS ₄ (Exribit 20-19) 61.7 free-flow speed, FFS ₄ (Exribit 20-19) 61.7 free-flow speed, FFS ₄ (Exribit 20-10 or 20-16) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 865 | Adj. for lane width and shoulder | 0 |
| Fig. Fig. Fig. Fig. Fig. Fig. Fig. | 61.7 | Adj. for access points, 3 f _A (Exhili | |
| FFS_a = BFFS - I_s = I_h FFS_a = BFFS - I_s = I_h FFS_a = BFFS - I_s = I_h FFS_a = BFFS - I_s = I_h FFS_a = BFFS - I_s = I_h FFS_a = BFFS - I_s = I_h FFS_a = BFFS - I_s = I_h FFS_a = BFFS - I_s = I_h FFS_a = BFFS - I_s = I_h FFS_a = I_s = | $FFS_d = S_{FM} + 0.00776 \left(\frac{V_f}{I_{BM}} \right)$ | Free-flow speed, FFS _d | 61.7 |
| 18 Marg = FF5q = 0.00716[V _q + V _q) = V _q 46.3 18 May Mag = FF5q = 0.00716[V _q + V _q) = V _q 46.3 18 Marg = FF5q = 0.00716[V _q + V _q) = V _q 1 1 19 Marg = FF5q = 0.00716[V _q + V _q] = V _q 1 1 19 Marg = M | A.F 16. A.F | FFS _d = BFFS - f _{LS} - f _A | |
| Many | | | 6. |
| Analysis Direction (d) | = rr3d - 0.00770(vd + vg) | | 46.3 |
| Lotes, E. (Exhibit 20-10 or 20-16) List (texhibit 20-10 or 20-16) List (texhibit 20-10 or 20-16) List (texhibit 20-10 or 20-14) N = Pite * List (Exhibit 20-20) | | | |
| 1 1 1 1 1 1 1 1 1 1 | Passenner-car equivalent for tooks F. (Fyhihi) 20.10 or 20.16) | Analysis Direction (d) | Opposing Direction (o) |
| 1, thus has 1.1.20-8 or 20-14) 1, thinki 20-8 or 20-14) 1, the hir 1.20-8 or 20-14) 1, the hir 1.20-8 or 20-14) 1, the hir 1.20-8 or 20-14) 1, the Performance Measures 2, the Performance Measures 2, the Performance Measures 2, the Performance Measures 2, the Performance Measures 2, the Performance Measures 2, the Performance Measures 2, the Performance Measures 2, the Performance Measures 2, the Performance Measures 2, the Performance Measures 2, the Performance Measures 2, the Performance Measures 2, the Performance Measures 2, the Performance Measures 2, the Performance Measures 2, the Performan | Passenger-car equivalent for RVs, Eg (Exhibit 20-10 or 20-16) | | |
| 1 1 1 1 1 1 1 1 1 1 | 1 | | |
| Wiley Wile | 71 + P ₁ (E _T - 1) + P _R (E _R - | | |
| Pite - tight | טומטר מקוטאווופות ומתנטן, יוק (באוווטון בט-ס טו בט- ויין) | | |
| High PRTS 6 (%) 87.8 | | 911 | 963 |
| 156 178 | Base percent time-spent-following, ⁴ BPTSF _d (%) RPTSF _{,=} 100(1 = a ^{Nu/a}) | | 87.8 |
| 1556_(66) PTSF_e BPTSF_e + frq. 91.4 | Adjustment for no-passing zone, f., (Exhibit 20-20) | | 3 6 |
| Ther Performance Measures E | Percent time-spent-following, PTSF ₄ (%) PTSF ₄ = BPTSF ₄ + f ₂₁₁ | | 914 |
| 00.3 or 20.4) Re = 1700 1.54 3.4 3.4 3.4 3.55 3.54 3.58 3.58 3.68 3.78 3 | Level of Service and Other Performance Measures | And the party of the construction and the party of the construction of the party of the construction of the party of the construction of the party of the construction | |
| | Level of service. LOS (Exhibit 20-3 or 20-4) | THE REAL PROPERTY AND PERSONS ASSESSED. | T. |
| 100 17 17 17 17 17 17 17 | Volume to capacity ratio. v/c | | 54 |
| 455 1730 1745 (velt-II) Tris=NMTis 1750 175 (velt-II) Tris=NMTis 1750 175 (velt-II) Tris=NMTis 1750 175 (velt-II) Tris=NMTis 1750 175 (velt-II) Tris=NMTis 1750 175 (velt-II) Tris=NMTis 1750 175 (velt-II) Tris=NMTis 1750 | Peak 15-min vehicle-miles of Iravel, VMT ₁₅ (veh-mi) | | |
| el, VMTgg (veh-mi) VMTgg = Vg * L _t T ₁₅ (veh-lt) Tr ₁₅ = VMT ₁₅ wat (level) or rolling terrain, L _e = 1.0 minate analysis—the LOS is F. 1 and b. if some trucks operate at crawl speeds on a specific drowing ade. | VMT ₁₅ = 0.254 (Pilk) | | 455 |
| T ₁₅ (verti-1) T ₁₁₅ MST ₁₅ MSS ₁₅ 9.8 wer (level) or rolling terrain, $I_{\rm c} = 1.0$ minate analysis—the LOS is $F_{\rm c}$ and $D_{\rm c}$ | Peak-hour vehicle-miles of travel, VMTg0 (veh-mi) VMTg0 = Va L | | 1730 |
| and (level) or rolling terroin, $(y_{\rm e}=1.0)$ minate analysis—the LOS is $f_{\rm e}$. and $h_{\rm e}$ and $h_{\rm e}$. | | | 8.6 |
| and (even) or rolling tenchs, $t_0=1.0$ minus analysis—the LOS is t_1^* and t_2^* and t_3^* and t_3^* come trucks operate at crawl speeds on a specific downgrade. | | The state of the s | |
| and b, is some trucks operate at crawl speeds on a specific downgrade. | 1. If the highway is extended segment (level) or rolling terrain, $f_0 \approx 1.0$ 2. If $v_0 (w_0 r_{v_0} \ge 1.00)$ pc/h, terminate analysis—the LOS is F. | | |
| THE PROPERTY OF THE PROPERTY O | Exhibit 20-21 provides factors and b. Use alternative Equation 20-14 if some trucks operate at crawl speeds on a specific | ilic downgrade. | |
| Market Contract of the Contrac | HICAP 2000 TM | | 1 of 2 |

| CHAPTER 20 - DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WITH PASSING LANE WORKSHEET | NY SEGMENT WITH PASSIN | G LANE WORKSHEET |
|--|--|--|
| al Informat | Site Information | |
| Agency or Company M&E PACIFIC Agency or Company EXAM EXAM Comment 2006 EXISTING AM SB | Jurisdiction/Date Highway G. KAAH From/To KAIMINA | 4/19/2008 O. KAAHUMANU HWY SB KAIMINANI TO KOHANAIKI |
| ☐ Operational (LOS) | 2 Planning (LOS) | ☐ Planning (v _p) |
| Input Data G Class I highway | □ Class II highway | 2 |
| l si | - Tourism | |
| Analysis direction | ction | Show North Arrow |
| | L _{de} L _d | |
| | | TANK THE PERSON NAMED IN COLUMN TO T |
| lotal length of analysis segment, L ₁ (mi) Length of two-lane highway upstream of the passing lane, L ₁ , (mi) | 2 0 | |
| Length of passing lane including tapers, Lpl (ml) | | |
| Average travel speed, ATS _d (from Directional Two-Lane Highway Segment Worksheet) | 46.3 | |
| Percent time-spent-following, PTSF _d (from Directional Two-Lane Highway Segment Worksheet) | 91.4 | |
| Level of service, ¹ LOS _d (from Directional Two-Lane Highway Segment Worksheet) | til. | |
| Average Travel Speed | | THE REAL PROPERTY AND ADDRESS OF THE PERSON NAMED IN COLUMN TWO PERSONS ASSESSED. |
| Downstream length of two-lane highway within effective length of passing | 1.7 | |
| igne for gwerdge traver speed, Life (IIII) (EXTIBIT 20-23) anoth of the practice | | |
| Length to two-take nightway downstream of elective rength of the passing hane for average travel speed, $L_{\bf d}$ (mi) $L_{\bf d}=L_{\bf l}-\{l_{\bf u}+L_{\bf pl}+L_{\bf de}\}$ | | |
| Adj. factor for the effect of passing lane on average speed, f _{pl} (Exhibit 20-24) | 11.1 | |
| Average travel speed including passing lane, 2 ATS _{p1} | 0.000 | The state of the s |
| $A1S_{\mu} = \frac{1}{L_{\mu} + L_{\alpha} + \frac{L_{\mu}}{l_{\mu}}} + \frac{2L_{\alpha}}{l_{\mu}}$ | | |
| Percent Time-Spent-Following | | |
| Downstream length of two-lane highway within effective length of passing tane for persent time-sevent following 1 (mi) (Exhibit 20, 23) | 5.7 | |
| Length of two-lane highway downstream of effective length of the passing | | A SECTION AND ADDRESS OF THE PARTY OF THE PA |
| lane for percent time-spent-following, L_d (mi) $L_d = L_t - (L_u + L_{pl} + L_{de})$ | | |
| Adj. factor for the effect of passing lane on percent time-spert-following, t _{ol} (Exhibit 20-24) | .62 | |
| Percent time-spent-following including passing lane, 3 PTSFpt (%) | | |
| $PTSF_{pl} = \frac{PTSF_{0l}L_{10} + L_{4} + f_{pl}L_{pl} + \left(\frac{1+p_{0l}}{2}\right)L_{\underline{doj}}}{1}$ | | |
| Level of Service and Other Performance Measures 4 | | |
| Level of service including passing lane, LOS _{pl} (Exhibits 20-3 or 20-4) | The second state of the second | |
| Peak 15-min total travel time, TT ₁₅ (veh-fi) TT ₁₅ *-ATS ₃₁ . | | |
| Notes | | |
| 1. If $LOS_d = F_t$ passing lane analysis cannot be performed. 2. If $I_d < 0$, use alternative Equation 20-22. 3. If $I_d < 0$, use alternative Equation 20-20. | | |
| 4. VC, VM 15, and VM160 are calculated on Directional IWo-Lane Highway Segment Worksheel. | vay segment worksneet. | 2 of 2 |
| HICAP 2000 IM ©Catalina Engineering, Inc. | | 1 |

101 QUEEN KAAHUMANU HWY KAIMINANI TO KOHANAIK 4/14/2008 Plan. (v_p) _pc/h/ln pc/h/ln _pc/mi/ln Output LOS, S, D N, S, D LOS, S, D N, S, D N, S, D mi/h u/h mi/h H/H Ę. mi/h f_{LC} - Exhibit 21-4 f_{LC} - Exhibit 21-5 f_M - Exhibit 21-6 f_A - Exhibit 21-7 ☐ Mountainous 972 55 Calculate Speed Adjustments and FFS 0 0 Input FFS, N, v_p FFS, LOS, v_p FFS, LOS, N FFS, N, AADT FFS, LOS, AADT FFS, LOS, N Up/Down Plan. (N) CHAPTER 21 - MULTILANE HIGHWAYS WORKSHEET $\begin{array}{llll} E_{T} & - & Exhibit \ 21-9, \ 21-9, \ 21-11 \\ E_{R} & - & Exhibit \ 21-8, \ 21-10 \\ I_{\rho} & - & Page \ 21-11 \\ LOS, S, \ FFS, \ v_{\rho} & - & Exhibit \ 21-2, \ 21-3 \end{array}$ Design (N) or Planning (N) 2nd Iteration Design (N) or Planning (N) 1st Iteration FFS = BFFS - ILW - ILC - IA - IM Application Operational (LOS) Design (N) Design (v_p) Planning (LOS) Planning (N) Planning (V_p) C Rolling 111 " 1 + P1(E1 - 1) + PR(ER - 1) Design, Planning (N) Highway/Direction of Travel From/To $V_{\rho} = \frac{V \text{ or DDHV}}{V \text{ or DDHV}} V_{\rho}$ $V_{p} = \frac{V_{qf} \text{ or both } V_{qf}}{V_{qf}}$ Factor Location Site Information Length % Trucks and buses, P₁ Peak-hour factor, PHF Plan. (LOS) Jurisdiction/Date Number of Janes General terrain E Level % RVs, P_R $D = v_p/S$ 2400 Grade: frw frc S - Speed
D - Density
FFS - Free-flow speed
BFFS- Base free-flow speed Operational, Planning (LOS); Design, Planning (vp) _pc/mi/ln pc/mi/ln 2015 veh/day pc/h/ln pc/h/ln Des. (v_p) veh/h velv/h weh/h "mi/h mi/h mi/h A/mi mj/h BOO 1700 Ed Divided Cl Recreational/Weekend 797 B 55 14.5 Flow Rate (pc/h/ln) 1395 .5 09 2 2 Agency or Company M&E PACIFIC
Analysis Period/Year TOT AM
Comment 2015 AM TOTAL Calculate Flow Adjustments DDHV - Directional design-hour volume Des. (N) Undivided Operational (LOS) or Planning (LOS) ΜY Peak-hour direction proportion, D Peak-hour proportion of AADT, K Annual avg. daily traffic, AADT Design (v_p) or Planning (v_p) LOS General Information Base free-flow Speed, BFFS Total lateral clearance, TLC Commuter/Weekday V = Vp * PHF * N * 4+10 * fp N - Number of lanes V - Hourly volume ν_ρ - Flow rate LOS - Level of service DDHV = AADT * K * D Speed Inputs Access points, A Median type, M Flow Inputs Lane width, LW FFS (measured) Glossary Oper. (LOS) Driver type $D = v_p / S$ t 60 Free-Fl. Volume, V $D = v_0/S$ (Alim) beed? tsJ-regnazzsq agsravA 100

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| 30 400 800 | C C D C C C C C C C C C C C C C C C C C | Application (LOS) Design (N) Design (N) Planning (US) Planning (U) Planning (V) | FFS, N, Vp FFS, LOS, Vp FFS, LOS, N FFS, LOS, N FFS, LOS, AADT FFS, LOS, N | Output 1.05, S, D N, S, D V _p , S, D N, S, D N, S, D V _p , S, D |
| ral Informati | THE RESIDENCE OF THE PARTY OF T | Site Information | AND STATEMENT AND RESIDENCE AN | |
| | | , | | 4/14/2008 |
| Agency or Company M&E PACIFIC Analysis Period/Year AMB AM Comment 2020 AM AMBIENT | M 2020 | Highway/Direction of Travel From/To | QUEEN KAAHUMANU HWY KAIMINANI TO KOHANAIK | MANU HW KOHANAI |
| | Des. (vp) | | Plan. (N) | Plan. (v _p) |
| Flow Inputs | | THE STATE OF THE S | THE REAL PROPERTY AND ADDRESS OF THE PERSON | 1 |
| Volume, V | 1370 veh/h | Peak-hour factor, PHF | 6. | - Anna |
| Annual avg. daily traffic, AADT Death hour propertion of AADT K | veh/day | % Trucks and buses, P _T | 0 0 | |
| Peak-Hour direction proportion D | | 70 KVS, FR | 1 | |
| DDHV = AADT * K * D | veh/fn | M Level □ Rolling | ☐ Mountainous | SI |
| | | Grade: Length | mi Up/Down | % |
| Calculate Flow Adjustments | - Recreational/Weekend ents | Number of lanes | 7 | A STATE OF THE PARTY OF THE PAR |
| | | | - | |
| - آ- ا ا | 1.5 | f _{RV} = 1 + P.(F _x - 1) + P.(F _x - 1) | 972 | 5 |
| Speed Inputs | 14.100 | Calculate Speed Adjustments and FFS | tments and FFS | A A A A A A A A A A A A A A A A A A A |
| Lane width, LW | 10 11 | T IN | 9.9 | ml/h |
| Total lateral clearance, TLC | 12 # | 3 3 | 0 | mi/h |
| Access points, A | Ami | . | | mi/h |
| FFS (measured) | | , W | 0 | mi/h |
| Base free-flow Speed, BFFS | 60 ті/н | FFS = BFFS - f _{LW} - f _{LC} - f _A - f _M | f _M 55 | mi/h |
| Operational, Planning (LC | Operational, Planning (LOS); Design, Planning (vp) | Design, Planning (N) | | Annual III / |
| Operational (LOS) or Planning (LOS) | | Design (N) or Planning (N) 1st Iteration | ation | |
| ν _p = V or DDIN | ~ | N | | assumed |
| | J3 mi/h | Vp = PHF · N · f _{th} · f _{th} | | pc/h/ln |
| D = v _p /S LOS | 55 pc/mi/ln 14.24 | 501 | | |
| Design (v _p) or Planning (v _p) | | Design (N) or Planning (N) 2nd Iteration | ration | |
| SOT | | Z | | assumed |
| a a | pc/h/ln | y or DHY | | pc/h/ln |
| V = Vp * PHF * N * fgv * fp | weh/h | 507 | | |
| S | m/h | S | | mi/h |
| $D = v_p/S$ | pc/mi/ln | $0 = v_p/S$ | | pc/ml/ln |
| Glossary | THE RESIDENCE AND ADDRESS OF THE PERSON NAMED AND ADDRESS OF T | Factor Location | | |
| V · Number of lanes | S - Speed | E Exhibit 21-8, 21-9, 21-11 | f.w. Exhibit 21-4 | 1 21-4 |
| V - Hourly volume | D Density | E _R - Exhibit 21-8, 21-10 | LC - Exhibit 21-5 | it 21-5 |
| v _p - Flow rate | FFS - Free-flow speed | (p - Page 21-11 | | 1 21-6 |
| LOS - Level of service | BFFS - Base free-flow speed | LOS, S, FFS, vp - Exhibit 21-2, 21-3 | | 1 21-7 |

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| The Property of the Property o | Work Wash | Application Operational (LOS) Design (N) Design (N) Planning (LOS) Planning (N) Planning (N) | FFS, N, V _p FFS, LOS, V _p FFS, LOS, N FFS, LOS, N FFS, N, AADT FFS, LOS, AADT FFS, LOS, AADT | Output 105, 5, D N, 5, D V _p , 5, D LOS, 5, D N, 5, D |
| our our of the control | /n) | 410 | | |
| | William Commission with the Control of the Control | olte illioimanon | | 00000 |
| Agency or Company M&E PACIFIC | ACIFIC | Jurisdiction/Date Highway/Direction of Travel | QUEEN KAAHUMANU HW | MANU HW |
| Analysis Period/Year TOT AM Comment 2020 AM TOTAL. | 2020 | From/To | KAIMINANI TO KOHANAIK | KOHANA |
| | Des. (v _p) | Plan. (LOS) | Plan. (N) | Plan. (v _o) |
| Flow Inputs | · | | | |
| Volume, V | 1435 veh/h | Peak-hour factor, PHF | S | |
| Annual avg. daily traffic, AAU1 Peak-hour proportion of AADI. K | veh/day | % frucks and buses, P _T % RVs. P _s | 2 | |
| Peak-hour direction proportion, D | | General terrain | | |
| DDHV = AADT • K • D | weh/h | evel | ٥ | |
| Driver type Commuter/Weekday | ☐ Recreational/Weekend | Grade: LengthNumber of lanes | mi Up/Down 2 | 98 |
| justm | ıts | | | The state of the s |
| | | | 1.2 | |
| - L | 15 | 1 + P.(F 1) + Po(F 1) | .972 | 2 |
| Speed Inputs | desired programment shall a come or selected being | Calculate Speed Adjustments and FFS | ments and FFS | |
| Lane width, LW | 10 # | | 9.9 | mi/m |
| Total lateral clearance, TLC | 12 11 | j _j | 0 | mi/h |
| Access points, A Modian Ivne M | A/mi | ي | | mi/h |
| | | f _M | 0 | mi/h |
| Base free-flow Speed, BFFS | 60 mi/h | FFS = BFFS - fLW - fLC - fA - fM | f _M 55 | mi/h |
| Operational, Planning (LOS); Design, Planning (vp) | S); Design, Planning (vp) | Design, Planning (N) | | |
| erati | | Design (N) or Planning (N) 1st fteration | tion | |
| Vp = Vor DDHV | | | | assumed |
| S | 55 milh | Vp = PHF - N - 4, W - 1, | | pc/h/ln |
| SOT | 2 | | | |
| Design (v _p) or Planning (v _p) | | Design (N) or Planning (N) 2nd Iteration | ation | |
| F0S | | N | | paumsse |
| , and a second | nl/l/lu | νρ = PHF N *1μ " | | pc/h/ln |
| _ q_ v _t . Mtf · N · t _{tt} v = V | veh/h | 507 | | : |
| 2 - 2 | milh | S 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | | mi/n |
| | The second secon | | | |
| 2 : | | Factor Location | | |
| N - Number of lanes | S - Speed | E _T - Exhibit 21-8, 21-9, 21-11 | f _{Lw} - Exhibit 21-4 | 21-4 |
| v Flow rate | FFS - Free-flow speed | t, - Page 21-11 | | 21-6 |
| LOS - Level of service | | LOS, S, FFS, v _n - Exhibit 21-2, 21-3 | -3 f _h - Exhibit 21-7 | 21-7 |
| | | | | |

| | State Stat | | CHAPTER 21 - MULTILANE HIGHWAYS WORKSHEET | INE HIGHWAYS WORK | SHEET | |
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| Standard | Sample S | | | | | |
| State Security (10.5) Se | Sample S | | THE PROPERTY OF THE PROPERTY O | Application | Input | Output |
| Standard | Design (b) Des | 60 Free-Flow Spend | | Operational (LOS | | 10S. S. D |
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| 105.5, | Commation Comm | 22 | | Design (v _o) | FFS, LOS, N | v. S. D |
| Annual A | Comparison Co | | Ţ. | Planning (LOS) | FFS, N. AADT | 10S S D |
| Agin | Planning (t _p) Specific Sp | 100 | | Planning (N) | FFS. LOS. AADT | 0 0 |
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| Site Information Site Information Site Information | Wake PACIFIC | | | | | |
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| Things Des. (W) Des. (V _p) Plan. (LOS) | Des. (W) Des. (v _p) Plan (LOS) | | | From/To | KAIMINIAMI TO | VOUANIA |
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| 2 | Weekday Recreational/Weekend Weekday Sk RVs, P ₁ Sk RVs, P ₂ Sk RVs P ₂ Sk V | annual avg. dally frame, AAUT | veh/day | % Trucks and buses, P ₁ | 2 | |
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| Part | Park | | | 601 | | 1 |
| Part | Pactor Location Pactor Location Pactor Location Pactor Location Factor Location Factor Location Factor Location Iw - Embir 21-4 Iw - Embir 21-4 Iw - Embir 21-4 Iw - Embir 21-5 FES - Free-liow speed Iw - Page 21-11 Iw - Embir 21-5 Iw - | 1 | m/m | S | | mi/h |
| Factor Location Factor Location S - Speed E ₁ - Exhibit 21-9, 2 | Factor Location Factor Location Factor Location | S/ ^d v | pc/mi/ln | D = v. /S | | of mills |
| Columns S Speed Eq. (Exhibit 21-8, 21-11 | Factor Location Factor Location S - Speed E ₁ - Exhibit 21-0, 21-10 E ₂ - Exhibit 21-0, 21-10 EFS - Bres-liow speed E ₁ - Page 21-11 BFFS - Bres free-liow speed E ₁ - Page 21-11 BFFS - Bres free-liow speed LOS, S, FFS, V _p - Exhibit 21-2, 21-3 | | | | 11 11 11 11 | DC/III/III |
| S - Speed E, - Enthiol 21-0, 21-0, 21-11 D - Density E _e - Enthiol 21-0, 21-0 FFS - Free-flow speed I _q - Page 21-11 BFFS - Base free-flow speed 10.5, S, FFS, V _q - Exhibit 21-2, 21-3 | anes S - Speed E ₁ - Enhibi 21-0, 21-3, 21-11 D - Density E ₂ - Enhibi 21-0, 21-3, 21-10 FFS - Free-flow speed I ₁ - Page 21-11 BFFS - Base free-flow speed LOS, S, FFS, v _p - Enhibit 21-2, 21-3 design-hour volume | lossary | | Factor Location | | |
| 0 - Density | me 5 - 3pecu c c c c c c c c c c c c c c c c c c | - Number of lanes | | | The state of the s | |
| FFS - Free-llow speed | The second of th | - Hourly votume | | E1 - Exhibit 21-8, 21-9, 21-11 | Lw - Exhibit 2 | -4 |
| FFS - Free-flow speed 'y - Page 21-11 BFFS- Base free-flow speed LOS, S, FFS, vp - Exhibit 21-2, 21-3 | Vice PFP - Free-flow speed Ip - Page 21-11 Idesign-hour volume BFFS - Bisse free-flow speed LOS, S, FFS, Vp - Exhibit 21-2, 21-3 | Classical vocalities | U - Density | E _R - Exhibit 21-8, 21-10 | | -5 |
| BFFS - Base free-flow speed LOS, S, FFS, vp - Exhibit 21-2, 21-3 | Wite BFFS- Base free-flow speed LOS, S, FFS, v_p - Exhibit 21-2, 21-3 if design-hour volume | ion falls | rrs - Free-flow speed | f, - Page 21-11 | | 9- |
| | I design-hour volume | S - Level of Service | | LOS, S, FFS, v., - Exhibit 21-2, 21- | | -7 |
| | | HV - Directional design-hour volu | ume | | | |
| HiCAP 2000 TM | | | | | | |

| 70 | | - Anniestication | 1 | 1 |
|--|--|---|--|--|
| Free-Flow Speed | | Operational (LOS) | FFS, N, v _p | 10S, S, D |
| | | Design (N) | FFS, LOS, v _p | o s |
| 90 | | Planning (LOS) | FFS, N, AADT | LOS, S, D |
| William P | Minipo Minipo | Planning (V _p) | FFS, LOS, NADI | N, S, D |
| 30 400 | 1200 Rate (nc/h/ | 2400 | | |
| General Information | | Site Information | | |
| Analyst WY | MANAGEMENT OF THE PROPERTY OF | Jurisdiction/Date | | 4/14/2008 |
| or Company | M&E PACIFIC | Highway/Direction of Travel | QUEEN KAAHUMANU HW | MANU H |
| - 1 | TOT AM 2029 | From/To | KAIMINANI TO KOHANAIK | KOHAN |
| Comment 2029 AM TOTAL | TAL | | | |
| Der. (LOS) | Des. (N) Des. (v _p) | □ Plan. (LOS) | O Plan. (N) | Plan. (v _p) |
| Flow Inputs | | | | |
| Volume, V | 1040 veh/h | Peak-hour factor, PHF | 5 | |
| Peak-hour proportion of AADT, K | | % RVs, Po | 2 | |
| Peak-hour direction proportion, D | | General terrain | | |
| DDHV = AADT • K • D | weh/h | Cal Level Calling | g Mountainous | s |
| Driver type | | Grade: Length | ті Цр/Домп | % |
| Commuter/Weekday Likec | ☐ Recreational/Weekend | Number of lanes | 7 | *************************************** |
| Calculate 1 10w Aujust | 1 | Commence of the second | C - | |
| ر می | 5 1 | , r | Control of the Contro | |
| £1 | 261 | $^{I_{IW}} = 1 + P_{I}(E_{I} - 1) + P_{R}(E_{R} - 1)$ | | |
| Speed Inputs | The Appears 1 | Calculate Speed Adjustments and FFS | stments and FFS | |
| Lane width, LW | 12 # | t _{LW} | 0.0 | |
| Access points. A | | lıc. | | m() |
| | C) Undivided SA Divided | ٠. ا | | mi/h |
| FFS (measured) Base free-flow Sneed RFFS | mi/h | 'M FFS = BFFS = f = f. = -f. | | mi/n |
| Operational, Planning | Operational, Planning (LOS): Design, Planning (v.) | Design, Planning (N) | | |
| Operational (LOS) or Planning (LOS) | 35) | Design (N) or Planning (N) 1st Iteration | eration | And in case of the latest and the la |
| V _D = V or DDHV | 938 pc/h/ln | N | | assumed |
| | B mi/h | Vp = Vor DDIIV | | m/h/h |
| $D = v_p / S$ | 55 pc/mi/ln | S01 | | 1 |
| LO3 Design (v,) or Planning (v,) | | Design (N) or Planning (N) 2nd fleration | leration | |
| 507 | and the second s | Z | | assumed |
| a rd . | pc/h/ln | Vp = V or DDHV | | pc/h/ln |
| V = Vp * PHF * N * Upv * Cp | welv/h | . S01 | | - Sim |
|) = v /S | nemina | 2/ ×= 0 | | ne/mi/lu |
| Glossarv | The state of the s | Factor Location | 11/A000 00 00 10 11 1 1 1 1 1 1 1 1 1 1 1 1 | |
| N - Number of lanes | S - Speed | F Exhibit 21-8 21-9 21-11 | f Exhibit 21-4 | 21-4 |
| V - Hourly volume | | E _R - Exhibit 21-8, 21-10 | | 21-5 |
| ν _p - Flow rate LOS - Level of service | FFS - Free-flow speed BFFS - Base free-flow speed | f _p - Page 21-11 LOS, S, FFS, v _p - Exhibit 21-2, 21-3 | f _M - Exhibit 21-6 21-3 f _A - Exhibit 21-7 | 21-6 21-7 |
| DOHV - Directional design-hour volume | | | | |

| CHAPTER 20 - DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET | NE HIGHWAY SEGMENT WO | RKSHEET |
|--|--|--|
| ral Informat | Site Information | |
| Analyst | Jurisdiction/Date | 4/19/2008 |
| M&E PACIFIC | | Q. KAAHUMANU HWY SB |
| Analysis Period/Year EX PM 2006 Comment 2006 EXISTING PM SB | From/To KAIMINAN | KAIMINANI TO KOHANAIKI |
| C Operational (LOS) | CV Planning (LOS) | ☐ Planning (v _o) |
| Input Data | | |
| Shoulder width 6 ft | s I hig | Ö |
| 12 | | H C Rolling |
| l ane width 12 | Claus Length | - 1111 Up/100WII |
| Shoulder width 6 | | |
| | % Recreational vehicles, P _R | o |
| Segment length, L ₁ 2 mi | % No-passing zone | 50 % |
| Analysis direction volume, V ₀ 825 veh/h | Opposing direction volume, Vo | 830 veh/h |
| Average Travel Speed | Amountain finite in the finite of the finite | The second of th |
| The state of the s | Analysis Direction (d) | Opposing Direction (o) |
| Passenger-car equivalent for trucks, E _T (Exhibit 20-9 or 20-15) | 1.1 | -: |
| Passenger-car equivalent for RVs, E _R (Exhibit 20-9 or 20-17) | | 100000000000000000000000000000000000000 |
| Heavy-vehicle adjustment factor, 5 f _{HV} f _{HV} = 1 + P ₁ (E _T - 1) + P ₀ (E _u - 1) | 766: | 766. |
| Grade adjustment factor, 1 fg (Exhibit 20-6 or 20-12) | - | |
| Directional flow rate, 2 v_i (pc/h) $v_i = \frac{V_i}{pHF} \cdot \frac{V_i}{F_{in}} \cdot F_c$ | 871 | 876 |
| Free-Flow Speed from Field Measurement | Estimated Free-Flow Sneed | low Sneed |
| Field measured speed, 3 SFM 55 mi/h | Base free-flow speed, 3 BFFS | m/h |
| Observed volume, 3 V _t 865 veh/h | Adj. for lane width and shoulder width, 3 f _{1,5} (Exh. 20-5) | 0 |
| Free-flow speed, FFS _d 61.7 mi/h | Adj. for access points, 3 f _A (Exhibit 20-6) | 6) S. mil/h |
| $FFS_d = S_{FM} + 0.00776 \left(\frac{v_1}{t_{HV}} \right)$ | Free-flow speed, FFS _d | 61.7 mi/h |
| Adjustment for no marcing none I (milk) (Cultis 20 10) | V - S7 - C170 = 0C17 | |
| Adjustment to 110-passing zones, Imp (filtrit) (Exmon 20-13) | | |
| Average traver speed, A134 (mint) A134 = FF34 = 0.000 / lote4 + v_0 = 1.pp. Percent Time-Spent-Following | 47.2 | |
| 1147) IIIIIIIIIIII AANDONAATIIIIIIII 1147 JAMAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA | Analysis Direction (d) | Opposing Direction (a) |
| Passenger-car equivalent for trucks, E _T (Exhibit 20-10 or 20-16) | 1 | |
| Passenger-car equivalent for RVs, Eg (Exhibit 20-10 or 20-16) | | |
| Heavy-vehicle adjustment factor, f_{HV} $f_{FW} = \frac{1}{1 + P_1(E_T - 1) + P_R(E_R - 1)}$ | _ | _ |
| Grade adjustment factor, 1 f _G (Exhibit 20-8 or 20-14) | | |
| Directional flow rate, 2 v_i (pc/h) $v_i = \frac{V_i}{PHF} \cdot \frac{V_i}{I_{av}} \cdot f_c$ | 898 | 874 |
| Base percent time-spent-following, ⁴ BPTSF _d (%) RPTSF. = 100/1 = 6 ³⁰ (4) | 9.98 | |
| Adjustment for no-passing zone, I _{rm} (Exhibit 20-20) | 4.5 | |
| Percent time-spent-following, PTSF _d (%) PTSF _d = BPTSF _d + f _m | 1 16 | TANK TO THE PERSON NAMED IN COLUMN T |
| Level of Service and Other Performance Measures | | THE PARTY OF THE P |
| Level of service, LOS (Exhibit 20-3 or 20-4) | ш | THE RESIDENCE AND ADDRESS OF THE PROPERTY OF T |
| Volume to capacity ratio, v/c v/c = 1700 | 15. | |
| Peak 15-min vehicle-miles of travel, VMT ₁₅ (veh-mi) VMT ₁₅ = 0.251, (plg) | 434 | |
| 3 | 1650 | 100 |
| Peak 15-min total travel time, TT ₁₅ (veh-h) TT ₁₅ = VMT ₁₅ . | 9.2 | |
| Notes | A SOURCE COMMISSION OF THE PROPERTY OF THE PRO | make a service of the |

| | 1 of 2 |
|--|--|
| | |
| If the highway is extended segment (level) or rolling terrain, $t_c=1.0$ in $V_0 d_c \sigma_{c,c} > 1.7$. The Open terminal analysis—the LOS is F_c for the analysis direction rolls or V_c and V_c and V_c and V_c and V_c and V_c and V_c and V_c and V_c and V_c and V_c and V_c and V_c and V_c and V_c and V_c and V_c analysis closed on a specific downgrade, as the strainfier Equation 20-14 if some tracks operate at crast speech on a specific downgrade. | M jineering, Inc. |
| 1. If the highwa 2. If v_i (v_a or v_o 3. For the analy 4. Exhibit 20-21 5. Use alternative | HiCAP 2000 TM ©Catalina Engineering, Ir |

| ACIFIC | THE R. P. LEWIS CO., LANSING, MICH. LANSING, THE PRINCIPLE AND PERSONS. | The state of the s | |
|--|--|--|---------------------|
| M&E PACIFIC | Jurisdiction/Date | 4 | 4/19/2008 |
| Analysis Period/Year EX PM 2006 Comment 2006 EXISTING PM SB | Highway Q From/To K | Q. KAAHUMANU HWY SB KAIMINANI TO KOHANAIKI | SB |
| □ Operational (LOS) | Planning (LOS) | □ Planning (v _p) | (qv) Gr |
| | | A CALL THE RESERVE THE PROPERTY OF THE PROPERT | |
| Class I highway Class | Class II highway | | |
| • Opposing direction | tion | | |
| Analysis direction | uo | Show North Arrow | > |
| lg L | Lde | | |
| 7 | | | |
| Total length of analysis segment, L ₁ (mi) | | 2 | |
| Length of passing lane including tapers, L _{n1} (m) | | The state of the s | |
| Average travel speed, ATS _d (from Directional Two-Lane Highway Segment Worksheel) | | 47.2 | |
| Percent time-spent-following, PTSF _d (from Directional Two-Lane Highway Semment Worksheet) | | 91.1 | |
| Level of service, ¹ LOS _d (from Directional Two-Lane Highway Segment | | ш | |
| Average Travel Speed | manifold (commencement) and the second of th | AND THE PROPERTY OF THE PROPER | |
| Downstream length of woo-lane highway within effective length of passing lane for average travel speed, L _{ae} (mi) (Exhibit 20-23) | | 1.7 | |
| Length of two-lane highway downstream of effective length of the passing lane for average travel speed, L_d (mi) $L_d = L_1 - (L_{1d} + L_{1d} + L_{1d})$ | Alex | THE TAXABLE PROPERTY OF TAXABLE PROPERTY OF TAXABLE PR | |
| Adj. factor for the effect of passing lane on average speed, f _{pl} (Exhibit 20-24) | | 1.11 | |
| Average travel speed including passing lane, ATSpI $ATS_{\mu} = \frac{ATS_{\mu}}{1 + 4 + 7 + \frac{ATS_{\mu}}{1 + 4 + \frac{ATS_{\mu}}{1 + ATS_$ | | | |
| Percent Time-Spent-Following | | | |
| Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, L _{co.} (ml) (Exhibit 20-23) | | 5.7 | |
| Length of two-lane highway downstream of effective length of the passing tane for percent time-spent-following, L_d (m), $L_d=L_1-(L_u+L_{pl}+L_{qo})$ | | | |
| Adj. factor for the effect of passing lane on percent time-spent-following, $t_{\rm pl}$ (Exhibit 20-24) | | .62 | |
| Percent time-spent-following including passing lane, 3 PTSF $_{\mu}$ (%) PTSF $_{\mu}$ PTSF $_{\mu}$ PTSF $_{\mu}$ PTSF $_{\mu}$ PTSF $_{\mu}$ PTSF $_{\mu}$ PTSF $_{\mu}$ | | | |
| Level of Service and Other Performance Measures 4 | A SECTION OF THE PERSON OF THE | The state of the s | |
| Level of service including passing lane, LOSpi (Exhibits 20-3 or 20-4) | | The state of the s | |
| Peak 15-min total travel time, TT $_{15}$ (veh-th) $_{115}$ $^{-}$ $^{-}$ $^{-}$ $^{-}$ ATS $_{pl}$ | | A DESCRIPTION OF THE PROPERTY | a very and a second |
| Notes | | AND THE RESERVE THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TW | |
| If LOAD, a F. passing after analysis carding to performed. If LoA Ob, to a eletranial vergation 20-22. If LoA Ob, to a eletranial vergation 20-20. vic, VMT1s, and VMT₁₆₀ are calculated on Directional Two-Lane Highway Segment Worksheet. | ay Segment Worksheet. | | |

| | Application Operational (LOS) Design (N) Design (N) Planning (LOS) Planning (N) Pla | FFS, N, Vp FFS, LOS, Vp FFS, LOS, Vp FFS, LOS, N | Output |
|--|--|--|--|
| Information 1200 1500 | 2460 Site Information Jurisdiction/Date Highway/Direction of Travel From/To | FFS, N, AADT FFS, LOS, AADT FFS, LOS, N | 105, S, D N, S, D V, S, D 1, S, D N, S, D N, S, D |
| teneral Information Tables WY WY AMB PM Segrety of Company MAGE PACIFIC Town Inputs Segrety of Company MAGE PACIFIC Town Inputs Segrety of Company MAGE PACIFIC Town Inputs Segrety of Company MAGE PACIFIC Town Inputs Segrety of Company MAGE PACIFIC Town Inputs Segrety of Company MAGE PACIFIC Segrety of Company Segrety of Planning (LOS); Design, Planning (Vp) Segrety of Planning (Vp) | Site Information Jurisdiction/Date Highway/Direction of Travel From/To | | |
| Mayes May | Jurisdiction/Date Highway/Direction of Travel From/To | | |
| gency or Company M&E PACIFIC AMB IN 2015 | Highway/Direction of Travel From/To | | 4/9/2008 |
| per (LOS) Dec (LOS) | | QUEEN KAAHUMANU HW KAIMINANI TO KOHANAII | MANU HW KOHANAI |
| Now Inputs Anne, V As-hour proportion of AADT As-hour proportion of AADT As-hour proportion of AADT As-hour proportion of AADT As alculate Plow Adjustments Commuter/Weekday Commuter/Weekday Commuter/Weekday Commuter/Weekday Commuter/Weekday Commuter/Weekday I S Ami Ami Ami Ami Ami Ami Ami Am | Dlan (108) | (S) reld | Dlan (v.) |
| Annew V 2045 web/h web/day alculate Flow Adjustments 1.5 1.5 peed Inputs ne with, LW nol lateral clearance, TLC 1.2 nol lateral clearance, TLC 1.5 peed Inputs ne with, LW nol lateral clearance, TLC it Ami delan type Seas points, A seational, USB peed, BFFS seational, USB peed, BFFS seational, Planning (LOS); Design, Planning (vp) web/day sign (v _p) or Planning (v _p) Sign (v _p) or Planning (v _p) Sign (v _p) or Planning (v _p) Sign (v _p) or Planning (v _p) Sign (v _p) or Planning (v _p) Sign (v _p) or Planning (v _p) Sign (v _p) or Planning (v _p) Sign (v _p) or Planning (v _p) Sign (v _p) or Planning (v _p) Sign (v _p) or Planning (v _p) Sign (v _p) or Planning (v _p) | | | 4 |
| alculate Flow Adjustments Deed Inputs Beralical Flow Adjustments Commuter/Neekday Commuter/Neekday Commuter/Neekday Commuter/Neekday Commuter/Neekday Commuter/Neekday Commuter/Neekday Commuter/Neekday Commuter/Neekday I 1.5 Deed Inputs Brea | Peak-hour factor, PHF | 6. | manufactivities owner are |
| as-hour proportion of AADI, K alk author intercin proportion, D This author intercin proportion, D Commuter/Weekday | $\%$ Trucks and buses, $P_{\rm T}$ | 5 | |
| And The Annual Proposition of the Annual Proposition of the Annual Proposition of the Annual Proposition of the Annual Proposition of the Annual Proposition of the Annual Proposition of the Annual Proposition of the Annual Institution of the Annual Annual Institution of the Annual Annual Institution of the Annual Institution of | % RVs, P _R | 2 | İ |
| New type Commuser/Weekday Commuser/Weekday Commuser/Weekday Deed Inputs In 15 Peed Inputs In 10 | CA Level CD Rolling | Mountainous | so. |
| alculate Flow Adjustments alculate Flow Adjustments 1.5 peed Inputs ne width, LW not lateral clearance, TLC 1.2 1.5 1.5 1.5 1.5 1.5 1.6 Minimizers points, A Armin clearance, TLC 1.2 1.4 Armin clearance, TLC 1.5 Armin clearance, TLC 1.6 Armin clearance, TLC 1.7 Armin clearance, TLC 1.8 Armin clearance, TLC 1.9 Armin clearance, TLC 1.16 Armin clearance, TLC 1.16 Armin clearance, TLC 1.16 Armin clearance, TLC 1.26 Armin clearance, TLC 1.26 Armin clearance, TLC 1.26 Armin clearance, TLC 1.26 Armin clearance, TLC 1.26 Armin clearance, TLC Armin clea | Length | Ē | % |
| 1.5 | Number of lanes | 7 | |
| 1.5 | : | 1.2 | |
| Peed Inputs ne width, LW not lateral clearance, TLC 12 nt Armi Adm | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | |
| ne width, LW 10 11 12 11 11 11 11 11 11 11 11 11 11 11 | Calculate Speed Adjustments and FFS | stments and FFS | |
| Anial lateral cheannee, TLC 1.2 In Anial lateral cheannee, TLC 1.2 In Anial seeds high. A consistence of the cheanneest of the cheannest of th | , and a second | 9.9 | mi/h |
| Storesured Stores American Storesured Stores | f _{LC} | 0 | mi/h |
| Stylespace Sty | r, | | mi/h |
| restions (prince appear 2015) perational, Planning (LOS); Design, Planning (Vp) a pile 'N 'lua' 'p C mith c' p/S 55 point/in S 51.26 Sign (v _p) or Planning (V _p) S | W _j | 0 35 | mi/h |
| equional (LOS) or Planning (LOS) - v _p /S - v _p /S - v _p /S Sign (v _p) or Planning (v _p) Sign (v _p) or Planning (v _p) S - v _p /S Sign (v _p) or Planning (v _p) S - chhlin - v _p · PHF · N · t _{fl} · T _f - v _p · PHF · N · t _{fl} · T _f - v _p · PHF · N · t _{fl} · T _f | Design, Planning (N) | , MM | |
| 1169 III - III - Iuu - Iuu - Iuu SS 21.26 J. or Planning (v _p) | Design (N) or Planning (N) 1st Iteration | ration | |
| SS 21.26 3 or Planning (v _p) | N | | assumed |
| 55 21.26 3 or Planning (v _p) HF • N • f _t w • f _t | Vp = V or DDNV | | pc/h/ln |
| gn (v _p) or Planning (v _p). , PHF - N - f _{th} - f ₀ | | | |
| , PHF N - Hy '0 | Design (N) or Planning (N) 2nd Iteration | ration | |
| ", - PHF - N - f _{IV} - f ₀ | | | assumed |
| | d. M. J. N. Jild da | | pc/h/tn |
| William | sm v | | 1 |
| o = √S | D=v_/S | | nc/mi/le |
| Vie | Factor Location | | 100,000 |
| N - Number of lanes S - Speed | Er - Exhibit 21-8, 21-9, 21-11 | f _{1.w} - Exhibit 21-4 | 21-4 |
| Q | E _R - Exhibit 21-8, 21-10 | | 21-5 |
| ν _ρ - Frow rate LOS - Level of service BFFS - Base free-flow speed | lp Page 21-11 LOS, S, FFS, vp Exhibit 21-2, 21-3 | l _A - Exhibit 21-0 1-3 l _A - Exhibit 21-7 | 21-7 |

DDHV - Directional design-hour volume
HICAP 2000 TM
©Catalline Engineering, Inc.

1 of 1

| (4/H) | | | 100 | 100.000 |
|--|--|--|--|--|
| Fine-Bina Spaces Bination B | 000Z 0088 00ZL | Application Operational (LOS) Design (W) Design (W) Planning (LOS) Planning (W) Planning (W) Planning (W) | Input FFS, N, v _p FFS, LOS, v _p FFS, LOS, v _p FFS, LOS, AADT FFS, LOS, AADT | Output LOS, S, D N, S, D LOS, S, D N, S, D N, S, D |
| Flow R General Information | Flow Rate (pc/hv/in) | Site Information | THE RESIDENCE OF THE PARTY AND ADDRESS OF THE PARTY ADDRESS OF THE PARTY AND ADDRESS OF THE PARTY AND ADDRESS OF THE PARTY AND ADDRESS OF THE PARTY AND ADDRESS OF THE PARTY AND ADDRESS OF THE PARTY AND ADDRESS OF THE PARTY AND ADDRESS OF THE PARTY AND ADDRESS OF THE PARTY AND ADDRESS OF THE PARTY AND ADDRESS OF THE PARTY AND ADDRESS OF THE PARTY AND ADDRESS OF THE PARTY AND ADDRESS OF THE PARTY ADDRESS OF THE PARTY AN | |
| Analyst WY | The second secon | hrisdiction/Data | | 4/14/2008 |
| Agency or Company M&E PACIFIC | FIC | n of Travel | OUEEN KAAHUMANU HW | MANUHW |
| Analysis Period/Year TOT PM | 2015 | 1 | KAIMINANI TO KOHANAIK | KOHANAI |
| Comment 2015 PM TOTAL | | | | |
| Oper. (LOS) Des. (N) | Des. (v _n) | Plan. (LOS) | Plan. (N) | Plan. (v.) |
| Flow Inputs | manufacture from the property of the same | AND THE RESIDENCE OF SECURIOR ASSESSMENT OF S | mindental (III) (I | |
| Volume, V | 2120 veh/h | Peak-hour factor, PHF | 6. | |
| Annual avg. daily traffic, AADT | veh/day | $\%$ Trucks and buses, $P_{\rm I}$ | 5 | |
| Peak-hour proportion of AADT, K | | % RVs, P _R | 2 | |
| Peak-hour direction proportion, D | | eral terrain | | |
| Driver tyme | veh/h | Rolling | _ | |
| nmuter/Weekday | ☐ Recreational/Weekend | r of lanes | riii uproown 2 | g |
| Calculate Flow Adjustments | ; | a may make your | THE CALL VINCENT AND THE RESERVE | |
| To the state of th | - | : , டூ | 1.2 | : |
| - 4- | 1.5 | | 972 | |
| Speed Inputs | 10 M 1 m manual 1 M 1 M 1 m manual 1 M 1 M 1 M 1 M 1 M 1 M 1 M 1 M 1 M 1 | Calculate Speed Adjustments and EES | onte and | |
| Lane width, I.W | 10 11 | | 9.9 | mi/h |
| Total lateral clearance, TLC | 12 # | MT. | 0 | |
| Access points, A | Ami | ນ ຢູ | | mi/h |
| FES (measured) | as Divided | : _2 | 0 | wi/w |
| Base free-flow Speed, BFFS | 4/ш 09 | $FFS = BFFS - t_{LW} - t_{LC} - t_A - t_M$ | 55 | - File |
| Operational, Planning (LOS); Design, Planning (vp) | Design, Planning (v _p) | Design, Planning (N) | | |
| Operational (LOS) or Planning (LOS) V or DOHV PIET N V IN V V V | 1212 pc/tv/ln C mith | Design (N) or Planning (N) 1st Reration N V or DDHV | | assumed |
| D = vp/S | | LOS PIIF N 'ster's | | house |
| 601 | 10.22 | | | |
| Design (v _p) or Planning (v _p) LOS | | Design (N) or Planning (N) 2nd Iteration N | E . | assumed |
| y partial state of the state of | pc/h/ln | νρ = Vor DDIV | | pc/h/ln |
| S S P FRIT IN 1 IN 1 IN 1 IN 1 IN 1 IN 1 IN 1 IN | wen/h mi/h | LOS | | mi/h |
| D = v _p /S | pc/mi/ln | $D = v_{\mu}/S$ | | pc/mi/ln |
| Glossary | The second of th | Factor Location | | TANK DEPARTMENT OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NA |
| N - Number of fanes | į | E ₁ - Exhibit 21-8, 21-9, 21-11 | f _{LW} - Exhibit 21-4 | 1-4 |
| V - Hourly volume | | E _R - Exhibit 21-8, 21-10 | f _{LC} - Exhibit 21-5 | 5.5 |
| Vp - riow rate I OS - I evel of service | RFEC. Raso free-Boat shoot | los e ere e. e. e. 21.2 | I _M - Exhibit 21-6 | - 1-6 |
| DDHV - Directional design-hour volume | | d la la la la la la la la la la la la la | Ψ. | <u> </u> |

CHAPTER 21 - MULTILANE HIGHWAYS WORKSHEET

| (frium) band, 2 %)-spentarsers ages was a spentar of the spentar o | 250 policy (2000) 1800 2000 | Application (DS) Design (W) Design (W) Design (W) Design (W) Planning (W) Planning (W) Planning (W) Planning (W) | Input FFS, N. v, FFS, LOS, v, FFS, LOS, v, FFS, LOS, AADT FFS, LOS, AADT FFS, LOS, A | Output 1, S, D 1, S, D 1, D, S, D 1, D, S, D 1, S, D 1, S, D 1, S, D 1, S, D |
|--|--|--|--|--|
| General Information | | Site Information | | |
| ' | Cicio | | | 4/9/2008 |
| Agency or Company M&E FACIFIC Analysis Period/Year AMB PM Comment 2020 PM AMBIENT | M 2020 | Highway/Direction of Iravel From/To | COUEEN KAAHUMANU HW KAIMINANI TO KOHANAIK | KOHANA |
| | Des. (v _p) | D Plan. (LOS) | Plan. (N) | Plan. (v _p) |
| Volume, V | 2065 veh/h | Peak-hour factor, PHF | 6. | |
| Annual avg. daily traffic, AADT | veh/day | % Trucks and buses, P _T | 50 | |
| Peak-nour proportion of AAD1, K Peak-hour direction proportion, D | | Serves, PR General terrain | 4 | |
| DDHV = AADT • K • D | veh/h | Ed Level C3 Rolling | ☐ Mountainous | sr |
| Driver type ☐ Commuter/Weekday | ☐ Recreational/Weekend | Grade: Length Number of lanes | ıni Up/Down 2 | % |
| ustm | its | The state of the s | 100 | 0.000 |
| ئ | - | £. | 1.2 | |
| | 1.5 | $I_{11}V = 1 + P_T(E_T - 1) + P_R(E_R - 1)$ | .972 | 2 |
| Speed Inputs | tit 137/100 | Calculate Speed Adjustments and FFS | tments and FFS | |
| Lane width, LW | 10 " | , m | 9.9 | mi/h |
| Total lateral clearance, TLC | 12 11 | l _{ic} | 0 | mi/h |
| Access points, A Median type, M C) Undivided | A/mi | , K. | | mi/h |
| FFS (measured) | | ₩. | | |
| Base free-Ilow Speed, BFFS Operational, Planning (LC | Base free-flow Speed, BFFS 60 mil/h Operational, Planning (LOS); Design, Planning (Vn.) | FFS = BFFS - t_{LW} - t_{LC} - t_A - t_M Design, Planning (N) | f _M 55 | ml/h |
| Operational (LOS) or Planning (LOS) | THE RESERVE THE PERSON NAMED IN TAXABLE PARTY OF TAXABLE PARTY OF TAXABLE PARTY OF TA | Design (N) or Planning (N) 1st Reration | Mion | AND ASSESSED ASSESSED AND ASSESSED. |
| Vp = Vor DDHV | 1180 pc/h/ln | ARGUSON | | assumed |
| S = Vp /S | 55 pc/mi/ln | ν _ρ = PHF · N · 1 _{HV} · 1 _p | | pc/h/in |
| LOS Design (v _o) or Planning (v _o) | 21.40 | Design (N) or Planning (N) 2nd Iteration | ation | |
| S07 | | 2 | | assumed |
| ď | pc/h/ln | d. M. N. JHd d. | | pc/h/ln |
| - d ₁ . M·1, . N . JHd . d _n = N | veh/h | 507 | | 4 |
| | pc/mi/la | 5 D = v ₀ /S | | pc/mi/in |
| Glossary | THE RESERVE THE PROPERTY OF TH | Factor Location | The state of the s | 100,000 |
| N - Number of lanes | 1 | E _T - Exhibit 21-8, 21-9, 21-11 | f _{tw} - Exhibit 21-4 | 21-4 |
| V - Hourly volume | D - Density FFS - Free-flow speed | E _R - Exhibit 21-8, 21-10 (Page 21-11 | | 21-5 |
| LOS - Level of service | BFFS | LOS, S, FFS, vp Exhibit 21-2, 21-3 | | 121-7 |
| | | | | |

| Simple S | 50 Free-Flow Speed a 60 mith 50 mith 50 mith 51 mith 52 mith 52 mith 53 mith 54 mith 55 mith . | | and the same of th | | |
|--|--|--|--|--|--|
| | 60 Free-Free Speed = 60 milh St. milh St | - | | | |
| Second S | 60 Free-Flow Speed = 60 mifn (55 mifn (45 mi | | | | Output |
| Section Standing (No.) Design | 50 50 milh Si 100 A Si milh Si 100 A Si | | _ | | LOS, S, D |
| Second S | 50 50 milh Series 105 N 25 B | | Design (N) | FFS, LOS, v, | N, S, D |
| | 50 45 ml/h SF. 10 10 S P 12 S B | | Dacion (v.) | FFS LOS M | 0 |
| | B Vill B | | Planning (10%) | FFS N AADT | 1000 |
| Planning (l/s) Planning (l/s) | | | Dinning (M) | EEC 10C AADT | i con |
| Single S | 170 | | (a) Simple | 100 100 M | i : |
| Separate Information Site Information Site Information Site Information Site Information Site Information Site Information Site Information Site Information Jurisdiction/Date Highway/Direction of Travel General Information Mark Period/Year TOT PM 2020 From To From T | in sing | 15.00.01 | (da) finning (ab) | rr 3, 203, IV | , pr 3, D |
| Ste Information | 400 | 1200 1600 | 2400 | | |
| Name | | Flow Rate (pc/h/ln) | | | |
| WY M&E P.ACIFIC Highway/Direction of Travel Feriod/Year TOT P.M. 2020 From/To F | General Information | | Site Information | | |
| r Company M&E PACIFIC Highway(Direction of Travel Period/Year TOT PM | | | luriodistion/Data | | 4/14/200 |
| Period/Year TOT PM 2020 Highway/Direction of Travel 1 | | | חווו זמור מוחוו מפוב | 100000000000000000000000000000000000000 | |
| 10 10 10 10 10 10 10 10 | ٠, | | Highway/Direction of Travel | QUEEN KAAHU | MANCH |
| Des. (W) Des. (Vp) Des. | | | From/To | KAIMINANI TO | KOHAN |
| 12 12 13 14 15 15 15 15 15 15 15 | ATOT MO COC | | | | |
| Plan. (LOS) Plan. (N) Plan. (LOS) Plan. (N) Plan. (LOS) Plan. (N) Plan. (LOS) Plan. (N) Plan. (LOS) Plan. (N) Plan. (LOS) Plan. (N) Plan. (LOS) Plan. (N) Plan. (LOS) Plan. (N) Plan. (LOS) Plan. (N) Plan. (LOS) Plan. (N) Plan. (LOS) Plan. (N) Plan. (N) Plan. (LOS) Plan. (N) Plan | - 1 | December of the second | CHANGE IN THE PROPERTY OF THE PARTY OF THE P | The state of the s | |
| Pauk-hour lactor, PHF Pauk-hour lactor, PHF S Pauk-hour lactor, PHF S S | | | Dlan. (LOS) | Plan. (N) | Plan. (v. |
| 10 10 10 10 10 10 10 10 | | | | man Artifestant Art Section 1 is assessed | |
| Post-hour factor, PHF Street Post-hour factor, PHF Street | Flow Inputs | | | | : |
| 9, flucks and buses, P₁ | Volume, V | | Peak-hour factor, PHF | 6. | |
| Topopartion of AADT, K Sw Rvs, P _R Control formula for | Annual avg. daily traffic, AADT | veh/day | % Trucks and buses, P _T | 5 | |
| Control to proportion, D | Peak-hour aronortion of AADT. K | | % RVs. P. | 2 | |
| Mumber of lares Rolling Mumber of lares Rolling Mumber of lares Rolling Mumber of lares Length Mumber of lares Length Mumber of lares Length Mumber of lares Length Mumber of lares Length Mumber of lares Length Mumber of lares Length Mumber of lares Length Mumber of lares Length Mumber of lares Length Mumber of lares Length Mumber of lares Length Mumber of lares Length Mumber of lares Length | Don't hour direction property | | Canaral terrain | | |
| The purple The | rear-noal anecaou proportion | | C | | |
| Condition Cond | UDHV = AADI * K * U | Weh/h | evel | | |
| ate Flow Adjustments 1 | Driver type | | | | % |
| 1.5 1.2 | ımıner/Weekdav | Recreational/Weekend | Number of lanes | 2 | |
| 1.2 | Colombato Classic Administra | | Total and trivial annual of the state of the | THE PERSON NAMED AND PERSONS NAMED IN COLUMN 2 IN COLU | The same of the sa |
| 1.5 1.2 | Calculate Flow Aujustille | | | | |
| 1.5 | , | | , E | 1.2 | |
| Inputs | الله عا | 1.5 | - 1 | | |
| The control of the | | | 11N 1 + 1 (1 (1 - 1) + 1 (1 (1 - 1) | and the same | |
| h, LW 10 | Speed Inputs | | Calculate Speed Adjus | stments and FFS | |
| 12 | Lane width 1W | | , , | 9.9 | |
| The color of the | Total lateral clearance Ti C | | | | |
| A | Out of the second of the secon | Afrei | ວາ, | | TIES . |
| FFS = BFFS - f ₁ w - f ₁ C - f ₂ - f ₃ w 0 | | - Dividos | _< | | mi/h |
| FFS = BFFS - f_w - f_LC - f_W - f_LC - f_W - f_LC - f_W - f_LC - f_W - f_LC - f_W - f_LC - f_W - f_LC - f_W - f_LC - f_W - f_LC - f_W - f_LC - | | Saniaio de | : | 0 | mi/h |
| FFS = BFF = -f_w - f_C = -f_w FFS = BFF = -f_w FFS = BFF = -f_w FFS = BFF = -f_w FFS = BFF = -f_w FFS = BFF = -f_w FFS = BFF = -f_w FFS = BFF = -f_w FFS = BFF = -f_w FFS = BFF = -f_w FFS = BFF = -f_w FFS = BFF = -f_w FFS = BFF = -f_w FFS = BFF = -f_w FFS = BFF = -f_w FFS = BFF = -f_w FFS = BFF = -f_w FFS = BFF = -f_w FFS = BFF = -f_w FFS = FFS = FFS = FFS FFS FFS = FFS = FFS FFS = FFS FFS FFS = FFS FFS FFS = FFS FFS FFS FFS = FFS FF | FFS (measured) | | 101 | | |
| He and I (LOS); Design, Planning (LOS); Design, Planning (LOS); Design (N) or Planning (N) 13t heration Design (N) or Planning (N) 13t heration I (LOS); or Planning (LOS); Design (N) or Planning (N) 13t heration N I (LOS); or Planning (N) 2 Planning (N | Base free-flow Speed, BFFS | DQ mi/h | FFS = BFFS - ILW - ILC - IA- | | mi/h |
| 10 10 10 10 10 10 10 10 | Operational, Planning (L. | OS); Design, Planning (vn) | Design, Planning (N) | | |
| 1258 polyhlin Ver Dinky | 200 | Commence of the latest and the lates | AN | | |
| Ver DBMV Ver DBMV N Ver DBMV 1 22 87 pochnin Ver DBMV Ver DBMV 2 22 87 Design (N) or Planning (N) 2nd heration N N | Operational (LUS) or Planning (LUS) | | Design (N) or Planning (W) 151 tie | cration | |
| 10 10 10 10 10 10 10 10 | 1 | ļ | | | assumed |
| 10 or Planning (v _p) 22.87 Design (N) or Planning (N) 20.87 Design (N) or Planning (N) 20 floration N V or District (N) or Planning (N) 2nd floration N V or District (N) or Planning (N) 2nd floration N V or District (N) or Planning (N) 2nd floration V or District (N) 2nd floration V or District (N) 2nd floration V or District (N) 2nd floration V or District (N) 2nd floration V or District (N) 2nd floration V o | | | | | pc/h/ln |
| Design (N) or Planning (N) 2nd Ineration Design (N) or Planning (N) 2nd Ineration N Ver DBNV Ver DBN | 9 | | | | |
| Design (N) 2 rol Planning (V _p) N read Design (N) 2 rol Breadon N read Design (N) 2 rol Breadon N read Design (N) 2 rol Breadon N read Design (N) 2 rol Breadon V _p = PHF * N * V _t V | 0 = vp /5 | | rns | | |
| Design (N) or Planning (Vp) Design (N) or Planning (N) 2nd fleration N N Ver CDBN Vp Pile** Vig.** Vp Ver CDBN Vp Ver CDBN Vp Ver CDBN Vp Ver CDBN Vp Ver CDBN Vp Ver CDBN Vp Ver CDBN Vp Ver CDBN Vp Ver CDBN Vp Ver CDBN Vp Ver CDBN Vp Vp Vp Vp Vp Vp Vp V | 507 | 78.77 | | | |
| N | Design (v.) or Planning (v.) | | Design (N) or Planning (N) 2nd Ite | teration | |
| Perform Perf | 30 | | 2 | | assum |
| HE * N * t _{(W} * t _p t _p | | of the second | | | nolb/lin |
| Alice Alic | - | DOUGH | ı | | 100 |
| Part | V = Vp - PHF • N • ftv • fp | veh/h | | | |
| D = \(\begin{align*}{c c c c c c c c c c c c c c c c c c c | | mi/h | S | | mi/h |
| Factor Location Factor Loc | S/~= 0 | nc/mi/ln | D = v. /S | | l/im/od |
| Factor Location Factor Loc | | AND THE RESIDENCE OF THE PARTY | TO THE REAL PROPERTY AND ADDRESS OF THE PERSON OF THE PERS | CONTRACT OF STREET, ST | |
| S - Speed | Glossary | | Factor Location | | |
| D - Density Fig Exhibit 21-8, 21-10 FFS - Free-flow speed I ₀ - Page 21-11 BFFS - Base free-flow speed LOS, S, FFS, V ₀ - Exhibit 21-2, 21-3 | | | E _T - Exhibit 21-8, 21-9, 21-11 | f _{LW} - Exhibi | 21-4 |
| FFS - Free-flow speed to 1.05, S, FFS, vp - Exhibit 21-2, 21-3 | | D - Density | E _R - Exhibit 21-8, 21-10 | | 21-5 |
| BFFS - Base free-flow speed LOS, S, FFS, vp - Exhibit 21-2, 21-3 | v _o - Flow rate | FFS - Free-Bow speed | l _b - Page 21-11 | | 21-6 |
| | LOS - Level of service | BFFS - Base free-flow speed | LOS, S, FFS, v., - Exhibit 21-2, 2 | | 21-7 |
| | DOHV - Directional design-hour vol. | | | | |

| film) bands to Sobard mill) and the sobard mill) an | C C C C C C C C C C C C C C C C C C C | Application Operations (LOS) Design (N) Design (N) Planning (LS) Planning (LS) Planning (LS) | hiput FFS, N. v. FFS, LOS, v. FFS, LOS, v. FFS, ILOS, N. FFS, LOS, AADT FFS, LOS, N. | Output 105. S, D N, S, D Vp. S, D LOS, S, B N, S, D Vp. S, D |
|--|--|--|--|--|
| General Information | | Site Information | The second secon | |
| | 01107 | | | 4/9/2008 |
| Agency or Company M&E 1'ACII Analysis Period/Year AMB PM Comment 2029 PM AMBIENT | AMB PM 2029 | Highway/Direction of Travel (From/To | QUEEN KAAHUMANU HWY KAIMINANI TO KOHANAIK | MANU HV KOHANA |
| Oper. (LOS) Des. (N) | N) Des. (v _p) | Plan. (LOS) | Plan. (N) | Plan. (v _n) |
| Flow Inputs | | TANKA MANAGEMENT TO AN ADMINISTRATION OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF T | | The state of the s |
| volume, v Annual avg. daily traffic. AADT | thav C112 | Peak-hour factor, PHF | 0. 4 | |
| Peak-hour proportion of AADT, K | (an in the internal | % RVs, P _R | 3 64 | |
| Peak-hour direction proportion, D | | nic | | |
| | Vehl | Grade: Length | _mi Up/Down | 8 |
| Calculate Flow Adjustments | U Kecreational/Weekend ents | Number of lanes | 2 | |
| A STATE OF THE PERSON OF THE PERSON NAMED AND THE PERSON OF THE PERSON NAMED AND THE PERSON N | The second secon | 1 | , - | |
| | 1.5 | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | .972 | 1 |
| Speed Inputs | | Calculate Sneed Adjustments and FES | mente and FES | |
| Lane width, LW | 10 | confine pands company | C L Die Sillon | and the |
| Total lateral clearance, TLC | 12 " | T.W. | 0 | E É |
| Access points, A D Undivided | A/mi | 3 4 | | mi/h |
| | | ,#I | 0 | mi/h |
| Base free-flow Speed, BFFS | 60 mi/h | FFS = BFFS - 1LW - 1LC - 1A - 1M | 55 | mi/h |
| Operational, Planning (LC | Operational, Planning (LOS); Design, Planning (v _p) | Design, Planning (N) | | The second secon |
| Operational (LOS) or Planning (LOS) | | Design (N) or Planning (N) 1st Iteration | ion | |
| VI = V or DOIN | 5 | N | | assumed |
| D=v./S | 55 nefmills | Vp = PHF 'N' I'm 'p | | nl/tl/n |
| S01 | | | | - |
| Design (vp) or Planning (vp) | | Design (N) or Planning (N) 2nd Iteration | lion | |
| S01 | AA MARADANA | | | assumed |
| d _v | pc/h/ln | Vp = PHF W Siv Ip | | pc/h/ln |
| d Mi N m dy = v | Veh/fi | S07 | - | 1 |
| D = v _p /S | pc/mi/ln | 5 D = v _n /S | | mi/h oc/mi/ln |
| Glossary | | Factor Location | : | |
| N - Number of lanes | | E _T - Exhibit 21-8, 21-9, 21-11 | f _{LW} - Exhibit 21-4 | 1-4 |
| r - riourity visume | D - Density FFS - Free-flow sneed | E _R - Exhibit 21-8, 21-10 | | 2-5 |
| LOS - Level of service | BFFS | 19 - Fedge 21-11 LOS, S, FFS, ν _p - Exhibit 21-2, 21-3 | 44 - Exhibit 21-7 | 1-7 |
| | | | | |

| Seed (m) 70 Free-Flow Speed = 60 ml/n / | | | | |
|--|--|--|--|---|
| Free-Flow Speed | | 1000000 | · · | |
| GO TOWN | 1 | Operational (108) | EFC N . | o soli |
| | | Design (N) | FFS 105 " | N C 2 2 |
| 50 mith | | (a) using | G 100 151 | i : |
| 25 | | da) ligitado | EFE N AADT | 2 0 |
| 105 A 22 | ,, | Planning (N) | FFS 10S AADY | N C O |
| * 70. | THE STATE OF THE S | (v) financial | EEC 100 M | 2 5 |
| | जिल्हा रहे हैं है है है है है है है है है है है है है | رطم (اسسبب | N '503' 15 | pr o'r |
| 0 400 | 800 1200 | 0 2400 | | |
| | Flow Rate (pc/h/in) | | | |
| General Information | TOTAL THE STREET OF THE STREET | Site Information | | |
| dualier W | WY | furiation of the | The state of the s | 4/14/2008 |
| | Clairo ra a a | on Sanction Date | | |
| Agency or Company INI | CIFIC | Highway/Direction of Travel | COEEN KAAHUMANU HW | MANUH |
| Analysis Period/Year TC | TOT PM 2029 | From/To | KAIMINANI TO KOHANAIK | KOHANA |
| Common 2020 PM TOTAT | | | | |
| | AND PERSONS ASSESSMENT OF VINCENSIA AND PARTY | And the control of th | | Total Control of the |
| [3] | | | و ا | ָם |
| oper, (LOS) | Ues. (N) | Pran. (LUS) | rian. (N) | Flan. (Vp.) |
| Flow Inputs | | | | |
| Volume. V | 2450 veh/h | Peak-hour factor PHF | 6 | |
| Annual avo. dally traffic. AADT | | % Trucks and busses P. | 5 | |
| Don't hour proportion of AADT 1 | | 0 DW D | , | |
| rear-tiout proportion of Avior | | 70 KVS, PR | 1 | |
| Peak-hour direction proportion, D | | E E | | |
| DDHV = AADT • K • D | n/h | CK Level C Rolling | Mountainous C | SIII |
| Driver type | | Grade: Length | mi Un/Down | % |
| Committee/Meekrlay | ☐ Recreational/Meekend | r of Janes | | |
| Calculate Closs Adjustmonts | otmonto | Accessed the control of the control | | |
| Succession of the succession o | 1 | | | |
| ů. | | ក្ន | 1.2 | 2 |
| - 4 | 1.5 | 1 | 972 | 2 |
| AND THE RESERVE AND THE PERSON NAMED IN CO. OF STREET | | 1+ P1(Er - 1) + PR(ER - 1) | | |
| Speed Inputs | | Calculate Speed Adjustments and FFS | stments and FFS | |
| Lane width, LW | 10 R | 3 | 9.9 | mi/h |
| Total lateral clearance, TLC | 12 # | | 0 | r/im |
| Access points. A | A/mi | 21. | | |
| | Undivided SA Divided | <u></u> | | mi/h |
| | | | 0 | d/im |
| Pres fron flour Chand Office | (b) | 3 | 35 | |
| nase nec-now speed, pr. 3 | min and a second | MI - VI - O'I - M'I - C - IV | 1100 | II/III |
| Operational, Plannin | Operational, Planning (LOS); Design, Planning (vp) | Design, Planning (N) | | |
| Onerational (LOS) or Planning (LOS) | 100) | Design (N) or Planning (N) 1st Berntion | ntion | |
| Nor DHA | 1401 | | | |
| V = PHF N - (c) | L4O1 pc/h/ln | Z | | assumed |
| S | C mi/h | View Pite a V | | pc/h/fin |
| D = v. /S | 55 nc/mi/ln | | | |
| 30 l | 25.47 | | | l |
| | | | , | |
| Design (v _p) or Planning (v _p) | | Design (N) or Planning (N) 2nd Reration | ration | |
| 105 | | × | | assumed |
| 2 | pc/h/tn | V _D = V or DDHV | | nl/tl/pd |
| J. "J. N. JHd. "A = A | weh/h | | | |
| d. ML d | 4) | 3 | | -William |
| 2 | | ז | | |
| 0 = v _p /S | pc/mi/ln | $D = v_p/S$ | | pc/mi/ln |
| Glossary | | Factor Location | | |
| N - Number of lanes | C Const | F Evhihit 21.9 21.9 21.11 | f. Fyhihir 21.4 | 121.4 |
| | • | E Exhibit 21-8, 21-10 | f.c - Exhibit 21-5 | 121-5 |
| v Flow rate | S | f Pape 21-11 | 3 .3 | 121-6 |
| LOS - Level of service | BFFS - Base free-flow speed | LOS, S, FFS, v., - Exhibit 21-2, 21-3 | 1-3 (_A - Exhibit 21-7 | 121-7 |
| DDHV - Directional design-hour volume | | | • | |
| | | | | |