



Kakaako Community Development District

Final Supplemental Environmental Impact Statement - Volume II

Appendix B: Urban Design Analysis

Appendix C: Transportation Analysis

Draft Mauka Area Plan

Prepared for:
Hawaii Community Development Authority
Prepared by:
EDAW, Inc.

May 2009

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Appendix B

Urban Design Analysis

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1.0 INTRODUCTION

This report is the urban design analysis (UDA) and evaluation portion of the Supplemental Environmental Impact Statement (SEIS) for the revisions to the Kakaako Community Development District Mauka Area Plan and Rules (Mauka Area Plan). The Kakaako Community Development District Mauka Area is strategically located in the center of urban Honolulu, bounded by Piikoi Street, Ala Moana Boulevard, Punchbowl Street, and King Street.

As a response to the public comments received on the Draft SEIS for the Draft Mauka Area Plan, a variation to the Draft Mauka Area Plan (Variation to Draft Mauka Area Plan, or Alternative 3) has been created to address those concerns and provide alternative analysis that supplement the Draft Mauka Area Plan.

Figure 1-1 Project Area

Source: EDAW 2008

1.1 Guiding Principles

As described in the Draft Mauka Area Plan, seven urban design guiding principles are proposed to reshape and transform the Mauka Area into a new community. These principles reflect the vision for the Mauka Area – a distinct and vibrant community where people can live, work, and play in close proximity to different uses. The principles are:

- Develop an outstanding pedestrian environment;
- Create a network of green streets;
- Provide for maximum road connections;
- Connect pedestrian paths across major thoroughfares;
- Strong Mauka-Makai linkage;
- Support the small-lot, mixed-use pattern of Central Kakaako; and
- Support transit-oriented development (TOD).

In response to the public comments on DSEIS, several additional urban design principles have been included in this urban design analysis as overarching principles guiding development.

Neighborhoods as Form Givers

The Draft Mauka Area Plan recognizes that distinct characteristics exist throughout different neighborhoods in the community. It is important to enhance unique identities through land use, architecture, landscape design, landmarks, gathering places and community events, and to guide future development.

Figure 1-2 District / Neighborhood Diagram

Source: EDAW 2008

Create Gateways and Nodes into the Community

The entry portal into the community is the starting point for people to experience the Mauka Area and recognize the community. Several major gateways are identified through the UDA. They are Ala Moana Boulevard and South Street intersection, Ala Moana Boulevard and Cooke Street intersection, Ala Moana Boulevard and Ward Avenue intersection, Kapiolani Boulevard and King Street intersection, Kapiolani Boulevard and Piikoi Street intersection, Ward Avenue and King Street intersection, and Punchbowl Street and Queen Street intersection (Figure 1-3). It is important to create the sense of arrival at critical entry points through configuration of the gathering place, iconic architecture landmarks, minor plazas, and pocket parks (Figure 1-4).

Figure 1-3 Potential Gateway Nodes

Source: EDAW 2008

Figure 1-4 Gateway Node Illustrative

Source: EDAW 2008

Linkage Nodes

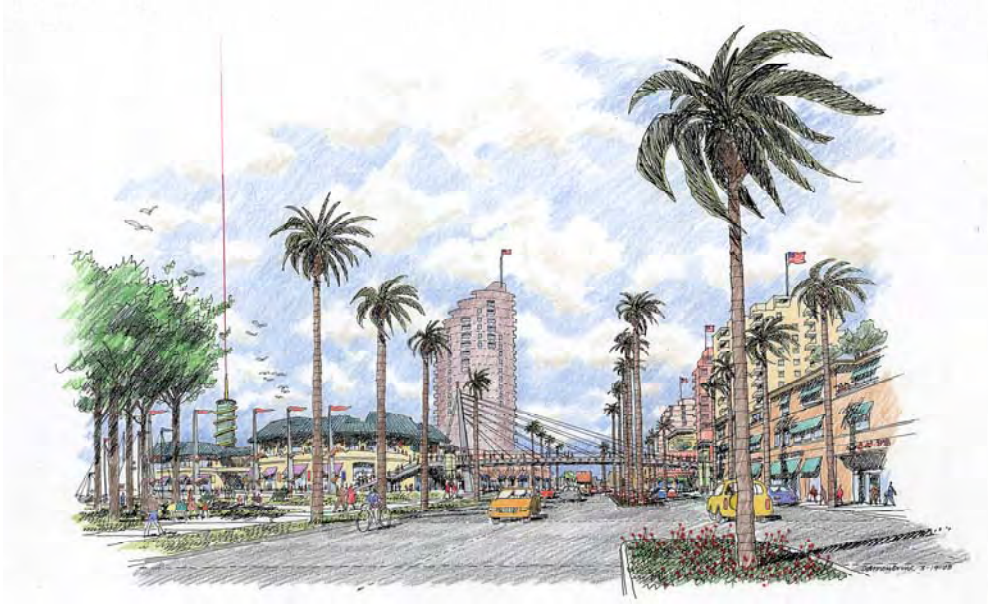
Ward Avenue is a major Mauka-Makai linkage in the community. A series of nodes along Ward Avenue would strengthen its role as a key axis enhancing the Mauka Area (Figure 1-5). The Draft Mauka Area Plan proposes a new alignment that connects Auahi and Pohukaina Streets and a park/open space at Ward Avenue and new Auahi-Pohukaina section. This provides a unique opportunity to create an attractive gathering place that integrates the surrounding retail/entertainment development. The intersection of Queen Street and Ward Avenue is another opportunity. Its proximity to the proposed transit station linking the Central Kakaako Neighborhood and the Auahi Neighborhood make it an adequate location for a vibrant destination node uniting the Mauka Area. Kapiolani Boulevard and Ward Avenue is also a transitional node where Kapiolani Neighborhood meets Thomas Square. The development pattern transitions from in-fill high rise developments to low rise civic/cultural uses. A node would integrate the two neighborhoods.

Figure 1-5 Nodes along Ward Avenue

Source: EDAW 2008

A linear park is proposed in Draft Mauka Area Plan at Ala Moana Boulevard and Cooke Street, which will not only create a sense of arrival, but also provide a connection to the Makai area of the Kakaako Waterfront Park. The Ala Moana and Ward gateway is also a node that unites Kakaako Mauka and Makai Areas, presenting a unique opportunity for a pedestrian bridge connecting pedestrian activities from Ward Avenue to Kewalo Basin waterfront.

Figure 1-6 Illustration of Gateway Node / Landmark

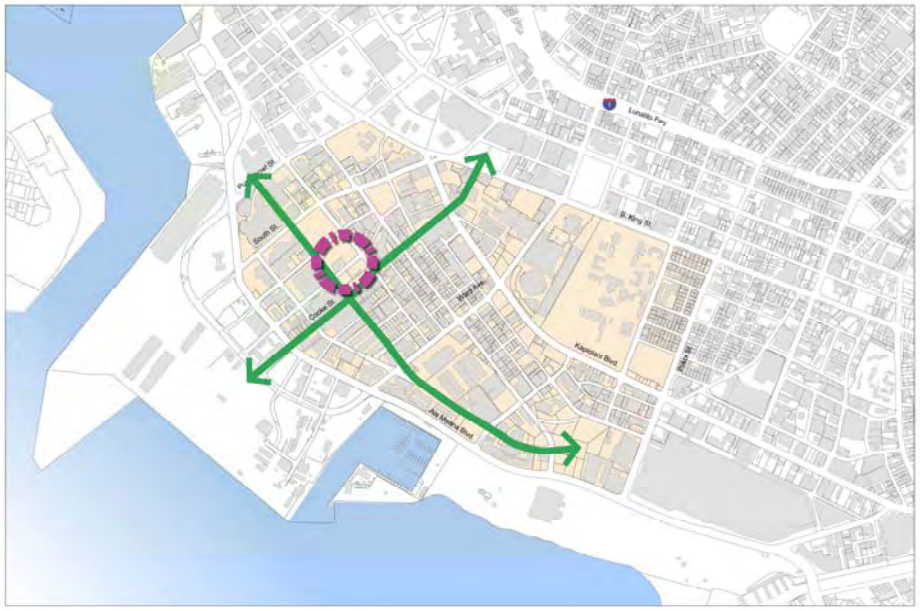


Source: EDAW 2008

The Green Node

Mother Waldron Neighborhood Park not only serves as the green node of the community, but also can be a programmed gathering venue that hosts performance events, fairs, festivals, and farmers markets. It can be transformed into a great amenity for people to enjoy, and attract quality development in the neighborhood (Figure 1-7).

Figure 1-7 Mother Waldron Neighborhood Park Node



Source: EDAW 2008

Intensified Transit-Ready Development

The proposed Honolulu High-Capacity Transit System project is still a future possibility. This system would have a dramatic impact on the Mauka Area as well as provide tremendous opportunities to the community. According to the current Honolulu High Capacity Transit System project update, the system would run through the Mauka Area via Halekauwila Street, Queen Street, and Waimanu Street with two proposed stations at the Halekauwila Street and South Street intersection and the corner of Queen Street and Ward Avenue.

Develop a Transit Node

The presence of a transit station will further energize the node. A transit plaza with local art reflecting the Mauka Area's traditions and mixed-use complexes (retail, residential, and office) could attract pedestrian activity and visual interest. Integrating the design of the transit station with the site plan for that block is the key to a successful transit node.

Figure 1-8 Example of a Transit Node/Plaza

Source: Microsoft Live Map Bird-Eye View

Pursue a Higher-Density Development around the Station

The high-capacity transit option would be conducive to concentrate higher density development within a five-minute walking distance from the future transit station. The development density of blocks that are close to the transit station could go as high as an FAR of 6.0 or 8.0 to capture the value of being close to the transit station. The blocks further away from the station could have a reduced density to balance the overall development intensity.

21st Century Ahupua'a in Kakaako

In September 2007, Honolulu's first comprehensive sustainability plan was developed with full participation from all affected City departments.

> *We must benefit from the wisdom of our Polynesian ancestors combined with the technological innovations of today to make our island home sustainable and self sufficient for future generations. Hawaii's original inhabitants developed a sophisticated and successful resource management system based on the ahupua'a land division that supported a population more than half as large as it is today. We must continue to learn from our Polynesian predecessors and renew our commitment to self-sufficiency and to the protection of our precious `aina. The concept of the "21st Century Ahupua'a" is to develop a culturally appropriate strategy for restoring balance and sustainability to our island home.*
>
> *-- VISION FOR A 21ST CENTURY AHUPUA`A*

As one of the most important areas of Oahu, the Mauka Area would contribute to the achievement of the comprehensive sustainable vision. From an urban design perspective the guiding principles and development provision proposed in Draft Mauka Area Plan and supplemental recommendations proposed above are not only good urban planning and design practice but also effective measures to ensure a sustainable development approach in the community. Some key elements of this approach are summarized below:

- **Pursue Compact Development** – urban form that preserves historic neighborhood character and high density mixed-use development;
- **Enhance Green Connectivity and Mobility** – Green Street Network, Mauka-Makai linkages, and potential mass transit;
- **Maximize Open Space** – urban forestry, native Hawaiian landscape palette;
- **Green Streets** – enhanced canopy providing shades, pavement reduction; and
- **Green Buildings and Site** – encouraging passive solar design, participating green building program such as Leadership in Energy and Environmental Design (LEED), achieve sustainability on construction sites, etc.

1.2 Urban Design Analysis Criteria

In this UDA report, the objective is to assess the existing and potential impacts to visual resources and the urban environment that could result from the implementation of the existing Mauka Area Plan and the Draft Mauka Area Plan. A set of urban design criteria were developed to compare the existing Mauka Area Plan, the Draft Mauka Area Plan, and the Variation to the Draft Mauka Area Plan. The criteria are based on previous urban design studies conducted for both plans and the Primary Urban Center Development Plan (PUCDP) by the City and County of Honolulu. The criteria are:

- **Urban Form** – streetscape scale, shape of city, and massing;
- **Legibility and Urban Identity** - the distinguishing features of the plan;
- **Linkages and Access** – connections and access to the ocean and mountains;
- **Pedestrian Experience** – street level and pedestrian-oriented experience;

- **Panoramic Scenic Views** – panoramic views of natural features and landmarks; panoramic views of the urban skyline; Mauka-Makai street corridors; and
- **Development Parameters** – provisions that shape and control the built form.

These criteria are described in Chapter 2 and applied to the alternatives in Chapter 3.There are also two fundamental development assumptions guiding the urban design analysis process. They are:

- The analysis of the current and revised Mauka Plan did not include any impact from future development outside the project boundary; and
- The future development in the Mauka Area will seek to achieve maximum development square footage and maximum allowable building heights.

2.0 PLANNING AND URBAN DESIGN CONTEXT

2.1 Historic Context

In 1976, with the establishment of Hawaii Community Development Authority (HCDA), great efforts had been invested to plan and design a vibrant Kaka'ako. As a result, the HCDA adopted the existing Mauka Area Plan.

Since the inception of the existing Mauka Area Plan, the Mauka Area has been gradually changing from an industrial/commercial service district to an area mixed with low-to-high density projects with thriving industrial, commercial, and residential uses. In 2005, HCDA along with PlanPacific, Inc. conducted a comprehensive review and revision of the existing Mauka Area Plan in response to issues relating to the existing urban design scheme and the livability of Kaka'ako neighborhoods. Through an extensive public input process, the Draft Mauka Area Plan was developed.

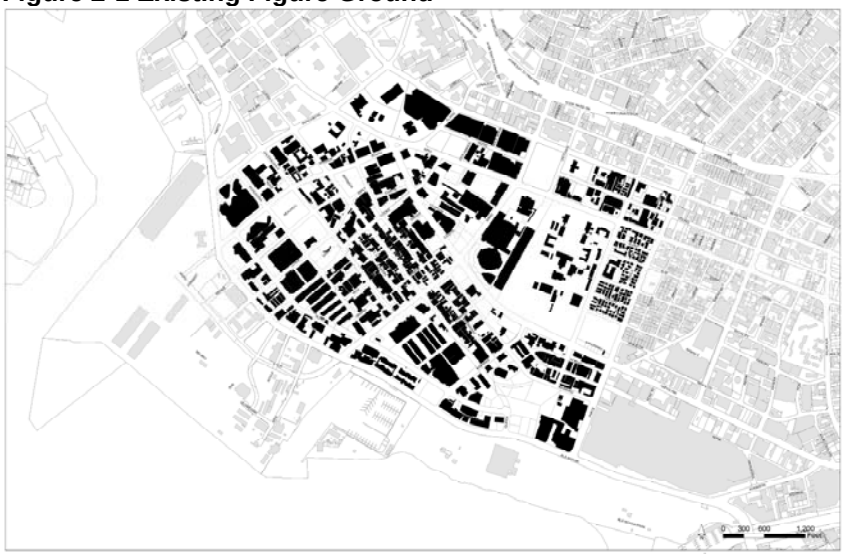
2.2 Existing Development Context

Existing Urban Forms

Currently the Mauka Area is a mix of historic low density residential small lots, new high density residential towers, cultural and educational facilities, industrial and commercial buildings, and warehouses. The existing and emerging land uses, forms, land tenure suggest the formation of several distinct neighborhoods within Kaka'ako. These neighborhoods are:

- **Sheridan** – older, small lot, low density neighborhood;
- **Central Kakaako** – small service and light industrial business;
- **Thomas Square** – mostly institutional uses and open space;
- **Civic Center** – public buildings in a campus-like setting;
- **Kapiolani** – in-fill high density mixed-use development; and
- **Pauahi and Auahi** – large scale mixed-use, residential development.

Figure 2-1 Existing Figure Ground

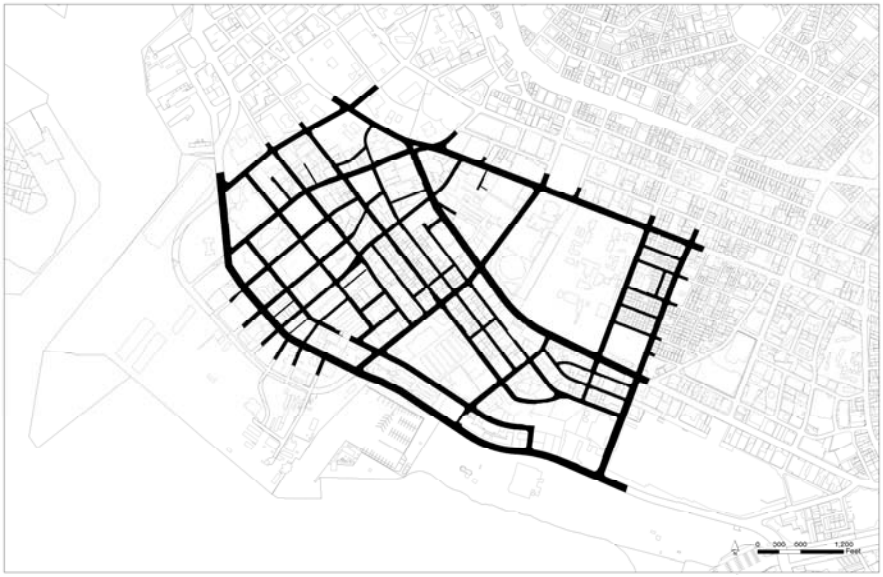


Source: EDAW 2008

Road System

- **Major Mauka-Makai Thoroughfares:** Ward Avenue, Piikoi Street, Punchbowl Street.
- **Secondary Mauka-Makai Roads**: South Street, Cooke Street, and Kamakee Street
- **Major Ewa-Diamond Head Thoroughfares**: Ala Moana Boulevard, Kapiolani Boulevard, and
- **Secondary Ewa-Diamond Head Road**: Queen Street.

Figure 2-2 Existing Road Network



Source: EDAW 2008

Open Space

Currently, there are two dedicated public parks in the Mauka Area– Mother Waldron Neighborhood Park and Queen Street Park. Other open spaces include well-landscaped grounds in the Civic Center Neighborhood, the McKinley High School campus, and the Neal Blaisdell Center (NBC). The open space system is also populated by private pocket parks and plazas. Along Cooke Street and South Street there are a few small pocket parks. In addition, there are some major regional open space resources close to the Mauka Area, such as the Kakaako Waterfront Park, Ala Moana Beach Park, and the Thomas Square.

Figure 2-3 Existing Parks and Open Spaces

Source: EDAW 2008

2.3 Urban Design Criteria

Urban Form

Urban form refers to the shape and scale of the urban space, the dimensions of inter-relationship between streets and buildings, and also the private and public spaces enclosed by the buildings. The existing urban pattern of the Mauka Area is largely a result of decades of development, transforming the community from residential and small business to light industrial and warehouse and back to mixed-use development. During this transformation some of the traditional neighborhood characteristics have been diluted or have disappeared. A primary objective of future development is to create a new urban form that, while acknowledging the historic culture of the area, looks toward the future.

Legibility and Urban Identity

Legibility relates to clear understanding of a place so people can interact with, move through, and predict the layout of a place. Legibility depends on key buildings and landmarks that are easily distinguishable both visually and physically. Each neighborhood in the Mauka Area has distinct characteristics depicted in the architecture, activities, and streetscape. To enhance those characteristics requires good place-making through street landscape parameters, architectural controls, building setbacks, and location of landmark buildings.

Linkage and Access

Linkages are paths, urban spaces, and corridors that connect neighborhoods and districts within a community. For native Hawaiians, the most important linkage, which is also known as *ahupuaa*, or ocean to mountain land ownership pattern, represents the important tie between the mountains, the agricultural lands on the slopes, and access to the sea for fishing and commerce. It is necessary to preserve and enhance these linkages through future development in the area. As the existing land use pattern shows, there are different neighborhoods and districts within the community. Providing strong linkages between them and knitting the disparate components together is critical to creating a coherent urban image of the community. The central location of the Mauka Area also presents a unique opportunity to link and respond to developments in Downtown and Ala Moana/Waikiki Districts.

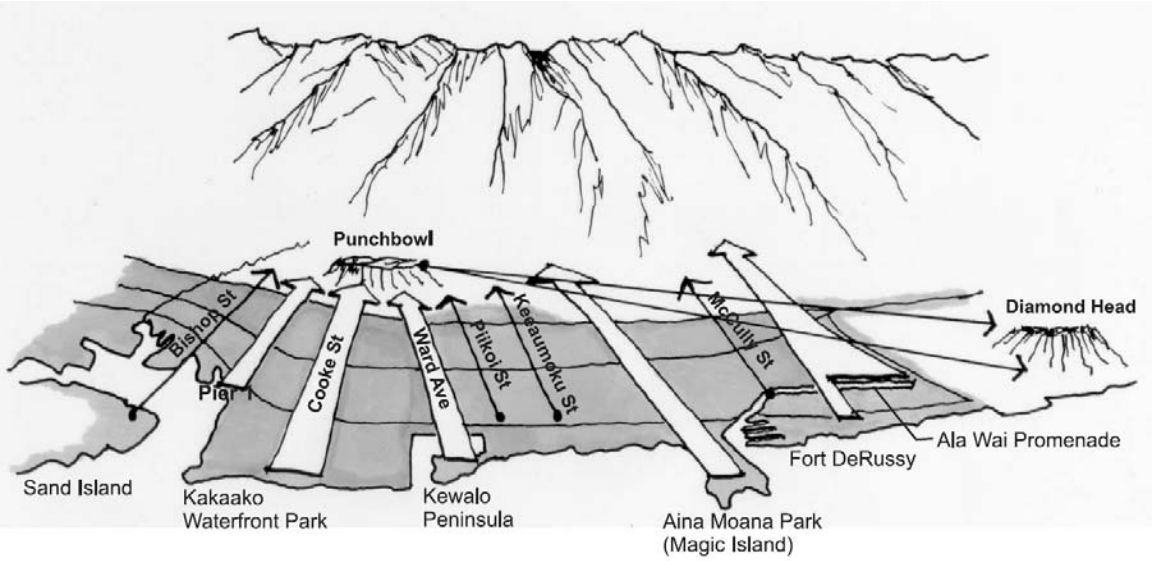
Pedestrian Experience

Pedestrian experience refers to spaces that are designed to human-scale – the relative size of streets, buildings, and enclosed space juxtaposed to the human body, the activities that transform a space to a meaningful place, and comfortable pedestrian environment. Within the context of the Draft Mauka Area Plan, one of the key factors is ensuring that development and density occur while maintaining the human-scale and a pleasant and relatable pedestrian experience.

Panoramic Scenic Views

Panoramic views are broad vistas from distant vantage points. With its central location in Honolulu, the Mauka Area possesses spanning views of both natural features and urban skylines. There are panoramic views of the Koolau Ranges and Punchbowl that are great assets to the community, especially from the Ala Moana Beach Park, Kakaako Waterfront Park, and Kewalo Basin. Conversely, the urban skyline defined by high rise structures and denser clustering of buildings in the downtown area, is also a visually prominent element of the area. It is important to preserve the views and visual assets and integrate the new development into the existing urban skylines in a consistent and harmonious way to enhance the community image.

Figure 2-4 PUCDP Identified View Corridor



Source: PUCDP

Development Parameters

A contiguously built fabric, diversity of uses, and critical mass of users are common elements of a successful, market-driven development. Development parameters prevent the risk of overzealous modifications to the built fabric. These parameters shape the ways in which community visions and objectives can be implemented. In some instances, development parameters are eligible for reconsideration; other parameters are fixed. Among various development parameters, building height restriction, FAR, and the building envelope impact future redevelopment efforts greatly, although other parameters may also apply. Together they shape and control the physical form of the development, as well as partially determine the financial feasibility of the development.

3.0 URBAN DESIGN ANALYSIS

3.1 Alternatives

Alternative 1: No Action

The No Action Alternative is a continuation of the existing Mauka Area Plan. The existing Mauka Area Plan proposes the construction of a network of towers, pedestrian and park spaces with building podiums 45 feet above the ground. Superblock developments and Planned Developments (PD) with tower footprints up to 16,000 square feet and 400 foot height limits (depending on lot size) would be permitted with no required studies demonstrating the mass, orientation, and scale in comparison to adjoining uses, or view impacts at the street level or from distant locations.

Alternative 2: Draft Mauka Area Plan

The Draft Mauka Area Plan proposes that properties in the project area be allowed to be developed to a maximum FAR of 3.5. To promote active uses at street level and to enhance a human-scaled built environment, building form guidelines are organized into three elements: the Street-front Element (40 to 65 foot high); the Mid-Height Element (80 to 215 foot high); and the Tower Element (up to 400 foot high). The proposed maximum tower footprint is 9,000 square feet with a 3:1 length to width ratio for tower footprint. Tower orientation is with the longer side of the tower to be orientated in the Mauka-Makai direction.

Alternative 3: Variation to the Draft Mauka Area Plan

The third alternative was developed in response to the public comments received from DSEIS. It is a variation to the Draft Mauka Area Plan as requested through the DSEIS public comments. The same level of design analyses were performed for Alternatives 2 and 3. The distinguishing characteristics of this alternative are:

1. **Density**

   Recognizing new development opportunities and possibilities brought by parcel consolidation, Alternative 3 encourages density transfer towards larger parcels. To capture and maximize the benefits of future light rail transit in the community and to create a more sustainable Mauka Area, Also density bonus on parcels within five minute walking distance from future transit stations is proposed.

2. **Building Height**

   a. **Street-front Element**

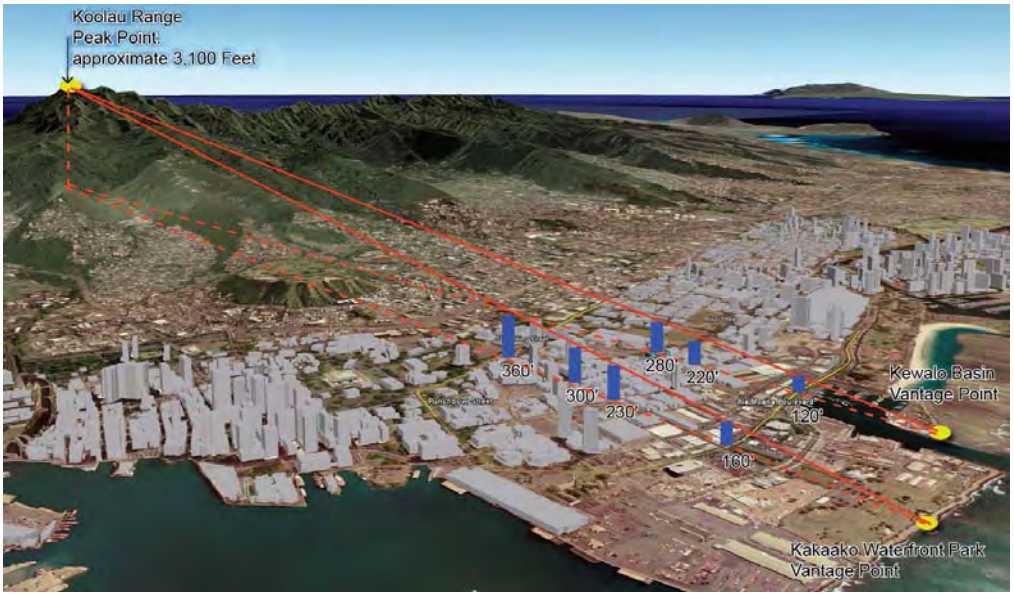
      The Street-front Element plays a key role in creating various streetscapes and a sense of place. It must house active uses, such as offices, residences, and retail, and reflect the character of the

street as well as neighborhoods. Alternative 3 proposes to link the building height of the street-front elements with street classification and neighborhood characters and differentiate residential uses and non-residential uses. It provides a wider range of building heights that can be applied in different development contexts. Range of heights for mixed-use developments are from a minimum 40 feet or three story (three story mixed-use and/or three story townhouse) to a maximum height of 65 feet (five story mixed-use and/or six story residential).

b. Mid-height Element

The Mid-height Element is devised to implement effective development control on important view cones and visual corridors, as well as to provide additional development scale choices. To determine the scale, view corridors were used as a tool. Kakaako Waterfront Park and Kewalo Basin are two important regional open spaces adjacent to the Mauka area, where two Mauka-Makai view planes are identified in the PUCDP as visual resources with regional significance.

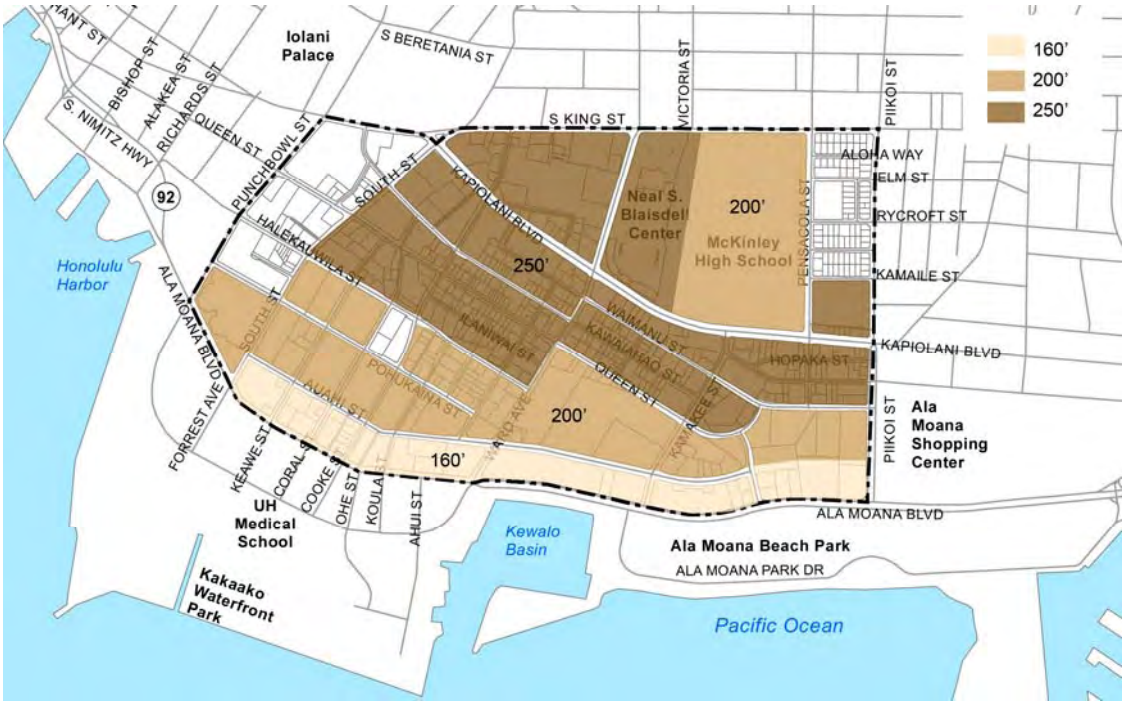
Figure 3-1: Building Height along View Corridor Study



Source: Google Earth -EDAW, 2008

To preserve and enhance the views, the maximum height is largely defined by view cones and corridors from shoreline parks looking towards the Koolau Ranges. The building heights increase as the building location is further away from the waterfront. (Figure 3-2).

Figure 3-2: Mid-height Element Building Height Map



Source: EDAW 2008

c. Tower Element

A maximum building height of 400 feet is allowed for tower elements in most parts of the Mauka Area except the Civic Center Neighborhood, McKinley High School area, Sheridan Neighborhood, and Mother Waldron Neighborhood Park.

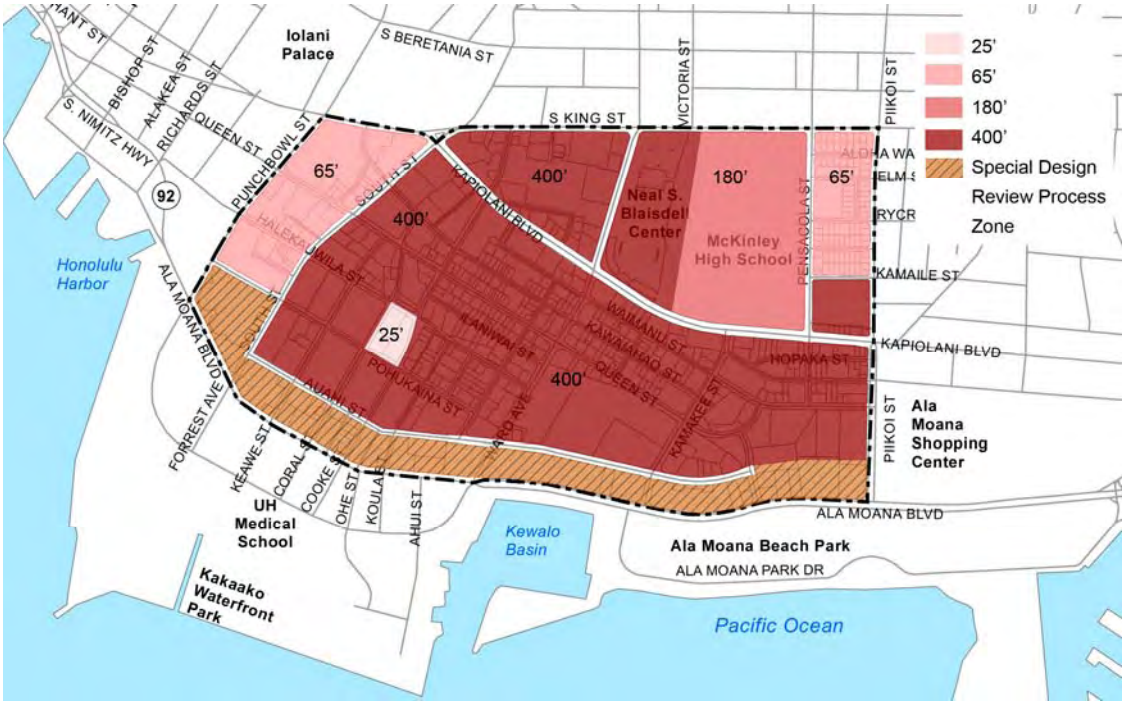
Special Design Review Process Zone

Ala Moana Boulevard serves as both a major transportation corridor connecting the Mauka Area to Downtown Honolulu and Ala Moana/Waikiki and a major scenic drive that showcases Kakaako's unique urban waterfront skyline. The location of towers in this area will have a great impact on view corridors as well as the overall community urban image. Thus, a special design review process zone is suggested to ensure that any tower elements that would be planned will help to enhance the Mauka Area's urban design framework. The following principles will be used as guidance to the review process:

- *Visual access to the ocean* – the Mauka Area has the potential to provide a unique urban waterfront experience of Oahu . The building orientation, footprint size, and tower location will need to preserve views of the major waterfront amenities at the Kewalo Basin and Ala Moana Beach Park. Building forms should step down towards the waterfront.

- *Preserve and encourage pedestrian access to the waterfront/Makai Area* – pedestrian pathways through large blocks.
- *Create nodes of activities and gateways at street corners* - Design considerations would include special paving, building openings, and active uses at the corner.

Figure 3-3: Tower Building Height Map



Source: EDAW 2008

3. Building Envelope

a. Mid-height Element

There are no restrictions on mid-height building footprint, aside from Street-front Element and Height Setback requirements: 50 feet setback from promenade street and 20 feet setback from other streets are required. If the Mid-height element is located within the Special Design Review Process Zone, its building envelope is also subject to special review.

b. Tower Element:

The lot sizes listed below are required for building heights and the size of the floor plate. It does not allow cross street/parcel joint development with the required floor area all on one side.

Lot Size (Actual Development Lot)	Floor Plate
< 40,000 SF	8,000 SF
40,000 SF – 80,000 SF	8,000 SF – 10,000 SF
80,000 SF – 120,000 SF	10,000 SF – 12,000 SF
120,000 SF – 160,000 SF	12,000 SF – 16,000 SF
> 160,000 SF	16,000 SF

c. Building Orientation and Plate Ratio

- The longer side of the tower should be oriented Mauka-Makai;
- To encourage point/slender towers (small footprint and narrow in circumference or width in proportion to length or height) rather than slab towers (rectangular building that has little width with respect to its length and usually height); and
- For development parcels with a 16,000 square feet maximum floor plate, the width to length ratio shall not exceed 1:4 for residential building and not exceed 1:2 for commercial building.

4. Tower Setback

- Minimum 50 feet setback from Street-front Element along promenade street; and
- For all other situations, a minimum 20 feet setback from the Street-front Element is required.

3.2 Urban Form

Alternative 1

Under the existing Mauka Area Plan, large development lots are allowed to be developed up to 16,000 square feet at the height of 400 foot. This is the dominant appearance of existing high density development on large parcels in the community (See Figure 3-4). It created an urban form characterized as large tower buildings and superblocks.

Figure 3-4: Koolani – Development under existing Mauka Area Plan

Source: HCDA 2007

Without proper development guidance, the same development pattern would proliferate throughout the Mauka Area. This development pattern does not reflect the diverse neighborhood characters that exist,

such as the Sheridan and the Civic Center Neighborhoods. To create more efficient mixed-use developments, developments would likely pursue land parcel consolidation. Nevertheless, market-driven parcel consolidation process alone may not reflect the actual neighborhood vision, potentially creating incompatible development uses and scales. Figure 3-5 shows how parcel size and parcel development were congruent. Smaller scale development occurred in smaller parcels. Figure 3-6 shows how superblocks have been formed by consolidating the same small parcels to allow larger developments.

Figure 3-5 Super-Block Formation - Parcels along Kapiolani – 1998

Source: EDAW 2008

Figure 3-5 Super-Block Formation - Parcels along Kapiolani – 2008

Source: EDAW 2008

Figure 3-6: Example of Small-Scale Mixed Use Development

Source: EDAW 2006

Alternative 2

The Draft Mauka Area Plan identifies the unique characteristics of each neighborhood in the Mauka Area, and mandates new development in each neighborhood to preserve and enhance its unique neighborhood character. Urban forms that reflect different urban experiences of each neighborhood, from large-scale office/commercial complex to intimate neighborhood mom-pop shops would be created.

Figure 3-7: Example of Large-Scale High Density Development

Source: PlanPacific 2005

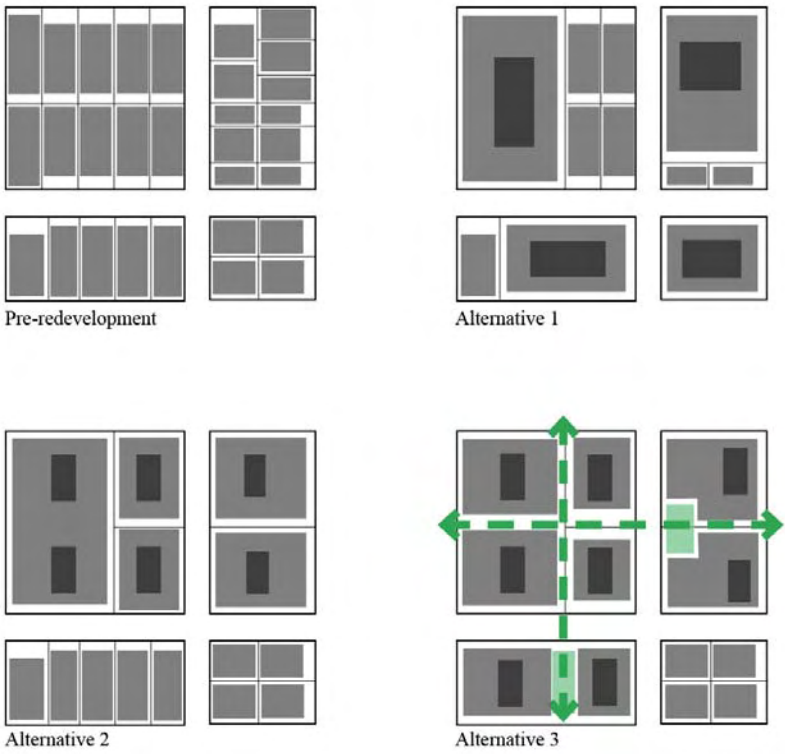
Alternative 3

In addition to preserving the urban form with small-scale development patterns, Alternative 3 also proposes a more mixed development pattern, where small and large blocks can be integrated with subtle transition, and together provide a more pedestrian-friendly environment (See Figure 3-8).

Figure 3-8 Example of Pedestrian-Friendly Large-Scale Development

Source: EDAW 2007

Figure 3-9 Urban Form Transformation



Source: EDAW 2008

3.3 Legibility and Urban Identity

Alternative 1

Under the existing Mauka Area Plan, neighborhoods in the Mauka Area are treated the same in terms of the physical form of future development - a network of towers and superblocks. The uniqueness of each neighborhood would likely be diminished gradually and become less legible.

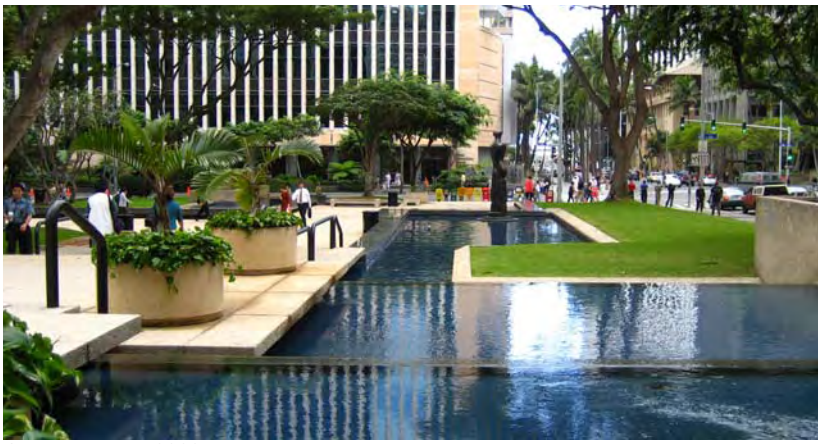
Figure 3-10 Typical High-density Development in Mauka Area

Source: HCDA 2008

Alternative 2

The Draft Mauka Area Plan recognizes the importance of preserving and enhancing the distinctive neighborhood characters of the community. A series of community images would be created to reflect the characteristics and values of the Mauka Area through a network of green streets, maximum building heights, strong Mauka-Makai connection, and special pedestrian crosswalk treatment at critical intersections.

Figure 3-11: Example of Urban Plaza that Enhances Neighborhood Character



Source: EDAW 2008

Alternative 3

To further enhance the urban identity of the area, detailed and strategic urban design strategies can be added. These would include identifying community gateways that can create a sense of arrival—the creation of gathering places and community cores with local features and celebrating key landmark buildings, through architectural, landscape, and spatial treatments.

Through the establishment of Special Design Review Process Zone and the location of strategic towers, gateway nodes along Ala Moana Boulevard will be created to provide a sense of arrival to ensure a unique start to the urban experience of the Mauka Area. It is important to create other nodes through the configuration of the gathering places, iconic architectural landmarks, minor plazas, and pocket parks. Blocks/parcels located at the critical nodes would be subject to special review and be allowed flexibility in floor plate or building height to achieve the goal of creating meaningful and legible urban nodes (Figure 3-12).

Figure 3-12: Example of Gateway Plaza with Anchor Towers

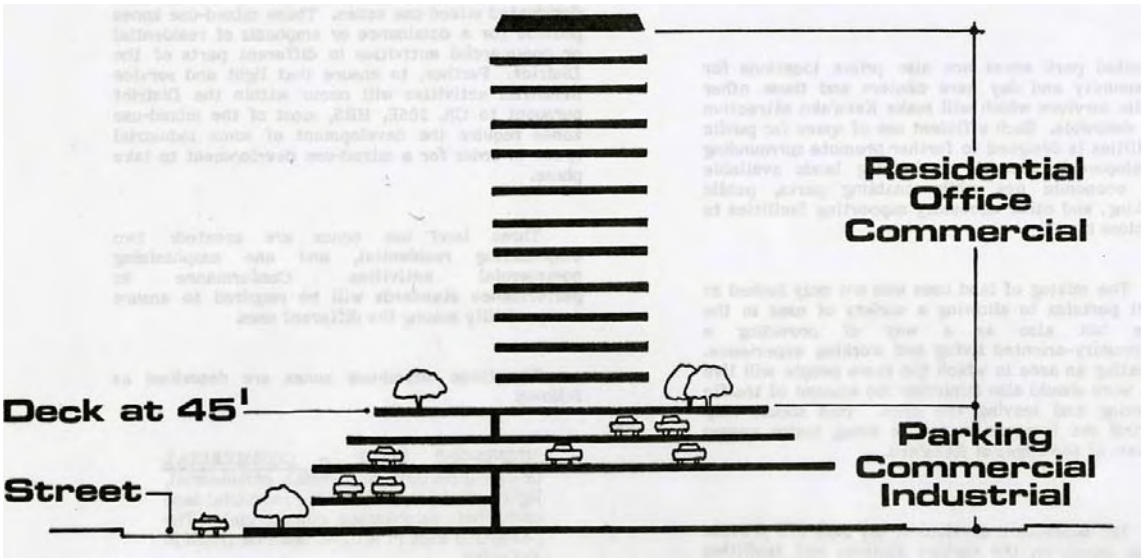
Source: Microsoft Live Map Bird-eye View

3.4 Linkage and Access

Alternative 1

The existing Mauka Area Plan proposes a network of pedestrian and park spaces atop building podiums 45 feet above the ground, while vehicular traffic occupies the ground level. The separation of pedestrian network and vehicular traffic is likely to place more emphasis on the vehicular users when streets are designed in new development areas. In this vehicular-oriented environment, it would be a challenge to create green pedestrian corridors, which are crucial in integrating the community with surrounding communities and neighborhoods from a regional perspective. The parks on podium proposed in the existing Mauka Area Plan would likely be less accessible to the general public than to tenants of the adjacent tower. Though a bridge/skywalk system is proposed to connect them, it is still difficult for any of those parks on podium to become vibrant people-gathering places that are easy for people to access in and out of.

Figure 3-13: Typical Mixed-use Project Section – existing Mauka Area Plan

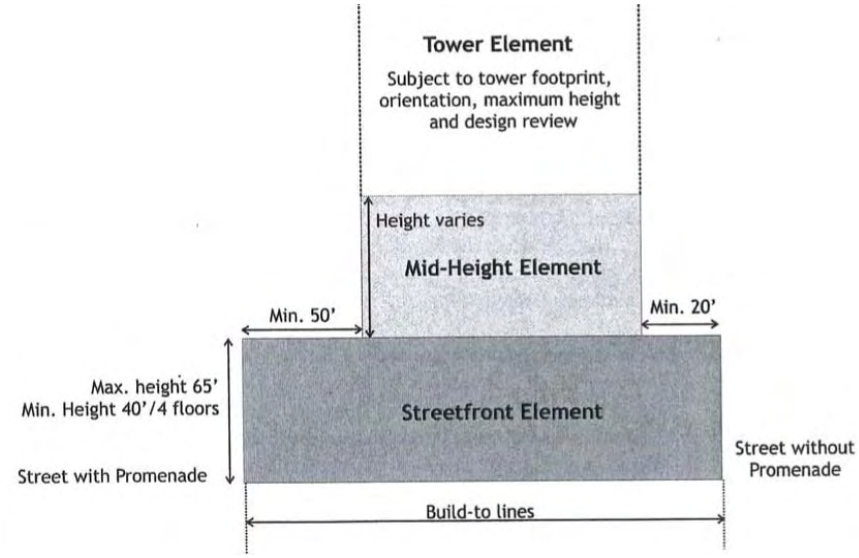


Source: Kakaako Community Development District Plan 1983

Alternative 2

Under the guidance of the Draft Mauka Area Plan, a network of ground-level green streets would be established to create a more pedestrian friendly streetscape throughout the community. An example of a stronger Mauka-Makai linkage is Cooke Street, which would be enhanced through landscape improvement, resurgence of pedestrian activity, and the establishment of a series of gathering places. Similar linkages shall also be encouraged along Ewa-Diamond Head to connect the community with Downtown and Waikiki to further enhance the prominent urban image of Honolulu.

Figure 3-14: Typical Mixed-Use Project Section – Draft Mauka Area Plan



Source: Draft Mauka Area Plan 2007

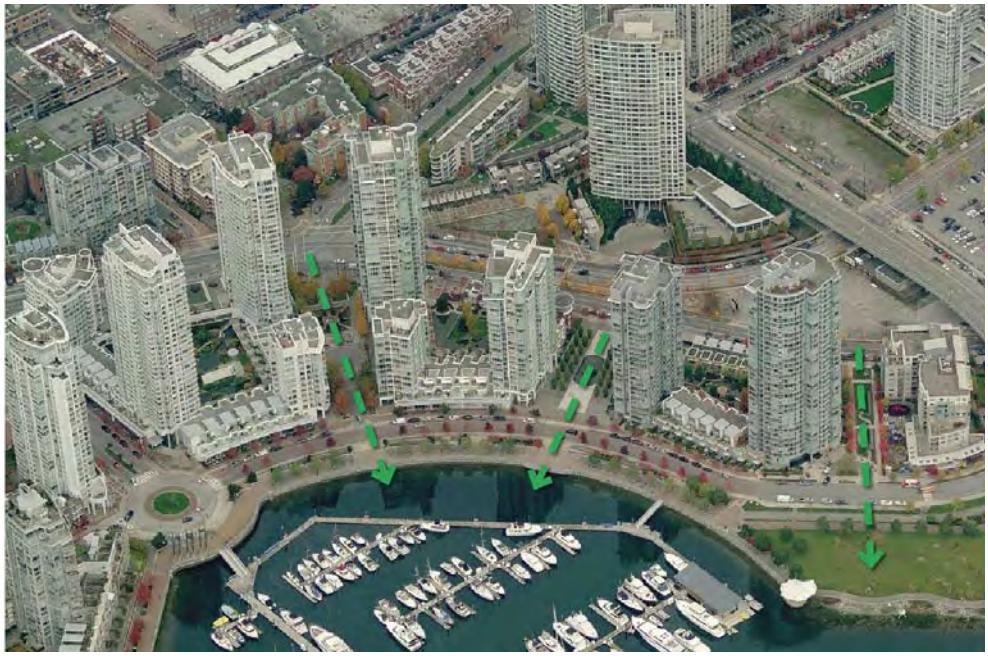
Figure 3-15: Typical Mixed-use Streetscape – Draft Mauka Area Plan

Source: Draft Mauka Area Plan 2007

Alternative 3

In addition to the emphasis on the pedestrian accessibility and nodes connectivity as Alternative 2, Alternative 3 also proposes strong neighborhood linkage, encourages towers to be located where anchors neighborhood nodes, and enhance neighborhood identity. When development occurs in a superblock, pedestrian linkages need to be identified and incorporated into the development, (See Figure 3-16).

Figure 3-16: Example of Pedestrian Linkage through a Superblock



Source: Microsoft Live Map Bird-eye View - EDAW

3.5 Pedestrian Experience

Cities and communities often contain complex networks of alleys, streets, parks and pedestrian networks or zones, making it challenging for pedestrians to explore or reach their destinations. Their experience is compromised and they are discouraged from spending time in a place when they find the scale of the place/street uncomfortable or unsafe. On the other hand, amenities or event infrastructures would always entice pedestrian activity. Mitigating the environmental factors such as shadows and wind that do not contribute to the enjoyment of outdoor places is another important means to keep people in the neighborhood.

Scale

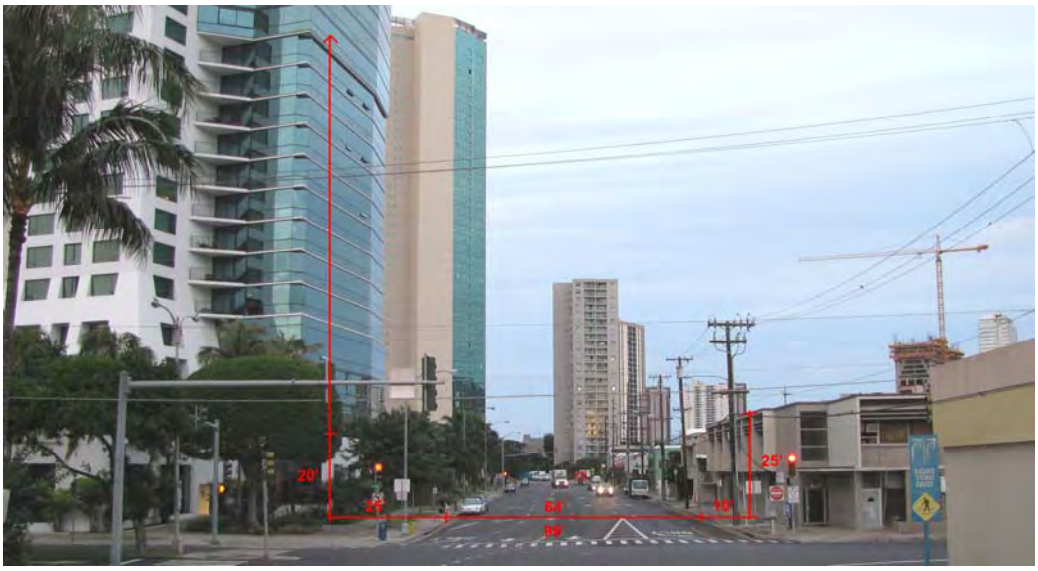
The scale of a street is an important element that affects the pedestrian perception of the built environment. It refers to the relationship between building height and street width, and is also known as the enclosure ratio. Many studies have been conducted to determine the best proportion of building height to street width to create an optimum sense of place. Both the American Institute of Architects (AIA) and LEED recommend a maximum width to height ratio of 3:1. The Main Street Center of the National Trust for Historic Places recommends proportions for commercial streets of between 2:1 and 3:1. Many

experts, however, report that a ratio closer to 1:1 is ideal because it strengthens a sense of place even more and increases real estate values.

Alternative 1

The existing Mauka Area Plan proposes to build a network of towers and podium level open spaces. There is limited discussion on the relationship between street-front building height and width of a street. Though the existing Mauka Plan has a prototype 20 feet frontage that goes back at a 1:1 slope up to the 45 foot height limit, such prototype does not always work for all types of streetscape and neighborhood character. As a result, some streets in the community have a width-to-height ratio of 4:1 or 5:1, others are creating oversized street-front, and both conditions have fail to provide comfortable pedestrian environment (Figure 3-17).

Figure 3-17: Waimanu Street Existing Condition



Source: HCDA 2009

Alternative 2

The Draft Mauka Area Plan introduces street-front elements with a minimum height of 40 feet and a maximum height of 65 feet for the building form to energize streets. The proposed building height is a more comfortable human-scale range that enriches the pedestrian experience. Under this Street-front element parameter, it would be easier for future development to create more intimate urban spaces within the comfortable width to height ratio.

Figure 3-18: Example of Streetscape with Intimate Pedestrian Scale

Source: EDAW 2008

Alternative 3

Alternative 3 further expands the application of street-front element and encourages the linkage between the height of street-front element with street classification and character where it is located so that a comfortable pedestrian-scale could be achieved. For example, on a small street (around 50 feet wide) with primarily residential uses, the street-front element can be as low as 40 feet (a typical three-story townhome—Figure 3-19) to create a quiet and comfortable residential neighborhood character. While on a wider street (around 100 feet wide) with mixed-use development, the street-front element can be as high as 65 feet (Figure 3-20).

Figure 3-19: Example of Two-Story Street-Front Element

Source: EDAW 2008

Figure 3-20: Example of Six-story Mixed-Use Street-Front Element

Source: EDAW 2008

Pedestrian Activity

Alternative 1

Under the existing Mauka Area Plan, most pedestrian activities will be in the park/open spaces atop the building podium, with the ground level dedicated to vehicular uses; this separation would create connectivity and accessibility problems for pedestrians. The street profiles are generally not designed to be conducive to pedestrian activity.

Figure 3-21: Podium-level Open Space without Ground Level Pedestrian Activity

Source: HCDA 2009

Alternative 2

A green street network and landscaped pedestrian corridor are proposed in the Draft Mauka Area Plan to improve the pedestrian experiences. With the ground level linkage to open spaces, commercial street-front, and landscapes, more pedestrian activities would take place on the streets, parks, and plazas (Figure 3-22).

Figure 3-22: Example of Open Space with Commercial Street-Front Attracting Crowd

Source: EDAW 2007

Alternative 3

Pedestrian trails would be encouraged to reduce the length and mass of superblock developments. Pocket park is additional feature that can be used to break the visual length of the façade, thereby creating pedestrian-scaled buildings.

Figure 3-23: Example of Pedestrian Street within Superblock

Source: EDAW 2007

Shadows

The shadow analysis on the three scenarios shows that Alternative 2 and Alternative 3 would have less daytime shadow impact (Figure 3-25 to 3-26) than Alternative 1 (Figure 3-24). Smaller building footprint and more variety of building height limits would create shorter shadows and have less impact on existing development. The introduction of mid-height element in Alternative 2 and 3 also help to reduce the length of shadows.

Figure 3-24 Shadow Analysis – Alternative 1

Source: EDAW 2008

Figure 3-25 Shadow Analysis – Alternative 2

Source: EDAW 2008

Figure 3-26 Shadow Analysis – Alternative 3

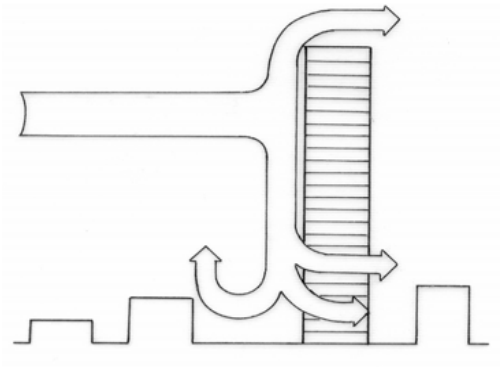
Source: EDAW 2008

Ventilation and Breeze

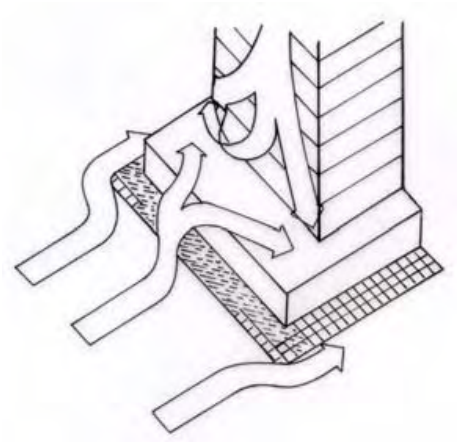
Honolulu's tropical climate results in sunny and mild weather throughout the year. The wind from the northeast (mountain) and seasonal winds from the south (ocean) envelope the island. The existing Mauka Area Plan recommends building orientation between 25 degree and 55 degree east of the ocean to capture the prevailing breezes, which would help to design buildings to take advantage of natural ventilation and passive solar heating and cooling, thus less energy will be consumed.

Wind velocity close to the earth surface is close to zero and it increases with an increase in height. The wind strikes tall building surface first, then deflects towards the ground surface causing high speed winds – downwash. At the pedestrian level, the presence of tall buildings near low-rise structures may alter wind environment resulting in unpleasant wind conditions around tall buildings. Building podiums proposed in the existing Mauka Area Plan would help to reduce wind speed at ground level. However, the podium level is also where most pedestrian activities would occur, making it the most affected area by high-rise altered winds. Alternative 2 introduces Street-front Elements and setback requirement for towers, which would reduce wind speed and create a more desirable environment for pedestrians at street level. The enhanced canopy tree lined streets and pedestrian corridors proposed in Alternative 3 would further protect the pedestrian environment. Large canopy may interrupt the flow as it moves down the windward face of the building. This would protect the building entrances and sidewalk area by deflecting the downwash.

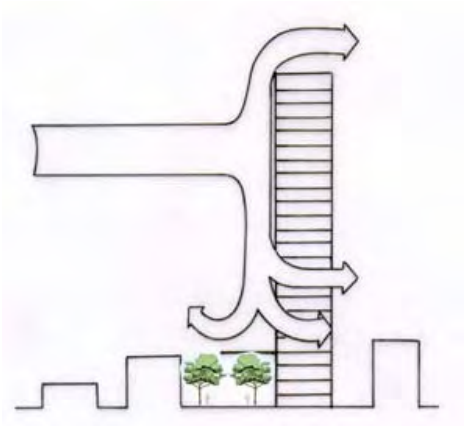
Figure 3-27 Wind Flow Diagrams



Downwash to street level



The Tower-on-podium



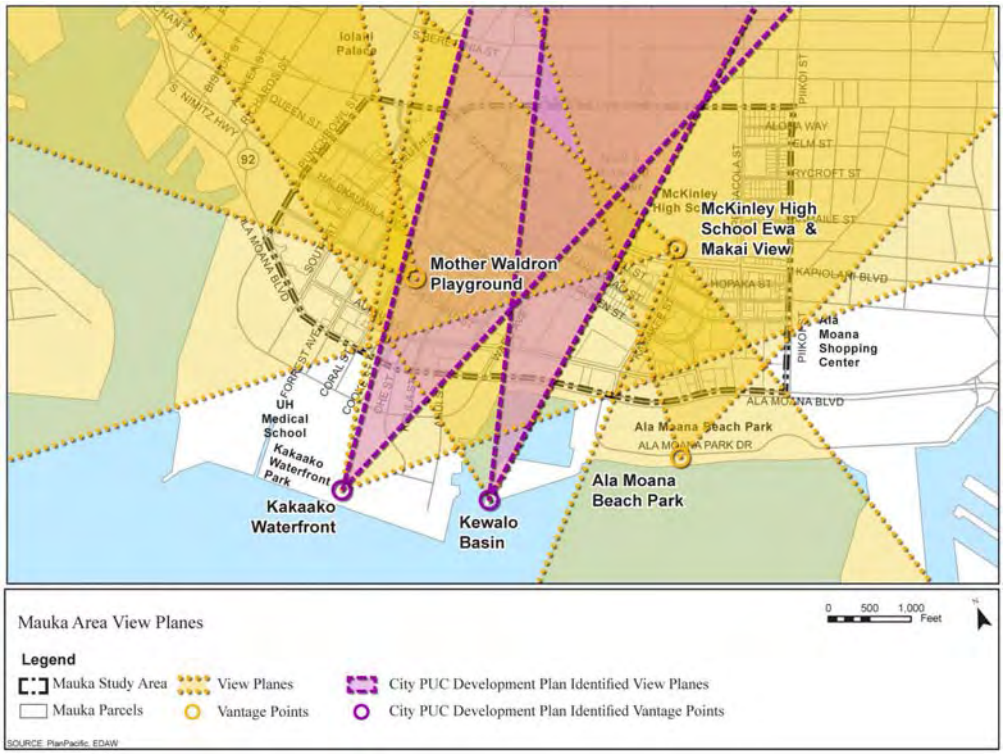
A large canopy as a solution to the pedestrian-wind problem

Source: <Unpleasant Pedestrian Wind Conditions Around Buildings>, Asian Jornal of Civil Engineering VOL. 7 NO. 2, 2006

3.6 Panoramic Scenic View

A defining feature of Oahu's natural visual assets is views of the Koolau Ranges. The PUCDP identifies two vantage points that offer panoramic views of the Koolau Ranges: Kakaako Waterfront Park and the Kewalo Basin. Both vantage points offer a panoramic view of the Waianae Range, downtown Honolulu skyline, Kakaako, the Koolau Ranges, Ala Moana, Waikiki, and Diamond Head. There are also several other vantage points within the Mauka Area that offer views of the Koolau Ranges and other significant neighborhoods and demonstrate the views within, around, and out of the Mauka Area. These notable vantage points are Ala Moana Beach Park, Mother Waldron Neighborhood Park, McKinley High School looking in the direction of Ewa, and McKinley High School looking in the direction of Makai (Figure 3-28).

Figure 3-28 View Planes and Vantage Points



Source: EDAW 2008

Kaka‘ako Waterfront Park

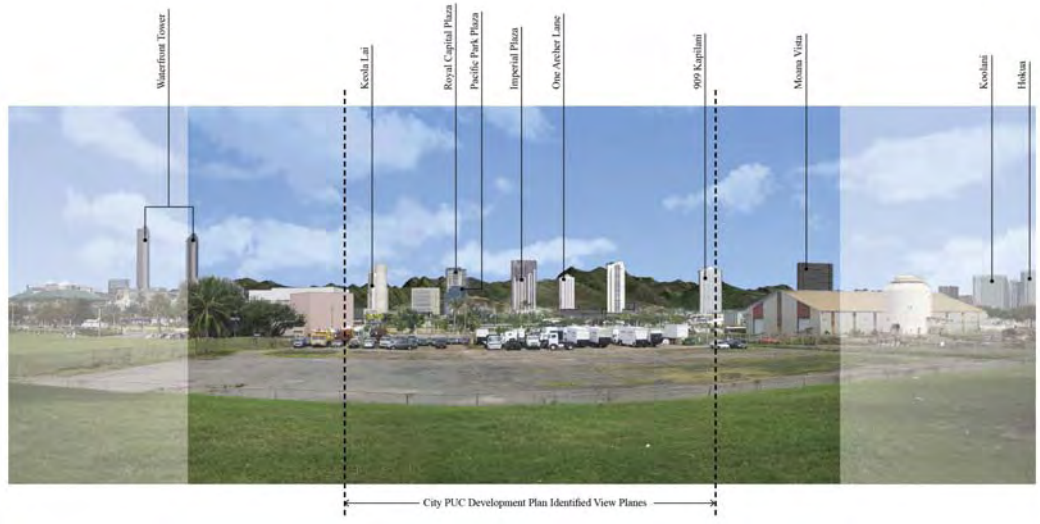
Under the existing Mauka Area Plan development, future maximum density development coupled with the allowable maximum tower footprint and building orientation could possibly result in the Mauka view becoming completely blocked within and outside of the PUCDP view corridor. One or two visual pockets would be spared where a small portion of the Koolau Ranges would still be visible (Figure 3-30). From an urban skyline perspective, there would possibly be few variations in building heights, resulting in a static or less dynamic skyline.

The Draft Mauka Area Plan promotes smaller tower footprints and orients the longer side of the towers in the Mauka-Makai direction resulting in a more slender tower (Figure 3-32). The Draft Mauka Area Plan at maximum development would greatly increase the number of potential towers in comparison to the existing conditions. However, there would be substantially more interspersed views of the Koolau Ranges. Also, the introduction of mid-height elements in the Draft Mauka Area Plan would help to diversify the skyline and provide an urban image with multiple layers.

The variation to the Draft Mauka Area Plan introduces a sliding scale of tower footprint, which encourages a variety of building profiles and skyline. The maximum building height of the mid-height element is determined by the distance from the waterfront, so that more view corridors and windows to the Koolau Ranges can be preserved (Figure 3-33).

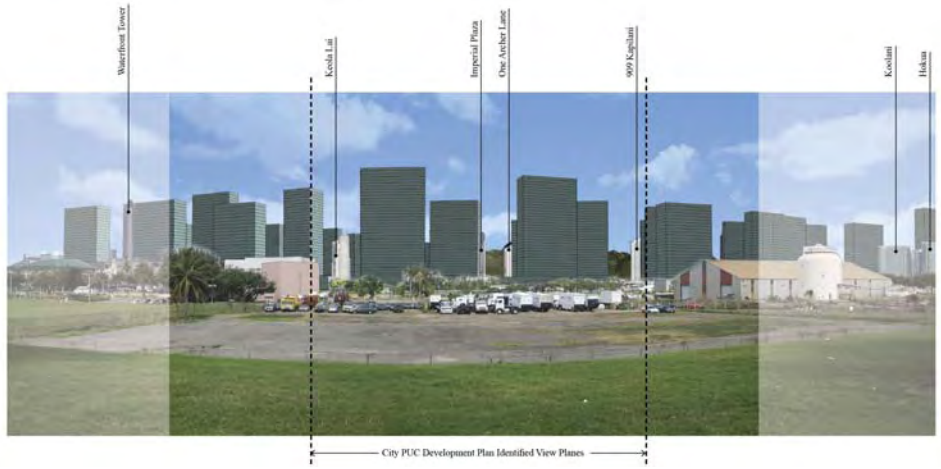
The narrow view corridor seen in plan view is identified from the PUCDP. The wider view corridor extends to a 60 degree optical view cone simulating the eye’s natural cone of vision. The panoramic view that exceeds 60 degree is shaded in the simulated pictures below.

Figure 3-29 Kaka‘ako Waterfront Park – Existing Condition



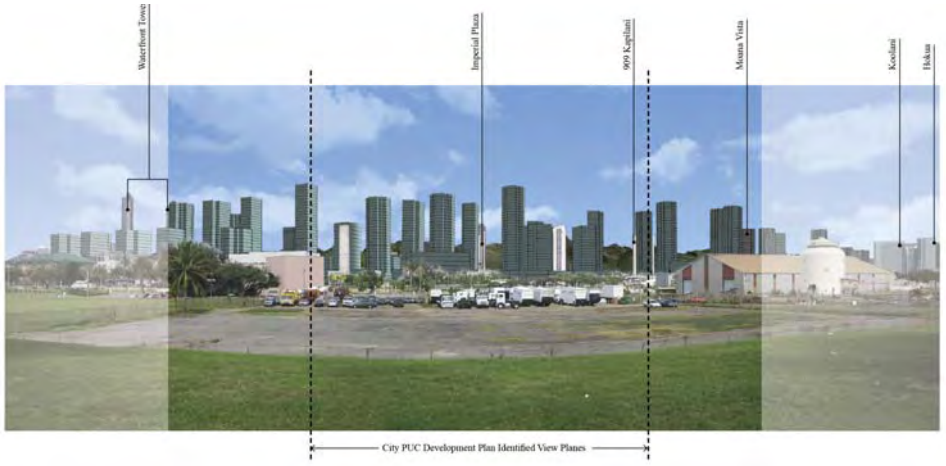
Source: EDAW 2008

Figure 3-30 Kaka'ako Waterfront Park – Alternative 1



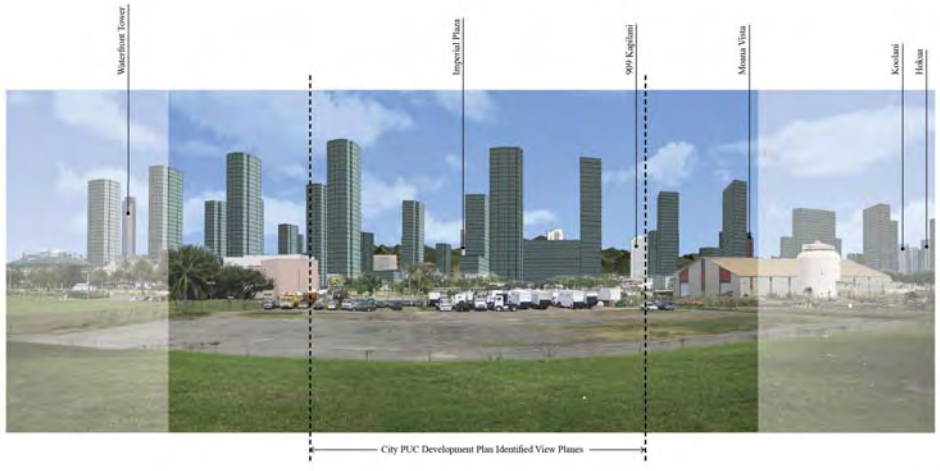
Source: EDAW 2008

Figure 3-31 Kaka'ako Waterfront Park – Alternative 2



Source: EDAW 2008

Figure 3-32 Kaka'ako Waterfront Park – Alternative 3



Source: EDAW 2008

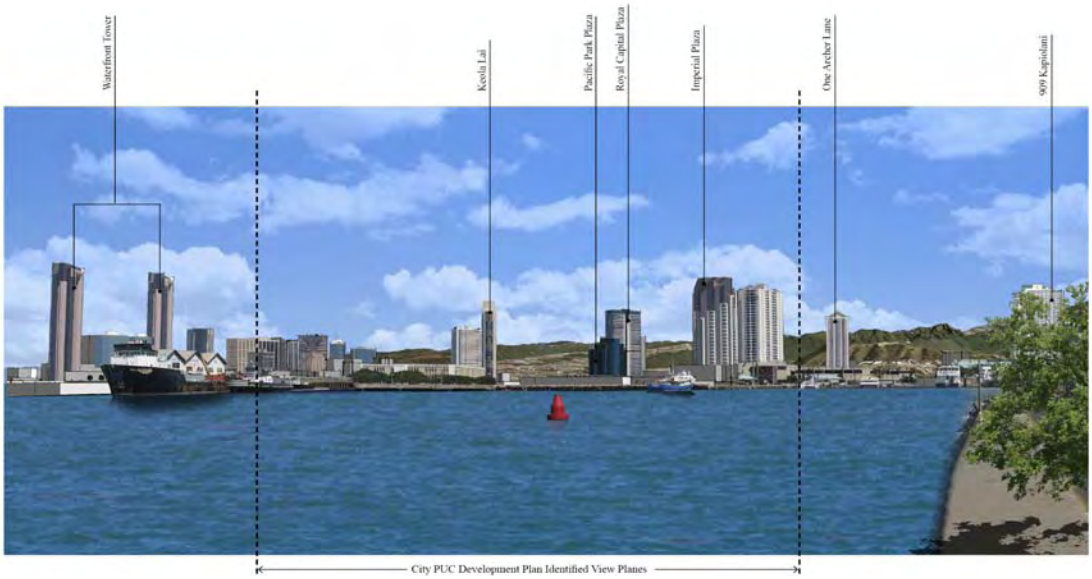
Kewalo Basin

Under the existing Mauka Area Plan, the maximum height of future development along Ala Moana Boulevard is 400 feet. If built out to full potential, this would potentially create a wall of towers blocking most views of Downtown and the Koolau Ranges within and outside of PUCDP's view corridor (Figure 3-34). This simulated panoramic view does not include a view cone larger than 60 degree as it would not provide any context to the view corridor.

Under the Draft Mauka Area Plan, future development towers would be less prominent in the skyline because of the Mauka-Makai orientation of the towers and the more slender tower footprint (Figure 3-15). Although most views to Downtown would still be impacted, the Draft Mauka Area Plan preserves a greater portion of the Koolau Rangse views.

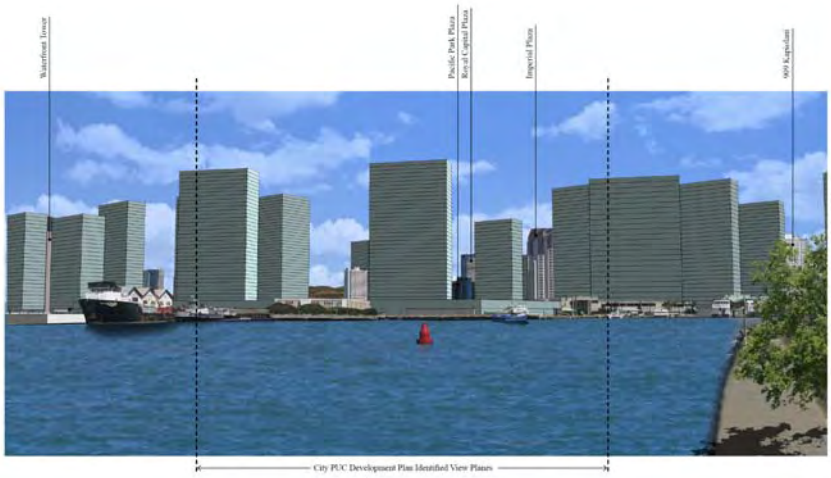
Alternative 3 shows a balance between development with waterfront premium and the preservation of Makai-Mauka views.

Figure 3-33 Kewalo Basin – Existing Condition



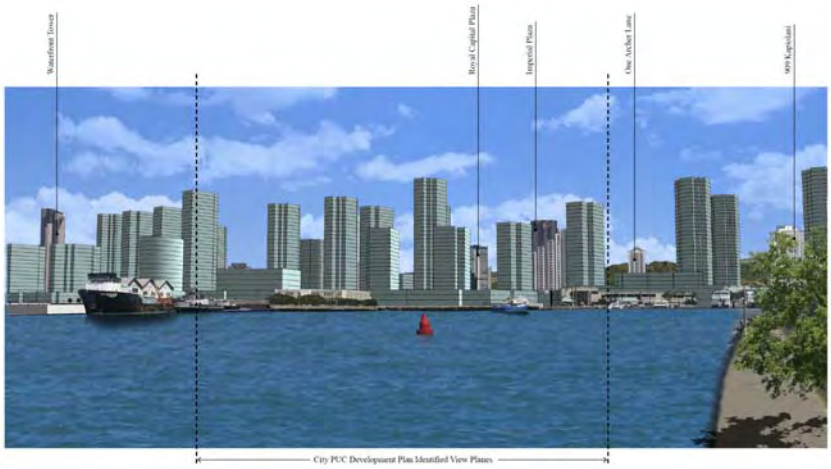
Source: EDAW 2008

Figure 3-34 Kewalo Basin – Alternative 1



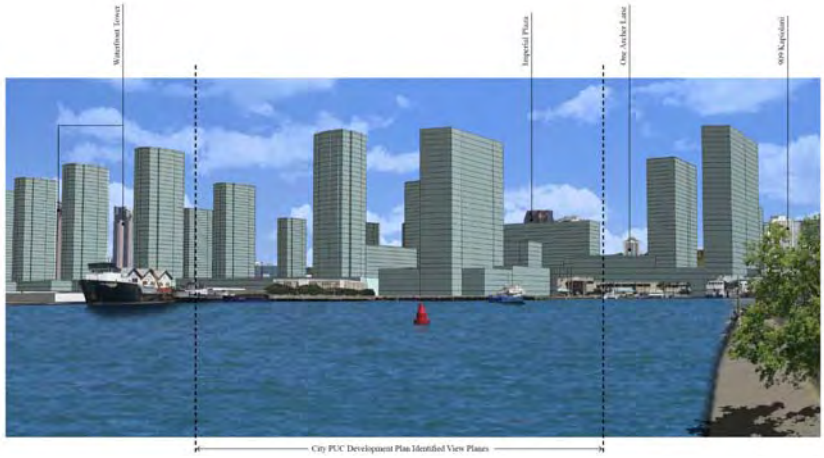
Source: EDAW 2008

Figure 3-35 Kewalo Basin – Alternative 2



Source: EDAW 2008

Figure 3-36 Kewalo Basin – Alternative 3



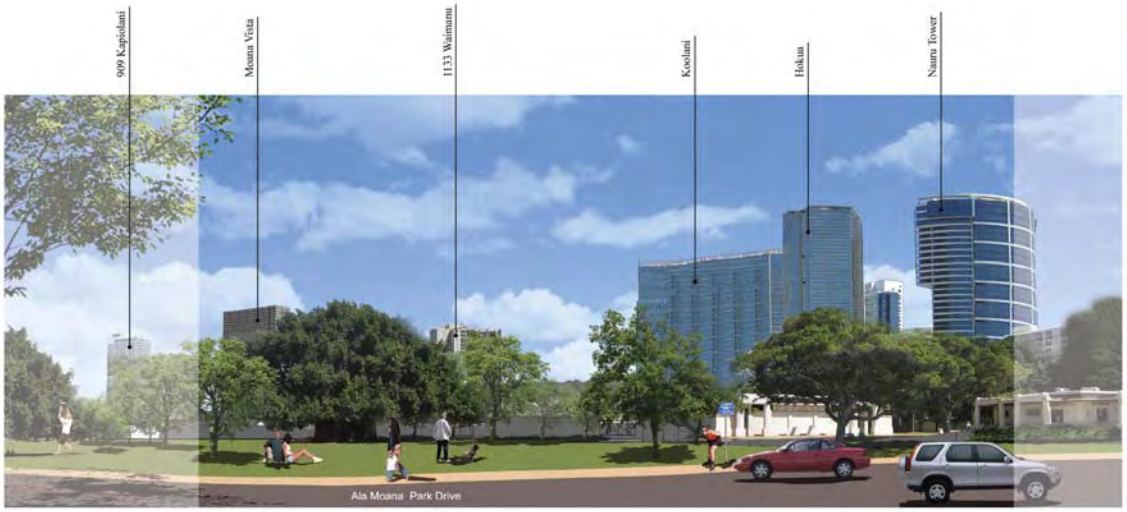
Source: EDAW 2008

Ala Moana Beach Park

Under the existing Mauka Area Plan, continued construction of high-rise towers would very likely block the views of the horizon and open sky from Ala Moana Beach Park (Figure 3-38).

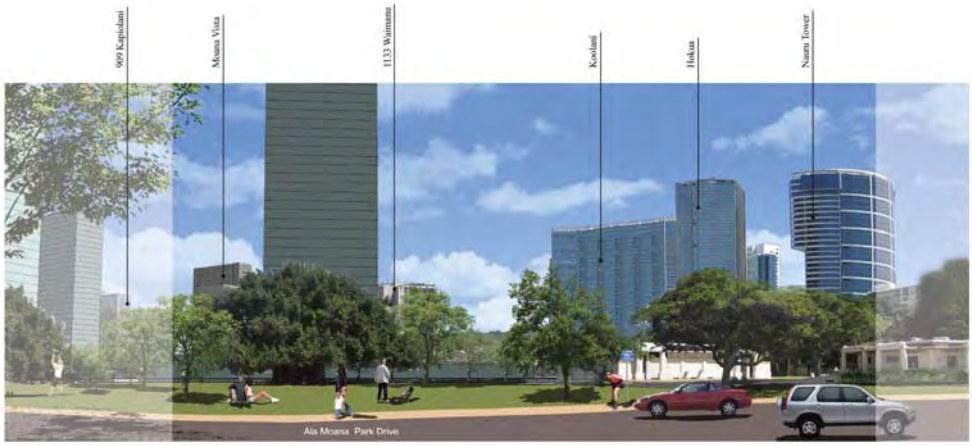
Under the Draft Mauka Area Plan, the massing of future development would be minimized to create more opportunities for the preservation of the view corridor. The mid-rise buildings along Ala Moana Boulevard would provide a smooth transition—from the urban edge to the open space Makai of Ala Moana Boulevard, thereby preserving more of the view corridor. The special design review district established in Alternative 3 would further ensure such a transition and preservation efforts.

Figure 3-37 Ala Moana Beach Park – Existing Condition



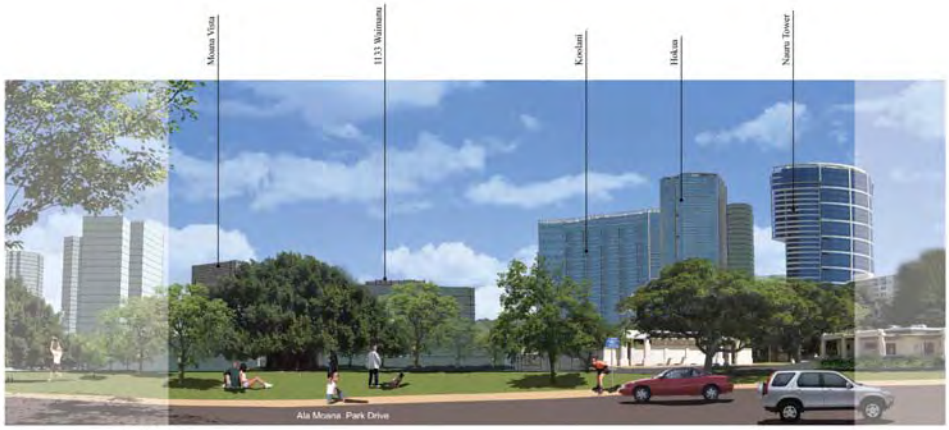
Source: EDAW 2008

Figure 3-38 Ala Moana Beach Park – Alternative 1



Source: EDAW 2008

Figure 3-39 Ala Moana Beach Park – Alternative 2



Source: EDAW 2008

Figure 3-40 Ala Moana Beach Park – Alternative 3

Source: EDAW 2008

Mother Waldron Neighborhood Park

Future development under the existing Mauka Area Plan's guidance would potentially add towers to the views of the downtown skyline (Figure 3-41). The orientation of the proposed 400 foot tower elements would likely create multiple towers close to and around the playground to capitalize on the public amenity provided by the playground.

Under the Draft Mauka Area Plan, smaller building footprints and mid-height feature would decrease the overall perceived mass of buildings, thus creating more views of the downtown skyline between buildings.

Alternative 3 introduces mid-height element that provide an alternative development scale with consideration of view preservation. It would help to add another dynamic layer to the existing downtown skyline.

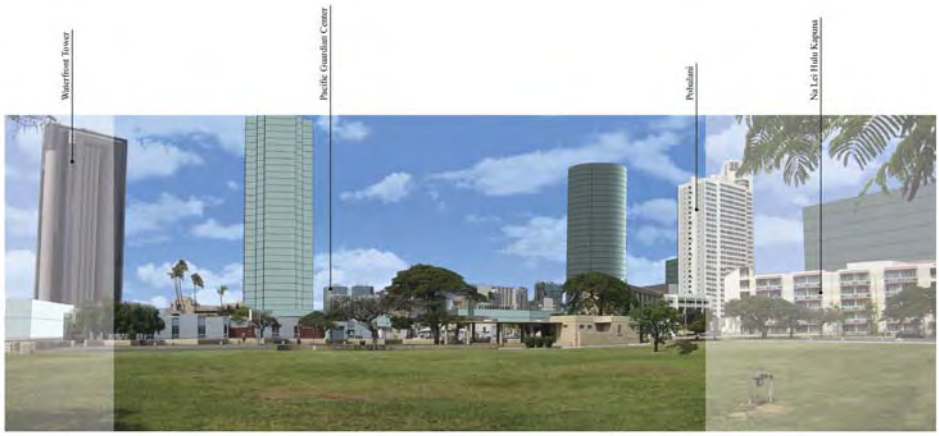
Figure 3-41 Mother Waldron Neighborhood Park – Existing Condition

Source: EDAW 2008

Figure 3-42 Mother Waldron Neighborhood Park – Alternative 1

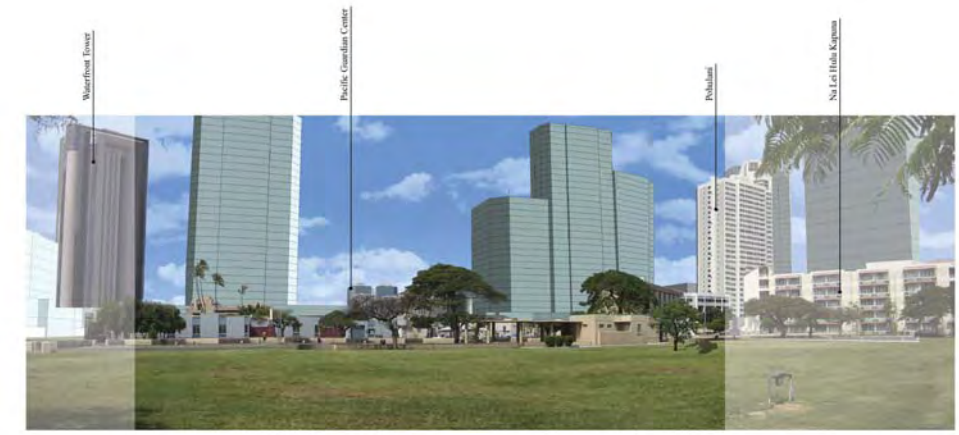
Source: EDAW 2008

Figure 3-43 Mother Waldron Neighborhood Park – Alternative 2



Source: EDAW 2008

Figure 3-44 Mother Waldron Neighborhood Park – Alternative 3



Source: EDAW 2008

McKinley High School Ewa View

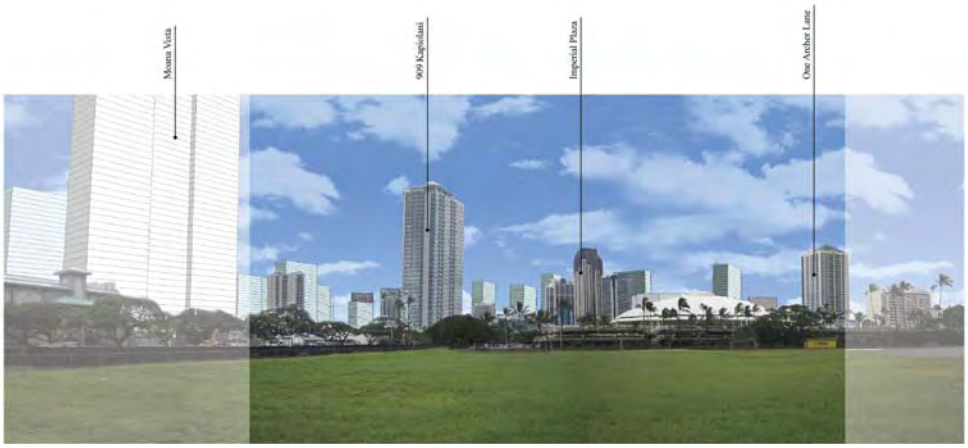
Future development under the existing Mauka Area Plan's guidance would likely result in towers with a large footprint oriented Ewa-Diamond Head. An example of such tower is the Moana Vista Tower (Figure 3-46). The tower elements, if developed as planned, would create a denser skyline with fewer through sightlines.

With Alternative 2 and 3, the difference would be in the orientation and visual quality of the towers to create a more varied skyline. Some of the more significant impacts are actually outside the view cone analysis to the more proximate towers.

Figure 3-45 McKinley High School Ewa View – Existing Condition

Source: EDAW 2008

Figure 3-46 McKinley High School Ewa View – Alternative 1

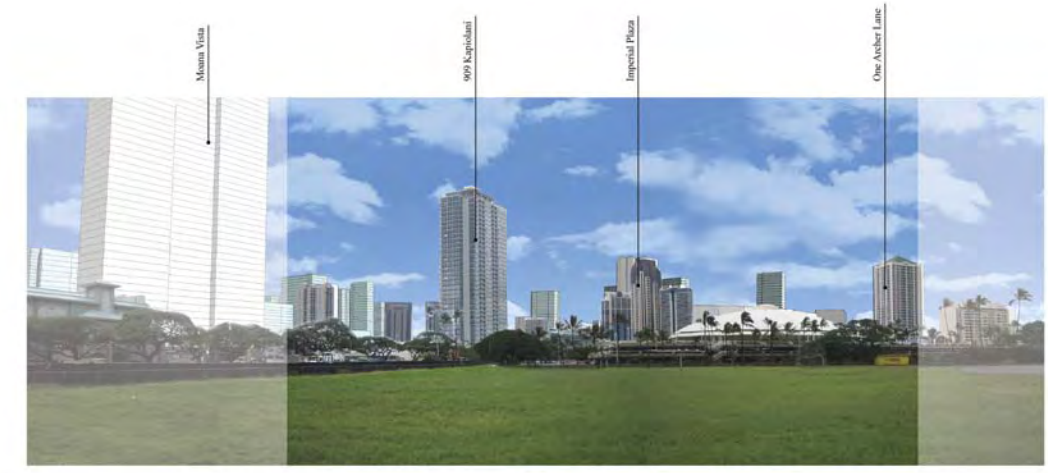


Source: EDAW 2008

Figure 3-47 McKinley High School Ewa View – Alternative 2

Source: EDAW 2008

Figure 3-48 McKinley High School Ewa View – Alternative 3



Source: EDAW 2008

McKinley High School Makai View

The existing Mauka Area Plan would add more towers creating the vertical picket fence effect, resulting in an abrupt transition from high-rise to open space (Figure 3-50). This continued style of development would also result in an increase of 400 foot tall tower, creating a visual wall effect blocking large portions of downtown skyline views.

The Draft Mauka Area Plan would be an improvement over the existing Mauka Area Plan by providing a mix of mid-rise and high-rise buildings that enriches the skyline by adding vertical and horizontal layers to lead to a more articulated urban image

Both the Draft Mauka Area Plan and the Third Alternative introduce the mid-rise element and establishes an emphasis on the street-front elements, thus providing a more dynamic skyline and a much more subtle scale transition between the tower elements and the pedestrian street level elements.

Figure 3-49 McKinley High School Makai View – Existing Condition

Source: EDAW 2008

Figure 3-50 McKinley High School Makai View – Alternative 1

Source: EDAW 2008

Figure 3-51 McKinley High School Makai View– Alternative 2

Source: EDAW 2008

Figure 3-52 McKinley High School Makai View – Alternative 3

Source: EDAW 2008

Summary

The strategies proposed by Alternative 2 and Alternative 3 would positively impact the visual resources in the Mauka Area. The recommended urban design modifications promote smaller tower footprints minimizing the wall effect seen in the Auahi neighborhood, minimize the obstruction of the urban skyline on the views of the Koolau Ranges, diversify the skyline with a mix of low-rise and high-rise tower elements, and minimize abrupt transitions from the skyline to urban open spaces. Compared to Alternative 2, Alternative 3 provides a more flexible development provision and reflected the concerns and comments received on the DEIS. Its intension was to preserve visual assets of the Mauka Area, while at the same time maximizing the opportunities to capture the view premiums for successful development.

3.7 Development Parameters

Key Parameters Comparison

The table below shows the major differences among the development provisions of the three alternatives:

	Alternative 1* **			**Alternative 2**	**Alternative 3**				
	Lot Size: 20,000 - 40,000 SF	**Lot Size: 40,000 - 80,000 SF**	**Lot Size: >80,000 SF**	**All Lots**	**Lot Size: <40,000 SF**	**Lot Size: 40,000-80,000 SF**	**Lot Size: 80,000-120,000 SF**	**Lot Size: 120,000-160,000 SF**	**Lot Size: > 160,000 SF**
Tower Floor Plate	≤ 8,000 SF	8,000 - 14,000 SF	14,000 - 16,000 SF	≤ 9,000 SF	≤ 8,000 SF	8,000 – 10,000 SF	10,000-12,000 SF	12,000-16,000 SF	16,000 SF
Max. Tower Height	100'*	200'*	400'*	400'	400' **				
Tower Setback	45'-60' from build-to line			50' from build-to line (Promenade St.) 20' from build-to line (Others)	50' from build-to line (Promenade St.) 20' from build-to line (Others)				
Mid-height Element Floor Plate				no restriction	50' setback from build-to line (Promenade St.)20' setback from build-to line (Others)				
Mid-height Element Height	N/A			80'-215'	160'-250' (Based on the distance to waterfront)				
FAR	1.5	2.5	3.5	3.5	3.5				

***** Under Alternative 1, the area bounded by Punchbowl, King, South and Ala Moana Blvd. where the max. building height shall be 65'.

** Additional height limits would be applied along identified view corridor and along portion of Ala Moana Boulevard.

*** Details for Alternative 1 were extrapolated from the Mauka Area Plan and current regulations.

Development Intensity

Alternative 2 and 3 increase the potential development intensity of those smaller lots in Mauka Area, thus providing the opportunity to build a more thriving urban Mauka Area. Though the tower footprint has been reduced to preserve more visual assets for the community in Alternative 2 and 3, the overall development potential would increase without compromising the urban design amenities.

3.8 Conclusion

The Urban Design Analysis Report should help provide guidelines for the future development of the Mauka Area. From an urban design perspective, the guiding principles and development provisions proposed in the Draft Mauka Area Plan and supplemental recommendations proposed above are not only good urban planning and design practice, but also effective measures to ensure a sustainable development approach in the community.

Appendix C

Transportation Analysis

KAKAAKO MAUKA AREA PLAN
SUPPLEMENTAL ENVIROMENTAL IMPACT STATEMENT
TRANSPORTATION ANALYSIS

Final Report

Prepared for:

Hawaii Community Development Authority

EDAW | AECOM

DMJM HARRIS | AECOM

April 14, 2009

Kakaako Mauka Area Plan
Supplemental Environmental Impact Statement
Transportation Analysis

Final Report

April 14, 2009

Submitted to:

Hawaii Community Development Authority

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LIST OF ABBREVIATIONS AND ACRONYMS

AVO	average vehicle occupancy
AWSC	all-way stop-controlled
CBD	central business district
DTS	Department of Transportation Services of the City and County of Honolulu
HART	Honolulu Area Rapid Transit
HBW	home-based work
HCDA	Hawaii Community Development Authority
HCM	Highway Capacity Manual
HDOT	Hawaii Department of Transportation
HOV	high-occupancy vehicle
ITE	Institute of Transportation Engineers
JTW	Journey to Work
LOS	level of service
MOE	measure of effectiveness
MOS	Minimum Operable Segment
MLP	maximum load point
OMPO	Oahu Metropolitan Planning Organization
ORTP	Oahu Regional Transportation Plan
OTS	Oahu Transit Services
SEIS	Supplemental Environmental Impact Statement
SFMTA	San Francisco Municipal Transportation Agency
SOV	single-occupancy vehicle
UH	University of Hawaii
TAZ	traffic analysis zone
TDM	transportation demand management / travel demand management
TOD	transit-oriented development
TWSC	two-way stop-controlled

Ave	Avenue
Blvd	Boulevard
cap.	capacity
cap. util.	capacity utilization
Ctr.	Center
Cum.	Cumulative
entrmt.	entertainment
mph	miles per hour
pax	passengers
pphpd	passengers per hour per direction
rid.	ridership
St	Street
v/c	volume-to-capacity

1.0 EXECUTIVE SUMMARY

The original Mauka Area Plan was drafted in 1982 to serve as a set of guidelines for future development in the Mauka Area. The plan encompasses and addresses future change in all aspects of the neighborhood, including land use, transportation, urban design, historic and cultural resources, open space, and community. The ultimate goal of the plan is to develop the Mauka Area into the most livable community in Hawaii and serve as a role model for smart urban planning.

In 2007, the Hawaii Community Development Authority (HCDA) drafted a set of revisions to the Mauka Area Plan that attempt to adapt the most current urban design and planning principles to the achievement of the plan goals. The Draft Mauka Area Plan integrates the concepts of "urban village," smart growth, and transit-oriented development (TOD) into the ultimate vision for the Mauka Area.

This transportation analysis assesses the transportation-related impacts of adoption of the Draft Mauka Area Plan and addresses the travel demand from future developments, as well as the following transportation-related elements outlined in the plan:

- Urban design that is pedestrian-friendly and encourages travel by foot, including improvements to pedestrian facilities such as sidewalks and crosswalks and better connections across major thoroughfares;
- A multi-modal transportation network that recognizes the needs of all travelers (residents, workers, and visitors) and all travel modes (automobile, transit, bicycle, and pedestrian);
- TOD centered around stations on a fixed guideway system; and,
- A street grid that is better connected and provides alternative routes for travelers.

1.1 METHODOLOGY

In addition to Existing Conditions, the transportation analysis evaluates Cumulative Conditions (build-out conditions in year 2030) under both the Existing Mauka Area Plan and the Draft Mauka Area Plan. The No Action Alternative assumes that the Existing Mauka Area Plan remains in effect, while the Preferred Alternative assumes that the Draft Mauka Area Plan is adopted.

Land use projections were obtained from the 2002 Oahu Metropolitan Planning Organization (OMPO) travel demand forecast model and a survey of parcels available for potential development, compiled by HCDA. Trip generation rates were obtained from the Institute of Transportation Engineers' (ITE) *Trip Generation (Seventh Edition)* and combined with auto-vehicle occupancy (AVO) data from the OMPO model. Mode split was obtained from the 2000 U.S. Census Journey to Work data and adjusted based on OMPO model projections. Trip distribution was developed using OMPO model traffic volumes. Any changes to the roadway or transit networks under each alternative were also considered during the evaluation.

Traffic conditions were evaluated at intersections using the 2000 *Highway Capacity Manual* (HCM) methodology, and a micro-simulation analysis was conducted for key roadway segments in the Mauka Area. Any expected changes to the roadway networks under each alternative were also included during the analysis.

Transit conditions were evaluated using a screenline methodology with data obtained from TheBus and the Department of Transportation Services (DTS) of the City and County of Honolulu. Expected transit improvements, including the future fixed guideway system, were also included in the analysis.

Bicycle and pedestrian conditions were evaluated qualitatively based on observations of existing operations and the bicycle and pedestrian elements of each plan.

When evaluating the significance of impacts under the Draft Mauka Area Plan, the Preferred Alternative is compared directly to the No Action Alternative. In general, adoption of the Draft Mauka Area Plan would result in a significant impact if traffic operations at any intersection under the Preferred Alternative would perform worse than under the No Action Alternative. Volume-to-capacity (v/c) ratios were used to perform this determination. Impacts which were identified as significant were then considered for mitigation.

1.2 PLAN IMPACTS AND MITIGATION MEASURES

Based on the results of the analysis of Cumulative Conditions traffic operations under the Preferred Alternative, it is recommended that the existing one-way couplet between Pensacola Street and Piikoi Street remain unchanged. Converting both streets to two-way operation would significantly impact traffic circulation in the area, particularly to and from Interstate H-1.

It is also recommended that the two intersections of Halekauwila Street / Cooke Street and Pohukaina Street / Cooke Street be signalized, as these intersections are expected to handle more traffic with the closure of several smaller streets and improved east-west roadway connections through the Mauka Area.

The Draft Mauka Area Plan would also generate significant and unavoidable impacts at the intersections of Ward Avenue / Halekauwila Street and Ward Avenue / Queen Street. Due to constraints on geometry modifications, mitigation of plan-generated impacts at these intersections is infeasible.

The Draft Mauka Area Plan is not expected to result in any significant impacts to transit, bicycle, or pedestrian conditions, as adoption of the Draft Mauka Area Plan would result in more preferable conditions.

1.3 MODE SHIFT

Mode shift refers to the percentage of travelers using a given mode of travel, such as automobile, transit, bicycle, or pedestrian travel. Because of the difficulty in estimating the effect of the plan's urban design and TOD elements on travel behavior in the Mauka Area—particularly, mode split—the analysis has conservatively assumed no changes, with a future-year mode split of 76.9 percent auto, 12.8 percent transit, 2.3 percent

bicycle, and 8.0 percent walk. However, the mode split in comparable neighborhoods in other cities with similar characteristics indicates that much lower auto mode share and much higher transit, bicycle, and walk mode shares could reasonably be expected. In order to fully realize the benefits of the urban design and TOD elements proposed in the Draft Mauka Area Plan, it is recommended that a set of design standards be drafted based on effective TOD projects in other cities. Developments that meet these design standards should then be expedited through the development approval process.

It is also recommended that transportation demand management (TDM) measures be implemented in conjunction with TOD in order to fully realize the potential for mode shift. These TDM measures could include transit pass subsidies, carpooling and carsharing programs, improvements to transit service, or congestion pricing and variable tolls. The most effective solution to induce mode shift would employ several of these measures in conjunction.

2.0 INTRODUCTION

This transportation analysis for the Supplemental Environmental Impact Statement (SEIS) has been prepared to assess the potential transportation-related impacts associated with the 2007 proposed revisions to the Kakaako Mauka Area Plan adopted in 1982. The analysis addresses the following transportation topics:

- Traffic conditions;
- Transit conditions;
- Pedestrian conditions;
- Bicycle conditions; and,
- On-street parking conditions.

The analysis also addresses opportunities for changing travel behavior in the Mauka Area through urban design principles and transportation policy.

2.1 PLAN AREA

The Kakaako District is bordered by Downtown Honolulu and Honolulu Harbor to the west and the Ala Moana Shopping Center to the east, and consists of the Mauka and Makai Areas, as illustrated in **Figure 1**.

The Mauka Area, bounded by King Street to the north (mauka), Ala Moana Boulevard to the south (makai), Piikoi Street to the east (Diamond Head), and Punchbowl Street to the west (Ewa), is an emerging mixed-use neighborhood consisting of commercial (office and retail), residential, and significant light industrial land uses. In addition to condominium and office towers and retail centers, warehouses are still present throughout much of the Mauka Area, a reminder of Kakaako's primarily industrial past.

The Makai Area is located adjacent to and directly south of the Mauka Area, bounded by Ala Moana Boulevard to the north, the harbor to the south, Ala Moana Beach Park to the east, and Forrest Avenue to the west. Also included in the Makai Area is the parcel bounded by Route 92 (Nimitz Highway) to the north, Aloha Tower Drive to the south, Richards Street to the east, and Bishop Street to the west. The Makai Area consists of primarily recreational uses—including Kewalo Basin and Kakaako Waterfront Park—interspersed with some industrial uses.

2.2 PLAN DESCRIPTION

In 1982, the Hawaii Community Development Authority (HCDA) adopted the Kakaako Community Development District Plan, an attempt to redevelop the Mauka Area into a mixed-use neighborhood. A subsequent plan for the Makai Area followed in 1983.

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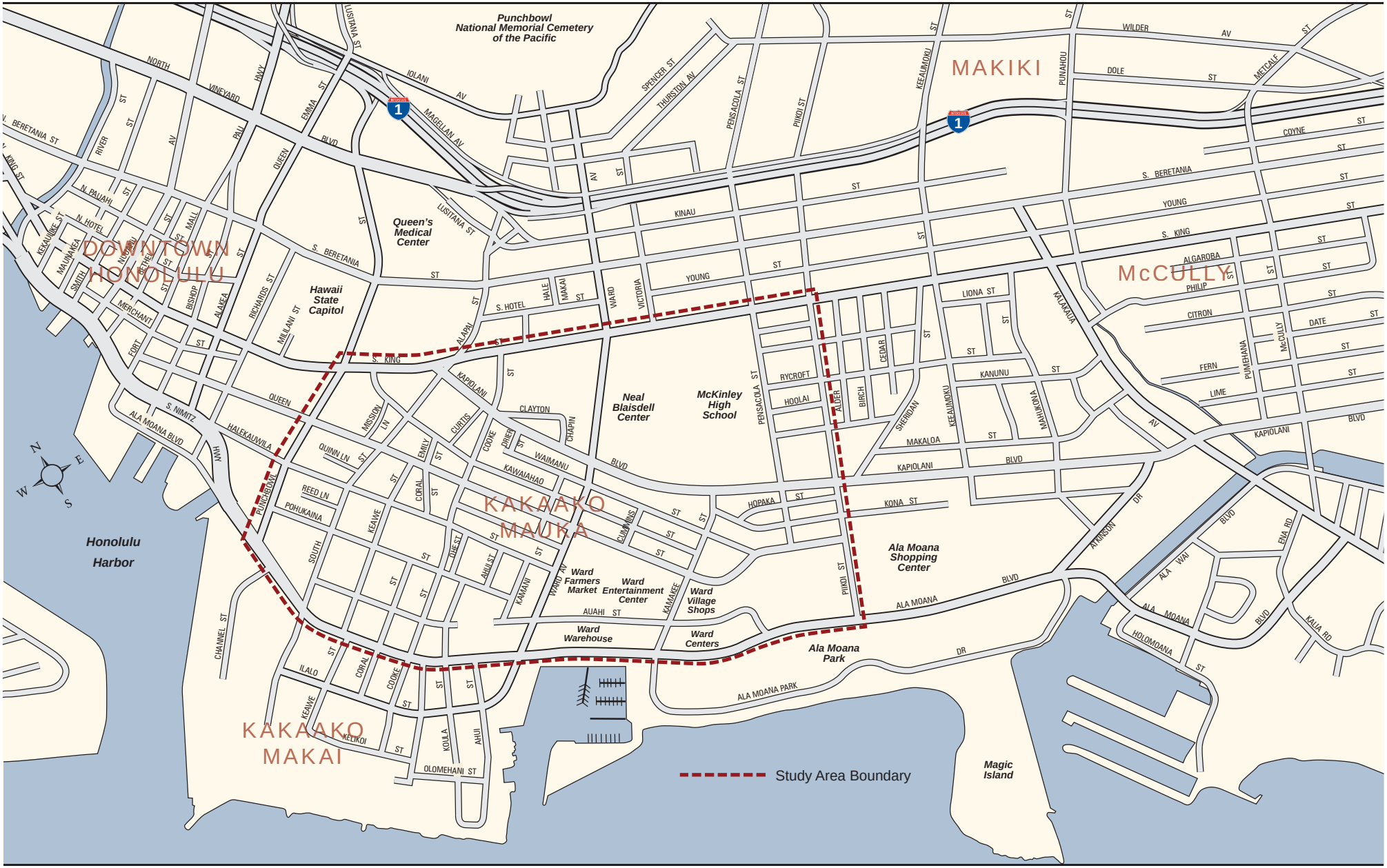

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KAKAAKO MAUKA AREA PLAN SEIS

Figure 1

PLAN AREA

In 2005, the HCDA commissioned a review of the Mauka Area Plan and Rules, including a set of proposed revisions. The analysis presented in this document evaluates the impact of these revisions on the transportation network and identifies mitigation measures for impacts which are considered significant.

Two alternatives were considered in the analysis: a No Action Alternative, which assumes no changes to the Existing Mauka Area Plan dated from 1982; and a Preferred Alternative, which assumes adoption of the revisions proposed under the Draft Mauka Area Plan.

2.3 STUDY SCOPE AND APPROACH

The following three scenarios were evaluated to identify the potential transportation impacts of the Draft Mauka Area Plan:

- Existing Conditions;
- Cumulative No Action Alternative Conditions; and,
- Cumulative Preferred Alternative Conditions.

The term “Cumulative” herein refers to build-out conditions in year 2030. It should be noted that the Cumulative No Action Alternative assumes that the Existing Mauka Area Plan adopted in 1982 remains in place and none of the revisions proposed in 2007 are adopted.

For the purpose of this transportation study, directionality is expressed relative to the compass in place of commonly used directionality in Hawaii: north in place of mauka; south in place of makai; east in place of Diamond Head; and west in place of Ewa. Ala Moana Boulevard, Kapiolani Boulevard, and parallel roadways are assumed to operate in the east-west (Diamond Head-Ewa) orientation; Ward Avenue, Piikoi Street, and parallel roadways are assumed to operate in the north-south (mauka-makai) orientation.

The study area is bounded by Kapiolani Boulevard to the north, Ala Moana Boulevard to the south, Piikoi Street to the east, and Punchbowl Street to the west. The portions of the Mauka Area north of Kapiolani Boulevard and west of South Street were omitted from the analysis because these areas are not expected to experience appreciable development in the future.

For automobile traffic, the weekday AM (7:00 AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) peak period are usually selected for consideration, as other times of the day (midday, evening) and other times of the week (weekend) generally experience much less congestion. For intersection level of service (LOS) calculations, the peak hour of the peak period is selected for analysis. For instances of the term “peak hour” or “peak period” hereafter in this study, it is understood that weekday conditions are implied.

AM and PM peak hour intersection LOS was analyzed for the following key intersections:

1. Kapiolani Boulevard / South Street / King Street (*signalized*);
2. Kapiolani Boulevard / Ward Avenue (*signalized*);
3. Kapiolani Boulevard / Kamakee Street (*signalized*);
4. Kapiolani Boulevard / Pensacola Street (*signalized*);
5. Kapiolani Boulevard / Piikoi Street (*signalized*);
6. Ala Moana Boulevard / South Street (*signalized*);
7. Ala Moana Boulevard / Keawe Street (*signalized*);
8. Ala Moana Boulevard / Coral Street (*signalized*);
9. Ala Moana Boulevard / Cooke Street (*signalized*);
10. Ala Moana Boulevard / Ward Avenue (*signalized*);
11. Ala Moana Boulevard / Kewalo Basin (*signalized*);
12. Ala Moana Boulevard / Kamakee Street (*signalized*);
13. Ala Moana Boulevard / Queen Street (*signalized*);
14. Ala Moana Boulevard / Piikoi Street (*signalized*);
15. Ward Avenue / Auahi Street (*signalized*);
16. Ward Avenue / Halekauwila Street (*signalized*);
17. Ward Avenue / Queen Street (*signalized*);
18. Piikoi Street / Ala Moana Shopping Center / Hawaiki Tower (*signalized*);
19. Piikoi Street / Waimanu Street (*signalized*);
20. Piikoi Street / Kona Street (*signalized*);
21. Pensacola Street / Waimanu Street (*signalized*);
22. Kamakee Street / Queen Street (*all-way stop-controlled*);
23. Kamakee Street / Auahi Street (*signalized*);
24. Auahi Street / Pedestrian Crossing (Ward Entertainment Center) (*signalized*);
25. Auahi Street / Pedestrian Crossing (Ward Warehouse / Farmers Market) (*signalized*);
26. South Street / Pohukaina Street (*signalized*);
27. South Street / Halekauwila Street (*signalized*);
28. South Street / Queen Street (*signalized*);
29. Queen Street / Emily Street (*signalized*);
30. Queen Street / Cooke Street (*signalized*);
31. Halekauwila Street / Cooke Street (*all-way stop-controlled*);
32. Pohukaina Street / Cooke Street (*all-way stop-controlled*); and
33. Auahi Street / Cooke Street (*two-way stop-controlled*).

The location of the study intersections is shown in **Figure 2**.

Data collection—including intersection turning movement counts, lane configuration, parking restrictions, and signal timing information from the Department of Transportation Services of the City and County of Honolulu (DTS)—was conducted by Austin, Tsutsumi, & Associates, Inc.

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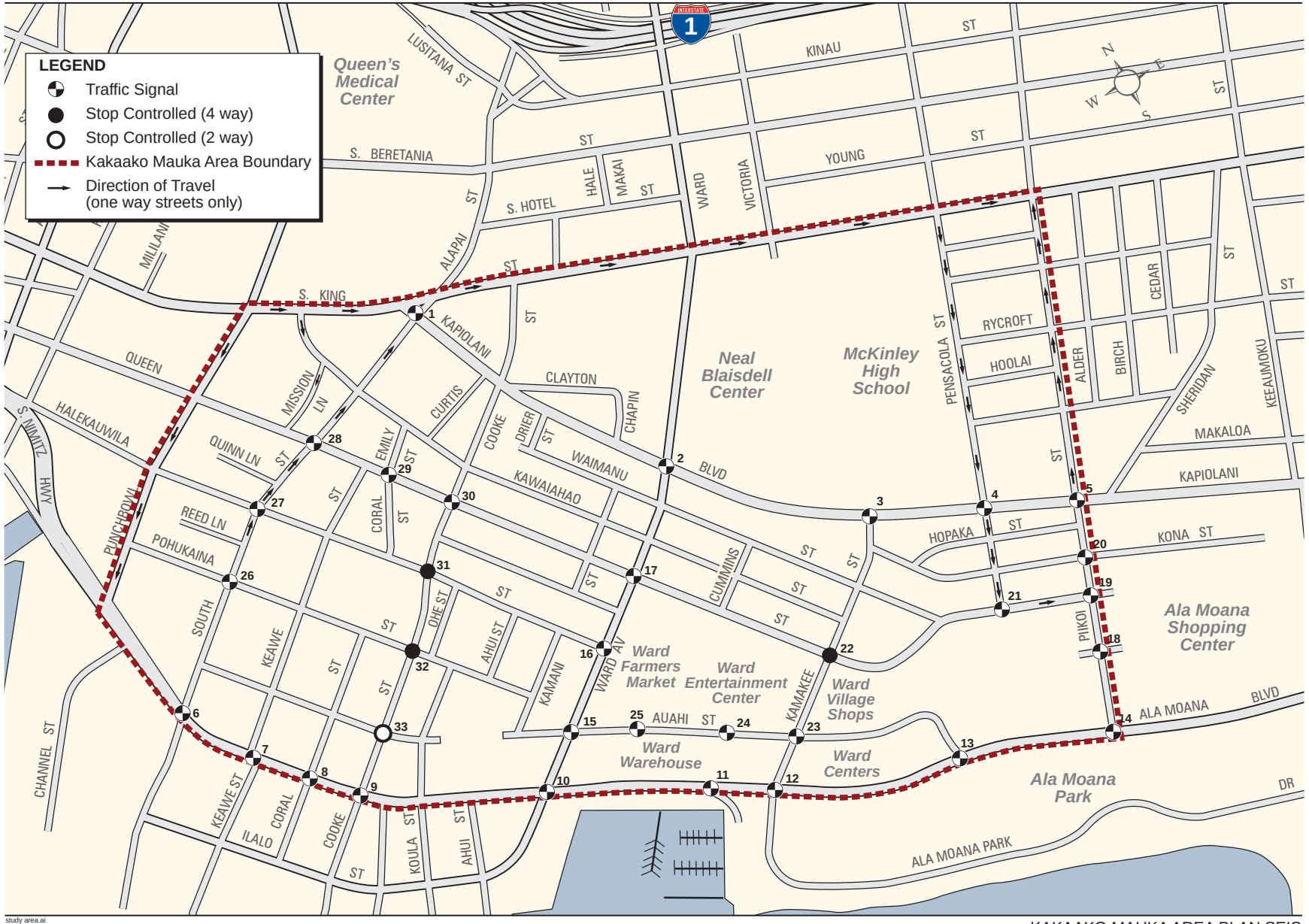


study area.ai

KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 2

STUDY AREA AND STUDY INTERSECTIONS

After an evaluation of Existing Conditions traffic operations, Cumulative Conditions traffic operations were evaluated by estimating year 2030 build-out conditions traffic volumes due to changes in land uses and incorporating expected changes to the roadway network under each alternative.

A micro-simulation was also conducted along roadway segments in the Mauka Area to determine average speed and travel time for all three scenarios. The following key roadways were selected for micro-simulation:

1. Kapiolani Boulevard;
2. Queen Street;
3. Ala Moana Boulevard;
4. Piikoi Street;
5. Kamakee Street;
6. Ward Avenue;
7. Cooke Street; and
8. South Street.

To evaluate the Draft Mauka Area Plan's impact on transit operations in the Mauka Area, a screenline analysis was conducted using existing ridership and capacity for transit services in the Mauka Area. Cumulative Conditions transit operations were evaluated based on expected changes to transit service and ridership behavior.

A qualitative analysis of pedestrian and bicycle operations is also presented, based primarily on visual observations of existing pedestrian and bicycle conditions in the Mauka Area and expected future pedestrian and bicycle traffic. Expected changes to the pedestrian and bicycle network under each alternative were also incorporated into the evaluation of Cumulative Conditions.

A qualitative analysis of existing on-street parking conditions in the Mauka Area was conducted based on visual observations of on-street parking facilities.

Based on the results of the Existing Conditions and Cumulative Conditions analyses, a set of mitigation measures was drafted for the Preferred Alternative. No mitigation measures were drafted for the No Action Alternative, as only the Draft Mauka Area Plan is under consideration for mitigation.

The primary purpose of the study is to estimate the expected future transportation impacts of the Draft Mauka Area Plan, including changes in the intensity of development and changes to the transportation network such as roadways and transit facilities. The Existing Mauka Area Plan is also included in the analysis to provide a basis for comparison when evaluating the significance of impacts generated by the Draft Mauka Area Plan and to help identify possible mitigation measures.

3.0 EXISTING CONDITIONS

This chapter provides a description of the existing transportation conditions within the plan area. Included in this chapter are descriptions of the existing roadway and transit networks, and documentation of the existing traffic, transit, parking, pedestrian, and bicycle conditions.

3.1 ROADWAY NETWORK

The Roadway Plan component of the Existing Mauka Area Plan uses two categories for classifying roadways:

- *Major Street:* Arterial or collector streets designed for the movement of traffic within and through the district. Major streets carry moderate to high traffic volumes.

- *Local Street:* Roadways primarily used for local traffic, providing access to adjacent properties. Local streets carry low traffic volumes and are not designed to handle the through traffic typically observed on a Major Street.

Located adjacent to Honolulu's primary central business district (CBD), the Mauka Area is well-served by several regional roadways, including Interstate H-1 (H-1) and major arterials such as Ala Moana Boulevard. Additional north-south arterials provide access between the area and H-1. Because of heavy traffic volumes into and out of the area, many of these secondary arterials operate as one-way couplets.

Interstate H-1 is the primary interstate highway of Hawaii, connecting east-west traffic in Honolulu County. It runs between Kapolei in the west (where it becomes Route 73) and Kahala in the east (where it becomes Route 72) and provides direct access to Waipahu, Pearl City, Pearl Harbor, Honolulu International Airport, and Downtown Honolulu.

Ala Moana Boulevard, designated as Route 92, is a six-lane east-west arterial (Major Street) running through the south part of the Mauka Area and serving as the primary regional access for the area. It generally operates with three lanes in each direction and connects Kalakaua Avenue near Waikiki in the east with Downtown Honolulu. West of Downtown Honolulu, it becomes the Nimitz Highway until the junction with H-1. Traffic is separated by a raised, landscaped median in most locations, and most of the major intersections are signalized with left turn pockets. No on-street parking is provided along Ala Moana Boulevard during the weekday AM and PM peak periods.

Kapiolani Boulevard is a six-lane east-west arterial (Major Street) running through the north part of the Mauka Area, connecting Kakaako in the west with Kahapulu in the east. At South Street in Kakaako, Kapiolani merges with South King Street, which provides access to Downtown Honolulu and H-1 at Middle Street. In Kapahulu, Kapiolani Boulevard becomes Waialae Avenue at H-1 near the University of Hawaii (UH) Manoa campus, offering access further east to the Kahala area. No on-street parking is provided along Kapiolani Boulevard during the weekday AM and PM peak periods.

Ward Avenue is a four-lane, two-way north-south collector (Major Street) running between Ala Moana Boulevard and Kewalo Basin north to Prospect Street, just south of Punchbowl National Cemetery. North of H-1, it operates primarily as a two-lane residential roadway, expanding to a four-lane arterial south of H-1 to the Makai Area. Left turn pockets are provided at most intersections in the Mauka Area. On-street parking is provided on both sides of the street, with curb cuts for driveways serving various commercial uses lining the street.

South Street is a north-south collector (Major Street) in the Mauka Area connecting Ala Moana Boulevard in the south with South King Street—herein referred to collectively as King Street—in the north. North of Pohukaina Street, South Street operates with three to five lanes in a one-way northbound couplet with Punchbowl Street one block to the west. Between 3:30 PM and 5:30 PM, parking is restricted on both sides of this segment of South Street and it operates with five lanes of traffic. North of King Street, South Street becomes Alapai Street, offering access to South Beretania Street. South of Pohukaina Street, South Street operates with two lanes in each direction to Ala Moana Boulevard, where it becomes Forrest Avenue, providing access to warehouses and industrial uses along the Makai Area waterfront.

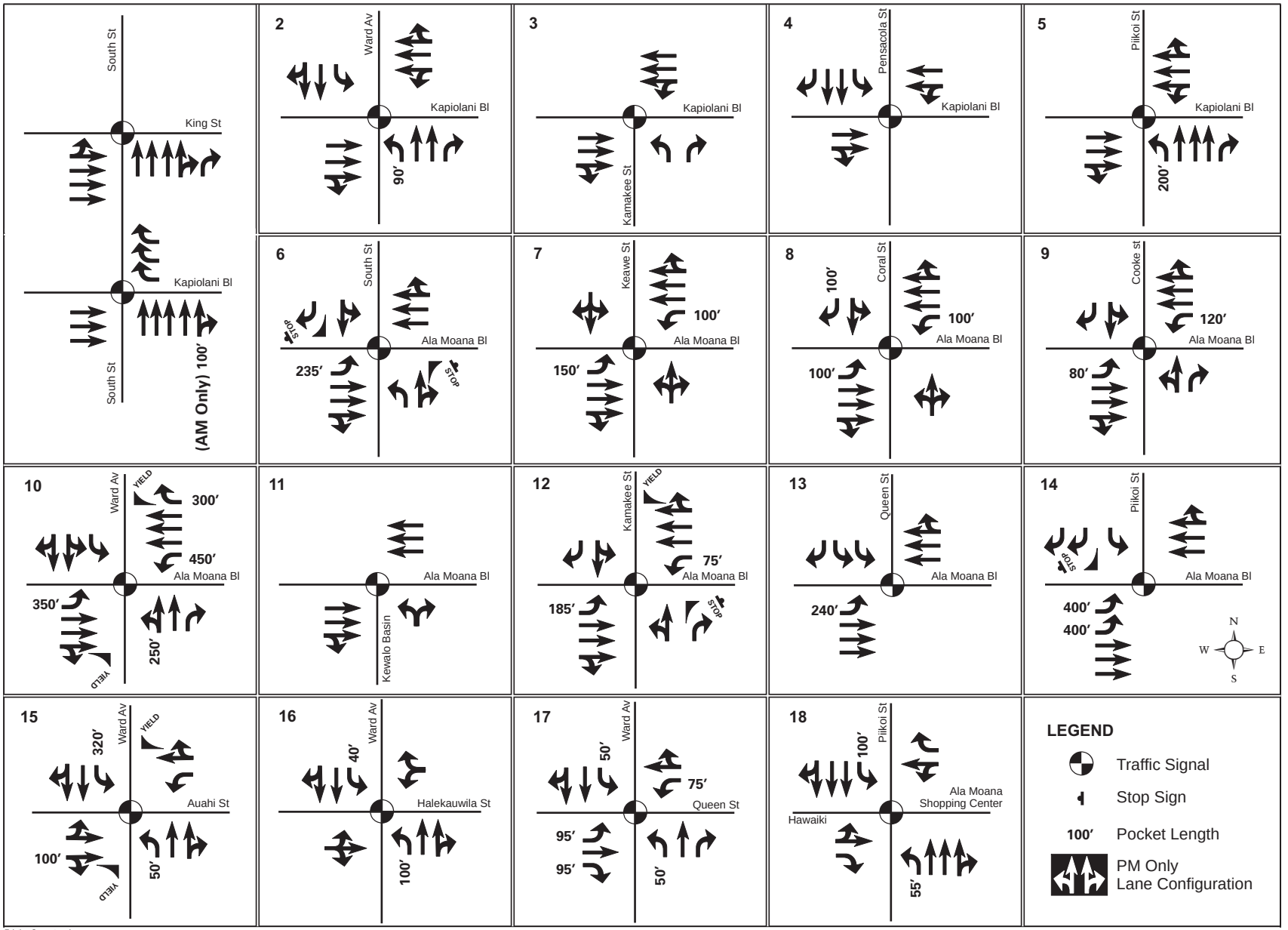
Piikoi Street is a north-south arterial (Major Street) connecting Ala Moana Boulevard in the south with H-1 and Wilder Avenue. Between Ala Moana Boulevard and Kapiolani Boulevard, Piikoi Street operates in two directions, with two to three lanes in the southbound direction and three to four lanes in the northbound direction. This segment of Piikoi Street also services the primary driveway entrance to the Ala Moana Shopping Center at Waimanu Street, in addition to providing access to various residential towers in the area. Left turn pockets are provided at most intersections on this stretch of Piikoi Street. No on-street parking is provided during the weekday AM and PM peak periods and traffic is separated by a raised, landscaped median.

North of Kapiolani Boulevard, Piikoi Street turns into a one-way, five-lane northbound roadway operating in a couplet with Pensacola Street one block to the west. This lane configuration continues until Lunalillo Street just north of H-1, where Piikoi Street becomes a primarily residential roadway. Limited on-street parking is provided during the weekday AM and PM peak periods on both sides of the street.

Pensacola Street is a north-south arterial (Major Street) connecting Waimanu Street in the south with residential neighborhoods north in the hills near Punchbowl National Cemetery. South of H-1, Pensacola Street operates as a four- to five-lane southbound roadway in a couplet with Piikoi Street, with on-street parking provided during the weekday AM and PM peak periods on the west side of the street.

In addition to the primary roadways listed above, other secondary roadways such as Queen Street, Auahi Street, Cooke Street, and Kamakee Street are classified as Major Streets. Local Streets in the Mauka Area include Kona Street, Waimanu Street, Kawaiahao Street, and Ilaniwai Street.

Figure 3 presents the existing lane configuration and traffic control at each of the study intersections for the AM and PM peak hours.



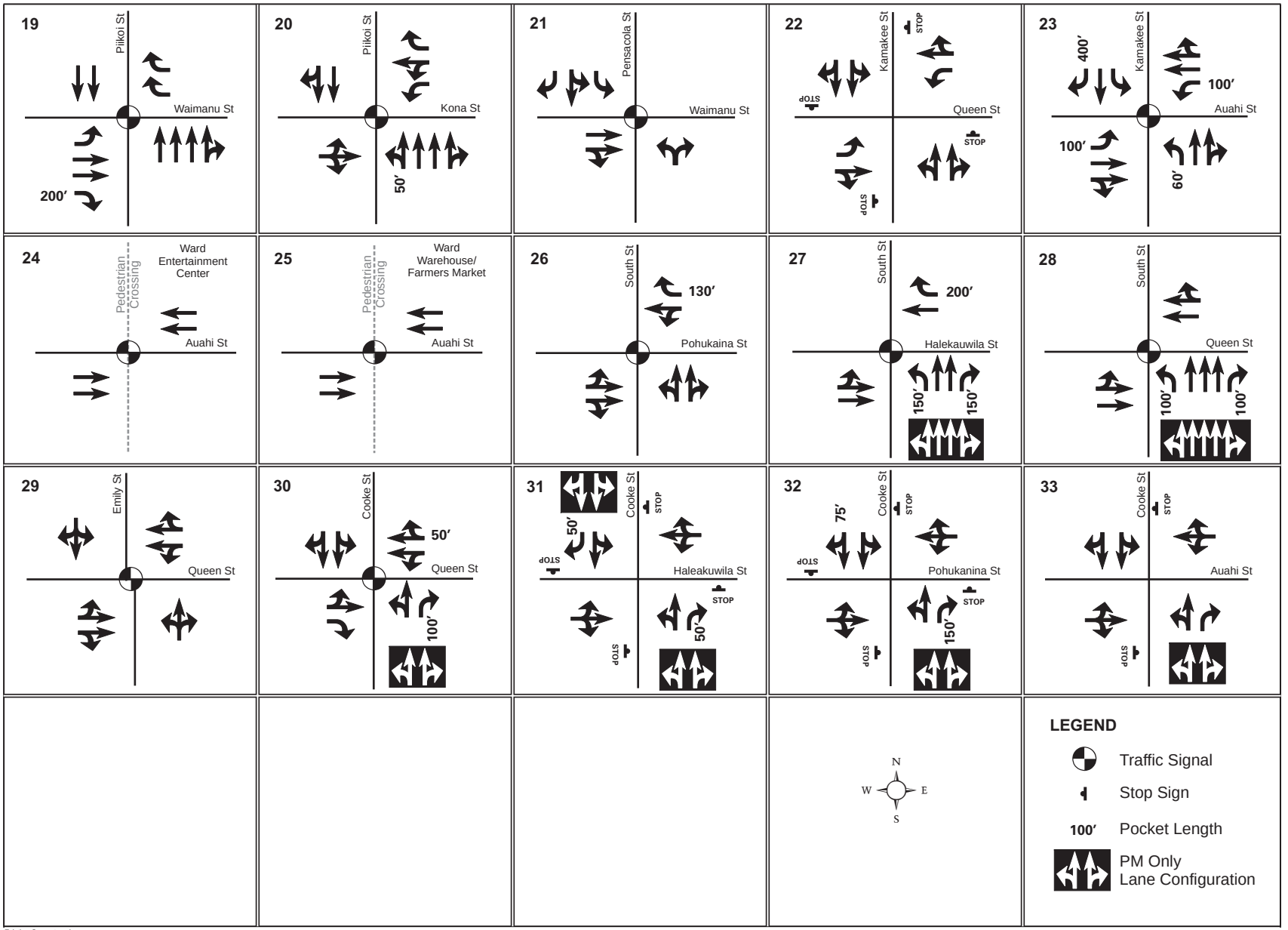
Existing Geometry.cdr

KAKA AKO MAUKA AREA PLAN SEIS

Source: Austin, Tsutsumi & Associates, Inc., 2008

Figure 3a

EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL



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KAKA AKO MAUKA AREA PLAN SEIS

Source: Austin, Tsutsumi & Associates, Inc., 2008

Figure 3b

EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL

3.2 INTERSECTION OPERATING CONDITIONS

Existing intersection operating conditions were evaluated for both the AM and PM peak hours. Intersection turning movement counts were conducted at all study intersections on Tuesdays, Wednesdays, and Thursdays in October 2007.

The operation of intersections can be analyzed using the level of service (LOS) methodology. The LOS methodology is a qualitative description of the performance of an intersection based on the average delay per vehicle. Intersection levels of service range from LOS A, which indicates free flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays. Most large cities consider LOS A through LOS E acceptable and LOS F unacceptable in urban areas or CBDs such as the Mauka Area. The LOS methodology is summarized in **Table 1**.

Table 1: Intersection Level of Service Methodology

LOS	Description	Delay (seconds/vehicle)	
		Signalized Intersections	Unsignalized Intersections
A	Little or no delay	≤ 10.0	≤ 10.0
B	Short traffic delay	> 10.0 and ≤ 20.0	> 10.0 and ≤ 15.0
C	Average traffic delay	> 20.0 and ≤ 35.0	> 15.0 and ≤ 25.0
D	Long traffic delay	> 35.0 and ≤ 55.0	> 25.0 and ≤ 35.0
E	Very long traffic delay	> 55.0 and ≤ 80.0	> 35.0 and ≤ 50.0
F	Extreme traffic delay	> 80.0	> 50.0

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

The 33 study intersections were evaluated using the 2000 *Highway Capacity Manual* (HCM) methodology.[(1)] For signalized intersections, this methodology determines the capacity of each lane group approaching the intersection. The LOS is then based on average delay (in seconds per vehicle) for the various movements within the intersection. A combined weighted average delay and LOS are presented for the intersection. For two-way stop-controlled (TWSC) intersections, the intersection LOS is given as the LOS for the worst intersection approach. For all-way stop-controlled (AWSC) intersections, delay is given as an average of all four approaches.

(1) As part of the HCM methodology, adjustments are typically made to the capacity of each intersection to account for various factors that reduce the ability of the streets to accommodate vehicles (such as the number of pedestrians, vehicle types, lane widths, grades, on-street parking, and queues). These adjustments are performed to ensure that the LOS analysis results reflect the operating conditions observed in the field.

There are several common software packages in use which can be used to evaluate traffic operations, including Synchro, published by Trafficware, Ltd., and Traffix, published by Dowling Associates, Inc.. Synchro plus SimTraffic was chosen for this analysis for its flexibility, presentation, and basic micro-simulation capabilities, as well as its consistency with the 2000 HCM methodology as required by DTS.

Table 2 presents the results of the intersection LOS analysis for the existing weekday AM and PM peak hour conditions. Due to limitations in the HCM methodology, delay values over 80.0 seconds are typically considered unreliable. In these cases, the delay is simply given as "greater than 80.0" (>80.0), with the understanding that the intersection is operating poorly. For unsignalized intersections, delay values over 50.0 seconds are considered unreliable and delay is given as "greater than 50.0" (>50.0).

Figure 4 and **Figure 5** summarize the existing weekday AM peak hour LOS at each of the intersections and show movements operating at LOS E or LOS F. **Figure 6** and **Figure 7** summarize the same information for the weekday PM peak hour.

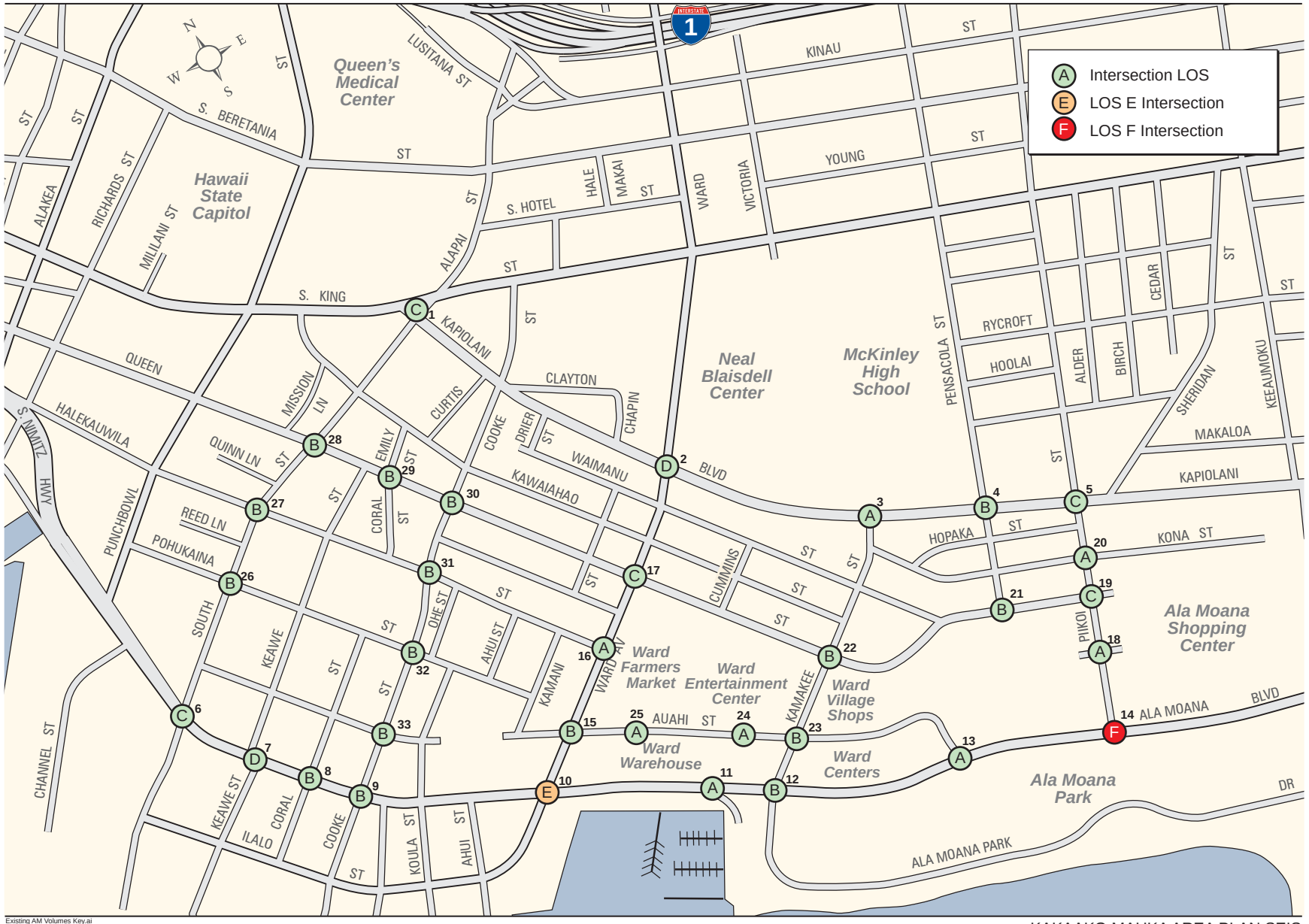
Table 2: Existing Intersection Level of Service

Intersection		Traffic Control	Peak Hour	Existing Conditions	
				LOS	Delay
1	Kapiolani Blvd / South St / King St	Signalized	AM	C	30.6
			PM	C	32.0
2	Kapiolani Blvd / Ward Ave	Signalized	AM	D	39.6
			PM	E	57.1
3	Kapiolani Blvd / Kamakee St	Signalized	AM	A	8.7
			PM	A	6.9
4	Kapiolani Blvd / Pensacola St	Signalized	AM	B	19.6
			PM	C	21.5
5	Kapiolani Blvd / Piikoi St	Signalized	AM	C	22.9
			PM	C	24.2
6	Ala Moana Blvd / South St	Signalized	AM	C	26.0
			PM	B	18.6
7	Ala Moana Blvd / Keawe St	Signalized	AM	D	40.6
			PM	E	66.4
8	Ala Moana Blvd / Coral St	Signalized	AM	B	10.9
			PM	B	10.5
9	Ala Moana Blvd / Cooke St	Signalized	AM	B	10.2
			PM	A	4.9
10	Ala Moana Blvd / Ward Ave	Signalized	AM	E	79.8
			PM	F	>80.0
11	Ala Moana Blvd / Kewalo Basin	Signalized	AM	A	4.1
			PM	A	6.2
12	Ala Moana Blvd / Kamakee St	Signalized	AM	B	11.3
			PM	B	19.5
13	Ala Moana Blvd / Queen St	Signalized	AM	A	7.4
			PM	B	12.0

Intersection		Traffic Control	Peak Hour	Existing Conditions	
				LOS	Delay
14	Ala Moana Blvd / Piikoi St	Signalized	AM	F	>80.0
			PM	E	64.3
15	Ward Ave / Auahi St	Signalized	AM	B	15.5
			PM	C	21.5
16	Ward Ave / Halekauwila St	Signalized	AM	A	7.3
			PM	C	21.4
17	Ward Ave / Queen St	Signalized	AM	C	25.4
			PM	D	50.3
18	Piikoi St / Ala Moana Ctr.	Signalized	AM	A	7.2
			PM	C	21.1
19	Piikoi St / Waimanu St	Signalized	AM	C	24.7
			PM	C	29.6
20	Piikoi St / Kona St	Signalized	AM	A	9.1
			PM	B	13.8
21	Pensacola St / Waimanu St	Signalized	AM	B	18.4
			PM	E	55.1
22	Kamakee St / Queen St	AWSC	AM	B	11.3
			PM	C	20.4
23	Kamakee St / Auahi St	Signalized	AM	B	17.1
			PM	C	24.9
24	Auahi St / Ward Entertainment Ctr.	Signalized	AM	A	1.8
			PM	A	6.4
25	Auahi St / Ward Warehouse	Signalized	AM	A	3.2
			PM	A	6.4
26	South St / Pohukaina St	Signalized	AM	B	16.2
			PM	B	17.6
27	South St / Halekauwila St	Signalized	AM	B	14.2
			PM	B	17.0

Intersection		Traffic Control	Peak Hour	Existing Conditions	
				LOS	Delay
28	South St / Queen St	Signalized	AM	B	19.2
			PM	C	23.4
29	Queen St / Emily St	Signalized	AM	B	16.1
			PM	B	15.0
30	Queen St / Cooke St	Signalized	AM	B	17.7
			PM	B	17.4
31	Halekauwila St / Cooke St	AWSC	AM	B	11.6
			PM	B	13.6
32	Pohukaina St / Cooke St	AWSC	AM	B	11.0
			PM	C	16.8
33	Auahi St / Cooke St	TWSC	AM	B	12.9
			PM	B	13.4

Source: DMJM Harris – 2008
Notes:
Delay in seconds per vehicle
BOLD denotes unacceptable conditions



KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 4

EXISTING INTERSECTION LEVEL OF SERVICE

AM Peak Hour

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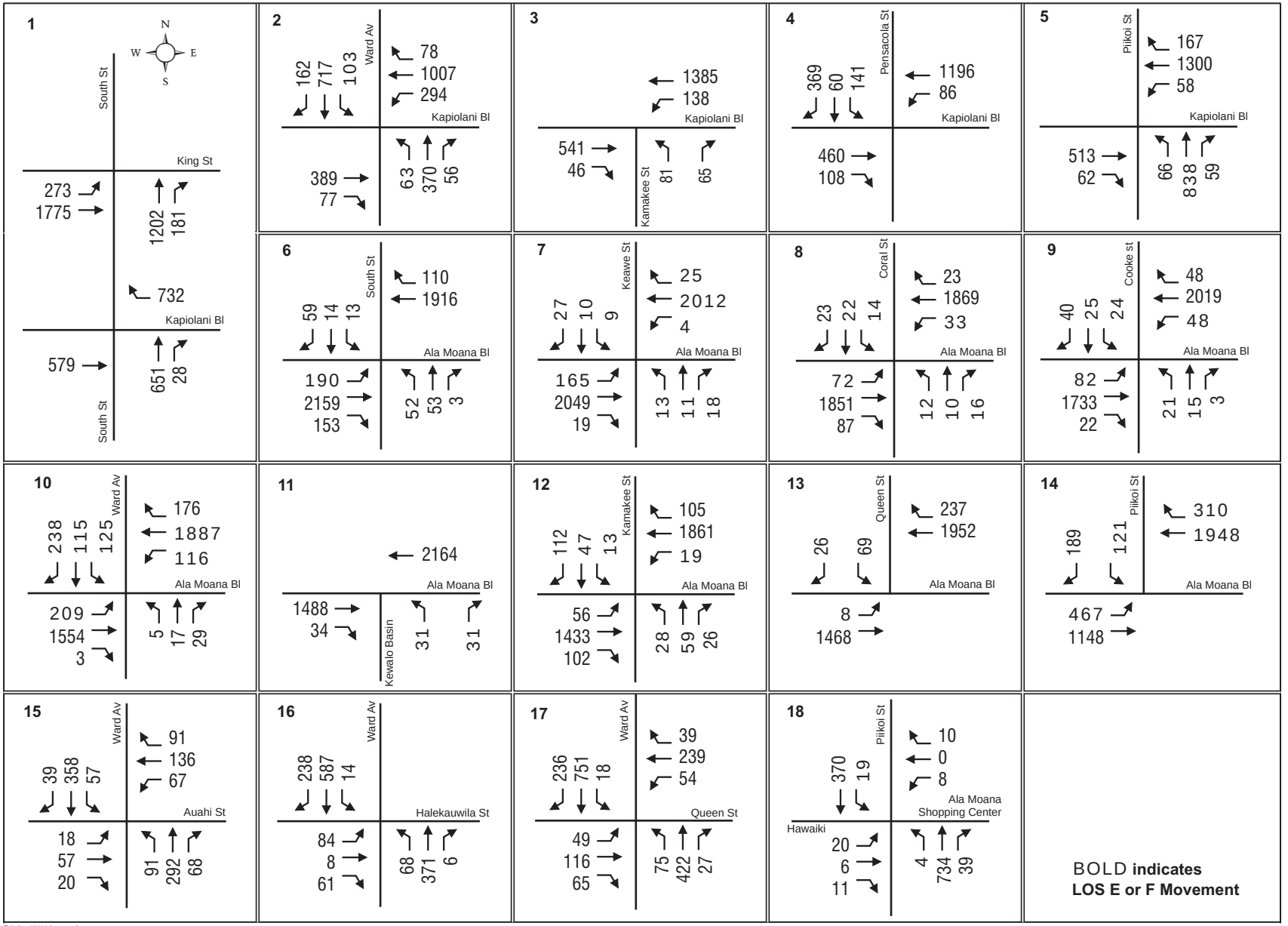


Existing AM Volumes.cdr

KAKAAKO MAUKA AREA PLAN SEIS

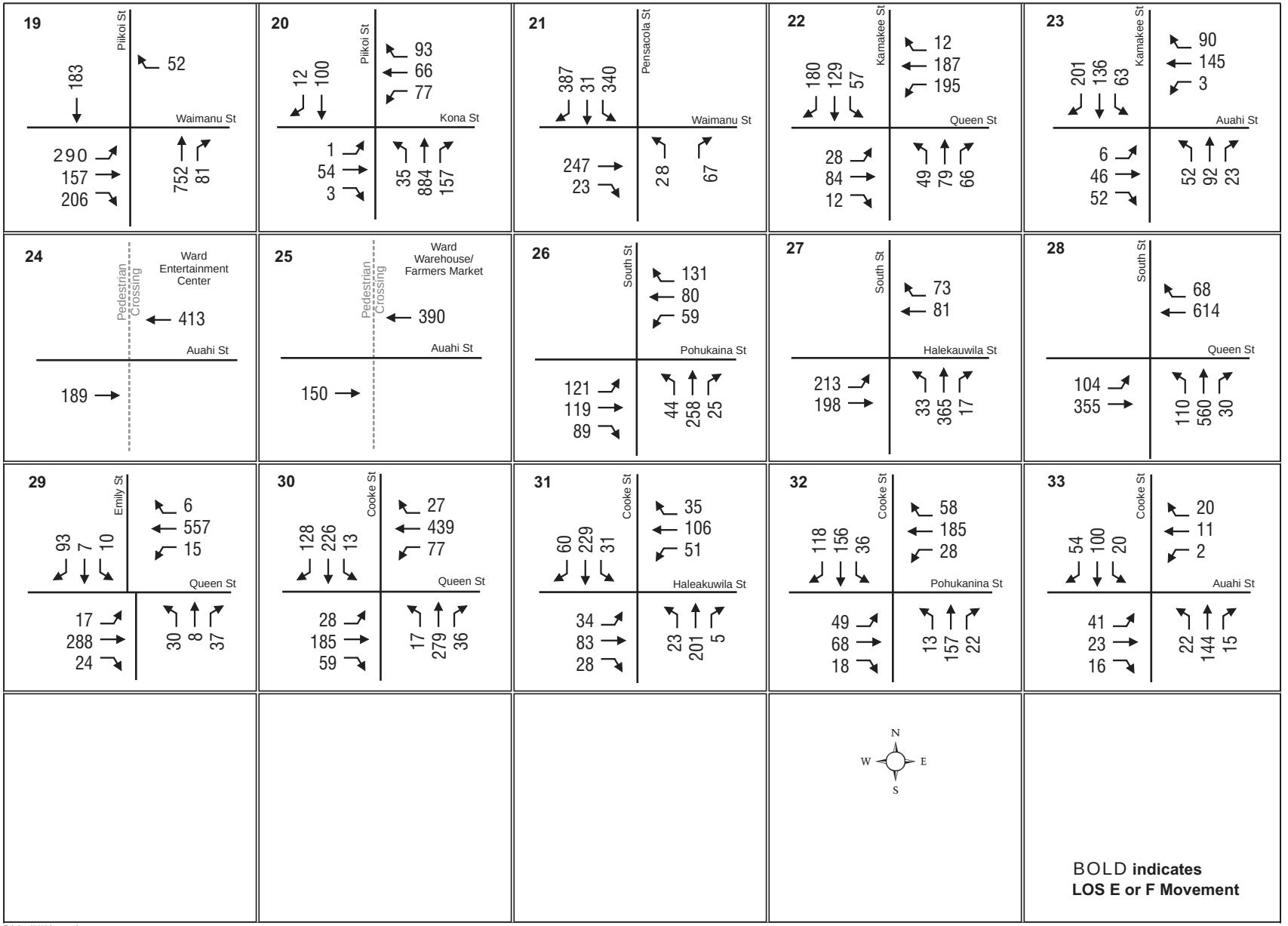
Source: Austin, Tsutsumi & Associates, Inc., 2008

Figure 5a

EXISTING TRAFFIC VOLUMES

AM Peak Hour

DMJM HARRIS | AECOM



Existing AM Volumes.cdr

KAKAAKO MAUKA AREA PLAN SEIS

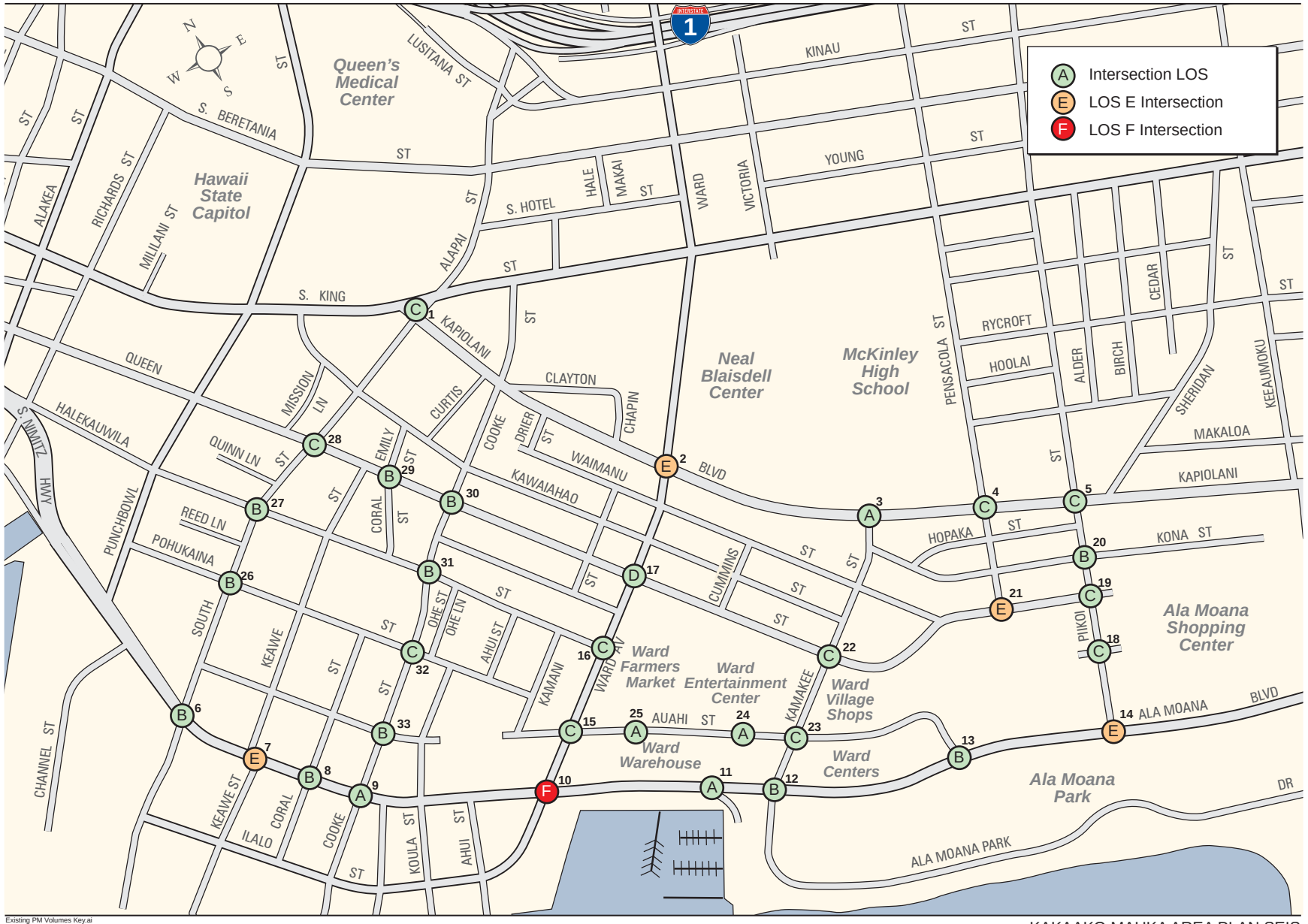
Source: Austin, Tsutsumi & Associates, Inc., 2008

Figure 5b

EXISTING TRAFFIC VOLUMES

AM Peak Hour

DMJM HARRIS | AECOM



Existing PM Volumes Key.ai

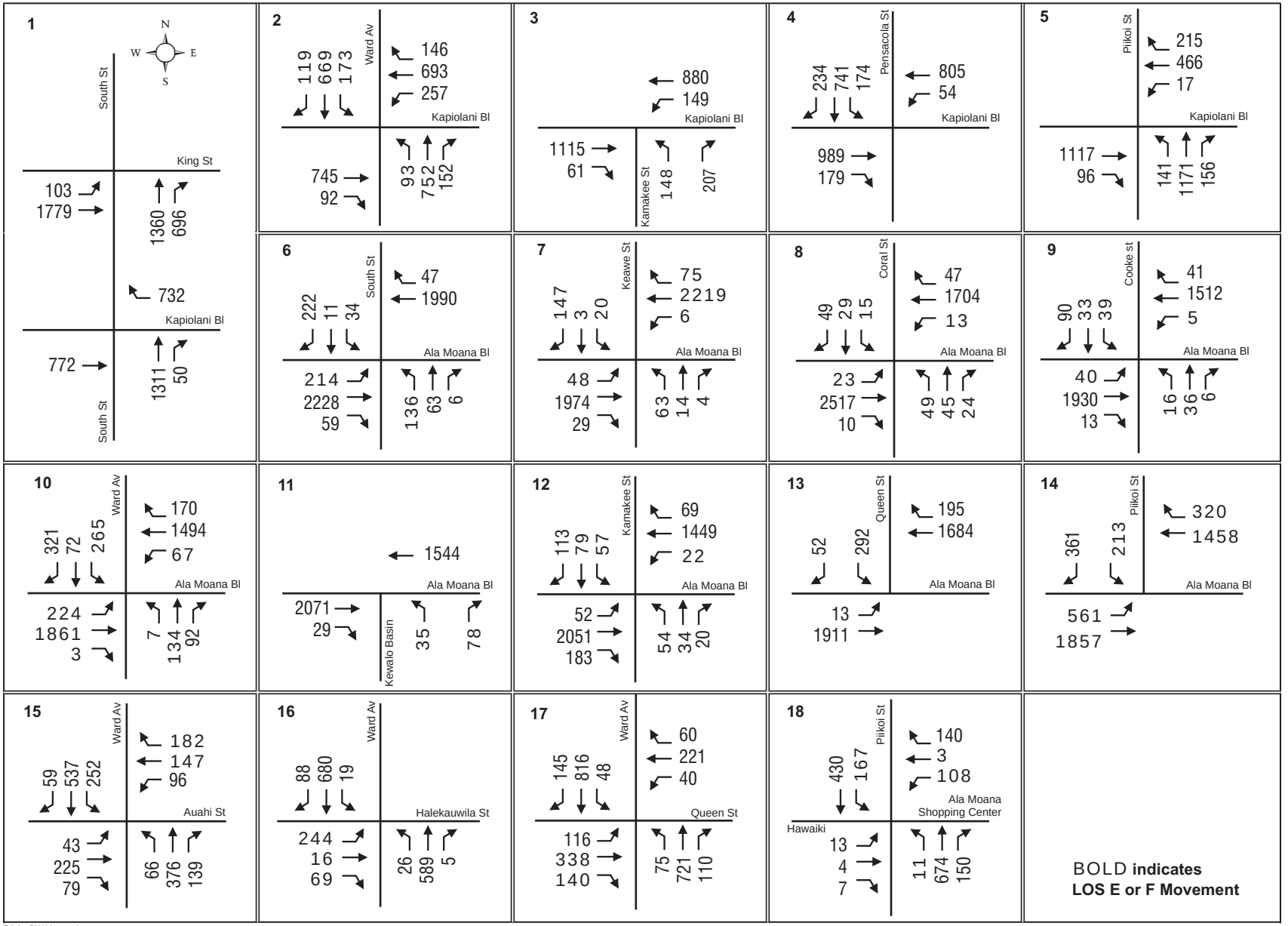
KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 6

EXISTING INTERSECTION LEVEL OF SERVICE

PM Peak Hour



Existing PM Volumes.cdr

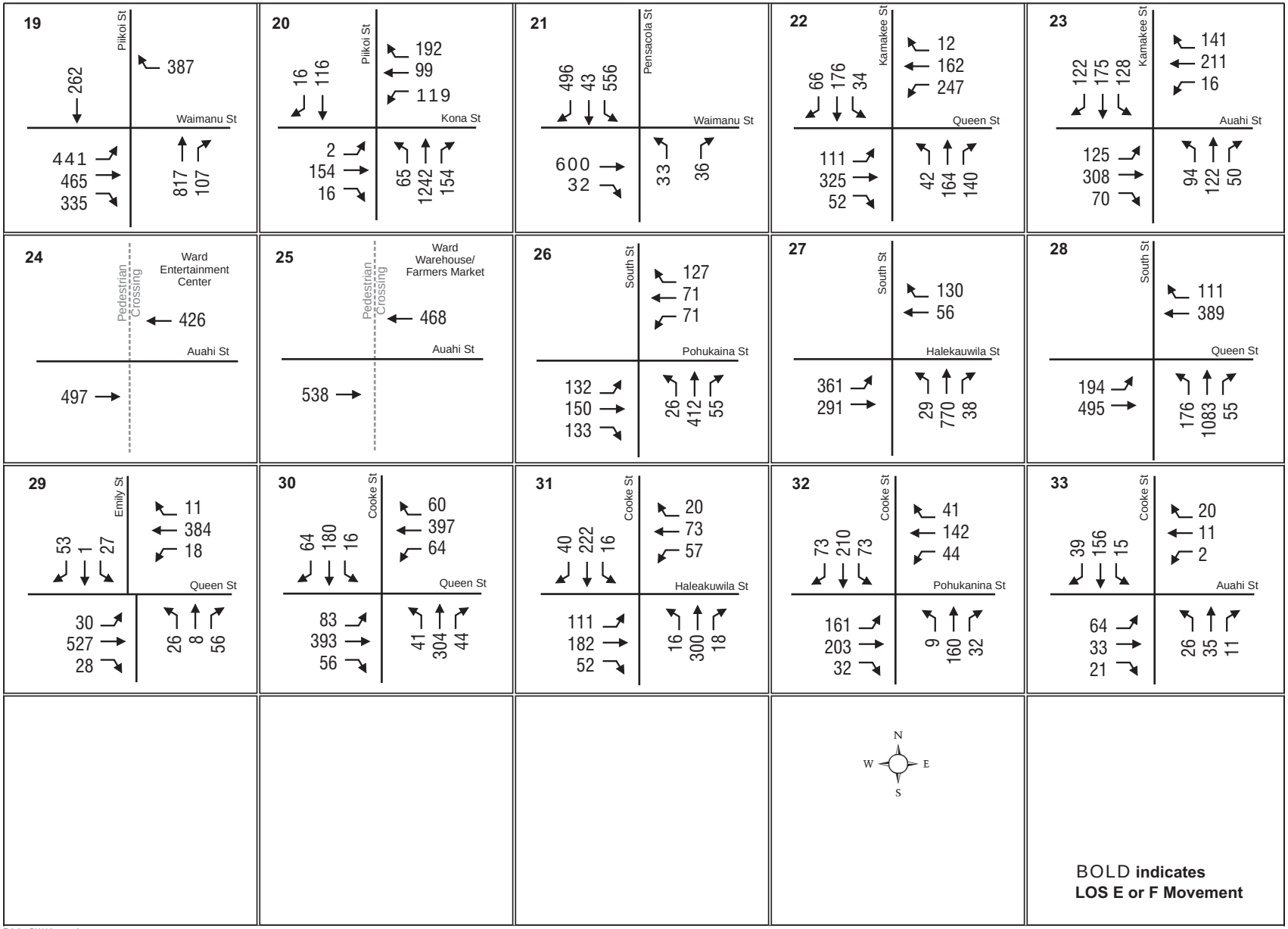
KAKAAKO MAUKA AREA PLAN SEIS

Source: Austin, Tsutsumi & Associates, Inc., 2008

Figure 7a

EXISTING TRAFFIC VOLUMES

PM Peak Hour



Existing PM Volumes.cdr

KAKAAKO MAUKA AREA PLAN SEIS

Source: Austin, Tsutsumi & Associates, Inc., 2008

Figure 7b

EXISTING TRAFFIC VOLUMES

PM Peak Hour

As shown in **Table 2**, most study intersections currently operate at acceptable conditions during the AM and PM peak hour, with intersections along Ala Moana Boulevard operating poorly (LOS E or LOS F). Observations were conducted during the weekday peak periods to confirm any analytical results and provide basis for any necessary calibration to the simulation. It should be noted that because of limitations with the Synchro software package, several intersections along Ala Moana Boulevard such as Ala Moana Boulevard / Kamakee Street will appear to operate better than in reality. This is due to significant queuing that occurs along eastbound and westbound Ala Moana Boulevard, particularly in the PM peak period, when queuing can extend from downstream intersections and cause gridlock conditions at upstream intersections.

3.3 ROADWAY SEGMENT CONDITIONS

Due to the multi-modal nature of transportation in the Mauka Area, micro-simulation was used to model the interactions between transportation modes and supporting infrastructure. Trafficware's SimTraffic software was used to simulate the Mauka Area transportation network. SimTraffic uses stochastic methodologies and algorithms to track the movements of individual vehicles in a model street network and quantifies the performance of the network by summing the results of the individual vehicle movements. As compared with empirical and analytical models such as Synchro 7, micro-simulation models predict performance by stepping through time and across space, tracking events as the system state unfolds.

To ensure the validity of the model, the simulated network parameters must be calibrated to mimic actual network conditions, based on collected data and field observations. In addition to the network geometry (lane configuration, signal timing, etc.), calibration parameters included intersection traffic volumes and queue lengths, travel time and on-street parking maneuvers, and pedestrian behavior.

The SimTraffic software provides the analyst with vast amounts of output. However, this output may be classified into two general types:

- A visual representation of the traffic simulation. This real-time, aerial animation displays vehicle movements and operations on the simulated network; and,
- A quantified aggregation of vehicle performance—such as travel time and delay. Vehicle performance can be identified from a macroscopic (entire simulated network) or a microscopic (individual intersection movements) perspective.

Micro-simulation can be used to produce measures of effectiveness (MOE), which can then be used to evaluate various alternatives. For the purposes of this study, the two following MOE were chosen for analysis:

- **Travel time**, representing the amount of time required for vehicles to traverse a roadway segment; and,
- **Travel speed**, representing the average speed maintained by vehicles along a roadway segment, including time spent waiting at traffic signals.

The micro-simulation results for Existing Conditions are summarized in **Table 3**.

Table 3: Existing Average Speed and Travel Time

#	Roadway	Direction	Peak Hour	Existing Conditions	
				Average Travel Time (minutes)	Average Speed (mph)
1	**Kapiolani Boulevard** *between South Street and Piikoi Street*	EB	AM	4.0	16
			PM	4.3	13
		WB	AM	2.9	13
			PM	4.7	14
2	**Queen Street** *between South Street and Piikoi Street*	EB	AM	4.6	13
			PM	3.5	10
		WB[(1)]	AM	3.5	14
			PM	6.0	14
3	**Ala Moana Boulevard** *between South Street and Piikoi Street*	EB	AM	4.7	16
			PM	5.3	18
		WB	AM	9.5	9
			PM	3.8	20
4	**Piikoi Street** *between Kapiolani Boulevard and Ala Moana Boulevard*	NB	AM	2.0	13
			PM	2.1	10
		SB	AM	2.2	13
			PM	2.5	9
5	**Kamakee Street** *between Kapiolani Boulevard and Ala Moana Boulevard*	NB	AM	2.5	10
			PM	2.6	10
		SB	AM	2.5	10
			PM	3.0	8
6	**Ward Avenue** *between Kapiolani Boulevard and Ala Moana Boulevard*	NB	AM	1.5	13
			PM	2.2	10
		SB	AM	2.8	13
			PM	3.0	11
7	**Cooke Street** *between Kapiolani Boulevard and Ala Moana Boulevard*	NB	AM	2.5	13
			PM	2.3	15
		SB	AM	3.5	14
			PM	2.9	14

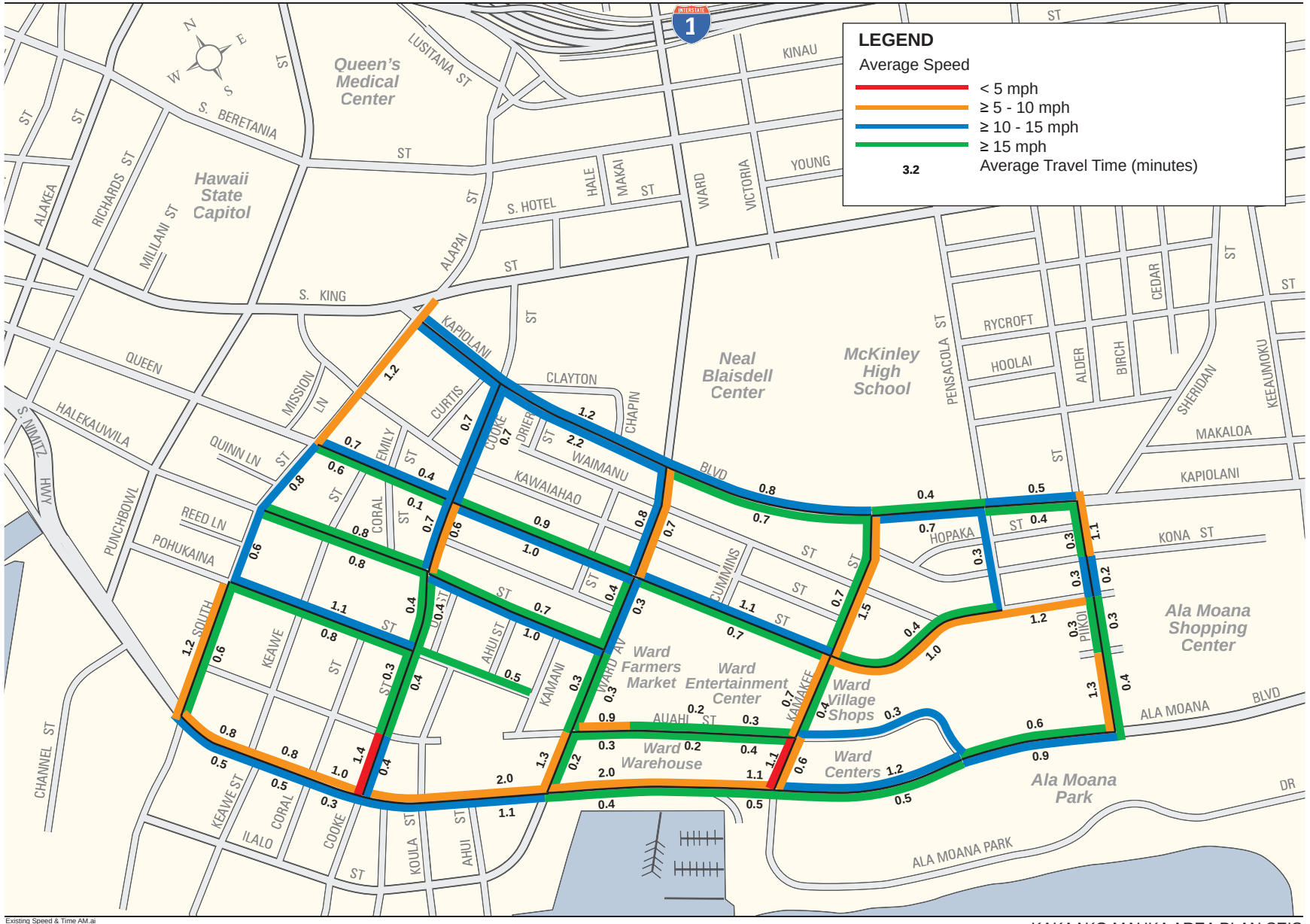
#	Roadway	Direction	Peak Hour	Existing Conditions	
				Average Travel Time (minutes)	Average Speed (mph)
8	**South Street** *between Kapiolani Boulevard and Ala Moana Boulevard*	NB	AM	3.2	11
			PM	3.2	11
		SB[(2)]	AM	1.2	9
			PM	1.0	10

Source: DMJM Harris – 2008
Notes:
(1) WB Queen Street between South Street and Pensacola Street only.
(2) SB South Street between Pohukaina Street and Ala Moana Boulevard only.

As shown in **Table 3**, average speeds in the Mauka Area are in the 10 to 15 mph range, with the slowest average speeds along westbound Ala Moana Boulevard in the AM peak hour and along southbound Kamakee Street in the PM peak hour.

Figure 8 and **Figure 9** illustrate the average speed and travel time for key roadway segments during the weekday peak hours.

DMJM HARRIS | AECOM



Existing Speed & Time AM.ai

KAKAAKO MAUKA AREA PLAN SEIS

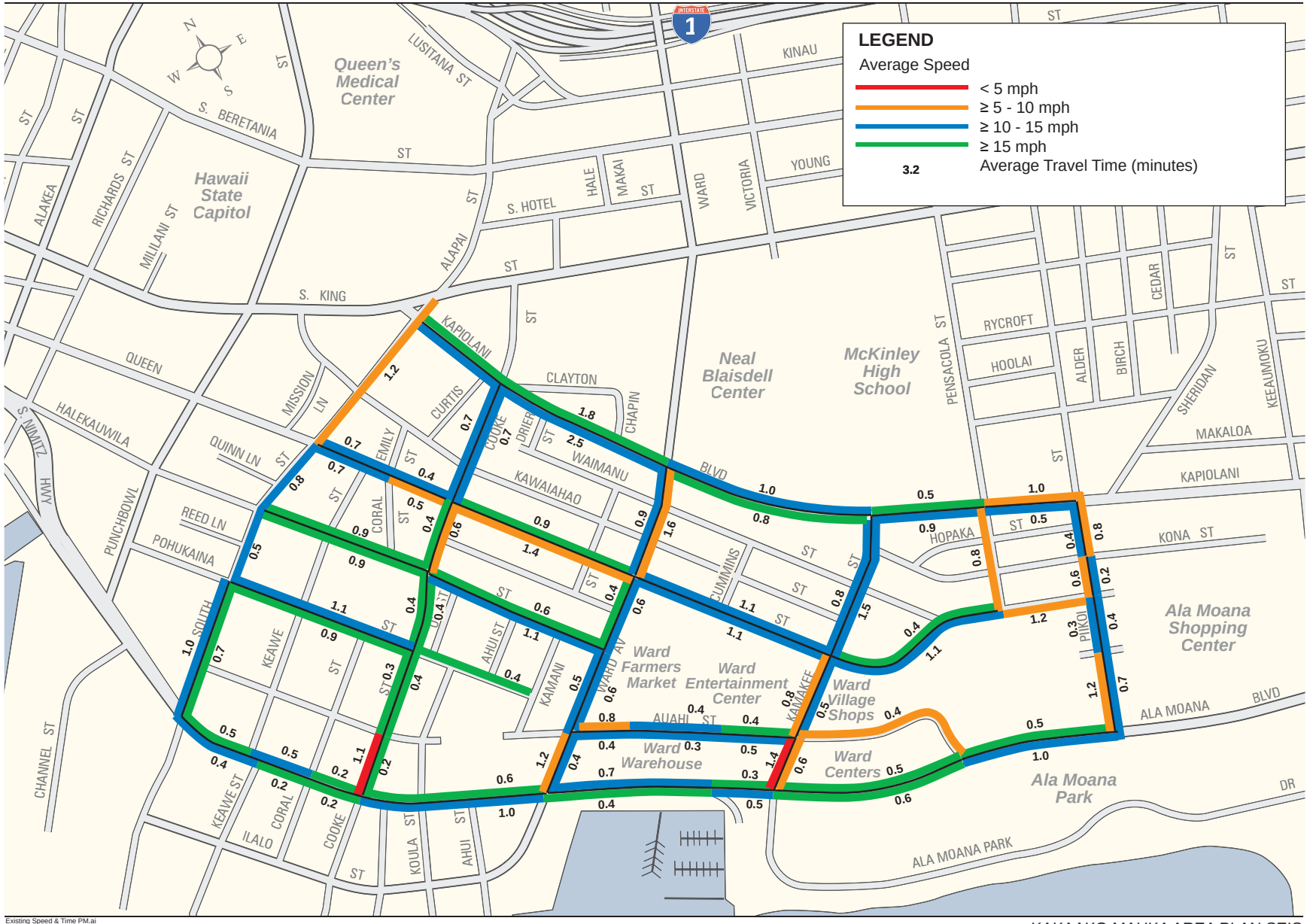
Source: DMJM Harris, 2008

Figure 8

EXISTING VEHICLE SPEED AND TRAVEL TIME

AM Peak Hour

DMJM HARRIS | AECOM



Existing Speed & Time PM.ai

KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 9

EXISTING VEHICLE SPEED AND TRAVEL TIME

PM Peak Hour

3.4 TRANSIT NETWORK

TheBus, operated by Oahu Transit Services (OTS), provides fixed-route public transit and paratransit service in the Mauka Area, Honolulu, and throughout the island of Oahu. TheBus operates a "hub-and-spoke" network, with the majority of services centralized along major corridors and serving major destinations, such as the Ala Moana Shopping Center or UH Manoa. Within the Mauka Area, most lines run along major corridors such as King Street, Kapiolani Boulevard, or Ala Moana Boulevard. All buses are equipped with wheelchair lifts and bicycle racks. Existing transit service in the Mauka Area in the AM and PM peak periods is summarized in **Table 4** and illustrated in **Figure 10**. The "screenline" column in **Table 4** refers to a grouping of transit lines for analytical purposes which will be explained in further detail later in this section.

Major trunk lines such as the 1 / 1L and 2 / 13 provide high-frequency service all day, with the remainder operating at lower and sometimes irregular frequencies. Feeder lines connect various neighborhoods within Honolulu to major destinations or transfer points. Peak expresses run a limited number of runs in the peak period in the peak direction, connecting various parts of Oahu with Downtown Honolulu and the Mauka Area. TheBus also operates four rapid bus lines through the Mauka Area: CityExpress! A, CityExpress! B, CountryExpress! C, and CountryExpress! E.

TheBus service is complemented by ferry service operated as TheBoat, which runs between the Aloha Tower in Downtown and Kalaeloa on the west side of Oahu. Connecting bus services operate as "F-series" lines at both ferry terminals.

SCREENLINE ANALYSIS

Because of the nature of Downtown Honolulu and the Mauka Area as a focal point of transit service on Oahu, a screenline analysis was used in the evaluation of transit operations. A screenline is a theoretical grouping of transit lines that serve an identifiable corridor or area, chosen such that it passes these lines either at or near their maximum load point (MLP). The MLP is defined as the point along a particular route at which passenger loading on the transit vehicle is the highest. For example, for a peak express line that serves Downtown Honolulu, the MLP could be considered the point at which the bus leaves Downtown and enters the freeway, as the bus is most crowded after all the passengers who will ride have boarded. After it exits the freeway and passengers begin alighting, the bus only gets less and less crowded.

Once the relevant transit lines are grouped into screenlines, the ridership and capacity for each screenline are combined to obtain a capacity utilization ratio—the ratio of ridership to capacity. A screenline operating at a high capacity utilization, e.g., 80 percent, indicates that transit vehicles operating on lines grouped in that screenline generally operate with high loads relative to vehicle capacity. To obtain screenline ridership and capacity, the ridership and capacity for each individual line in the screenline are summed together. For the purposes of this study, ridership information was obtained from TheBus and capacity numbers were calculated based on vehicle size and capacity (both seated passengers and standees) and line frequency.

Table 4: Existing Transit Network

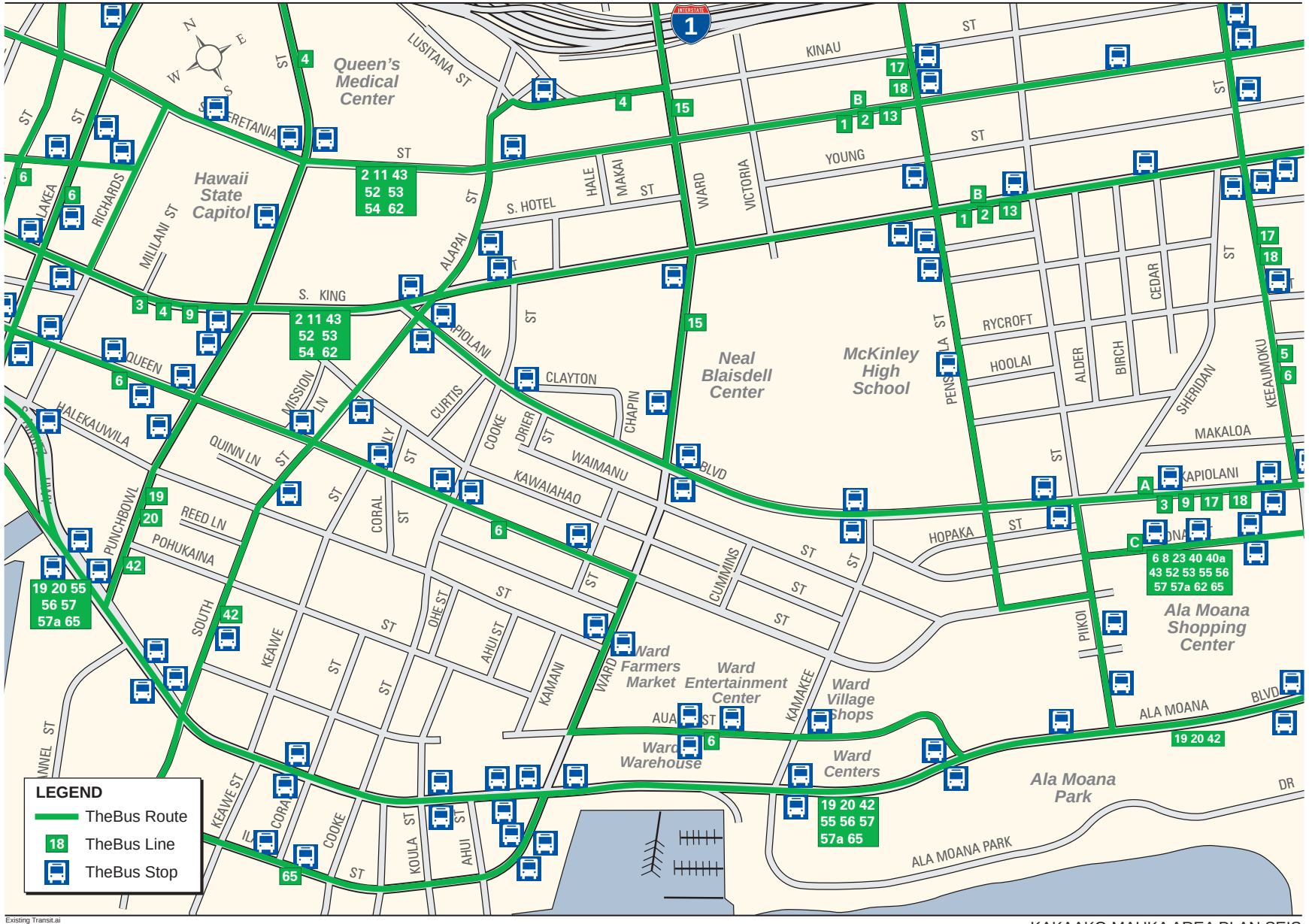
Line	Route	Screenline	Service Frequency (minutes)			
			Eastbound		Westbound	
			AM	PM	AM	PM
Trunk Lines						
1	Kalihi / Aala Park to Hawaii Kai	East, West	10	10	10	10
1L	Kalihi / Aala Park to Hawaii Kai	East, West	30	30	30	30
2	Kalihi and Liliha to Waikiki	East, West	5-15	10	15	10-15
3	Salt Lake to Kaimuki	East, West	10-15	15-30	15	10-15
6	Pauoa to University / Woodlawn	East, West	20-30	20	20	20
9	Pearl Harbor to Palolo Valley	East, West	10-15	20	15	20
8	Ala Moana Center to Waikiki	East	20-30	5-15	10-20	10-20
13	Liliha to Campbell Ave	East, West	10-15	10-15	15	10-15
19	Hickam AFB / HNL Airport to Waikiki	East, West	20-40	20-30	30-40	30-40
20	Pearlridge to Waikiki	East, West	30-40	20-30	30-40	30-40
23	Ala Moana / Waikiki to Sea Life Park	East	20[(1)]	50, 80	20-30[(1)]	30-40
40	Makaha to Honolulu	West	30	30	30	20-40
42	Waikiki to Ewa Beach	East, West	30	30	30	35
43	Waipahu Street to Ala Moana Center	West	30	30	30	30
52	Honolulu to North Shore	West	30	30	30	30-45
53	Pacific Palisades to Honolulu	West	20-30	45	15-30	20-30
54	Pearl City to Alapai Transit Center	West	20-30	10-20[(1)]	30	10-20
55	Ala Moana to Kaneohe-Kahaluu	West	30	60	30-40	35
56	Kaneohe / Kailua to Honolulu	West	30[(1)]	30-40	40	15-30

Line	Route	Screenline	Service Frequency (minutes)			
			Eastbound		Westbound	
			AM	PM	AM	PM
57	Ala Moana to Sea Life Park	West	20[1]	30	60-75	20[1]
57A	Kailua to Ala Moana Center	West	25[1]	50-70	60	70
62	Wahiawa Heights to Honolulu	West	20-30	20-30	30	20-40
65	Honolulu to Kahaluu	West	--	30[1]	30[1]	30-40
Feeder Lines						
15	Pacific Heights to Honolulu	North	40-60[1]	10-20	15[1]	10-20[1]
17	Makiki to Ala Moana	North	30-40	15-20[1]	40	20-40
18	Ala Moana Center to UH	North	60-70	60	75	60
Peak Express Service[2]						
80	Hawaii Kai to Downtown	East	--	20	20	--
80A	Hawaii Kai to Downtown/UH	East	--	60	60	--
82	Kalama Valley to Downtown	East	--	45	--	--
83	Wahiawa to Downtown	West	15-20	--	--	10-30
84	Mililani to Downtown/UH	West	30	--	--	30
84A	Mililani Express to Downtown/UH	West	30	--	--	30
85	Kailua/Kaneohe to Downtown/UH	West	15	--	--	30[1]
85A	Kaneohe to Downtown/UH	West	15-30	--	--	30
88	Kahaluu to Downtown	West	25	--	--	30-45
88A	Honolulu to North Shore	West	--	60	--	60
89	Waimanalo to Downtown	West	40	--	--	40

Line	Route	Screenline	Service Frequency (minutes)			
			Eastbound		Westbound	
			AM	PM	AM	PM
90	Pearl City to Downtown	West	30	--	--	30
98	Mililani Park to Downtown/Waikiki	West	--	--	--	30-40
98A	Kunia to Downtown/Waikiki	West	--	--	--	40
201	Waipahu/Ewa Beach to Waikiki	West	--	--	--	20
202	Waipahu to Waikiki	West	--	--	--	20
Rapid Bus Lines						
A	Waipahu to UH	East, West	5-15(1)	15	15	10-15
B	Kalihi Transit Center to Waikiki	East, West	15	15	15	15
C	Makaha to Honolulu	West	30(1)	30	30	30
E	Ewa Beach to Waikiki	East, West	25-30	30	30	30
Ferry Bus Routes(2)						
F2	Aloha Tower to UH	West	30, 120	--	--	60, 90
F3	Aloha Tower to Waikiki	West	30, 120	--	--	60, 90

Source: TheBus – 2008
Notes:
AM = AM Peak Period
PM = PM Peak Period
(1) Irregular frequency.
(2) Service in peak direction only.

DMJM HARRIS | AECOM



Existing Transit.ai

KAKAAKO MAUKA AREA PLAN SEIS

Source: TheBus, 2008
DMJM Harris, 2008

Figure 10

EXISTING TRANSIT NETWORK

It should be noted that a screenline analysis also inherently incorporates some sense of travel direction. When lines are grouped together in a screenline, each direction of travel through the screenline is analyzed separately. During the travel demand analysis, it was determined that the peak direction of travel is into the Mauka Area in the AM peak period and out of the Mauka Area in the PM peak period. Therefore, these were the directions chosen for the screenline analysis.

The transit analysis assumes three screenlines for the Mauka Area—west, north, and east—with each line serving the area being assigned to one or more screenlines as shown in **Table 4**. The resulting existing transit capacity utilization is summarized in **Table 5** and illustrated in **Figure 11** and **Figure 12**.

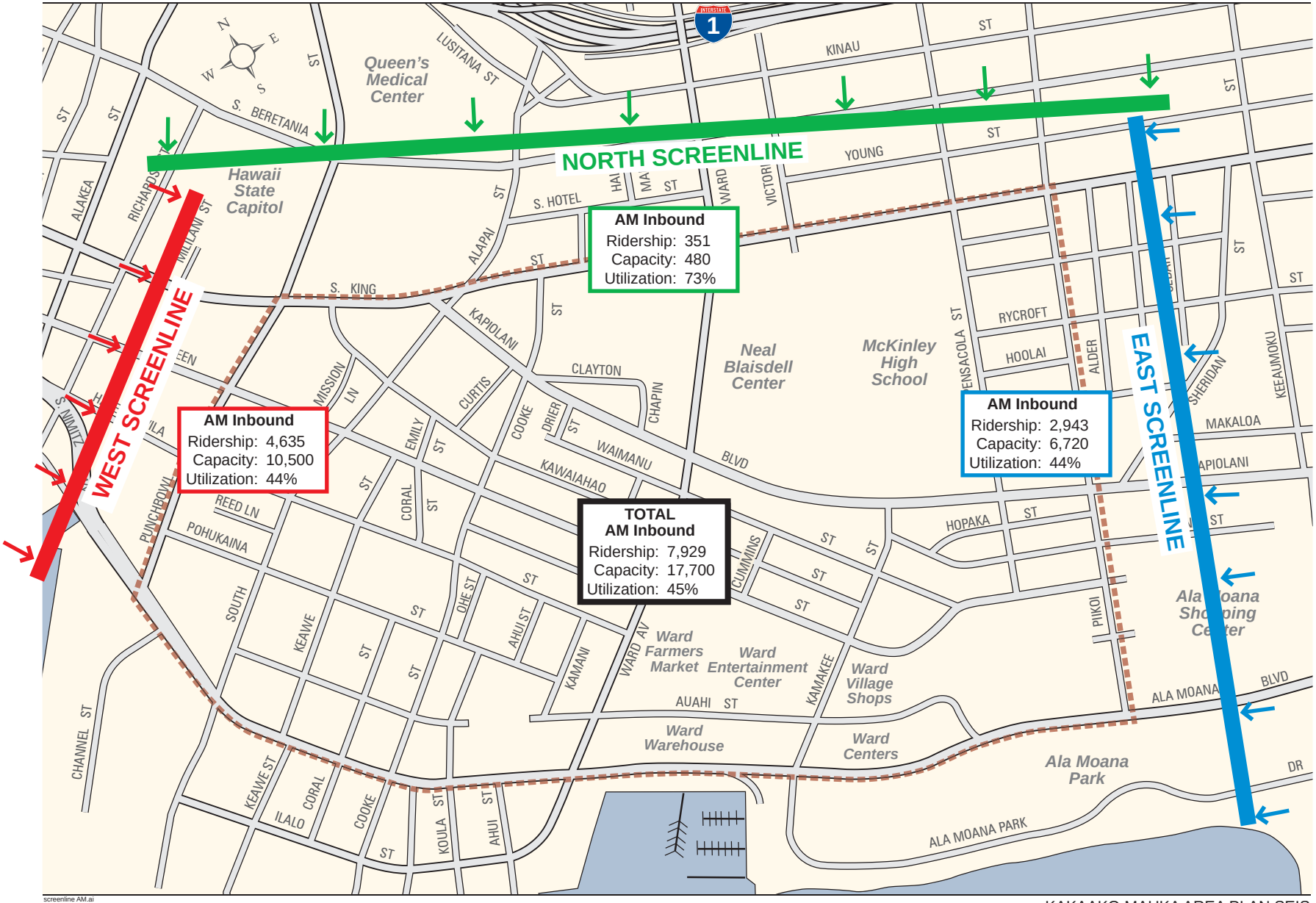
Table 5: Existing Transit Capacity Utilization

Screenline	Existing Conditions		
	Ridership (passengers)	Capacity (passengers)	Capacity Utilization
AM Peak Hour – Inbound			
West	4,635	10,500	44%
East	2,943	6,720	44%
North	351	480	73%
Total	**7,929**	**17,700**	**45%**
PM Peak Hour – Outbound			
West	4,645	10,590	44%
East	2,915	6,300	46%
North	440	660	67%
Total	**8,000**	**17,550**	**46%**

Source: DTS, City and County of Honolulu; DMJM Harris – 2008

As shown in **Table 5**, all three screenlines operate under capacity, with more crowding on buses serving the north screenline. Lines grouped under the west screenline carry the bulk of trips into and out of the Mauka Area.

DMJM HARRIS | AECOM



screenline AM.ai

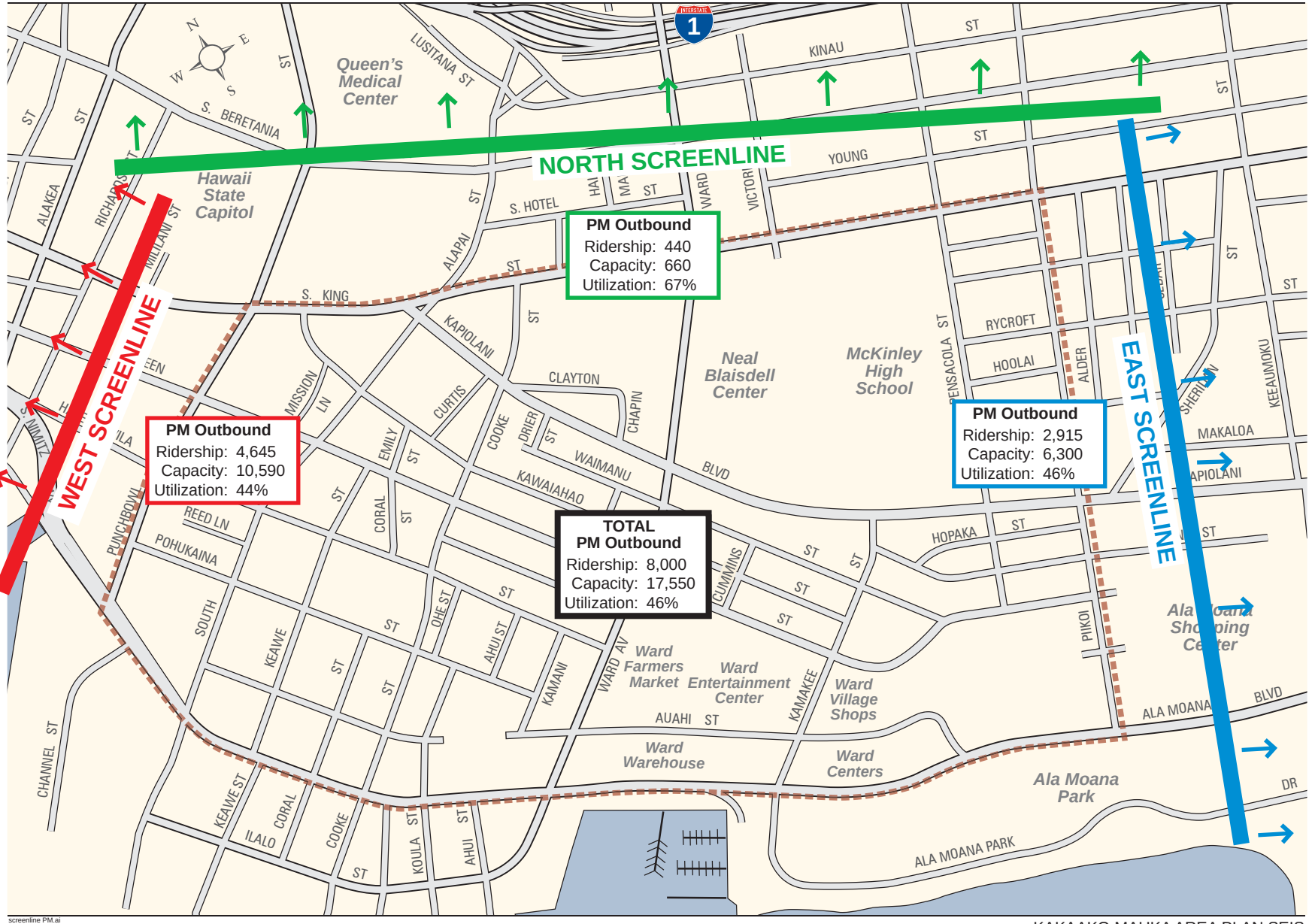
KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 11

EXISTING TRANSIT CAPACITY UTILIZATION

AM Peak Hour



screenline PM.ai

KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 12

EXISTING TRANSIT CAPACITY UTILIZATION

PM Peak Hour

It should be noted that capacity utilization standards generally vary from one transit operator to another and from one mode to another. For example, it is generally more acceptable for a high-capacity transit system with frequent stops such as a subway or metro to operate at a higher capacity utilization than a bus line serving two distant destinations, as passengers would typically not be expected to stand for long periods of time. Since capacity calculations have already included standees, a capacity utilization in the 80 to 90 percent range would be considered a typical threshold for lines serving urban areas such as the Mauka Area.(2)

3.5 BICYCLE CONDITIONS

The existing and proposed bicycle facilities in the Mauka Area are illustrated in **Figure 13**. The proposed facilities shown in **Figure 13** represent a combination of the bikeway plan presented in the Hawaii Department of Transportation (HDOT) *Bike Plan Hawaii 2003* and the bikeway plan presented in the 2005 Final Environment Assessment (FEA) for the Makai Area Plan Amendment prepared by Wilson Okamoto Corporation.

Bikeways are typically classified as Class I, Class II, and Class III facilities, depending primarily on the level of separation from vehicular traffic:

- *Class I bicycle facility*: Also known as a bicycle path, this is a dedicated path for bicyclists and pedestrians that does not permit motorized travel. Bicycle paths create a relaxed environment for non-motorized travel and reduce the risk of potential conflict between vehicles and bicyclists. Often these type of paths exist in parks or greenway areas, areas connecting two dead end streets, or atop railroad rights of way that are no longer in use. The only existing Class I bicycle facility in the vicinity of the plan area runs from Kakaako Waterfront Park in the Makai Area east through Kewalo Basin and Ala Moana Park.

- *Class II bicycle facility*: Also known as a bicycle lane, this is a portion of the roadway network that has been striped and signed for bicycle use. Implementation of Class II facilities requires sufficient right-of-way between the vehicle stream and the curb or curbside parking. Bicycle lanes are typically used along collector or major streets with medium to high traffic volumes and provide additional travel space for bicyclists along busy roadway segments. As shown in **Figure 13**, bicycle lanes currently do not exist in the Mauka Area but are proposed along major streets, including Ala Moana Boulevard, King Street, Ward Avenue, Piikoi Street, and Pensacola Street. Additional Class II facilities are proposed on Keawe Street and Coral Street south of Ala Moana Boulevard as part of the Makai Area Plan.

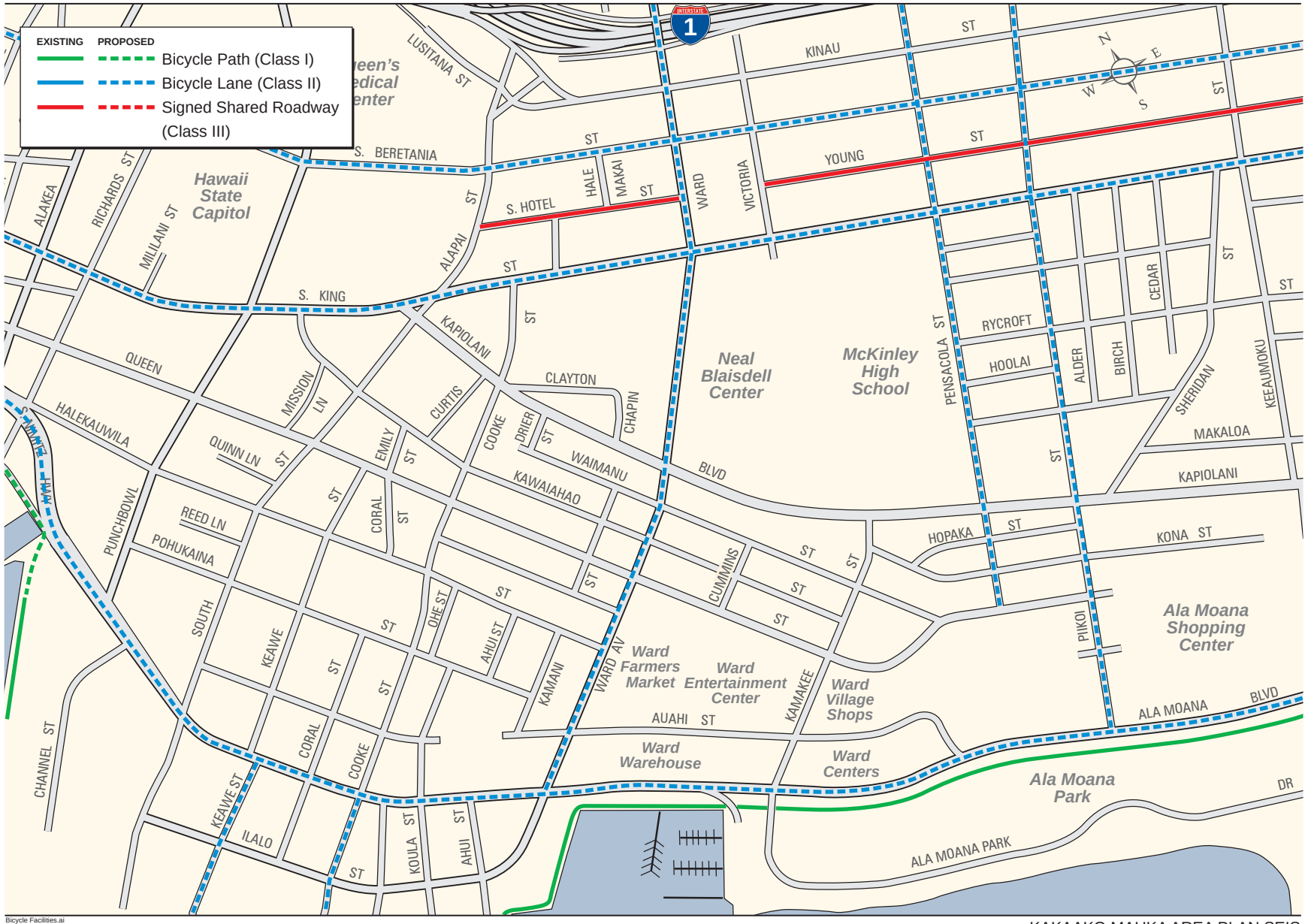
- *Class III bicycle facility:* Also known as a bicycle route, this is a bikeway that primarily serves to connect other facilities and destinations in the bicycle network but contains a lower level of service than Class I or II bikeway facilities. These routes include signage but do not have roadway markings or striping to indicate reserved space for the bicyclist. Bicycle routes are easier to implement because they do not require right of way to be reallocated from vehicular traffic. Within the

(2) Email communication with Peter Straus, Service Planning Manager, San Francisco Municipal Transportation Agency (SFMTA).

Mauka Area, Class III bikeways exist along South Hotel Street and Young Street. No additional Class III facilities are proposed for the Mauka Area.

It should be noted that the proposed bikeway plan from the Existing Mauka Area Plan does not necessarily agree with the proposed bikeway plan presented in the most recent update to *Bike Plan Hawaii 2003*. The City and County of Honolulu Department of Transportation Services' *Honolulu Bicycle Master Plan* (1999) is mostly in agreement with *Bike Plan Hawaii 2003*, but it also proposes a bikeway on Cooke Street. The *Honolulu Bicycle Master Plan* classifies the bikeways proposed for Cooke Street, Ala Moana Boulevard, Piikoi Street, and Pensacola Street as Priority 2 projects.

For the purposes of this study, the more recent state bicycle plan is assumed to have precedence and was thus chosen for inclusion in the evaluation of bicycle operations.



Bicycle Facilities.ai

KAKAAKO MAUKA AREA PLAN SEIS

Source: HDOT, 2003
Wilson, Okamoto Corporation, 2005

Figure 13

EXISTING AND PROPOSED BICYCLE FACILITIES

3.6 PEDESTRIAN CONDITIONS

Pedestrian facilities can be classified according to their conduciveness to pedestrian travel, including but not limited to factors such as sidewalk width, traffic separation, and amenities such as benches, trees, or building frontage. Existing pedestrian conditions are described using the following classifications as identified in the Draft Mauka Area Plan:

- *Pedestrian Places*: These are districts of limited extent, with mixed-use land development, moderate to high densities, good transit service, great streets, and extensive pedestrian accommodation in the form of sidewalks, crosswalks, and other facilities. Here people will stroll and linger at store fronts and urban landscape features, walking for both utilitarian and recreational purposes. Pedestrian Places have people moving about between multiple activities.

- *Pedestrian Supportive Environments*: These include well-designed residential and commercial neighborhoods, employment centers, parks and recreational areas. These are safe environments for walking, where sidewalks are continuous and buffered from streets and wide enough for passing and walking side by side, and where good street crossings have been provided. Land uses are either dense enough to both generate and attract utilitarian walking trips of reasonably short lengths (half mile or less), or are of the sort that will attract recreational walkers and joggers. Buildings, not parking lots, face streets.

- *Pedestrian Tolerant Environments*: These are areas and corridors where walking is technically safe (there are continuous sidewalks and some kind of reasonably safe street crossings), but the land use patterns are such that little walking activity is likely to be generated. Tolerant environments provide pedestrian facilities, but include a very minimal level of accommodation.

- *Pedestrian Intolerant Environments*: Pedestrian Intolerant Environments are areas where walking is unsafe and unattractive. Examples include freeway corridors, certain industrial land uses, and roadways lacking continuous sidewalks. A major characteristic of Intolerant Environments is that they lack pedestrians, either due to a lack of pedestrian accommodations and/or dominance by automobile traffic and auto-oriented land uses.

Existing pedestrian facilities in the Mauka Area are primarily Pedestrian Tolerant or Pedestrian Intolerant Environments. In particular, many streets in Central Kakaako such as Queen Street and Waimanu Street lack curbs and sidewalks, forcing pedestrians to walk in the street. Cooke Street between Queen Street and Kapiolani Boulevard and Halekauwila Street between Punchbowl Street and South Street are Pedestrian-Supportive Environments. The Ward Centers adjacent to Auahi Street and Kamakee Street is the only Pedestrian Place in the Mauka Area, attracting pedestrians who come to shop. However, these Pedestrian Supportive Environments and Pedestrian Places are connected by Pedestrian Tolerant and Pedestrian Intolerant Environments, making travel by foot an unattractive and sometimes unsafe alternative.

In assessing pedestrian sidewalk conditions, the effective sidewalk width is generally considered a key factor. The effective sidewalk width represents the width between the building face and the curb, omitting space occupied by obstructions such as landscaping, fire hydrants, bus shelters, or utility poles. For the purposes of this study, existing sidewalk in the Mauka Area is defined as either obstructed (effective width less than four feet) or unobstructed (effective width greater than or equal to four feet).

Existing sidewalk and crosswalk facilities are illustrated in **Figure 14.**

3.7 ON-STREET PARKING CONDITIONS

Observations of existing on-street parking conditions were conducted during the weekday AM and PM peak hour. Currently, there is ample available parking along most streets where on-street parking is provided. Several roadways, such as South Street, prohibit parking during certain time periods, so observations of on-street parking regulations in the Mauka Area were also conducted.

Any observed unrestricted parking was classified based on whether or not the parking lane blocks traffic. For example, a narrow parking lane can block traffic in the adjacent lane, reducing the effective capacity of a roadway. On-street parking regulation along key roadways is illustrated in **Figure 15**.

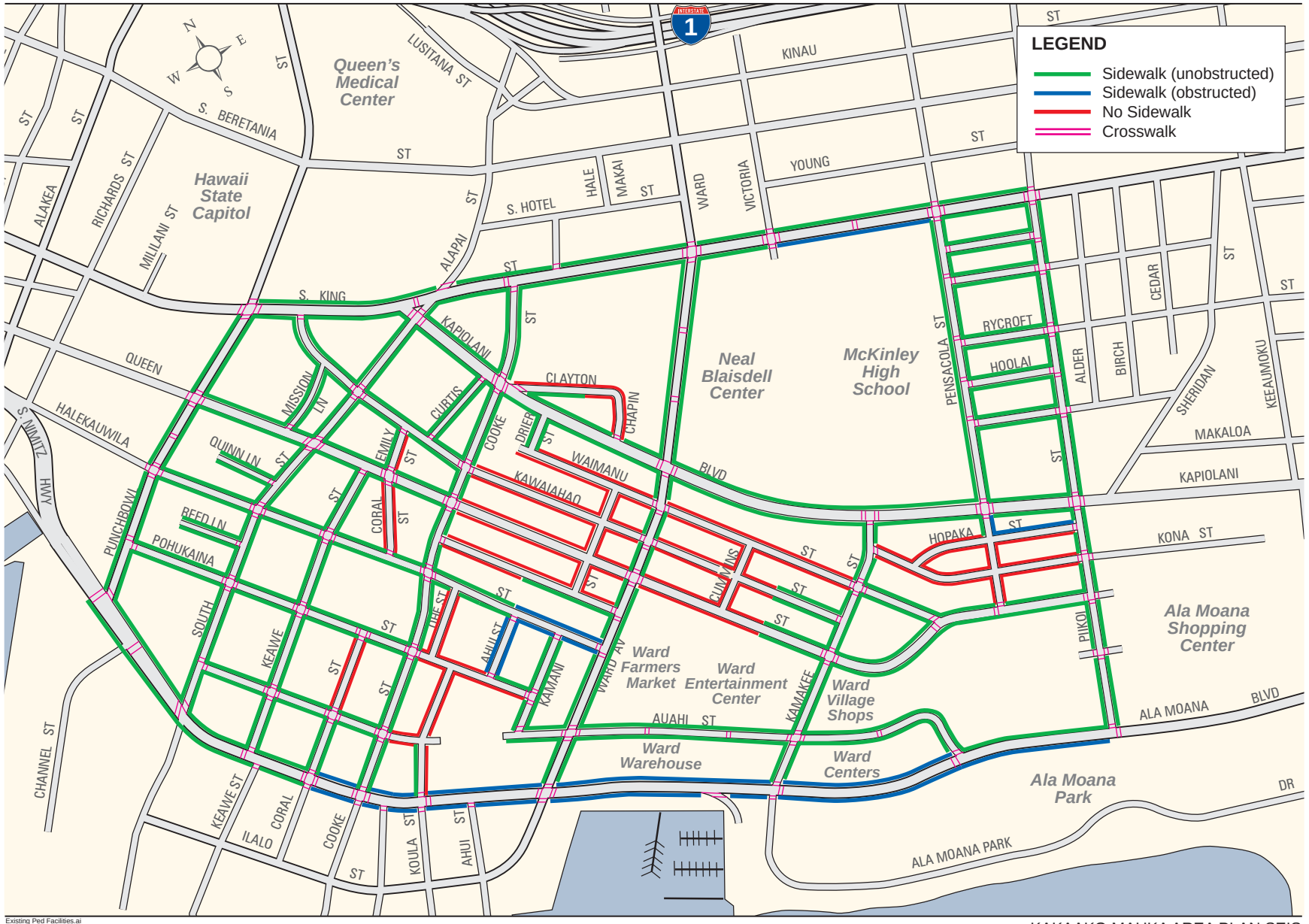
3.8 ROADWAY CROSS-SECTIONS

Existing roadway cross-sections for key roadways, showing medians, traffic lanes, bicycle lanes, and on-street parking, are shown in **Figure 16**. As shown in **Figure 16**, many key roadways—Kapiolani Boulevard and Ward Avenue, in particular—are currently undivided.

3.9 LAND USE

As mentioned previously, existing development in the Mauka Area is mixed-use, featuring primarily residential, commercial, and industrial uses. Because new development is expected to occur in scattered locations throughout the Mauka Area, in order to analyze Cumulative Conditions, a traffic analysis zone (TAZ) approach was selected, which groups nearby land uses together and analyzes them as a single “project” of composite land uses. The TAZs selected for analysis are identical to the TAZs used in the Oahu Metropolitan Planning Organization (OMPO) travel demand forecast model.

The TAZ boundaries are illustrated in Figure 17.



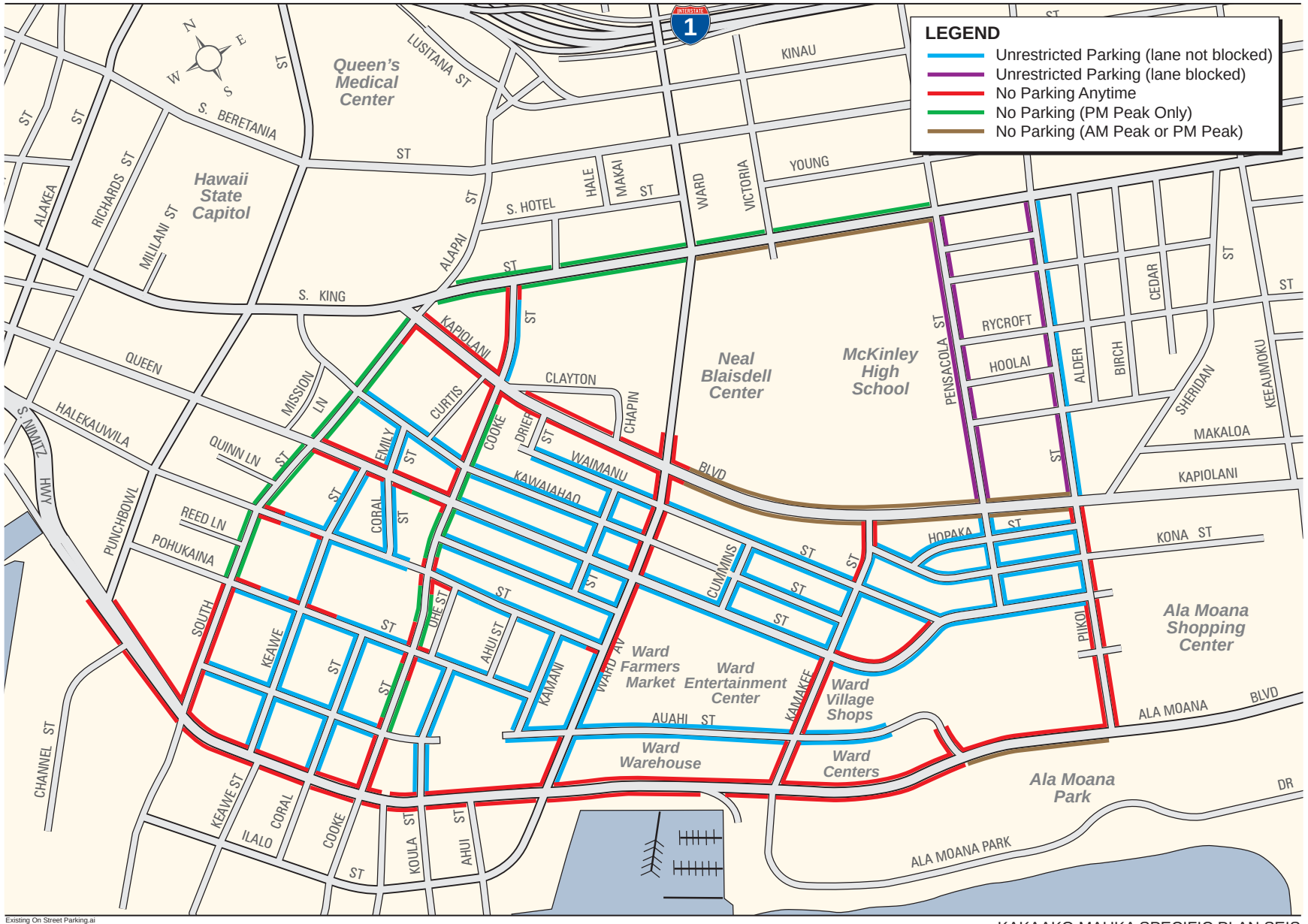
Existing Ped Facilities.ai

KAKAAKO MAUKA AREA PLAN SEIS

Source: Austin, Tsutsumi & Associates, Inc., 2008; DMJM Harris, 2008

Figure 14

EXISTING PEDESTRIAN FACILITIES



Existing On Street Parking.ai

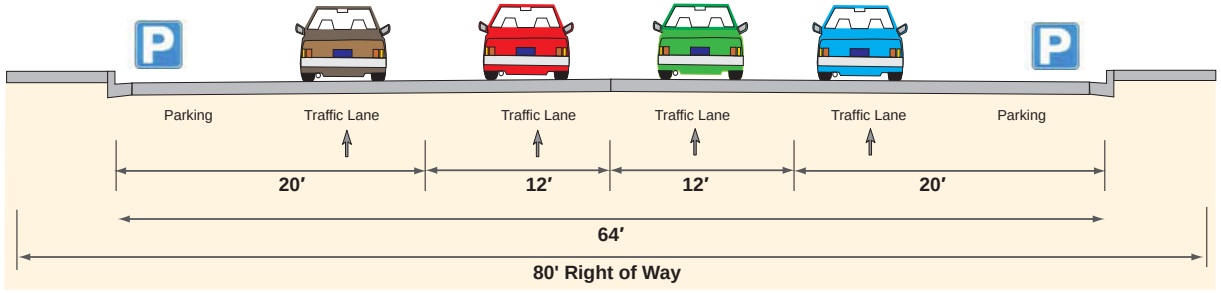
KAKAAKO MAUKA SPECIFIC PLAN SEIS

Source: Austin, Tsutsumi & Associates, Inc., 2008;
DMJM Harris, 2008

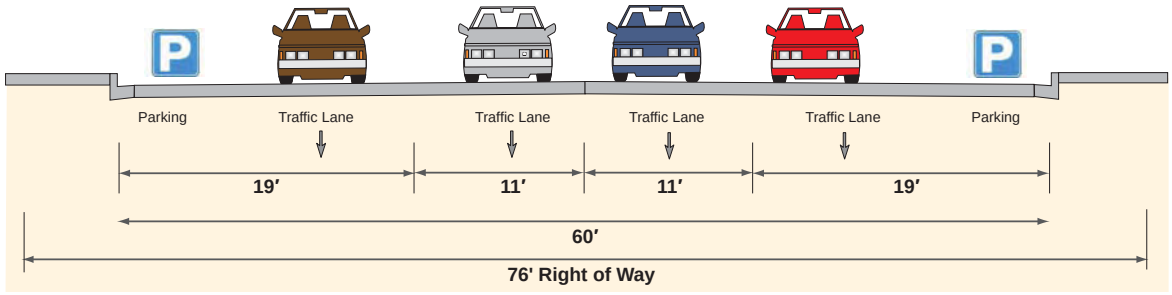
Figure 15

ON-STREET PARKING CONDITIONS

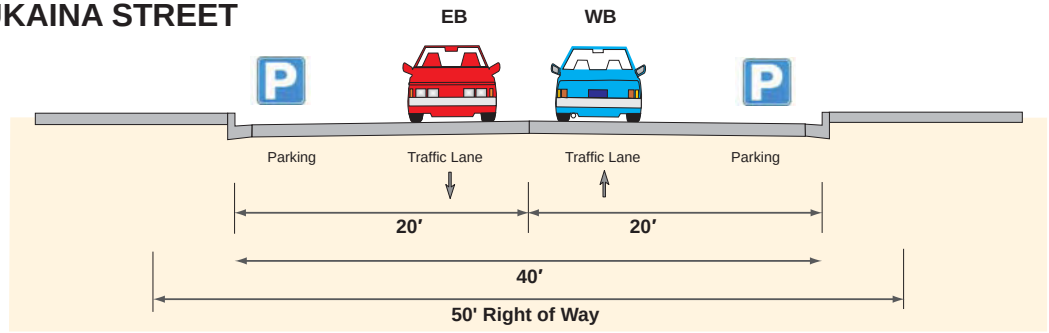
PIIKOI STREET (One Way Northbound)



PENSACOLA STREET (One Way Southbound)



POHUKAINA STREET



PA Cross Sections b.ai

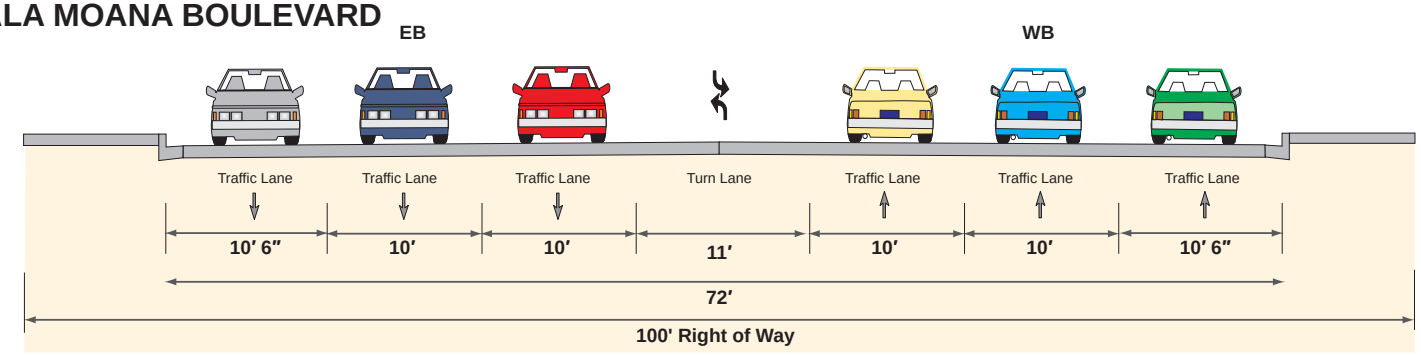
KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

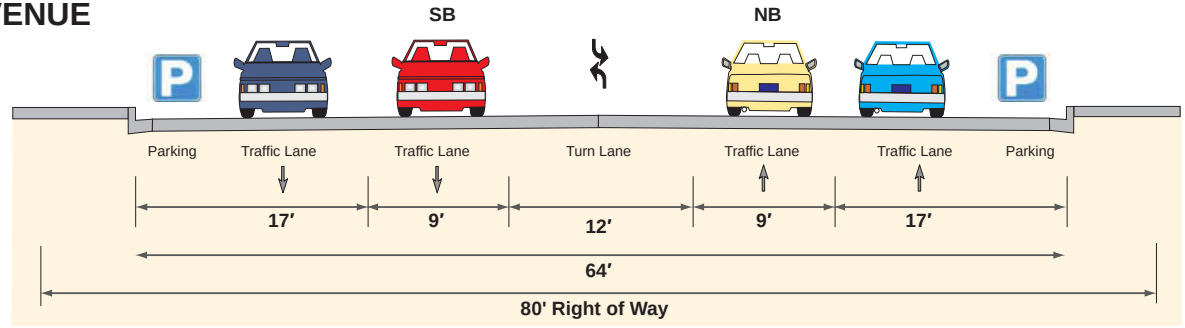
Figure 16a

EXISTING ROADWAY CROSS SECTIONS

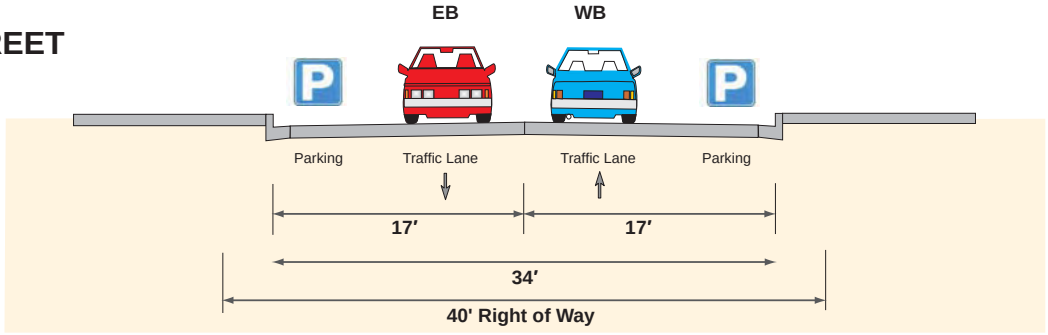
ALA MOANA BOULEVARD



WARD AVENUE



ILANIWAI STREET



Existing Sections b.ai

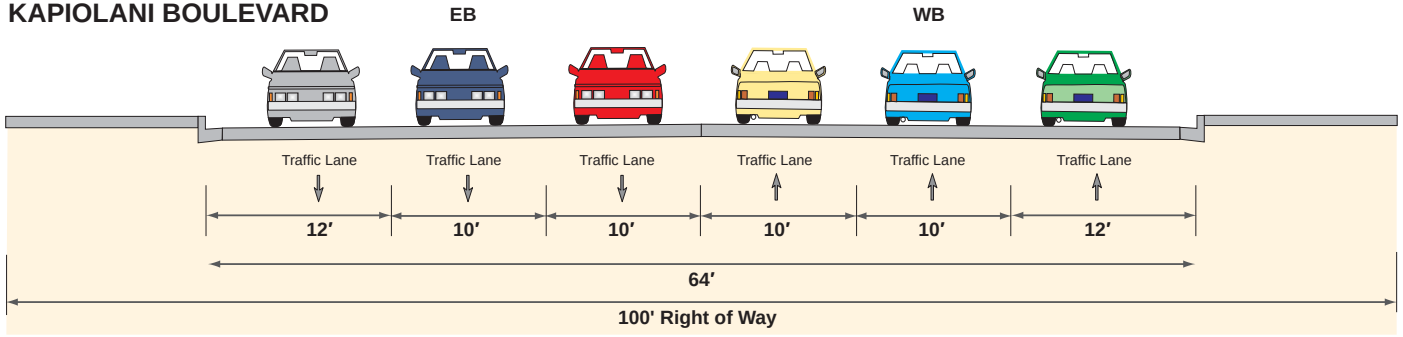
KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

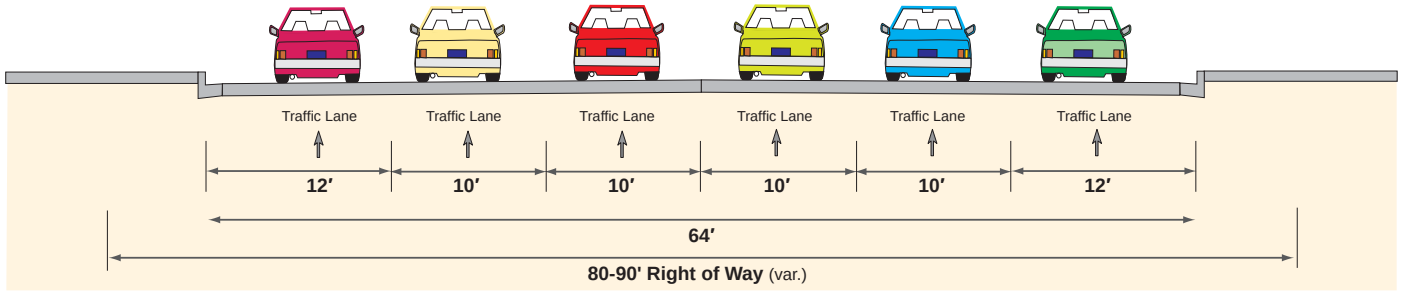
Figure 16b

EXISTING ROADWAY CROSS SECTIONS

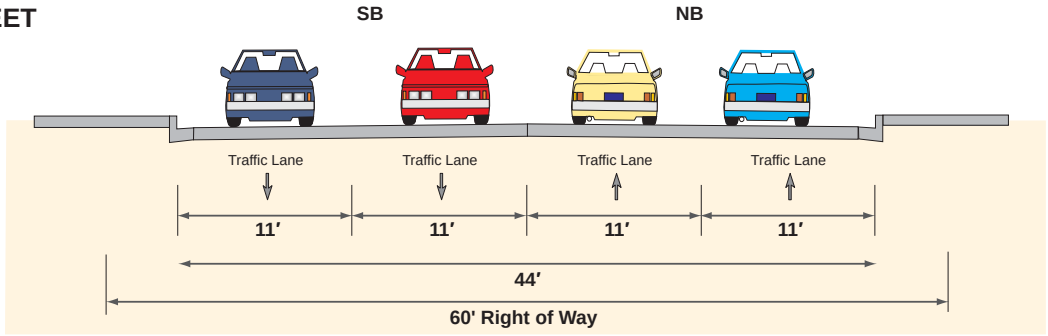
KAPIOLANI BOULEVARD



KING STREET One Way Eastbound



COOKE STREET



PA Cross Sections c.ai

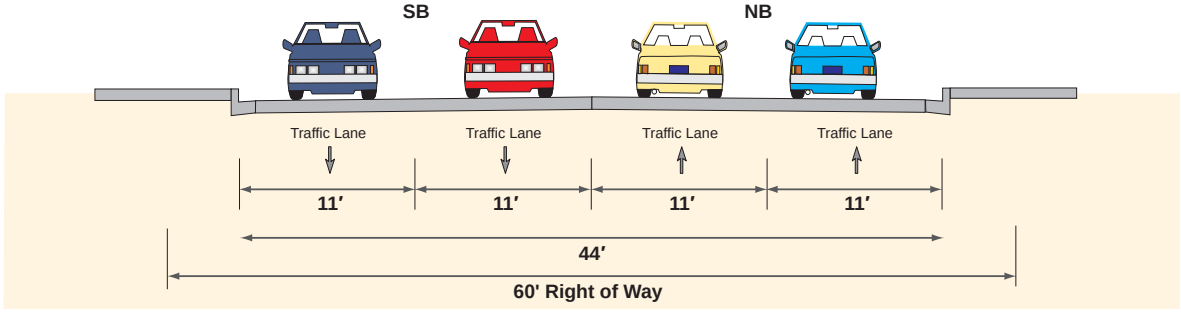
Source: DMJM Harris, 2008

KAKAAKO MAUKA AREA PLAN SEIS

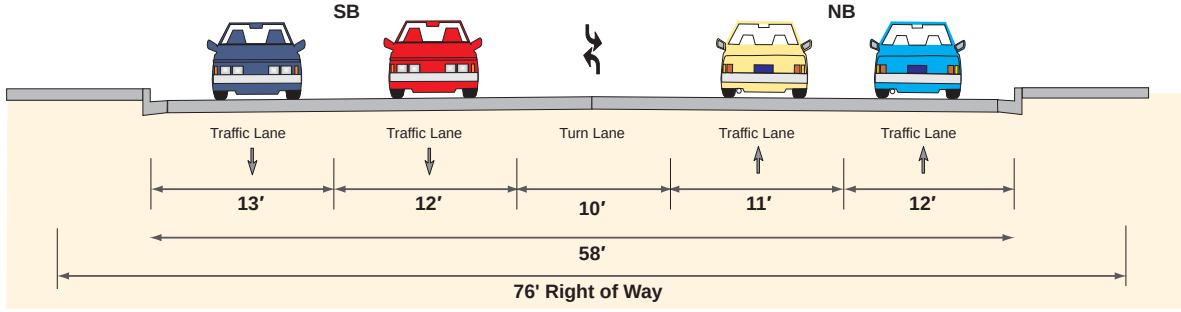
Figure 16c

EXISTING ROADWAY CROSS SECTIONS

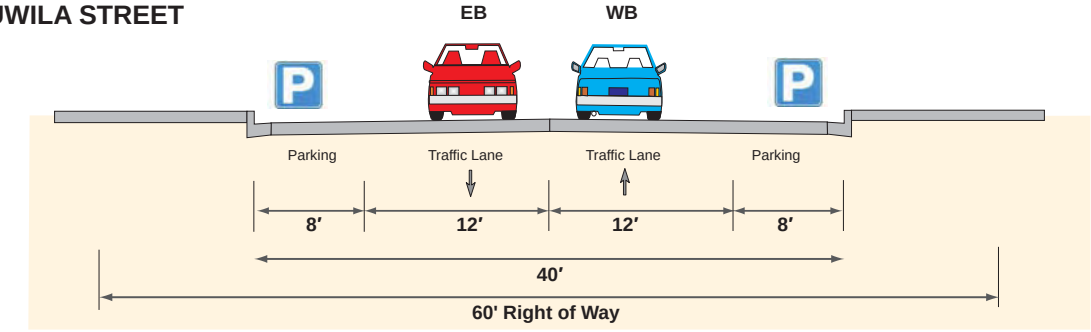
KAMAKEE STREET (between Kapiolani Blvd and Queen St)



KAMAKEE STREET (between Ahaui St and Queen St)



HALEKAUWILA STREET



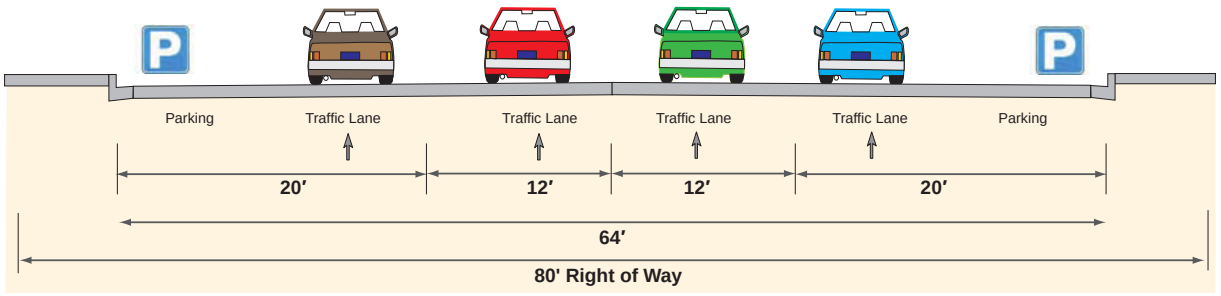
PA Cross Sections d.ai

Source: DMJM Harris, 2008

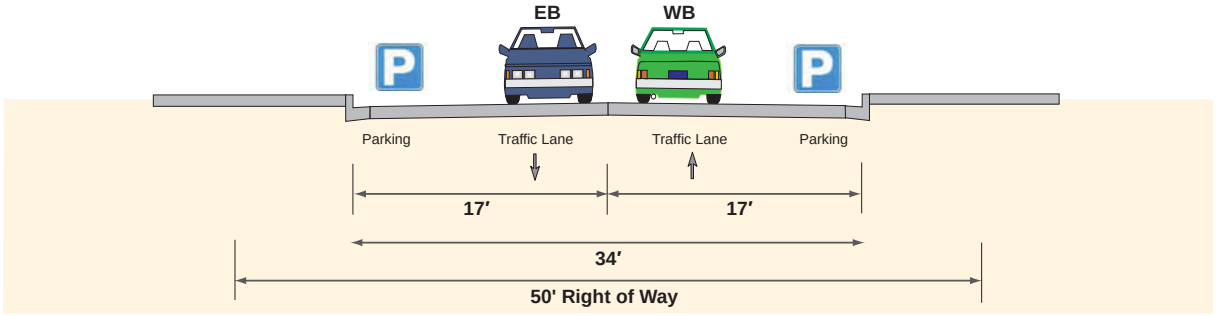
Figure 16d

EXISTING ROADWAY CROSS SECTIONS

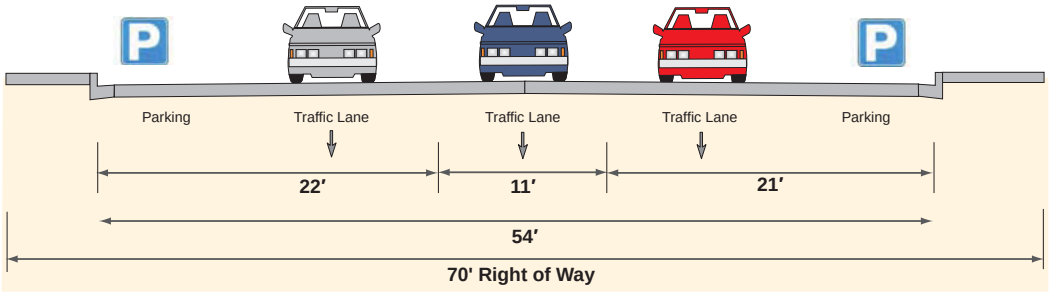
WAIMANU STREET (One Way Eastbound from Pensacola St to Piikoi St)



WAIMANU STREET (from Dreier St to Kamakee St)



PUNCHBOWL STREET (One Way Southbound)



Existing Sections e.ai

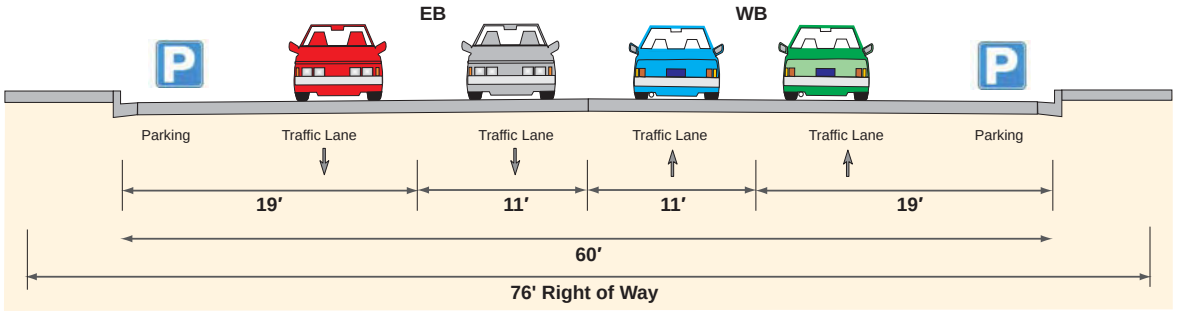
KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

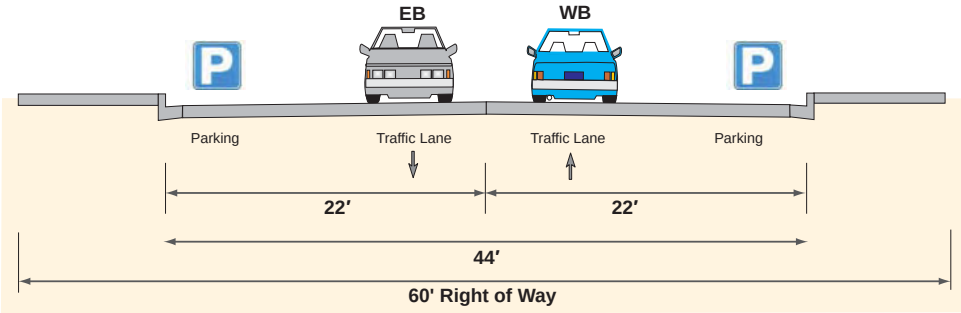
Figure 16e

EXISTING ROADWAY CROSS SECTIONS

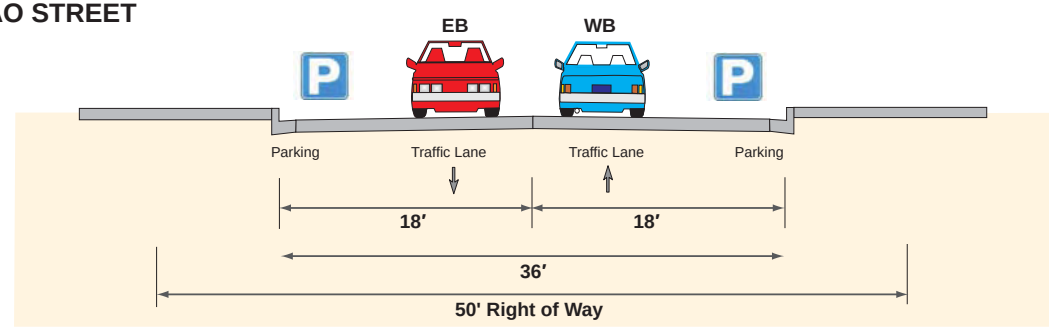
AUAHI STREET (between Ward Av and Kamakee St)



AUAHI STREET (between South St and Cooke St)



KAWAIAHAO STREET



Existing Sections f.ai

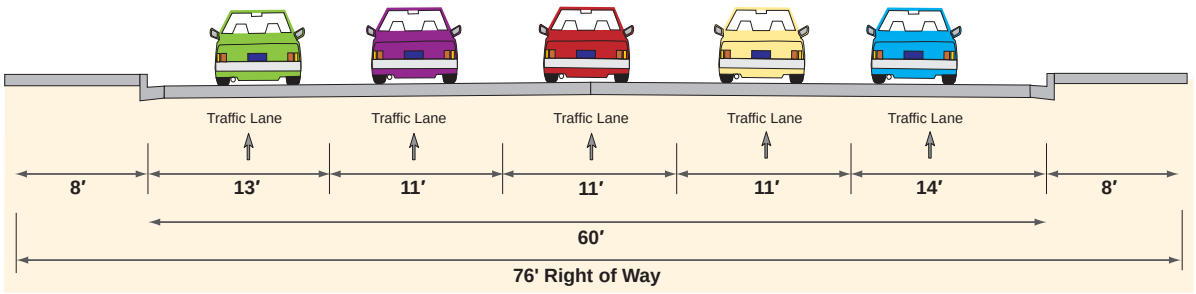
Source: DMJM Harris, 2008

KAKAAKO MAUKA AREA PLAN SEIS

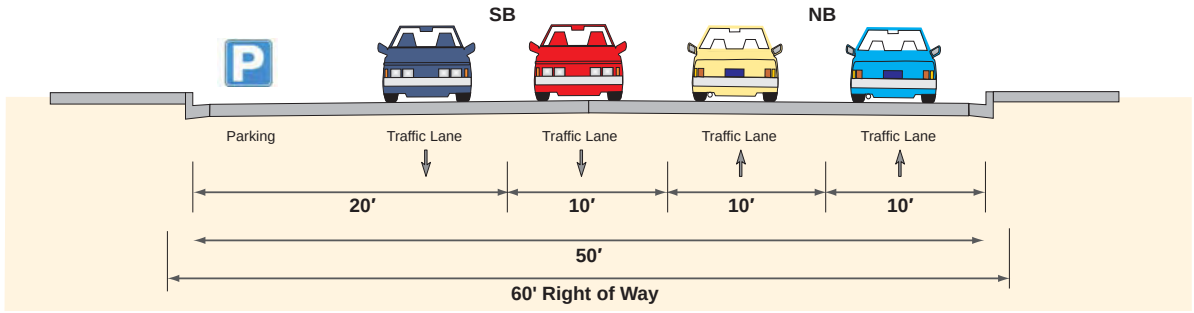
Figure 16f

EXISTING ROADWAY CROSS SECTIONS

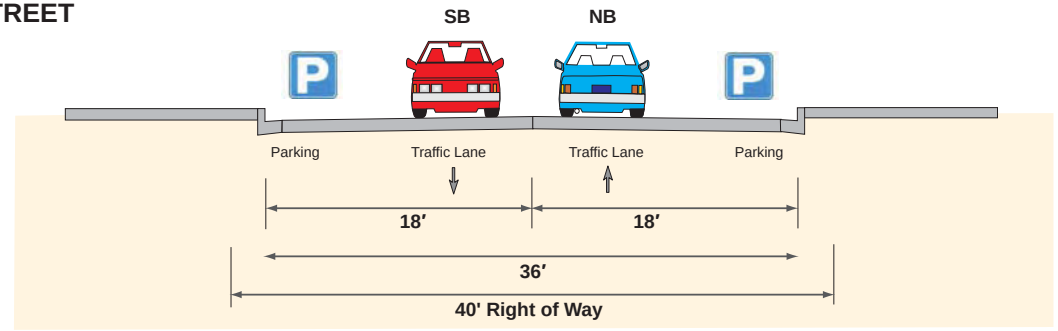
SOUTH STREET (One Way Northbound between Pohukaina St and King St)



SOUTH STREET (between Ala Moana Blvd and Pohukaina St)



KAMANI STREET

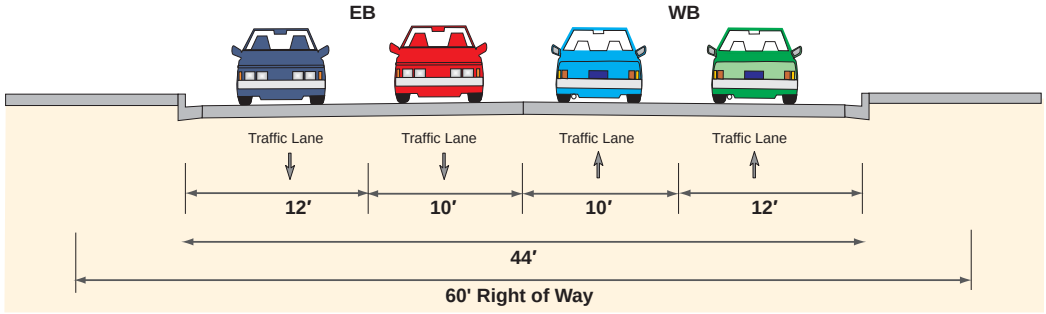


Source: DMJM Harris, 2008

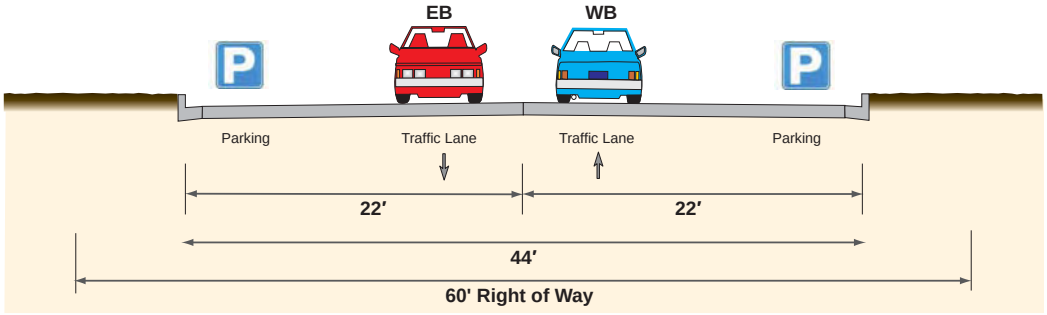
Figure 16g

EXISTING ROADWAY CROSS SECTIONS

QUEEN STREET (between South St and Cooke St)



QUEEN STREET (between Cooke St and Kamakee St)



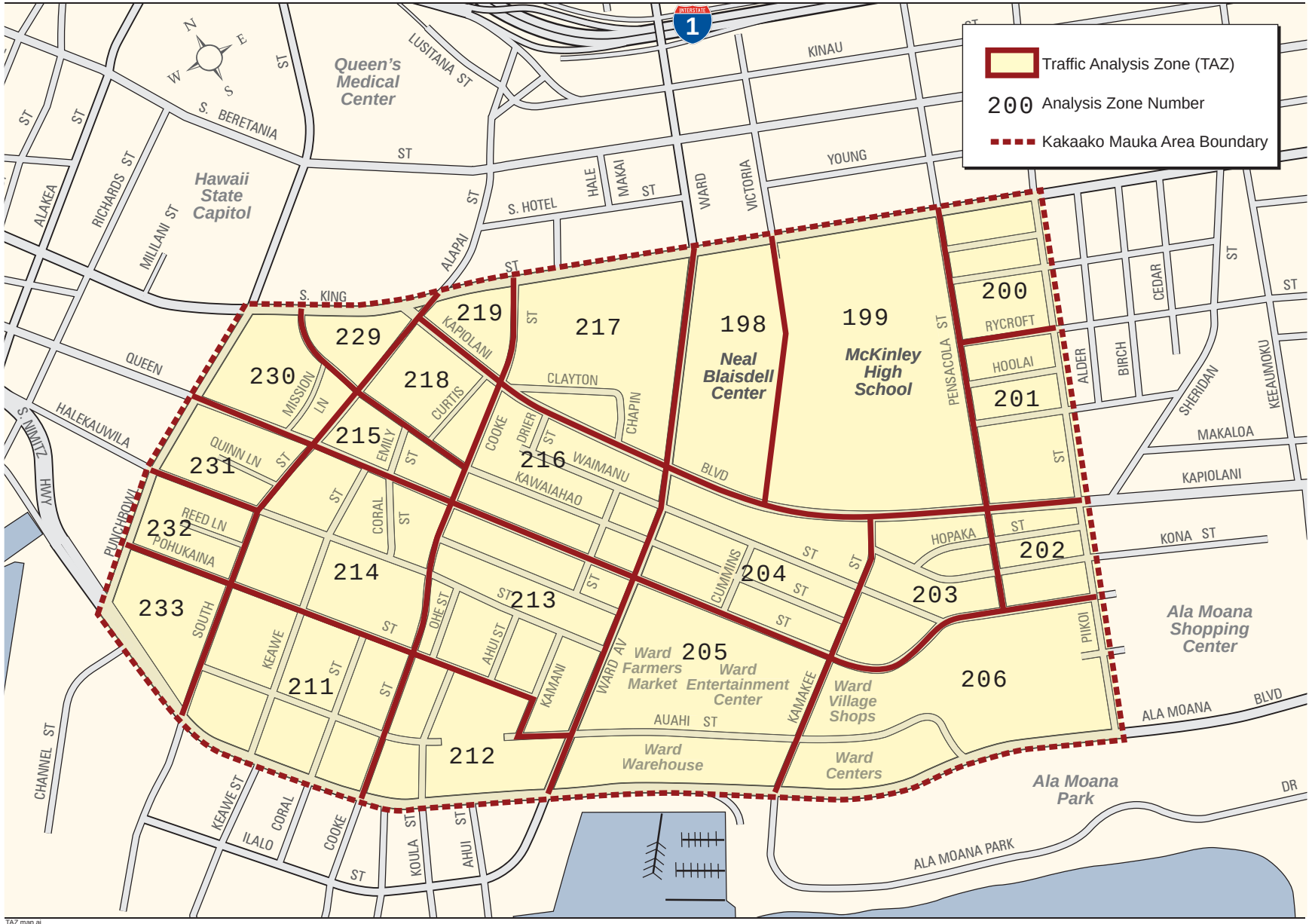
Existing Sections h.ai

Source: DMJM Harris, 2008

KAKAAKO MAUKA AREA PLAN SEIS

Figure 16h

EXISTING ROADWAY CROSS SECTIONS



TAZ map.ai

KAKAAKO MAUKA AREA PLAN SEIS

Source: OMPO, 2003

Figure 17

TRAFFIC ANALYSIS ZONE (TAZ) MAP

4.0 NO ACTION ALTERNATIVE

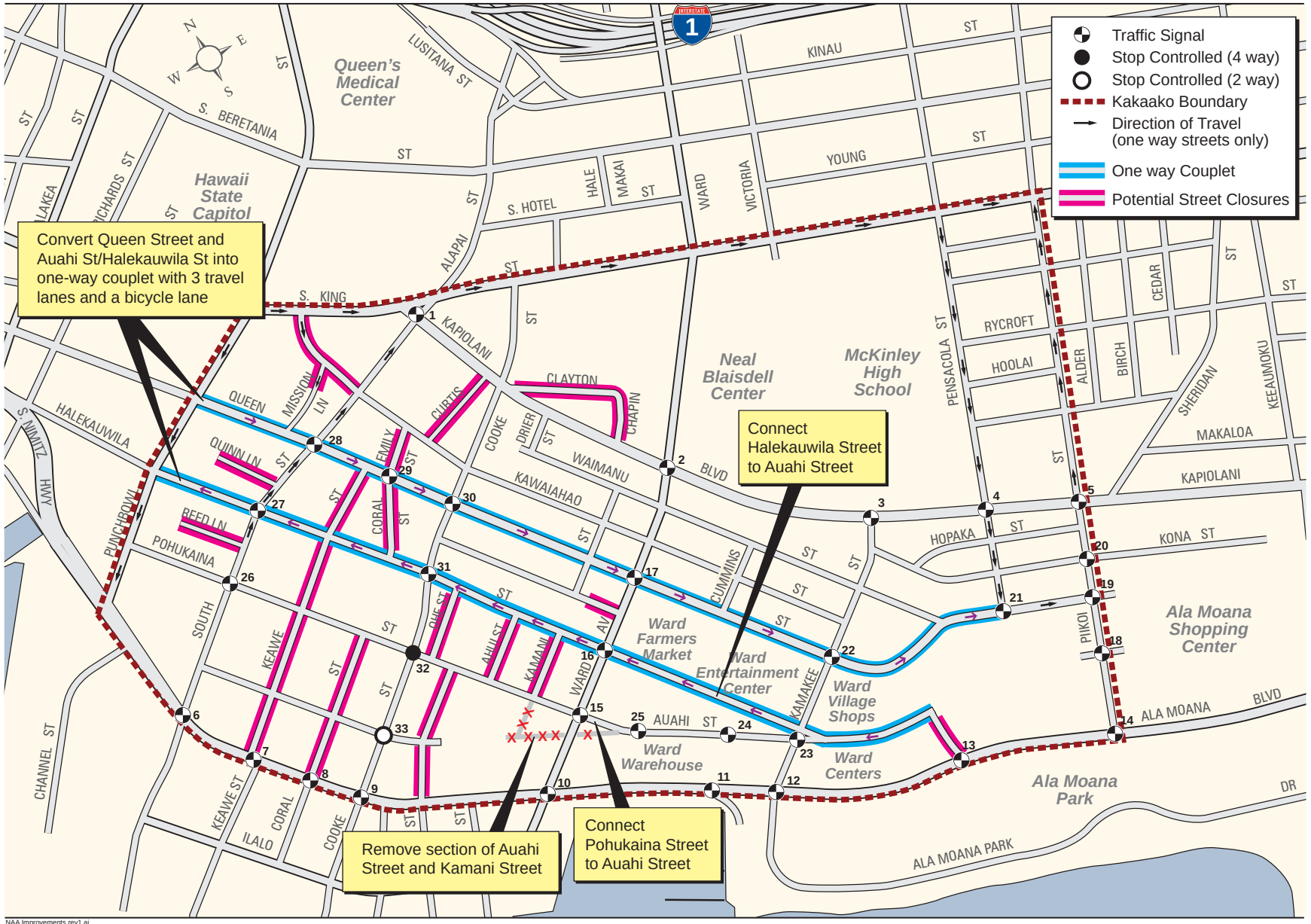
This chapter analyzes expected Cumulative Conditions traffic, transit, bicycle, and pedestrian operations under the No Action Alternative. As mentioned previously, the No Action Alternative assumes that no changes are made to the Existing Mauka Area Plan adopted in 1982.

NO ACTION ALTERNATIVE ROADWAY NETWORK CHANGES

The Existing Mauka Area Plan proposes several changes to the roadway network which have yet to be implemented, including the following:

- Reconfigure Queen Street to operate one-way eastbound with three lanes between South Street and Pensacola Street in conjunction with Halekauwila Street as a one-way couplet;
- Extend Halekauwila Street to Auahi Street and reconfigure Halekauwila Street to operate one-way westbound with three lanes between South Street and Auahi Street;
- Extend Auahi Street from Queen Street to Pensacola Street;
- Realign Auahi Street at Ward Avenue to connect with Pohukaina Street;
- Close off minor streets such as Coral Street, Keawe Street, Emily Street, Ahui Street, and Kamani Street to create superblocks and facilitate larger developments.

The proposed roadway changes are shown in **Figure 18.** Roadway cross sections after implementation of the proposed changes are shown in **Figure 19**.



NAA Improvements rev1.ai

KAKAAKO MAUKA AREA PLAN SEIS

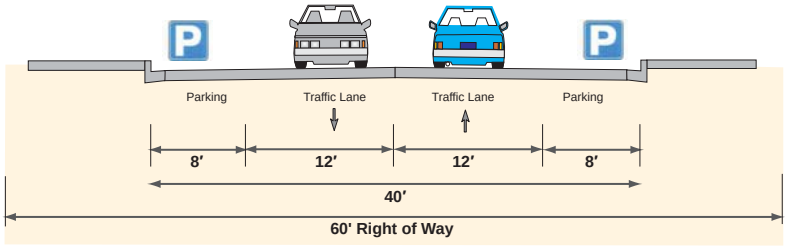
Figure 18

Source: HCDA, 1982, 2008

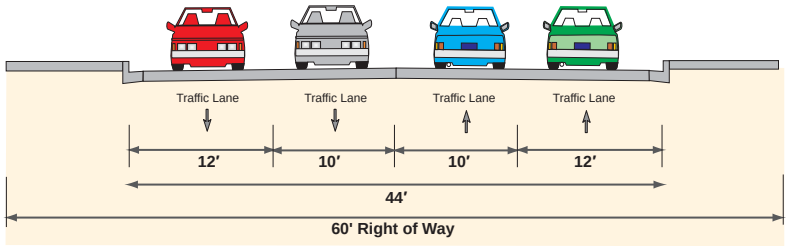
NO ACTION ALTERNATIVE ROADWAY IMPROVEMENTS

EXISTING

Halekauwila Street

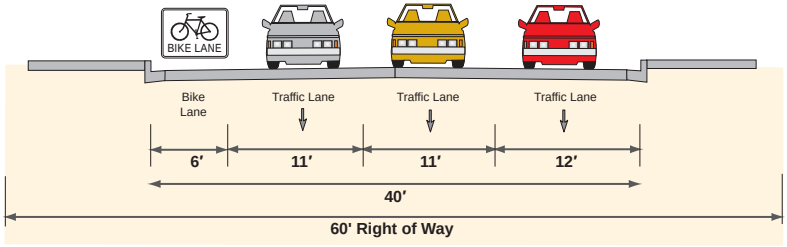


Queen Street

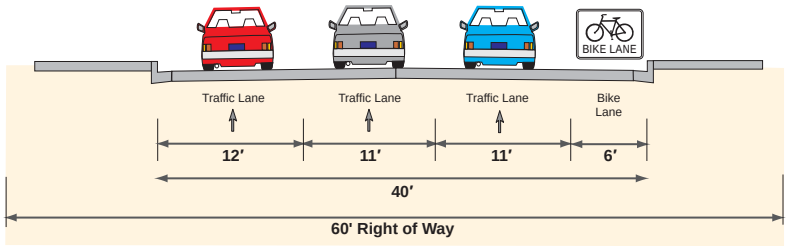


PROPOSED

One Way Westbound



One Way Eastbound



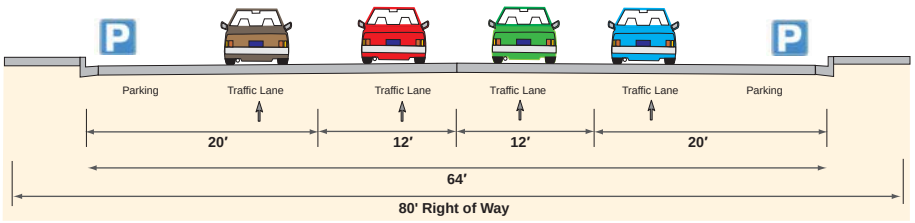
Source: HCDA, 1982, 2008

Figure 19a

NO ACTION ALTERNATIVE ROADWAY CROSS SECTIONS

EXISTING

Piikoi Street One Way Northbound

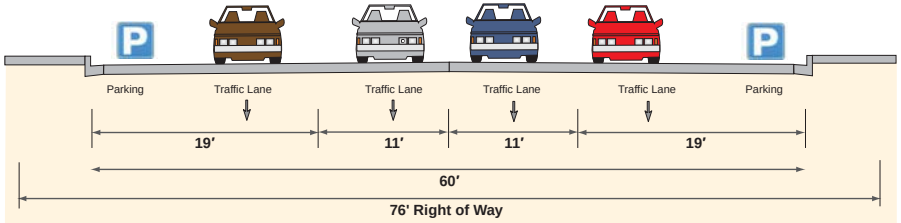


PROPOSED

No Change Proposed

EXISTING

Pensacola Street



PROPOSED

No Change Proposed

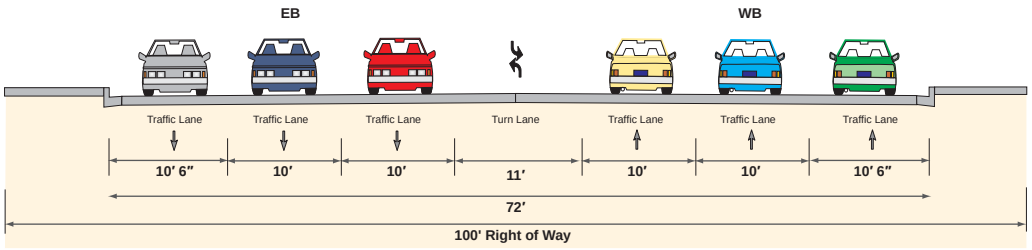
Source: HCDA, 1982, 2008

Figure 19b

NO ACTION ALTERNATIVE ROADWAY CROSS SECTIONS

EXISTING

Ala Moana Boulevard

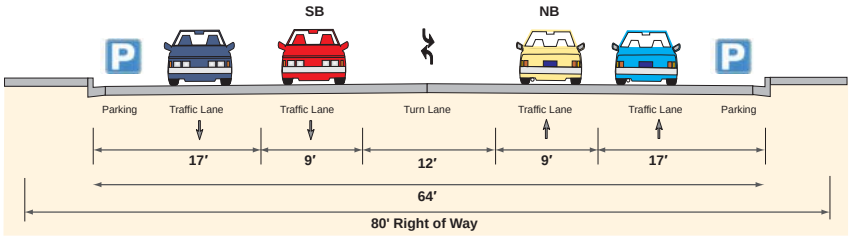


PROPOSED

No Change Proposed

EXISTING

Ward Avenue



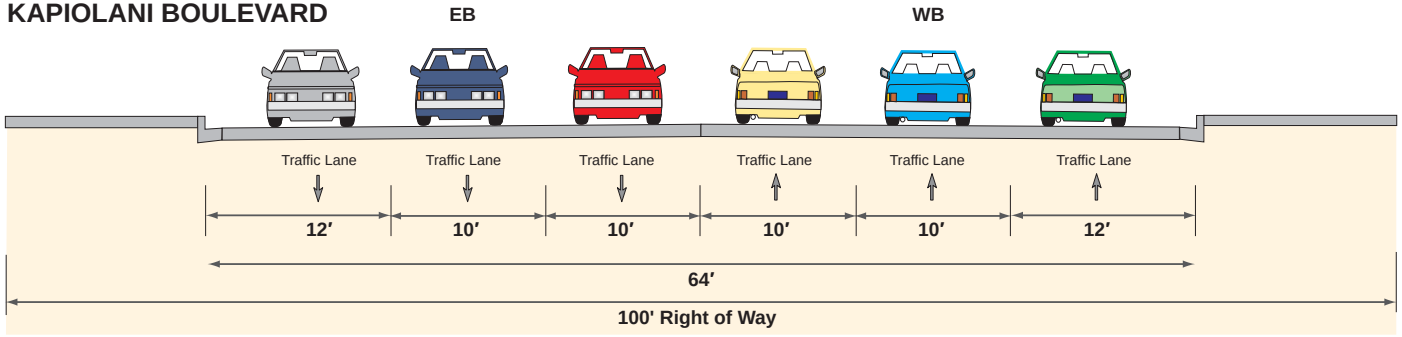
PROPOSED

No Change Proposed

EXISTING

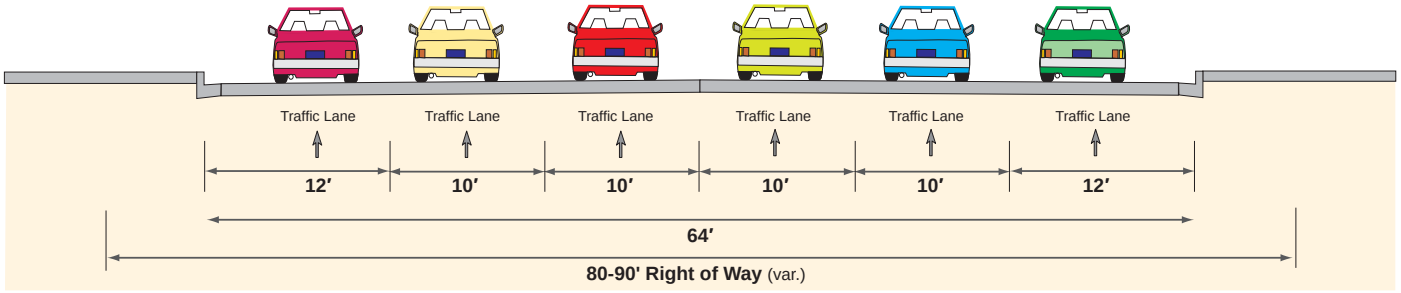
PROPOSED

KAPIOLANI BOULEVARD



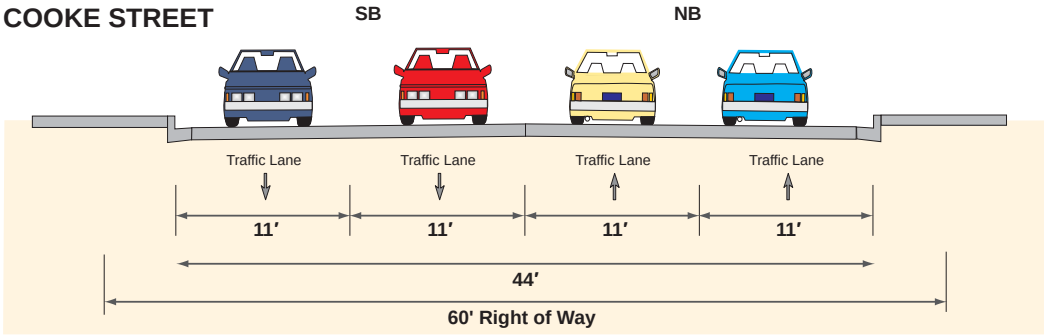
No Change Proposed

KING STREET (One Way Eastbound)



No Change Proposed

COOKE STREET



No Change Proposed

NAA Cross Section d.ai

Source: HCDA, 1982, 2008

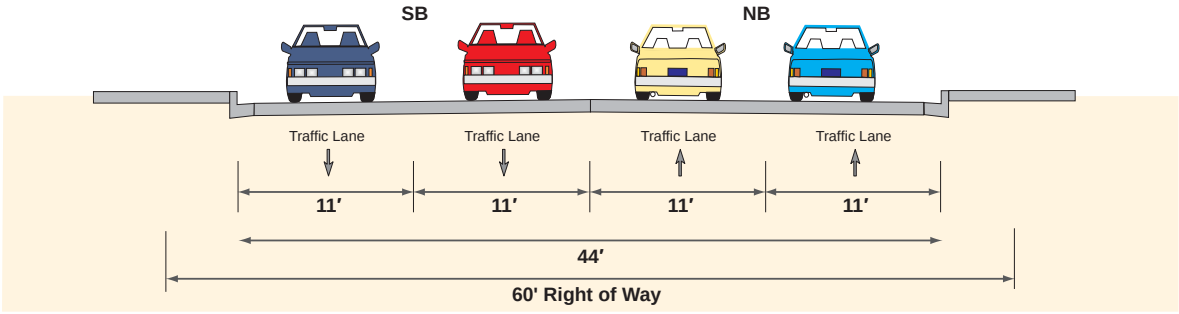
Figure 19d

NO ACTION ALTERNATIVE ROADWAY CROSS SECTIONS

EXISTING

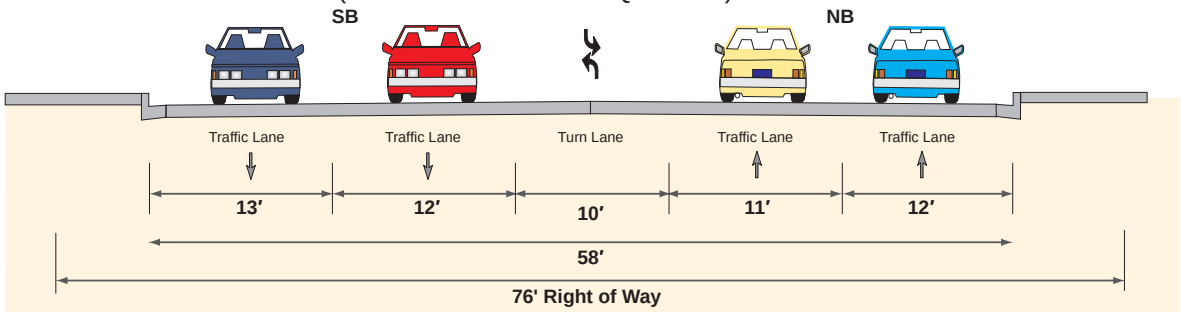
PROPOSED

KAMAKEE STREET (between Kapiolani Blvd and Queen St)



No Change Proposed

KAMAKEE STREET (between Ahaui St and Queen St)



No Change Proposed

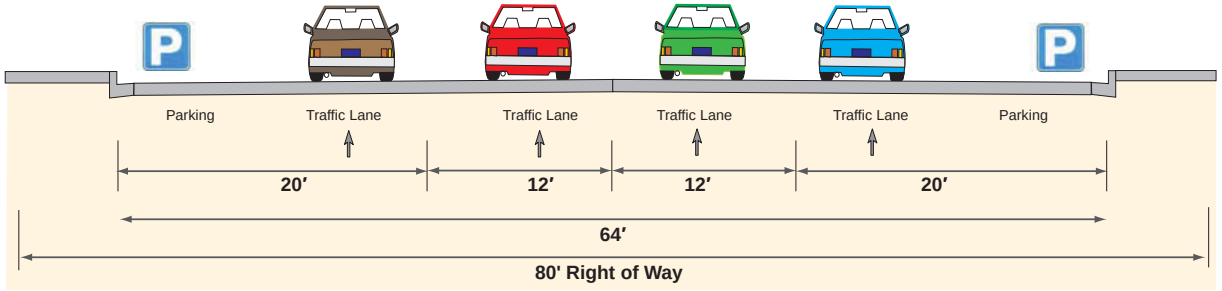
Figure 19e

NO ACTION ALTERNATIVE ROADWAY CROSS SECTIONS

EXISTING

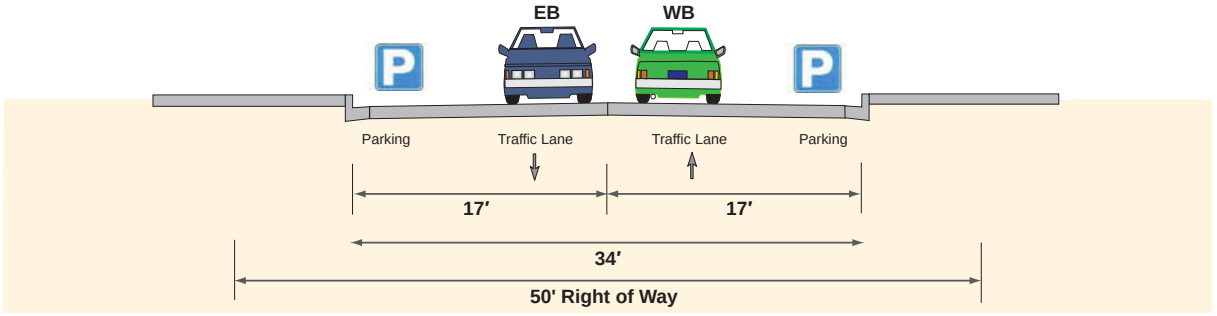
PROPOSED

WAIMANU STREET (One Way Eastbound from Pensacola St to Piikoi St)



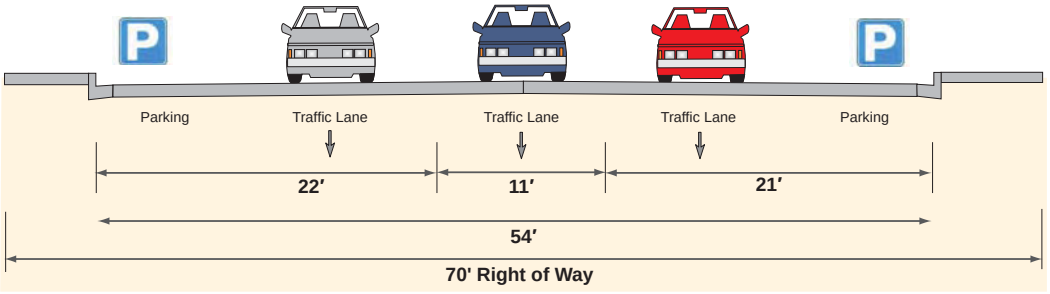
No Change Proposed

WAIMANU STREET (from Dreier St to Kamakee St)



No Change Proposed

PUNCHBOWL STREET (One Way Southbound)



No Change Proposed

NAA Cross Section f.ai

KAKAAKO MAUKA AREA PLAN SEIS

Source: HCDA, 1982, 2008

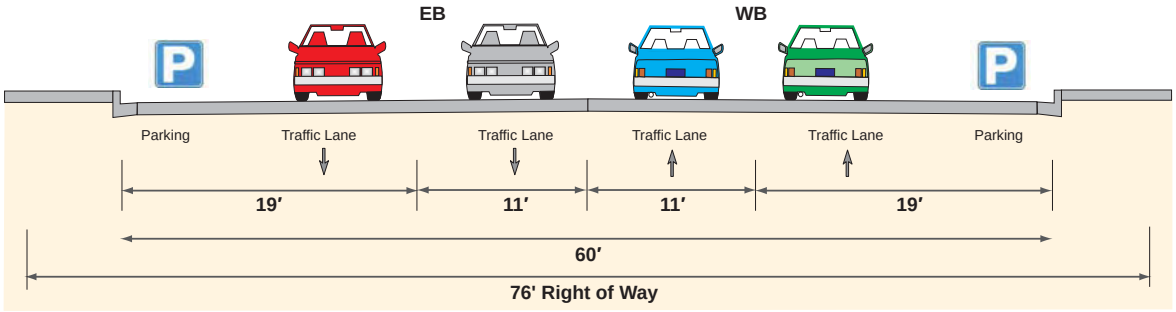
Figure 19f

NO ACTION ALTERNATIVE ROADWAY CROSS SECTIONS

EXISTING

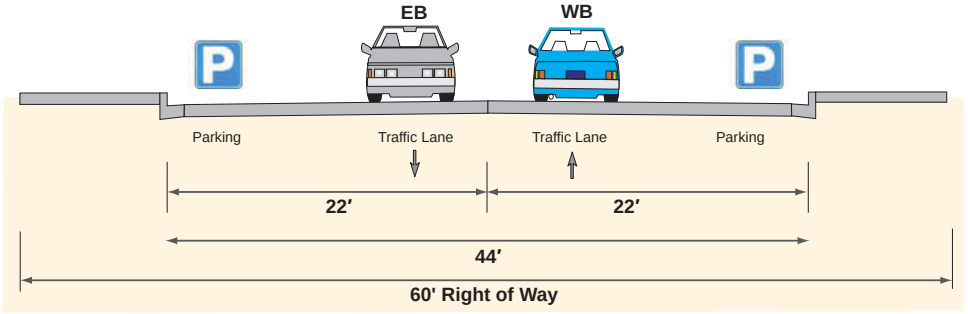
PROPOSED

AUAHI STREET (between Ward Av and Kamakee St)



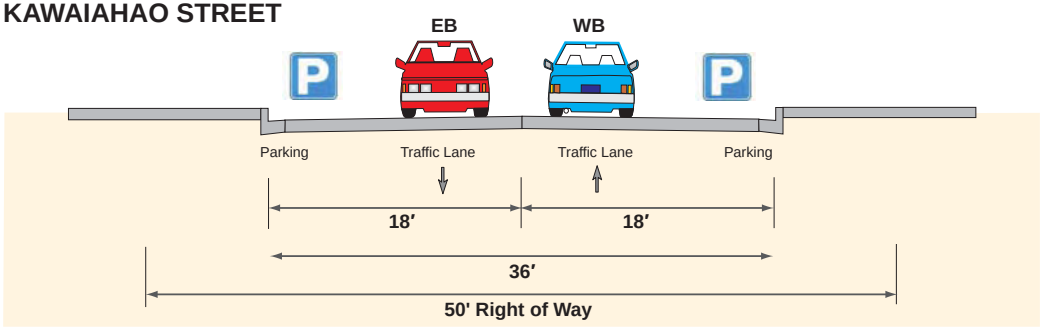
No Change Proposed

AUAHI STREET (between South St and Cooke St)



No Change Proposed

KAWAIAHAO STREET



No Change Proposed

NAA Cross Section g.ai

Source: HCDA, 1982, 2008

KAKAAKO MAUKA AREA PLAN SEIS

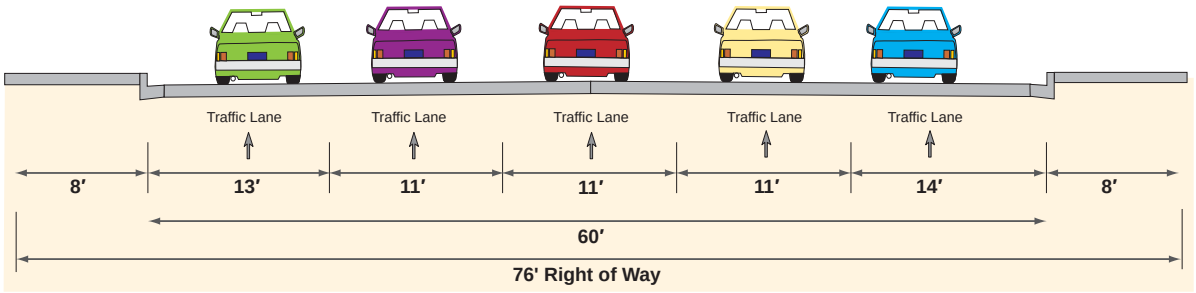
Figure 19g

NO ACTION ALTERNATIVE ROADWAY CROSS SECTIONS

EXISTING

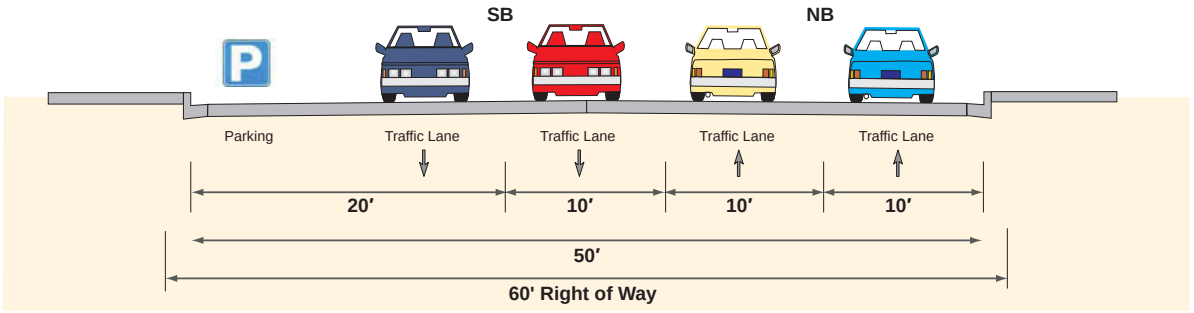
PROPOSED

SOUTH STREET (One Way Northbound between Pohukaina St and King St)



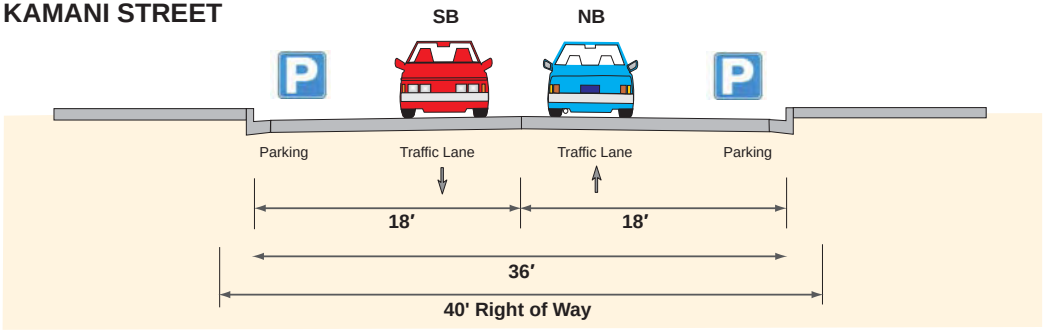
No Change Proposed

SOUTH STREET (between Ala Moana Blvd and Pohukaina St)



No Change Proposed

KAMANI STREET



No Change Proposed

NAA Cross Section h.ai

KAKAAKO MAUKA AREA PLAN SEIS

Source: HCDA, 1982, 2008

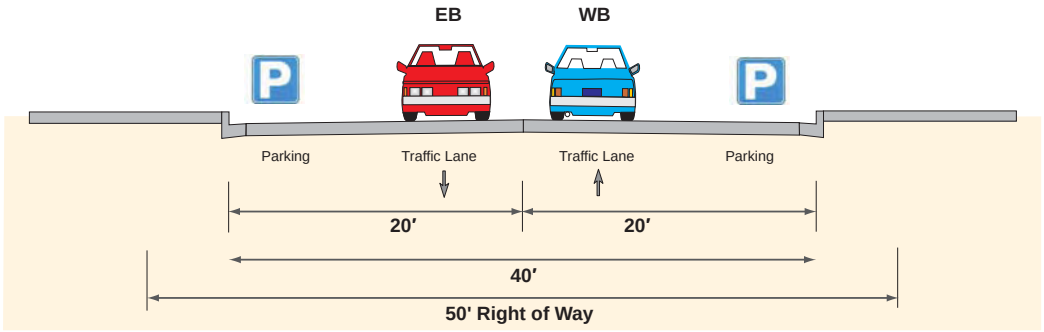
Figure 19h

NO ACTION ALTERNATIVE ROADWAY CROSS SECTIONS

EXISTING

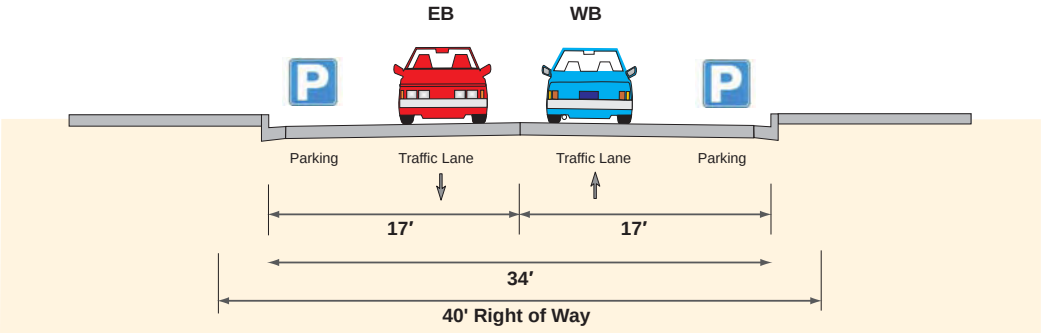
PROPOSED

POHUKAINA STREET



No Change Proposed

ILANIWAI STREET



No Change Proposed

Source: HCDA, 1982, 2008

Figure 19i

NO ACTION ALTERNATIVE ROADWAY CROSS SECTIONS

NO ACTION ALTERNATIVE TRANSIT NETWORK CHANGES

In addition to TheBus services, the Existing Mauka Area Plan proposes an internal shuttle system for circulation within the Mauka Area. The shuttle service would operate in a clockwise loop along Pohukaina Street, South Street, Kawaiahao Street, Kamakee Street, Queen Street, Waimanu Street, Piikoi Street, Kona Street, Pensacola Street to Auahi Street.

The Existing Mauka Area Plan also incorporates a planned heavy rail rapid transit system, the Honolulu Area Rapid Transit (HART) system, which has since been replaced by plans for a fixed guideway system. The proposed HART alignment would have entered the Mauka Area along Kapiolani Boulevard, with a station on Waimanu Street between Ward Avenue and Cummins Street.[3] Although plans for a heavy rail rapid transit system such as HART have been dropped, a fixed guideway system along the congested east-west corridor from Kapolei to UH Manoa is currently under consideration.[4]

The main goal of the fixed guideway system would be to provide faster, more reliable transit, serving as an attractive alternative to the private automobile. The project would strengthen the connection between Kapolei, Downtown Honolulu and the Mauka Area, UH Manoa, and Waikiki. Implementation of the project, in conjunction with other improvements included in the Oahu Regional Transportation Plan (ORTP) published by OMPO, would ease anticipated traffic congestion in the corridor and support the goals of the Oahu General Plan and the ORTP by serving areas designated for urban growth.

In February 2007, the Honolulu City Council approved the Minimum Operable Segment (MOS) to run from East Kapolei to Ala Moana Shopping Center, with two stations planned for the Mauka Area—one at South Street / Halekauwila Street and another adjacent to the Ward Farmers Market and Ward Entertainment Center. In March 2008, modern rail ("steel-on-steel") was selected as the preferred technology for the proposed system.[5]

The 2006 alternatives screening analysis conducted by Parsons Brinckerhoff identified the likely impacts to the existing bus network with the implementation of the fixed guideway system, including changes in service area, routing, hours of operation, and frequency. The expected transit network after implementation of the fixed guideway system, showing station stops as well as bus lines, is illustrated in **Figure 20**.

(3) HCDA. *Kakaako Community Development District Plan: Transportation Plan* (1982).
(4) DTS, City and County of Honolulu. *Honolulu High-Capacity Transit Corridor Project*. http://www.honolulutransit.org/
(5) DTS, City and County of Honolulu. *Honolulu on the Move* (Mar. 2008).

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KAKAAKO MAUKA AREA PLAN SEIS

Figure 20

NO ACTION ALTERNATIVE TRANSIT NETWORK

Source: HCDA, 1982, 2008

NO ACTION ALTERNATIVE BIKEWAY NETWORK CHANGES

The Existing Mauka Area Plan proposes the following bikeway routes in the Mauka Area:

- Bikeway couplet on Punchbowl Street and South Street between King Street and Ala Moana Boulevard;
- Bikeway couplet on King Street and Beretania Street between Punchbowl Street and Piikoi Street;
- Bikeway couplet on Piikoi Street / Queen Street and Pensacola Street / Halekauwila Street between King Street and Punchbowl Street
- Bikeway on Ward Avenue between King Street and Ala Moana Boulevard; and,
- Bikeway on Kamakee Street between Queen Street and Ala Moana Boulevard.

Because of ambiguity between the Existing Mauka Area Plan, *Bike Plan Hawaii 2003*, and the *Honolulu Bicycle Master Plan* (1999), the plan chosen for the analysis presented here is the plan illustrated in **Figure 13**.

The Existing Mauka Area Plan also calls for the installation of bicycle racks and lockers in public parking garages, but prohibits the use of bicycles on the proposed above-street pedestrianway network.

NO ACTION ALTERNATIVE PEDESTRIAN NETWORK CHANGES

In addition to 10-foot wide sidewalks along all streets and crosswalks and curb ramps at all intersections, the Existing Mauka Area Plan also proposes elevated pedestrian crossings over streets to form an above-street pedestrianway system. Pedestrianways would be provided within one block of most parcels in the Mauka Area and would be integrated with adjacent buildings and other pedestrian facilities within superblocks in the Mauka Area. The Existing Mauka Area Plan calls for stairwells and ramps at the end of each structure, with additional access to the pedestrianway system provided by elevators, escalators, and stairways in adjacent buildings connected to the system.

NO ACTION ALTERNATIVE ON-STREET PARKING CHANGES

The Existing Mauka Area Plan proposes that on-street parking should be discouraged as much as possible, with streets reserved for automobile, transit, and bicycle traffic. On-street parking would be provided only on local roadways and only until an adequate supply of off-street parking is available.

4.1 TRAVEL DEMAND

Travel demand refers to the new vehicle, transit, bicycle, pedestrian, and other traffic that would be generated by a proposed project—in this case, the expected development according to the Existing Mauka Area Plan. This section provides an estimate of the travel demand that would be generated by the land use program for the No Action Alternative. Travel demand estimates were partly based on information contained in the Institute of Transportation Engineers' (ITE) *Trip Generation (Seventh Edition)*, with reductions taken to account for linked and passby trips. Linked trips are trips which occur in series en route to a primary destination, such as stopping by a coffee shop on the way to work. Passby trips are existing vehicle trips that deviate from the primary route to make a stop, such as drivers who already use Ward Avenue who decide to stop at a new shopping center.[6]

4.1.1 METHODOLOGY

LAND USE

Land use information for development projects for Cumulative Conditions in the Mauka Area were classified into two categories:

- Pipeline development land use projections, obtained from the 2002 OMPO travel demand forecast model; and,
- Potential development land use projections, based on the likelihood of development of each parcel, compiled by HCDA.

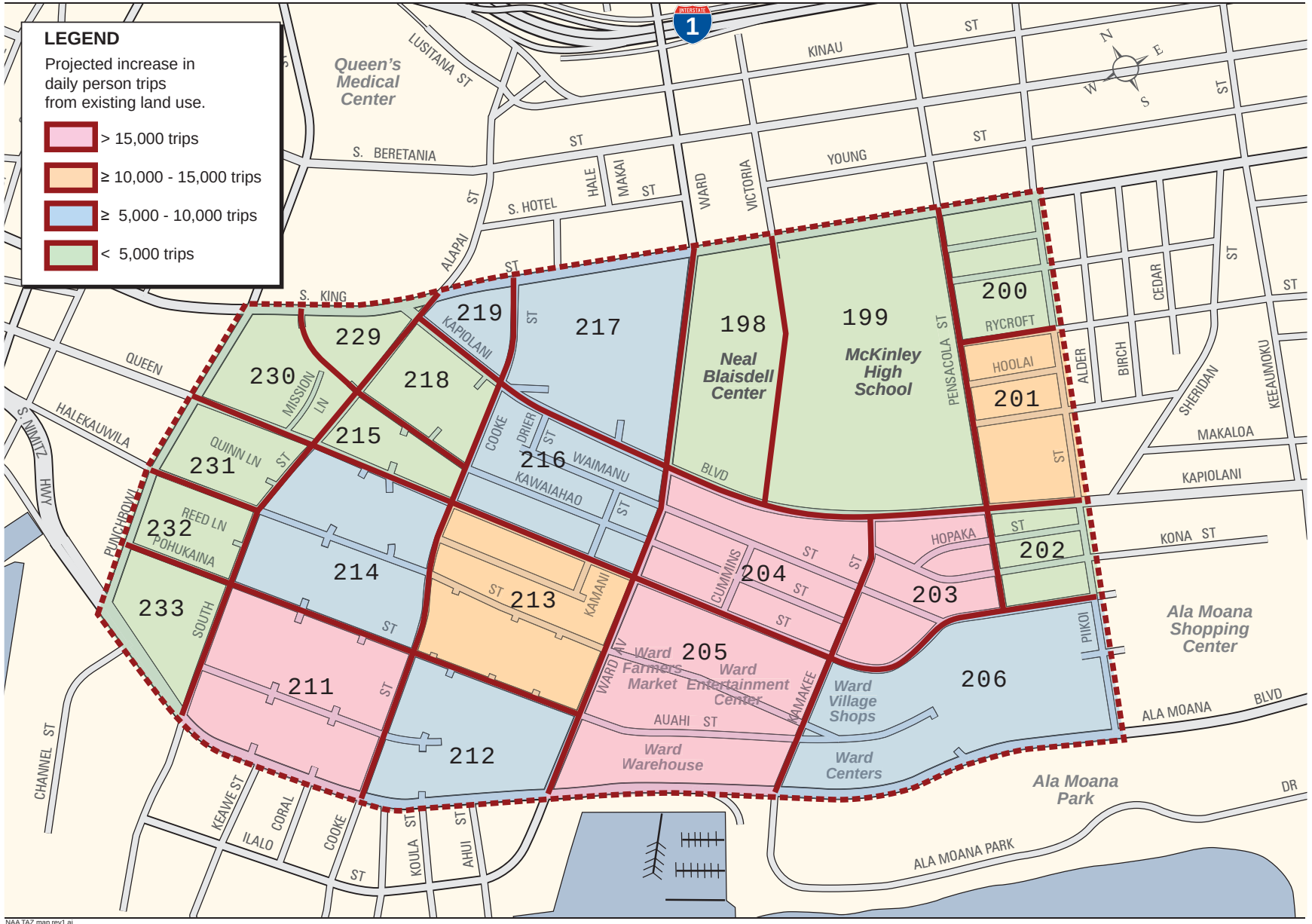
The land use information was categorized into the following uses: residential (expressed in number of dwelling units), office commercial (expressed in total square feet of area), retail commercial (expressed in total square feet of area), and light industrial (expressed in total square feet of area). The land uses were then aggregated by TAZ to simplify the traffic analysis. **Figure 21** shows the approximate increase in trips from Existing Conditions to Cumulative Conditions for each TAZ.

The resulting aggregate land uses for each TAZ were then adjusted to account for projects which were completed after the release of the 2002 travel demand model. Since these projects are complete, their impact on the transportation network is already included in the evaluation of existing conditions.

TRIP GENERATION

ITE's *Trip Generation (Seventh Edition)* provides vehicle trip generation rates for typical land uses. However, the ITE trip generation rates alone do not necessarily reflect people's travel behavior and the multi-modal aspects of the Mauka Area's transportation system.

(6) ITE. *Trip Generation Handbook* (2001).



NAA TAZ map rev1.ai

KAKAAKO MAUKA AREA PLAN SEIS

Source: OMPO, 2003

Figure 21

NO ACTION ALTERNATIVE TRAFFIC ANALYSIS ZONE (TAZ) MAP

Trip generation rates for the proposed land uses were taken from ITE's *Trip Generation (Seventh Edition)* and combined with average vehicle occupancy (AVO) data for home-based work (HBW) trips from the OMPO travel demand forecast model to obtain total person-trips (each individual making one trip counts as a "person-trip"). The AVO for vehicle trips was the result of a Household Interview Survey that provides correlation between Journey to Work vehicle trips and the number of persons occupying each vehicle making such trips. The vehicle occupancy data used to derive the resulting AVO for JTW HBW trips is presented in **Table 6**.

Table 6: No Action Alternative Average Vehicle Occupancy

Vehicle Occupancy			Total Vehicles	Total Persons	AVO
SOV	HOV 2	HOV 3+			
3,835	878	188	4,901	6,155	1.26

Source: Household Classification Survey, OMPO – 1995; OMPO Travel Demand Forecast Model – December 2002; DMJM Harris – 2008

Notes:
SOV = Single-Occupancy Vehicle (driver only)
HOV 2 = High-Occupancy Vehicle with 2 persons (1 driver, 1 passenger)
HOV 3+ = High-Occupancy Vehicles with 3 or more persons (1 driver, 2+ passengers)

Mode split data was obtained from the year 2000 U.S. Census Journey to Work survey for the Mauka Area and adjusted based on Cumulative Conditions OMPO travel demand model projections. This mode split was then used to distribute person-trips across the various travel modes—auto, transit, bicycle, and walk.

Table 7: No Action Alternative Mode Split

Scenario	Auto	Transit	Bicycle	Walk
Existing Conditions	79.9%	11.9%	1.3%	7.0%
Cumulative Conditions	76.9%	12.8%	2.3%	8.0%

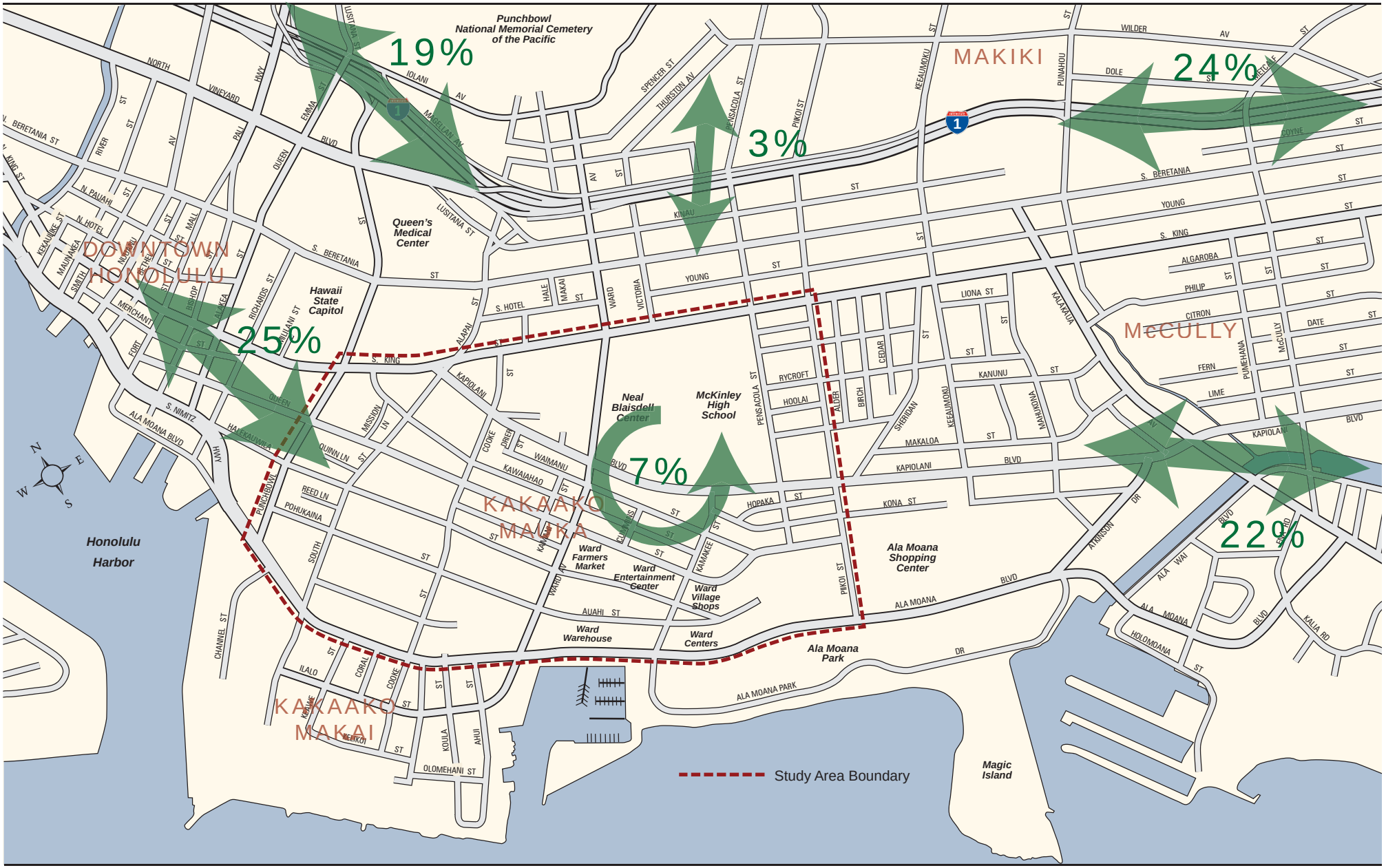
Source: 2000 U.S. Census Journey to Work; OMPO Travel Demand Forecast Model – December 2002; DMJM Harris – 2008

TRIP DISTRIBUTION / ASSIGNMENT

Using Cumulative Conditions OMPO travel demand forecast model traffic volumes, the person-trips by the various modes are then distributed to each of six destination areas:

- To Ewa and the west (via surface streets): 25%
- To Diamond Head and the east (via surface streets): 22%
- To Ewa and the west (via H-1): 19%
- To Diamond Head and the east (via H-1): 24%
- To the north: 3%; and,
- Within Kakaako (Mauka and Makai Areas): 7%.

Figure 22 illustrates the No Action Alternative trip distribution percentages.



NAA Trip Distribution rev1.ai

Source: DMJM Harris, 2008

KAKAAKO MAUKA AREA PLAN SEIS

Figure 22

NO ACTION ALTERNATIVE TRIP DISTRIBUTION

4.1.2 TRAVEL DEMAND

TRIP GENERATION

The person-trips generated by the No Action Alternative are then calculated based on the expected land use program. The resulting peak-hour and daily person-trips by land use are summarized in **Table 8**.

Table 8: No Action Alternative Person-Trip Generation

Land Use	Total Person-Trips		
	Daily	AM Peak Hour	PM Peak Hour
Residential	57,521	4,134	5,035
Retail	63,108	1,081	3,931
Office	47,390	6,909	7,212
Industrial	9,809	1,293	1,378
Total	**177,828**	**13,417**	**17,556**

Source: DMJM Harris – 2008

MODE SPLIT

Using the mode split data presented in **Table 7**, person-trips are then distributed to the various modes of travel. **Table 9** summarizes the resulting trips by mode and vehicle trips for the weekday AM and PM peak hours. It should be noted that there is a distinction between auto person-trips and vehicle trips—the former refers to the number of people using a vehicle for their trip either as driver or passenger, while the latter refers to the number of vehicles actually being used for trip-making.

Table 9: No Action Alternative Trip Generation by Mode

Land Use	Total Person-Trips[1]				Vehicle Trips[2]
	Auto[2]	Transit	Pedestrian	Bicycle	
Weekday AM Peak Hour					
Residential	2,849	529	331	94	2,262
Retail	482	138	87	21	387
Office	5,209	881	554	158	4,134
Industrial	976	165	102	29	775
Total	**9,516**	**1,713**	**1,074**	**302**	**7,558**
Weekday PM Peak Hour					
Residential	3,472	644	401	115	2,756
Retail	1,761	504	315	89	1,400
Office	5,439	925	576	165	4,322
Industrial	1,040	176	109	32	826
Total	**11,712**	**2,249**	**1,401**	**401**	**9,304**

Source: DMJM Harris – 2008

Notes:

(1) The total person-trips presented here do not sum to the total person-trips presented in Table 8 due to reductions for pass-by trips and linked trips.

(2) Auto person-trips refers to the number of people using a vehicle for their trip, whether they are driver or passenger. Vehicle trips refers to the number of actual vehicles on the road.

4.2 IMPACT ANALYSIS

This section presents the assessment of transportation conditions for Cumulative Conditions under the No Action Alternative. The impact analysis considers conditions for traffic, transit, bicycles, and pedestrians.

4.2.1 SIGNIFICANCE CRITERIA

Significance criteria are a means of evaluating the significance of impacts generated by a proposed change. In the case of this analysis, the change being proposed is the change in Cumulative Conditions traffic operations as a result of adoption of the Draft Mauka Area Plan. In order to determine the change in Cumulative Conditions traffic operations under the Draft Mauka Area Plan, a "baseline" case, which assumes no changes to the Existing Mauka Area Plan (currently in effect), must also be evaluated.

As noted previously, the No Action Alternative and Preferred Alternative both evaluate Cumulative Conditions traffic operations, but the former assumes the Existing Mauka Area Plan remains in effect and the latter assumes the Draft Mauka Area Plan is adopted. Since the Existing Mauka Area Plan is currently in effect, the No Action Alternative represents the "baseline" case for evaluating the significance of impacts under the Preferred Alternative. Since the No Action Alternative does not represent a change over the expected Cumulative Conditions traffic operations, any impacts under the No Action Alternative are not considered for mitigation. Therefore, no significance criteria are defined for the No Action Alternative.

4.3 CUMULATIVE CONDITIONS

4.3.1 TRAFFIC CONDITIONS

Cumulative Conditions traffic volumes under the No Action Alternative can be considered a function of two values: the background traffic volumes due to growth from land uses outside of the Mauka Area and the traffic volumes attributable to land use changes in the Mauka Area as a result of development according to the No Action Alternative. This can be summarized using the following equation:

$$V_{NA} = BG \times V_{EX} + V_{Makai} + TG_{NA}$$

where V_{NA} = cumulative traffic volumes under the No Action Alternative
BG = background growth rate
V_{EX} = existing traffic volumes
V_{Makai} = cumulative traffic volumes generated by the Makai Plan
TG_{NA} = cumulative traffic volumes generated under the No Action Alternative

Because the Makai Area is immediately adjacent to the Mauka Area, any Cumulative Conditions analysis must also consider any traffic generated by the Makai Area. Cumulative Conditions traffic volumes for the Makai Plan were based on the 2005 Makai Area Transportation Plan prepared by Wilson Okamoto Corporation. Cumulative east-west through volumes along Ala Moana Boulevard were also compared to volumes given in the same analysis to ensure consistency.

As calculated in Section 3.1, TG_{NA} is a function of the intensity and type of land use.

Cumulative Conditions for the No Action Alternative were analyzed by adding the trips generated by the alternative to expected Cumulative Conditions traffic volumes. A background growth factor (*BG*) of 1.15, based on OMPO travel demand forecast model results, was assumed to account for land use changes in other parts of Oahu that would increase traffic levels within the Mauka Area, and the additional traffic resulting from already constructed but not yet fully occupied projects. The resulting intersection level of service for weekday AM and PM peak hours is summarized in **Table 10**.

Figure 23 and **Figure 24** summarize the existing weekday AM peak hour LOS at each of the intersections and show movements operating at LOS E or LOS F. Where appropriate, the incremental change in traffic volumes over Existing Conditions is included for each movement, in parentheses. **Figure 25** and **Figure 26** summarize the same information for the weekday PM peak hour.

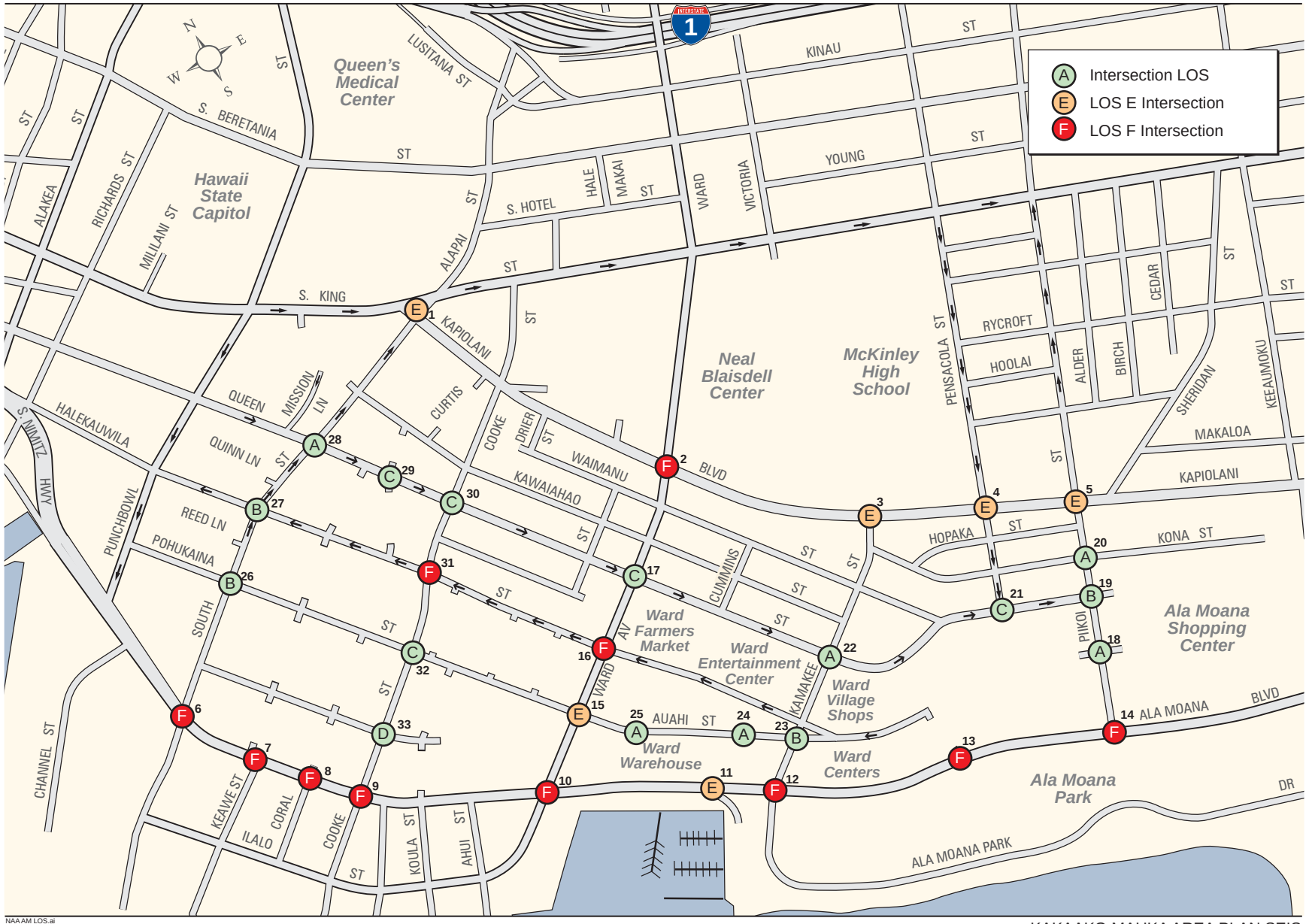
Table 10: No Action Alternative Intersection Level of Service

Intersection		Peak Hour	Existing Conditions		Cumulative Conditions – No Action Alternative	
			LOS	Delay	LOS	Delay
1	Kapiolani Blvd / South St / King St	AM	C	30.6	E	66.3
		PM	C	32.0	F	>80.0
2	Kapiolani Blvd / Ward Ave	AM	D	39.6	F	>80.0
		PM	E	57.1	F	>80.0
3	Kapiolani Blvd / Kamakee St	AM	A	8.7	E	75.6
		PM	A	6.9	C	24.8
4	Kapiolani Blvd / Pensacola St	AM	B	19.6	E	75.9
		PM	C	21.5	D	39.1
5	Kapiolani Blvd / Piikoi St	AM	C	22.9	E	58.1
		PM	C	24.2	D	37.0
6	Ala Moana Blvd / South St	AM	C	26.0	F	>80.0
		PM	B	18.6	F	>80.0
7	Ala Moana Blvd / Keawe St	AM	D	40.6	F	>80.0
		PM	E	66.4	F	>80.0
8	Ala Moana Blvd / Coral St	AM	B	10.9	F	>80.0
		PM	B	10.5	F	>80.0
9	Ala Moana Blvd / Cooke St	AM	B	10.2	F	>80.0
		PM	A	4.9	F	>80.0
10	Ala Moana Blvd / Ward Ave	AM	E	79.8	F	>80.0
		PM	F	>80.0	F	>80.0
11	Ala Moana Blvd / Kewalo Basin	AM	A	4.1	D	37.4
		PM	A	6.2	E	71.6
12	Ala Moana Blvd / Kamakee St	AM	B	11.3	F	>80.0
		PM	B	19.5	F	>80.0
13	Ala Moana Blvd / Queen St	AM	A	7.4	F	>80.0
		PM	B	12.0	F	>80.0

Intersection		Peak Hour	Existing Conditions		Cumulative Conditions – No Action Alternative	
			LOS	Delay	LOS	Delay
14	Ala Moana Blvd / Piikoi St	AM	F	>80.0	F	>80.0
		PM	E	64.3	F	>80.0
15	Ward Ave / Auahi St	AM	B	15.5	C	31.9
		PM	C	21.5	F	>80.0
16	Ward Ave / Halekauwila St	AM	A	7.3	D	54.3
		PM	C	21.4	D	43.0
17	Ward Ave / Queen St	AM	C	25.4	C	30.1
		PM	D	50.3	D	53.5
18	Piikoi St / Ala Moana Ctr	AM	A	7.2	A	9.0
		PM	C	21.1	B	18.8
19	Piikoi St / Waimanu St	AM	C	24.7	B	13.2
		PM	C	29.6	C	26.4
20	Piikoi St / Kona St	AM	A	9.1	B	10.0
		PM	B	13.8	B	11.2
21	Pensacola St / Waimanu St	AM	B	18.4	A	9.2
		PM	E	55.1	B	14.2
22	Kamakee St / Queen St	AM	B	11.3	A	7.1
		PM	C	20.4	A	8.4
23	Kamakee St / Auahi St	AM	B	17.1	B	13.3
		PM	C	24.9	C	26.7
24	Auahi St / Ward Entrmt. Ctr.	AM	A	1.8	A	1.9
		PM	A	6.4	A	9.1
25	Auahi St / Ward Warehouse	AM	A	3.2	A	2.8
		PM	A	6.4	A	6.9
26	South St / Pohukaina St	AM	B	16.2	C	24.1
		PM	B	17.6	E	55.6
27	South St / Halekauwila St	AM	B	14.2	B	12.3
		PM	B	17.0	B	14.7

Intersection		Peak Hour	Existing Conditions		Cumulative Conditions – No Action Alternative	
			LOS	Delay	LOS	Delay
28	South St / Queen St	AM	B	19.2	B	15.2
		PM	C	23.4	C	25.0
29	Queen St / Emily St	AM	B	16.1	C	26.8
		PM	B	15.0	C	33.1
30	Queen St / Cooke St	AM	B	17.7	B	14.7
		PM	B	17.4	B	15.1
31	Halekauwila St / Cooke St	AM	B	11.6	B	11.9
		PM	B	13.6	B	11.0
32	Pohukaina St / Cooke St	AM	B	11.0	D	30.2
		PM	C	16.8	F	>50.0
33	Auahi St / Cooke St	AM	B	12.9	C	18.8
		PM	B	13.4	D	29.2

Source: DMJM Harris – 2008
Notes:
Delay in seconds per vehicle



KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 23

NO ACTION ALTERNATIVE INTERSECTION LEVEL OF SERVICE

AM Peak Hour

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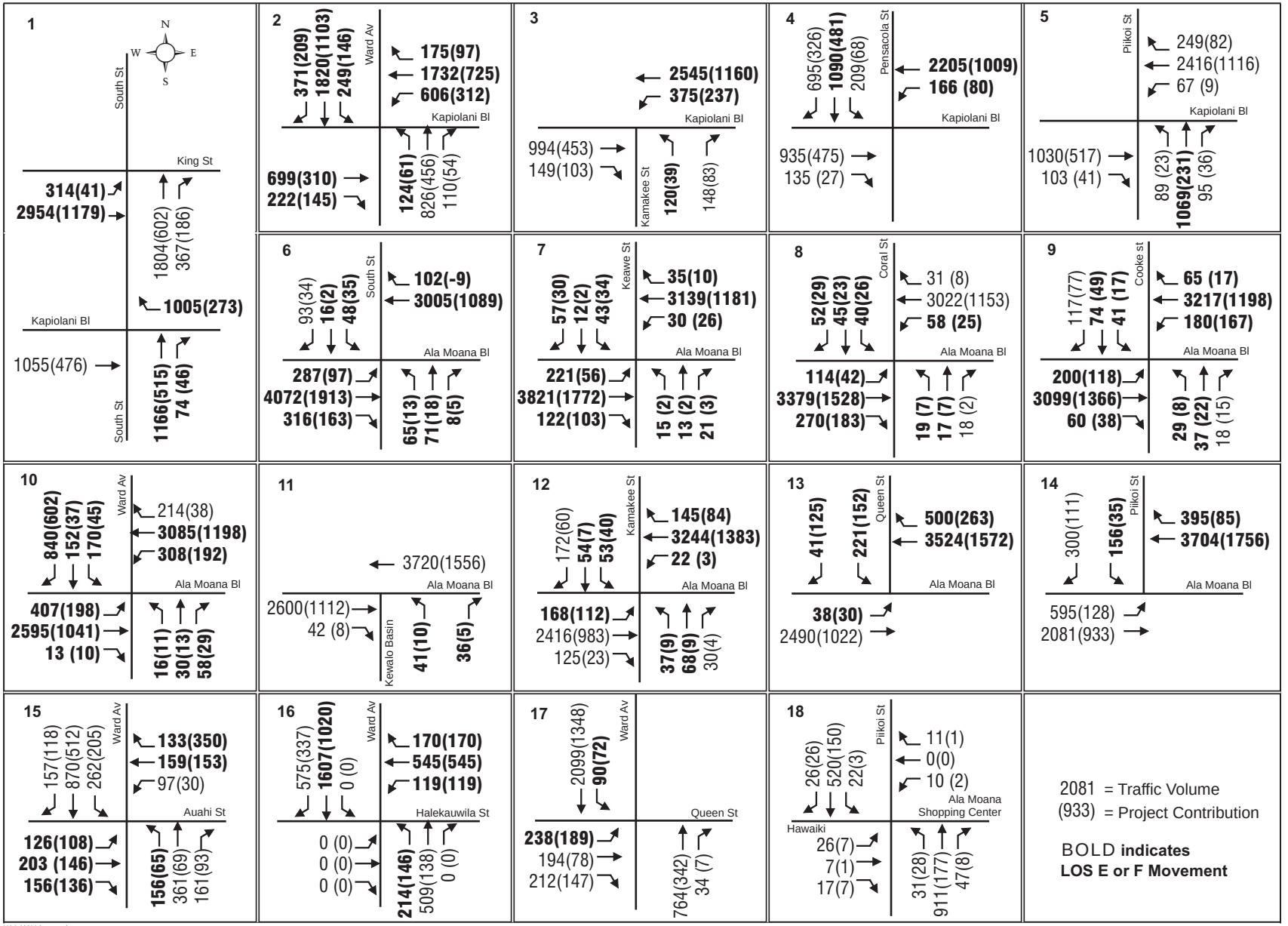


NAA AM Volumes.cdr

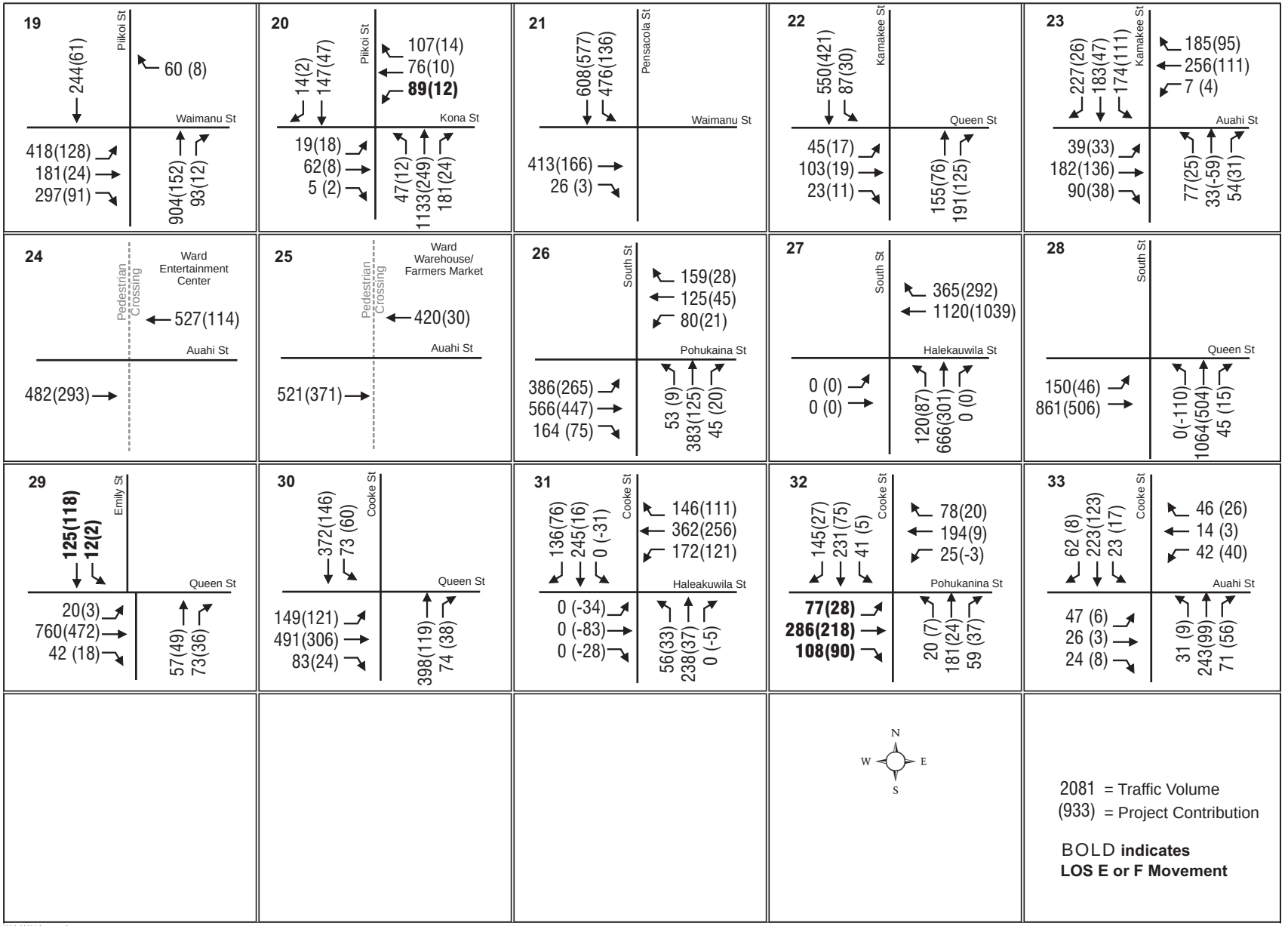
KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 24a

NO ACTION ALTERNATIVE TRAFFIC VOLUMES

AM Peak Hour



NAA AM Volumes.cdr

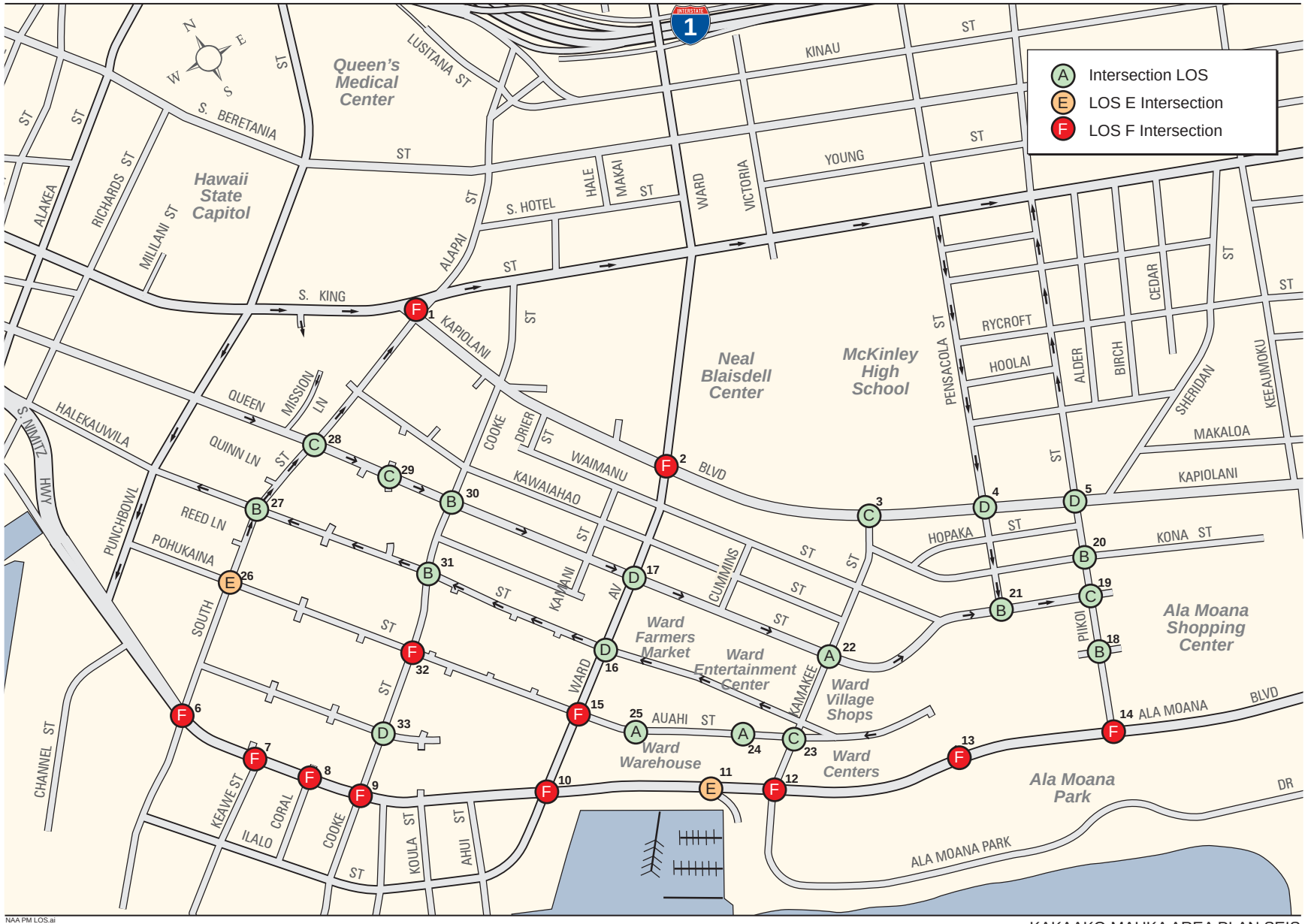
KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 24b

NO ACTION ALTERNATIVE TRAFFIC VOLUMES

AM Peak Hour



NAA PM LOS.ai

KAKAAKO MAUKA AREA PLAN SEIS

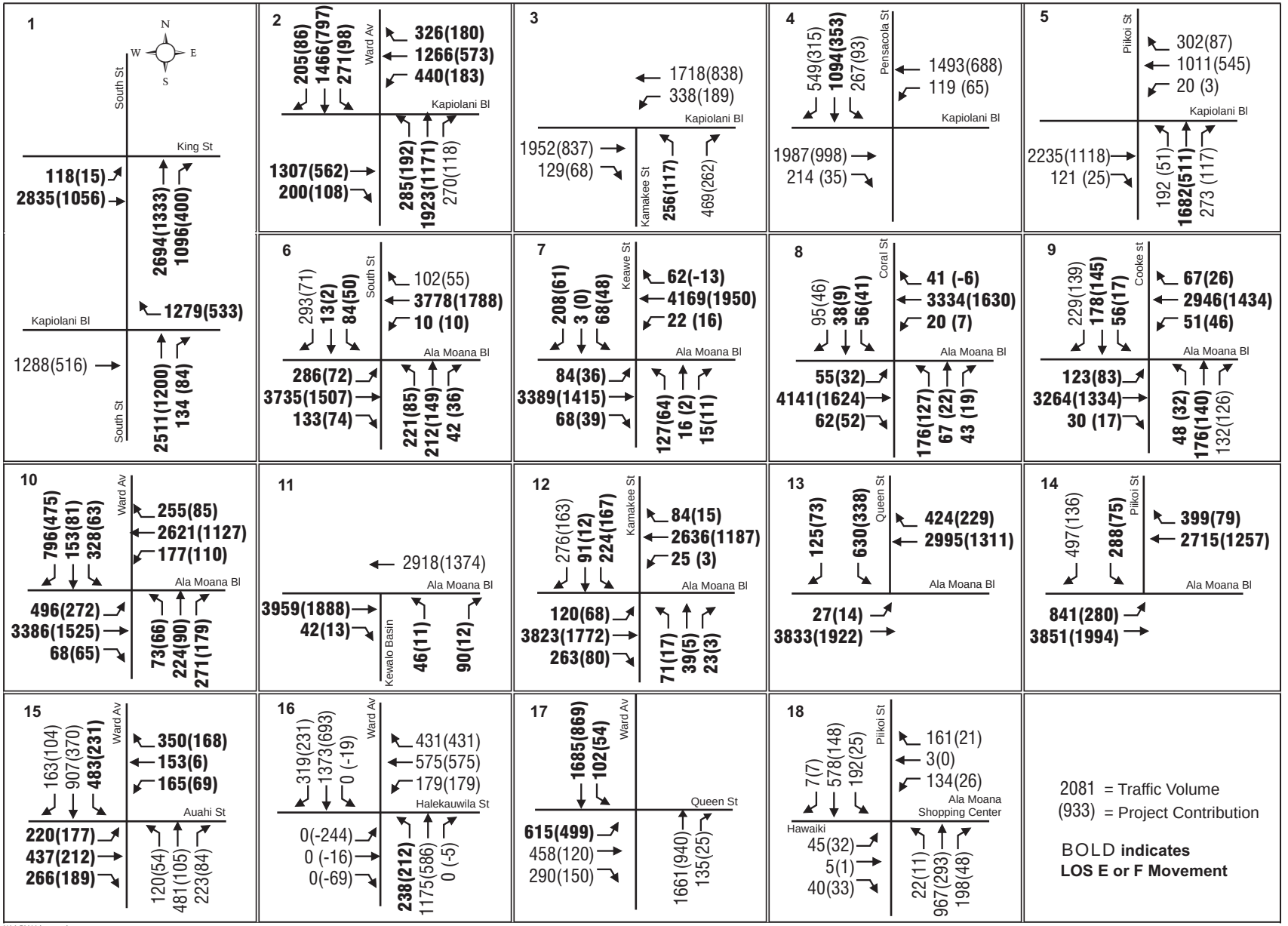
Source: DMJM Harris, 2008

Figure 25

NO ACTION ALTERNATIVE INTERSECTION LEVEL OF SERVICE

PM Peak Hour

DMJM HARRIS | AECOM



NAA PM Volumes.cdr

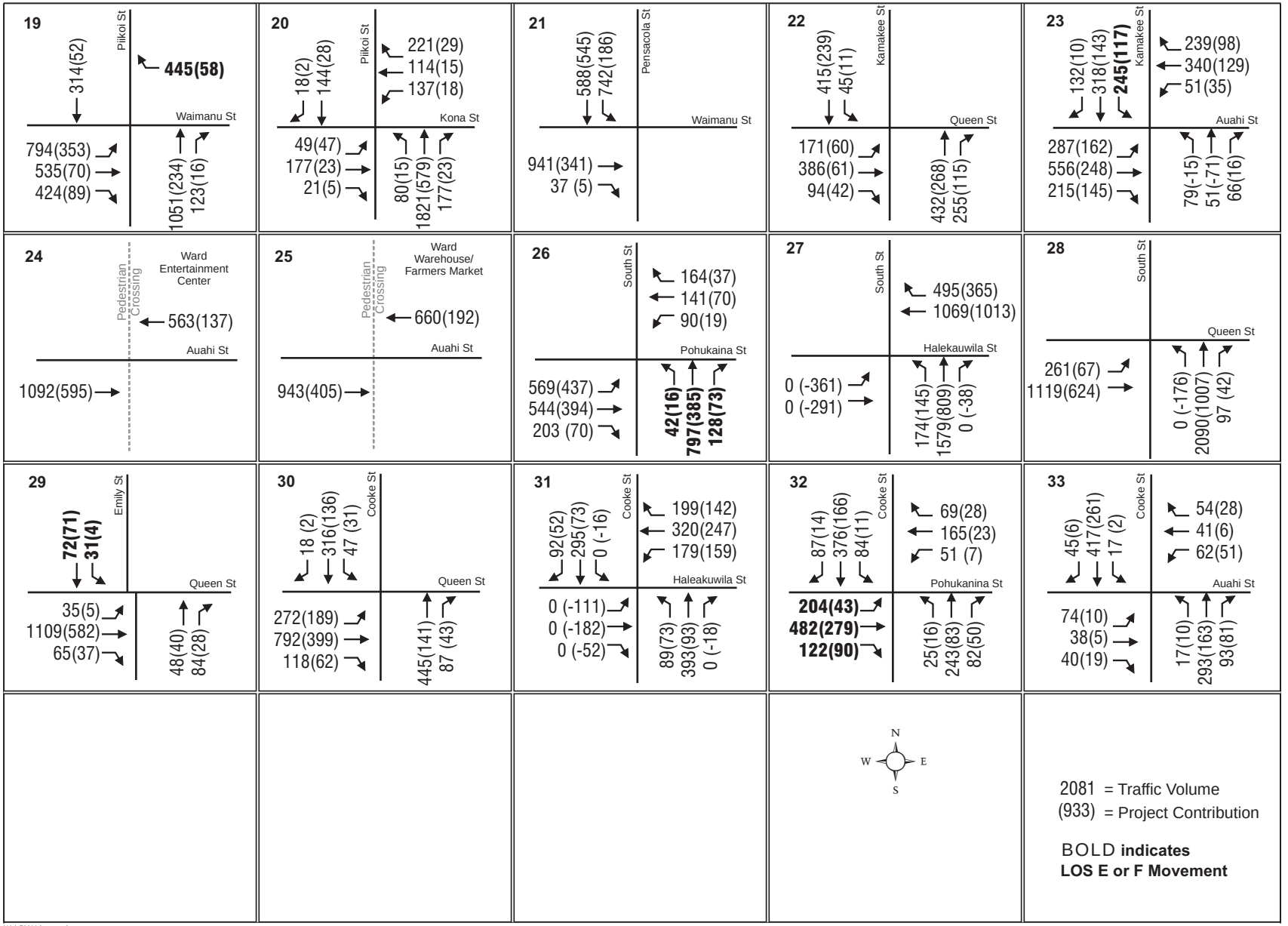
KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 26a

NO ACTION ALTERNATIVE TRAFFIC VOLUMES

PM Peak Hour



NAA PM Volumes.cdr

KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 26b

NO ACTION ALTERNATIVE TRAFFIC VOLUMES

PM Peak Hour

As shown in **Table 10**, in Cumulative Conditions under the No Action Alternative most intersections are expected to operate worse than they do in Existing Conditions. Intersections along Kapiolani Boulevard, Ala Moana Boulevard, and Ward Avenue are expected to operate poorly (LOS E or LOS F) during both the weekday AM and PM peak hours.

Average speed and travel time were also calculated through micro-simulation for Cumulative Conditions under the No Action Alternative. The results of that analysis are summarized in **Table 11**.

Table 11: No Action Alternative Average Speed and Travel Time

#	Roadway	Direc-tion	Peak Hour	Existing Conditions		Cum. Conditions – No Action Alternative	
				Average Travel Time (minutes)	Average Speed (mph)	Average Travel Time (minutes)	Average Speed (mph)
1	**Kapiolani Boulevard** *between South Street and Piikoi Street*	EB	AM	4.0	16	7.9	9
			PM	4.3	13	13.2	5
		WB	AM	2.9	13	11.7	5
			PM	4.7	14	13.2	3
2	**Queen Street** *between South Street and Piikoi Street*	EB	AM	4.6	13	9.7	6
			PM	3.5	10	7.9	7
		WB[(1)]	AM	3.5	14	--	--
			PM	6.0	14	--	--
3	**Ala Moana Boulevard** *between South Street and Piikoi Street*	EB	AM	4.7	16	14.1	6
			PM	5.3	18	12.5	6
		WB	AM	9.5	9	16.5	5
			PM	3.8	20	14.7	6
4	**Piikoi Street** *between Kapiolani Boulevard and Ala Moana Boulevard*	NB	AM	2.0	13	3.3	8
			PM	2.1	10	8.7	3
		SB	AM	2.2	13	5.1	7
			PM	2.5	9	8.3	4
5	**Kamakee Street** *between Kapiolani Boulevard and Ala Moana Boulevard*	NB	AM	2.5	10	7.4	4
			PM	2.6	10	6.7	3
		SB	AM	2.5	10	5.6	4
			PM	3.0	8	10.4	2

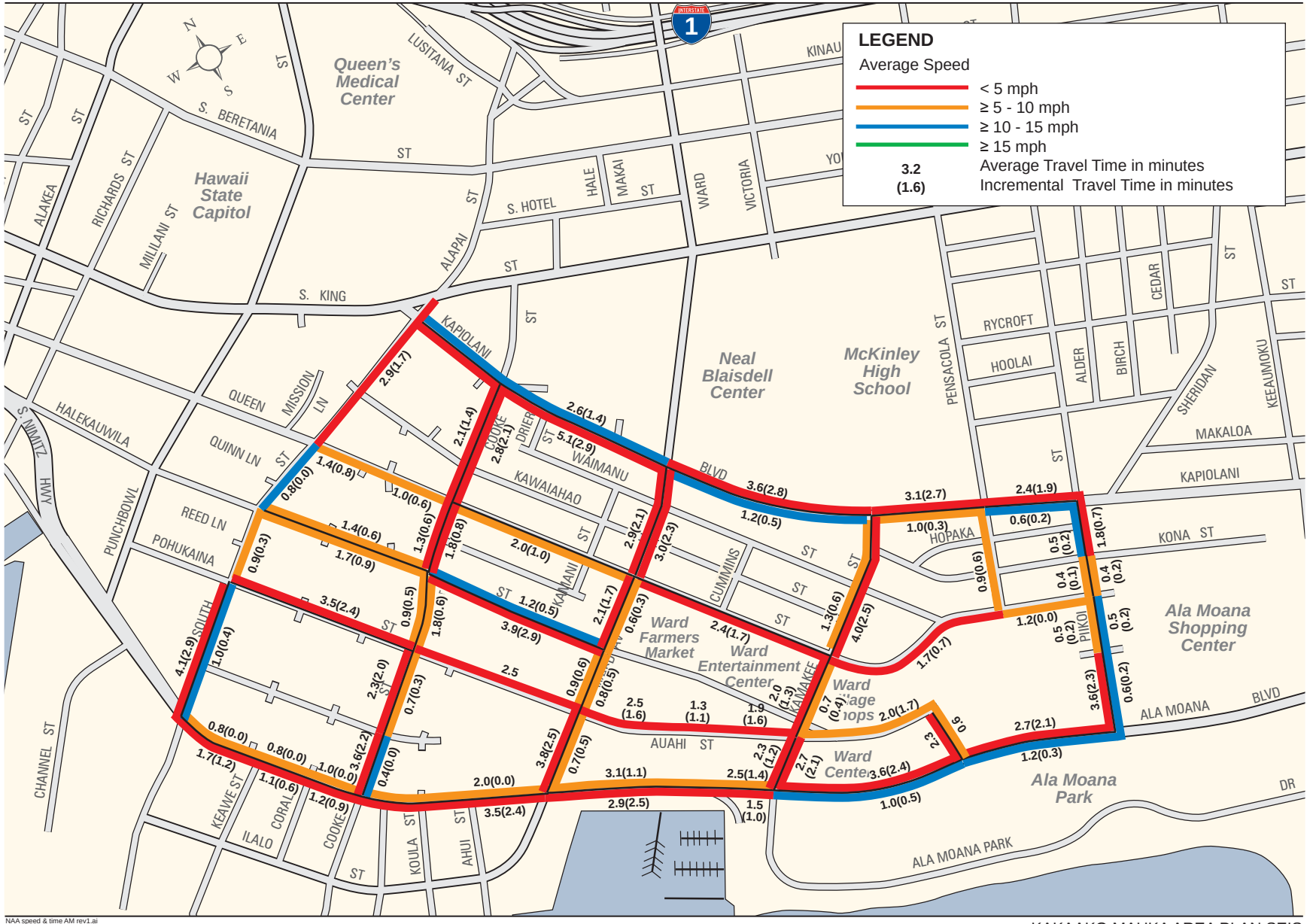
#	Roadway	Direc-tion	Peak Hour	Existing Conditions		Cum. Conditions – No Action Alternative	
				Average Travel Time (minutes)	Average Speed (mph)	Average Travel Time (minutes)	Average Speed (mph)
6	**Ward Avenue** *between Kapiolani Boulevard and Ala Moana Boulevard*	NB	AM	1.5	13	5.1	7
			PM	2.2	10	8.6	4
		SB	AM	2.8	13	9.7	3
			PM	3.0	11	5.3	6
7	**Cooke Street** *between Kapiolani Boulevard and Ala Moana Boulevard*	NB	AM	2.5	13	7.5	7
			PM	2.3	15	4.3	7
		SB	AM	3.5	14	10.2	4
			PM	2.9	14	9.3	5
8	**South Street** *between Kapiolani Boulevard and Ala Moana Boulevard*	NB	AM	3.2	11	5.6	8
			PM	3.2	11	5.7	6
		SB[(2)]	AM	1.2	9	4.1	2
			PM	1.0	10	3.2	1

Source: DMJM Harris – 2008
Notes:
Cum. = Cumulative
(1) Queen Street is one-way eastbound in the No Action Alternative.
(2) SB South Street between Pohukaina Street and Ala Moana Boulevard only

As shown in **Table 7**, average speeds are expected to decrease along all key roadways, with the slowest average speeds along north-south roadways such as Kamakee Street, Ward Avenue, Cooke Street, and South Street.

Figure 27 and **Figure 28** illustrate the average speed and travel time for key roadway segments during the weekday peak hours. Where appropriate, the incremental change in average travel time over Existing Conditions is included for each segment, in parentheses.

DMJM HARRIS | AECOM



NAA speed & time AM rev1.ai

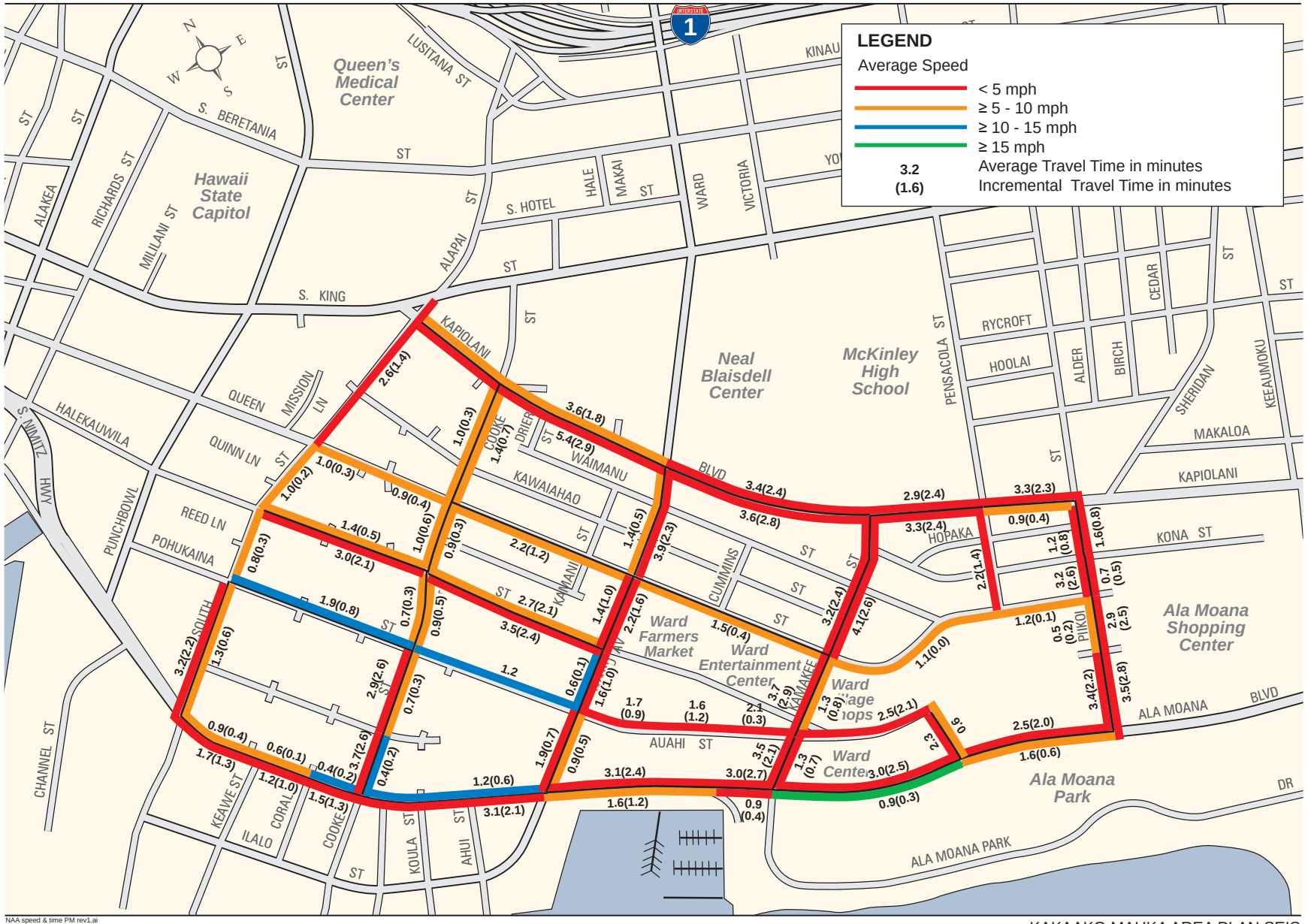
KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 27

NO ACTION ALTERNATIVE VEHICLE SPEED AND TRAVEL TIME

AM Peak Hour



NAA speed & time PM rev1.ai

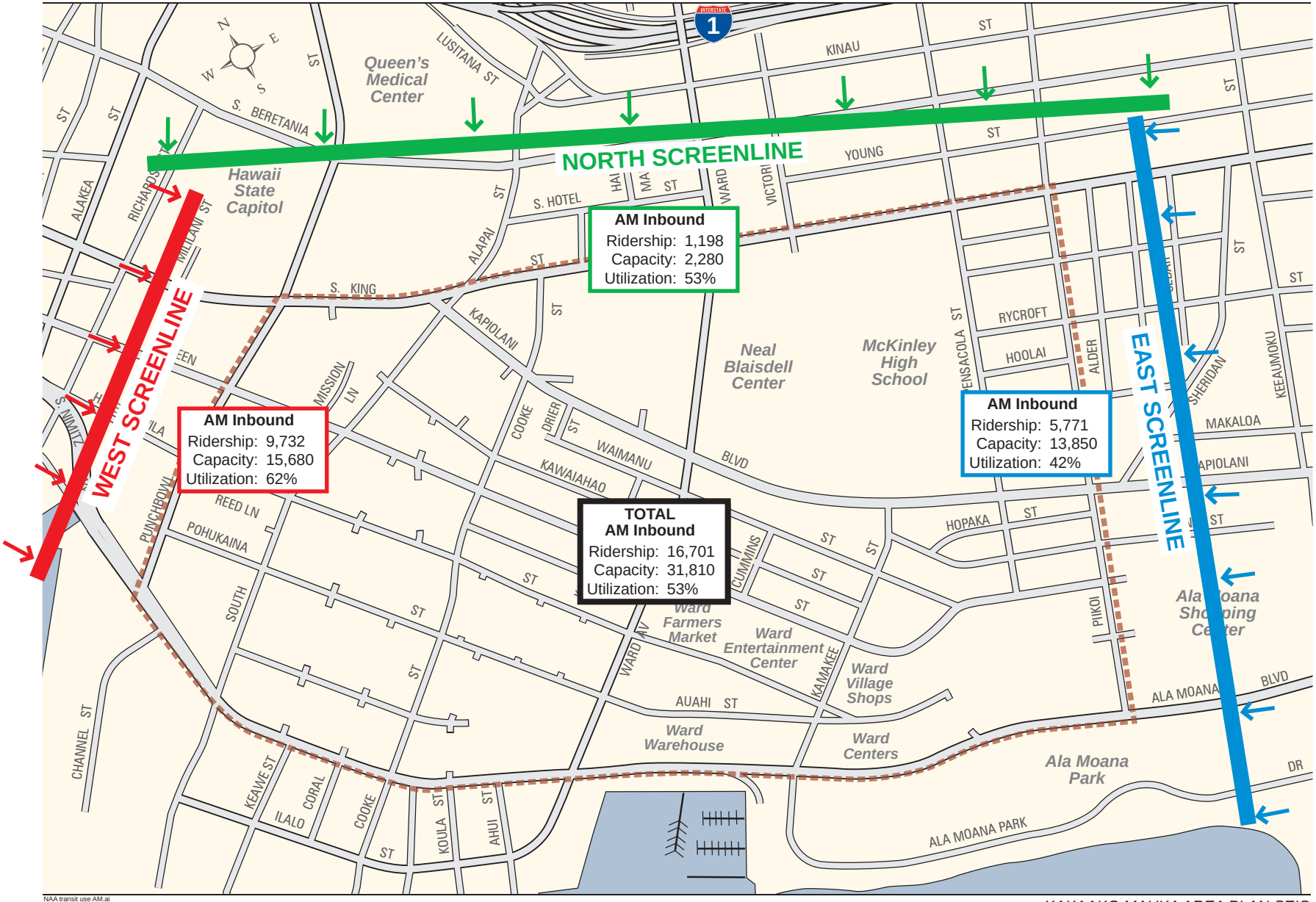
KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 28

NO ACTION ALTERNATIVE VEHICLE SPEED AND TRAVEL TIME

PM Peak Hour



NAA transit use AM.ai

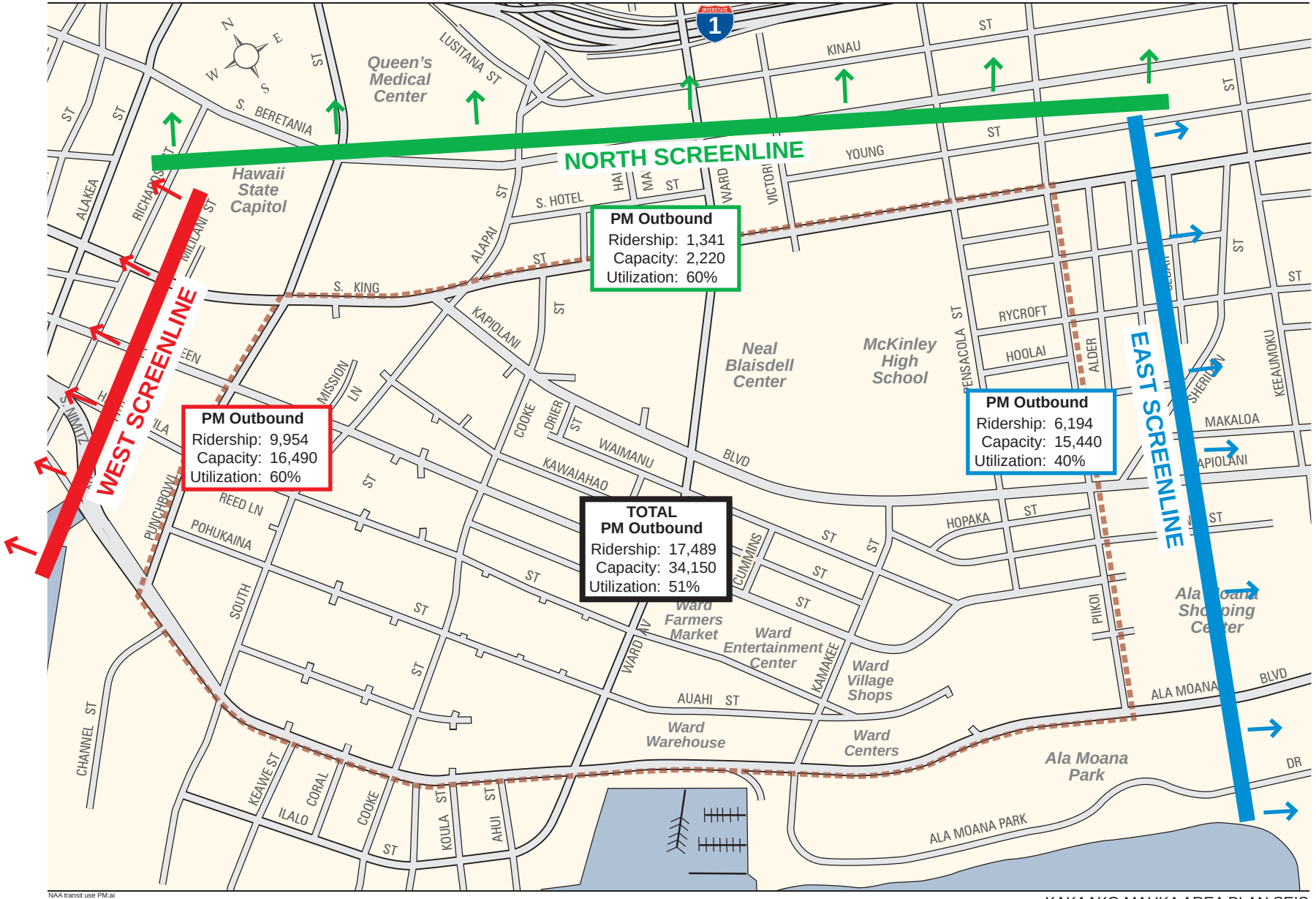
KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 29

NO ACTION ALTERNATIVE TRANSIT CAPACITY UTILIZATION

AM Peak Hour



NAA transit use PM.ai

KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 30

NO ACTION ALTERNATIVE TRANSIT CAPACITY UTILIZATION

PM Peak Hour

As shown in **Table 12**, the fixed guideway system is expected to substantially increase capacity in the west and east screenlines. The guideway system is also expected to draw new riders to transit because of its improvement over existing bus services in terms of speed, reliability, and frequency, thus causing an increase in ridership across the west screenline. However, Cumulative Conditions screenline capacity utilization is still below the 80 to 90 percent threshold typically considered acceptable for urban areas.

The implementation of an internal circulation shuttle could be an attractive alternative for trips within the Mauka Area. Residents who do not or cannot use a private automobile could have difficulty walking or bicycling if carrying baggage or other belongings. Other factors such as weather or disability can also limit the number of people who walk or bicycle. An internal shuttle, however, would provide a viable travel alternative if it is operated frequently and reliably, and connects major internal destinations, such as the Ward Centers and the Ala Moana Shopping Center.

4.3.3 BICYCLE CONDITIONS

Because of ambiguity between the Existing Mauka Area Plan, *Bike Plan Hawaii 2003*, and the *Honolulu Bicycle Master Plan* (1999), the bikeway plan chosen for analysis is the plan illustrated in **Figure 13**.

As shown in **Figure 13**, Class II bicycle facilities (bicycle lanes) are planned for most major streets in the Mauka Area, including Ala Moana Boulevard, King Street, Ward Avenue, Piikoi Street, and Pensacola Street. Bicycle lanes along Ala Moana Boulevard would likely require removal of at least one lane of vehicular traffic due to roadway right-of-way constraints. Given the heavy traffic volumes on these streets, it seems impractical to remove one lane of traffic for a bicycle lane which will likely not be heavily used. In addition, Ala Moana Boulevard is a wide arterial with relatively high speeds compared to local streets, which may reduce the utility of a dedicated bicycle lane if bicyclists choose not to use it due to safety concerns.

It should also be noted that there is already an existing Class I bicycle facility (bicycle path) along the waterfront, paralleling Ala Moana Boulevard. An extension further west has also been proposed as part of *Bike Plan Hawaii 2003*. Implementing an additional Class II facility on Ala Moana Boulevard would likely duplicate the existing and planned Class I facilities along the waterfront. However, because of the importance of Ala Moana Boulevard as a major east-west boulevard connecting Kakaako with other parts of the island, designating it as a Class III facility would likely be sufficient.

Roadway width on Ward Avenue, Piikoi Street, and Pensacola Street should be sufficient to accommodate bicycle lanes. These streets carry lower traffic volumes than Ala Moana Boulevard and continue past the freeway into the hills, offering important north-south connections in the bikeway network. For these reasons, installing bicycle lanes on Ward Avenue, Piikoi Street, and Pensacola Street should be considered a top priority after the extension of the recreational bicycle path from Ala Moana Park.

The proposed installation of additional bicycle racks and lockers inside public parking facilities will also help to make bicycling a feasible alternative for people who live or work in the Mauka Area.

Although the No Action Alternative is expected to generate 300 trips in the AM peak hour and 400 trips in the PM peak hour, many of these trips are expected to be short-distance trips either within or just outside the Mauka Area. These trips would likely make use of more local roadways such as Queen Street or Halekauwila Street, which have lower traffic volumes and slower traffic speeds, and can more safely accommodate bicyclists. The exact state of future bicycle conditions under the No Action Alternative is difficult to estimate given the wide range of uncertainties surrounding each development at this stage of the process. Each proposed development should be evaluated during the approval process to ensure that no significant impacts to bicycle facilities are likely to occur due to design elements which increase the potential for conflict between bicycles and other modes of travel such as automobiles and pedestrians.

4.3.4 PEDESTRIAN CONDITIONS

The Existing Mauka Area Plan proposes crosswalks at all intersections and sidewalks along all streets, which should create a minimum of Pedestrian Tolerant Environments along all streets in the Mauka Area. This should help to improve pedestrian safety, particularly in Central Kakaako where many streets lack curbs and sidewalks.

In addition, the Existing Mauka Area Plan proposes a system of pedestrian overpasses to allow for separation between pedestrians and other moving traffic such as automobiles and bicycles. It should be noted, however, that pedestrian overpasses are generally not considered acceptable by current urban design standards for several reasons. Elevated walkways can present difficulties for pedestrians who cannot easily climb stairs, including people with disabilities or people carrying luggage. So while pedestrian overpasses separate pedestrian traffic from moving traffic, they also have limited access and generally make walking more difficult for all pedestrians, and in particular for people who would normally already have difficulty walking. A well-planned and efficient pedestrian network provides connectivity, safety, and accessibility for all pedestrians and considers the effects of roadway design on all modes of travel, both motorized and non-motorized.[8]

Pedestrian overpasses can also negatively impact street activity by making it possible for people to never set foot on the ground when going between buildings. Current urban design typically encourages street activity by calling for open, activated storefronts with heavy pedestrian activity. By removing foot traffic away from the sidewalk, businesses located on the street potentially lose passby pedestrian trips—customers who coincidentally walk by a store and decide to buy something.

The No Action Alternative is expected to generate an additional 1,100 pedestrian trips in the AM peak hour and an additional 1,400 pedestrian trips in the PM peak hour. Observations indicated that existing pedestrian traffic was light, with pedestrian facilities such as sidewalks and crosswalks operating at free-flow conditions. The exact state of future pedestrian conditions under the No Action Alternative is difficult to estimate given the wide range of uncertainties surrounding each development at this stage of the process. Each proposed development should be evaluated during the approval process to ensure that no significant impacts to pedestrian facilities are likely to occur due to location of driveways and curb cuts and design elements such as building frontage.

[8] American Planning Association. *Policy Guide on Smart Growth* (2002).

4.3.5 ON-STREET PARKING

The Existing Mauka Area Plan would discourage on-street parking along all streets in favor of off-street public and private facilities.

5.0 PREFERRED ALTERNATIVE

This chapter analyzes expected Cumulative Conditions traffic, transit, bicycle, and pedestrian operations under the Preferred Alternative. As mentioned previously, the Preferred Alternative assumes that the proposed revisions to the Existing Mauka Area Plan are adopted.

PREFERRED ALTERNATIVE ROADWAY NETWORK CHANGES

The Draft Mauka Area Plan replaces the existing roadway classification system of major and local streets with a system developed by ITE for urban roadway facilities[9]:

- *Low-Speed Boulevard:* Walkable, low speed (35 mph or less) divided arterial thoroughfare in urban environments designed to carry both through and local traffic, pedestrians and bicyclists. Boulevards may be long corridors, typically four lanes but sometimes wider, serve longer trips and provide limited access to land. Boulevards may be high ridership transit corridors. Boulevards are primary goods movement and emergency response routes and use access management techniques. Curb parking may be allowed on boulevards.

- *Avenue:* Walkable, low-to-medium speed (30 to 35 mph) urban arterial or collector thoroughfare, generally shorter in length than boulevards, serving access to abutting land. Avenues serve as primary pedestrian and bicycle routes and may serve local transit routes. Avenues do not exceed four lanes and access to land is a primary function. Goods movement is typically limited to local routes and deliveries. Some avenues feature a raised landscaped median. Avenues may serve commercial or mixed-use sectors and usually provide curb parking.

- *Street:* Walkable, low speed (25 mph) thoroughfare in urban areas primarily serving abutting property. A street is designed to connect residential neighborhoods with each other, connect neighborhoods with commercial and other districts, and connect local streets to arterials. Streets may serve as the main street of commercial or mixed-use sectors and emphasize curb parking. Goods movement is restricted to local deliveries only.

- *Service Street:* A Service Street is intended primarily to provide vehicular access to lots. The Service Street has two travel lanes, one parking/loading lane. The minimum right-of-way of 40 feet recognizes existing conditions in Central Kakaako, where lots are small and rights-of-way narrow. The pedestrian realm requires no front yard space and no trees.

- *Alley*: The “Alley” type provides the most basic form of vehicular access. It has been applied to a limited number of existing roads.

[9] *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities (2006).*

The Draft Mauka Area Plan defines the roadway facilities in the Mauka Area as follows:

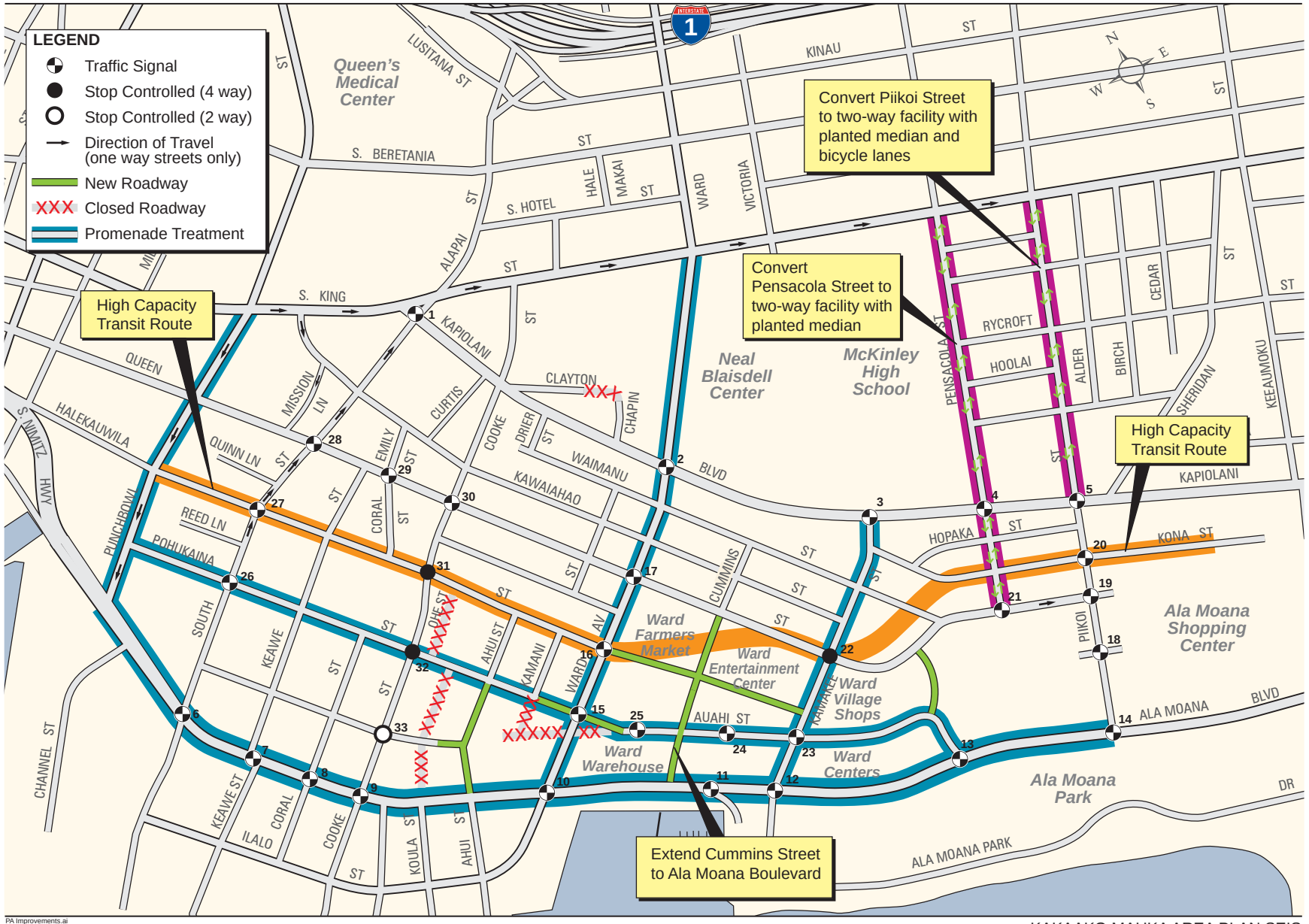
- *Low-Speed Boulevard:* Ala Moana Boulevard, Kapiolani Boulevard;
- *Avenue:* Ward Avenue, South Street, Piikoi Street, Pensacola Street;
- *Street:* Queen Street, Auahi Street, Cooke Street, Kamakee Street;
- *Service Street:* Coral Street, Ilaniwai Street, Waimanu Street; and
- *Alley:* Quinn Lane, Reed Lane.

In addition to a revised classification system, the Draft Mauka Area Plan also proposes several changes to the roadway network itself, including the following measures:

- Reserve portions of Halekauwila Street between Punchbowl Street and Ward Avenue for a fixed guideway system or other high-capacity transit route;
- Extend Halekauwila Street from Ward Avenue to Kamakee Street;
- Extend Pohukaina Street past Ward Avenue to connect with Auahi Street;
- Extend Ahui Street from Pohukaina Street to intersect with Auahi Street and Ala Moana Boulevard;
- Extend Queen Street to intersect with Auahi Street and Ala Moana Boulevard;
- Remove on-street parking on Queen Street and Auahi Street between Queen Street and Kamani Street and install a planted median;
- Install a planted median along Ala Moana Boulevard between Punchbowl Street and Ward Avenue and reduce lane width from 12 feet to 10 feet;
- Extend Cummins Street from Queen Street to intersect with Auahi Street and Ala Moana Boulevard;
- Close off OHE Lane and Koula Street to vehicular traffic;
- Reinstitute two-way traffic on Pensacola Street north of Kapiolani Boulevard (two southbound lanes and one northbound lane) and install a planted median; and,
- Reinstitute two-way traffic on Piikoi Street north of Kapiolani Boulevard (two northbound lanes and one southbound lane) and install a planted median and bicycle lanes.

The proposed roadway changes are shown in **Figure 31.** Roadway cross sections after implementation of the proposed changes are shown in **Figure 32**.

In addition, several streets such as Auahi Street and Pohukaina Street would be designated for “Promenade” treatment, which would widen sidewalks and reduce roadway width. These roadways are indicated in **Figure 31**.



PA Improvements.ai

KAKAAKO MAUKA AREA PLAN SEIS

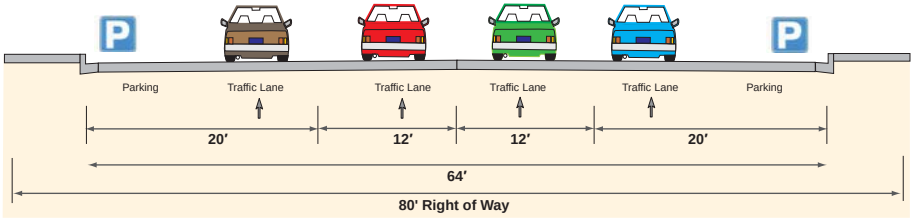
Source: HCDA, 2007, 2008

Figure 31

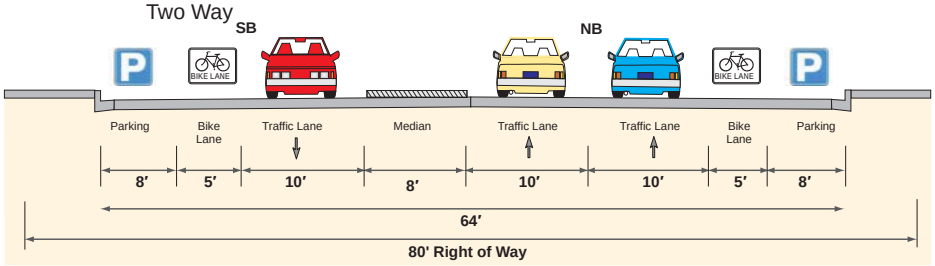
PREFERRED ALTERNATIVE ROADWAY IMPROVEMENTS

EXISTING

Piikoi Street One Way Northbound

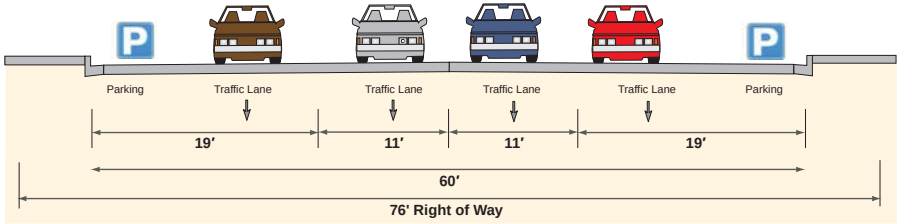


PROPOSED

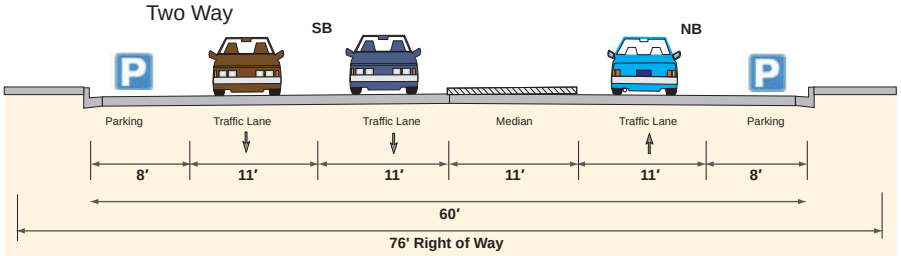


EXISTING

Pensacola Street



PROPOSED



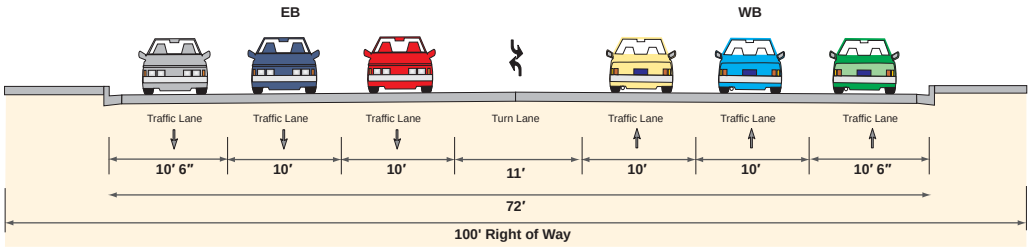
Source: HCDA, 2007

Figure 32a

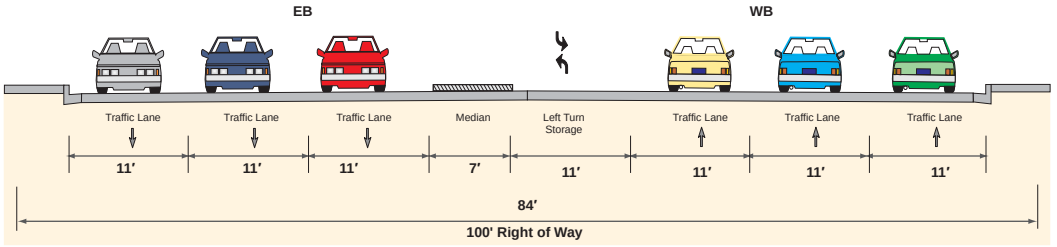
PREFERRED ALTERNATIVE ROADWAY CROSS SECTIONS

EXISTING

Ala Moana Boulevard

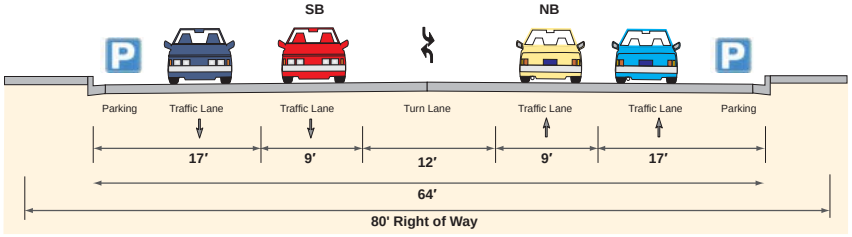


PROPOSED

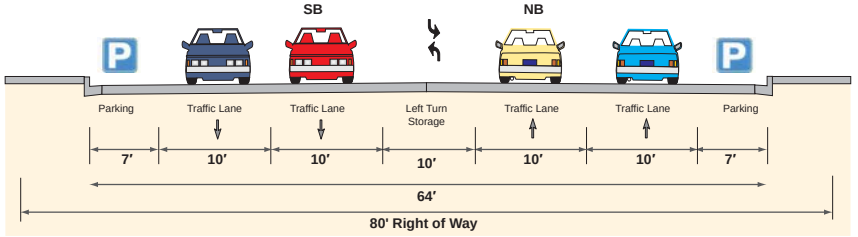


EXISTING

Ward Avenue



PROPOSED



PA Cross Sections a.ai

KAKAAKO MAUKA AREA PLAN SEIS

Source: HCDA, 2007

Figure 32b

PREFERRED ALTERNATIVE ROADWAY CROSS SECTIONS

4.3.2 TRANSIT CONDITIONS

Because the fixed guideway system will operate along an east-west alignment through the Mauka Area, it was assigned to both the east and west screenlines for the Cumulative Conditions transit analysis. The expected capacity of the fixed guideway system was based on a line-haul capacity standard of 3,000 to 5,000 passengers per hour per direction (pphpd) used in the technology screening analysis, although modern rail can provide much higher capacity if required.(7) The expected Cumulative Conditions ridership after implementation of the fixed guideway system is also based on the numbers presented in the technology screening analysis. The resulting Cumulative Conditions transit capacity utilization under the No Action Alternative for the weekday AM and PM peak hour is summarized in **Table 12**. The internal shuttle proposed in the Existing Mauka Area Plan has been omitted from the screenline analysis because it serves trips within the Mauka Area and thus does not cross any of the chosen screenlines.

Figure 29 and **Figure 30** show the No Action Alternative transit capacity utilization for the AM and PM peak hours, respectively.

Table 12: No Action Alternative Transit Capacity Utilization

Screenline	Existing Conditions			Cumulative Conditions – No Action Alternative		
	Rid. (pax)	Cap. (pax)	Cap. Util.	Rid. (pax)	Cap. (pax)	Cap. Util.
AM Peak Hour – Inbound						
West	4,635	10,500	44%	9,732	15,680	62%
East	2,943	6,720	44%	5,771	13,850	42%
North	351	480	73%	1,198	2,280	53%
Total	**7,929**	**17,700**	**45%**	**16,701**	**31,810**	**53%**
PM Peak Hour – Outbound						
West	4,645	10,590	44%	9,954	16,490	60%
East	2,915	6,300	46%	6,194	15,440	40%
North	440	660	67%	1,341	2,220	60%
Total	**8,000**	**17,550**	**46%**	**17,489**	**34,150**	**51%**

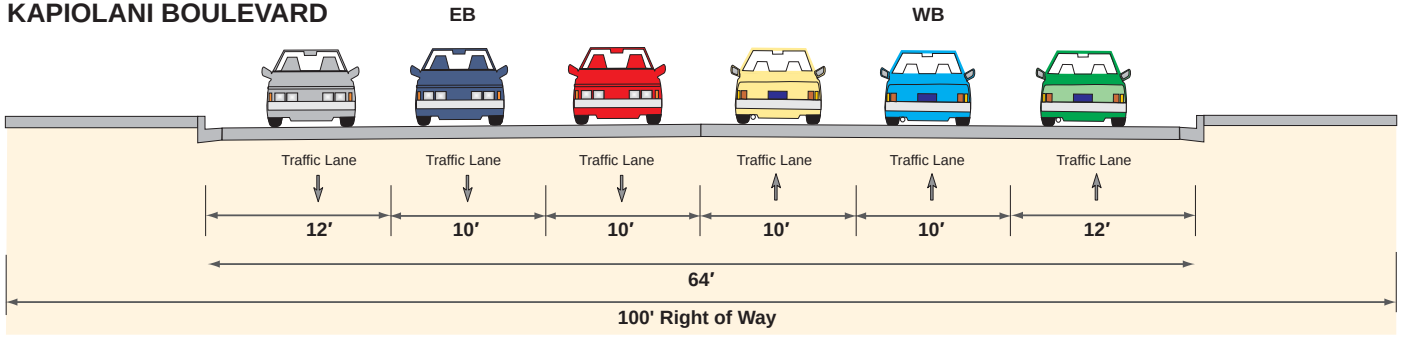
Source: DMJM Harris – 2008
Notes:
Pax = passengers
Rid. = Ridership
Cap. = Capacity
Cap. Util. = Capacity Utilization

(7) Parsons Brinckerhoff Quade & Douglas, Inc. *Alternatives Screening Memo: Honolulu High-Capacity Transit Corridor Project* (2006).

EXISTING

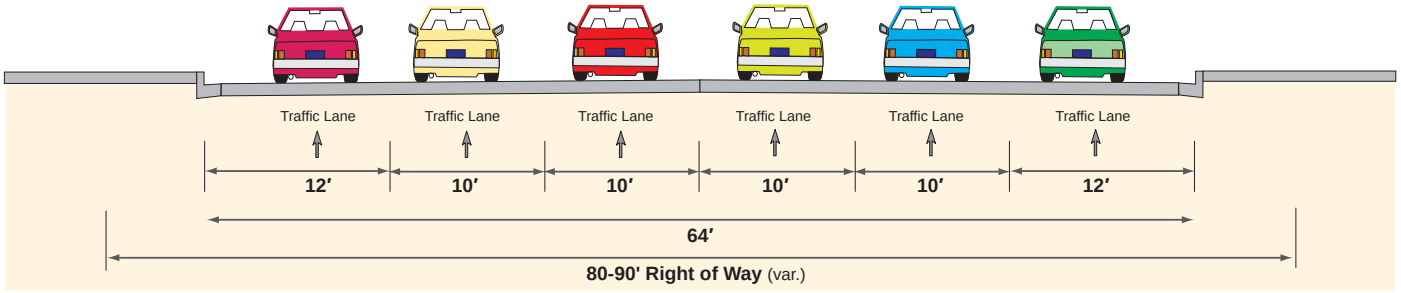
PROPOSED

KAPIOLANI BOULEVARD



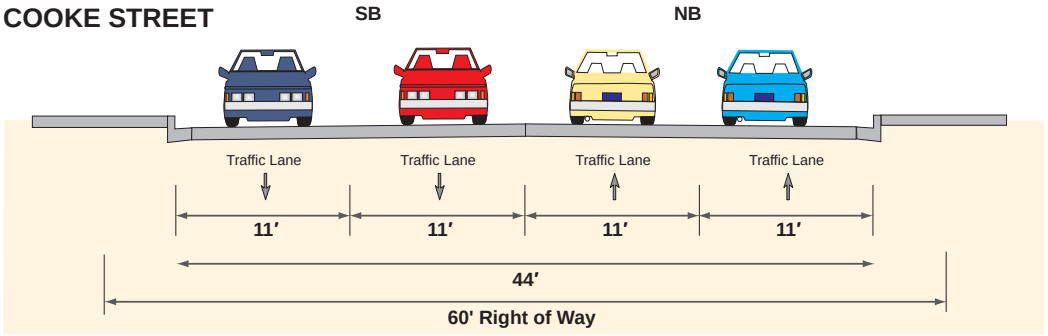
No Change Proposed

KING STREET (One Way Eastbound)



No Change Proposed

COOKE STREET



No Change Proposed

PA Cross Sections c.ai

Source: HCDA, 2007

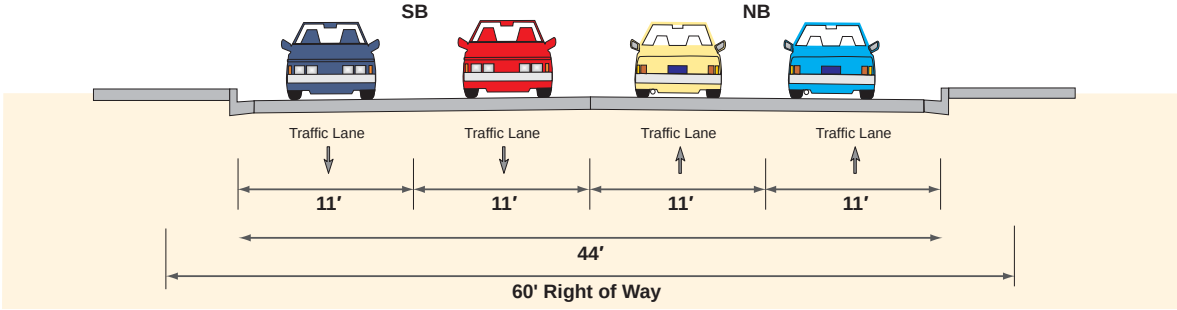
Figure 32c

PREFERRED ALTERNATIVE ROADWAY CROSS SECTIONS

EXISTING

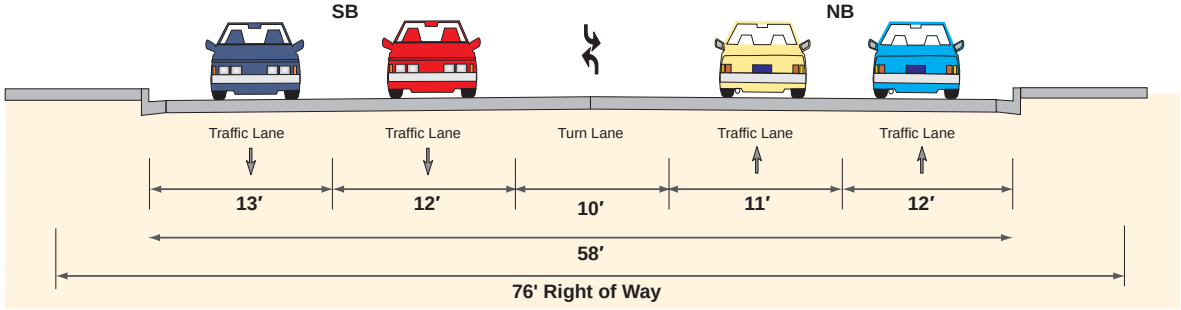
PROPOSED

KAMAKEE STREET (between Kapiolani Blvd and Queen St)



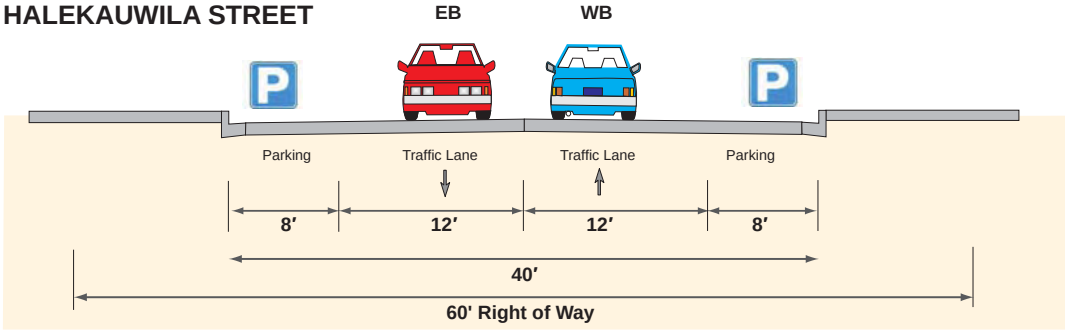
No Change Proposed

KAMAKEE STREET (between Ahaui St and Queen St)



No Change Proposed

HALEKAUWILA STREET



No Change Proposed

PA Cross Sections d.ai

KAKAAKO MAUKA AREA PLAN SEIS

Source: HCDA, 2007

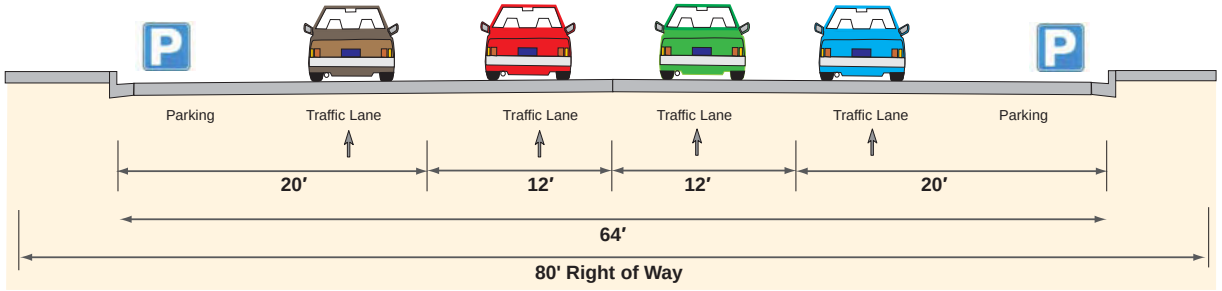
Figure 32d

PREFERRED ALTERNATIVE ROADWAY CROSS SECTIONS

EXISTING

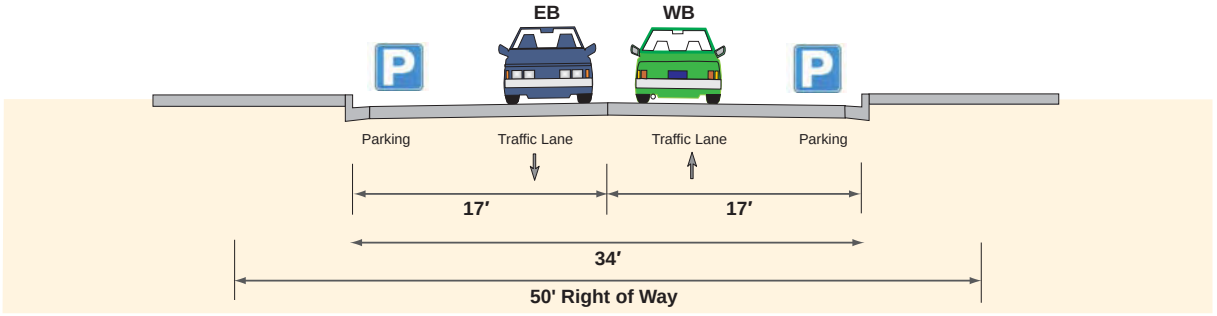
PROPOSED

WAIMANU STREET (One Way Eastbound from Pensacola St to Piikoi St)



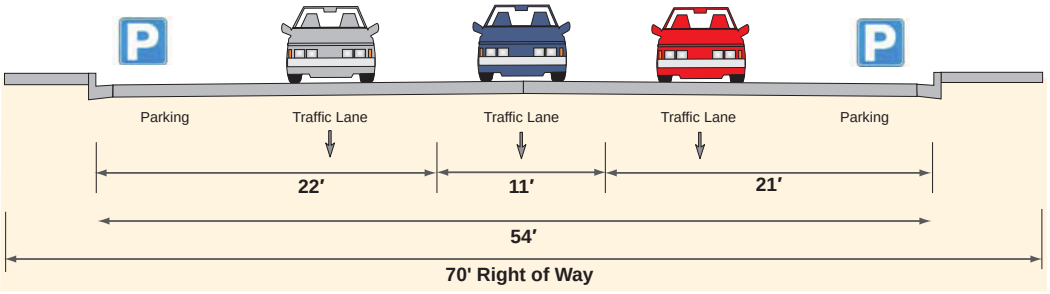
No Change Proposed

WAIMANU STREET (from Dreier St to Kamakee St)



No Change Proposed

PUNCHBOWL STREET (One Way Southbound)



No Change Proposed

PA Cross Sections e.ai

KAKAAKO MAUKA AREA PLAN SEIS

Source: HCDA, 2007

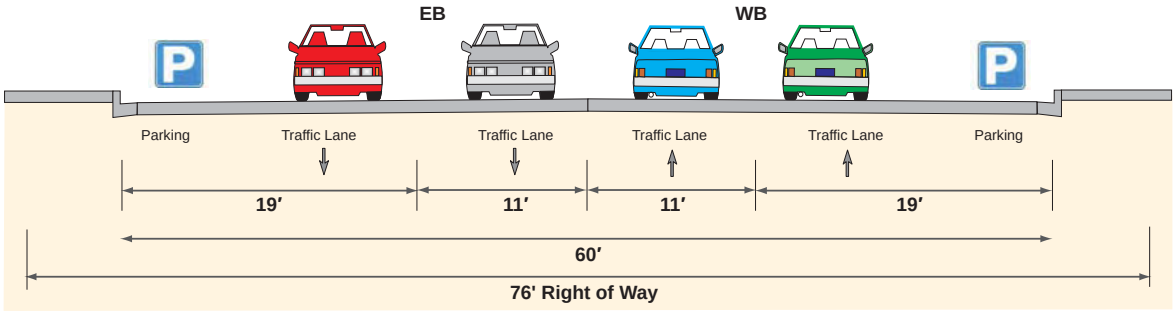
Figure 32e

PREFERRED ALTERNATIVE ROADWAY CROSS SECTIONS

EXISTING

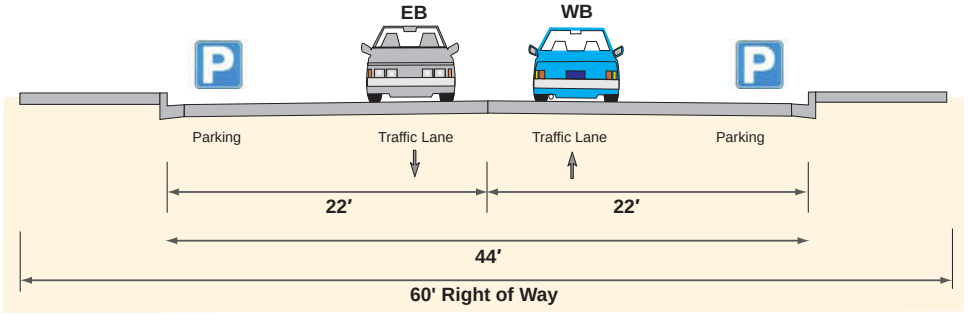
PROPOSED

AUAHI STREET (between Ward Av and Kamakee St)



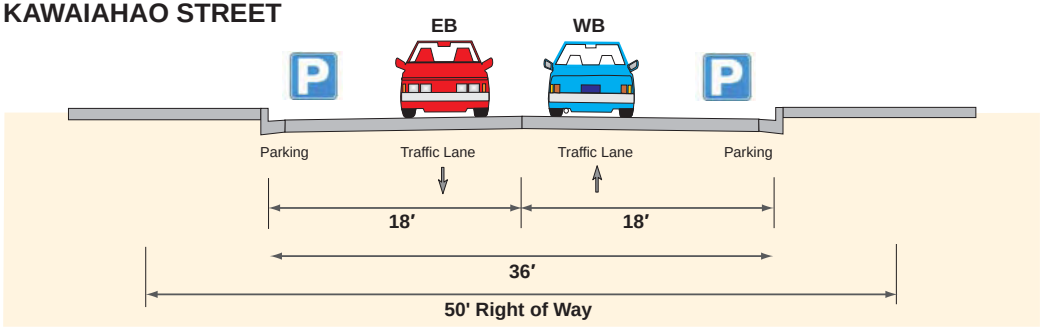
No Change Proposed

AUAHI STREET (between South St and Cooke St)



No Change Proposed

KAWAIAHAO STREET



No Change Proposed

Source: HCDA, 2007

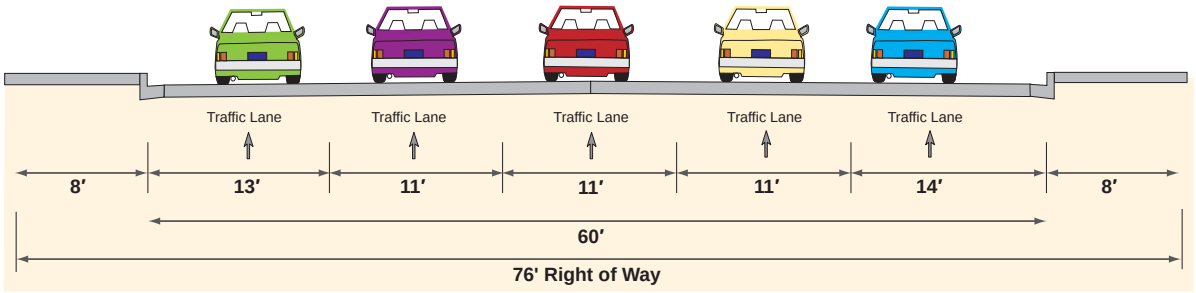
Figure 32f

PREFERRED ALTERNATIVE ROADWAY CROSS SECTIONS

EXISTING

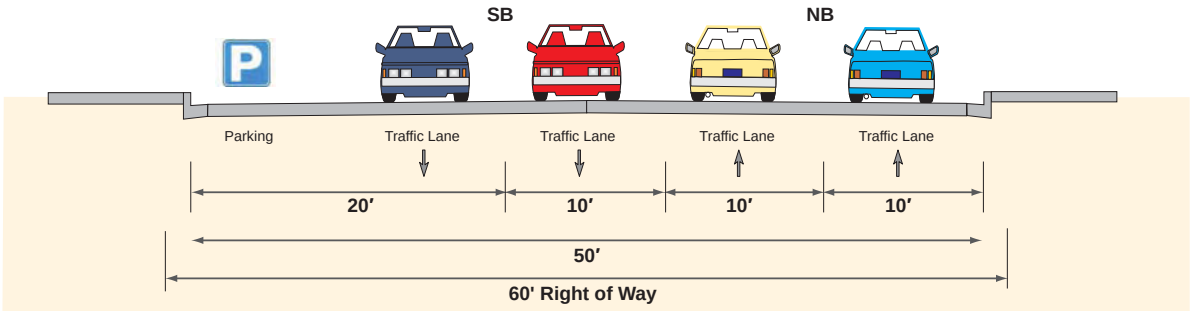
PROPOSED

SOUTH STREET (One Way Northbound between Pohukaina St and King St)



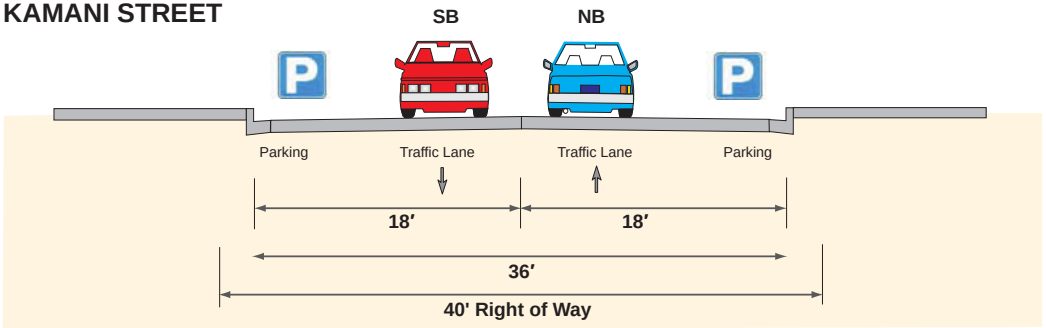
No Change Proposed

SOUTH STREET (between Ala Moana Blvd and Pohukaina St)



No Change Proposed

KAMANI STREET



No Change Proposed

Source: HCDA, 2007

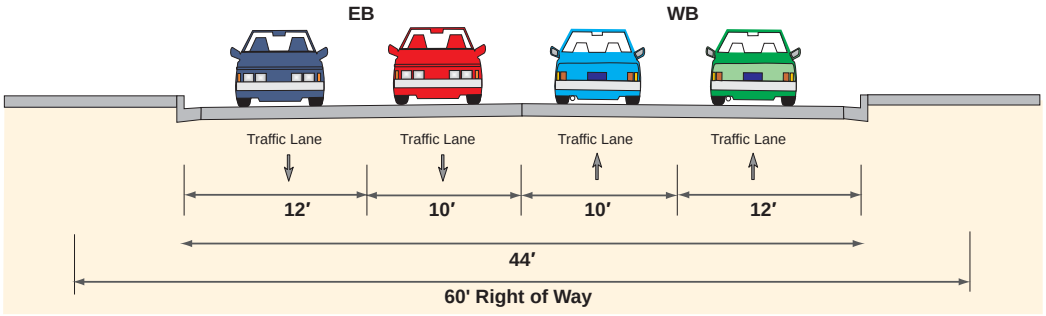
Figure 32g

PREFERRED ALTERNATIVE ROADWAY CROSS SECTIONS

EXISTING

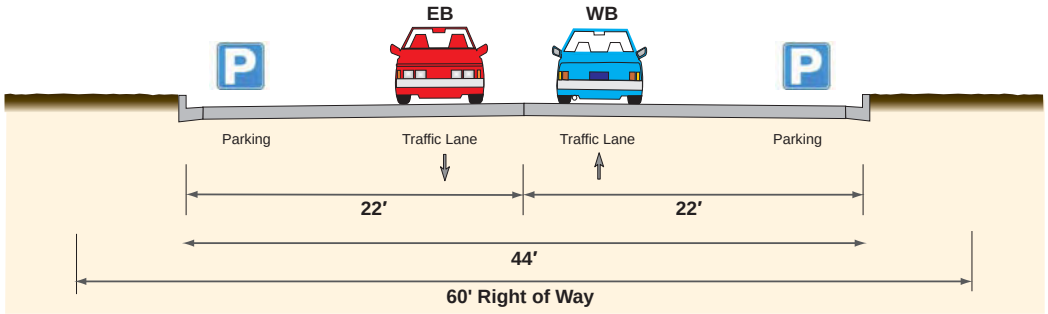
PROPOSED

QUEEN STREET (between South St and Cooke St)



No Change Proposed

QUEEN STREET (between Cooke St and Kamakee St)



No Change Proposed

Source: HCDA, 2007

Figure 32h

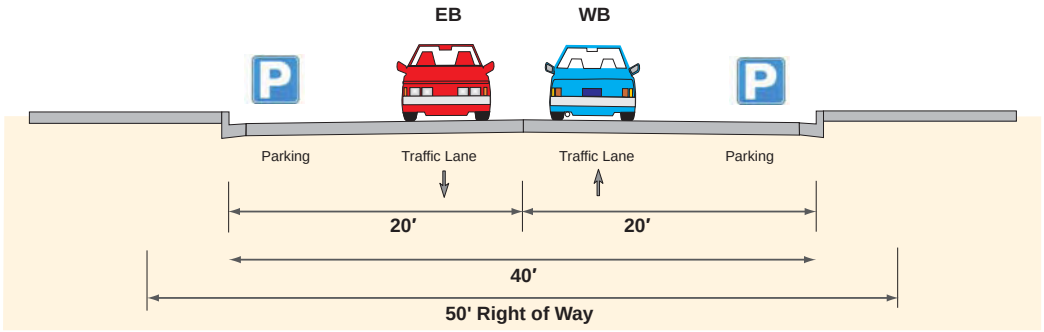
PREFERRED ALTERNATIVE ROADWAY CROSS SECTIONS

DMJM HARRIS | AECOM

EXISTING

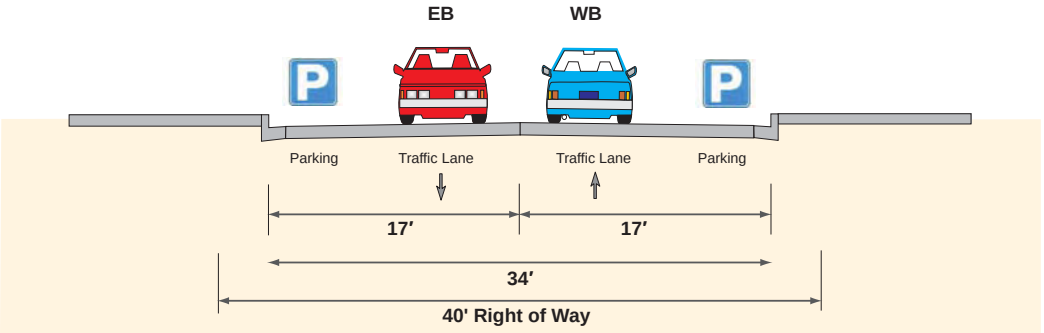
PROPOSED

POHUKAINA STREET



No Change Proposed

ILANIWAI STREET



No Change Proposed

Source: HCDA, 2007

Figure 32i

PREFERRED ALTERNATIVE ROADWAY CROSS SECTIONS

PREFERRED ALTERNATIVE TRANSIT NETWORK CHANGES

In addition to the proposed roadway changes, a fixed guideway transit system is currently in the planning stages for the congested east-west corridor between Kapolei and UH Manoa. The aim of the project is to provide faster, more reliable transit along the corridor, where many transit vehicles must operate in mixed-flow traffic, and serve as an attractive alternative to the private automobile. The project would strengthen the connection between Kapolei, Downtown Honolulu and Kakaako, UH Manoa, and Waikiki.[10] Implementation of the project, in conjunction with other improvements included in the ORTP, would moderate anticipated traffic congestion in the corridor. The project also supports the goals of the Oahu General Plan and the ORTP by serving areas designated for urban growth.

In February 2007, the Honolulu City Council approved the Minimum Operable Segment (MOS) to run from East Kapolei to Ala Moana Shopping Center, with two stations planned for the Mauka Area—one at South Street / Halekauwila Street and another on Queen Street adjacent to the Ward Farmers Market and Ward Entertainment Center. In March 2008, modern rail ("steel-on-steel") was selected as the preferred technology for the proposed system.[11]

The 2006 alternatives screening analysis conducted by Parsons Brinckerhoff identified the likely impacts to the existing bus network with the implementation of the fixed guideway system, including changes in service area, routing, hours of operation, and frequency. The expected transit network after implementation of the fixed guideway system, showing station stops as well as bus lines, is illustrated in **Figure 33**.

It should be noted that a major goal of the Preferred Alternative is to encourage transit-oriented development, designed to facilitate and encourage transit use by placing relatively high-density development adjacent to or within easy walking access of major transit facilities such as stations on the fixed guideway system or transfer points between bus lines. TOD projects also typically encourage the use of non-motorized modes of travel, including pedestrian and bicycle travel, and discourage the use of private automobiles.

However, it can be difficult to measure the effects of TOD on actual transit use, as the concept is still relatively new and still requires additional research. Although the share of transit use will likely go up, the actual increase in transit mode split likely depends on a multitude of factors that cannot be estimated without better knowledge of the intensity of development and the types of support measures that will be included in the ultimate design of these developments. If, for example, high-density condominium towers are proposed adjacent to stations on the fixed guideway system but each unit is provided with one or more off-street parking spaces, the increase in transit use would likely be negligible compared to units without off-street parking spaces.

Without knowledge of the quantitative standards for the proposed TOD and the types of supportive measures to be implemented, the Preferred Alternative mode split is conservatively assumed to be identical to that of the No Action Alternative.

(10) DTS, City and County of Honolulu. *Honolulu High-Capacity Transit Corridor Project*. http://www.honolulutransit.org/

(11) DTS, City and County of Honolulu. *Honolulu on the Move* (Mar. 2008).

DMJM HARRIS | AECOM

Source: HCDA, 2007, 2008

KAKAAKO MAUKA AREA PLAN SEIS

Figure 33

PREFERRED ALTERNATIVE TRANSIT NETWORK

PREFERRED ALTERNATIVE BIKEWAY NETWORK CHANGES

In addition to proposing a new bicycle corridor along Piikoi Street, the revisions to the Existing Mauka Area Plan also suggest the future restriping of existing four-lane roadways to accommodate bicycle lanes.

In addition to being pedestrian-friendly, the designated "green" streets—Cooke Street, Pohukaina Street, and Kamakee Street—will also be bicycle-friendly and allow for safe bicycle connections to existing open space in the area.

PREFERRED ALTERNATIVE PEDESTRIAN NETWORK CHANGES

In general, the proposed revisions call for a well-developed network of Pedestrian Tolerant and Pedestrian Supportive Environments, with wide, landscaped sidewalks and active building frontage that invites pedestrian traffic. Cooke Street, Pohukaina Street, and Kamakee Street will be designated as "green" streets and connect pedestrians and bicyclists with park and open space facilities both within and outside of the Mauka Area.

Several streets in the Mauka Area would receive special "Promenade" treatment, with sidewalks at least 15 feet in width. This would be accomplished by reducing roadway width and encouraging building setbacks. The following streets are planned for Promenade treatment:

- Auahi Street;
- Pohukaina Street;
- Ala Moana Boulevard;
- Punchbowl Street;
- Cooke Street; and,
- Kamakee Street.

The Draft Mauka Area Plan also emphasizes a Mauka-Makai connectivity and identifies six intersections which would require special crosswalk design—such as ladder striping, flashing lights, and improved signage—in order to encourage this connectivity and promote continuity of the pedestrian network across major thoroughfares:

- Cooke Street / Ala Moana Boulevard;
- Ward Avenue / Queen Street;
- Ward Avenue / Pohukaina Street;
- Ward Avenue / Ala Moana Boulevard;
- Kamakee Street / Ala Moana Boulevard; and,
- Piikoi Street / Ala Moana Boulevard.

The revisions also propose planters, street furniture such as benches, and on-street parking to help create a buffer zone between pedestrians and street traffic. Critical streets in the network will be designated as Pedestrian Supportive Environments, featuring active street uses and with minimal or no driveways or curb cuts.

PREFERRED ALTERNATIVE ON-STREET PARKING CHANGES

The Draft Mauka Area Plan proposes that on-street parking be provided where appropriate, particularly on pedestrian-oriented and service streets. On-street parking supports local businesses by providing convenient access and serves as a buffer zone protecting pedestrians on the sidewalk from street traffic.

5.1 TRAVEL DEMAND

Travel demand refers to the new vehicle, transit, bicycle, pedestrian, and other traffic that would be generated by a proposed project—in this case, the expected development according to the Draft Mauka Area Plan. This section provides an estimate of the travel demand that would be generated by the land use program for the Preferred Alternative. Travel demand estimates were partly based on information contained in ITE's *Trip Generation (Seventh Edition)*, with reductions taken to account for linked and passby trips. Linked trips are trips which occur in series en route to a primary destination, such as stopping by a coffee shop on the way to work. Passby trips are existing vehicle trips that deviate from the primary route to make a stop, such as drivers who already use Ward Avenue who decide to stop at a new shopping center.[12]

5.1.1 METHODOLOGY

LAND USE

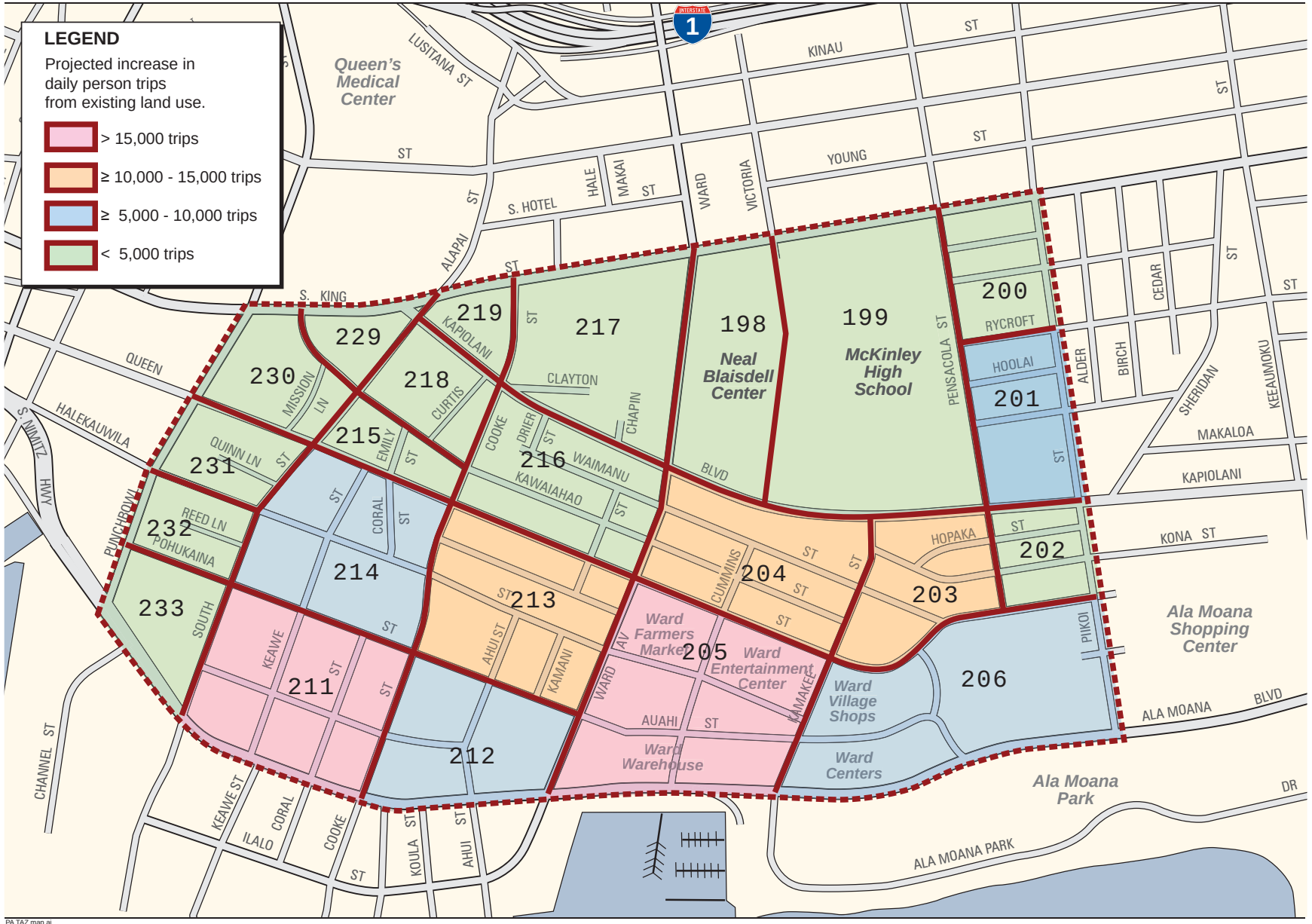
Land use information for development projects for Cumulative Conditions in the Mauka Area were classified into two categories:

- Pipeline development land use projections, obtained from the 2002 OMPO travel demand forecast model; and,
- Potential development land use projections, based on the likelihood of development of each parcel, compiled by HCDA.

The land use information was categorized into the following uses: residential (expressed in number of dwelling units), office commercial (expressed in total square feet of area), retail commercial (expressed in total square feet of area), and light industrial (expressed in total square feet of area). The land uses were then aggregated by TAZ to simplify the traffic analysis. **Figure 34** shows the approximate increase in trips from Existing Conditions to Cumulative Conditions for each TAZ.

The resulting aggregate land uses for each TAZ were then adjusted to account for projects which were completed after the release of the 2002 travel demand model. Since these projects are complete, their impact on the transportation network is already included in the evaluation of existing conditions.

(12) ITE. *Trip Generation Handbook* (2001).



PA TAZ map.ai

KAKAAKO MAUKA AREA PLAN SEIS

Figure 34

Source: OMPO, 2003

PREFERRED ALTERNATIVE TRAFFIC ANALYSIS ZONE (TAZ) MAP

TRIP GENERATION

ITE's *Trip Generation (Seventh Edition)* provides vehicle trip generation rates for typical land uses. However, the ITE trip generation rates alone do not necessarily reflect people's travel behavior and the multi-modal aspects of the Mauka Area's transportation system.

Trip generation rates for the proposed land uses were taken from ITE's *Trip Generation (Seventh Edition)* and combined with AVO data for HBW trips from the OMPO travel demand forecast model to obtain total person-trips (each individual making one trip counts as a "person-trip"). The AVO for vehicle trips was the result of a Household Interview Survey that provides correlation between Journey to Work vehicle trips and the number of persons occupying each vehicle making such trips. The vehicle occupancy data used to derive the resulting AVO for JTW HBW trips is presented in **Table 13**.

Table 13: Preferred Alternative Average Vehicle Occupancy (AVO)

Vehicle Occupancy			Total Vehicles	Total Persons	AVO
SOV	HOV 2	HOV 3+			
3,835	878	188	4,901	6,155	1.26

Source: Household Classification Survey, OMPO – 1995; OMPO Travel Demand Forecast Model – December 2002; DMJM Harris – 2008

Notes:
SOV = Single-Occupancy Vehicle (driver only)
HOV 2 = High-Occupancy Vehicle with 2 persons (1 driver, 1 passenger)
HOV 3+ = High-Occupancy Vehicles with 3 or more persons (1 driver, 2+ passengers)

Mode split data was obtained from the year 2000 U.S. Census Journey to Work survey for the Mauka Area and adjusted based on Cumulative Conditions OMPO travel demand model projections. This mode split was then used to distribute person-trips across the various travel modes—auto, transit, bicycle, and walk.

Table 14: Preferred Alternative Mode Split

Scenario	Auto	Transit	Bicycle	Walk
Existing Conditions	79.9%	11.9%	1.3%	7.0%
Cumulative Conditions	76.9%	12.8%	2.3%	8.0%

Source: 2000 U.S. Census Journey to Work; OMPO Travel Demand Forecast Model – December 2002; DMJM Harris – 2008

TRIP DISTRIBUTION / ASSIGNMENT

Using Cumulative Conditions OMPO travel demand forecast model traffic volumes, the person-trips by the various modes are then distributed to each of six destination areas:

- To Ewa and the west (via surface streets): 25%
- To Diamond Head and the east (via surface streets): 22%
- To Ewa and the west (via H-1): 19%
- To Diamond Head and the east (via H-1): 24%
- To the north: 3%; and,
- Within Kakaako (Mauka and Makai Areas): 7%.

Figure 35 illustrates the Preferred Alternative trip distribution percentages.

5.1.2 TRAVEL DEMAND

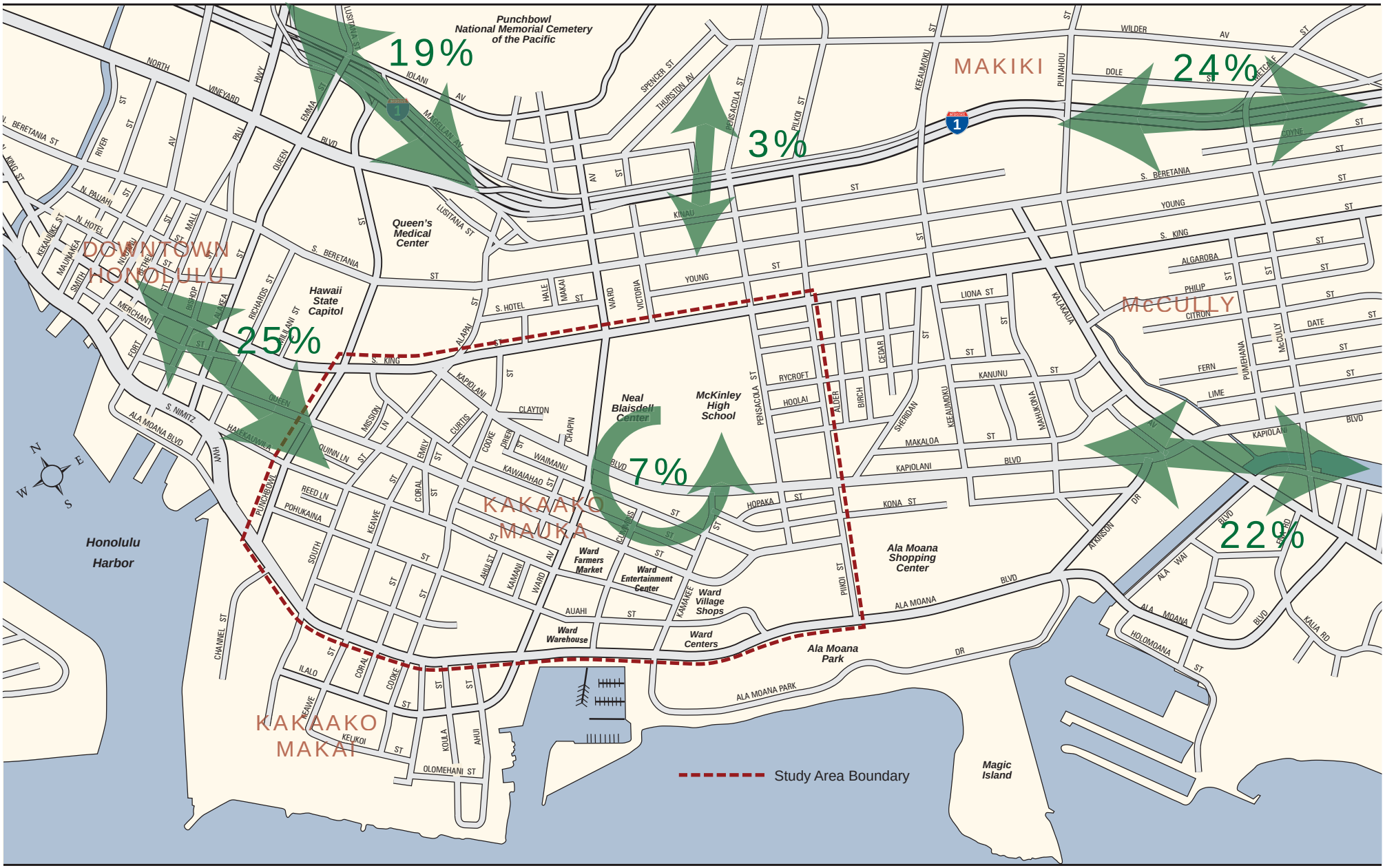
TRIP GENERATION

The person-trips generated by the Preferred Alternative are then calculated based on the expected land use program. The resulting peak-hour and daily person-trips by land use are summarized in **Table 15**.

Table 15: Preferred Alternative Person-Trip Generation

Land Use	Total Person-Trips		
	Daily	AM Peak Hour	PM Peak Hour
Residential	50,823	3,679	4,469
Retail	54,669	957	3,477
Office	42,398	6,154	6,240
Industrial	8,600	1,133	1,208
Total	**156,490**	**11,923**	**15,394**

Source: DMJM Harris – 2008



PA Trip Distribution.ai

Source: DMJM Harris, 2008

KAKAAKO MAUKA AREA PLAN SEIS

Figure 35

PREFERRED ALTERNATIVE TRIP DISTRIBUTION

MODE SPLIT

Using the mode split data presented in **Table 13**, person-trips are then distributed to the various modes of travel. **Table 16** summarizes the resulting trips by mode and vehicle trips for the weekday AM and PM peak hours. It should be noted that there is a distinction between auto person-trips and vehicle trips—the former refers to the number of people using a vehicle for their trip either as driver or passenger, while the latter refers to the number of vehicles actually being used for trip-making.

Table 16: Preferred Alternative Trip Generation by Mode

Land Use	Total Person-Trips[1]				Vehicle Trips[2]
	Auto[2]	Transit	Pedestrian	Bicycle	
Weekday AM Peak Hour					
Residential	2,538	471	294	84	2,014
Retail	430	123	78	18	341
Office	4,641	786	491	140	3,685
Industrial	856	145	90	26	679
Total	**8,465**	**1,525**	**953**	**268**	**6,719**
Weekday PM Peak Hour					
Residential	3,084	572	356	103	2,448
Retail	1,558	444	277	79	1,234
Office	4,705	800	497	144	3,738
Industrial	911	154	95	27	724
Total	**10,258**	**1,970**	**1,225**	**353**	**8,144**

Source: DMJM Harris – 2008

Notes:

(1) The total person-trips presented here do not sum to the total person-trips presented in Table 15 due to reductions for pass-by trips and linked trips.

(2) Auto person-trips refers to the number of people using a vehicle for their trip, whether they are driver or passenger. Vehicle trips refers to the number of actual vehicles on the road.

5.2 IMPACT ANALYSIS

This section presents the assessment of transportation conditions for Cumulative Conditions under the Preferred Alternative. The impact analysis considers conditions for traffic, transit, bicycles, and pedestrians.

5.2.1 SIGNIFICANCE CRITERIA

Significance criteria are a means of evaluating the significance of impacts generated by a proposed change. In the case of this analysis, the change being proposed is the change in Cumulative Conditions traffic operations as a result of adoption of the Draft Mauka Area Plan.

As noted previously, the No Action Alternative and Preferred Alternative both evaluate Cumulative Conditions traffic operations, but the former assumes the Existing Mauka Area Plan remains in effect and the latter assumes the Draft Mauka Area Plan is adopted. Since the Existing Mauka Area Plan is currently in effect, the No Action Alternative represents our "baseline" case for evaluating the significance of impacts under the Preferred Alternative. The Preferred Alternative is then compared directly to the No Action Alternative using the significance criteria to identify significant impacts which would require mitigation.

A set of significance criteria was developed based on typical significance criteria used in urban areas such as the Mauka Area. In general, if operations under the Preferred Alternative are expected to perform worse than under the No Action Alternative, the Draft Mauka Area Plan would result in a significant impact and any possible mitigation measures must be considered. The significance criteria developed for this analysis are summarized below.

For intersections

- The operational impacts on intersections are considered significant if plan-related traffic causes the level of service to deteriorate from LOS E or better under the No Action Alternative to LOS F under the Preferred Alternative.
- The operational impacts on signalized intersections operating at LOS F under both the No Action and Preferred Alternatives are considered significant if the volume-to-capacity (v/c) ratio under the Preferred Alternative exceeds that of the No Action Alternative.

For transit facilities

- The operational impacts on transit facilities are considered significant if the plan causes a substantial increase in transit demand that could not easily be accommodated by available transit capacity, resulting in unacceptable levels of transit service. A capacity utilization above 80 to 90 percent is generally considered unacceptable for urban transit services.
- The operational impacts on transit facilities are considered significant if the plan causes a substantial increase in operational delay or costs that could result in adverse impacts to transit service.

For bicycle facilities

- The operational impacts on pedestrian facilities are considered significant if the plan would create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the site and adjoining areas.

For pedestrian facilities

- The operational impacts on pedestrian facilities are considered significant if the plan would result in substantial overcrowding on public sidewalks, create potentially hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the site and adjoining areas.

5.3 CUMULATIVE CONDITIONS

5.3.1 TRAFFIC IMPACTS

Cumulative Conditions traffic volumes under the Preferred Alternative can be considered a function of two values: the background traffic volumes due to growth from land uses outside of the Mauka Area and the traffic volumes attributable to land use changes in the Mauka Area as a result of development according to the Preferred Alternative. This can be summarized using the following equation:

$$V_{PA} = BG \times V_{EX} + V_{Makai} + TG_{PA}$$

where V_{PA} = cumulative traffic volumes under the Preferred Alternative
BG = background growth rate
V_{EX} = existing traffic volumes
V_{Makai} = cumulative traffic volumes generated by the Makai Plan
TG_{PA} = cumulative traffic volumes generated under the Preferred Alternative

Because the Makai Area is immediately adjacent to the Mauka Area, any Cumulative Conditions analysis must also consider any traffic generated by the Makai Area. Cumulative Conditions traffic volumes for the Makai Plan were based on the 2005 Makai Area Transportation Plan prepared by Wilson Okamoto Corporation. Cumulative east-west through volumes along Ala Moana Boulevard were also compared to volumes given in the same analysis to ensure consistency.

As calculated in Section 4.1, TG_{PA} is a function of the intensity and type of land use.

Cumulative Conditions for the Preferred Alternative were analyzed by adding the trips generated by the alternative to traffic volumes in existing conditions. A background growth factor (*BG*) of 1.13, based on OMPO travel demand forecast model results, was assumed to account for land use changes in other parts of Oahu that would increase traffic levels within the Mauka Area, and the additional traffic resulting from already constructed but not yet fully occupied projects.

A slightly lower growth rate than the No Action Alternative was assumed to account for a decrease in trips due to lower-intensity land uses. Because of the limitations of modeling a roadway network, not every origin and destination can be analyzed. This results in turning movements that may not change between the No Action Alternative and the Preferred Alternative because no Mauka Area trips are being added to those movements. A lower growth factor thus reflects relatively less traffic on a particular movement in the Preferred Alternative. The resulting intersection level of service for weekday AM and PM peak hours is summarized in **Table 17**.

Figure 36 and **Figure 37** summarize the existing weekday AM peak hour LOS at each of the intersections and show movements operating at LOS E or LOS F. Where appropriate, the incremental change in traffic volumes over Existing Conditions is included for each movement, in parentheses. **Figure 38** and **Figure 39** summarize the same information for the weekday PM peak hour.

Table 17: Preferred Alternative Intersection Level of Service

Intersection		Peak Hour	Existing Conditions		Cumulative Conditions			
					No Action Alternative		Preferred Alternative	
			LOS	Delay	LOS	Delay	LOS	Delay
1	Kapiolani Blvd / South St / King St	AM	C	30.6	E	66.3	E	59.4
		PM	C	32.0	F	>80.0	F	>80.0
2	Kapiolani Blvd / Ward Ave	AM	D	39.6	F	>80.0	F	>80.0
		PM	E	57.1	F	>80.0	F	>80.0
3	Kapiolani Blvd / Kamakee St	AM	A	8.7	E	75.6	E	75.3
		PM	A	6.9	C	24.8	C	28.3
4	Kapiolani Blvd / Pensacola St	AM	B	19.6	E	75.9	**F**	**>80.0**
		PM	C	21.5	D	39.1	**F**	**>80.0**
5	Kapiolani Blvd / Piikoi St	AM	C	22.9	E	58.1	**F**	**>80.0**
		PM	C	24.2	D	37.0	**F**	**>80.0**
6	Ala Moana Blvd / South St	AM	C	26.0	F	>80.0	F	>80.0
		PM	B	18.6	F	>80.0	F	>80.0
7	Ala Moana Blvd / Keawe St	AM	D	40.6	F	>80.0	F	>80.0
		PM	E	66.4	F	>80.0	F	>80.0
8	Ala Moana Blvd / Coral St	AM	B	10.9	F	>80.0	F	>80.0
		PM	B	10.5	F	>80.0	F	>80.0
9	Ala Moana Blvd / Cooke St	AM	B	10.2	F	>80.0	F	>80.0
		PM	A	4.9	F	>80.0	F	>80.0
10	Ala Moana Blvd / Ward Ave	AM	E	79.8	F	>80.0	F	>80.0
		PM	F	>80.0	F	>80.0	F	>80.0
11	Ala Moana Blvd / Kewalo Basin	AM	A	4.1	D	37.4	D	35.6
		PM	A	6.2	E	71.6	E	74.1
12	Ala Moana Blvd / Kamakee St	AM	B	11.3	F	>80.0	E	71.6
		PM	B	19.5	F	>80.0	F	>80.0
13	Ala Moana Blvd / Queen St	AM	A	7.4	F	>80.0	F	>80.0
		PM	B	12.0	F	>80.0	F	>80.0

Intersection		Peak Hour	Existing Conditions		Cumulative Conditions			
					No Action Alternative		Preferred Alternative	
			LOS	Delay	LOS	Delay	LOS	Delay
14	Ala Moana Blvd / Piikoi St	AM	F	>80.0	F	>80.0	F	>80.0
		PM	E	64.3	F	>80.0	F	>80.0
15	Ward Ave / Auahi St	AM	B	15.5	C	31.9	D	42.4
		PM	C	21.5	F	>80.0	D	53.2
16	Ward Ave / Halekauwila St	AM	A	7.3	D	54.3	**F**	**>80.0**
		PM	C	21.4	D	43.0	**F**	**>80.0**
17	Ward Ave / Queen St	AM	C	25.4	C	30.1	**F**	**>80.0**
		PM	D	50.3	D	53.5	**F**	**>80.0**
18	Piikoi St / Ala Moana Ctr.	AM	A	7.2	A	9.0	A	9.7
		PM	C	21.1	B	18.8	B	19.4
19	Piikoi St / Waimanu St	AM	C	24.7	B	13.2	B	15.7
		PM	C	29.6	C	26.4	B	14.1
20	Piikoi St / Kona St	AM	A	9.1	B	10.0	A	7.7
		PM	B	13.8	B	11.2	A	9.2
21	Pensacola St / Waimanu St	AM	B	18.4	A	9.2	B	11.4
		PM	E	55.1	B	14.2	C	34.8
22	Kamakee St / Queen St	AM	B	11.3	A	7.1	C	17.4
		PM	C	20.4	A	8.4	E	50.0
23	Kamakee St / Auahi St	AM	B	17.1	B	13.3	B	16.1
		PM	C	24.9	C	26.7	C	24.4
24	Auahi St / Ward Entrmt. Ctr.	AM	A	1.8	A	1.9	A	2.0
		PM	A	6.4	A	9.1	A	8.1
25	Auahi St / Ward Warehouse	AM	A	3.2	A	2.8	A	2.7
		PM	A	6.4	A	6.9	A	6.6
26	South St / Pohukaina St	AM	B	16.2	C	24.1	B	19.4
		PM	B	17.6	E	55.6	C	25.1

Intersection		Peak Hour	Existing Conditions		Cumulative Conditions			
					No Action Alternative		Preferred Alternative	
			LOS	Delay	LOS	Delay	LOS	Delay
27	South St / Halekauwila St	AM	B	14.2	B	12.3	B	12.7
		PM	B	17.0	B	14.7	B	15.3
28	South St / Queen St	AM	B	19.2	B	15.2	B	18.7
		PM	C	23.4	C	25.0	D	39.3
29	Queen St / Emily St	AM	B	16.1	C	26.8	B	16.7
		PM	B	15.0	C	33.1	B	17.4
30	Queen St / Cooke St	AM	B	17.7	B	14.7	C	22.3
		PM	B	17.4	B	15.1	C	30.1
31	Halekauwila St / Cooke St	AM	B	11.6	B	11.9	E	48.8
		PM	B	13.6	B	11.0	**F**	**>50.0**
32	Pohukaina St / Cooke St	AM	B	11.0	D	30.2	**F**	**>50.0**
		PM	C	16.8	F	>50.0	**F**	**>50.0**
33	Auahi St / Cooke St	AM	B	12.9	C	18.8	C	16.6
		PM	B	13.4	D	29.2	D	25.4

Source: DMJM Harris – 2008
Notes:
Delay in seconds per vehicle
BOLD denotes a significant impact

As shown in **Table 17**, in Cumulative Conditions under the Preferred Alternative most intersections are expected to operate worse than they do in Existing Conditions. Intersections along Kapiolani Boulevard, Ala Moana Boulevard, and Ward Avenue are expected to operate poorly (LOS E or LOS F) during both the weekday AM and PM peak hours.

PA AM Volumes Key.ai

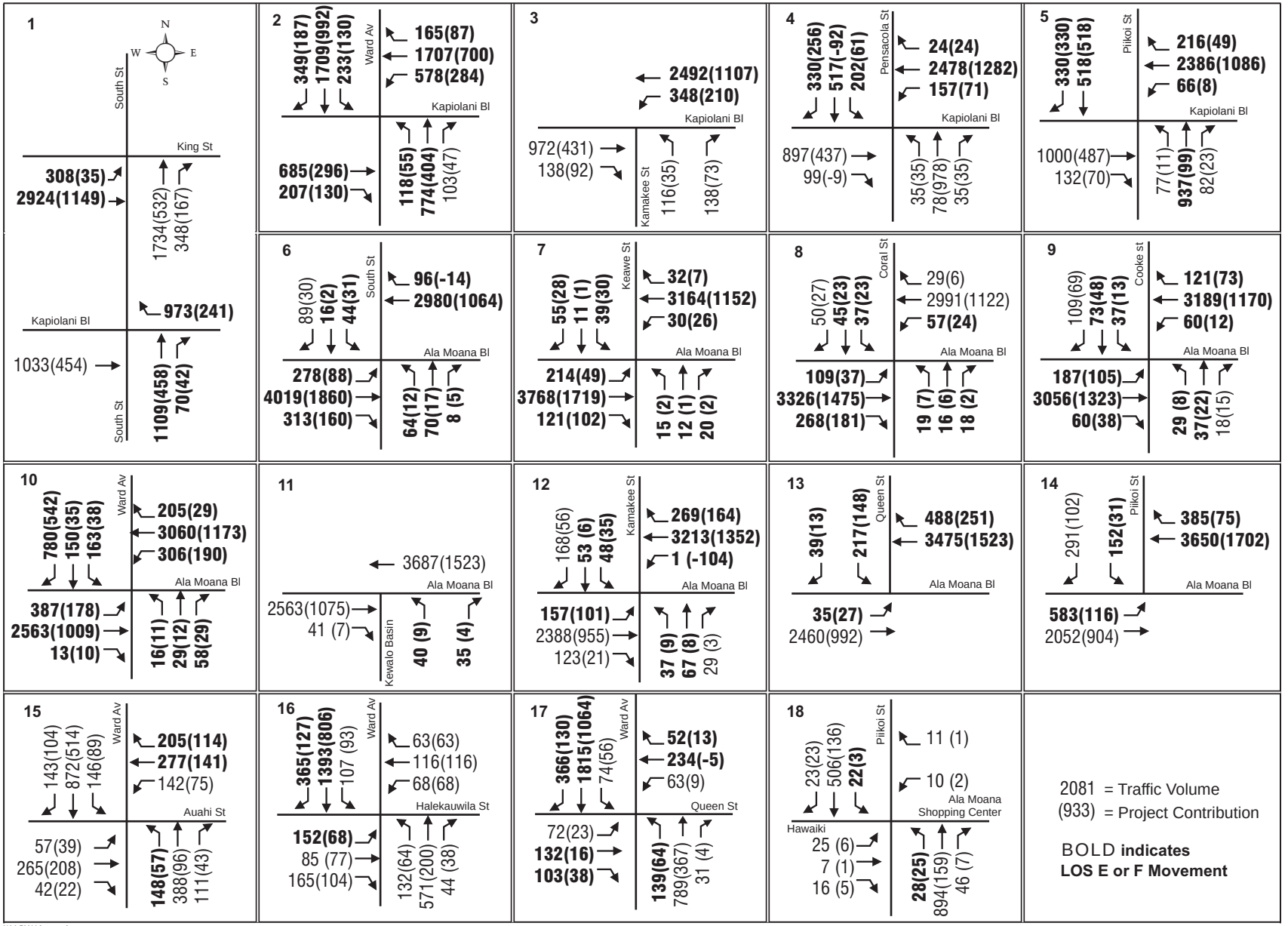
KAKAAKO MAUKA AREA PLAN SEIS

Figure 36

Source: DMJM Harris, 2008

PREFERRED ALTERNATIVE INTERSECTION LEVEL OF SERVICE

AM Peak Hour



NAA PM Volumes.cdr

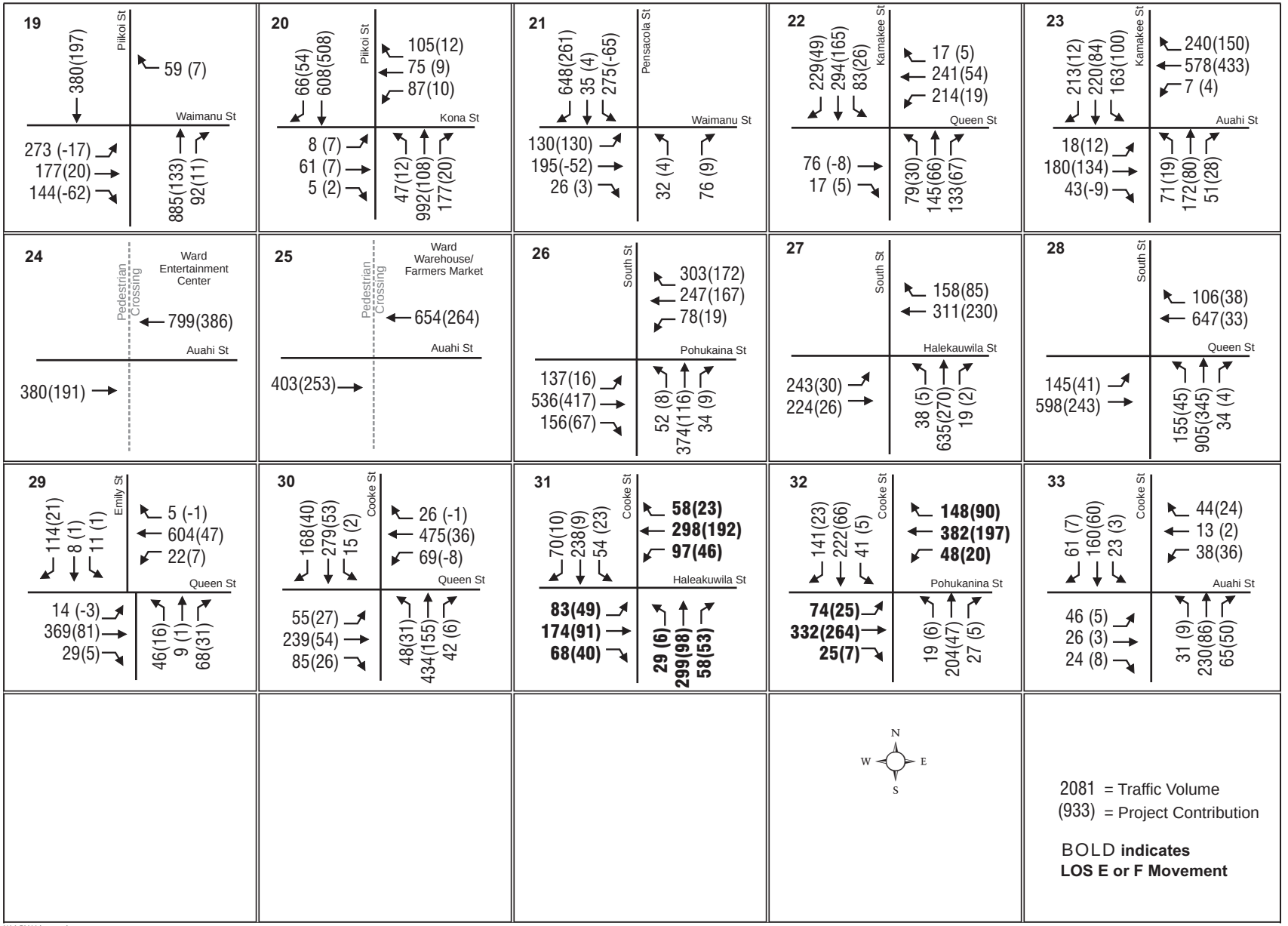
KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 37a

PREFERRED ALTERNATIVE TRAFFIC VOLUMES

AM Peak Hour



NAA PM Volumes.cdr

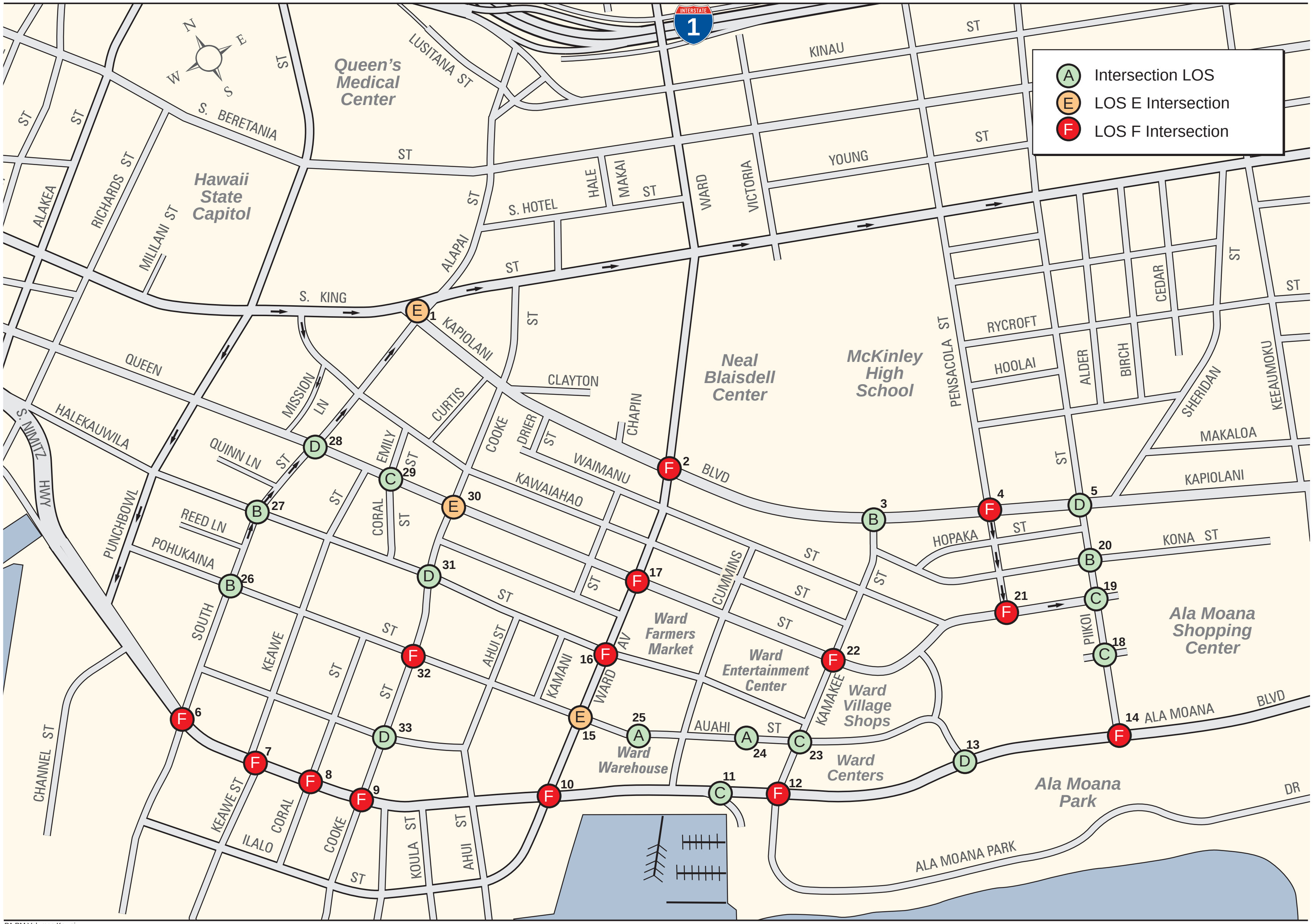
KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 37b

PREFERRED ALTERNATIVE TRAFFIC VOLUMES

AM Peak Hour



PA PM Volumes Key.ai

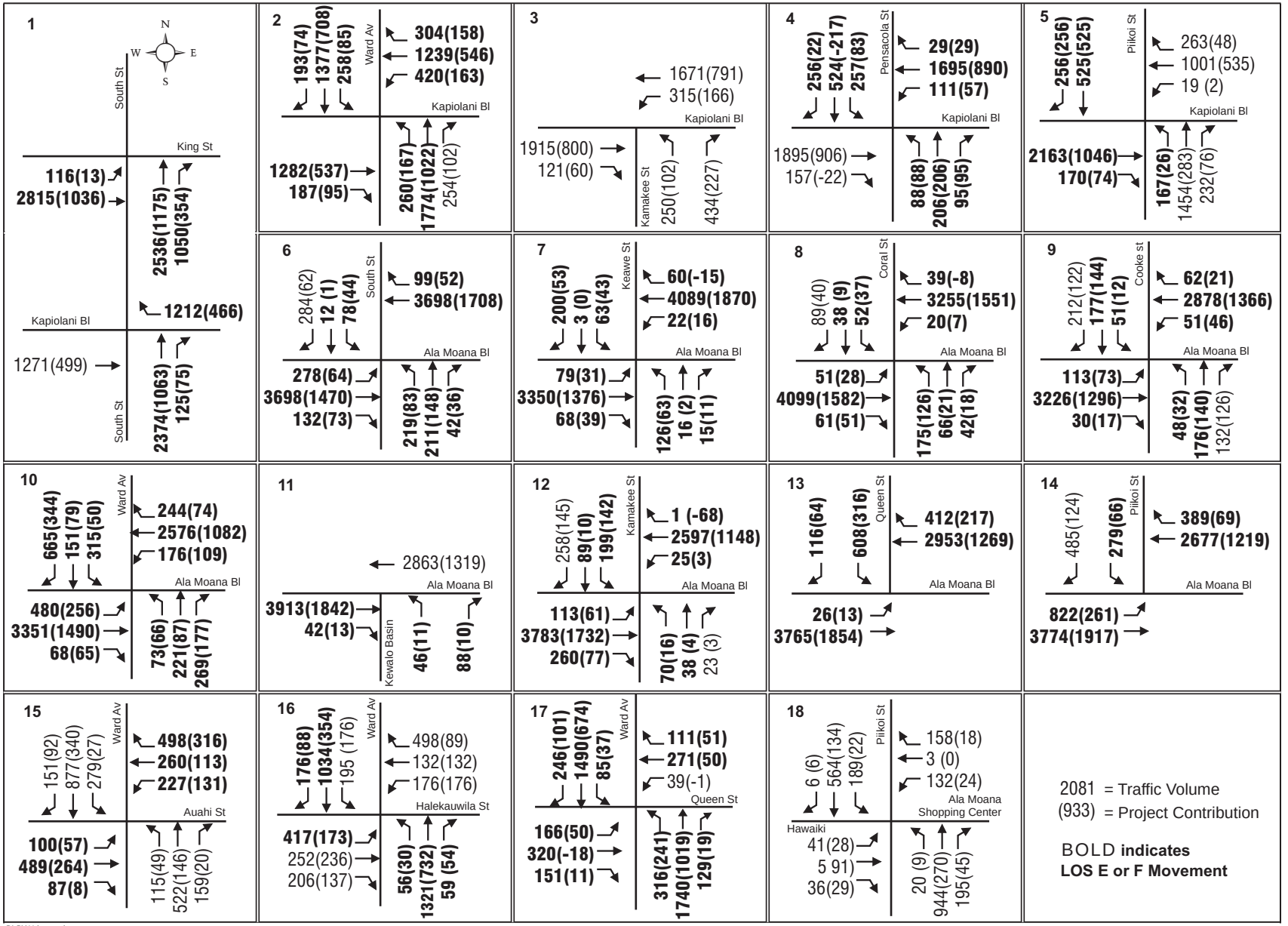
Source: DMJM Harris, 2008

KAKAAKO MAUKA AREA PLAN SEIS

Figure 38

PREFERRED ALTERNATIVE INTERSECTION LEVEL OF SERVICE

PM Peak Hour



PA PM Volumes.cdr

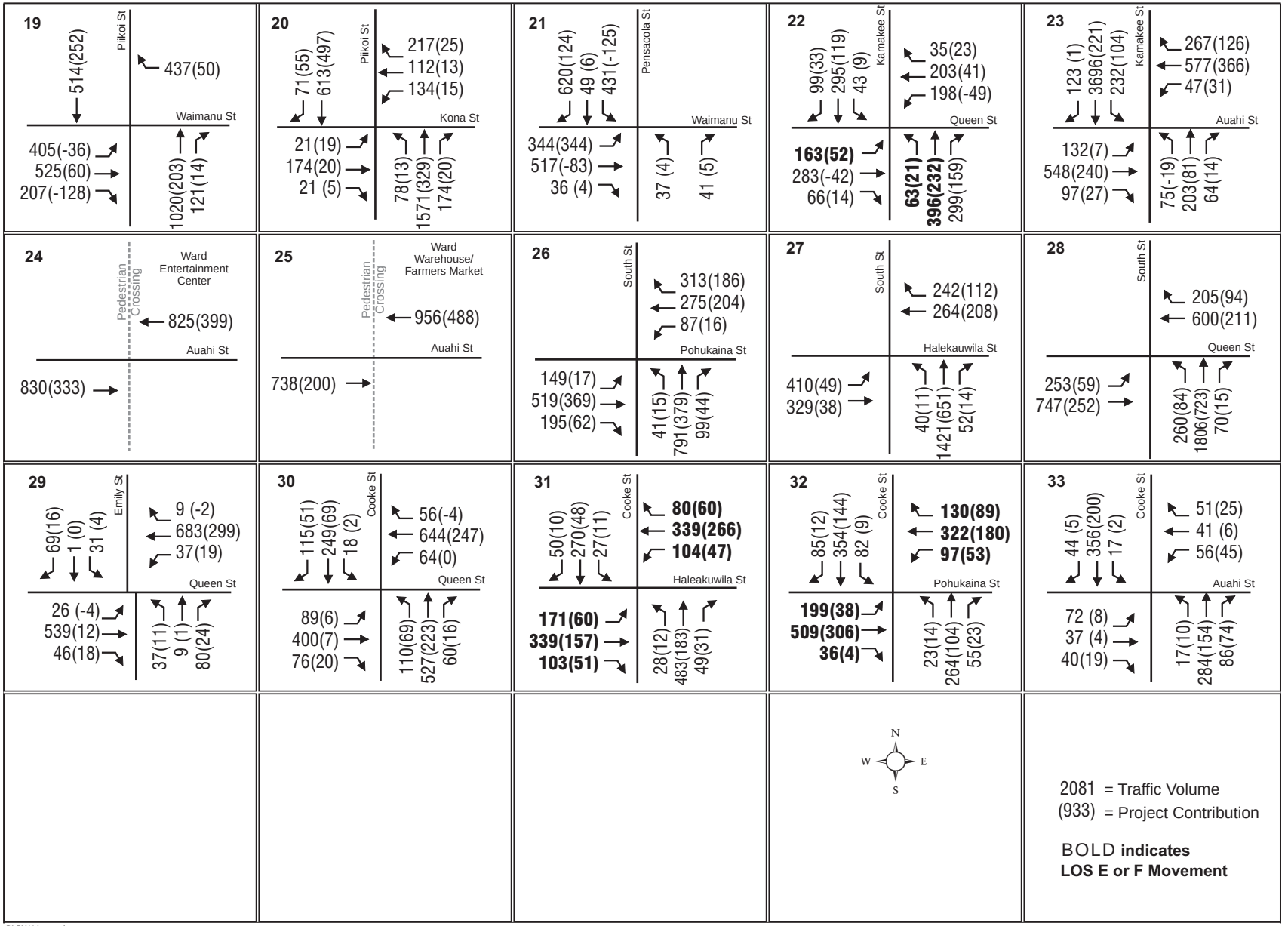
KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 39a

PREFERRED ALTERNATIVE TRAFFIC VOLUMES

PM Peak Hour



PA PM Volumes.cdr

KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 39b

PREFERRED ALTERNATIVE TRAFFIC VOLUMES

PM Peak Hour

In Cumulative Conditions under the Preferred Alternative, the signalized intersection of Kapiolani Boulevard / Pensacola Street operates at LOS F in both the AM and PM peak hours. In Cumulative Conditions under the No Action Alternative, it operates at LOS E in the AM peak hour and at LOS D in the PM peak hour. Based on the significance criteria presented in Section 4.2.1, the Draft Mauka Area Plan is likely to generate a significant impact at this intersection. To mitigate the impact, the current one-way couplet between Pensacola Street and Piikoi Street should be retained.

In Cumulative Conditions under the Preferred Alternative, the signalized intersection of Kapiolani Boulevard / Piikoi Street operates at LOS F in both the AM and PM peak hours. In Cumulative Conditions under the No Action Alternative, it operates at LOS E in the AM peak hour and at LOS D in the PM peak hour. Based on the significance criteria presented in Section 4.2.1, the Draft Mauka Area Plan is likely to generate a significant impact at this intersection. To mitigate the impact, the current one-way couplet between Pensacola Street and Piikoi Street should be retained.

In Cumulative Conditions under the Preferred Alternative, the signalized intersection of Ward Avenue / Halekauwila Street operates at LOS F in both the AM and PM peak hours. In Cumulative Conditions under the No Action Alternative, it operates at LOS D in both the AM and PM peak hours. Based on the significance criteria presented in Section 4.2.1, the Draft Mauka Area Plan is likely to generate a significant impact at this intersection. To mitigate the impacts to less-than-significant levels would require significant geometric or network modifications which would likely be infeasible given right-of-way constraints and other considerations.

In Cumulative Conditions under the Preferred Alternative, the signalized intersection of Ward Avenue / Queen Street operates at LOS F in both the AM and PM peak hours. In Cumulative Conditions under the No Action Alternative, it operates at LOS C in the AM peak hour and at LOS D in the PM peak hour. Based on the significance criteria presented in Section 4.2.1, the Draft Mauka Area Plan is likely to generate a significant impact at this intersection. To mitigate the impact to less-than-significant levels would require significant geometric or network modifications which would likely be infeasible given right-of-way constraints and other considerations.

In Cumulative Conditions under the Preferred Alternative, the all-way stop-controlled intersection of Halekauwila Street / Cooke Street operates at LOS F in the PM peak hour. In Cumulative Conditions under the Existing Mauka Area Plan, it operates at LOS B in the PM peak hour. Based on the significance criteria presented in Section 4.2.1, the Draft Mauka Area Plan is likely to generate a significant impact at this intersection. To mitigate the impact, the intersection should be signalized.

In Cumulative Conditions under the Preferred Alternative, the all-way stop-controlled intersection of Pohukaina Street / Cooke Street operates at LOS F in the AM peak hour. In Cumulative Conditions under the Existing Mauka Area Plan, it operates at LOS D in the AM peak hour. Based on the significance criteria presented in Section 4.2.1, the Draft Mauka Area Plan is likely to generate a significant impact at this intersection. To mitigate the impact, the intersection should be signalized.

Average speed and travel time were also calculated through micro-simulation for Cumulative Conditions under the Preferred Alternative. The results of that analysis are summarized in **Table 18**.

Table 18: Preferred Alternative Average Speed and Travel Time

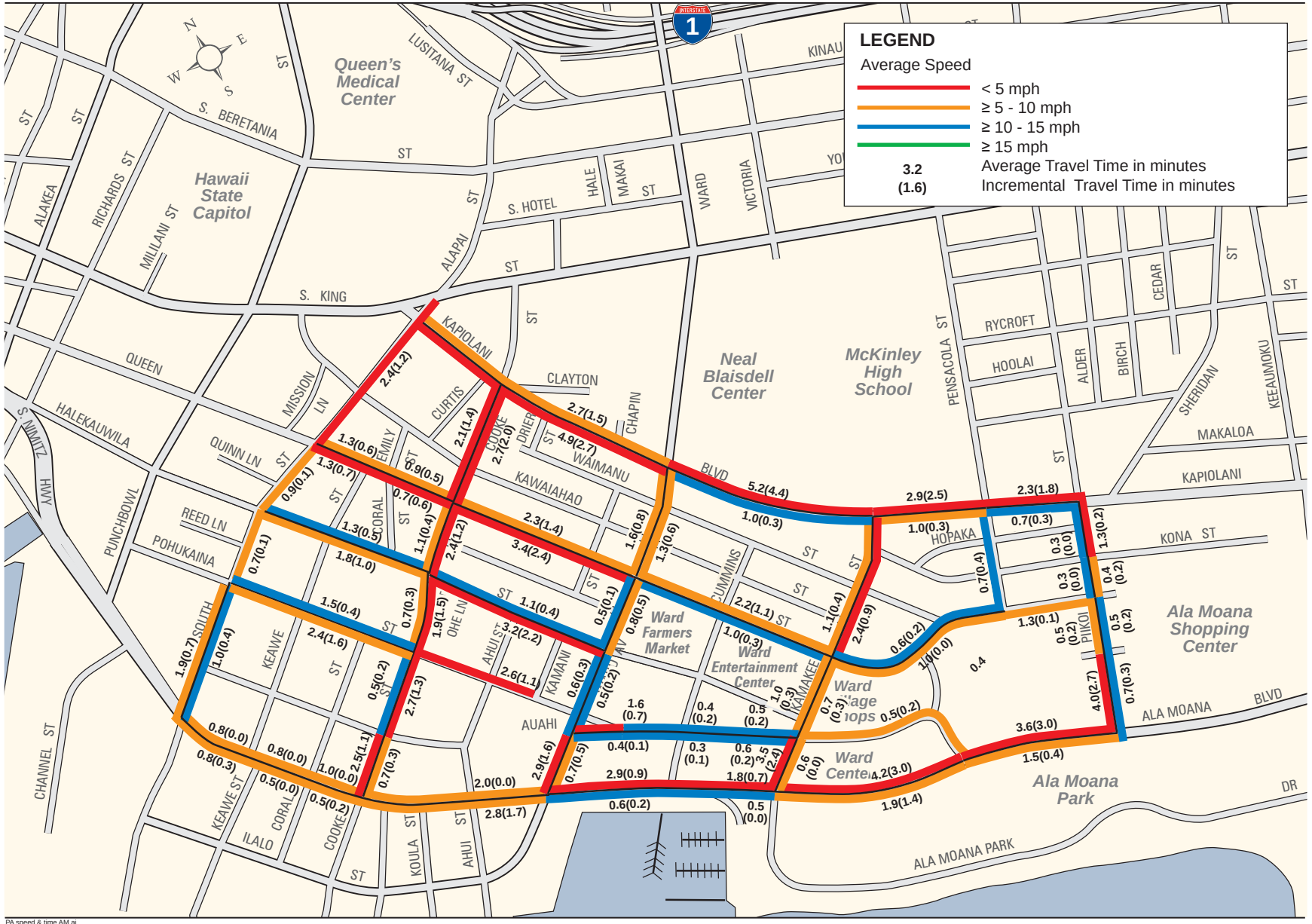
#	Roadway	Direc-tion	Peak Hour	Existing Conditions		Cum. Conditions – Preferred Alternative	
				Average Travel Time (minutes)	Average Speed (mph)	Average Travel Time (minutes)	Average Speed (mph)
1	**Kapiolani Boulevard** *between South Street and Piikoi Street*	EB	AM	4.0	16	7.6	9
			PM	4.3	13	9.7	7
		WB	AM	2.9	13	13.1	5
			PM	4.7	14	13.4	4
2	**Queen Street** *between South Street and Piikoi Street*	EB	AM	4.6	13	8.7	6
			PM	3.5	10	17.9	3
		WB[(1)]	AM	3.5	14	7.3	8
			PM	6.0	14	10.2	6
3	**Ala Moana Boulevard** *between South Street and Piikoi Street*	EB	AM	4.7	16	9.1	9
			PM	5.3	18	10.2	9
		WB	AM	9.5	9	17.1	5
			PM	3.8	20	15.8	5
4	**Piikoi Street** *between Kapiolani Boulevard and Ala Moana Boulevard*	NB	AM	2.0	13	2.9	8
			PM	2.1	10	5.5	5
		SB	AM	2.2	13	5.1	9
			PM	2.5	9	5.5	5
5	**Kamakee Street** *between Kapiolani Boulevard and Ala Moana Boulevard*	NB	AM	2.5	10	3.7	7
			PM	2.6	10	4.4	6
		SB	AM	2.5	10	5.6	6
			PM	3.0	8	9.1	2
6	**Ward Avenue** *between Kapiolani Boulevard and Ala Moana Boulevard*	NB	AM	1.5	13	3.3	9
			PM	2.2	10	8.7	3
		SB	AM	2.8	13	5.6	7
			PM	3.0	11	7.4	4

#	Roadway	Direc-tion	Peak Hour	Existing Conditions		Cum. Conditions – Preferred Alternative	
				Average Travel Time (minutes)	Average Speed (mph)	Average Travel Time (minutes)	Average Speed (mph)
7	**Cooke Street** *between Kapiolani Boulevard and Ala Moana Boulevard*	NB	AM	2.5	13	10.4	4
			PM	2.3	15	5.9	8
		SB	AM	3.5	14	6.9	7
			PM	2.9	14	16.2	2
8	**South Street** *between Kapiolani Boulevard and Ala Moana Boulevard*	NB	AM	3.2	11	5.0	8
			PM	3.2	11	7.7	5
		SB[(2)]	AM	1.2	9	1.9	6
			PM	1.0	10	3.2	4

Source: DMJM Harris – 2008
Notes:
Cum. = Cumulative
(1) WB Queen Street between South Street and Pensacola Street only.
(2) SB South Street between Pohukaina Street and Ala Moana Boulevard only.

As shown in **Table 18**, average speeds are expected to be decrease along all key roadways, with the slowest average speeds along north-south roadways such as Kamakee Street, Ward Avenue, Cooke Street, and South Street.

Figure 40 and **Figure 41** illustrate the average speed and travel time for key roadway segments during the weekday peak hours. Where appropriate, the incremental change in average travel time over Existing Conditions is included for each segment, in parentheses.



PA speed & time AM.ai

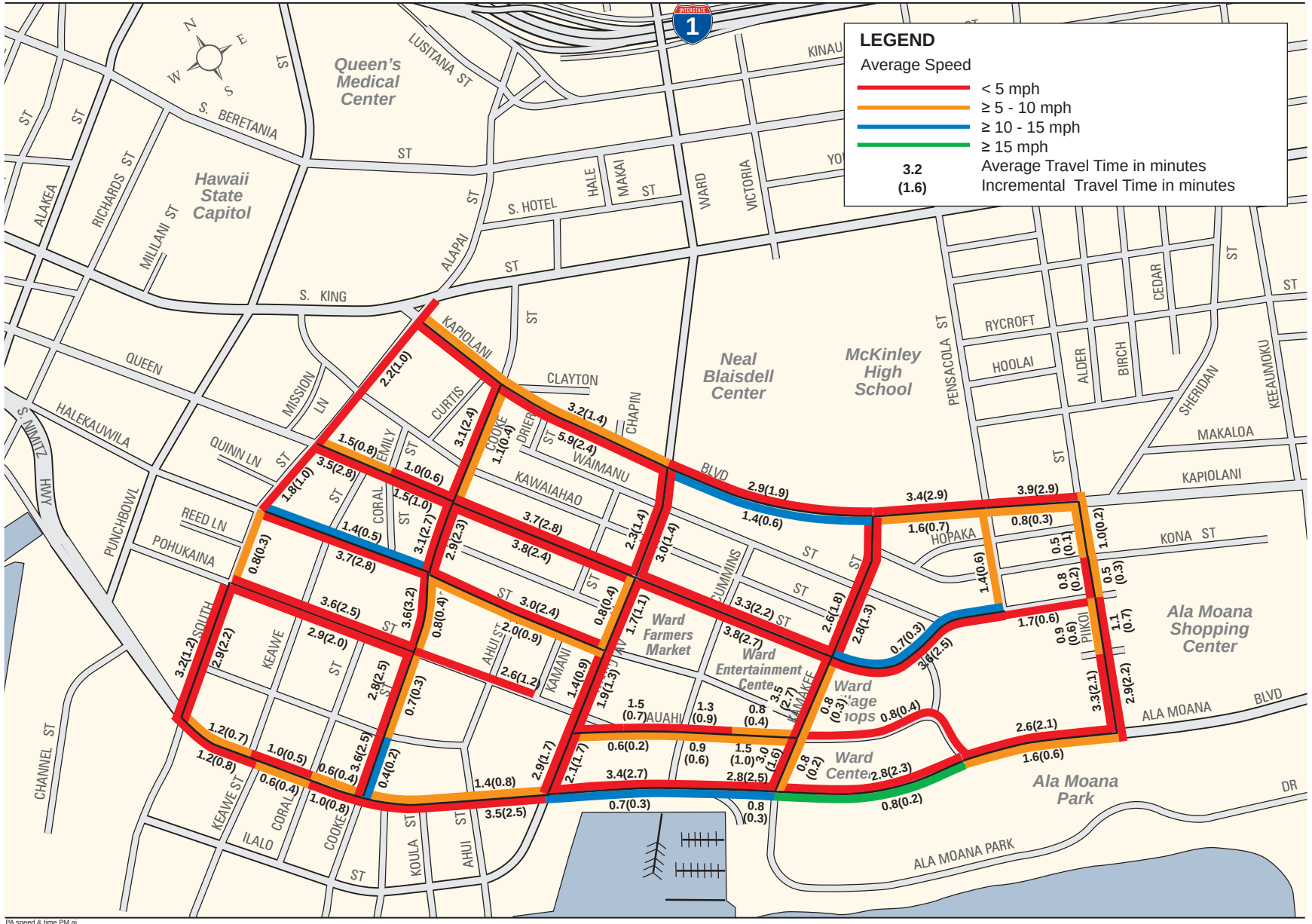
KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 40

PREFERRED ALTERNATIVE VEHICLE SPEED AND TRAVEL TIME

AM Peak Hour



PA speed & time PM.ai

KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 41

PREFERRED ALTERNATIVE VEHICLE SPEED AND TRAVEL TIME

PM Peak Hour

5.3.2 TRANSIT IMPACTS

Because the fixed guideway system will operate along an east-west alignment through the Mauka Area, it was assigned to both the east and west screenlines for the Cumulative Conditions transit analysis. The expected capacity of the fixed guideway was based on a line-haul capacity standard of 3,000 to 5,000 pphpd used in the technology screening analysis, although modern rail can provide much higher capacity if required.[13] The expected Cumulative Conditions ridership after implementation of the fixed guideway system is also based on the numbers presented in the technology screening analysis. The resulting Cumulative Conditions transit capacity utilization under the No Action Alternative for the weekday AM and PM peak hour is summarized in **Table 19**.

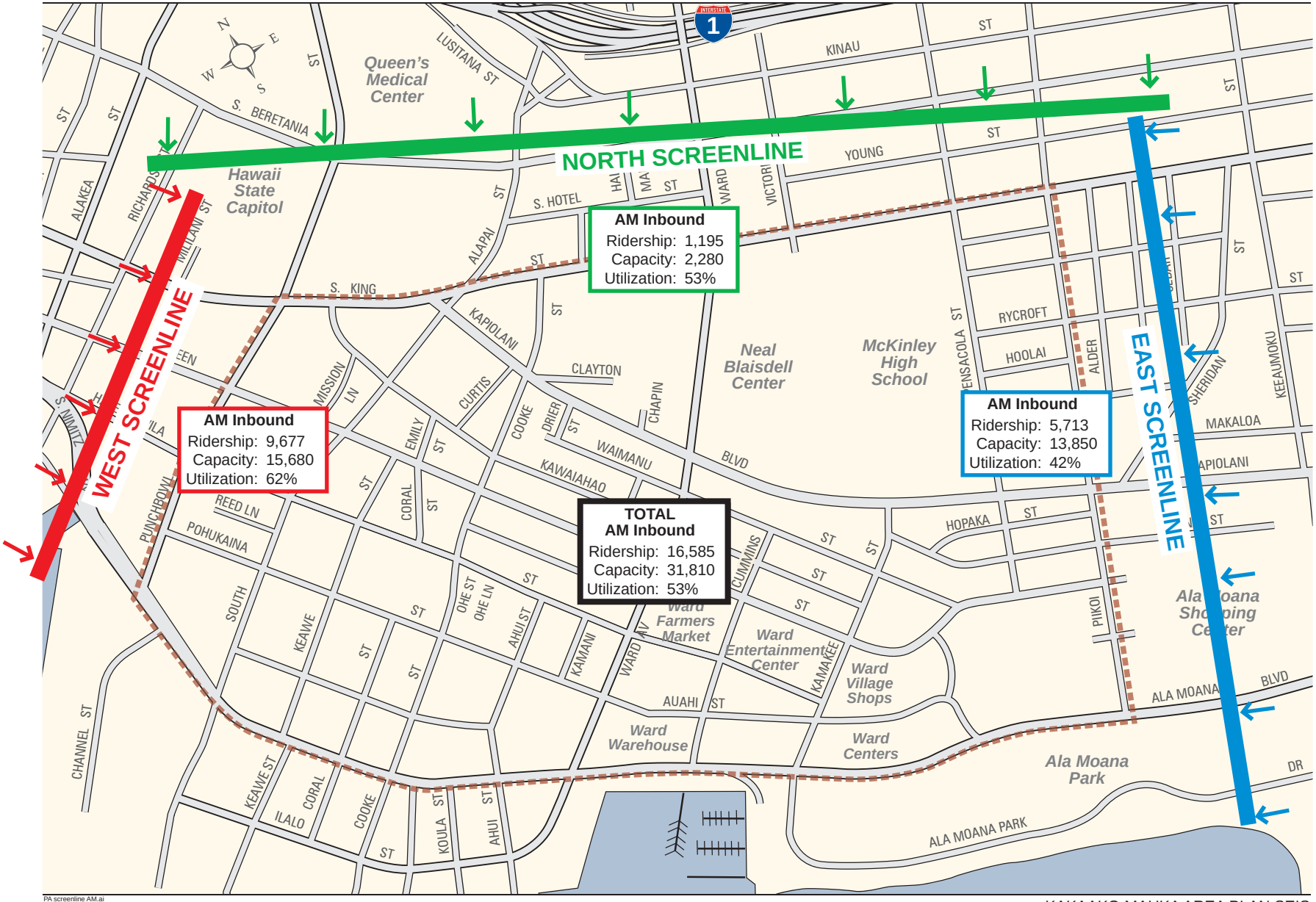
Figure 42 and **Figure 43** show the Preferred Alternative transit capacity utilization for the AM and PM peak hours, respectively.

Table 19: Preferred Alternative Transit Capacity Utilization

Screenline	Existing Conditions			Cumulative Conditions					
				No Action Alternative			Preferred Alternative		
	Rid. (pax)	Cap. (pax)	Cap. Util.	Rid. (pax)	Cap. (pax)	Cap. Util.	Rid. (pax)	Cap. (pax)	Cap. Util.
AM Peak Hour – Inbound									
West	4,635	10,500	44%	9,732	15,680	62%	9,677	15,680	62%
East	2,943	6,720	44%	5,771	13,850	42%	5,713	13,850	42%
North	351	480	73%	1,198	2,280	53%	1,195	2,280	53%
Total	**7,929**	**17,700**	**45%**	**16,701**	**31,810**	**53%**	**16,585**	**31,810**	**53%**
PM Peak Hour – Outbound									
West	4,645	10,590	44%	9,954	16,490	60%	9,873	16,490	60%
East	2,915	6,300	46%	6,194	15,440	40%	6,108	15,440	40%
North	440	660	67%	1,341	2,220	60%	1,338	2,220	60%
Total	**8,000**	**17,550**	**46%**	**17,489**	**34,150**	**51%**	**17,319**	**34,150**	**51%**

Source: DMJM Harris – 2008
Notes:
pax = passengers
Rid. = Ridership
Cap. = Capacity
Cap. Util. = Capacity Utilization

(13) Parsons Brinckerhoff Quade & Douglas, Inc. *Alternatives Screening Memo: Honolulu High-Capacity Transit Corridor Project* (2006).



PA screenline AM.ai

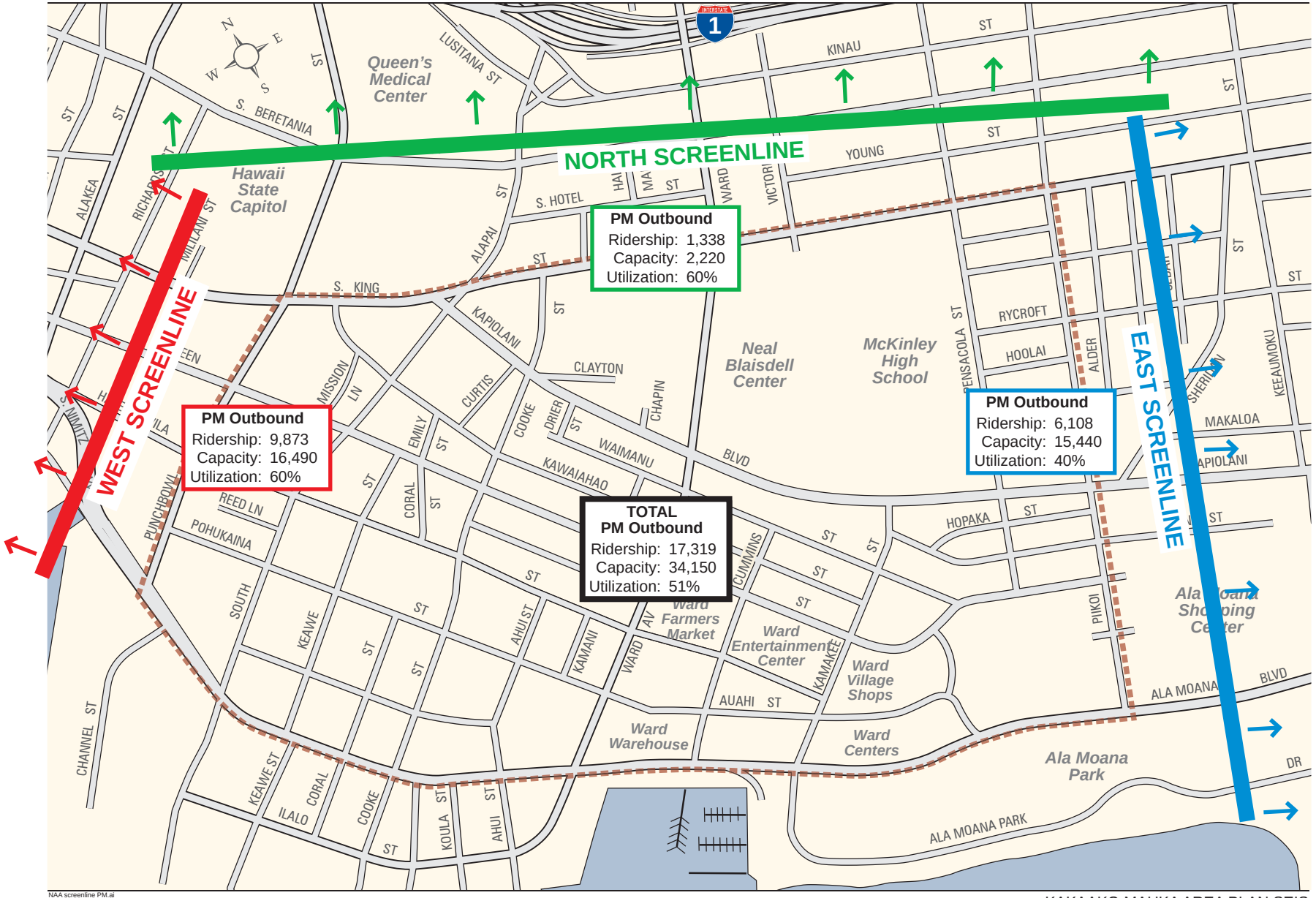
KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 42

PREFERRED ALTERNATIVE TRANSIT CAPACITY UTILIZATION

AM Peak Hour



NAA screenline PM.ai

KAKAAKO MAUKA AREA PLAN SEIS

Source: DMJM Harris, 2008

Figure 43

PREFERRED ALTERNATIVE TRANSIT CAPACITY UTILIZATION

PM Peak Hour

As shown in **Table 19**, the fixed guideway system is expected to substantially increase capacity in the west and east screenlines. The guideway system is also expected to draw new riders to transit because of its improvement over existing bus services in terms of speed, reliability, and frequency, thus causing an increase in ridership across the west screenline. However, Cumulative Conditions screenline capacity utilization is still below the 80 to 90 percent threshold typically considered acceptable for urban areas.

It should be emphasized, however, that this analysis assumes an identical mode split as the No Action Alternative, primarily because of a lack of information necessary to make an informed estimate of the expected transit mode split. These factors include but are not limited to the following[14]:

- Intensity and type of development;
- Proximity of development to transit facilities such as stations, stops, and lines;
- Level of transit service provided;
- Quality of pedestrian connections between transit facilities and development;
- Restrictions on off-street parking;
- Provision of alternative means of transportation such as shuttles, bicycle facilities, or carsharing docks; or,
- Other policies to encourage transit use, such as free or discounted transit passes.

Until a set of quantitative development standards is drafted for the proposed TOD in the Mauka Area, it may be difficult to accurately estimate the ultimate benefit of such development on transit mode split. It should also be noted that much will ultimately depend on the final design and operation of the proposed fixed guideway system. A reliable, fast, high-frequency system would clearly be a more attractive option for choice riders than a system that is less reliable, slower, and less frequent. In any event, the guideway system and surrounding TOD should both be planned and designed to facilitate transit, walking, and bicycling, and reduce dependency on private automobiles.

5.3.3 BICYCLE IMPACTS

Because of ambiguity between *Bike Plan Hawaii 2003* and the *Honolulu Bicycle Master Plan* (1999), the bikeway plan chosen for analysis is the plan illustrated in **Figure 13**.

As shown in **Figure 13**, Class II bicycle facilities (bicycle lanes) are planned for most major streets in the Mauka Area, including Ala Moana Boulevard, King Street, Ward Avenue, Piikoi Street, and Pensacola Street. Bicycle lanes along Ala Moana Boulevard would likely require removal of at least one lane of vehicular traffic due to roadway right-of-way constraints. Given the heavy traffic volumes on these streets, it seems impractical to remove one lane of traffic for a bicycle lane which will likely not be heavily used. In addition, Ala Moana Boulevard is a wide arterial with relatively high speeds compared to local streets, which may reduce the utility of a dedicated bicycle lane if bicyclists choose not to use it due to safety concerns.

[14] Cervero, Robert; Ferrell, Christopher; Murphy, Steven. "Transit-Oriented Development and Joint Development in the United States: A Literature Review," *Research Results Digest 52* (Oct. 2002), Transit Cooperative Research Program.

It should also be noted that there is already an existing Class I bicycle facility (bicycle path) along the waterfront, paralleling Ala Moana Boulevard. An extension further west has also been proposed as part of *Bike Plan Hawaii 2003*. Implementing an additional Class II facility on Ala Moana Boulevard would likely duplicate the existing and planned Class I facilities along the waterfront. However, because of the importance of Ala Moana Boulevard as a major east-west boulevard connecting Kakaako with other parts of the island, designating it as a Class III facility would likely be sufficient.

Roadway width on Ward Avenue, Piikoi Street, and Pensacola Street should be sufficient to accommodate bicycle lanes. These streets carry lower traffic volumes than Ala Moana Boulevard and continue past the freeway into the hills, offering important north-south connections in the bikeway network. For these reasons, installing bicycle lanes on Ward Avenue, Piikoi Street, and Pensacola Street should be considered a top priority after the extension of the recreational bicycle path from Ala Moana Park.

The additional facilities proposed for Cooke Street, Pohukaina Street, and Kamakee Street should provide needed connections to the bikeway network and help promote bicycling among people who live and work in Kakaako. Given that these streets carry mostly local traffic, the addition of bikeway facilities on these roadways is not expected to cause significant impacts to traffic conditions.

Although the Preferred Alternative is expected to generate 250 bicycle trips in the AM peak hour and 350 bicycle trips in the PM peak hour, many of these trips are expected to be short-distance trips either within or just outside the Mauka Area. These trips would likely make use of more local roadways such as Queen Street or Halekauwila Street, which have lower traffic volumes and slower traffic speeds, and can more safely accommodate bicyclists. Therefore, the Preferred Alternative is not expected to have a significant impact on future bicycle conditions. However, each proposed development should be evaluated during the approval process to ensure that no significant impacts to bicycle facilities are likely to occur due to design elements which increase the potential for conflict between bicycles and other modes of travel such as automobiles and pedestrians.

5.3.4 PEDESTRIAN IMPACTS

The Draft Mauka Area Plan proposes an urban design that is pedestrian-friendly and encourages walking for both leisure and business. Development of a base network of Pedestrian Tolerant and Pedestrian Supportive Environments will make walking safer and more attractive for residents, workers, and visitors in the Mauka Area.

Under the Preferred Alternative, there are expected to be an additional 950 pedestrian trips in the AM peak hour and an additional 1,200 pedestrian trips in the PM peak hour. it should be noted, however, that the pedestrian mode split assumed for the Preferred Alternative is identical to the pedestrian mode split assumed for the No Action Alternative. Given that the Preferred Alternative is designed with more Pedestrian Supportive elements, it seems likely that the number of pedestrian trips would increase substantially. Therefore, the mode split assumed for the Preferred Alternative is likely a conservative estimate of actual travel behavior in the Mauka Area after build-out conditions in the year 2030. In reality, it is likely that there would be fewer vehicle trips and more pedestrian trips than calculated here. However, this expected mode shift is difficult to estimate, as it depends on many other factors such as the quality of pedestrian, bicycle, and transit

facilities, and the proximity of each development to amenities such as shops and services. Because of the uncertainty in estimating this expected mode shift, however, the analysis has conservatively assumed that no mode shift would occur. Opportunities for mode shift are described in further detail in Chapter 7 of the report.

Observations indicated that existing pedestrian traffic was light, with pedestrian facilities such as sidewalks and crosswalks operating at free-flow conditions. Once the proposed improvement measures have been implemented, however, not only the quality but also the capacity of the pedestrian network are expected to increase.

The exact impact of the Preferred Alternative on future pedestrian operations is difficult to estimate given the wide range of uncertainties surrounding each development at this stage of the process. Each proposed development should be evaluated during the approval process to ensure that no significant impacts to pedestrian facilities are likely to occur due to location of driveways and curb cuts and design elements such as building frontage. In particular, any development that is proposed as TOD should be designed to maximize transit use, including the provision of a safe, pleasant walking environment between the development and the transit facility.

5.3.5 ON-STREET PARKING

The Draft Mauka Area Plan would retain on-street parking where appropriate, both to support local businesses and to serve as a buffer zone for pedestrians on the sidewalk.

6.0 MITIGATION MEASURES

This chapter presents the transportation mitigation measures that would be required to reduce the impacts of development under the Draft Mauka Area Plan to less-than-significant levels. An impact is considered significant if it satisfies the significance criteria outlined in Section 4.2.1.

The proposed mitigation measures are summarized in **Table 21**. Each owner, developer, and / or successor-in-interest of any proposed project in the Mauka Area shall be responsible for their proportionate share of the following mitigation measures.

Table 20: Mitigation Measures

#	Impact	Level of Significance	Mitigation Measure	Significance After Mitigation
Traffic Impacts				
1	In Cumulative Conditions under the Preferred Alternative, the signalized intersection of Kapiolani Boulevard / Pensacola Street operates at LOS F in both the AM and PM peak hours. In Cumulative Conditions under the No Action Alternative, it operates at LOS E in the AM peak hour and at LOS D in the PM peak hour.	Significant	Retain the existing one-way couplet between Pensacola Street and Piikoi Street.	Less than Significant
2	In Cumulative Conditions under the Preferred Alternative, the signalized intersection of Kapiolani Boulevard / Piikoi Street operates at LOS F in both the AM and PM peak hours. In Cumulative Conditions under the No Action Alternative, it operates at LOS E in the AM peak hour and at LOS D in the PM peak hour.	Significant	Retain the existing one-way couplet between Pensacola Street and Piikoi Street.	Less than Significant
3	In Cumulative Conditions under the Preferred Alternative, the signalized intersection of Ward Avenue / Halekauwila Street operates at LOS F in both the AM and PM peak hours. In Cumulative Conditions under the No Action Alternative, it operates at LOS D in both the AM and PM peak hours.	Significant	No feasible mitigation measure available. Insufficient right-of-way to accommodate modifications to roadway and intersection geometry to mitigate this impact.	Significant and Unavoidable

#	Impact	Level of Significance	Mitigation Measure	Significance After Mitigation
4	In Cumulative Conditions under the Preferred Alternative, the signalized intersection of Ward Avenue / Queen Street operates at LOS F in both the AM and PM peak hours. In Cumulative Conditions under the No Action Alternative, it operates at LOS C in the AM peak hour and at LOS D in the PM peak hour.	Significant	No feasible mitigation measure available. Insufficient right-of-way to accommodate modifications to roadway and intersection geometry to mitigate this impact.	Significant and Unavoidable
5	In Cumulative Conditions under the Preferred Alternative, the all-way stop-controlled intersection of Halekauwila Street / Cooke Street operates at LOS F in the PM peak hour. In Cumulative Conditions under the No Action Alternative, it operates at LOS B in the PM peak hour.	Significant	Signalize the intersection.	Less than Significant
6	In Cumulative Conditions under the Preferred Alternative, the all-way stop-controlled intersection of Pohukaina Street / Cooke Street operates at LOS F in the AM peak hour. In Cumulative Conditions under the No Action Alternative, it operates at LOS D in the AM peak hour.	Significant	Signalize the intersection.	Less than Significant

Transit Impacts

No significant transit impacts were identified.

Bicycle Impacts

No significant bicycle impacts were identified.

Pedestrian Impacts

No significant pedestrian impacts were identified.

Source: DMJM Harris – 2008

7.0 OPPORTUNITIES FOR MODE SHIFT

The travel demand analysis conducted for both the No Action Alternative and the Preferred Alternative assumes no significant changes to mode share in the future. However, one of the primary elements of the Draft Mauka Area Plan is to fully realize the benefits of TOD by focusing high-density, mixed-use developments around the two planned stations on the fixed guideway system.

The main goal of the fixed guideway system would be to provide faster, more reliable transit, serving as an attractive alternative to the private automobile. The project would strengthen the connection between Kapolei, Downtown Honolulu and the Mauka Area, UH Manoa, and Waikiki. The system would use modern rail technology, which can provide a capacity of over 9,000 pphpd and operate at a minimum headway of two to three minutes.(15)

In the Mauka Area, the alignment follows Halekauwila Street west of Ward Avenue, crossing over to Queen east of Ward Avenue and to Kona Street east of Pensacola Street. Stations would be provided at the intersection of South Street / Halekauwila Street and on Queen Street near the Ward Farmers Market / Ward Entertainment Center.

7.1 TOD DEVELOPMENT STANDARDS

A set of design standards should be drafted based on research on existing TOD and a supporting policy framework created to expedite proposed development in and around stations on the fixed guideway system.

The following considerations should be included during the drafting process for development and design standards, many of which are based on research on successful TOD examples(16):

- Stations should act as community centers, with a concentration of activities and services both within and around the stations.
- Development density should be sufficient in the immediate station area to encourage transit use, and, if being used to finance transit investments, development density should be sufficient to at least partially support the investment. TOD is most effective when placed within a five to fifteen minute walking distance of the transit hub (approximately a quarter-mile to a half-mile).
- The surrounding station area should be a pedestrian-friendly and bicycle-friendly environment, with pedestrian-scaled buildings; landscaping such as trees and planters; bicycle racks and other bicycle facilities; traffic calming measures such as on-street parking, street tables, or chicanes; pedestrian-only shortcuts; minimal building setbacks to create an inviting pedestrian environment; frequent crosswalks; and, an integrated pedestrian network in a grid pattern of short block lengths.

(15) DTS, City and County of Honolulu. *Honolulu on the Move* (Mar. 2008).
(16) Cervero, Robert; Ferrell, Christopher; Murphy, Steven. "Transit-Oriented Development and Joint Development in the United States: A Literature Review," *Research Results Digest 52* (Oct. 2002), Transit Cooperative Research Program.

- Only the minimum amount of parking necessary should be provided in order to encourage people to walk, bicycle, or take transit to the station, and any off-street parking provided should be included within other buildings such that no lot is occupied solely by parking and parking is obscured from the sidewalk and street.
- For infrequent bus lines or periods of infrequent transit service (such as midday or evening), transfers should be timed with the arrival of trains to facilitate travel by transit.

Once a set of acceptable standards is drafted, a framework should be established whereby any development proposal that satisfies the standards is fast-tracked through the approval process.

7.2 TOD ANALOGIES

Although TOD is an emerging concept, there have been several successful examples within the United States in the Washington, D.C. metro area, Portland, Oregon, the San Francisco Bay Area, and other urban areas similar to the Mauka Area.

In jurisdictions with comprehensive transit systems and pedestrian- and bicycle-friendly environments, a non-auto mode share of 30% or more is not uncommon for home-based work trips. **Table 21** summarizes the mode split behavior in selected neighborhoods similar to the Kakaako Mauka Area.

Table 21: Mode Split in Other Jurisdictions

Jurisdiction/ Neighborhood	Home-Based Work Trip Mode Share		
	Auto	Transit	Walk/Bike/ Other[(1)]
Berkeley, California *Downtown, Telegraph Avenue*	22%	19%	59%
Portland, Oregon *Pearl District*	38%	26%	36%
Denver, Colorado *Downtown*	41%	11%	48%
San Francisco, California *Mission District*	42%	38%	20%
Arlington, Virginia *Ballston*	48%	43%	9%
Los Angeles, California *Hollywood/Vine*	65%	20%	15%

Source: 2000 U.S. Census Journey to Work; DMJM Harris – 2008
Notes:
(1) Includes motorcycle, bicycle, walk, "other means," and work at home.

As shown in **Table 21**, areas with comprehensive transit service can have transit mode shares in the 35 to 45 percent range. San Francisco's Mission District is served well by both underground heavy rail service (BART) and surface bus lines which provide good local and regional connections. The Ballston-MU Station on the Washington Metro serves a high-density neighborhood of apartment and condo complexes, government offices, and a college campus.

Areas which offer amenities for pedestrians and bicyclists can also have high non-auto mode shares. For example, the University of California Berkeley campus encourages students, faculty, and staff to use alternative modes of travel to reach campus. In addition to discounts for transit passes, pedestrian paths and bicycle racks are provided throughout campus, making travel without an automobile both a feasible and attractive alternative. In addition, Telegraph Avenue and Downtown Berkeley are vibrant mixed-use areas directly adjacent to the campus, with good transit access and strong commercial corridors. Together, they provide people who live in and around campus with a wide array of nearby goods and services and reduce the need for an automobile.

7.3 TRANSPORTATION DEMAND MANAGEMENT

Whereas TOD generally refers to influencing travel behavior through urban design, "transportation demand management" or "travel demand management" generally refers to influencing travel behavior through policy. There is a wide array of TDM measures currently in use, but their primary objective is the same: to reduce automobile travel demand. This concept encompasses both reducing the total number of automobile trips by shifting people to other modes or reducing the need for trips, as well as shifting auto trips to other roadway facilities or to different time periods.

The subsidization of transit passes mentioned in the previous section is one example of a TDM measure that aims to shift people who currently drive onto transit. Other similar measures include the following:

- Removing parking subsidies and forcing drivers such as residents or workers who have reserved parking spaces to pay fair market value for parking;
- Maintaining a carpool database which provides a real-time carpool match and guarantees a ride home;
- Establishing a flexible, easy-to-use carsharing program for residents;
- Improving transit service by providing real-time arrival information; increasing vehicle reliability, frequency, and speed; and improving transfers;
- Providing shower and locker facilities and secured bicycle parking in commercial buildings to encourage bicycle use; and,
- Encouraging work-at-home programs or alternative workweek programs that reduce the need to commute to the office.

In addition to TDM measures which encourage mode shift, some TDM measures aim to redistribute automobile travel demand to other roadways or to other time periods. Congestion pricing, for example, levies a toll on drivers using certain roadway facilities. Congestion pricing can be applied to single limited-capacity facilities such as HOV lanes or bridges, or to entire districts, such as has already been implemented in Singapore's

Electronic Road Pricing program and London's Congestion Charge Zone. In London, the revenue generated from the congestion charge is directed towards improving bus services into and out of Central London. Congestion pricing can be combined with a variable toll scheme which charges a different toll based on the time of day. Vehicles attempting to use a bridge in the commute direction during the peak period can be assessed a higher toll, encouraging drivers to use the bridge during non-peak periods and reducing the impact of traffic peaking.

It should be noted however that an effective TDM program will employ a variety of measures to attain the goal of reducing automobile travel demand. As with London's congestion charge program where toll revenues are directed towards transit improvements, there should be a balance of "push" and "pull" factors or disincentives and incentives to maximize the effectiveness of a TDM program.[17]

7.4 SENSITIVITY ANALYSIS

A concrete TOD design framework, in conjunction with an effective TDM program, would induce a sizable mode shift of 15 to 25 percent. For illustrative purposes, a sensitivity analysis was conducted assuming a mode shift of 15 percent with the implementation of these two strategies. The assumed mode split is summarized in **Table 22**.

Table 22: TDM Sensitivity Analysis – Mode Split

Scenario	Auto	Transit	Bicycle	Walk
Existing Conditions	79.9%	11.9%	1.3%	7.0%
Cumulative Conditions without TDM	76.9%	12.8%	2.3%	8.0%
Cumulative Conditions with TDM	61.9%	23.8%	3.8%	10.5%

Source: 2000 U.S. Census Journey to Work; OMPO Travel Demand Forecast Model – December 2002; DMJM Harris – 2008

Based on the mode split presented in **Table 22**, the following two Cumulative Conditions scenarios were considered for the sensitivity analysis:

- Preferred Alternative (without TDM); and,
- Preferred Alternative (with TDM).

The resulting trip generation figures for these two scenarios are presented in **Table 23**.

It should be noted that a 15 percent mode shift resulting from well-established TOD guidelines and a well-implemented TDM program was conservatively assumed in the analysis for illustrative purposes. Examining the neighborhoods presented in **Table 21**, however, indicates that many of those areas have attained non-auto mode shares of 60 percent or higher. In particular, there is a stark difference in the walk/bicycle/other mode share, which is assumed to be only 15 percent for the purposes of this analysis, but is at

(17) Litman, Todd. "London Congestion Pricing: Implications for Other Cities," Victoria Transport Policy Institute (2006).

least twice as much in many of the analogous areas listed above. Given these facts, the mode splits assumed for this sensitivity analysis could be considered conservative, with a relatively high auto mode share. Ultimately, it is not unlikely that well-designed TOD, in conjunction with a comprehensive TDM program, could induce a mode shift larger than 15 percent.

Table 23: TDM Sensitivity Analysis — Trip Generation by Mode

Land Use	Total Person-Trips				Vehicle Trips[1]
	Auto[1]	Transit	Pedestrian	Bicycle	
Weekday AM Peak Hour					
Residential	2,538 2,040	471 875	294 385	84 141	2,014 1,621
Retail	430 347	123 230	78 100	18 37	341 275
Office	4,641 3,736	786 1,462	491 646	140 232	3,685 2,966
Industrial	856 688	145 268	90 118	26 42	679 544
Total	**8,465** **6,811**	**1,525** **2,835**	**953** **1,249**	**268** **452**	**6,719** **5,406**
Weekday PM Peak Hour					
Residential	3,084 2,483	572 1,062	356 469	103 172	2,448 1,970
Retail	1,558 1,254	444 828	277 365	79 133	1,234 984
Office	4,705 3,790	800 1,483	497 654	144 239	3,738 3,010
Industrial	911 735	154 287	95 126	27 46	724 580
Total	**10,258** **8,262**	**1,970** **3,660**	**1,225** **1,614**	**353** **590**	**8,144** **6,554**

Source: DMJM Harris – 2008
Notes:
2,538 = without TDM
2,040 = with TDM
[1] Auto person-trips refers to the number of people using a vehicle for their trip, whether they are driver or passenger. Vehicle trips refers to the number of actual vehicles on the road.

As shown in **Table 23**, vehicle trips would be reduced by approximately 1,300 trips in the AM peak hour and 1,600 trips in the PM peak hour, which is equivalent to a reduction of 100 to 200 trips on major roadways such as Ala Moana Boulevard and Kapiolani Boulevard. At the key intersection of Ward Avenue and Kapiolani Boulevard, there would be a substantial reduction of 400 to 500 trips in the peak hour.

By helping to remove traffic from roadways and shifting trips to alternative modes, well-designed TOD and a comprehensive TDM program can create a healthier, more sustainable, more livable urban community. Together, these strategies can substantially reduce the impact of future developments under the Draft Mauka Area Plan and encourage a more multi-modal approach to transportation for residents, employees, and visitors alike.

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8.3 TELEPHONE

No parties consulted by telephone.

8.4 EMAIL

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Straus, Peter. Service Planning Manager, San Francisco Municipal Transportation Agency (SFMTA). Sent 03/24/08, 11:31 AM PST.

Kakaako Mauka Area Plan
Supplemental Environmental Impact Statement

Transportation Analysis

Technical Appendix

A: Traffic Count Worksheets
B: Signal Timing Worksheets
C: Trip Generation
D: Intersection Level of Service Calculations
E: Traffic Simulation Output
F: Transit Analysis

Appendix A

Traffic Count Worksheets

AM Peak Hour

File Name: X:\2007\07-097\counts\merged data\AM\Kapiolani - South 2.ppd
Start Date: 10/18/2007
Start Time: 6:00:00 AM
Site Code: 00000000
Comment 1: Kapiolani Boulevard/South Street
Comment 2: AM Peak Hour
Comment 3:
Comment 4:

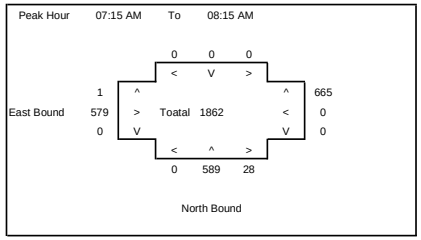
	SOUTH From North				KAP From East				SOUTH From South				KAP From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	0	0	0	0	45	0	0	13	4	52	0	9	0	36	0	5	137
06:15 AM	0	0	0	0	43	0	0	6	4	71	0	11	0	75	0	8	193
06:30 AM	0	0	0	0	88	0	0	5	5	96	0	11	0	119	0	8	308
06:45 AM	0	0	0	0	87	0	0	13	6	133	0	13	0	138	0	12	364
07:00 AM	0	0	0	0	183	0	0	9	6	144	0	12	0	145	0	8	478
07:15 AM	0	0	0	0	137	0	0	10	8	177	0	14	0	141	0	11	463
07:30 AM	0	0	0	0	211	0	0	18	8	125	0	20	0	115	0	16	459
07:45 AM	0	0	0	0	138	0	0	20	3	162	0	17	0	145	0	24	448
08:00 AM	0	0	0	0	179	0	0	11	9	125	0	13	0	178	1	14	492
08:15 AM	0	0	0	0	117	0	0	12	17	125	0	9	0	165	0	13	424
PHF		#####				0.788				0.834				0.81			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	07:00 AM	0	0	0	0	263	0	0	37	19	352	0	44	0	368	0	33	1002
06:15 AM	07:15 AM	0	0	0	0	401	0	0	33	21	444	0	47	0	477	0	36	1343
06:30 AM	07:30 AM	0	0	0	0	495	0	0	37	25	550	0	50	0	543	0	39	1613
06:45 AM	07:45 AM	0	0	0	0	618	0	0	50	28	579	0	59	0	539	0	47	1764
07:00 AM	08:00 AM	0	0	0	0	669	0	0	57	25	608	0	63	0	546	0	59	1848
07:15 AM	08:15 AM	0	0	0	0	665	0	0	59	28	589	0	64	0	579	1	65	1862
07:30 AM	Hour After	0	0	0	0	645	0	0	61	37	537	0	59	0	603	1	67	1823

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	0	0	0	0	665	0	0	59	28	589	0	64	0	579	1	65	1862



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Start Time: 6:00:00 AM
Site Code: 00000000
Comment 1: King Street/South Street
Comment 2: AM Peak Hour
Comment 3:
Comment 4:

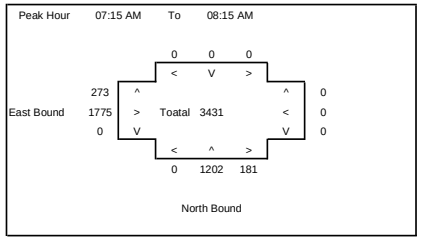
	SOUTH From North				KAP From East				SOUTH From South				KING From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	0	0	0	1	0	0	0	0	24	70	0	2	0	178	34	6	306
06:15 AM	0	0	0	9	0	0	0	0	19	93	0	7	0	145	20	14	277
06:30 AM	0	0	0	9	0	0	0	0	57	146	0	6	0	304	55	14	562
06:45 AM	0	0	0	19	0	0	0	0	64	187	0	19	0	380	56	29	687
07:00 AM	0	0	0	24	0	0	0	0	72	300	0	10	0	496	70	14	938
07:15 AM	0	0	0	38	0	0	0	0	78	267	0	30	0	490	71	35	906
07:30 AM	0	0	0	27	0	0	0	0	31	339	0	35	0	445	65	38	880
07:45 AM	0	0	0	26	0	0	0	0	40	270	0	11	0	493	85	34	888
08:00 AM	0	0	0	12	0	0	0	0	32	326	0	8	0	347	52	13	757
08:15 AM	0	0	0	10	0	0	0	0	62	226	0	17	0	418	46	8	752
PHF		#####				#####				0.934				0.886			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	07:00 AM	0	0	0	38	0	0	0	0	164	496	0	34	0	1007	165	63	1832
06:15 AM	07:15 AM	0	0	0	61	0	0	0	0	212	726	0	42	0	1325	201	71	2464
06:30 AM	07:30 AM	0	0	0	90	0	0	0	0	271	900	0	65	0	1670	252	92	3093
06:45 AM	07:45 AM	0	0	0	108	0	0	0	0	245	1093	0	94	0	1811	262	116	3411
07:00 AM	08:00 AM	0	0	0	115	0	0	0	0	221	1176	0	86	0	1924	291	121	3612
07:15 AM	08:15 AM	0	0	0	103	0	0	0	0	181	1202	0	84	0	1775	273	120	3431
07:30 AM	Hour After	0	0	0	75	0	0	0	0	165	1161	0	71	0	1703	248	93	3277

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	0	0	0	103	0	0	0	0	181	1202	0	84	0	1775	273	120	3431



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Comment 2: 6:30 am to 8:30 am
Comment 3: AM Peak Hour
Comment 4:

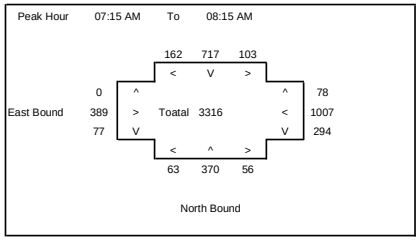
	WARD From North				KAP From East				WARD From South				KAP From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	11	130	18	7	8	150	39	7	3	39	12	10	10	67	0	19	487
06:45 AM	24	128	22	6	24	168	58	12	8	62	18	11	14	70	0	14	596
07:00 AM	23	132	16	11	19	256	59	11	7	97	15	8	11	89	0	8	724
07:15 AM	17	151	23	14	12	244	71	25	9	108	11	14	16	96	0	12	758
07:30 AM	43	137	23	15	27	298	76	18	20	98	22	15	22	91	0	10	857
07:45 AM	46	222	29	11	16	225	70	20	16	81	14	13	10	78	0	8	807
08:00 AM	56	207	28	15	23	240	77	13	11	83	16	11	29	124	0	6	894
08:15 AM	37	176	33	7	12	159	57	10	13	89	16	8	19	108	0	12	719
PHF		0.827				0.86				0.873				0.761			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	07:30 AM	75	541	79	38	63	818	227	55	27	306	56	43	51	322	0	53	2565
06:45 AM	07:45 AM	107	548	84	46	82	966	264	66	44	365	66	48	63	346	0	44	2935
07:00 AM	08:00 AM	129	642	91	51	74	1023	276	74	52	384	62	50	59	354	0	38	3146
07:15 AM	08:15 AM	162	717	103	55	78	1007	294	76	56	370	63	53	77	389	0	36	3316
07:30 AM	Hour After	182	742	113	48	78	922	280	61	60	351	68	47	80	401	0	36	3277

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	162	717	103	55	78	1007	294	76	56	370	63	53	77	389	0	36	3316



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Start Time: 6:30:00 AM
Site Code: 00000000
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Comment 2: 6:30 am to 8:30 am
Comment 3: AM Peak Hour
Comment 4:

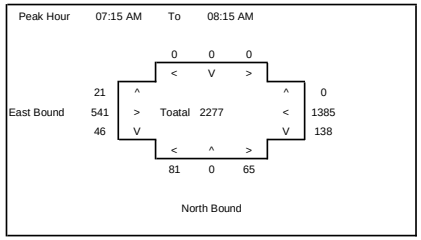
	KAMAKEE From North				KAPIOLANI From East				KAMAKEE From South				KAPIOLANI From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	0	0	0	0	0	220	35	2	9	0	7	7	5	98	0	10	374
06:45 AM	0	0	0	0	0	230	45	1	15	0	19	4	16	118	0	12	443
07:00 AM	0	0	0	0	0	376	24	0	7	0	8	5	11	112	0	11	538
07:15 AM	0	0	0	0	0	385	32	1	9	0	17	8	7	140	0	24	590
07:30 AM	0	0	0	0	0	357	27	3	22	0	27	14	11	130	0	58	574
07:45 AM	0	0	0	0	0	325	37	6	22	0	17	10	14	129	21	77	565
08:00 AM	0	0	0	0	0	318	42	4	12	0	20	6	14	142	0	37	548
08:15 AM	0	0	0	0	0	242	39	1	10	0	15	5	9	143	0	22	458
PHF		#####				0.913				0.745				0.927			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	07:30 AM	0	0	0	0	0	1211	136	4	40	0	51	24	39	468	0	57	1945
06:45 AM	07:45 AM	0	0	0	0	0	1348	128	5	53	0	71	31	45	500	0	105	2145
07:00 AM	08:00 AM	0	0	0	0	0	1443	120	10	60	0	69	37	43	511	21	170	2267
07:15 AM	08:15 AM	0	0	0	0	0	1385	138	14	65	0	81	38	46	541	21	196	2277
07:30 AM	Hour After	0	0	0	0	0	1242	145	14	66	0	79	35	48	544	21	194	2145

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	0	0	0	0	0	1385	138	14	65	0	81	38	46	541	21	196	2277



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Start Time: 6:30:00 AM
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Comment 2: 6:30 am to 8:30 am
Comment 3: AM Peak Hour
Comment 4:

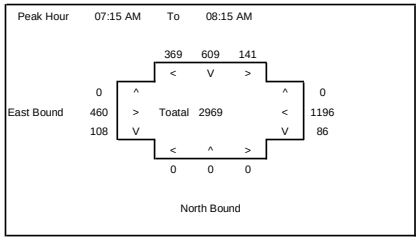
	PENSACOLA From North				KAPIOLANI From East				PENSACOLA From South				KAPIOLANI From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	50	104	16	12	0	207	15	0	0	0	0	2	21	70	0	4	483
06:45 AM	47	85	22	5	0	274	10	1	0	0	0	4	18	107	0	3	563
07:00 AM	63	121	23	11	0	323	19	0	0	0	0	0	23	83	0	1	655
07:15 AM	64	110	30	1	0	342	26	0	0	0	0	6	24	128	0	3	724
07:30 AM	85	146	31	14	0	320	25	0	0	0	0	6	27	103	0	6	737
07:45 AM	102	151	36	25	0	293	22	0	0	0	0	4	30	116	0	12	750
08:00 AM	118	202	44	17	0	241	13	0	0	0	0	4	27	113	0	9	758
08:15 AM	81	163	40	11	0	212	23	0	0	0	0	4	33	96	0	6	648
PHF		0.769				0.871				#####				0.934			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	07:30 AM	224	420	91	29	0	1146	70	1	0	0	0	12	86	388	0	11	2425
06:45 AM	07:45 AM	259	462	106	31	0	1259	80	1	0	0	0	16	92	421	0	13	2679
07:00 AM	08:00 AM	314	528	120	51	0	1278	92	0	0	0	0	16	104	430	0	22	2866
07:15 AM	08:15 AM	369	609	141	57	0	1196	86	0	0	0	0	20	108	460	0	30	2969
07:30 AM	Hour After	386	662	151	67	0	1066	83	0	0	0	0	18	117	428	0	33	2893

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	369	609	141	57	0	1196	86	0	0	0	0	20	108	460	0	30	2969



File Name: X:\2007\07-097\counts\merged data\AM\Kapiolani - Piikoi.ppd
Start Date: 10/16/2007
Start Time: 6:30:00 AM
Site Code: 00000000
Comment 1: Kapiolani Boulevard/Piikoi Street
Comment 2: AM Peak Hour
Comment 3:
Comment 4:

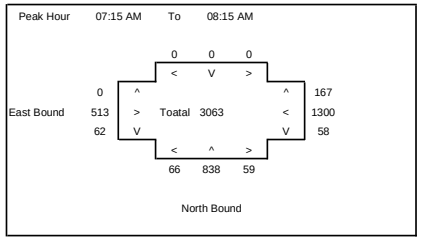
	PIIKOI From North				KAPIOLANI From East				PIIKOI From South				KAPIOLANI From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	0	0	0	8	30	222	14	11	5	109	12	10	14	80	0	6	486
06:45 AM	0	0	0	9	39	252	8	23	10	167	10	9	9	109	0	17	604
07:00 AM	0	0	0	9	42	331	9	14	16	179	19	3	13	110	0	6	719
07:15 AM	0	0	0	7	34	352	14	9	11	253	19	5	16	134	0	5	833
07:30 AM	0	0	0	10	56	341	15	8	13	194	19	5	6	108	0	2	752
07:45 AM	0	0	0	10	41	312	14	15	18	204	14	9	17	127	0	12	747
08:00 AM	0	0	0	8	36	295	15	11	17	187	14	2	23	144	0	3	731
08:15 AM	0	0	0	6	34	272	7	7	11	246	18	6	19	145	0	14	752
PHF		#####				0.925				0.851				0.861			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	07:30 AM	0	0	0	33	145	1157	45	57	42	708	60	27	52	433	0	34	2642
06:45 AM	07:45 AM	0	0	0	35	171	1276	46	54	50	793	67	22	44	461	0	30	2908
07:00 AM	08:00 AM	0	0	0	36	173	1336	52	46	58	830	71	22	52	479	0	25	3051
07:15 AM	08:15 AM	0	0	0	35	167	1300	58	43	59	838	66	21	62	513	0	22	3063
07:30 AM	Hour After	0	0	0	34	167	1220	51	41	59	831	65	22	65	524	0	31	2982

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	0	0	0	35	167	1300	58	43	59	838	66	21	62	513	0	22	3063



File Name: X:\2007\07-097\counts\merged data\AM\Ala Moana - South.ppd
Start Date: 10/16/2007
Start Time: 6:30:00 AM
Site Code: 00000000
Comment 1: Ala Moana Boulevard/South Street
Comment 2: AM Peak Hour
Comment 3:
Comment 4:

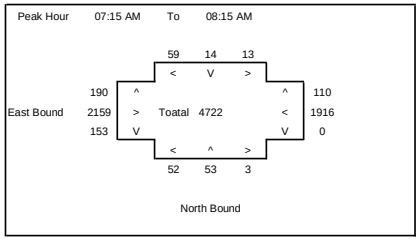
	SOUTH From North				ALAMOANA From East				SOUTH From South				ALAMOANA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	5	5	1	2	20	248	0	0	0	2	4	2	22	459	42	24	808
06:45 AM	8	4	3	5	21	381	0	0	1	3	6	3	36	507	45	23	1015
07:00 AM	7	3	4	2	26	383	0	0	0	8	6	4	20	501	50	14	1008
07:15 AM	8	3	2	3	28	523	0	0	0	9	9	2	34	569	35	13	1220
07:30 AM	14	2	4	6	33	450	0	0	1	12	16	1	38	531	48	23	1149
07:45 AM	18	4	4	10	27	487	0	0	1	14	11	3	34	504	47	22	1151
08:00 AM	19	5	3	2	22	456	0	0	1	18	16	2	47	555	60	12	1202
08:15 AM	12	6	2	6	33	375	0	0	0	12	16	17	62	526	35	12	1079
PHF		0.796				0.919				0.771				0.945			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	07:30 AM	28	15	10	12	95	1535	0	0	1	22	25	11	112	2036	172	74	4051
06:45 AM	07:45 AM	37	12	13	16	108	1737	0	0	2	32	37	10	128	2108	178	73	4392
07:00 AM	08:00 AM	47	12	14	21	114	1843	0	0	2	43	42	10	126	2105	180	72	4528
07:15 AM	08:15 AM	59	14	13	21	110	1916	0	0	3	53	52	8	153	2159	190	70	4722
07:30 AM	Hour After	63	17	13	24	115	1768	0	0	3	56	59	23	181	2116	190	69	4581

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	59	14	13	21	110	1916	0	0	3	53	52	8	153	2159	190	70	4722



File Name: X:\2007\07-097\counts\merged data\AM\Ala Moana - Keawe.ppd
Start Date: 10/16/2007
Start Time: 6:00:00 AM
Site Code: 00000000
Comment 1: Ala Moana Boulevard/Keawe Street
Comment 2: AM Peak Hour
Comment 3:
Comment 4:

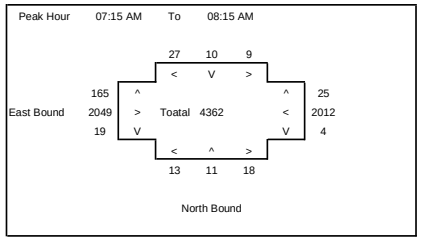
	KEAWE From North				ALA MOANA From East				KEAWE From South				ALA MOANA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	1	0	1	0	0	117	0	8	0	0	0	0	0	0	0	1	119
06:15 AM	1	0	0	0	3	231	3	4	0	3	0	4	0	0	0	0	241
06:30 AM	4	2	4	4	2	256	3	5	3	0	1	3	11	469	17	2	772
06:45 AM	4	0	1	0	0	389	1	2	4	0	5	7	8	490	17	4	919
07:00 AM	8	0	2	0	0	404	3	4	0	2	2	5	3	501	24	11	949
07:15 AM	3	0	0	2	2	553	3	1	3	1	2	5	5	558	21	11	1151
07:30 AM	6	3	2	4	8	489	0	3	2	4	0	3	5	496	42	4	1057
07:45 AM	7	1	2	4	9	514	0	2	8	4	4	7	5	444	57	6	1055
08:00 AM	11	6	5	0	6	456	1	2	5	2	7	1	4	551	45	1	1099
08:15 AM	8	1	1	1	4	408	3	2	4	1	6	15	6	515	40	15	997
PHF		0.523				0.914				0.656				0.93			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	07:00 AM	10	2	6	4	5	993	7	19	7	3	6	14	19	959	34	7	2051
06:15 AM	07:15 AM	17	2	7	4	5	1280	10	15	7	5	8	19	22	1460	58	17	2881
06:30 AM	07:30 AM	19	2	7	6	4	1602	10	12	10	3	10	20	27	2018	79	28	3791
06:45 AM	07:45 AM	21	3	5	6	10	1835	7	10	9	7	9	20	21	2045	104	30	4076
07:00 AM	08:00 AM	24	4	6	10	19	1960	6	10	13	11	8	20	18	1999	144	32	4212
07:15 AM	08:15 AM	27	10	9	10	25	2012	4	8	18	11	13	16	19	2049	165	22	4362
07:30 AM	Hour After	32	11	10	9	27	1867	4	9	19	11	17	26	20	2006	184	26	4208

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	27	10	9	10	25	2012	4	8	18	11	13	16	19	2049	165	22	4362



File Name: X:\2007\07-097\counts\merged data\AM\Ala Moana - Coral.ppd
Start Date: 11/14/2007
Start Time: 6:30:00 AM
Site Code: 00000000
Comment 1: Ala Moana - Coral
Comment 2: AM Peak Hour
Comment 3: 630 am to 830 am
Comment 4:

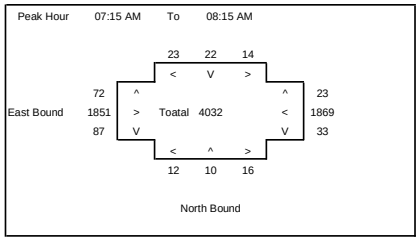
	CORAL From North				ALA MOANA From East				CORAL From South				ALA MOANA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	1	4	3	4	4	283	8	0	0	1	0	0	11	392	6	3	713
06:45 AM	3	2	2	3	3	342	12	0	0	1	1	2	13	486	6	11	871
07:00 AM	3	6	4	6	9	393	6	0	1	4	2	2	13	472	5	4	918
07:15 AM	1	2	3	0	5	483	7	1	3	0	1	1	10	421	13	4	949
07:30 AM	6	8	2	3	7	458	10	1	3	2	3	2	18	497	19	11	1033
07:45 AM	8	7	5	4	9	453	10	0	5	5	3	3	28	430	21	10	984
08:00 AM	8	5	4	3	2	475	6	2	5	3	5	1	31	503	19	17	1066
08:15 AM	3	11	0	0	5	432	13	0	1	1	3	2	17	426	16	6	928
PHF		0.738				0.972				0.731				0.909			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	07:30 AM	8	14	12	13	21	1501	33	1	4	6	4	5	47	1771	30	22	3451
06:45 AM	07:45 AM	13	18	11	12	24	1676	35	2	7	7	7	7	54	1876	43	30	3771
07:00 AM	08:00 AM	18	23	14	13	30	1787	33	2	12	11	9	8	69	1820	58	29	3884
07:15 AM	08:15 AM	23	22	14	10	23	1869	33	4	16	10	12	7	87	1851	72	42	4032
07:30 AM	Hour After	25	31	11	10	23	1818	39	3	14	11	14	8	94	1856	75	44	4011

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	23	22	14	10	23	1869	33	4	16	10	12	7	87	1851	72	42	4032



File Name: X:\2007\07-097\counts\merged data\AM\Ala Moana - Cooke.ppd
Start Date: 10/16/2007
Start Time: 5:45:00 AM
Site Code: 00000000
Comment 1: Ala Moana Boulevard/Cooke Street
Comment 2: AM Peak Hour

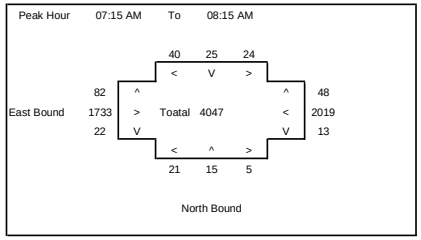
	COOKE From North				ALAMOANA From East				COOKE From South				ALAMOANA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
05:45 AM	3	0	1	4	1	170	0	1	0	0	0	0	0	0	0	0	175
06:00 AM	3	3	3	3	5	170	2	4	0	0	0	0	0	0	0	0	186
06:15 AM	8	1	4	4	8	241	2	6	0	0	0	0	0	0	0	0	264
06:30 AM	10	4	3	2	3	271	4	2	1	3	2	2	5	393	17	2	716
06:45 AM	4	2	6	8	8	408	3	6	2	1	6	2	3	427	19	1	889
07:00 AM	7	4	5	4	10	398	0	4	1	4	4	8	7	413	20	1	873
07:15 AM	10	4	2	1	11	542	2	1	2	3	5	3	5	485	21	1	1092
07:30 AM	12	5	9	3	14	494	3	1	1	2	7	4	1	439	14	0	1001
07:45 AM	10	7	9	5	12	535	3	1	1	5	3	7	7	371	19	3	982
08:00 AM	8	9	4	8	11	448	5	0	1	5	6	3	9	438	28	2	972
08:15 AM	23	4	8	4	17	376	4	4	0	6	3	12	2	456	26	3	925
PHF		0.856				0.937				0.854				0.899			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
Prev. Hour	06:45 AM	24	8	11	13	17	852	8	13	1	3	2	2	5	393	17	2	1341
06:00 AM	07:00 AM	25	10	16	17	24	1090	11	18	3	4	8	4	8	820	36	3	2055
06:15 AM	07:15 AM	29	11	18	18	29	1318	9	18	4	8	12	12	15	1233	56	4	2742
06:30 AM	07:30 AM	31	14	16	15	32	1619	9	13	6	11	17	15	20	1718	77	5	3570
06:45 AM	07:45 AM	33	15	22	16	43	1842	8	12	6	10	22	17	16	1764	74	3	3855
07:00 AM	08:00 AM	39	20	25	13	47	1969	8	7	5	14	19	22	20	1708	74	5	3948
07:15 AM	08:15 AM	40	25	24	17	48	2019	13	3	5	15	21	17	22	1733	82	6	4047
07:30 AM	Hour After	53	25	30	20	54	1853	15	6	3	18	19	26	19	1704	87	8	3880

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	40	25	24	17	48	2019	13	3	5	15	21	17	22	1733	82	6	4047



File Name: X:\2007\07-097\counts\merged data\AM\Ala Moana - Ward.ppd
Start Date: 10/16/2007
Start Time: 6:15:00 AM
Site Code: 00000000
Comment 1: Ala Moana Blvd/Ward Ave
Comment 2: AM Peak Hour
Comment 3:
Comment 4:

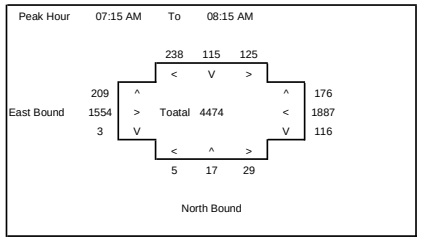
	WARD From North				ALA MOANA From East				WARD From South				ALA MOANA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:15 AM	20	15	17	3	15	1	0	6	0	0	0	0	1	118	20	0	207
06:30 AM	19	19	33	5	13	37	7	5	0	0	0	0	0	275	45	0	448
06:45 AM	52	22	31	2	24	0	0	0	0	0	0	0	0	395	46	5	570
07:00 AM	50	20	18	6	20	197	5	3	2	4	1	7	1	356	55	4	729
07:15 AM	65	22	36	2	45	481	21	11	3	4	0	8	0	423	56	5	1156
07:30 AM	58	23	23	5	41	484	31	7	6	3	3	10	0	380	59	3	1111
07:45 AM	64	41	33	4	48	465	30	6	10	5	0	9	2	321	49	4	1068
08:00 AM	51	29	33	6	42	457	34	12	10	5	2	6	1	430	45	2	1139
08:15 AM	69	45	39	2	33	326	26	3	11	6	5	3	1	375	51	3	987
PHF		0.866				0.98				0.75				0.922			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:15 AM	07:15 AM	141	76	99	16	72	235	12	14	2	4	1	7	2	1144	166	9	1954
06:30 AM	07:30 AM	186	83	118	15	102	715	33	19	5	8	1	15	1	1449	202	14	2903
06:45 AM	07:45 AM	225	87	108	15	130	1162	57	21	11	11	4	25	1	1554	216	17	3566
07:00 AM	08:00 AM	237	106	110	17	154	1627	87	27	21	16	4	34	3	1480	219	16	4064
07:15 AM	08:15 AM	238	115	125	17	176	1887	116	36	29	17	5	33	3	1554	209	14	4474
07:30 AM	Hour After	242	138	128	17	164	1732	121	28	37	19	10	28	4	1506	204	12	4305

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	238	115	125	17	176	1887	116	36	29	17	5	33	3	1554	209	14	4474



File Name: X:\2007\07-097\counts\merged data\AM\Ala Moana - Kewalo.ppd
Start Date: 11/13/2007
Start Time: 6:30:00 AM
Site Code: 00000000
Comment 1: Ala Moana - Kewalo
Comment 2: AM Peak Hour
Comment 3: 630 am to 830 am
Comment 4:

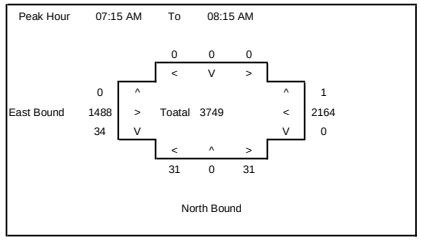
	KEWALO From North				ALA MOANA From East				KEWALO From South				ALA MOANA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	0	0	0	0	0	321	0	0	3	1	6	9	2	405	0	0	738
06:45 AM	0	0	0	0	0	384	0	0	2	0	4	4	2	383	0	0	775
07:00 AM	0	0	0	0	0	463	0	0	2	0	3	7	4	448	0	0	920
07:15 AM	0	0	0	0	0	563	0	0	8	0	5	5	8	417	0	0	1001
07:30 AM	0	0	0	0	0	532	0	0	6	0	9	8	13	354	0	1	914
07:45 AM	0	0	0	0	1	571	0	0	7	0	7	6	6	339	0	0	931
08:00 AM	0	0	0	0	0	498	0	0	10	0	10	8	7	378	0	0	903
08:15 AM	0	0	0	0	0	465	0	0	6	0	3	6	0	356	0	0	830
PHF		#####				0.946				0.775				0.895			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	07:30 AM	0	0	0	0	0	1731	0	0	15	1	18	25	16	1653	0	0	3434
06:45 AM	07:45 AM	0	0	0	0	0	1942	0	0	18	0	21	24	27	1602	0	1	3610
07:00 AM	08:00 AM	0	0	0	0	1	2129	0	0	23	0	24	26	31	1558	0	1	3766
07:15 AM	08:15 AM	0	0	0	0	1	2164	0	0	31	0	31	27	34	1488	0	1	3749
07:30 AM	Hour After	0	0	0	0	1	2066	0	0	29	0	29	28	26	1427	0	1	3578

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	0	0	0	0	1	2164	0	0	31	0	31	27	34	1488	0	1	3749



File Name: X:\2007\07-097\counts\merged data\AM\AM Ala Moana - Kamakee.ppd
Start Date: 11/14/2007
Start Time: 6:30:00 AM
Site Code: 00000000
Comment 1: Ala Moana - Kamakee
Comment 2: AM Peak Hour
Comment 3: 630 am to 830 am
Comment 4:

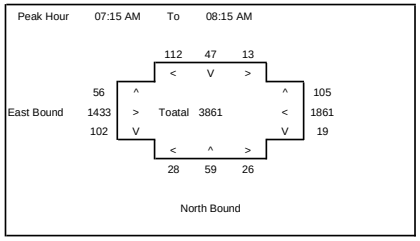
	KAMAKEE From North				ALA MOANA From East				KAMAKEE From South				ALA MOANA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	6	7	1	5	4	322	3	12	3	2	3	4	27	317	8	0	703
06:45 AM	16	16	5	1	5	325	1	6	3	4	12	2	23	361	13	0	784
07:00 AM	16	3	2	2	85	346	1	14	8	7	14	1	28	393	16	0	919
07:15 AM	31	13	3	8	13	514	2	12	6	10	13	6	25	320	7	0	957
07:30 AM	26	11	4	6	22	448	7	7	8	19	7	3	30	359	19	0	960
07:45 AM	26	8	5	5	34	477	3	12	5	18	3	4	19	378	15	0	991
08:00 AM	29	15	1	11	36	422	7	14	7	12	5	4	28	376	15	0	953
08:15 AM	29	8	6	6	18	451	2	4	2	14	7	2	22	361	19	0	939
PHF		0.915				0.938				0.831				0.949			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	07:30 AM	69	39	11	16	107	1507	7	44	20	23	42	13	103	1391	44	0	3363
06:45 AM	07:45 AM	89	43	14	17	125	1633	11	39	25	40	46	12	106	1433	55	0	3620
07:00 AM	08:00 AM	99	35	14	21	154	1785	13	45	27	54	37	14	102	1450	57	0	3827
07:15 AM	08:15 AM	112	47	13	30	105	1861	19	45	26	59	28	17	102	1433	56	0	3861
07:30 AM	Hour After	110	42	16	28	110	1798	19	37	22	63	22	13	99	1474	68	0	3843

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	112	47	13	30	105	1861	19	45	26	59	28	17	102	1433	56	0	3861



File Name: X:\2007\07-097\counts\merged data\AM\Ala Moana - Queen.ppd
Start Date: 10/10/2007
Start Time: 6:00:00 AM
Site Code: 00000000
Comment 1: Intersection- Ala Moana & Queen
Comment 2: AM Peak Hour
Comment 3: 6:00 am to 8:30 am
Comment 4:

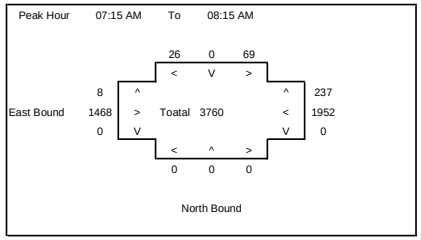
	QUEEN From North				ALAMOANA From East				QUEEN From South				ALAMOANA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	0	0	4	5	14	93	1	0	0	0	0	0	0	221	4	3	337
06:15 AM	1	0	4	8	18	232	0	0	0	0	0	0	0	294	2	1	551
06:30 AM	2	0	13	13	27	293	0	0	0	0	0	0	0	337	2	14	674
06:45 AM	6	0	11	5	28	351	0	0	0	0	0	0	0	365	3	10	764
07:00 AM	6	0	13	10	38	461	0	0	0	0	0	0	0	380	0	12	898
07:15 AM	5	0	22	3	54	498	0	0	0	0	0	0	0	404	1	6	984
07:30 AM	7	0	20	14	55	491	0	0	0	0	0	0	0	364	1	15	938
07:45 AM	6	0	9	5	55	522	0	0	0	0	0	0	0	360	0	3	952
08:00 AM	8	0	18	11	73	441	0	1	0	0	0	0	0	340	6	4	886
08:15 AM	5	0	30	9	39	446	0	0	0	0	0	0	0	360	6	8	886
PHF		0.88				0.948				#####				0.911			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	07:00 AM	9	0	32	31	87	969	1	0	0	0	0	0	0	1217	11	28	2326
06:15 AM	07:15 AM	15	0	41	36	111	1337	0	0	0	0	0	0	0	1376	7	37	2887
06:30 AM	07:30 AM	19	0	59	31	147	1603	0	0	0	0	0	0	0	1486	6	42	3320
06:45 AM	07:45 AM	24	0	66	32	175	1801	0	0	0	0	0	0	0	1513	5	43	3584
07:00 AM	08:00 AM	24	0	64	32	202	1972	0	0	0	0	0	0	0	1508	2	36	3772
07:15 AM	08:15 AM	26	0	69	33	237	1952	0	1	0	0	0	0	0	1468	8	28	3760
07:30 AM	Hour After	26	0	77	39	222	1900	0	1	0	0	0	0	0	1424	13	30	3662

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	26	0	69	33	237	1952	0	1	0	0	0	0	0	1468	8	28	3760



File Name: X:\2007\07-097\counts\merged data\AM\Ala Moana - Piikoi.ppd
Start Date: 10/11/2007
Start Time: 4:45:00 AM
Site Code: 00000000
Comment 1: Intersection: Ala Moana - Piikoi
Comment 2: AM Peak Hour
Comment 3: 5:45 am to 8:30 am
Comment 4:

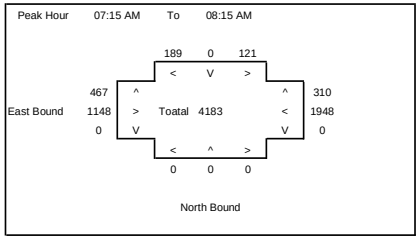
	PIIKOI From North				ALAMOANA From East				PIIKOI From South				ALAMOANA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
05:45 AM	0	0	0	0	21	106	0	6	0	0	0	0	0	0	0	0	127
06:00 AM	7	0	11	3	41	156	0	5	0	0	0	0	0	76	54	0	345
06:15 AM	27	0	18	4	42	220	0	18	0	0	0	0	0	259	72	2	638
06:30 AM	18	0	16	8	61	285	0	20	0	0	0	0	0	253	70	0	703
06:45 AM	31	0	26	6	52	311	0	21	0	0	0	0	0	260	116	0	796
07:00 AM	45	0	19	7	89	465	0	12	0	0	0	0	0	309	104	0	1031
07:15 AM	58	0	35	3	82	484	0	6	0	0	0	0	0	302	145	0	1106
07:30 AM	33	0	29	6	73	498	0	16	0	0	0	0	0	301	109	0	1043
07:45 AM	44	0	30	17	78	530	0	8	0	0	0	0	0	254	103	0	1039
08:00 AM	54	0	27	16	77	436	0	12	0	0	0	0	0	291	110	0	995
08:15 AM	56	0	25	12	82	396	0	9	0	0	0	0	0	303	123	0	985
PHF			0.833				0.928				#####				0.903		

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
05:45 AM	06:45 AM	52	0	45	15	165	767	0	49	0	0	0	0	0	588	196	2	1813
06:00 AM	07:00 AM	83	0	71	21	196	972	0	64	0	0	0	0	0	848	312	2	2482
06:15 AM	07:15 AM	121	0	79	25	244	1281	0	71	0	0	0	0	0	1081	362	2	3168
06:30 AM	07:30 AM	152	0	96	24	284	1545	0	59	0	0	0	0	0	1124	435	0	3636
06:45 AM	07:45 AM	167	0	109	22	296	1758	0	55	0	0	0	0	0	1172	474	0	3976
07:00 AM	08:00 AM	180	0	113	33	322	1977	0	42	0	0	0	0	0	1166	461	0	4219
07:15 AM	08:15 AM	189	0	121	42	310	1948	0	42	0	0	0	0	0	1148	467	0	4183
07:30 AM	Hour After	187	0	111	51	310	1860	0	45	0	0	0	0	0	1149	445	0	4062

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	189	0	121	42	310	1948	0	42	0	0	0	0	0	1148	467	0	4183



File Name: X:\2007\07-097\counts\merged data\AM\Ward - Auahi.ppd
Start Date: 10/10/2007
Start Time: 6:30:00 AM
Site Code: 00000000
Comment 1: Ward Avenue/Auahi Street
Comment 2: 6:30 am to 8:30 am
Comment 3: AM Peak Hour
Comment 4:

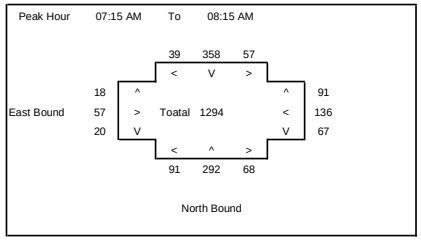
	WARD From North				AUAHI From East				WARD From South				AUAHI From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	6	56	7	3	8	6	4	8	16	47	14	3	4	4	2	5	174
06:45 AM	5	72	14	6	10	8	4	10	19	75	11	4	6	7	3	1	234
07:00 AM	11	63	15	4	13	21	5	6	14	66	17	1	4	12	2	1	243
07:15 AM	10	94	11	2	12	18	8	6	17	74	16	5	7	11	6	9	284
07:30 AM	11	90	15	1	21	20	13	9	18	76	31	0	3	11	3	2	312
07:45 AM	10	78	19	4	28	52	20	4	14	71	25	3	1	18	7	12	343
08:00 AM	8	96	12	5	30	46	26	8	19	71	19	0	9	17	2	2	355
08:15 AM	0	0	0	0	0	0	0	0	17	63	18	3	10	10	3	10	121
PHF			0.978				0.721				0.902				0.848		

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	07:30 AM	32	285	47	15	43	53	21	30	66	262	58	13	21	34	13	16	935
06:45 AM	07:45 AM	37	319	55	13	56	67	30	31	68	291	75	10	20	41	14	13	1073
07:00 AM	08:00 AM	42	325	60	11	74	111	46	25	63	287	89	9	15	52	18	24	1182
07:15 AM	08:15 AM	39	358	57	12	91	136	67	27	68	292	91	8	20	57	18	25	1294
07:30 AM	Hour After	29	264	46	10	79	118	59	21	68	281	93	6	23	56	15	26	1131

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	39	358	57	12	91	136	67	27	68	292	91	8	20	57	18	25	1294



File Name: X:\2007\07-097\counts\merged data\AM\Ward - Halekauwila.ppd
Start Date: 10/17/2007
Start Time: 6:30:00 AM
Site Code: 00000000
Comment 1: Ward Avenue/Halekauwila Street
Comment 2: AM Peak Hour
Comment 3:
Comment 4:

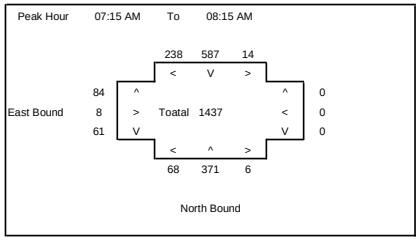
	WARD From North				HALEKAUWILA From East				WARD From South				HALEKAUWILA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	28	113	3	0	0	0	0	0	3	53	5	13	6	0	17	13	228
06:45 AM	46	109	0	0	0	0	0	0	5	83	14	12	8	0	11	9	276
07:00 AM	34	108	2	0	0	0	0	0	0	119	16	10	7	3	17	8	306
07:15 AM	68	121	1	3	0	0	0	0	0	98	19	13	11	1	23	6	342
07:30 AM	47	142	2	0	0	0	0	0	2	88	15	8	17	4	19	6	336
07:45 AM	67	154	4	0	0	0	0	0	3	89	23	8	16	1	24	7	381
08:00 AM	56	170	7	0	0	0	0	0	1	96	11	11	17	2	18	7	378
08:15 AM	42	156	4	0	0	0	0	0	1	108	10	11	10	3	24	2	358
PHF		0.9				#####				0.951				0.933			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	07:30 AM	176	451	6	3	0	0	0	0	8	353	54	48	32	4	68	36	1152
06:45 AM	07:45 AM	195	480	5	3	0	0	0	0	7	388	64	43	43	8	70	29	1260
07:00 AM	08:00 AM	216	525	9	3	0	0	0	0	5	394	73	39	51	9	83	27	1365
07:15 AM	08:15 AM	238	587	14	3	0	0	0	0	6	371	68	40	61	8	84	26	1437
07:30 AM	Hour After	212	622	17	0	0	0	0	0	7	381	59	38	60	10	85	22	1453

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	238	587	14	3	0	0	0	0	6	371	68	40	61	8	84	26	1437



File Name: X:\2007\07-097\counts\merged data\AM\Ward - Queen.ppd
Start Date: 10/11/2007
Start Time: 6:00:00 AM
Site Code: 00000000
Comment 1: Ward Avenue/Queen Street
Comment 2: AM Peak Hour
Comment 3:
Comment 4:

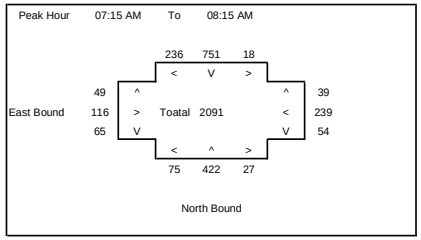
	WARD From North				QUEEN From East				WARD From South				QUEEN From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	18	106	3	0	6	11	1	3	4	31	8	2	7	6	5	5	206
06:15 AM	28	116	5	2	1	14	1	7	5	33	6	2	12	12	9	9	242
06:30 AM	22	139	3	3	1	12	4	5	5	54	11	0	14	10	9	6	284
06:45 AM	35	178	2	0	0	18	6	6	8	60	13	3	15	12	5	13	352
07:00 AM	46	136	2	4	7	29	4	8	7	111	17	0	16	21	14	4	410
07:15 AM	66	188	4	1	6	49	10	11	6	103	16	3	11	22	7	3	488
07:30 AM	61	193	2	4	15	61	14	8	8	103	18	2	17	34	19	7	545
07:45 AM	55	174	8	1	12	70	14	7	9	109	20	1	16	32	10	17	529
08:00 AM	54	196	4	1	6	59	16	8	4	107	21	3	21	28	13	3	529
08:15 AM	55	182	10	1	9	48	4	3	13	94	13	0	16	26	19	7	489
PHF		0.974				0.865				0.949				0.821			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	07:00 AM	103	539	13	5	8	55	12	21	22	178	38	7	48	40	28	33	1084
06:15 AM	07:15 AM	131	569	12	9	9	73	15	26	25	258	47	5	57	55	37	32	1288
06:30 AM	07:30 AM	169	641	11	8	14	108	24	30	26	328	57	6	56	65	35	26	1534
06:45 AM	07:45 AM	208	695	10	9	28	157	34	33	29	377	64	8	59	89	45	27	1795
07:00 AM	08:00 AM	228	691	16	10	40	209	42	34	30	426	71	6	60	109	50	31	1972
07:15 AM	08:15 AM	236	751	18	7	39	239	54	34	27	422	75	9	65	116	49	30	2091
07:30 AM	Hour After	225	745	24	7	42	238	48	26	34	413	72	6	70	120	61	34	2092

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	236	751	18	7	39	239	54	34	27	422	75	9	65	116	49	30	2091



File Name: X:\2007\07-097\counts\merged data\AM\Piikoi Hawaiki AM.ppd
Start Date: 10/11/2007
Start Time: 6:30:00 AM
Site Code: 00000000
Comment 1: Piikoi/Hawaiki
Comment 2: AM Peak Hr
Comment 3:
Comment 4:

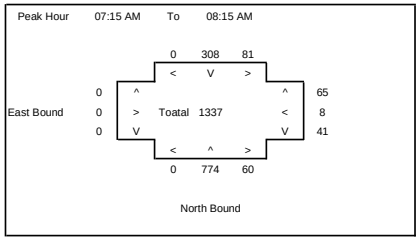
	PII From North				HAWAIKI From East				PII From South				HAWAIKI From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	0	43	3	0	4	0	6	0	2	107	0	0	0	0	0	0	165
06:45 AM	0	60	5	0	4	5	4	0	8	143	0	0	0	0	0	0	229
07:00 AM	0	72	13	0	6	5	9	0	10	182	0	0	0	0	0	0	297
07:15 AM	0	85	18	0	12	0	8	0	18	210	0	0	0	0	0	0	351
07:30 AM	0	54	21	0	10	6	9	0	21	168	0	0	0	0	0	0	289
07:45 AM	0	75	20	0	16	2	17	0	13	202	0	0	0	0	0	0	345
08:00 AM	0	94	22	0	27	0	7	0	8	194	0	0	0	0	0	0	352
08:15 AM	0	88	15	0	13	3	7	0	10	197	0	0	0	0	0	0	333
PHF		0.838				0.814				0.914				#####			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	07:30 AM	0	260	39	0	26	10	27	0	38	642	0	0	0	0	0	0	1042
06:45 AM	07:45 AM	0	271	57	0	32	16	30	0	57	703	0	0	0	0	0	0	1166
07:00 AM	08:00 AM	0	286	72	0	44	13	43	0	62	762	0	0	0	0	0	0	1282
07:15 AM	08:15 AM	0	308	81	0	65	8	41	0	60	774	0	0	0	0	0	0	1337
07:30 AM	Hour After	0	311	78	0	66	11	40	0	52	761	0	0	0	0	0	0	1319

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	0	308	81	0	65	8	41	0	60	774	0	0	0	0	0	0	1337



File Name: X:\2007\07-097\counts\merged data\AM\Piikoi - Waimanu.ppd
Start Date: 10/11/2007
Start Time: 6:30:00 AM
Site Code: 00000000
Comment 1: Piikoi Street/Waimanu Street
Comment 2: AM Peak Hour
Comment 3:
Comment 4:

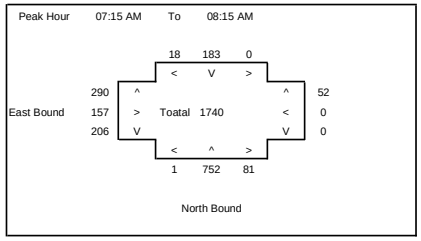
	PIIKOI From North				WAIMANU From East				PIIKOI From South				WAIMANU From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	0	20	1	0	5	0	0	4	13	96	0	15	26	40	36	10	237
06:45 AM	0	34	0	0	6	0	0	13	10	141	0	9	31	33	47	7	302
07:00 AM	0	33	0	0	6	0	0	3	18	174	0	9	52	28	77	6	388
07:15 AM	0	49	0	0	8	0	0	6	11	217	0	12	54	34	78	9	451
07:30 AM	15	43	0	0	20	0	0	7	21	168	0	14	32	38	79	6	416
07:45 AM	0	43	0	0	13	0	0	9	29	186	0	14	52	40	74	9	437
08:00 AM	3	48	0	1	11	0	0	13	20	181	1	3	68	45	59	5	436
08:15 AM	0	49	0	0	26	0	0	8	23	184	0	6	54	69	75	5	480
PHF		0.866				0.65				0.914				0.949			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	07:30 AM	0	136	1	0	25	0	0	26	52	628	0	45	163	135	238	32	1378
06:45 AM	07:45 AM	15	159	0	0	40	0	0	29	60	700	0	44	169	133	281	28	1557
07:00 AM	08:00 AM	15	168	0	0	47	0	0	25	79	745	0	49	190	140	308	30	1692
07:15 AM	08:15 AM	18	183	0	1	52	0	0	35	81	752	1	43	206	157	290	29	1740
07:30 AM	Hour After	18	183	0	1	70	0	0	37	93	719	1	37	206	192	287	25	1769

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	18	183	0	1	52	0	0	35	81	752	1	43	206	157	290	29	1740



File Name: X:\2007\07-097\counts\merged data\AM\Piikoi Kona AM.ppd
Start Date: 10/11/2007
Start Time: 6:30:00 AM
Site Code: 00000000
Comment 1: Piikoi/Kona
Comment 2: AM Peak Hr
Comment 3:
Comment 4:

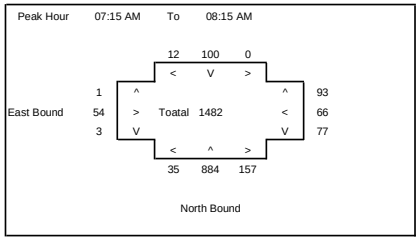
	PII From North				KONA From East				PII From South				KONA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	1	15	0	2	18	1	9	4	26	110	3	1	0	21	1	6	205
06:45 AM	1	15	1	2	20	9	11	12	36	140	7	0	2	9	0	3	251
07:00 AM	3	18	1	3	18	6	16	7	29	235	6	0	0	4	0	4	336
07:15 AM	3	29	0	2	16	18	20	7	43	247	7	0	0	7	0	9	390
07:30 AM	5	18	0	0	18	9	25	5	31	226	7	1	1	17	0	4	357
07:45 AM	3	24	0	8	23	19	18	13	43	204	12	1	0	11	1	4	358
08:00 AM	1	29	0	4	36	20	14	9	40	207	9	1	2	19	0	6	377
08:15 AM	1	23	0	11	19	39	24	12	50	212	7	0	2	21	0	3	398
PHF		0.875				0.843				0.906				0.69			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	07:30 AM	8	77	2	9	72	34	56	30	134	732	23	1	2	41	1	22	1182
06:45 AM	07:45 AM	12	80	2	7	72	42	72	31	139	848	27	1	3	37	0	20	1334
07:00 AM	08:00 AM	14	89	1	13	75	52	79	32	146	912	32	2	1	39	1	21	1441
07:15 AM	08:15 AM	12	100	0	14	93	66	77	34	157	884	35	3	3	54	1	23	1482
07:30 AM	Hour After	10	94	0	23	96	87	81	39	164	849	35	3	5	68	1	17	1490

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	12	100	0	14	93	66	77	34	157	884	35	3	3	54	1	23	1482



File Name: X:\2007\07-097\counts\merged data\AM\Pensacola Waimanu AM.ppd
Start Date: 10/10/2007
Start Time: 6:00:00 AM
Site Code: 00000000
Comment 1: Pensacola Street/Waimanu Street
Comment 2: AM Peak Hour
Comment 3:
Comment 4:

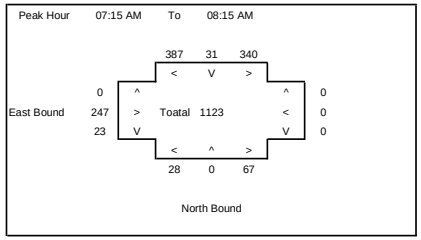
	PENSACOLA From North				WAIMANU From East				PENSACOLA From South				WAIMANU From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	18	2	44	0	0	0	0	0	8	0	2	4	0	15	0	0	89
06:15 AM	32	2	54	0	0	0	0	0	6	0	1	9	0	32	0	1	127
06:30 AM	38	2	77	2	0	0	0	0	13	0	5	6	1	31	0	1	167
06:45 AM	41	1	58	1	0	0	0	0	15	0	10	8	2	43	0	1	170
07:00 AM	55	6	53	0	0	0	0	0	22	0	5	6	1	33	0	3	175
07:15 AM	85	3	69	4	0	0	0	0	19	0	5	3	7	63	0	4	251
07:30 AM	106	5	80	2	0	0	0	0	17	0	9	7	6	71	0	3	294
07:45 AM	103	13	96	2	0	0	0	0	15	0	10	4	3	61	0	5	301
08:00 AM	93	10	95	1	0	0	0	0	16	0	4	5	7	52	0	1	277
08:15 AM	94	13	130	6	0	0	0	0	14	0	6	6	8	72	0	4	337
PHF		0.894				#####				0.913				0.877			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	07:00 AM	129	7	233	3	0	0	0	0	42	0	18	27	3	121	0	3	553
06:15 AM	07:15 AM	166	11	242	3	0	0	0	0	56	0	21	29	4	139	0	6	639
06:30 AM	07:30 AM	219	12	257	7	0	0	0	0	69	0	25	23	11	170	0	9	763
06:45 AM	07:45 AM	287	15	260	7	0	0	0	0	73	0	29	24	16	210	0	11	890
07:00 AM	08:00 AM	349	27	298	8	0	0	0	0	73	0	29	20	17	228	0	15	1021
07:15 AM	08:15 AM	387	31	340	9	0	0	0	0	67	0	28	19	23	247	0	13	1123
07:30 AM	Hour After	396	41	401	11	0	0	0	0	62	0	29	22	24	256	0	13	1209

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	387	31	340	9	0	0	0	0	67	0	28	19	23	247	0	13	1123



File Name: X:\2007\07-097\counts\merged data\AM\Kamakee - Queen.ppd
Start Date: 10/11/2007
Start Time: 5:45:00 AM
Site Code: 00000000
Comment 1: Kamakee Street/Queen Street
Comment 2: AM Peak Hour
Comment 3:
Comment 4:

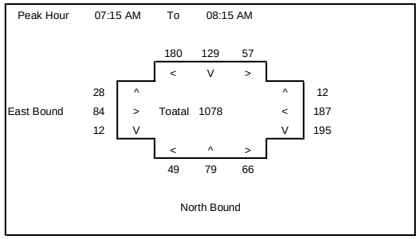
	KAMAKEE From North				QUEEN From East				KAMAKEE From South				QUEEN From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
05:45 AM	3	10	1	0	0	6	10	3	3	6	0	0	0	4	3	5	46
06:00 AM	2	13	1	1	0	9	15	6	3	7	5	0	0	8	0	2	63
06:15 AM	6	10	0	0	2	10	13	4	6	7	1	0	1	10	1	5	67
06:30 AM	9	28	2	1	0	14	24	5	3	14	2	0	1	14	5	3	116
06:45 AM	22	22	5	5	4	14	17	7	19	11	2	0	2	13	5	6	136
07:00 AM	25	24	13	3	3	20	32	4	8	14	3	0	2	16	5	4	165
07:15 AM	42	21	10	4	0	39	42	10	11	17	13	0	1	16	5	6	217
07:30 AM	52	34	16	1	3	40	46	4	15	18	11	0	2	24	4	7	265
07:45 AM	42	34	16	2	1	64	50	5	17	25	13	0	3	27	11	2	303
08:00 AM	44	40	15	3	8	44	57	7	23	19	12	0	6	17	8	1	293
08:15 AM	45	37	15	2	5	33	51	5	16	17	5	0	2	22	9	5	257
PHF		0.897				0.857				0.882				0.756			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
05:45 AM	06:45 AM	20	61	4	2	2	39	62	18	15	34	8	0	2	36	9	15	292
06:00 AM	07:00 AM	39	73	8	7	6	47	69	22	31	39	10	0	4	45	11	16	382
06:15 AM	07:15 AM	62	84	20	9	9	58	86	20	36	46	8	0	6	53	16	18	484
06:30 AM	07:30 AM	98	95	30	13	7	87	115	26	41	56	20	0	6	59	20	19	634
06:45 AM	07:45 AM	141	101	44	13	10	113	137	25	53	60	29	0	7	69	19	23	783
07:00 AM	08:00 AM	161	113	55	10	7	163	170	23	51	74	40	0	8	83	25	19	950
07:15 AM	08:15 AM	180	129	57	10	12	187	195	26	66	79	49	0	12	84	28	16	1078
07:30 AM	Hour After	183	145	62	8	17	181	204	21	71	79	41	0	13	90	32	15	1118

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	180	129	57	10	12	187	195	26	66	79	49	0	12	84	28	16	1078



File Name: X:\2007\07-097\counts\merged data\AM\Kamakee - Auahi.ppd
Start Date: 10/10/2007
Start Time: 6:30:00 AM
Site Code: 00000000
Comment 1: Kamakee Street/Auahi Street
Comment 2: AM Peak Hour
Comment 3:
Comment 4:

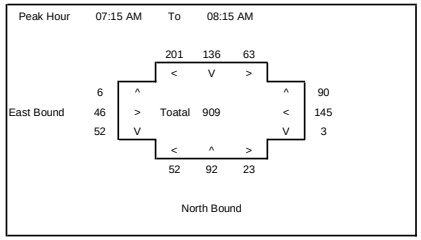
	KAMAKEE From North				AUAHI From East				KAMAKEE From South				AUAHI From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	22	20	11	5	8	23	3	10	4	19	4	0	2	15	4	5	135
06:45 AM	15	20	8	3	11	20	2	3	4	13	5	2	6	7	1	2	112
07:00 AM	14	35	8	8	9	36	2	12	3	12	10	4	5	4	1	2	139
07:15 AM	45	30	12	1	22	41	1	9	10	24	13	3	12	15	0	0	225
07:30 AM	73	27	6	5	20	33	0	6	6	16	17	0	9	9	0	0	216
07:45 AM	39	43	22	1	13	28	0	2	3	24	11	3	14	15	1	0	213
08:00 AM	44	36	23	7	35	43	2	12	4	28	11	2	17	7	5	3	255
08:15 AM	59	34	20	6	17	22	1	6	6	21	4	3	4	10	3	1	201
PHF		0.943				0.744				0.888				0.867			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	07:30 AM	96	105	39	17	50	120	8	34	21	68	32	9	25	41	6	9	611
06:45 AM	07:45 AM	147	112	34	17	62	130	5	30	23	65	45	9	32	35	2	4	692
07:00 AM	08:00 AM	171	135	48	15	64	138	3	29	22	76	51	10	40	43	2	2	793
07:15 AM	08:15 AM	201	136	63	14	90	145	3	29	23	92	52	8	52	46	6	3	909
07:30 AM	Hour After	215	140	71	19	85	126	3	26	19	89	43	8	44	41	9	4	885

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	201	136	63	14	90	145	3	29	23	92	52	8	52	46	6	3	909



File Name: X:\2007\07-097\counts\merged data\AM\Auahi - theater.ppd
Start Date: 10/10/2007
Start Time: 6:00:00 AM
Site Code: 00000000
Comment 1: Auahi Street/Theatre ped xing
Comment 2: AM Peak Hour
Comment 3: 6:00 am to 8:30 am
Comment 4:

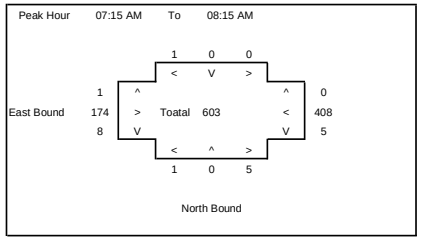
	THEATRE From North				AUAHI From East				THEATRE From South				AUAHI From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	0	0	0	0	0	22	0	0	0	0	0	7	0	12	0	0	34
06:15 AM	0	0	0	0	0	23	0	0	0	0	0	9	1	19	0	2	43
06:30 AM	0	0	0	0	0	44	1	0	1	0	0	17	1	26	0	7	73
06:45 AM	0	0	0	0	0	42	2	0	0	0	0	6	1	21	0	4	66
07:00 AM	0	0	0	0	0	58	2	0	1	0	0	3	0	28	0	5	89
07:15 AM	0	0	0	0	0	97	1	0	1	0	1	5	2	47	0	3	149
07:30 AM	0	0	0	0	0	116	1	0	1	0	0	5	1	35	0	4	154
07:45 AM	0	0	0	0	0	103	2	0	2	0	0	3	2	44	0	3	153
08:00 AM	1	0	0	0	0	92	1	0	1	0	0	1	3	48	1	8	147
08:15 AM	0	0	0	0	0	94	0	0	1	0	1	3	5	40	0	10	141
PHF		0.25				0.882				0.75				0.88			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	07:00 AM	0	0	0	0	0	131	3	0	1	0	0	39	3	78	0	13	216
06:15 AM	07:15 AM	0	0	0	0	0	167	5	0	2	0	0	35	3	94	0	18	271
06:30 AM	07:30 AM	0	0	0	0	0	241	6	0	3	0	1	31	4	122	0	19	377
06:45 AM	07:45 AM	0	0	0	0	0	313	6	0	3	0	1	19	4	131	0	16	458
07:00 AM	08:00 AM	0	0	0	0	0	374	6	0	5	0	1	16	5	154	0	15	545
07:15 AM	08:15 AM	1	0	0	0	0	408	5	0	5	0	1	14	8	174	1	18	603
07:30 AM	Hour After	1	0	0	0	0	405	4	0	5	0	1	12	11	167	1	25	595

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	1	0	0	0	0	408	5	0	5	0	1	14	8	174	1	18	603



File Name: X:\2007\07-097\counts\merged data\AM\Auahi - Farmer.ppd
Start Date: 11/15/2007
Start Time: 6:30:00 AM
Site Code: 00000000
Comment 1: Auahi Street/Farmers Market Ped Xing
Comment 2: 630 am to 830 am
Comment 3: AM Peak Hour
Comment 4:

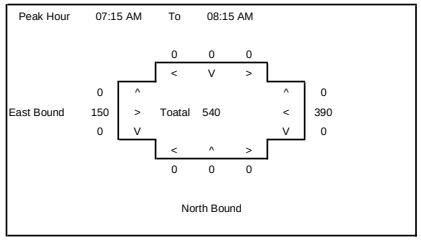
	FARMER From North				AUAHI From East				FARMER From South				AUAHI From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	0	0	0	0	1	36	0	0	0	0	0	0	0	36	0	3	73
06:45 AM	0	0	0	0	0	44	0	0	0	0	0	0	0	36	0	1	80
07:00 AM	0	0	0	0	0	61	0	0	0	0	0	0	0	30	0	4	91
07:15 AM	0	0	0	0	0	83	0	0	0	0	0	0	0	28	0	6	111
07:30 AM	0	0	0	0	0	86	0	0	0	0	0	0	0	38	0	5	124
07:45 AM	0	0	0	0	0	112	0	0	0	0	0	0	0	48	0	4	160
08:00 AM	0	0	0	0	0	109	0	0	0	0	0	0	0	36	0	7	145
08:15 AM	0	0	0	0	0	80	0	0	0	0	0	0	0	46	0	1	126
PHF		#####				0.871				#####				0.781			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	07:30 AM	0	0	0	0	1	224	0	0	0	0	0	0	0	130	0	14	355
06:45 AM	07:45 AM	0	0	0	0	0	274	0	0	0	0	0	0	0	132	0	16	406
07:00 AM	08:00 AM	0	0	0	0	0	342	0	0	0	0	0	0	0	144	0	19	486
07:15 AM	08:15 AM	0	0	0	0	0	390	0	0	0	0	0	0	0	150	0	22	540
07:30 AM	Hour After	0	0	0	0	0	387	0	0	0	0	0	0	0	168	0	17	555

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	0	0	0	0	0	390	0	0	0	0	0	0	0	150	0	22	540



File Name: X:\2007\07-097\counts\merged data\AM\South - Pohukaina AM.ppd
Start Date: 10/16/2007
Start Time: 6:30:00 AM
Site Code: 00000000
Comment 1: South Street/Pohukaina Street
Comment 2: 6:30 am to 8:30 am
Comment 3: AM Peak Hour
Comment 4:

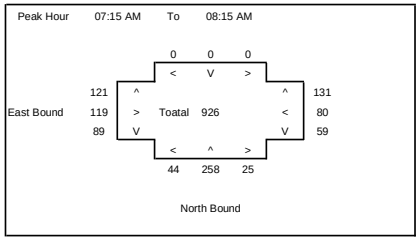
	SOUTH From North				POHUKAINA From East				SOUTH From South				POHUKAINA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	0	0	0	3	4	3	3	2	1	21	2	0	8	5	7	2	54
06:45 AM	0	0	0	14	15	14	9	7	6	51	8	2	32	19	17	4	171
07:00 AM	0	0	0	16	28	16	5	7	8	51	8	4	18	23	21	4	178
07:15 AM	0	0	0	15	28	18	13	9	5	68	8	4	16	29	30	7	215
07:30 AM	0	0	0	20	31	26	13	6	4	72	9	6	24	29	40	14	248
07:45 AM	0	0	0	18	39	14	15	11	10	67	12	11	27	33	30	5	247
08:00 AM	0	0	0	19	33	22	18	10	6	51	15	10	22	28	21	8	216
08:15 AM	0	0	1	11	22	22	24	10	4	42	13	6	19	31	32	7	210
PHF		#####				0.925				0.919				0.884			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	07:30 AM	0	0	0	48	75	51	30	25	20	191	26	10	74	76	75	17	618
06:45 AM	07:45 AM	0	0	0	65	102	74	40	29	23	242	33	16	90	100	108	29	812
07:00 AM	08:00 AM	0	0	0	69	126	74	46	33	27	258	37	25	85	114	121	30	888
07:15 AM	08:15 AM	0	0	0	72	131	80	59	36	25	258	44	31	89	119	121	34	926
07:30 AM	Hour After	0	0	1	68	125	84	70	37	24	232	49	33	92	121	123	34	921

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	0	0	0	72	131	80	59	36	25	258	44	31	89	119	121	34	926



File Name: X:\2007\07-097\counts\merged data\AM\South-Halekauwila.ppd
Start Date: 10/17/2007
Start Time: 6:15:00 AM
Site Code: 00000000
Comment 1: South Street/Halekauwila Street
Comment 2: AM Peak Hour
Comment 3:
Comment 4:

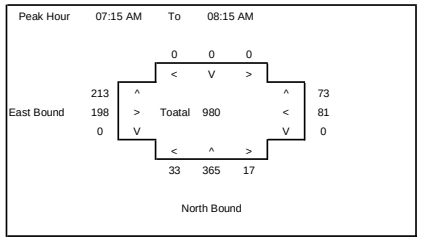
	SOUTH From North				HALEKAUWILA From East				SOUTH From South				HALEKAUWILA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:15 AM	0	0	0	5	11	3	0	2	2	35	4	10	2	26	32	10	115
06:30 AM	0	0	0	6	4	5	0	8	0	51	1	11	0	30	50	11	141
06:45 AM	0	0	0	15	8	16	0	14	1	67	8	18	0	26	60	13	186
07:00 AM	0	0	0	13	19	21	0	9	4	67	6	21	0	39	47	15	203
07:15 AM	0	0	0	18	15	17	0	28	5	82	8	26	0	49	63	24	239
07:30 AM	0	0	0	29	27	24	0	21	5	85	9	26	0	43	59	16	252
07:45 AM	0	0	0	13	18	24	0	10	6	108	8	11	0	56	48	14	268
08:00 AM	0	0	0	18	13	16	0	14	1	90	8	17	0	50	43	10	221
08:15 AM	0	0	0	15	11	18	0	18	3	73	13	24	0	43	56	20	217
PHF		#####				0.755				0.85				0.917			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:15 AM	07:15 AM	0	0	0	39	42	45	0	33	7	220	19	60	2	121	189	49	645
06:30 AM	07:30 AM	0	0	0	52	46	59	0	59	10	267	23	76	0	144	220	63	769
06:45 AM	07:45 AM	0	0	0	75	69	78	0	72	15	301	31	91	0	157	229	68	880
07:00 AM	08:00 AM	0	0	0	73	79	86	0	68	20	342	31	84	0	187	217	69	962
07:15 AM	08:15 AM	0	0	0	78	73	81	0	73	17	365	33	80	0	198	213	64	980
07:30 AM	Hour After	0	0	0	75	69	82	0	63	15	356	38	78	0	192	206	60	958

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	0	0	0	78	73	81	0	73	17	365	33	80	0	198	213	64	980



File Name: X:\2007\07-097\counts\merged data\AM\South - Queen.ppd
Start Date: 10/17/2007
Start Time: 6:15:00 AM
Site Code: 00000000
Comment 1: South Street/Queen Street
Comment 2: AM Peak Hour
Comment 3:
Comment 4:

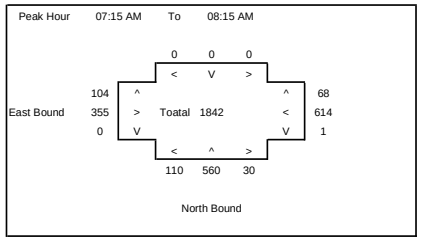
	SOUTH From North				QUEEN From East				SOUTH From South				QUEEN From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:15 AM	0	0	0	2	4	31	0	1	2	68	8	4	0	50	13	10	176
06:30 AM	0	0	0	8	7	39	0	5	8	83	12	8	0	44	18	11	211
06:45 AM	0	0	0	5	9	77	0	5	6	110	10	15	0	65	30	16	307
07:00 AM	0	0	0	6	12	109	0	7	7	109	12	6	0	78	29	12	356
07:15 AM	0	0	0	6	19	136	1	11	7	149	22	10	0	70	15	40	419
07:30 AM	0	0	0	13	19	138	0	12	8	137	29	15	0	92	30	20	453
07:45 AM	0	0	0	7	16	187	0	6	7	140	37	10	0	101	33	28	521
08:00 AM	0	0	0	11	14	153	0	7	8	134	22	9	0	92	26	17	449
08:15 AM	0	0	0	19	14	123	0	22	7	107	27	10	0	90	28	12	396
PHF		#####				0.841				0.951				0.856			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:15 AM	07:15 AM	0	0	0	21	32	256	0	18	23	370	42	33	0	237	90	49	1050
06:30 AM	07:30 AM	0	0	0	25	47	361	1	28	28	451	56	39	0	257	92	79	1293
06:45 AM	07:45 AM	0	0	0	30	59	460	1	35	28	505	73	46	0	305	104	88	1535
07:00 AM	08:00 AM	0	0	0	32	66	570	1	36	29	535	100	41	0	341	107	100	1749
07:15 AM	08:15 AM	0	0	0	37	68	614	1	36	30	560	110	44	0	355	104	105	1842
07:30 AM	Hour After	0	0	0	50	63	601	0	47	30	518	115	44	0	375	117	77	1819

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	0	0	0	37	68	614	1	36	30	560	110	44	0	355	104	105	1842



File Name: X:\2007\07-097\counts\merged data\AM\Queen - Emily.ppd
Start Date: 10/17/2007
Start Time: 6:00:00 AM
Site Code: 00000000
Comment 1: Queen Street/Emily Street/Coral Street
Comment 2: AM Peak Hour
Comment 3:
Comment 4:

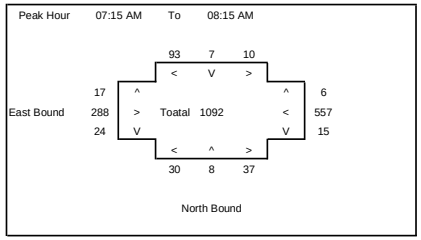
	EMILY From North				QUEEN From East				EMILY From South				QUEEN From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	3	1	1	0	2	12	2	2	2	0	1	2	1	8	1	5	34
06:15 AM	10	0	0	7	4	23	4	2	3	1	3	0	3	28	3	1	82
06:30 AM	19	1	1	3	2	36	6	2	4	1	0	2	3	41	6	7	120
06:45 AM	17	1	0	5	3	69	3	2	1	0	6	1	5	41	4	6	150
07:00 AM	26	0	1	14	2	98	4	5	3	1	7	1	3	58	2	9	205
07:15 AM	32	3	3	5	1	113	1	4	11	4	11	4	7	56	6	12	248
07:30 AM	25	2	1	6	1	141	3	3	7	1	9	2	5	73	5	11	273
07:45 AM	23	1	1	8	2	147	5	2	10	1	6	2	6	64	3	11	269
08:00 AM	13	1	5	5	2	156	6	9	9	2	4	2	6	95	3	16	302
08:15 AM	22	5	5	3	7	106	8	3	12	2	7	1	3	73	3	14	253
PHF		0.724				0.881				0.721				0.791			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	07:00 AM	49	3	2	15	11	140	15	8	10	2	10	5	12	118	14	19	386
06:15 AM	07:15 AM	72	2	2	29	11	226	17	11	11	3	16	4	14	168	15	23	557
06:30 AM	07:30 AM	94	5	5	27	8	316	14	13	19	6	24	8	18	196	18	34	723
06:45 AM	07:45 AM	100	6	5	30	7	421	11	14	22	6	33	8	20	228	17	38	876
07:00 AM	08:00 AM	106	6	6	33	6	499	13	14	31	7	33	9	21	251	16	43	995
07:15 AM	08:15 AM	93	7	10	24	6	557	15	18	37	8	30	10	24	288	17	50	1092
07:30 AM	Hour After	83	9	12	22	12	550	22	17	38	6	26	7	20	305	14	52	1097

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	93	7	10	24	6	557	15	18	37	8	30	10	24	288	17	50	1092



File Name: X:\2007\07-097\counts\merged data\AM\Queen - Cooke.ppd
Start Date: 10/17/2007
Start Time: 6:15:00 AM
Site Code: 00000000
Comment 1: Queen Street/Cooke Street
Comment 2: AM Peak hour
Comment 3:
Comment 4:

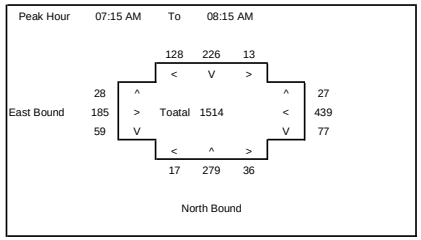
	COOKE From North				QUEEN From East				COOKE From South				QUEEN From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:15 AM	0	0	0	0	2	23	3	5	6	25	1	1	0	0	0	0	60
06:30 AM	18	27	1	7	7	20	5	15	7	30	5	1	12	24	3	7	159
06:45 AM	13	45	3	7	7	67	7	14	5	26	9	2	7	24	6	4	219
07:00 AM	36	51	3	1	3	68	15	10	6	55	2	4	12	37	8	5	296
07:15 AM	25	35	3	2	7	91	7	14	7	50	2	3	10	38	5	7	280
07:30 AM	30	76	5	12	6	109	21	17	10	78	2	5	18	47	6	11	408
07:45 AM	47	64	5	8	4	128	21	23	9	97	4	9	10	45	3	10	437
08:00 AM	26	51	0	3	10	111	28	12	10	54	9	4	21	55	14	13	389
08:15 AM	26	68	5	4	10	108	13	17	9	71	1	4	26	51	6	6	394
PHF		0.791				0.887				0.755				0.756			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:15 AM	07:15 AM	67	123	7	15	19	178	30	44	24	136	17	8	31	85	17	16	734
06:30 AM	07:30 AM	92	158	10	17	24	246	34	53	25	161	18	10	41	123	22	23	954
06:45 AM	07:45 AM	104	207	14	22	23	335	50	55	28	209	15	14	47	146	25	27	1203
07:00 AM	08:00 AM	138	226	16	23	20	396	64	64	32	280	10	21	50	167	22	33	1421
07:15 AM	08:15 AM	128	226	13	25	27	439	77	66	36	279	17	21	59	185	28	41	1514
07:30 AM	Hour After	129	259	15	27	30	456	83	69	38	300	16	22	75	198	29	40	1628

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	128	226	13	25	27	439	77	66	36	279	17	21	59	185	28	41	1514



File Name: X:\2007\07-097\counts\merged data\AM\Cooke Hale.ppd
Start Date: 10/17/2007
Start Time: 6:30:00 AM
Site Code: 00000000
Comment 1: Cooke Street/Halekauwila Street
Comment 2: AM Peak Hour
Comment 3: 6:30 am to 8:00 am
Comment 4:

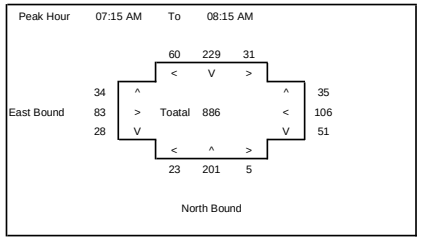
	COOKE From North				HALEKAUWILA From East				COOKE From South				HALEKAUWILA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	6	26	7	3	7	7	7	7	3	31	3	3	5	17	4	1	123
06:45 AM	19	33	9	5	7	19	12	3	4	26	0	4	5	14	5	3	153
07:00 AM	13	42	11	7	9	25	10	6	1	39	1	2	9	18	6	2	184
07:15 AM	12	37	7	7	4	36	16	8	2	44	9	3	5	21	9	4	202
07:30 AM	19	68	8	6	10	20	9	2	1	38	7	1	5	21	5	0	211
07:45 AM	17	57	10	5	13	30	14	8	2	67	3	4	6	20	10	0	249
08:00 AM	12	67	6	9	8	20	12	2	0	52	4	2	12	21	10	3	224
08:15 AM	26	64	12	6	16	24	11	1	0	55	6	1	8	17	6	1	245
PHF		0.842				0.842				0.795				0.843			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:30 AM	07:30 AM	50	138	34	22	27	87	45	24	10	140	13	12	24	70	24	10	662
06:45 AM	07:45 AM	63	180	35	25	30	100	47	19	8	147	17	10	24	74	25	9	750
07:00 AM	08:00 AM	61	204	36	25	36	111	49	24	6	188	20	10	25	80	30	6	846
07:15 AM	08:15 AM	60	229	31	27	35	106	51	20	5	201	23	10	28	83	34	7	886
07:30 AM	Hour After	74	256	36	26	47	94	46	13	3	212	20	8	31	79	31	4	929

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	60	229	31	27	35	106	51	20	5	201	23	10	28	83	34	7	886



File Name: X:\2007\07-097\counts\merged data\AM\Cooke - Pohukaina.ppd
Start Date: 10/17/2009
Start Time: 6:00:00 AM
Site Code: 00000000
Comment 1: Cooke Street/Pohukaina Street
Comment 2: AM Peak Hour
Comment 3:
Comment 4:

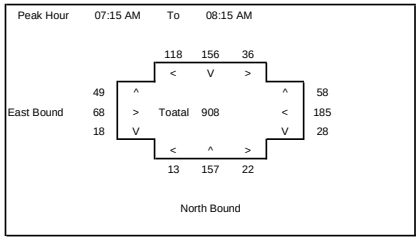
	COOKE From North				POHUKAINA From East				COOKE From South				POHUKAINA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	9	13	8	2	4	6	4	1	3	16	1	0	2	6	2	4	74
06:15 AM	5	16	9	1	4	12	1	0	4	19	2	1	1	11	7	4	91
06:30 AM	17	11	9	1	6	16	10	1	9	26	3	1	0	10	6	2	123
06:45 AM	21	19	7	1	7	26	2	2	9	25	4	1	4	9	7	2	140
07:00 AM	22	30	4	1	8	33	3	2	3	28	2	1	4	13	9	0	159
07:15 AM	21	27	7	3	14	43	6	2	5	34	5	8	2	12	11	0	187
07:30 AM	42	42	13	2	21	46	8	2	7	37	3	0	5	19	8	1	251
07:45 AM	32	38	6	2	14	60	8	5	3	48	2	0	6	27	23	5	267
08:00 AM	23	49	10	1	9	36	6	1	7	38	3	2	5	10	7	3	203
08:15 AM	27	41	6	1	10	31	6	2	5	47	2	0	3	23	14	1	215
PHF		0.799				0.826				0.906				0.603			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	07:00 AM	52	59	33	5	21	60	17	4	25	86	10	3	7	36	22	12	428
06:15 AM	07:15 AM	65	76	29	4	25	87	16	5	25	98	11	4	9	43	29	8	513
06:30 AM	07:30 AM	81	87	27	6	35	118	21	7	26	113	14	11	10	44	33	4	609
06:45 AM	07:45 AM	106	118	31	7	50	148	19	8	24	124	14	10	15	53	35	3	737
07:00 AM	08:00 AM	117	137	30	8	57	182	25	11	18	147	12	9	17	71	51	6	864
07:15 AM	08:15 AM	118	156	36	8	58	185	28	10	22	157	13	10	18	68	49	9	908
07:30 AM	Hour After	124	170	35	6	54	173	28	10	22	170	10	2	19	79	52	10	936

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	118	156	36	8	58	185	28	10	22	157	13	10	18	68	49	9	908



File Name: X:\2007\07-097\counts\merged data\AM\Cooke - Auahi.ppd
Start Date: 10/17/2007
Start Time: 6:00:00 AM
Site Code: 00000000
Comment 1: Cooke Street/Auahi Street
Comment 2: AM Peak Hour
Comment 3: 6:00 am to 8:30 am
Comment 4:

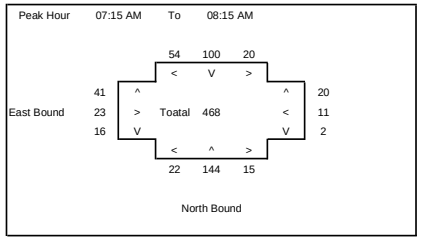
	COOKE From North				AUAHI From East				COOKE From South				AUAHI From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	6	7	4	1	2	0	0	1	1	10	1	1	0	3	5	2	39
06:15 AM	5	11	3	1	0	0	1	2	1	20	0	1	0	2	7	2	50
06:30 AM	6	11	3	1	0	2	0	1	0	27	0	1	4	4	12	0	69
06:45 AM	9	12	3	1	1	3	1	2	4	24	5	9	2	2	7	0	73
07:00 AM	12	16	3	2	0	6	0	3	1	34	2	2	3	3	6	1	86
07:15 AM	8	18	4	2	4	2	0	1	3	28	3	3	1	7	8	4	86
07:30 AM	18	21	5	2	6	2	0	1	4	42	7	1	3	2	5	3	115
07:45 AM	12	26	6	3	4	3	0	4	4	35	4	2	9	7	15	1	125
08:00 AM	16	35	5	1	6	4	2	1	4	39	8	1	3	7	13	1	142
08:15 AM	14	30	2	0	5	5	1	5	0	46	4	3	3	5	6	0	121
PHF		0.777				0.688				0.854				0.645			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
06:00 AM	07:00 AM	26	41	13	4	3	5	2	6	6	81	6	12	6	11	31	4	231
06:15 AM	07:15 AM	32	50	12	5	1	11	2	8	6	105	7	13	9	11	32	3	278
06:30 AM	07:30 AM	35	57	13	6	5	13	1	7	8	113	10	15	10	16	33	5	314
06:45 AM	07:45 AM	47	67	15	7	11	13	1	7	12	128	17	15	9	14	26	8	360
07:00 AM	08:00 AM	50	81	18	9	14	13	0	9	12	139	16	8	16	19	34	9	412
07:15 AM	08:15 AM	54	100	20	8	20	11	2	7	15	144	22	7	16	23	41	9	468
07:30 AM	Hour After	60	112	18	6	21	14	3	11	12	162	23	7	18	21	39	5	503

Peak Hour Trip Volumes (Set at 7:15 AM to 8:15 AM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
07:15 AM	08:15 AM	54	100	20	8	20	11	2	7	15	144	22	7	16	23	41	9	468



Traffic Count Worksheets

PM Peak Hour

File Name: X:\2007\07-097\counts\merged data\PM\Kapiolani - South.ppd
Start Date: 10/16/2007
Start Time: 3:15:00 PM
Site Code: 00000000
Comment 1: Kapiolani Blvd/South Street
Comment 2: PM Peak Hour
Comment 3: 400 pm to 600 pm
Comment 4:

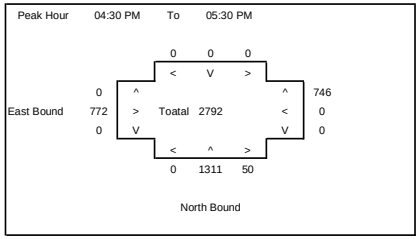
	SOUTH From North				KAPIOLANI From East				SOUTH From South				KAPIOLANI From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	0	0	0	0	209	0	0	21	14	269	0	22	0	153	0	16	645
03:45 PM	0	0	0	0	177	0	0	13	7	299	0	25	0	172	0	15	655
04:00 PM	0	0	0	0	186	0	0	19	14	303	0	13	0	175	0	18	678
04:15 PM	0	0	0	0	179	0	0	17	14	344	0	19	0	198	0	18	735
04:30 PM	0	0	0	0	196	0	0	29	14	367	0	39	0	192	0	29	769
04:45 PM	0	0	0	0	193	0	0	18	17	349	0	25	0	205	0	19	764
05:00 PM	0	0	0	0	186	0	0	12	10	291	0	36	0	195	0	31	682
05:15 PM	0	0	0	0	171	0	0	20	9	304	0	18	0	180	0	15	664
05:30 PM	0	0	0	0	155	0	0	4	13	277	0	12	0	237	0	12	682
05:45 PM	0	0	0	0	154	0	0	7	16	234	0	15	0	193	0	7	597
PHF		#####				0.952				0.893				0.941			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	0	0	0	0	751	0	0	70	49	1215	0	79	0	698	0	67	2713
03:45 PM	04:45 PM	0	0	0	0	738	0	0	78	49	1313	0	96	0	737	0	80	2837
04:00 PM	05:00 PM	0	0	0	0	754	0	0	83	59	1363	0	96	0	770	0	84	2946
04:15 PM	05:15 PM	0	0	0	0	754	0	0	76	55	1351	0	119	0	790	0	97	2950
04:30 PM	05:30 PM	0	0	0	0	746	0	0	79	50	1311	0	118	0	772	0	94	2879
04:45 PM	05:45 PM	0	0	0	0	705	0	0	54	49	1221	0	91	0	817	0	77	2792
05:00 PM	Hour After	0	0	0	0	666	0	0	43	48	1106	0	81	0	805	0	65	2625

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	0	0	0	0	746	0	0	79	50	1311	0	118	0	772	0	94	2792



File Name: X:\2007\07-097\counts\merged data\PM\King - South PM.ppd
Start Date: 10/16/2007
Start Time: 3:15:00 PM
Site Code: 00000000
Comment 1: South Street/King Street
Comment 2: PM Peak Hour
Comment 3:
Comment 4:

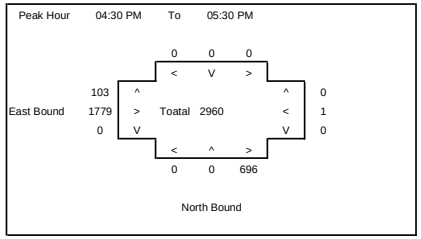
	SOUTH From North				KING From East				SOUTH From South				KING From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	0	0	0	0	0	0	0	0	114	0	0	14	0	370	25	26	509
03:45 PM	0	0	0	0	0	0	0	0	166	0	0	20	0	485	24	36	675
04:00 PM	0	0	0	0	0	0	0	0	142	0	0	17	0	467	19	28	628
04:15 PM	0	0	0	0	0	0	0	0	145	0	0	12	0	509	24	28	678
04:30 PM	0	0	0	0	0	0	0	0	159	0	0	14	0	328	21	52	508
04:45 PM	0	0	0	0	0	0	0	0	183	0	0	14	0	460	27	36	670
05:00 PM	0	0	0	0	0	1	0	0	218	0	0	20	0	470	30	29	719
05:15 PM	0	0	0	0	0	0	0	0	136	0	0	7	0	521	25	31	682
05:30 PM	0	0	0	0	0	0	0	0	231	0	0	6	0	645	13	10	889
05:45 PM	0	0	0	0	0	0	0	0	244	4	0	1	0	529	6	9	783
PHF		#####				0.25				0.798				0.862			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	0	0	0	0	0	0	0	0	567	0	0	63	0	1831	92	118	2490
03:45 PM	04:45 PM	0	0	0	0	0	0	0	0	612	0	0	63	0	1789	88	144	2489
04:00 PM	05:00 PM	0	0	0	0	0	0	0	0	629	0	0	57	0	1764	91	144	2484
04:15 PM	05:15 PM	0	0	0	0	0	1	0	0	705	0	0	60	0	1767	102	145	2575
04:30 PM	05:30 PM	0	0	0	0	0	1	0	0	696	0	0	55	0	1779	103	148	2579
04:45 PM	05:45 PM	0	0	0	0	0	1	0	0	768	0	0	47	0	2096	95	106	2960
05:00 PM	Hour After	0	0	0	0	0	1	0	0	829	4	0	34	0	2165	74	79	3073

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	0	0	0	0	0	1	0	0	696	0	0	55	0	1779	103	148	2960



File Name: X:\2007\07-097\counts\merged data\PM\Kapiolani - Ward.ppd
Start Date: 10/25/2007
Start Time: 4:00:00 PM
Site Code: 00000000
Comment 1: Kapiolani Boulevard/Ward Avenue
Comment 2: PM Peak Hour
Comment 3: Intersection:
Comment 4: Peak:

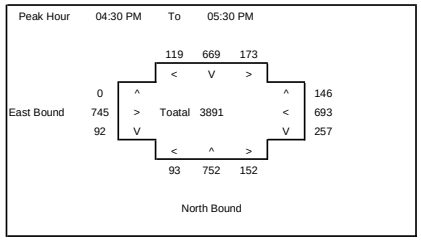
	WARD From North				KAPIOLANI From East				WARD From South				KAPIOLANI From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	41	152	37	12	32	178	63	15	17	190	25	5	20	108	0	6	863
04:15 PM	22	161	36	13	18	133	35	21	24	199	37	17	34	178	0	8	877
04:30 PM	32	146	54	21	27	212	67	16	36	163	21	16	34	179	0	5	971
04:45 PM	28	196	37	23	29	161	68	12	35	204	26	13	25	184	0	5	993
05:00 PM	31	179	43	22	33	166	60	38	46	199	31	24	0	182	0	0	970
05:15 PM	28	148	39	17	57	154	62	21	35	186	15	18	33	200	0	0	957
05:30 PM	32	145	41	10	31	137	40	34	32	168	26	21	54	191	0	3	897
05:45 PM	41	202	42	13	22	115	42	32	32	191	17	18	47	163	0	7	914
PHF		0.92				0.895				0.903				0.898			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	05:00 PM	123	655	164	69	106	684	233	64	112	756	109	51	113	649	0	24	3704
04:15 PM	05:15 PM	113	682	170	79	107	672	230	87	141	765	115	70	93	723	0	18	3811
04:30 PM	05:30 PM	119	669	173	83	146	693	257	87	152	752	93	71	92	745	0	10	3891
04:45 PM	05:45 PM	119	668	160	72	150	618	230	105	148	757	98	76	112	757	0	8	3817
05:00 PM	Hour After	132	674	165	62	143	572	204	125	145	744	89	81	134	736	0	10	3738

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	119	669	173	83	146	693	257	87	152	752	93	71	92	745	0	10	3891



File Name: X:\2007\07-097\counts\merged data\PM\Kapiolani - Kamakee.ppd
Start Date: 10/25/2007
Start Time: 3:30:00 PM
Site Code: 00000000
Comment 1: Kapiolani Boulevard/Kamakee Street
Comment 2: PM Peak Hour
Comment 3:
Comment 4:

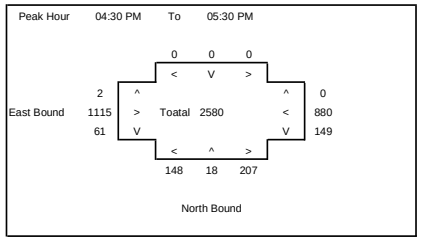
	KAMAKEE From North				KAPIOLANI From East				KAMAKEE From South				KAPIOLANI From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	0	0	0	0	0	211	32	3	34	0	42	3	43	160	0	11	522
03:45 PM	0	0	0	0	0	197	41	2	35	0	44	5	69	158	0	23	544
04:00 PM	0	0	0	0	0	225	16	1	41	0	45	9	22	187	0	19	536
04:15 PM	0	0	0	0	0	209	29	3	36	0	24	3	41	202	0	20	541
04:30 PM	0	0	0	0	0	221	38	4	64	18	37	5	9	281	0	15	668
04:45 PM	0	0	0	0	0	207	28	3	47	0	32	7	15	268	0	7	597
05:00 PM	0	0	0	0	0	217	36	5	49	0	42	4	21	262	2	23	629
05:15 PM	0	0	0	0	0	235	47	1	47	0	37	2	16	304	0	20	686
05:30 PM	0	0	0	0	0	167	50	2	42	9	46	3	16	246	0	12	576
05:45 PM	0	0	0	0	4	150	52	10	34	0	21	3	25	242	0	7	528
PHF		#####				0.912				0.784				0.92			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	0	0	0	0	0	842	118	9	146	0	155	20	175	707	0	73	2143
03:45 PM	04:45 PM	0	0	0	0	0	852	124	10	176	18	150	22	141	828	0	77	2289
04:00 PM	05:00 PM	0	0	0	0	0	862	111	11	188	18	138	24	87	938	0	61	2342
04:15 PM	05:15 PM	0	0	0	0	0	854	131	15	196	18	135	19	86	1013	2	65	2435
04:30 PM	05:30 PM	0	0	0	0	0	880	149	13	207	18	148	18	61	1115	2	65	2580
04:45 PM	05:45 PM	0	0	0	0	0	826	161	11	185	9	157	16	68	1080	2	62	2488
05:00 PM	Hour After	0	0	0	0	4	769	185	18	172	9	146	12	78	1054	2	62	2419

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	0	0	0	0	0	880	149	13	207	18	148	18	61	1115	2	65	2580



File Name: X:\2007\07-097\counts\merged data\PM\Kapiolani - Pensacola.ppd
Start Date: 10/25/2007
Start Time: 3:15:00 PM
Site Code: 00000000
Comment 1: Kapiolani Boulevard/Pensacola Street
Comment 2: PM Peak Hour
Comment 3:
Comment 4:

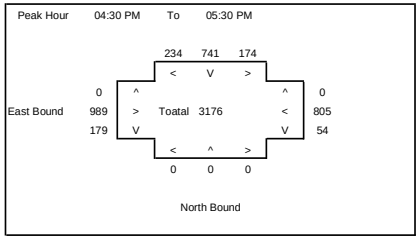
	PENSACOLA From North				KAPIOLANI From East				PENSACOLA From South				KAPIOLANI From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	63	161	37	18	0	189	15	0	0	0	0	17	45	172	0	7	682
03:45 PM	53	180	37	6	0	194	14	0	0	0	0	7	48	221	0	14	747
04:00 PM	38	158	46	14	0	203	15	0	0	0	0	13	46	166	0	6	672
04:15 PM	47	166	38	9	0	196	10	0	0	0	0	18	53	214	0	10	724
04:30 PM	64	199	44	17	0	200	11	0	0	0	0	15	55	218	0	11	791
04:45 PM	49	186	42	8	0	207	13	0	0	0	0	13	43	260	0	12	800
05:00 PM	58	168	47	21	0	190	7	0	0	0	0	13	34	247	0	4	751
05:15 PM	63	188	41	17	0	208	23	0	0	0	0	17	47	264	0	6	834
05:30 PM	31	191	36	7	0	174	20	0	0	0	0	16	61	218	0	6	731
05:45 PM	52	161	35	9	0	142	21	0	0	0	0	16	51	214	0	3	676
PHF		0.936				0.93				#####				0.939			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	201	665	158	47	0	782	54	0	0	0	0	55	192	773	0	37	2825
03:45 PM	04:45 PM	202	703	165	46	0	793	50	0	0	0	0	53	202	819	0	41	2934
04:00 PM	05:00 PM	198	709	170	48	0	806	49	0	0	0	0	59	197	858	0	39	2987
04:15 PM	05:15 PM	218	719	171	55	0	793	41	0	0	0	0	59	185	939	0	37	3066
04:30 PM	05:30 PM	234	741	174	63	0	805	54	0	0	0	0	58	179	989	0	33	3176
04:45 PM	05:45 PM	201	733	166	53	0	779	63	0	0	0	0	59	185	989	0	28	3116
05:00 PM	Hour After	204	708	159	54	0	714	71	0	0	0	0	62	193	943	0	19	2992

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	234	741	174	63	0	805	54	0	0	0	0	58	179	989	0	33	3176



File Name: X:\2007\07-097\counts\merged data\PM\Kapiolani - Piikoi.ppd
Start Date: 10/25/2007
Start Time: 3:15:00 PM
Site Code: 00000000
Comment 1: Kapiolani Boulevard/Piikoi Street
Comment 2: PM Peak hour
Comment 3:
Comment 4:

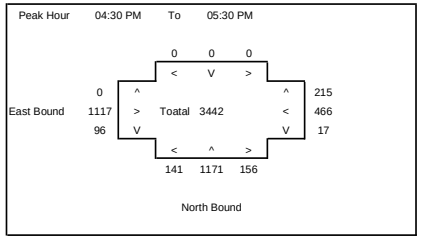
	PIIKOI From North				KAPIOLANI From East				PIIKOI From South				KAPIOLANI From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	0	0	0	14	39	103	2	13	18	319	34	22	14	164	0	15	693
03:45 PM	0	0	0	10	7	42	3	3	36	253	29	16	21	217	0	21	608
04:00 PM	0	0	0	22	51	111	7	18	41	300	46	19	17	192	0	20	765
04:15 PM	0	0	0	18	46	118	2	21	42	300	30	22	27	222	1	13	788
04:30 PM	0	0	0	21	64	115	7	29	25	309	35	20	19	236	0	21	810
04:45 PM	0	0	0	10	45	109	0	33	39	271	41	22	24	298	0	9	827
05:00 PM	0	0	0	25	52	117	3	30	41	316	32	13	24	288	0	32	873
05:15 PM	0	0	0	20	54	125	7	26	51	275	33	16	29	295	0	24	869
05:30 PM	0	0	0	17	46	108	21	25	48	349	40	18	17	243	1	23	873
05:45 PM	0	0	0	21	42	85	11	24	48	311	23	24	29	219	1	17	769
PHF		#####				0.938				0.943				0.936			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	0	0	0	64	143	374	14	55	137	1172	139	79	79	795	1	69	2854
03:45 PM	04:45 PM	0	0	0	71	168	386	19	71	144	1162	140	77	84	867	1	75	2971
04:00 PM	05:00 PM	0	0	0	71	206	453	16	101	147	1180	152	83	87	948	1	63	3190
04:15 PM	05:15 PM	0	0	0	74	207	459	12	113	147	1196	138	77	94	1044	1	75	3298
04:30 PM	05:30 PM	0	0	0	76	215	466	17	118	156	1171	141	71	96	1117	0	86	3379
04:45 PM	05:45 PM	0	0	0	72	197	459	31	114	179	1211	146	69	94	1124	1	88	3442
05:00 PM	Hour After	0	0	0	83	194	435	42	105	188	1251	128	71	99	1045	2	96	3384

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	0	0	0	76	215	466	17	118	156	1171	141	71	96	1117	0	86	3442



File Name: X:\2007\07-097\counts\merged data\PM\Ala Moana - South.ppd
Start Date: 10/16/2007
Start Time: 4:00:00 PM
Site Code: 00000000
Comment 1: Ala Moana Boulevard/South Street
Comment 2: PM Peak Hour
Comment 3:
Comment 4:

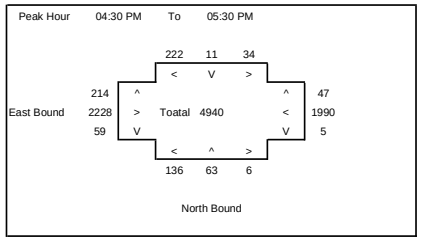
	SOUTH From North				ALAMOANA From East				SOUTH From South				ALAMOANA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	62	5	9	12	26	502	0	0	0	18	42	1	8	587	47	7	1306
04:15 PM	62	3	8	11	9	492	0	0	1	20	35	4	12	532	39	9	1213
04:30 PM	57	3	4	6	11	529	2	0	1	23	36	12	14	549	83	19	1312
04:45 PM	61	3	7	8	12	510	0	0	2	8	44	3	15	565	42	14	1269
05:00 PM	56	5	12	16	14	468	2	0	2	16	32	5	16	562	49	12	1234
05:15 PM	48	0	11	2	10	483	1	0	1	16	24	8	14	552	40	14	1200
05:30 PM	61	4	9	5	14	484	3	0	0	10	28	2	70	505	49	15	1237
05:45 PM	29	1	4	4	21	421	1	0	1	0	26	12	10	589	44	10	1147
PHF		0.914				0.942				0.854				0.968			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	05:00 PM	242	14	28	37	58	2033	2	0	4	69	157	20	49	2233	211	49	5100
04:15 PM	05:15 PM	236	14	31	41	46	1999	4	0	6	67	147	24	57	2208	213	54	5028
04:30 PM	05:30 PM	222	11	34	32	47	1990	5	0	6	63	136	28	59	2228	214	59	5015
04:45 PM	05:45 PM	226	12	39	31	50	1945	6	0	5	50	128	18	115	2184	180	55	4940
05:00 PM	Hour After	194	10	36	27	59	1856	7	0	4	42	110	27	110	2208	182	51	4818

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	222	11	34	32	47	1990	5	0	6	63	136	28	59	2228	214	59	4940



File Name: X:\2007\07-097\counts\merged data\PM\Ala Moana - Keawe.ppd
Start Date: 10/16/2007
Start Time: 4:00:00 PM
Site Code: 00000000
Comment 1: Ala Moana Boulevard/Keawe Street
Comment 2: PM Peak Hour
Comment 3:
Comment 4:

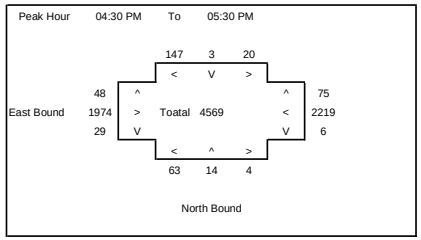
	KEAWE From North				ALAMOANA From East				KEAWE From South				ALAMOANA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	27	1	8	4	21	575	0	3	1	5	6	4	1	546	11	1	1202
04:15 PM	37	1	6	15	19	527	0	15	0	4	7	0	2	502	12	2	1117
04:30 PM	39	0	2	1	4	568	1	13	1	5	23	7	7	486	11	13	1147
04:45 PM	33	0	7	4	11	556	2	8	2	6	18	3	10	464	9	6	1118
05:00 PM	39	2	5	4	5	549	1	10	1	2	19	3	5	501	20	3	1149
05:15 PM	36	1	6	0	55	546	2	11	0	1	3	9	7	523	8	4	1188
05:30 PM	30	5	6	3	12	521	3	12	1	2	8	3	15	412	99	7	1114
05:45 PM	24	1	4	1	7	444	3	3	0	2	4	15	17	534	17	0	1057
PHF		0.924				0.954				0.698				0.953			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	05:00 PM	136	2	23	24	55	2226	3	39	4	20	54	14	20	1998	43	22	4584
04:15 PM	05:15 PM	148	3	20	24	39	2200	4	46	4	17	67	13	24	1953	52	24	4531
04:30 PM	05:30 PM	147	3	20	9	75	2219	6	42	4	14	63	22	29	1974	48	26	4602
04:45 PM	05:45 PM	138	8	24	11	83	2172	8	41	4	11	48	18	37	1900	136	20	4569
05:00 PM	Hour After	129	9	21	8	79	2060	9	36	2	7	34	30	44	1970	144	14	4508

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	147	3	20	9	75	2219	6	42	4	14	63	22	29	1974	48	26	4569



File Name: X:\2007\07-097\counts\merged data\PM\Ala Moana - Cooral.ppd
Start Date: 11/13/2007
Start Time: 4:00:00 PM
Site Code: 00000000
Comment 1: Ala Moana - Coral
Comment 2: PM Peak Hour
Comment 3: 400 pm to 600 pm
Comment 4:

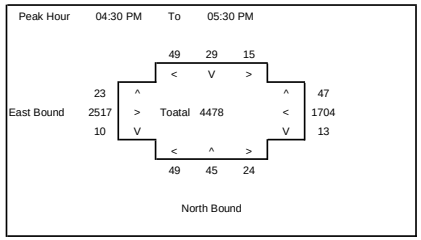
	CORAL From North				ALA MOANA From East				CORAL From South				ALA MOANA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	6	6	3	2	8	491	3	3	6	9	21	9	3	644	1	11	1201
04:15 PM	7	8	2	0	6	476	8	0	8	13	14	7	4	527	6	8	1079
04:30 PM	9	5	2	0	8	418	7	1	5	14	11	7	4	685	0	13	1168
04:45 PM	11	12	4	0	6	414	3	2	6	15	10	5	5	584	5	9	1075
05:00 PM	16	6	3	0	2	404	2	1	8	3	15	12	1	648	12	12	1120
05:15 PM	13	6	6	0	31	468	1	3	5	13	13	18	0	600	6	11	1162
05:30 PM	1	7	3	0	47	346	0	0	1	7	7	7	0	701	1	11	1121
05:45 PM	8	8	12	0	39	334	2	2	3	9	8	10	0	537	3	2	963
PHF		0.861				0.882				0.952				0.925			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	05:00 PM	33	31	11	2	28	1799	21	6	25	51	56	28	16	2440	12	41	4523
04:15 PM	05:15 PM	43	31	11	0	22	1712	20	4	27	45	50	31	14	2444	23	42	4442
04:30 PM	05:30 PM	49	29	15	0	47	1704	13	7	24	45	49	42	10	2517	23	45	4525
04:45 PM	05:45 PM	41	31	16	0	86	1632	6	6	20	38	45	42	6	2533	24	43	4478
05:00 PM	Hour After	38	27	24	0	119	1552	5	6	17	32	43	47	1	2486	22	36	4366

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	49	29	15	0	47	1704	13	7	24	45	49	42	10	2517	23	45	4478



File Name: X:\2007\07-097\counts\merged data\PM\Ala Moana - Cooke.ppd
Start Date: 11/13/2007
Start Time: 4:00:00 PM
Site Code: 00000000
Comment 1: Ala Moana - Cooke
Comment 2: PM Peak Hour
Comment 3: 400 pm to 600 pm
Comment 4:

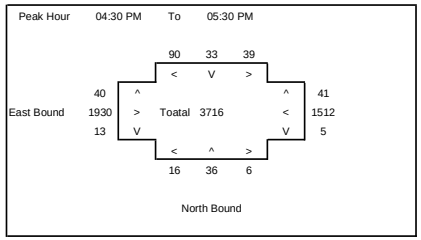
	COOKE From North				ALA MOANA From East				COOKE From South				ALA MOANA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	24	2	11	5	35	333	13	15	4	8	6	12	9	531	8	2	984
04:15 PM	19	6	16	2	8	419	0	0	2	14	1	8	5	426	13	5	929
04:30 PM	19	11	13	4	6	427	2	0	0	4	2	6	5	422	13	3	924
04:45 PM	24	6	13	4	14	368	0	2	0	10	4	7	2	475	13	0	929
05:00 PM	20	5	8	7	14	342	2	1	2	12	7	8	3	510	7	5	932
05:15 PM	27	11	5	10	7	375	1	0	4	10	3	16	3	523	7	7	976
05:30 PM	14	5	4	7	10	341	7	0	3	14	7	17	0	466	8	4	879
05:45 PM	14	1	6	2	1	339	0	0	1	7	9	15	6	430	1	5	815
PHF		0.942				0.895				0.69				0.93			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	05:00 PM	86	25	53	15	63	1547	15	17	6	36	13	33	21	1854	47	10	3766
04:15 PM	05:15 PM	82	28	50	17	42	1556	4	3	4	40	14	29	15	1833	46	13	3714
04:30 PM	05:30 PM	90	33	39	25	41	1512	5	3	6	36	16	37	13	1930	40	15	3761
04:45 PM	05:45 PM	85	27	30	28	45	1426	10	3	9	46	21	48	8	1974	35	16	3716
05:00 PM	Hour After	75	22	23	26	32	1397	10	1	10	43	26	56	12	1929	23	21	3602

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	90	33	39	25	41	1512	5	3	6	36	16	37	13	1930	40	15	3716



File Name: X:\2007\07-097\counts\merged data\PM\Ala Moana - Ward.ppd
Start Date: 10/16/2007
Start Time: 3:30:00 PM
Site Code: 00000000
Comment 1: Ala Moana Boulevard/Ward Avenue
Comment 2: PM Peak Hour
Comment 3:
Comment 4: Peak:

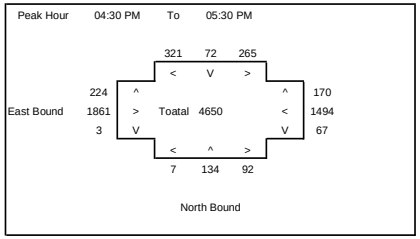
	WARD From North				ALA MOANA From East				WARD From South				ALA MOANA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	71	17	32	14	29	442	11	8	9	14	1	6	0	484	58	1	1168
03:45 PM	88	10	50	8	62	387	9	10	14	23	4	13	0	447	66	9	1160
04:00 PM	102	14	61	15	49	413	9	6	18	23	0	5	0	487	66	3	1242
04:15 PM	88	15	44	16	36	406	11	8	8	29	3	10	1	456	51	7	1148
04:30 PM	67	16	68	7	53	407	16	12	19	40	0	15	0	435	62	12	1183
04:45 PM	83	22	59	10	36	384	12	21	15	28	3	11	2	511	59	3	1214
05:00 PM	86	23	72	9	37	297	11	10	30	36	0	8	1	417	51	7	1061
05:15 PM	85	11	66	8	44	406	28	7	28	30	4	9	0	498	52	8	1252
05:30 PM	75	16	88	6	42	352	6	16	25	32	2	9	0	444	41	3	1123
05:45 PM	79	5	61	4	47	333	10	11	11	18	2	11	2	455	74	4	1097
PHF		0.909				0.905				0.883				0.913			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	349	56	187	53	176	1648	40	32	49	89	8	34	1	1874	241	20	4718
03:45 PM	04:45 PM	345	55	223	46	200	1613	45	36	59	115	7	43	1	1825	245	31	4733
04:00 PM	05:00 PM	340	67	232	48	174	1610	48	47	60	120	6	41	3	1889	238	25	4787
04:15 PM	05:15 PM	324	76	243	42	162	1494	50	51	72	133	6	44	4	1819	223	29	4606
04:30 PM	05:30 PM	321	72	265	34	170	1494	67	50	92	134	7	43	3	1861	224	30	4710
04:45 PM	05:45 PM	329	72	285	33	159	1439	57	54	98	126	9	37	3	1870	203	21	4650
05:00 PM	Hour After	325	55	287	27	170	1388	55	44	94	116	8	37	3	1814	218	22	4533

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	321	72	265	34	170	1494	67	50	92	134	7	43	3	1861	224	30	4650



File Name: X:\2007\07-097\counts\merged data\PM\Ala Moana - Kewalo.ppd
Start Date: 10/11/2007
Start Time: 3:30:00 PM
Site Code: 00000000
Comment 1: Intersection: Ala Moana - Kewalo
Comment 2: PM Peak Hour
Comment 3: 3:30 PM to 6:00 PM
Comment 4:

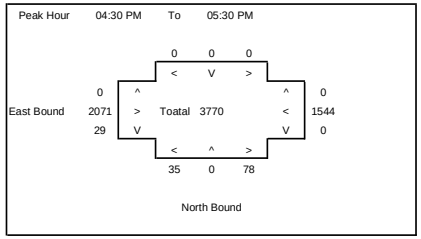
	KEWALO From North				ALAMOANA From East				KEWALO From South				ALAMOANA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	0	0	0	0	0	499	0	0	13	0	4	0	11	492	0	2	1019
03:45 PM	0	0	0	0	0	486	0	0	17	0	8	0	11	499	0	9	1021
04:00 PM	0	0	0	0	0	476	0	0	12	0	8	0	14	517	0	8	1027
04:15 PM	0	0	0	0	0	452	0	0	22	0	6	0	18	546	0	8	1044
04:30 PM	0	0	0	0	0	431	0	0	17	0	8	0	7	543	0	18	1006
04:45 PM	0	0	0	0	0	410	0	0	18	0	8	0	7	526	0	16	969
05:00 PM	0	0	0	0	0	323	0	0	21	0	10	0	9	503	0	6	866
05:15 PM	0	0	0	0	0	380	0	0	22	0	9	0	6	499	0	5	916
05:30 PM	0	0	0	0	0	412	0	0	9	0	9	0	8	581	0	20	1019
05:45 PM	0	0	0	0	0	428	1	0	18	0	18	0	5	526	0	14	996
PHF		#####				0.896				0.911				0.955			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	0	0	0	0	0	1913	0	0	64	0	26	0	54	2054	0	27	4111
03:45 PM	04:45 PM	0	0	0	0	0	1845	0	0	68	0	30	0	50	2105	0	43	4098
04:00 PM	05:00 PM	0	0	0	0	0	1769	0	0	69	0	30	0	46	2132	0	50	4046
04:15 PM	05:15 PM	0	0	0	0	0	1616	0	0	78	0	32	0	41	2118	0	48	3885
04:30 PM	05:30 PM	0	0	0	0	0	1544	0	0	78	0	35	0	29	2071	0	45	3757
04:45 PM	05:45 PM	0	0	0	0	0	1525	0	0	70	0	36	0	30	2109	0	47	3770
05:00 PM	Hour After	0	0	0	0	0	1543	1	0	70	0	46	0	28	2109	0	45	3797

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	0	0	0	0	0	1544	0	0	78	0	35	0	29	2071	0	45	3770



File Name: X:\2007\07-097\counts\merged data\PM\Ala Moana - Kamakee.ppd
Start Date: 11/13/2007
Start Time: 4:00:00 PM
Site Code: 00000000
Comment 1: Ala Moana - Kamakee
Comment 2: PM Peak Hour
Comment 3: 400 pm to 600 pm
Comment 4:

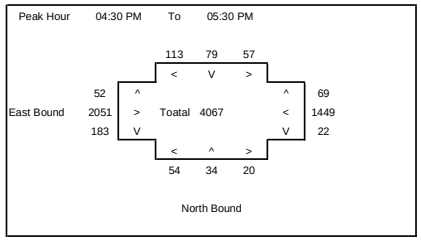
	KAMAKEE From North				ALA MOANA From East				KAMAKEE From South				ALA MOANA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	12	9	18	10	26	431	3	20	3	15	25	8	31	486	20	0	1079
04:15 PM	24	13	19	13	24	407	6	23	14	15	48	14	25	490	22	0	1107
04:30 PM	35	11	7	3	33	465	9	13	5	13	13	7	48	498	17	0	1154
04:45 PM	25	23	16	12	10	295	4	11	3	11	12	4	42	520	13	0	974
05:00 PM	25	17	16	0	16	361	4	22	7	7	17	16	52	552	7	0	1081
05:15 PM	28	28	18	9	10	328	5	20	5	3	12	12	41	481	15	0	974
05:30 PM	35	11	10	11	13	339	9	31	3	9	17	10	53	514	25	0	1038
05:45 PM	30	15	13	17	12	327	8	17	8	17	23	12	36	441	29	0	959
PHF		0.841				0.759				0.871				0.935			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	05:00 PM	96	56	60	38	93	1598	22	67	25	54	98	33	146	1994	72	0	4314
04:15 PM	05:15 PM	109	64	58	28	83	1528	23	69	29	46	90	41	167	2060	59	0	4316
04:30 PM	05:30 PM	113	79	57	24	69	1449	22	66	20	34	54	39	183	2051	52	0	4183
04:45 PM	05:45 PM	113	79	60	32	49	1323	22	84	18	30	58	42	188	2067	60	0	4067
05:00 PM	Hour After	118	71	57	37	51	1355	26	90	23	36	69	50	182	1988	76	0	4052

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	113	79	57	24	69	1449	22	66	20	34	54	39	183	2051	52	0	4067



File Name: X:\2007\07-097\counts\merged data\PM\Ala Moana - Queen.ppd
Start Date: 10/10/2007
Start Time: 3:30:00 PM
Site Code: 00000000
Comment 1: Intersection- Ala Moana & Queen
Comment 2: PM Peak Hour
Comment 3: 3:30 pm to 6:00 pm
Comment 4:

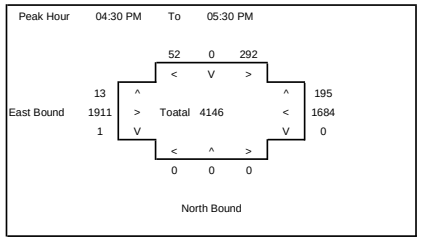
	QUEEN From North				ALAMOANA From East				QUEEN From South				ALAMOANA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	15	0	66	22	52	455	0	0	0	0	0	0	0	465	3	8	1056
03:45 PM	20	0	65	20	67	471	0	0	0	0	0	0	0	439	4	9	1066
04:00 PM	14	0	61	18	53	403	0	0	0	0	0	0	0	457	7	7	995
04:15 PM	21	0	68	21	50	403	0	0	0	0	0	0	0	418	3	5	963
04:30 PM	7	0	54	15	65	464	0	0	0	0	0	0	0	485	1	4	1076
04:45 PM	10	0	78	34	41	384	0	0	0	0	0	0	0	493	3	15	1009
05:00 PM	16	0	68	15	43	375	0	0	0	0	0	0	0	474	2	5	978
05:15 PM	19	0	92	20	46	461	0	0	0	0	0	0	1	459	7	6	1085
05:30 PM	20	0	74	19	47	418	0	0	0	0	0	0	0	514	1	6	1074
05:45 PM	12	0	48	40	54	406	0	0	0	0	0	0	0	577	4	22	1101
PHF		0.775				0.888				#####				0.97			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	70	0	260	81	222	1732	0	0	0	0	0	0	0	1779	17	29	4080
03:45 PM	04:45 PM	62	0	248	74	235	1741	0	0	0	0	0	0	0	1799	15	25	4100
04:00 PM	05:00 PM	52	0	261	88	209	1654	0	0	0	0	0	0	0	1853	14	31	4043
04:15 PM	05:15 PM	54	0	268	85	199	1626	0	0	0	0	0	0	0	1870	9	29	4026
04:30 PM	05:30 PM	52	0	292	84	195	1684	0	0	0	0	0	0	1	1911	13	30	4148
04:45 PM	05:45 PM	65	0	312	88	177	1638	0	0	0	0	0	0	1	1940	13	32	4146
05:00 PM	Hour After	67	0	282	94	190	1660	0	0	0	0	0	0	1	2024	14	39	4238

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	52	0	292	84	195	1684	0	0	0	0	0	0	1	1911	13	30	4146



File Name: X:\2007\07-097\counts\merged data\PM\Ala Moana - Piikoi.ppd
Start Date: 10/10/2007
Start Time: 3:15:00 PM
Site Code: 00000000
Comment 1: Intersection: Ala Moana - Piikoi
Comment 2: PM Peak Hour
Comment 3: 3:15 pm to 6:00 pm
Comment 4:

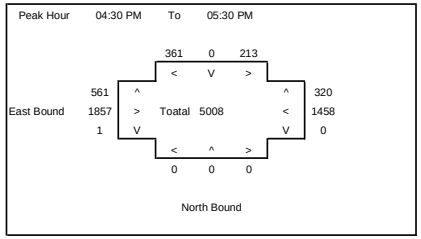
	PIIKOI From North				ALAMOANA From East				PIIKOI From South				ALAMOANA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	75	0	48	51	76	389	0	12	0	0	0	0	0	365	154	0	1107
03:45 PM	76	0	48	34	108	478	0	10	0	0	0	0	1	443	130	0	1284
04:00 PM	78	0	57	21	102	380	0	10	0	0	0	0	0	401	114	0	1132
04:15 PM	55	0	43	15	96	462	0	9	0	0	0	0	4	444	131	0	1235
04:30 PM	82	0	40	28	95	408	0	7	0	0	0	0	1	397	127	0	1150
04:45 PM	94	0	46	32	76	318	0	9	0	0	0	0	0	477	165	0	1176
05:00 PM	78	0	60	30	65	357	0	29	0	0	0	0	0	497	122	0	1179
05:15 PM	107	0	67	40	84	375	0	23	0	0	0	0	0	486	147	0	1266
05:30 PM	74	0	79	27	63	378	0	18	0	0	0	0	1	648	144	0	1387
05:45 PM	87	0	65	28	67	315	0	23	0	0	0	0	0	458	139	0	1131
PHF		0.825				0.884				#####				0.942			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	284	0	196	121	382	1709	0	41	0	0	0	0	5	1653	529	0	4758
03:45 PM	04:45 PM	291	0	188	98	401	1728	0	36	0	0	0	0	6	1685	502	0	4801
04:00 PM	05:00 PM	309	0	186	96	369	1568	0	35	0	0	0	0	5	1719	537	0	4693
04:15 PM	05:15 PM	309	0	189	105	332	1545	0	54	0	0	0	0	5	1815	545	0	4740
04:30 PM	05:30 PM	361	0	213	130	320	1458	0	68	0	0	0	0	1	1857	561	0	4771
04:45 PM	05:45 PM	353	0	252	129	288	1428	0	79	0	0	0	0	1	2108	578	0	5008
05:00 PM	Hour After	346	0	271	125	279	1425	0	93	0	0	0	0	1	2089	552	0	4963

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	361	0	213	130	320	1458	0	68	0	0	0	0	1	1857	561	0	5008



File Name: X:\2007\07-097\counts\merged data\PM\Ward - Auahi.ppd
Start Date: 10/10/2007
Start Time: 4:00:00 PM
Site Code: 00000000
Comment 1: Ward Avenue/Auahi Street
Comment 2: PM Peak Hour
Comment 3:
Comment 4:

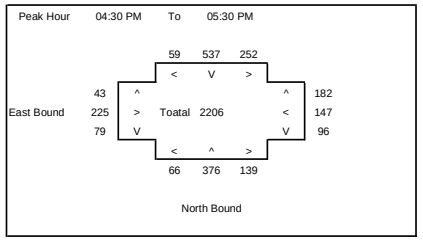
	WARD From North				AUAHI From East				WARD From South				AUAHI From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	13	95	37	12	46	41	37	21	28	68	19	14	20	34	16	28	454
04:15 PM	14	125	46	6	59	42	21	21	21	110	19	10	20	27	6	25	510
04:30 PM	15	112	55	13	44	39	36	17	28	98	17	5	20	47	10	18	521
04:45 PM	15	161	69	9	42	38	19	20	32	98	15	6	16	51	13	13	569
05:00 PM	16	125	66	12	42	36	23	9	32	89	11	6	23	66	11	13	540
05:15 PM	13	139	62	6	54	34	18	11	47	91	23	6	20	61	9	8	571
05:30 PM	9	117	74	8	62	37	18	15	32	87	21	11	20	41	8	11	526
05:45 PM	7	112	81	14	64	24	24	26	32	70	13	4	14	35	8	26	484
PHF		0.865				0.893				0.902				0.868			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	05:00 PM	57	493	207	40	191	160	113	79	109	374	70	35	76	159	45	84	2054
04:15 PM	05:15 PM	60	523	236	40	187	155	99	67	113	395	62	27	79	191	40	69	2140
04:30 PM	05:30 PM	59	537	252	40	182	147	96	57	139	376	66	23	79	225	43	52	2201
04:45 PM	05:45 PM	53	542	271	35	200	145	78	55	143	365	70	29	79	219	41	45	2206
05:00 PM	Hour After	45	493	283	40	222	131	83	61	143	337	68	27	77	203	36	58	2121

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	59	537	252	40	182	147	96	57	139	376	66	23	79	225	43	52	2206



File Name: X:\2007\07-097\counts\merged data\PM\Ward - Halekauwila.ppd
Start Date: 10/9/2007
Start Time: 3:15:00 PM
Site Code: 00000000
Comment 1: Ward Avenue/Halekauwila Street
Comment 2: PM Peak Hour
Comment 3:
Comment 4:

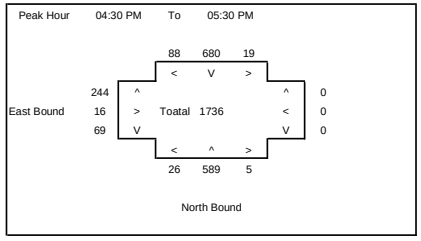
	WARD From North				HALEKAUWILA From East				WARD From South				HALEKAUWILA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	21	168	6	0	0	0	0	0	2	160	10	24	9	2	46	13	424
03:45 PM	38	162	8	0	0	0	0	0	2	150	8	6	13	5	44	6	430
04:00 PM	30	186	5	0	0	0	0	0	3	155	7	6	11	1	57	16	455
04:15 PM	30	145	5	0	0	0	0	0	2	154	3	20	13	3	55	2	410
04:30 PM	22	143	7	0	0	0	0	0	1	158	9	19	16	3	57	12	416
04:45 PM	14	199	3	0	0	0	0	0	2	133	5	12	16	5	65	9	442
05:00 PM	31	170	3	0	0	0	0	0	0	155	7	13	17	5	65	8	453
05:15 PM	21	168	6	0	0	0	0	0	2	143	5	17	20	3	57	14	425
05:30 PM	23	143	6	0	0	0	0	0	2	142	9	27	14	3	52	14	394
05:45 PM	21	154	5	6	0	0	0	0	3	140	5	35	12	6	59	11	405
PHF		0.911				#####				0.923				0.945			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	119	661	24	0	0	0	0	0	9	619	28	56	46	11	202	37	1719
03:45 PM	04:45 PM	120	636	25	0	0	0	0	0	8	617	27	51	53	12	213	36	1711
04:00 PM	05:00 PM	96	673	20	0	0	0	0	0	8	600	24	57	56	12	234	39	1723
04:15 PM	05:15 PM	97	657	18	0	0	0	0	0	5	600	24	64	62	16	242	31	1721
04:30 PM	05:30 PM	88	680	19	0	0	0	0	0	5	589	26	61	69	16	244	43	1736
04:45 PM	05:45 PM	89	680	18	0	0	0	0	0	6	573	26	69	67	16	239	45	1714
05:00 PM	Hour After	96	635	20	6	0	0	0	0	7	580	26	92	63	17	233	47	1677

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	88	680	19	0	0	0	0	0	5	589	26	61	69	16	244	43	1736



File Name: X:\2007\07-097\counts\merged data\PM\Ward - Queen.ppd
Start Date: 10/10/2007
Start Time: 3:30:00 PM
Site Code: 00000000
Comment 1: Ward Avenue/Queen Street
Comment 2: PM Peak Hour
Comment 3:
Comment 4:

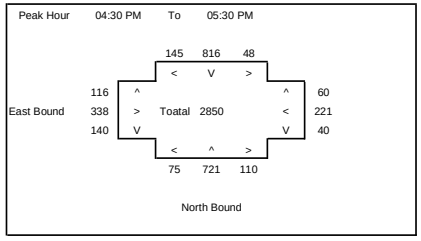
	WARD From North				QUEEN From East				WARD From South				QUEEN From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	47	189	12	6	22	57	13	24	21	171	18	5	23	50	20	18	643
03:45 PM	28	203	14	4	15	61	10	15	25	164	22	4	38	44	19	15	643
04:00 PM	26	171	13	5	16	59	9	15	31	194	26	2	21	38	21	8	625
04:15 PM	31	183	10	2	16	50	22	12	19	203	28	0	27	52	19	6	660
04:30 PM	37	186	11	10	17	44	10	9	30	180	21	3	36	60	28	14	660
04:45 PM	31	226	9	4	19	53	13	15	32	187	20	3	26	91	30	10	737
05:00 PM	35	200	11	4	13	54	8	16	24	192	18	5	46	90	21	10	712
05:15 PM	42	204	17	2	11	70	9	8	24	162	16	8	32	97	37	7	721
05:30 PM	37	187	9	1	10	50	10	10	32	155	29	5	35	97	29	11	680
05:45 PM	39	188	12	1	16	46	22	8	16	166	16	5	41	80	22	9	664
PHF		0.948				0.892				0.948				0.895			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	132	746	49	17	69	227	54	66	96	732	94	11	109	184	79	47	2571
03:45 PM	04:45 PM	122	743	48	21	64	214	51	51	105	741	97	9	122	194	87	43	2588
04:00 PM	05:00 PM	125	766	43	21	68	206	54	51	112	764	95	8	110	241	98	38	2682
04:15 PM	05:15 PM	134	795	41	20	65	201	53	52	105	762	87	11	135	293	98	40	2769
04:30 PM	05:30 PM	145	816	48	20	60	221	40	48	110	721	75	19	140	338	116	41	2830
04:45 PM	05:45 PM	145	817	46	11	53	227	40	49	112	696	83	21	139	375	117	38	2850
05:00 PM	Hour After	153	779	49	8	50	220	49	42	96	675	79	23	154	364	109	37	2777

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	145	816	48	20	60	221	40	48	110	721	75	19	140	338	116	41	2850



File Name: X:\2007\07-097\counts\merged data\PM\Piikoi Hawaiki PM.ppd
Start Date: 10/11/2007
Start Time: 3:30:00 PM
Site Code: 00000000
Comment 1: Piikoi Street/Hawaiki Tower/Ala Moana Shopping Center
Comment 2: PM Peak Hour
Comment 3:
Comment 4:

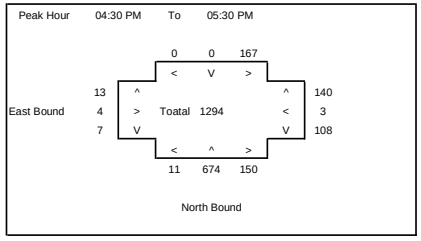
	Piikoi From North				Hawaiki From East				Piikoi From South				Hawaiki From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	0	0	37	0	32	2	32	3	22	175	1	11	3	0	6	1	310
03:45 PM	0	0	47	0	34	0	16	7	32	154	5	12	1	0	4	6	293
04:00 PM	0	0	30	0	33	0	25	3	29	197	2	7	2	0	2	1	320
04:15 PM	0	0	48	0	26	1	24	8	49	172	2	9	1	0	3	5	326
04:30 PM	0	0	36	0	36	0	29	13	33	179	0	13	1	1	5	9	320
04:45 PM	0	0	34	0	30	2	25	4	51	186	4	8	1	2	1	10	336
05:00 PM	0	0	45	0	38	0	34	8	36	151	3	11	3	1	6	3	317
05:15 PM	0	0	52	0	36	1	20	5	30	158	4	12	2	0	1	3	304
05:30 PM	0	0	43	0	45	0	25	11	32	184	3	14	3	0	2	4	337
05:45 PM	0	0	36	0	48	0	25	8	29	182	0	8	6	2	3	6	331
PHF			0.803				0.872				0.866				0.6		

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	0	0	162	0	125	3	97	21	132	698	10	39	7	0	15	13	1249
03:45 PM	04:45 PM	0	0	161	0	129	1	94	31	143	702	9	41	5	1	14	21	1259
04:00 PM	05:00 PM	0	0	148	0	125	3	103	28	162	734	8	37	5	3	11	25	1302
04:15 PM	05:15 PM	0	0	163	0	130	3	112	33	169	688	9	41	6	4	15	27	1299
04:30 PM	05:30 PM	0	0	167	0	140	3	108	30	150	674	11	44	7	4	13	25	1277
04:45 PM	05:45 PM	0	0	174	0	149	3	104	28	149	679	14	45	9	3	10	20	1294
05:00 PM	Hour After	0	0	176	0	167	1	104	32	127	675	10	45	14	3	12	16	1289

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	0	0	167	0	140	3	108	30	150	674	11	44	7	4	13	25	1294



File Name: X:\2007\07-097\counts\merged data\PM\Piikoi - Waimanu.ppd
Start Date: 10/11/2007
Start Time: 3:45:00 PM
Site Code: 00000000
Comment 1: Piikoi Street/Waimanu Street
Comment 2: PM Peak Hour
Comment 3:
Comment 4:

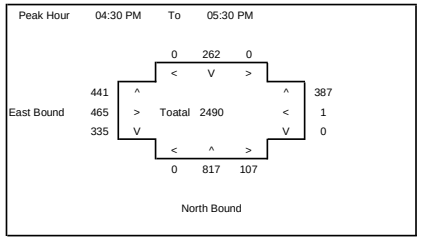
	PIIKOI From North				WAIMANU From East				PIIKOI From South				WAIMANU From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:45 PM	0	68	0	0	80	1	0	24	18	204	1	27	58	99	96	16	625
04:00 PM	0	62	1	0	83	0	0	19	24	205	0	29	69	90	105	8	639
04:15 PM	1	63	0	0	111	0	0	16	24	203	0	25	76	93	111	12	682
04:30 PM	0	56	0	0	88	0	0	23	19	205	0	28	80	116	112	18	676
04:45 PM	0	62	0	0	86	1	0	22	33	230	0	23	72	134	121	20	739
05:00 PM	0	70	0	1	104	0	0	19	27	168	0	43	87	111	107	16	674
05:15 PM	0	74	0	0	109	0	0	18	28	214	0	27	96	104	101	13	726
05:30 PM	0	34	0	0	56	0	0	13	14	107	0	8	41	47	52	5	351
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF			0.885				0.89				0.878				0.949		

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:45 PM	04:45 PM	1	249	1	0	362	1	0	82	85	817	1	109	283	398	424	54	2622
04:00 PM	05:00 PM	1	243	1	0	368	1	0	80	100	843	0	105	297	433	449	58	2736
04:15 PM	05:15 PM	1	251	0	1	389	1	0	80	103	806	0	119	315	454	451	66	2771
04:30 PM	05:30 PM	0	262	0	1	387	1	0	82	107	817	0	121	335	465	441	67	2815
04:45 PM	05:45 PM	0	240	0	1	355	1	0	72	102	719	0	101	296	396	381	54	2490
05:00 PM	Hour After	0	178	0	1	269	0	0	50	69	489	0	78	224	262	260	34	1751

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	0	262	0	1	387	1	0	82	107	817	0	121	335	465	441	67	2490



File Name: X:\2007\07-097\counts\merged data\PM\Piikoi - Kona.ppd
Start Date: 10/11/2007
Start Time: 4:00:00 PM
Site Code: 00000000
Comment 1: Piikoi Street/Kona Street
Comment 2: PM Peak Hour
Comment 3:
Comment 4:

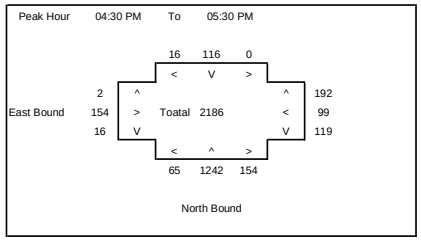
	PIIKOI From North				KONA From East				PIIKOI From South				KONA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	4	25	0	16	42	35	25	23	41	313	13	0	3	16	0	6	517
04:15 PM	4	28	0	8	37	23	27	25	31	337	17	0	2	17	0	8	523
04:30 PM	3	24	0	11	53	33	23	17	37	308	15	0	3	36	0	6	535
04:45 PM	4	26	0	11	42	19	24	20	50	314	18	0	3	33	0	10	533
05:00 PM	5	32	0	15	56	22	39	21	31	301	10	0	5	34	0	6	535
05:15 PM	4	34	0	19	41	25	33	33	36	319	22	1	5	51	2	14	572
05:30 PM	8	41	0	20	45	21	23	38	43	263	18	0	3	80	1	14	546
05:45 PM	4	31	0	19	49	34	35	17	42	356	14	0	3	33	0	5	601
PHF		0.868				0.876				0.956				0.741			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	05:00 PM	15	103	0	46	174	110	99	85	159	1272	63	0	11	102	0	30	2108
04:15 PM	05:15 PM	16	110	0	45	188	97	113	83	149	1260	60	0	13	120	0	30	2126
04:30 PM	05:30 PM	16	116	0	56	192	99	119	91	154	1242	65	1	16	154	2	36	2175
04:45 PM	05:45 PM	21	133	0	65	184	87	119	112	160	1197	68	1	16	198	3	44	2186
05:00 PM	Hour After	21	138	0	73	191	102	130	109	152	1239	64	1	16	198	3	39	2254

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	16	116	0	56	192	99	119	91	154	1242	65	1	16	154	2	36	2186



File Name: X:\2007\07-097\counts\merged data\PM\Pensacola - Waimanu.ppd
Start Date: 10/10/2007
Start Time: 3:45:00 PM
Site Code: 00000000
Comment 1: Pensacola Street/Waimanu Street
Comment 2: AM Peak Hour
Comment 3:
Comment 4:

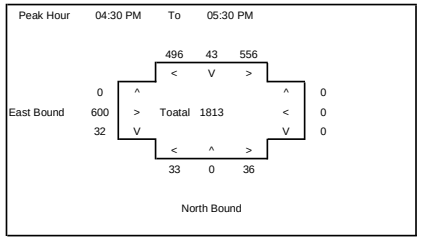
	PENSACOLA From North				WAIMANU From East				PENSACOLA From South				WAIMANU From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:45 PM	94	8	123	0	0	0	0	0	7	0	6	6	7	120	0	0	365
04:00 PM	109	16	132	1	0	0	0	0	5	0	6	16	9	96	0	3	373
04:15 PM	104	14	136	2	0	0	0	0	3	0	11	5	3	114	1	1	386
04:30 PM	133	13	140	3	0	0	0	0	13	0	11	6	11	130	0	2	451
04:45 PM	122	10	141	6	0	0	0	0	9	0	10	7	14	137	0	4	443
05:00 PM	115	8	126	3	0	0	0	0	9	0	8	12	5	162	0	0	433
05:15 PM	126	12	149	4	0	0	0	0	5	0	4	14	2	171	0	0	469
05:30 PM	122	14	133	3	0	0	0	0	8	0	8	14	6	177	0	5	468
05:45 PM	110	9	130	4	0	0	0	0	17	0	5	13	8	148	0	1	427
PHF		0.954				#####				0.719				0.913			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:45 PM	04:45 PM	440	51	531	6	0	0	0	0	28	0	34	33	30	460	1	6	1575
04:00 PM	05:00 PM	468	53	549	12	0	0	0	0	30	0	38	34	37	477	1	10	1653
04:15 PM	05:15 PM	474	45	543	14	0	0	0	0	34	0	40	30	33	543	1	7	1713
04:30 PM	05:30 PM	496	43	556	16	0	0	0	0	36	0	33	39	32	600	0	6	1796
04:45 PM	05:45 PM	485	44	549	16	0	0	0	0	31	0	30	47	27	647	0	9	1813
05:00 PM	Hour After	473	43	538	14	0	0	0	0	39	0	25	53	21	658	0	6	1797

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	496	43	556	16	0	0	0	0	36	0	33	39	32	600	0	6	1813



File Name: X:\2007\07-097\counts\merged data\PM\Kamakee - Queen.ppd
Start Date: 10/10/2007
Start Time: 3:30:00 PM
Site Code: 00000000
Comment 1: Kamakee - Queen
Comment 2: PM Peak Hour
Comment 3:
Comment 4:

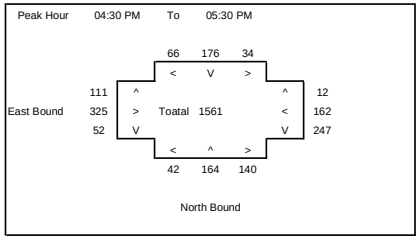
	KAMAKEE From North				QUEEN From East				KAMAKEE From South				QUEEN From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	13	32	8	4	4	39	53	8	20	50	7	0	11	60	23	5	320
03:45 PM	26	34	4	3	6	28	45	1	33	55	8	0	14	58	18	13	329
04:00 PM	18	28	6	1	4	46	41	8	26	55	6	0	12	63	13	17	318
04:15 PM	21	47	6	8	3	46	45	5	22	41	10	0	10	53	25	20	329
04:30 PM	13	44	1	5	4	46	63	3	40	41	7	0	13	71	20	15	363
04:45 PM	18	28	11	3	4	43	59	1	34	44	8	0	16	90	30	19	385
05:00 PM	19	47	8	6	3	34	59	8	32	37	11	0	7	80	31	22	368
05:15 PM	16	57	14	5	1	39	66	7	34	42	16	0	16	84	30	16	415
05:30 PM	6	55	9	4	0	46	57	6	40	32	17	0	11	89	31	12	393
05:45 PM	12	65	11	4	0	41	54	8	35	40	8	0	17	82	19	14	384
PHF		0.793				0.931				0.94				0.897			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	78	141	24	16	17	159	184	22	101	201	31	0	47	234	79	55	1296
03:45 PM	04:45 PM	78	153	17	17	17	166	194	17	121	192	31	0	49	245	76	65	1339
04:00 PM	05:00 PM	70	147	24	17	15	181	208	17	122	181	31	0	51	277	88	71	1395
04:15 PM	05:15 PM	71	166	26	22	14	169	226	17	128	163	36	0	46	294	106	76	1445
04:30 PM	05:30 PM	66	176	34	19	12	162	247	19	140	164	42	0	52	325	111	72	1531
04:45 PM	05:45 PM	59	187	42	18	8	162	241	22	140	155	52	0	50	343	122	69	1561
05:00 PM	Hour After	53	224	42	19	4	160	236	29	141	151	52	0	51	335	111	64	1560

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	66	176	34	19	12	162	247	19	140	164	42	0	52	325	111	72	1561



File Name: X:\2007\07-097\counts\merged data\PM\Kamakee Auahi.ppd
Start Date: 10/11/2007
Start Time: 2:15:00 PM
Site Code: 00000000
Comment 1: Kamakee Street/Auahi Street
Comment 2: PM Peak Hour
Comment 3:
Comment 4:

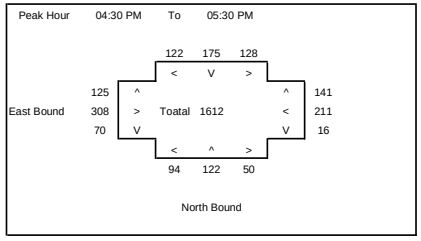
	KAMAKEE From North				AUAHI From East				KAMAKEE From South				AUAHI From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	39	42	15	39	27	59	13	26	7	35	21	84	16	53	26	25	353
03:45 PM	27	34	23	18	35	56	5	35	12	35	19	60	13	52	33	30	344
04:00 PM	33	37	19	20	33	54	4	26	9	36	21	57	11	61	24	28	342
04:15 PM	27	28	24	15	31	46	9	19	4	28	20	53	19	70	21	17	327
04:30 PM	36	31	31	22	32	36	4	30	16	20	19	68	13	73	31	34	342
04:45 PM	21	41	39	27	28	71	5	29	11	22	15	63	15	71	35	17	374
05:00 PM	30	50	21	15	39	51	5	18	9	38	20	59	26	85	32	21	406
05:15 PM	35	53	37	19	42	53	2	19	14	42	40	65	16	79	27	38	440
05:30 PM	37	32	33	49	24	59	4	46	12	30	22	62	26	84	29	51	392
05:45 PM	26	46	35	33	22	35	2	20	10	30	25	65	7	69	25	33	332
PHF		0.85				0.885				0.693				0.879			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	126	141	81	92	126	215	31	106	32	134	81	254	59	236	104	100	1366
03:45 PM	04:45 PM	123	130	97	75	131	192	22	110	41	119	79	238	56	256	109	109	1355
04:00 PM	05:00 PM	117	137	113	84	124	207	22	104	40	106	75	241	58	275	111	96	1385
04:15 PM	05:15 PM	114	150	115	79	130	204	23	96	40	108	74	243	73	299	119	89	1449
04:30 PM	05:30 PM	122	175	128	83	141	211	16	96	50	122	94	255	70	308	125	110	1562
04:45 PM	05:45 PM	123	176	130	110	133	234	16	112	46	132	97	249	83	319	123	127	1612
05:00 PM	Hour After	128	181	126	116	127	198	13	103	45	140	107	251	75	317	113	143	1570

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	122	175	128	83	141	211	16	96	50	122	94	255	70	308	125	110	1612



File Name: X:\2007\07-097\counts\merged data\PM\Auahi - theater.ppd
Start Date: 10/10/2007
Start Time: 3:30:00 PM
Site Code: 00000000
Comment 1: Auahi Street/Theatre ped xing
Comment 2: PM Peak Hour
Comment 3: 3:30 pm to 6:00 pm
Comment 4:

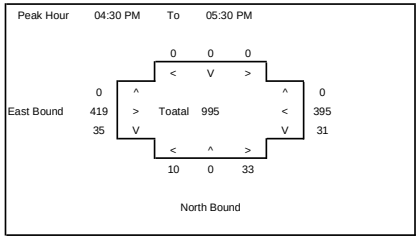
	AUAHI From North				THEATRE From East				AUAHI From South				THEATRE From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	0	0	0	0	0	126	8	0	16	0	7	26	6	79	0	59	242
03:45 PM	0	0	0	0	0	106	5	0	14	0	1	12	3	97	0	36	226
04:00 PM	0	0	0	0	0	92	7	0	6	0	2	17	9	92	0	29	208
04:15 PM	0	0	0	0	0	83	4	0	12	0	4	20	8	79	0	50	190
04:30 PM	0	0	0	0	0	88	6	0	7	0	2	13	6	91	0	34	200
04:45 PM	0	0	0	1	0	104	6	0	9	0	2	25	9	111	0	54	241
05:00 PM	0	0	0	0	0	83	8	0	5	0	2	25	7	116	0	43	221
05:15 PM	0	0	0	0	0	120	11	0	12	0	4	7	13	101	0	40	261
05:30 PM	0	0	0	0	0	117	7	0	9	0	3	9	6	130	0	36	272
05:45 PM	0	0	0	0	0	91	17	0	8	0	3	15	11	104	0	73	234
PHF		#####				0.813				0.672				0.923			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	0	0	0	0	0	407	24	0	48	0	14	75	26	347	0	174	866
03:45 PM	04:45 PM	0	0	0	0	0	369	22	0	39	0	9	62	26	359	0	149	824
04:00 PM	05:00 PM	0	0	0	1	0	367	23	0	34	0	10	75	32	373	0	167	839
04:15 PM	05:15 PM	0	0	0	1	0	358	24	0	33	0	10	83	30	397	0	181	852
04:30 PM	05:30 PM	0	0	0	1	0	395	31	0	33	0	10	70	35	419	0	171	923
04:45 PM	05:45 PM	0	0	0	1	0	424	32	0	35	0	11	66	35	458	0	173	995
05:00 PM	Hour After	0	0	0	0	0	411	43	0	34	0	12	56	37	451	0	192	988

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	0	0	0	1	0	395	31	0	33	0	10	70	35	419	0	171	995



File Name: X:\2007\07-097\counts\merged data\PM\Auahi - Farmers Market.ppd
Start Date: 11/13/2007
Start Time: 4:00:00 PM
Site Code: 00000000
Comment 1: Auahi - Farmers Market Ped Xing
Comment 2: PM Peak Hour
Comment 3: 400 pm to 600 pm
Comment 4:

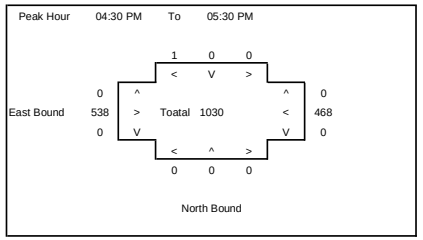
	FARMERS MARKET PED XING From North				AUAHI From East				FARMERS MARKET PED XING From South				AUAHI From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	0	0	0	0	0	118	0	16	0	0	0	0	0	97	0	0	215
04:15 PM	0	0	0	0	0	108	0	27	0	0	0	0	0	119	0	0	227
04:30 PM	0	0	0	0	0	115	0	17	0	0	0	0	0	111	0	0	226
04:45 PM	0	0	0	0	0	125	0	22	0	0	0	0	0	126	0	0	251
05:00 PM	0	0	0	0	0	118	0	18	0	0	0	0	0	143	0	0	261
05:15 PM	1	0	0	0	0	110	0	20	0	0	0	0	0	158	0	0	269
05:30 PM	0	0	0	0	0	102	0	16	0	0	0	0	0	147	0	0	249
05:45 PM	0	0	0	0	0	83	0	21	0	0	0	0	0	162	0	0	245
PHF		0.25				0.936				#####				0.851			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
#REF!	04:30 PM	0	0	0	0	0	226	0	43	0	0	0	0	0	216	0	0	442
#REF!	04:45 PM	0	0	0	0	0	341	0	60	0	0	0	0	0	327	0	0	668
04:00 PM	05:00 PM	0	0	0	0	0	466	0	82	0	0	0	0	0	453	0	0	919
04:15 PM	05:15 PM	0	0	0	0	0	466	0	84	0	0	0	0	0	499	0	0	965
04:30 PM	05:30 PM	1	0	0	0	0	468	0	77	0	0	0	0	0	538	0	0	1007
04:45 PM	05:45 PM	1	0	0	0	0	455	0	76	0	0	0	0	0	574	0	0	1030
05:00 PM	Hour After	1	0	0	0	0	413	0	75	0	0	0	0	0	610	0	0	1024

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	1	0	0	0	0	468	0	77	0	0	0	0	0	538	0	0	1030



File Name: X:\2007\07-097\counts\merged data\PM\South - Pohukaina.ppd
Start Date: 10/9/2007
Start Time: 4:00:00 PM
Site Code: 00000000
Comment 1: South Street/Pohukaina Street
Comment 2: PM Peak Hour
Comment 3:
Comment 4:

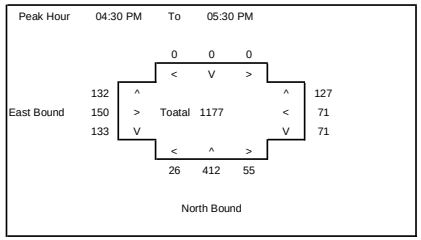
	SOUTH From North				POHUKAINA From East				SOUTH From South				POHUKAINA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	0	1	0	12	33	18	11	3	10	90	9	14	40	31	37	7	280
04:15 PM	0	0	1	12	30	24	19	1	8	88	4	5	35	23	29	9	261
04:30 PM	0	0	0	23	43	17	23	3	14	109	10	7	32	28	44	10	320
04:45 PM	0	0	0	16	28	16	19	6	5	89	4	8	33	48	31	6	273
05:00 PM	0	0	0	11	28	17	13	7	22	106	5	9	35	39	27	3	292
05:15 PM	0	0	0	9	28	21	16	7	14	108	7	6	33	35	30	6	292
05:30 PM	0	0	0	8	25	13	7	5	15	75	7	11	18	31	16	6	207
05:45 PM	0	0	0	1	15	11	9	2	8	82	7	7	21	19	23	3	195
PHF		#####				0.81				0.927				0.926			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	05:00 PM	0	1	1	63	134	75	72	13	37	376	27	34	140	130	141	32	1134
04:15 PM	05:15 PM	0	0	1	62	129	74	74	17	49	392	23	29	135	138	131	28	1146
04:30 PM	05:30 PM	0	0	0	59	127	71	71	23	55	412	26	30	133	150	132	25	1177
04:45 PM	05:45 PM	0	0	0	44	109	67	55	25	56	378	23	34	119	153	104	21	1064
05:00 PM	Hour After	0	0	0	29	96	62	45	21	59	371	26	33	107	124	96	18	986

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	0	0	0	59	127	71	71	23	55	412	26	30	133	150	132	25	1177



File Name: X:\2007\07-097\counts\merged data\PM\South - Halekauwila good.ppd
Start Date: 11/27/2007
Start Time: 4:00:00 PM
Site Code: 00000000
Comment 1: South Street/Halekauwila Street
Comment 2: PM Peak Hour
Comment 3:
Comment 4:

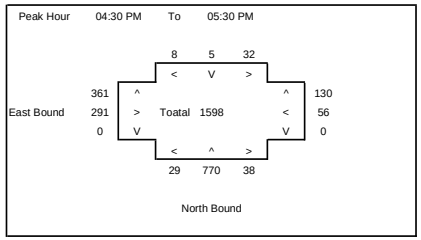
	SOUTH From North				HALEKAUWILA From East				SOUTH From South				HALEKAUWILA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	0	4	7	8	30	13	0	8	7	173	12	29	0	54	91	10	391
04:15 PM	6	4	8	23	30	16	0	20	9	199	12	16	7	66	82	10	439
04:30 PM	1	3	6	17	30	11	0	6	15	207	12	39	0	73	106	18	464
04:45 PM	3	1	10	16	38	15	0	13	7	179	3	25	0	71	79	13	406
05:00 PM	4	0	7	8	32	16	0	12	10	192	4	21	0	81	94	27	440
05:15 PM	0	1	9	11	30	14	0	4	6	192	10	16	0	66	82	11	410
05:30 PM	0	0	2	7	24	10	0	12	3	169	7	17	0	53	74	2	342
05:45 PM	0	0	1	7	28	9	0	0	6	144	6	5	0	54	69	2	317
PHF			0.804			0.877				0.894				0.911			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:00 PM	05:00 PM	10	12	31	64	128	55	0	47	38	758	39	109	7	264	358	51	1700
04:15 PM	05:15 PM	14	8	31	64	130	58	0	51	41	777	31	101	7	291	361	68	1749
04:30 PM	05:30 PM	8	5	32	52	130	56	0	35	38	770	29	101	0	291	361	69	1720
04:45 PM	05:45 PM	7	2	28	42	124	55	0	41	26	732	24	79	0	271	329	53	1598
05:00 PM	Hour After	4	1	19	33	114	49	0	28	25	697	27	59	0	254	319	42	1509

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	8	5	32	52	130	56	0	35	38	770	29	101	0	291	361	69	1598



File Name: X:\2007\07-097\counts\merged data\PM\South - Queen.ppd
Start Date: 10/11/2007
Start Time: 3:15:00 PM
Site Code: 00000000
Comment 1: South Street/Queen Street
Comment 2: PM Peak Hour
Comment 3:
Comment 4:

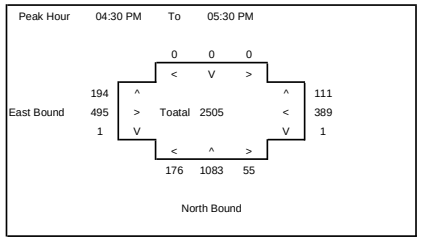
	SOUTH From North				QUEEN From East				SOUTH From South				QUEEN From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	0	0	0	0	28	115	5	12	13	236	71	7	0	72	25	5	565
03:45 PM	0	0	0	0	20	127	0	12	7	233	45	17	0	92	19	24	543
04:00 PM	0	0	0	18	15	109	0	10	14	300	70	0	0	73	32	20	613
04:15 PM	0	0	0	23	20	111	0	44	16	304	60	0	4	89	38	27	642
04:30 PM	0	0	0	7	20	85	0	12	9	320	54	1	0	92	48	14	628
04:45 PM	0	0	0	10	27	98	0	17	16	274	37	1	1	114	41	12	608
05:00 PM	0	0	0	7	39	93	1	18	13	231	43	1	0	128	50	20	598
05:15 PM	0	0	0	13	25	113	0	22	17	258	42	0	0	161	55	8	671
05:30 PM	0	0	0	9	31	70	0	24	12	228	48	0	0	148	39	9	576
05:45 PM	0	0	0	8	27	72	0	16	12	198	23	0	0	140	48	13	520
PHF		#####				0.908				0.858				0.799			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	0	0	0	41	83	462	5	78	50	1073	246	24	4	326	114	76	2363
03:45 PM	04:45 PM	0	0	0	48	75	432	0	78	46	1157	229	18	4	346	137	85	2426
04:00 PM	05:00 PM	0	0	0	58	82	403	0	83	55	1198	221	2	5	368	159	73	2491
04:15 PM	05:15 PM	0	0	0	47	106	387	1	91	54	1129	194	3	5	423	177	73	2476
04:30 PM	05:30 PM	0	0	0	37	111	389	1	69	55	1083	176	3	1	495	194	54	2505
04:45 PM	05:45 PM	0	0	0	39	122	374	1	81	58	991	170	2	1	551	185	49	2453
05:00 PM	Hour After	0	0	0	37	122	348	1	80	54	915	156	1	0	577	192	50	2365

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	0	0	0	37	111	389	1	69	55	1083	176	3	1	495	194	54	2505



File Name: X:\2007\07-097\counts\merged data\PM\Cooke - Emily.ppd
Start Date: 10/9/2007
Start Time: 3:15:00 PM
Site Code: 00000000
Comment 1: Cooke Street/Emily Street/Coral Street
Comment 2: PM Peak Hour
Comment 3: 3:30 pm to 6:00 pm
Comment 4:

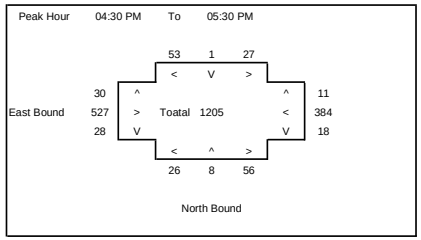
	EMILY From North				QUEEN From East				EMILY From South				QUEEN From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	44	0	3	4	4	110	7	3	6	1	9	2	4	85	8	41	281
03:45 PM	18	0	2	8	4	105	7	3	12	1	14	3	5	86	5	13	259
04:00 PM	16	0	3	15	3	111	4	3	6	3	9	3	6	112	8	27	281
04:15 PM	12	0	2	3	4	111	5	8	7	4	11	2	4	106	5	15	271
04:30 PM	15	1	8	10	0	88	5	7	8	0	5	3	3	122	5	23	260
04:45 PM	8	0	8	1	3	105	4	7	18	3	9	5	9	126	6	16	299
05:00 PM	17	0	4	8	4	91	5	9	10	3	7	7	11	140	10	13	302
05:15 PM	13	0	7	8	4	100	4	4	20	2	5	5	5	139	9	20	308
05:30 PM	12	2	5	6	6	74	8	3	16	4	2	1	7	155	5	8	296
05:45 PM	9	2	0	3	5	94	2	7	13	1	7	2	4	108	3	11	248
PHF		0.844				0.922				0.75				0.908			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	90	0	10	30	15	437	23	17	31	9	43	10	19	389	26	96	1092
03:45 PM	04:45 PM	61	1	15	36	11	415	21	21	33	8	39	11	18	426	23	78	1071
04:00 PM	05:00 PM	51	1	21	29	10	415	18	25	39	10	34	13	22	466	24	81	1111
04:15 PM	05:15 PM	52	1	22	22	11	395	19	31	43	10	32	17	27	494	26	67	1132
04:30 PM	05:30 PM	53	1	27	27	11	384	18	27	56	8	26	20	28	527	30	72	1169
04:45 PM	05:45 PM	50	2	24	23	17	370	21	23	64	12	23	18	32	560	30	57	1205
05:00 PM	Hour After	51	4	16	25	19	359	19	23	59	10	21	15	27	542	27	52	1154

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	53	1	27	27	11	384	18	27	56	8	26	20	28	527	30	72	1205



File Name: X:\2007\07-097\counts\merged data\PM\Cooke - Queen.ppd
Start Date: 10/9/2007
Start Time: 3:15:00 PM
Site Code: 00000000
Comment 1: Cooke Street/Queen Street
Comment 2: PM Peak Hour
Comment 3: 3:30 pm to 6:00 pm
Comment 4:

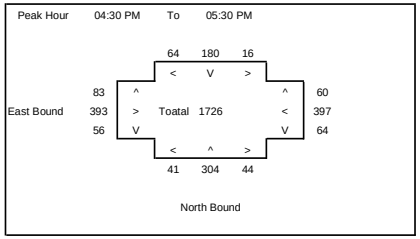
	COOKE From North				QUEEN From East				COOKE From South				QUEEN From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	22	36	4	2	11	111	30	3	17	116	1	2	15	64	8	7	435
03:45 PM	22	31	6	4	18	112	11	11	16	70	5	1	13	64	12	13	380
04:00 PM	19	54	8	15	13	82	25	4	11	90	5	2	20	77	14	16	418
04:15 PM	17	51	9	1	16	98	17	5	14	86	5	0	18	81	11	9	423
04:30 PM	18	54	7	7	18	109	13	0	7	61	11	0	12	75	20	5	405
04:45 PM	20	40	2	2	12	88	13	1	20	96	11	1	14	118	19	4	453
05:00 PM	14	47	4	10	20	87	16	8	5	73	9	3	15	92	20	8	402
05:15 PM	12	39	3	10	10	113	22	3	12	74	10	1	15	108	24	11	442
05:30 PM	25	44	7	2	15	80	11	3	12	65	7	0	15	120	28	14	429
05:45 PM	14	26	8	3	10	92	10	4	5	63	5	0	11	98	16	2	358
PHF		0.823				0.898				0.766				0.881			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	80	172	27	22	58	403	83	23	58	362	16	5	66	286	45	45	1656
03:45 PM	04:45 PM	76	190	30	27	65	401	66	20	48	307	26	3	63	297	57	43	1626
04:00 PM	05:00 PM	74	199	26	25	59	377	68	10	52	333	32	3	64	351	64	34	1699
04:15 PM	05:15 PM	69	192	22	20	66	382	59	14	46	316	36	4	59	366	70	26	1683
04:30 PM	05:30 PM	64	180	16	29	60	397	64	12	44	304	41	5	56	393	83	28	1702
04:45 PM	05:45 PM	71	170	16	24	57	368	62	15	49	308	37	5	59	438	91	37	1726
05:00 PM	Hour After	65	156	22	25	55	372	59	18	34	275	31	4	56	418	88	35	1631

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	64	180	16	29	60	397	64	12	44	304	41	5	56	393	83	28	1726



File Name: X:\2007\07-097\counts\merged data\PM\Cooke - Halekauwila.ppd
Start Date: 10/9/2007
Start Time: 3:15:00 PM
Site Code: 00000000
Comment 1: Cooke Street/Halekauwila Street
Comment 2: PM Peak Hour
Comment 3: 3:30 pm to 6:00 pm
Comment 4:

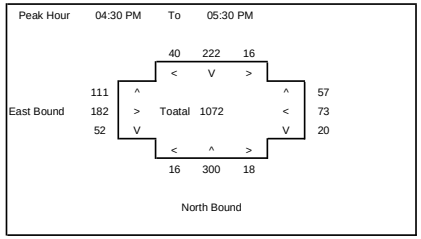
	COOKE From North				HALEKAUWILA From East				COOKE From South				HALEKAUWILA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	13	51	10	1	27	22	6	0	8	88	6	0	12	29	16	3	288
03:45 PM	13	47	3	4	19	21	7	7	6	68	10	6	16	24	14	7	248
04:00 PM	6	76	3	3	14	13	8	5	2	74	3	1	11	41	20	7	271
04:15 PM	13	59	10	4	16	14	11	2	4	70	14	1	11	29	32	4	283
04:30 PM	7	58	3	5	13	30	2	2	5	91	7	1	12	34	35	0	297
04:45 PM	13	56	3	3	8	14	6	2	3	81	1	1	12	41	22	3	260
05:00 PM	11	58	4	3	22	17	6	1	2	59	4	3	14	55	22	6	274
05:15 PM	9	50	6	4	14	12	6	1	8	69	4	1	14	52	32	7	276
05:30 PM	9	57	7	2	11	20	6	3	4	77	1	3	11	31	28	2	262
05:45 PM	5	42	4	5	7	11	4	4	10	62	5	3	8	22	15	0	195
PHF		0.952				0.833				0.811				0.88			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	45	233	26	12	76	70	32	14	20	300	33	8	50	123	82	21	1090
03:45 PM	04:45 PM	39	240	19	16	62	78	28	16	17	303	34	9	50	128	101	18	1099
04:00 PM	05:00 PM	39	249	19	15	51	71	27	11	14	316	25	4	46	145	109	14	1111
04:15 PM	05:15 PM	44	231	20	15	59	75	25	7	14	301	26	6	49	159	111	13	1114
04:30 PM	05:30 PM	40	222	16	15	57	73	20	6	18	300	16	6	52	182	111	16	1107
04:45 PM	05:45 PM	42	221	20	12	55	63	24	7	17	286	10	8	51	179	104	18	1072
05:00 PM	Hour After	34	207	21	14	54	60	22	9	24	267	14	10	47	160	97	15	1007

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	40	222	16	15	57	73	20	6	18	300	16	6	52	182	111	16	1072



File Name: X:\2007\07-097\counts\merged data\PM\Cooke - Pohukaina.ppd
Start Date: 11/27/2007
Start Time: 3:45:00 PM
Site Code: 00000000
Comment 1: Cooke Street/Pohukaina Street
Comment 2: PM Peak Hour
Comment 3:
Comment 4:

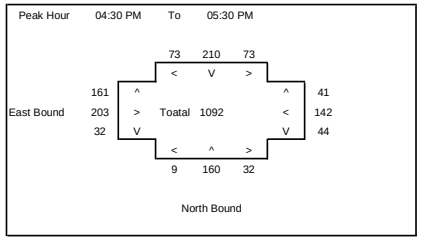
	COOKE From North				POHUKAINA From East				COOKE From South				POHUKAINA From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:45 PM	4	4	1	0	2	5	0	0	0	4	0	0	0	5	6	1	31
04:00 PM	17	57	13	0	14	50	9	2	4	39	5	6	12	39	47	3	306
04:15 PM	15	71	14	2	17	49	13	3	8	35	5	4	15	44	40	5	326
04:30 PM	9	60	15	2	12	45	13	5	5	43	0	2	5	58	52	6	317
04:45 PM	15	49	18	1	10	33	9	2	10	48	3	5	4	47	40	3	286
05:00 PM	32	49	17	1	9	30	17	0	11	41	4	4	15	51	34	1	310
05:15 PM	17	52	23	4	10	34	5	5	6	28	2	2	8	47	35	1	267
05:30 PM	15	32	13	3	6	31	10	5	11	34	2	1	6	38	31	3	229
05:45 PM	16	31	16	3	15	32	5	2	2	44	4	5	3	24	33	5	225
PHF		0.908				0.811				0.824				0.861			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:45 PM	04:45 PM	45	192	43	4	45	149	35	10	17	121	10	12	32	146	145	15	980
04:00 PM	05:00 PM	56	237	60	5	53	177	44	12	27	165	13	17	36	188	179	17	1235
04:15 PM	05:15 PM	71	229	64	6	48	157	52	10	34	167	12	15	39	200	166	15	1239
04:30 PM	05:30 PM	73	210	73	8	41	142	44	12	32	160	9	13	32	203	161	11	1180
04:45 PM	05:45 PM	79	182	71	9	35	128	41	12	38	151	11	12	33	183	140	8	1092
05:00 PM	Hour After	80	164	69	11	40	127	37	12	30	147	12	12	32	160	133	10	1031

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	73	210	73	8	41	142	44	12	32	160	9	13	32	203	161	11	1092



File Name: X:\2007\07-097\counts\merged data\PM\Cooke - Auahi.ppd
Start Date: 10/9/2007
Start Time: 3:15:00 PM
Site Code: 00000000
Comment 1: Cooke Street/Auahi Street
Comment 2: PM Peak Hour
Comment 3: 3:15 pm to 6:00 pm
Comment 4:

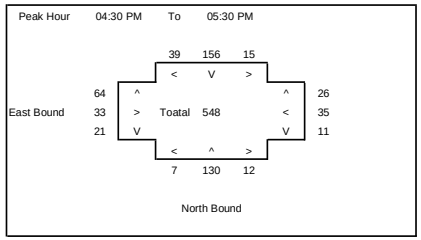
	COOKE From North				AUAHI From East				COOKE From South				AUAHI From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	19	32	8	4	5	8	2	0	3	34	5	0	10	7	20	0	153
03:45 PM	10	28	10	2	12	2	2	0	2	29	2	0	3	6	26	0	132
04:00 PM	14	46	6	2	5	11	6	2	6	28	1	1	2	10	23	4	158
04:15 PM	14	39	15	0	7	10	2	2	2	29	2	0	6	8	16	12	150
04:30 PM	7	34	5	4	5	5	2	2	4	30	2	2	5	6	26	1	131
04:45 PM	12	35	4	2	5	12	4	2	4	41	1	1	4	6	14	0	142
05:00 PM	9	45	5	1	7	7	3	0	3	35	3	1	6	11	12	3	146
05:15 PM	11	42	1	3	9	11	2	2	1	24	1	0	6	10	12	6	130
05:30 PM	10	37	3	2	7	3	2	1	3	31	3	0	3	5	23	6	130
05:45 PM	7	29	0	0	1	4	0	2	1	39	4	0	4	13	15	7	117
PHF		0.89				0.818				0.81				0.797			

Hourly Totals

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
03:30 PM	04:30 PM	57	145	39	8	29	31	12	4	13	120	10	1	21	31	85	16	593
03:45 PM	04:45 PM	45	147	36	8	29	28	12	6	14	116	7	3	16	30	91	17	571
04:00 PM	05:00 PM	47	154	30	8	22	38	14	8	16	128	6	4	17	30	79	17	581
04:15 PM	05:15 PM	42	153	29	7	24	34	11	6	13	135	8	4	21	31	68	16	569
04:30 PM	05:30 PM	39	156	15	10	26	35	11	6	12	130	7	4	21	33	64	10	549
04:45 PM	05:45 PM	42	159	13	8	28	33	11	5	11	131	8	2	19	32	61	15	548
05:00 PM	Hour After	37	153	9	6	24	25	7	5	8	129	11	1	19	39	62	22	523

Peak Hour Trip Volumes (Set at 4:30 PM to 5:30 PM)

Start Time		From North				From East				From South				From West				
From	To	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Total
04:30 PM	05:30 PM	39	156	15	10	26	35	11	6	12	130	7	4	21	33	64	10	548



Appendix B

Signal Timing Worksheets

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

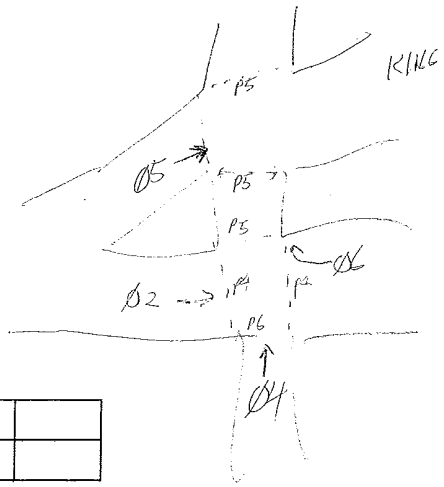
INTERSECTION: KAPIOLANI/SOUTH/KING

PHASING INFORMATION

Phase	2	4	5	6				
Ped Walk	7	7	12	7				
Ped FDW	15	15	14	15				
Min Green	5	5	5	5				
Veh Ext Max Gap Min Gap	1 1	1 1	1 1	2 1				
Max Limit	40	45	45	35				
Yellow All Red	4 2	4 2	4 2	4 2				

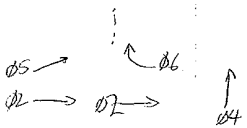
CYCLE INFORMATION

	AM PLAN 2	PM PLAN 3	SAT PLAN
Cycle Length	120	120	
Force Off 1			
Force Off 2	0	0	
Force Off 3			
Force Off 4	41	41	
Force Off 5	89	89	
Force Off 6	0	0	
Force Off 7			
Force Off 8			
Offset	0	0	



Phasing Diagram

Ø2 →	→	Ø4 ↑		
Ø5 ↗	Ø6 ↑			



APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

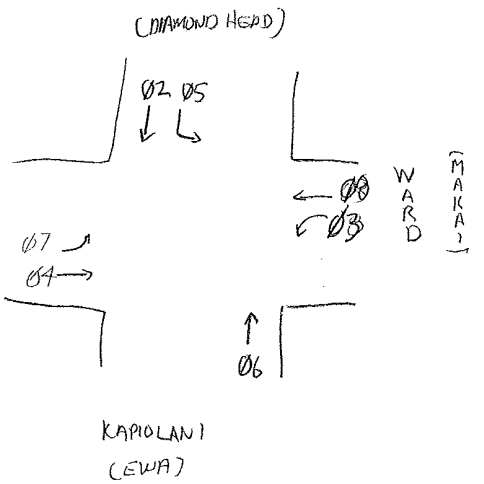
INTERSECTION: KAPIOLANI/WARD

PHASING INFORMATION

Phase	2	3	4	5	6	7	8	
Ped Walk	7		7		7		7	
Ped FDW	17		17		17		17	
Min Green	20	5	5	5	20	5	5	
Veh Ext Max Gap Min Gap	5 1	1 1	2 1	2 1	5 1	1 1	2 1	
Max Limit	35	20	35	25	35	20	35	
Yellow All Red	4 2	4 1	4 1	4 1	4 2	4 1	4 1	

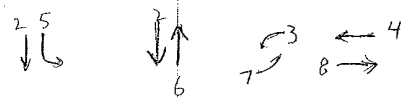
CYCLE INFORMATION

	AM PLAN	PM PLAN	SAT PLAN
Cycle Length	Free	Free	
Force Off 1			
Force Off 2			
Force Off 3			
Force Off 4			
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset			



Phasing Diagram

2 ↓	2 ↓	3 ↙	4 →	
5 ↳	6 ↑ ↓	7 ↗	8 ←	



APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

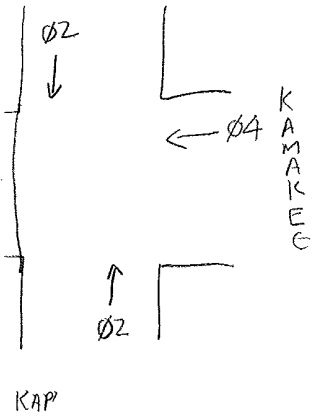
INTERSECTION: KAPIOLANI KAMAKEE

PHASING INFORMATION

Phase	2	4						
Ped Walk	7	7						
Ped FDW	10	17						
Min Green	20	3						
Veh Ext Max Gap Min Gap	5 | |	3 | ↓						
Max Limit	40	30						
Yellow All Red	4 1	4 1						

CYCLE INFORMATION

	AM PLAN 2	PM PLAN 3	SAT PLAN
Cycle Length	120	120	
Force Off 1			
Force Off 2	0	0	
Force Off 3			
Force Off 4	35	35	
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset	80	35	



Phasing Diagram

2 ↓↑↓	4 ←			

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

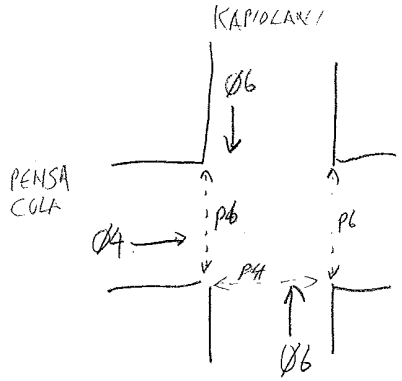
INTERSECTION: KAPIOLANI PENSACOLA

PHASING INFORMATION

Phase	4	6						
Ped Walk	7	7						
Ped FDW	17	17						
Min Green	5	20						
Veh Ext Max Gap Min Gap	2 |	5 |						
Max Limit	40	40						
Yellow All Red	4 1	4 1						

CYCLE INFORMATION

	AM PLAN 2	PM PLAN 3	SAT PLAN
Cycle Length	120	120	
Force Off 1			
Force Off 2			
Force Off 3			
Force Off 4	35	35	
Force Off 5			
Force Off 6	0	0	
Force Off 7			
Force Off 8			
Offset	65	52	



Phasing Diagram

4 →				
	6 ↓↑			

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

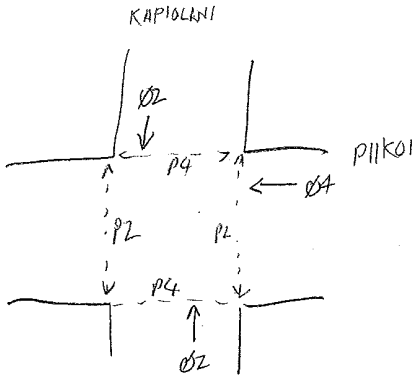
INTERSECTION: KAPIOLANI PIIKOI

PHASING INFORMATION

Phase	2	4						
Ped Walk	7	7						
Ped FDW	20	15						
Min Green	20	3						
Veh Ext Max Gap Min Gap	5 ↓	2 ↓						
Max Limit	40	45						
Yellow All Red	4 1	4 1						

CYCLE INFORMATION

	AM PLAN	PM PLAN	SAT PLAN
Cycle Length	120	120	
Force Off 1			
Force Off 2	0	0	
Force Off 3			
Force Off 4	32	45	
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset	55	62	



Phasing Diagram

2 ↓↑	←4			

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

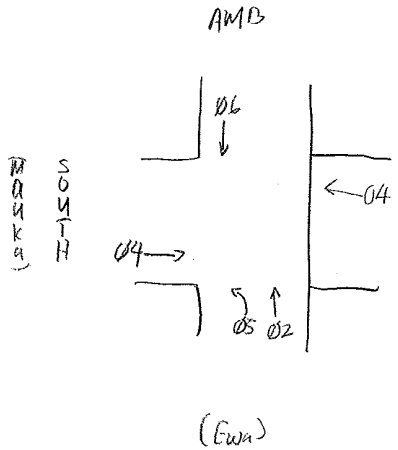
INTERSECTION: ALA MOANA SOUTH

PHASING INFORMATION

Phase	2	4	5	6				
Ped Walk	7	7		7				
Ped FDW	17	21		17				
Min Green	20	5	3	20				
Veh Ext Max Gap Min Gap	5 ↓	4 ↓	3 ↓	5 ↓				
Max Limit	40	25	15	40				
Yellow All Red	4 2	4 1	4 1	4 2				

CYCLE INFORMATION

	AM PLAN	PM PLAN	SAT PLAN
Cycle Length	140	140	
Force Off 1			
Force Off 2	0	0	
Force Off 3			
Force Off 4	34	34	
Force Off 5	54	54	
Force Off 6	0	0	
Force Off 7			
Force Off 8			
Offset	10	10	



Phasing Diagram

	Ø2	Ø4 ←		
Ø5 ↰	Ø6 ↓			

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

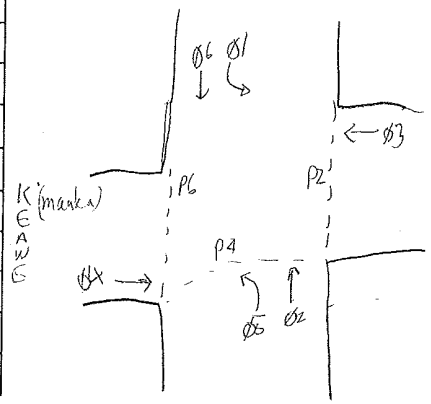
INTERSECTION: ALA MOANA KEAWE

PHASING INFORMATION

Phase	1	2	3	4	5	6		
Ped Walk		7		7		7		
Ped FDW		12 10		19 14		10		
Min Green	3	20	3	3	3	20		
Veh Ext Max Gap Min Gap	2 1	5 1	2 1	2 1	2 1	5 1		
Max Limit	15	40	22	15	15	40		
Yellow All Red	4 1	4 2	4 1	4 1	4 1	4 2		

CYCLE INFORMATION

	AM PLAN 1	PM PLAN 4	SAT PLAN
Cycle Length	140	140	
Force Off 1	72	72	
Force Off 2	0	0	
Force Off 3	52	52	
Force Off 4	27	27	
Force Off 5	72	72	
Force Off 6	0	0	
Force Off 7			
Force Off 8			
Offset	10	10	



Phasing Diagram

1 ↳	2 ↑	4 →	3 ←	
5 ↰	6 ↓			

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

INTERSECTION: ALA MOANA CORAL

PHASING INFORMATION

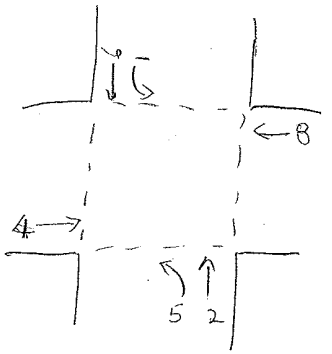
Phase	1	2	4	5	6	8		
Ped Walk		7	10		7	7		
Ped FDW		10 16	11 20		10 13	15		
Min Green	3	20	5	3	20	5		
Veh Ext Max Gap Min Gap	2 1	5 1	2 1	2 1	5 1	3 1		
Max Limit	12	40	25	12	40	30		
Yellow All Red	4 1	4 2	4 1	4 1	4 2	4 1		

CYCLE INFORMATION

	AM PLAN	PM PLAN 4	SAT PLAN
Cycle Length	140	140	
Force Off 1	54	54	
Force Off 2	0	0	
Force Off 3			
Force Off 4	34	34	
Force Off 5	54	54	
Force Off 6	0	0	
Force Off 7	55	55	
Force Off 8			
Offset	10	10	

CORAL (makai)

AM B



Phasing Diagram

1 ↳	2 ↑	4 →		
5 ↰	6 ↓	← 8		

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

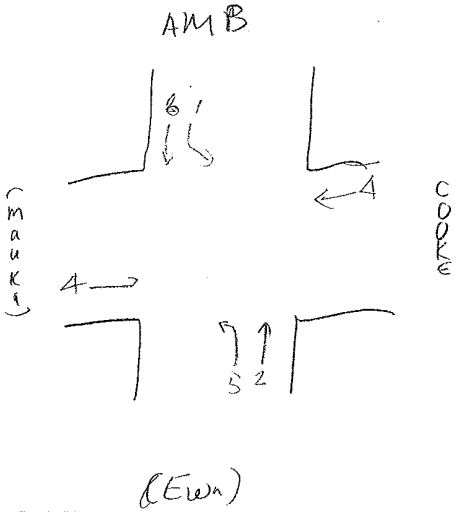
INTERSECTION: ALA MOANA COOKE

PHASING INFORMATION

Phase	1	2	4	5	6			
Ped Walk		7	7		7			
Ped FDW		10	14 (5 18)		10			
Min Green	3	20	5	3	20			
Veh Ext Max Gap Min Gap	2 1	5 1	4 1	2 1	5 1			
Max Limit	10	40	25	15	40			
Yellow All Red	4 1	4 2	4 1	4 1	4 2			

CYCLE INFORMATION

	AM PLAN	PM PLAN	SAT PLAN
Cycle Length	140	140	
Force Off 1	54	54	
Force Off 2	0	0	
Force Off 3			
Force Off 4	34	34	
Force Off 5	54	54	
Force Off 6	0	0	
Force Off 7			
Force Off 8			
Offset	10	10	



Phasing Diagram

1 ↳	↑ 2	4 ⟷		
5 ↰	↓ 6			

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

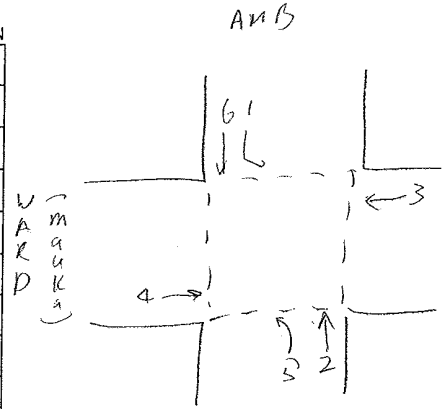
INTERSECTION: ALA MOANA WARD

PHASING INFORMATION

Phase	1	2	3	4	5	6		
Ped Walk		7	7	7		7		
Ped FDW		16	19	14		16		
Min Green	3	20	3	3	3	20		
Veh Ext Max Gap Min Gap	2 1	5 1	2 1	2 1	2 3 2	5 1		
Max Limit	15	40	15	25	25	40		
Yellow All Red	4 1	4 2	4 1	4 1	4 1	4 2		

CYCLE INFORMATION

	AM PLAN	PM PLAN	SAT PLAN
Cycle Length	140	140	
Force Off 1	78	78	
Force Off 2	0	0	
Force Off 3	32	32	
Force Off 4	58	58	
Force Off 5	88	78	
Force Off 6	0	0	
Force Off 7			
Force Off 8			
Offset	6	6	



Phasing Diagram

1 ↳	2 ↑	⟵ 3	4 ⟶	
5 ↰	6 ↓			

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

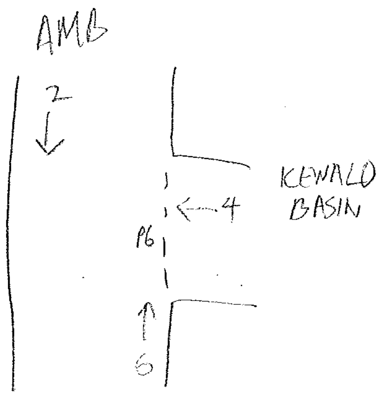
INTERSECTION: ALA MOANA KEWALO BASIN

PHASING INFORMATION

Phase	2	4	6					
Ped Walk			7					
Ped FDW			19					
Min Green	20	5	20					
Veh Ext Max Gap Min Gap	5 1	3 1	5 1					
Max Limit	40	30	40					
Yellow All Red	4 2	4 1	4 2					

CYCLE INFORMATION

	AM PLAN 1	PM PLAN 4	SAT PLAN
Cycle Length	140	140	
Force Off 1			
Force Off 2	0	0	
Force Off 3			
Force Off 4	32	32	
Force Off 5			
Force Off 6	0	0	
Force Off 7			
Force Off 8			
Offset			



Phasing Diagram

2 ↓	← 4			
6 ↑				

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

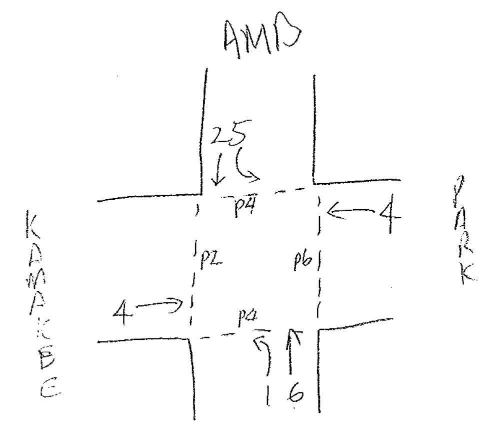
INTERSECTION: ALA MOANA PARK/KAMAKEE

PHASING INFORMATION

Phase	1	2	4	5	6			
Ped Walk		7	7		7			
Ped FDW		19	ф 24 19		19 ф 22			
Min Green	5	20	5	5	20			
Veh Ext Max Gap Min Gap	2 1	5 1	2 1	2 1	5 1			
Max Limit	30	40	30	30	40			
Yellow All Red	4 1	4 2	4 1	4 1	4 2			

CYCLE INFORMATION

	AM PLAN 1	PM PLAN 4	SAT PLAN
Cycle Length	140	140	
Force Off 1	67	67	
Force Off 2	0	0	
Force Off 3			
Force Off 4	32	32	
Force Off 5	67	67	
Force Off 6	0	0	
Force Off 7			
Force Off 8			
Offset	125	125	



Phasing Diagram

1 ↰	2 ↓	4 ⇆		
5 ↳	6 ↑			

PROT.

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

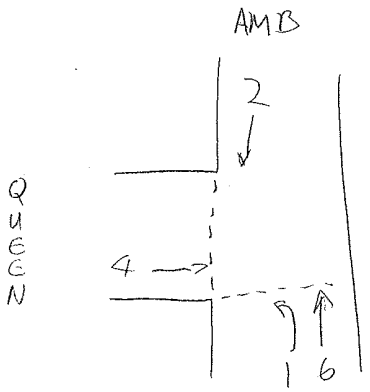
INTERSECTION: ALA MOANA QUEEN

PHASING INFORMATION

Phase	1	2	4	6				
Ped Walk		7	7					
Ped FDW		26	23					
Min Green	5	20	5	20				
Veh Ext Max Gap Min Gap	2 1	3 1	3 1	3 1				
Max Limit	20	40	30	40				
Yellow All Red	4 1	4 2	4 1	4 2				

CYCLE INFORMATION

	AM PLAN 1	PM PLAN 4	SAT PLAN
Cycle Length	140	140	
Force Off 1	61	61	
Force Off 2	0	0	
Force Off 3			
Force Off 4	36	36	
Force Off 5			
Force Off 6	0	0	
Force Off 7			
Force Off 8			
Offset	96	96	



Phasing Diagram PROT

1 ↖	2 ↓	4 →		
6 ↑	6 ↑			

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

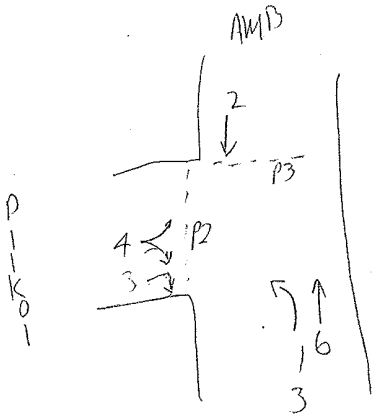
INTERSECTION: ALA MOANA PIIKOI

PHASING INFORMATION

Phase	1	2	3	4	6			
Ped Walk		7	7					
Ped FDW		31	23					
Min Green	5	20	7	3	20			
Veh Ext Max Gap Min Gap	3 1	5 1	2 1	2 1	5 1			
Max Limit	30	40	25	30	40			
Yellow All Red	4 2	4 2	4 2	4 2	4 2			

CYCLE INFORMATION

	AM PLAN 1	PM PLAN 4	SAT PLAN
Cycle Length	140	140	
Force Off 1	67	67	
Force Off 2	0	0	
Force Off 3	67	67	
Force Off 4	31	31	
Force Off 5			
Force Off 6	0	0	
Force Off 7			
Force Off 8			
Offset	70	70	



Phasing Diagram PROT

1 ↖	2 ↓	4 ↙	3 ↰	
6 ↑	6 ↑			

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

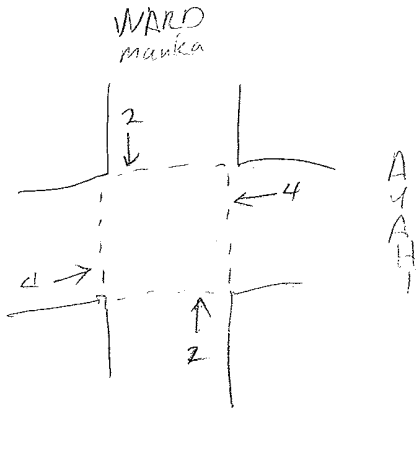
INTERSECTION: WARD AUAHI

PHASING INFORMATION

Phase	2	4						
Ped Walk	7	7						
Ped FDW	14	15						
Min Green	20	3						
Veh Ext Max Gap Min Gap	5 1	2 1						
Max Limit	60	40						
Yellow All Red	4 1	4 1						

CYCLE INFORMATION

	AM PLAN 1	PM PLAN 4	SAT PLAN
Cycle Length	90	90	
Force Off 1			
Force Off 2	0	0	
Force Off 3			
Force Off 4	37	37	
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset	44	44	



Phasing Diagram

2	4			

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

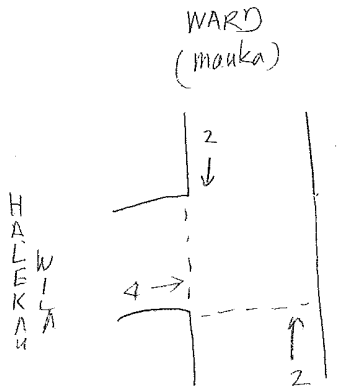
INTERSECTION: WARD HALEKAUWILA

PHASING INFORMATION

Phase	2	4						
Ped Walk	7	7						
Ped FDW	21	22						
Min Green	10	10						
Veh Ext Max Gap Min Gap	5 1	3 2 3						
Max Limit	40	40						
Yellow All Red	4 2	4 2						

CYCLE INFORMATION

	AM PLAN 1	PM PLAN 4	SAT PLAN
Cycle Length	90	90	
Force Off 1			
Force Off 2	0	0	
Force Off 3			
Force Off 4	40	40	
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset	16	16	



Phasing Diagram

2	4			

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

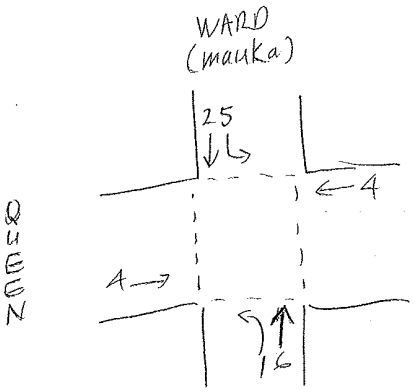
INTERSECTION: WARD QUEEN

PHASING INFORMATION

Phase	1	2	4	5	6			
Ped Walk		7	7		7			
Ped FDW		21	22		21			
Min Green	5	10	10	5	10			
Veh Ext Max Gap Min Gap	2 1	5 1	3 1	2 1	5 1			
Max Limit	20	60	40	20	60			
Yellow All Red	4 1	4 2	4 2	4 1	4 2			

CYCLE INFORMATION

	AM PLAN 1	PM PLAN 4	SAT PLAN
Cycle Length	90	90	
Force Off 1	51	51	
Force Off 2	0	0	
Force Off 3			
Force Off 4	35	35	
Force Off 5	51	51	
Force Off 6	0	0	
Force Off 7			
Force Off 8			
Offset	0	0	



Phasing Diagram

1 ↑	2 ↓	4 ⇐⇒		
5 ↘	6 ↑			

protected only

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

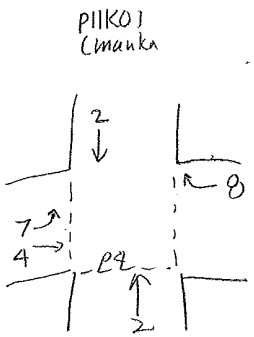
INTERSECTION: PIIKOI WAIMANU

PHASING INFORMATION

Phase	2	4	prot-perm 7	8				
Ped Walk	7	7						
Ped FDW	18	21						
Min Green	20	10	5	10				
Veh Ext Max Gap Min Gap	3 1	3 1	2 1	3 1				
Max Limit	60	45	10	30				
Yellow All Red	4 1	4 1	4 1	4 1				

CYCLE INFORMATION

	AM PLAN 2	PM PLAN 3	SAT PLAN
Cycle Length	120	120	
Force Off 1			
Force Off 2	0	0	
Force Off 3	--		
Force Off 4	33	45	
Force Off 5			
Force Off 6			
Force Off 7	15	15	
Force Off 8	33	45	
Offset	28	40	



Phasing Diagram

2 ↓ ↑	4 →	→		
	7 ↗	8 ←		

Prot/Perm

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

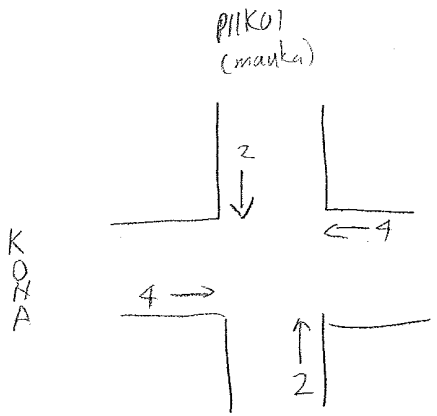
INTERSECTION: PIIKOI KONA

PHASING INFORMATION

Phase	2	4						
Ped Walk	7	7						
Ped FDW	18	16						
Min Green	15	5						
Veh Ext Max Gap Min Gap	5 1	3 1						
Max Limit	40	30						
Yellow All Red	4 1	4 1						

CYCLE INFORMATION

	AM PLAN[2]	PM PLAN[3]	SAT PLAN
Cycle Length	120	120	
Force Off 1			
Force Off 2	0	0	
Force Off 3			
Force Off 4	30	30	
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset	28	35	



Phasing Diagram

2 ↓ ↑	4 ← →			

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

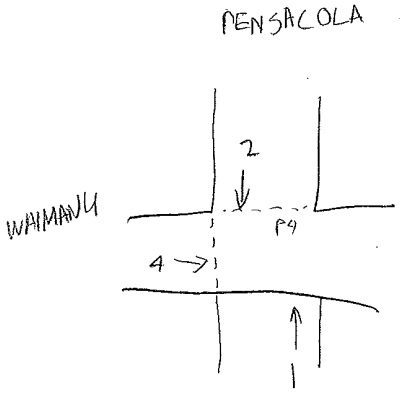
INTERSECTION: PENSACOLA WAIMANU

PHASING INFORMATION

Phase	1	2	4					
Ped Walk		7	7					
Ped FDW		20	15					
Min Green	5	20	5					
Veh Ext Max Gap Min Gap	2 1	3 1	3 1					
Max Limit	20	60	30					
Yellow All Red	4 1	4 1	4 1					

CYCLE INFORMATION

	AM PLAN	PM PLAN	SAT PLAN
Cycle Length	Free	Free	
Force Off 1			
Force Off 2			
Force Off 3			
Force Off 4			
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset			



Phasing Diagram

1 ↑	2 ↓	4 →		

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

INTERSECTION: KAMAKEE AUAHI

PHASING INFORMATION

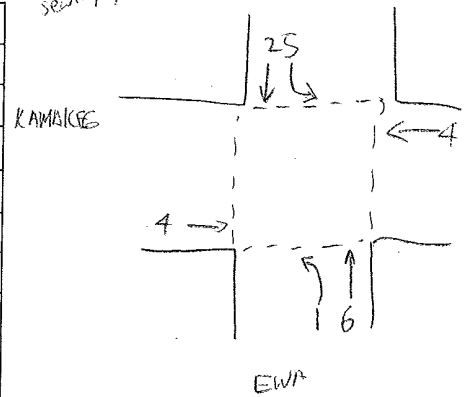
Phase	1	2	4	5	6			
Ped Walk		7	10		7			
Ped FDW		12	12		12			
Min Green	5	10	8	5	10			
Veh Ext Max Gap Min Gap	2 1	4 1	3 1	2 1	4 1			
Max Limit	20	40	30 20	20	40			
Yellow All Red	4 1	4 2	4 1	4 1	4 2			

2 2407 due to sewer project

QUEEN

CYCLE INFORMATION

	AM PLAN	PM PLAN	SAT PLAN
Cycle Length	Free	Free	
Force Off 1			
Force Off 2			
Force Off 3			
Force Off 4			
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset			



Phasing Diagram

1 ↰	2 ↓	4 ⇆			
5 ↳	6 ↑				

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

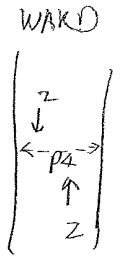
INTERSECTION: AUAHI PED XING (WARD ENT. CNTR.) & PED XING (FARMERS MKT) ← both same

PHASING INFORMATION

Phase	2	4						
Ped Walk		10						
Ped FDW		15						
Min Green	20							
Veh Ext Max Gap Min Gap	3 1							
Max Limit	40							
Yellow All Red	4 1	1 1						

CYCLE INFORMATION

	AM PLAN	PM PLAN	SAT PLAN
Cycle Length	Free	Free	
Force Off 1			
Force Off 2			
Force Off 3			
Force Off 4			
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset			



Phasing Diagram

2 ↓↑	4 ←→			

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

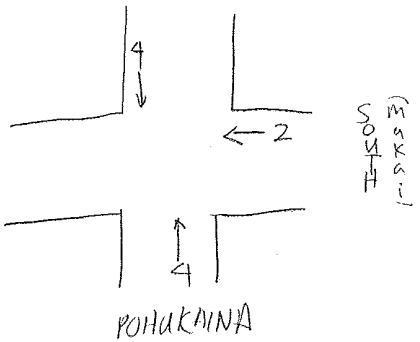
INTERSECTION: SOUTH — POHUKAINA

PHASING INFORMATION

Phase	2	4						
Ped Walk	10	10						
Ped FDW	12	13						
Min Green	15	8						
Veh Ext Max Gap Min Gap	4 1	3 1						
Max Limit	50	40						
Yellow All Red	4 2	4 2						

CYCLE INFORMATION

	AM PLAN	PM PLAN	SAT PLAN
Cycle Length	Free	Free	
Force Off 1			
Force Off 2			
Force Off 3			
Force Off 4			
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset			



Phasing Diagram

2	4			

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

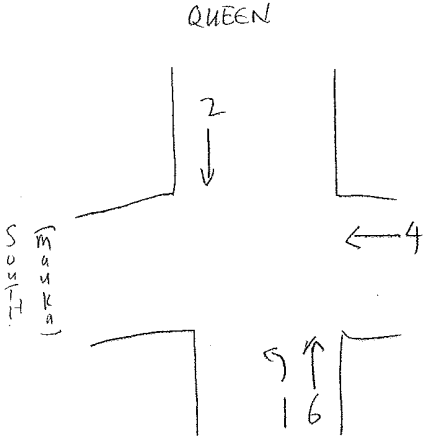
INTERSECTION: SOUTH — QUEEN

PHASING INFORMATION

Phase	1	2	4	6				
Ped Walk		7	7	7				
Ped FDW		10	16	10				
Min Green	3	3	5	3				
Veh Ext Max Gap Min Gap	3 1	3 1	3 1	3 1				
Max Limit	15	40	30	25				
Yellow All Red	4 1	4 1	4 1	4 1				

CYCLE INFORMATION

	AM PLAN	PM PLAN	SAT PLAN
Cycle Length	Free	Free	
Force Off 1			
Force Off 2			
Force Off 3			
Force Off 4			
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset			



Phasing Diagram Prot/Perm

2 ↓	1 ↱	4 ←		
6 ↑	6 ↑			

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

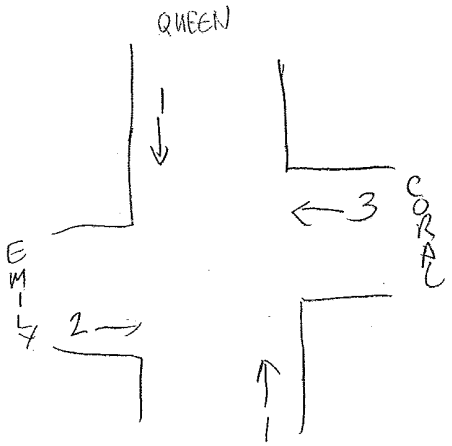
INTERSECTION: QUEEN EMILY

PHASING INFORMATION

Phase	1	2	3					
Ped Walk	10	10	10					
Ped FDW	13	13	13					
Min Green	10	8	8					
Veh Ext Max Gap Min Gap	4 1	3 1	2 1					
Max Limit	40	25	25					
Yellow All Red	5 2	4 1	4 1					

CYCLE INFORMATION

	AM PLAN	PM PLAN	SAT PLAN
Cycle Length	Free	Free	
Force Off 1			
Force Off 2			
Force Off 3			
Force Off 4			
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset			



Phasing Diagram

1 ↓ ↑	2 →	3 ←		

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

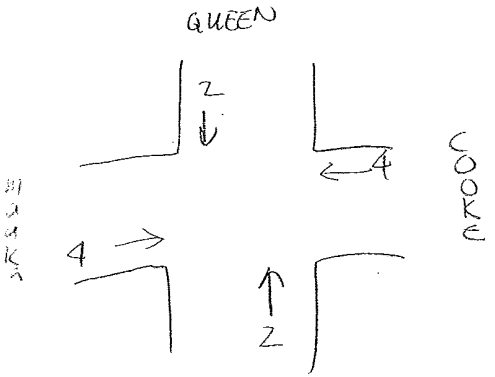
INTERSECTION: COOKE QUEEN

PHASING INFORMATION

Phase	2	4						
Ped Walk	7	7						
Ped FDW	10	10						
Min Green	10	5						
Veh Ext Max Gap Min Gap	5 1	3 1						
Max Limit	30	30						
Yellow All Red	4 2	4 2						

CYCLE INFORMATION

	AM PLAN	PM PLAN	SAT PLAN
Cycle Length	Free	Free	
Force Off 1			
Force Off 2			
Force Off 3			
Force Off 4			
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset			



Phasing Diagram

2 ↓ ↑	4 ← →			

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

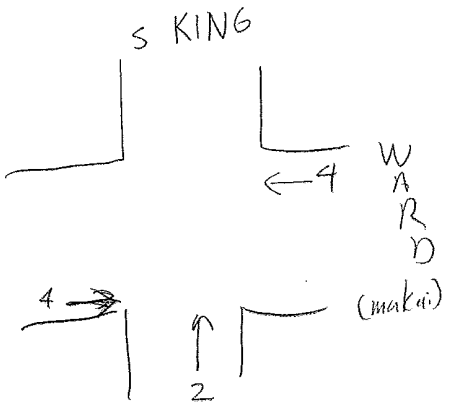
INTERSECTION: S KING WARD

PHASING INFORMATION

Phase	2	4						
Ped Walk	7	7						
Ped FDW	15	15						
Min Green	20	5						
Veh Ext Max Gap Min Gap	3 1	3 1						
Max Limit	40	40						
Yellow All Red	4 1	4 1						

CYCLE INFORMATION

	AM PLAN 1	PM PLAN 3	SAT PLAN
Cycle Length	80	80	
Force Off 1			
Force Off 2	0	0	
Force Off 3			
Force Off 4	40	35	
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset	65	30	



Phasing Diagram

2 ↑	4 ← →			

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

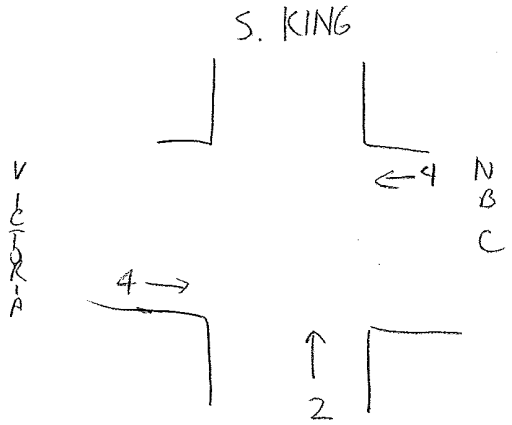
INTERSECTION: S KING VICTORIA

PHASING INFORMATION

Phase	2	4						
Ped Walk	7	7						
Ped FDW	12	16						
Min Green	5	5						
Veh Ext Max Gap Min Gap	3 1	3 1						
Max Limit	45	35						
Yellow All Red	4 1	4 1						

CYCLE INFORMATION

	AM PLAN 2	PM PLAN 3	SAT PLAN
Cycle Length	80	80	
Force Off 1			
Force Off 2	0	0	
Force Off 3	30	30	
Force Off 4			
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset	73	38	



Phasing Diagram

2 ↑	4 ← →			

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

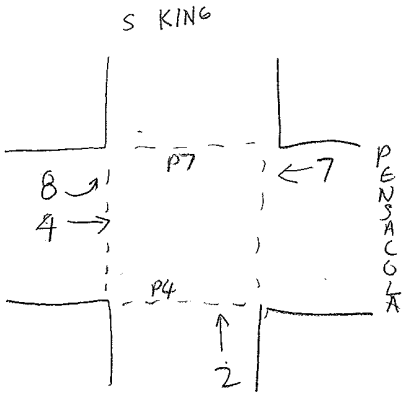
INTERSECTION: S KING PENSACOLA

PHASING INFORMATION

Phase	2	4	7	8				
Ped Walk	7	7	7					
Ped FDW	17	14	15					
Min Green	20	3	3	3				
Veh Ext Max Gap Min Gap	5 1	2 1	5 1	2 1				
Max Limit	40	30	20	30				
Yellow All Red	4 1	4 1	3 0	4 1				

CYCLE INFORMATION

	AM PLAN 2	PM PLAN 3	SAT PLAN
Cycle Length	80	80	
Force Off 1			
Force Off 2	0	0	
Force Off 3			
Force Off 4	45	40	
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset	28	28	



Phasing Diagram

2	4 →	4 →		
	7 ←→	8 ↷		

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

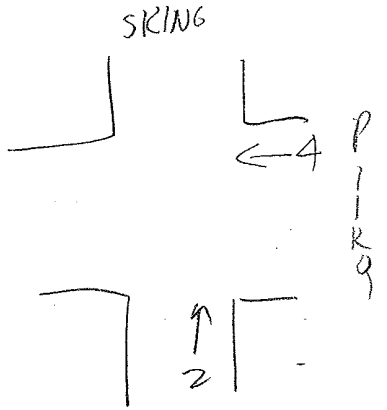
INTERSECTION: S KING PIKOI

PHASING INFORMATION

Phase	2	4						
Ped Walk	7	7						
Ped FDW	18	14						
Min Green	20	5						
Veh Ext Max Gap Min Gap	5 1	3 1						
Max Limit	45	35						
Yellow All Red	4 1	4 1						

CYCLE INFORMATION

	AM PLAN 2	PM PLAN 3	SAT PLAN
Cycle Length	80	80	
Force Off 1			
Force Off 2	0	0	
Force Off 3			
Force Off 4	40	35	
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset	42	42	



Phasing Diagram

2 ↑	4 ←			

TO: KEITH
3 sheets

RECEIVED
NOV 19 2007

JUSTIN, TSUTSUMI & ASSOC...
Honolulu, Hawaii 96817-5031

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

INTERSECTION: PIIKOI AMC/HAWAIKI

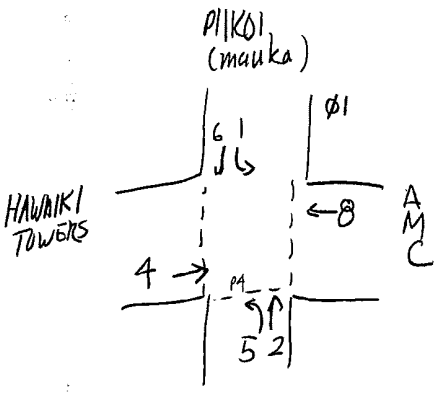
PHASING INFORMATION

Phase	1	2	4	5	6	8		
Ped Walk		7	8		7			
Ped FDW		15	22		15			
Min Green	5	20	5	5	20	5		
Veh Ext Max Gap Min Gap	2 1	3 1	3 1	2 1	3 1	3 1		
Max Limit	30	60	30	30	60	30		
Yellow All Red	4 1	4 1	4 1	4 1	4 1	4 1		

no ped recall

CYCLE INFORMATION

	AM PLAN	PM PLAN	SAT PLAN
Cycle Length	Free	Free	
Force Off 1			
Force Off 2			
Force Off 3			
Force Off 4			
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset			



Phasing Diagram

1 ↳	2 ↑	4 →		
5 ↰	6 ↓	8 ←		

PROTECTED ONLY

APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

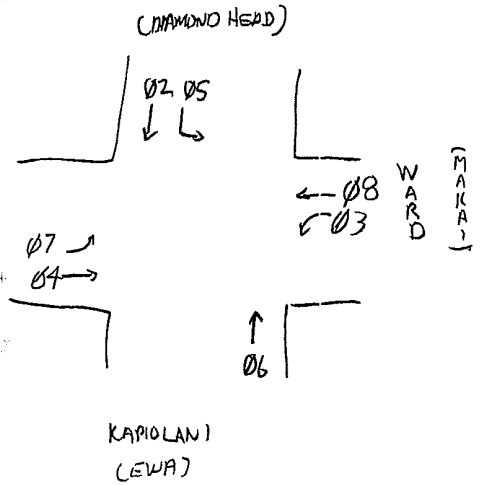
INTERSECTION: KAPIOLANI / WARD

PHASING INFORMATION

Phase	2	3	4	5	6	7	8	
Ped Walk	7		7		7		7	
Ped FDW	22		23		22		23	
Min Green	20	5	5	5	20	5	5	
Veh Ext Max Gap Min Gap	5 1	1 ↓	2 1	2 1	5 1	1 ↓	2 1	
Max Limit	35	20	35	25	35	20	35	
Yellow All Red	4 2	4 1	4 1	4 1	4 2	4 1	4 1	

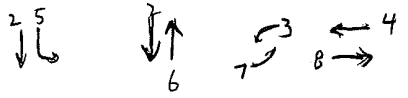
CYCLE INFORMATION

	AM PLAN	PM PLAN	SAT PLAN
Cycle Length	Free	Free	
Force Off 1			
Force Off 2			
Force Off 3			
Force Off 4			
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset			



Phasing Diagram

2 ↓	5 ↓	3 ↶	4 →	
5 ↳	6 ↑ ↕	7 ↷	8 ←	



APPENDED SIGNAL TIMING PLANS FOR CONSULTANTS

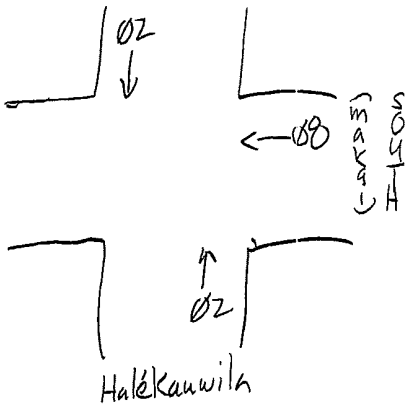
INTERSECTION: SOUTH HALEKAUWILA

PHASING INFORMATION

Phase	2	8						
Ped Walk	7	7						
Ped FDW	17	14						
Min Green	10	10						
Veh Ext Max Gap Min Gap	3 1 1	5 1 1						
Max Limit	35	35						
Yellow All Red	4 1	4 1						

CYCLE INFORMATION

	AM PLAN	PM PLAN	SAT PLAN
Cycle Length	Free	Free	
Force Off 1			
Force Off 2			
Force Off 3			
Force Off 4			
Force Off 5			
Force Off 6			
Force Off 7			
Force Off 8			
Offset			



Phasing Diagram

2 ↓↑	8 ←			

Appendix C

Trip Generation

TAZ	Land Use (70%)			
	DU (units)	Retail (sf)	Office (sf)	Industrial (sf)
198	0	5,985	13,965	0
199	0	12,915	30,135	0
200	363	15,189	35,442	0
201	1,106	87,780	204,820	0
202	89	13,065	30,486	240
203	229	339,976	38,955	482
204	1,018	205,283	225,793	13,809
205	1,106	380,257	1,531,208	1,404
206	114	58,148	785,088	2,653
211	2,717	62,084	296,701	467,565
212	1,194	50,400	117,600	1,426
213	1,160	24,731	57,705	910,743
214	1,807	19,525	45,559	0
215	285	15,133	35,310	449
216	660	25,851	60,319	93
217	197	28,037	253,114	5,011
218	218	5,499	132,938	0
219	142	14,070	376,754	0
229	0	15,645	330,378	0
230	155	15,750	36,750	0
231	17	1,428	3,331	0
232	102	8,610	155,971	0
233	22	11,892	27,748	3,492
Other	0	6,662	15,544	0
TOTAL	**12,700**	**1,423,915**	**4,841,614**	**1,407,365**

TAZ	Trip Generation (PERSON TRIPS)																										
	Residential							Retail							Office							Industrial						
	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total
198	0	0	0	0	0	0	0	265	6	4	10	16	20	36	293	34	5	39	4	17	21	0	0	0	0	0	0	0
199	0	0	0	0	0	0	0	572	9	5	14	23	29	52	530	63	9	72	8	37	45	0	0	0	0	0	0	0
200	1,920	25	120	145	116	57	173	673	10	6	16	26	32	58	600	72	10	82	9	44	53	0	0	0	0	0	0	0
201	4,950	60	293	353	289	142	431	3,890	39	25	64	102	130	232	2,317	293	40	333	52	253	305	0	0	0	0	0	0	0
202	581	8	39	47	37	18	55	579	9	6	15	23	30	53	534	64	9	73	8	37	45	2	0	0	0	0	0	0
203	1,298	17	83	100	80	39	119	15,068	140	90	230	368	469	837	646	77	11	88	10	48	58	3	0	0	0	0	0	0
204	4,614	56	274	330	270	133	403	9,098	86	55	141	226	288	514	2,498	317	43	360	57	279	336	96	11	2	13	2	12	14
205	4,950	60	293	353	289	142	431	16,853	157	100	257	411	523	934	10,906	1,464	200	1,664	388	1,893	2,281	10	1	0	1	0	1	1
206	715			57			67	2,577	27	17	44	71	90	161	6,520	858	117	975	199	971	1,170	18	2	0	2	0	3	3
211	10,627	123	602	725	604	297	901	2,752	29	18	47	75	95	170	3,082	394	54	448	75	367	442	3,259	378	52	430	55	403	458
212	5,283	64	311	375	308	151	459	2,234	24	15	39	62	80	142	1,511	188	26	214	30	145	175	10	1	0	1	0	1	1
213	5,155	62	305	367	301	148	449	1,096	13	9	22	36	45	81	874	106	15	121	15	71	86	6,348	737	101	838	107	786	893
214	7,514	89	434	523	432	213	645	865	12	7	19	30	38	68	728	88	12	100	12	56	68	0	0	0	0	0	0	0
215	1,563	20	99	119	95	47	142	671	10	6	16	26	32	58	598	72	10	82	9	44	53	3	0	0	0	0	0	0
216	3,192	40	194	234	189	93	282	1,146	14	9	23	37	47	84	904	110	15	125	15	75	90	1	0	0	0	0	0	0
217	1,142	15	74	89	70	35	105	1,243	15	9	24	39	50	89	2,727	347	47	394	64	313	377	35	4	1	5	1	4	5
218	1,245	16	80	96	76	38	114	244	6	4	10	15	20	35	1,661	208	28	236	34	164	198	0	0	0	0	0	0	0
219	865	12	56	68	54	26	80	624	9	6	15	24	31	55	3,705	477	65	542	95	466	561	0	0	0	0	0	0	0
229	0	0	0	0	0	0	0	693	10	6	16	26	33	59	3,348	429	59	488	84	408	492	0	0	0	0	0	0	0
230	932	12	61	73	58	28	86	698	10	6	16	26	33	59	617	74	10	84	9	46	55	0	0	0	0	0	0	0
231	143	2	11	13	9	5	14	63	4	3	7	11	14	25	97	11	1	12	1	4	5	0	0	0	0	0	0	0
232	653	9	43	52	41	20	61	382	7	5	12	18	24	42	1,879	236	32	268	39	193	232	0	0	0	0	0	0	0
233	174	3	12	15	11	6	17	527	9	5	14	22	28	50	497	59	8	67	7	34	41	24	3	0	3	0	3	3
Other	5	0	0	0	1	0	1	295	6	4	10	16	21	37	318	37	5	42	4	19	23	0	0	0	0	0	0	0
TOTAL	**57,521**	**693**	**3,384**	**4,134**	**3,330**	**1,638**	**5,035**	**63,108**	**661**	**420**	**1,081**	**1,729**	**2,202**	**3,931**	**47,390**	**6,078**	**831**	**6,909**	**1,228**	**5,984**	**7,212**	**9,809**	**1,137**	**156**	**1,293**	**165**	**1,213**	**1,378**

TAZ	Modal Split				Auto Occupancy (passengers / vehicle)				Pass-By Trips				Linked Trips			
	Auto	Transit	Bicycle	Walk	Residential	Retail	Office	Industrial	Residential	Retail	Office	Industrial	Residential	Retail	Office	Industrial
198	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
199	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
200	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
201	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
202	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
203	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
204	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
205	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
206	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
211	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
212	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
213	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
214	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
215	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
216	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
217	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
218	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
219	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
229	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
230	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
231	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
232	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
233	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
Other	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
TOTAL																

TAZ	Trip Generation (AUTO PERSON-TRIPS)																										
	Residential							Retail							Office							Industrial						
	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total
198	0	0	0	0	0	0	0	119	3	2	4	7	9	16	221	26	4	29	3	13	16	0	0	0	0	0	0	0
199	0	0	0	0	0	0	0	256	4	2	6	10	13	23	400	48	7	54	6	28	34	0	0	0	0	0	0	0
200	1,324	17	83	100	80	39	119	302	4	3	7	12	14	26	453	54	8	62	7	33	40	0	0	0	0	0	0	0
201	3,414	41	202	243	199	98	297	1,743	17	11	29	46	58	104	1,748	221	30	251	39	191	230	0	0	0	0	0	0	0
202	401	6	27	32	26	12	38	260	4	3	7	10	13	24	403	48	7	55	6	28	34	2	0	0	0	0	0	0
203	895	12	57	69	55	27	82	6,753	63	40	103	165	210	375	487	58	8	66	8	36	44	2	0	0	0	0	0	0
204	3,182	39	189	228	186	92	278	4,078	39	25	63	101	129	230	1,884	239	32	272	43	210	253	72	8	2	10	2	9	11
205	3,414	41	202	243	199	98	297	7,553	70	45	115	184	234	419	8,227	1,104	151	1,255	293	1,428	1,721	8	1	0	1	0	1	1
206	493	0	0	39	0	0	46	1,155	12	8	20	32	40	72	4,918	647	88	735	150	732	883	14	2	0	2	0	2	2
211	7,329	85	415	500	417	205	621	1,233	13	8	21	34	43	76	2,325	297	41	338	57	277	333	2,458	285	39	324	41	304	345
212	3,643	44	214	259	212	104	317	1,001	11	7	17	28	36	64	1,140	142	20	161	23	109	132	8	1	0	1	0	1	1
213	3,555	43	210	253	208	102	310	491	6	4	10	16	20	36	659	80	11	91	11	54	65	4,788	556	76	632	81	593	674
214	5,182	61	299	361	298	147	445	388	5	3	9	13	17	30	549	66	9	75	9	42	51	0	0	0	0	0	0	0
215	1,078	14	68	82	66	32	98	301	4	3	7	12	14	26	451	54	8	62	7	33	40	2	0	0	0	0	0	0
216	2,201	28	134	161	130	64	194	514	6	4	10	17	21	38	682	83	11	94	11	57	68	1	0	0	0	0	0	0
217	788	10	51	61	48	24	72	557	7	4	11	17	22	40	2,057	262	35	297	48	236	284	26	3	1	4	1	3	4
218	859	11	55	66	52	26	79	109	3	2	4	7	9	16	1,253	157	21	178	26	124	149	0	0	0	0	0	0	0
219	597	8	39	47	37	18	55	280	4	3	7	11	14	25	2,795	360	49	409	72	352	423	0	0	0	0	0	0	0
229	0	0	0	0	0	0	0	311	4	3	7	12	15	26	2,525	324	45	368	63	308	371	0	0	0	0	0	0	0
230	643	8	42	50	40	19	59	313	4	3	7	12	15	26	465	56	8	63	7	35	41	0	0	0	0	0	0	0
231	99	1	8	9	6	3	10	28	2	1	3	5	6	11	73	8	1	9	1	3	4	0	0	0	0	0	0	0
232	450	6	30	36	28	14	42	171	3	2	5	8	11	19	1,417	178	24	202	29	146	175	0	0	0	0	0	0	0
233	120	2	8	10	8	4	12	236	4	2	6	10	13	22	375	45	6	51	5	26	31	18	2	0	2	0	2	2
Other	3	0	0	0	1	0	1	132	3	2	4	7	9	17	240	28	4	32	3	14	17	0	0	0	0	0	0	0
TOTAL	**39,670**	**477**	**2,333**	**2,849**	**2,296**	**1,128**	**3,472**	**28,284**	**295**	**190**	**482**	**776**	**985**	**1,761**	**35,747**	**4,585**	**628**	**5,209**	**927**	**4,515**	**5,439**	**7,399**	**858**	**118**	**976**	**125**	**915**	**1,040**

TAZ	Trip Generation (VEHICLE TRIPS)																										
	Residential							Retail							Office							Industrial						
	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total
198	0	0	0	0	0	0	0	94	2	1	4	6	7	13	175	20	3	23	2	10	13	0	0	0	0	0	0	0
199	0	0	0	0	0	0	0	203	3	2	5	8	10	18	317	38	5	43	5	22	27	0	0	0	0	0	0	0
200	1,051	14	66	79	63	31	95	239	4	2	6	9	11	21	359	43	6	49	5	26	32	0	0	0	0	0	0	0
201	2,709	33	160	193	158	78	236	1,384	14	9	23	36	46	83	1,387	175	24	199	31	151	183	0	0	0	0	0	0	0
202	318	4	21	26	20	10	30	206	3	2	5	8	11	19	320	38	5	44	5	22	27	1	0	0	0	0	0	0
203	710	9	45	55	44	21	65	5,360	50	32	82	131	167	298	387	46	7	53	6	29	35	2	0	0	0	0	0	0
204	2,525	31	150	181	148	73	221	3,236	31	20	50	80	102	183	1,495	190	26	216	34	167	201	57	7	1	8	1	7	8
205	2,709	33	160	193	158	78	236	5,995	56	36	91	146	186	332	6,529	876	120	996	232	1,133	1,366	6	1	0	1	0	1	1
206	391	0	0	31	0	0	37	917	10	6	16	25	32	57	3,903	514	70	584	119	581	700	11	1	0	1	0	2	2
211	5,817	67	329	397	331	163	493	979	10	6	17	27	34	60	1,845	236	32	268	45	220	265	1,951	226	31	257	33	241	274
212	2,892	35	170	205	169	83	251	795	9	5	14	22	28	51	905	113	16	128	18	87	105	6	1	0	1	0	1	1
213	2,822	34	167	201	165	81	246	390	5	3	8	13	16	29	523	63	9	72	9	43	51	3,800	441	60	502	64	471	535
214	4,113	49	238	286	236	117	353	308	4	2	7	11	14	24	436	53	7	60	7	34	41	0	0	0	0	0	0	0
215	855	11	54	65	52	26	78	239	4	2	6	9	11	21	358	43	6	49	5	26	32	2	0	0	0	0	0	0
216	1,747	22	106	128	103	51	154	408	5	3	8	13	17	30	541	66	9	75	9	45	54	1	0	0	0	0	0	0
217	625	8	41	49	38	19	57	442	5	3	9	14	18	32	1,633	208	28	236	38	187	226	21	2	1	3	1	2	3
218	681	9	44	53	42	21	62	87	2	1	4	5	7	12	994	125	17	141	20	98	119	0	0	0	0	0	0	0
219	473	7	31	37	30	14	44	222	3	2	5	9	11	20	2,218	286	39	324	57	279	336	0	0	0	0	0	0	0
229	0	0	0	0	0	0	0	247	4	2	6	9	12	21	2,004	257	35	292	50	244	295	0	0	0	0	0	0	0
230	510	7	33	40	32	15	47	248	4	2	6	9	12	21	369	44	6	50	5	28	33	0	0	0	0	0	0	0
231	78	1	6	7	5	3	8	22	1	1	2	4	5	9	58	7	1	7	1	2	3	0	0	0	0	0	0	0
232	357	5	24	28	22	11	33	136	2	2	4	6	9	15	1,125	141	19	160	23	116	139	0	0	0	0	0	0	0
233	95	2	7	8	6	3	9	187	3	2	5	8	10	18	298	35	5	40	4	20	25	14	2	0	2	0	2	2
Other	3	0	0	0	1	0	1	105	2	1	4	6	7	13	190	22	3	25	2	11	14	0	0	0	0	0	0	0
TOTAL	**31,481**	**381**	**1,852**	**2,262**	**1,823**	**898**	**2,756**	**22,449**	**236**	**147**	**387**	**614**	**783**	**1,400**	**28,369**	**3,639**	**498**	**4,134**	**732**	**3,581**	**4,322**	**5,872**	**681**	**93**	**775**	**99**	**727**	**826**

TAZ	Trip Generation (TRANSIT TRIPS)																												
	Residential							Retail							Office							Industrial							
	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total
198	0	0	0	0	0	0	0	34	1	1	1	2	3	5	38	4	1	5	1	2	3	0	0	0	0	0	0	0
199	0	0	0	0	0	0	0	73	1	1	2	3	4	7	68	8	1	9	1	5	6	0	0	0	0	0	0	0
200	246	3	15	19	15	7	22	86	1	1	2	3	4	7	77	9	1	10	1	6	7	0	0	0	0	0	0	0
201	634	8	38	45	37	18	55	498	5	3	8	13	17	30	297	38	5	43	7	32	39	0	0	0	0	0	0	0
202	74	1	5	6	5	2	7	74	1	1	2	3	4	7	68	8	1	9	1	5	6	0	0	0	0	0	0	0
203	166	2	11	13	10	5	15	1,929	18	12	29	47	60	107	83	10	1	11	1	6	7	0	0	0	0	0	0	0
204	591	7	35	42	35	17	52	1,165	11	7	18	29	37	66	320	41	6	46	7	36	43	12	1	0	2	0	2	2
205	634	8	38	45	37	18	55	2,157	20	13	33	53	67	120	1,396	187	26	213	50	242	292	1	0	0	0	0	0	0
206	92	0	0	7	0	0	9	330	3	2	6	9	12	21	835	110	15	125	25	124	150	2	0	0	0	0	0	0
211	1,360	16	77	93	77	38	115	352	4	2	6	10	12	22	394	50	7	57	10	47	57	417	48	7	55	7	52	59
212	676	8	40	48	39	19	59	286	3	2	5	8	10	18	193	24	3	27	4	19	22	1	0	0	0	0	0	0
213	660	8	39	47	39	19	57	140	2	1	3	5	6	10	112	14	2	15	2	9	11	813	94	13	107	14	101	114
214	962	11	56	67	55	27	83	111	2	1	2	4	5	9	93	11	2	13	2	7	9	0	0	0	0	0	0	0
215	200	3	13	15	12	6	18	86	1	1	2	3	4	7	77	9	1	10	1	6	7	0	0	0	0	0	0	0
216	409	5	25	30	24	12	36	147	2	1	3	5	6	11	116	14	2	16	2	10	12	0	0	0	0	0	0	0
217	146	2	9	11	9	4	13	159	2	1	3	5	6	11	349	44	6	50	8	40	48	4	1	0	1	0	1	1
218	159	2	10	12	10	5	15	31	1	1	1	2	3	4	213	27	4	30	4	21	25	0	0	0	0	0	0	0
219	111	2	7	9	7	3	10	80	1	1	2	3	4	7	474	61	8	69	12	60	72	0	0	0	0	0	0	0
229	0	0	0	0	0	0	0	89	1	1	2	3	4	8	429	55	8	62	11	52	63	0	0	0	0	0	0	0
230	119	2	8	9	7	4	11	89	1	1	2	3	4	8	79	9	1	11	1	6	7	0	0	0	0	0	0	0
231	18	0	1	2	1	1	2	8	1	0	1	1	2	3	12	1	0	2	0	1	1	0	0	0	0	0	0	0
232	84	1	6	7	5	3	8	49	1	1	2	2	3	5	241	30	4	34	5	25	30	0	0	0	0	0	0	0
233	22	0	2	2	1	1	2	67	1	1	2	3	4	6	64	8	1	9	1	4	5	3	0	0	0	0	0	0
Other	1	0	0	0	0	0	0	38	1	1	1	2	3	5	41	5	1	5	1	2	3	0	0	0	0	0	0	0
TOTAL	**7,364**	**89**	**435**	**529**	**425**	**209**	**644**	**8,078**	**85**	**57**	**138**	**221**	**284**	**504**	**6,069**	**777**	**107**	**881**	**158**	**767**	**925**	**1,253**	**144**	**20**	**165**	**21**	**156**	**176**

TAZ	Trip Generation (BIKE TRIPS)																												
	Residential							Retail							Office							Industrial						
	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total
198	0	0	0	0	0	0	0	6	0	0	0	0	0	1	7	1	0	1	0	0	0	0	0	0	0	0	0	0
199	0	0	0	0	0	0	0	13	0	0	0	1	1	1	12	1	0	2	0	1	1	0	0	0	0	0	0	0
200	44	1	3	3	3	1	4	15	0	0	0	1	1	1	14	2	0	2	0	1	1	0	0	0	0	0	0	0
201	114	1	7	8	7	3	10	89	1	1	1	2	3	5	53	7	1	8	1	6	7	0	0	0	0	0	0	0
202	13	0	1	1	1	0	1	13	0	0	0	1	1	1	12	1	0	2	0	1	1	0	0	0	0	0	0	0
203	30	0	2	2	2	1	3	347	3	2	5	8	11	19	15	2	0	2	0	1	1	0	0	0	0	0	0	0
204	106	1	6	8	6	3	9	209	2	1	3	5	7	12	57	7	1	8	1	6	8	2	0	0	0	0	0	0
205	114	1	7	8	7	3	10	388	4	2	6	9	12	21	251	34	5	38	9	44	52	0	0	0	0	0	0	0
206	16	0	0	1	0	0	2	59	1	0	1	2	2	4	150	20	3	22	5	22	27	0	0	0	0	0	0	0
211	244	3	14	17	14	7	21	63	1	0	1	2	2	4	71	9	1	10	2	8	10	75	9	1	10	1	9	11
212	122	1	7	9	7	3	11	51	1	0	1	1	2	3	35	4	1	5	1	3	4	0	0	0	0	0	0	0
213	119	1	7	8	7	3	10	25	0	0	1	1	1	2	20	2	0	3	0	2	2	146	17	2	19	2	18	21
214	173	2	10	12	10	5	15	20	0	0	0	1	1	2	17	2	0	2	0	1	2	0	0	0	0	0	0	0
215	36	0	2	3	2	1	3	15	0	0	0	1	1	1	14	2	0	2	0	1	1	0	0	0	0	0	0	0
216	73	1	4	5	4	2	6	26	0	0	1	1	1	2	21	3	0	3	0	2	2	0	0	0	0	0	0	0
217	26	0	2	2	2	1	2	29	0	0	1	1	1	2	63	8	1	9	1	7	9	1	0	0	0	0	0	0
218	29	0	2	2	2	1	3	6	0	0	0	0	0	1	38	5	1	5	1	4	5	0	0	0	0	0	0	0
219	20	0	1	2	1	1	2	14	0	0	0	1	1	1	85	11	1	12	2	11	13	0	0	0	0	0	0	0
229	0	0	0	0	0	0	0	16	0	0	0	1	1	1	77	10	1	11	2	9	11	0	0	0	0	0	0	0
230	21	0	1	2	1	1	2	16	0	0	0	1	1	1	14	2	0	2	0	1	1	0	0	0	0	0	0	0
231	3	0	0	0	0	0	0	1	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
232	15	0	1	1	1	0	1	9	0	0	0	0	1	1	43	5	1	6	1	4	5	0	0	0	0	0	0	0
233	4	0	0	0	0	0	0	12	0	0	0	1	1	1	11	1	0	2	0	1	1	1	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	7	0	0	0	0	0	1	7	1	0	1	0	0	1	0	0	0	0	0	0	0
TOTAL	**1,322**	**12**	**77**	**94**	**77**	**36**	**115**	**1,449**	**13**	**6**	**21**	**41**	**52**	**89**	**1,089**	**140**	**17**	**158**	**26**	**136**	**165**	**225**	**26**	**3**	**29**	**3**	**27**	**32**

TAZ	Trip Generation (PED TRIPS)																												
	Residential							Retail							Office							Industrial						
	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total
198	0	0	0	0	0	0	0	21	0	0	1	1	2	3	23	3	0	3	0	1	2	0	0	0	0	0	0	0
199	0	0	0	0	0	0	0	46	1	0	1	2	2	4	42	5	1	6	1	3	4	0	0	0	0	0	0	0
200	154	2	10	12	9	5	14	54	1	0	1	2	3	5	48	6	1	7	1	4	4	0	0	0	0	0	0	0
201	396	5	23	28	23	11	34	311	3	2	5	8	10	19	185	23	3	27	4	20	24	0	0	0	0	0	0	0
202	46	1	3	4	3	1	4	46	1	0	1	2	2	4	43	5	1	6	1	3	4	0	0	0	0	0	0	0
203	104	1	7	8	6	3	10	1,205	11	7	18	29	38	67	52	6	1	7	1	4	5	0	0	0	0	0	0	0
204	369	4	22	26	22	11	32	728	7	4	11	18	23	41	200	25	3	29	5	22	27	8	1	0	1	0	1	1
205	396	5	23	28	23	11	34	1,348	13	8	21	33	42	75	872	117	16	133	31	151	182	1	0	0	0	0	0	0
206	57	0	0	5	0	0	5	206	2	1	4	6	7	13	522	69	9	78	16	78	94	1	0	0	0	0	0	0
211	850	10	48	58	48	24	72	220	2	1	4	6	8	14	247	32	4	36	6	29	35	261	30	4	34	4	32	37
212	423	5	25	30	25	12	37	179	2	1	3	5	6	11	121	15	2	17	2	12	14	1	0	0	0	0	0	0
213	412	5	24	29	24	12	36	88	1	1	2	3	4	6	70	8	1	10	1	6	7	508	59	8	67	9	63	71
214	601	7	35	42	35	17	52	69	1	1	2	2	3	5	58	7	1	8	1	4	5	0	0	0	0	0	0	0
215	125	2	8	10	8	4	11	54	1	0	1	2	3	5	48	6	1	7	1	4	4	0	0	0	0	0	0	0
216	255	3	16	19	15	7	23	92	1	1	2	3	4	7	72	9	1	10	1	6	7	0	0	0	0	0	0	0
217	91	1	6	7	6	3	8	99	1	1	2	3	4	7	218	28	4	32	5	25	30	3	0	0	0	0	0	0
218	100	1	6	8	6	3	9	20	0	0	1	1	2	3	133	17	2	19	3	13	16	0	0	0	0	0	0	0
219	69	1	4	5	4	2	6	50	1	0	1	2	2	4	296	38	5	43	8	37	45	0	0	0	0	0	0	0
229	0	0	0	0	0	0	0	55	1	0	1	2	3	5	268	34	5	39	7	33	39	0	0	0	0	0	0	0
230	75	1	5	6	5	2	7	56	1	0	1	2	3	5	49	6	1	7	1	4	4	0	0	0	0	0	0	0
231	11	0	1	1	1	0	1	5	0	0	1	1	1	2	8	1	0	1	0	0	0	0	0	0	0	0	0	0
232	52	1	3	4	3	2	5	31	1	0	1	1	2	3	150	19	3	21	3	15	19	0	0	0	0	0	0	0
233	14	0	1	1	1	0	1	42	1	0	1	2	2	4	40	5	1	5	1	3	3	2	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	24	0	0	1	1	2	3	25	3	0	3	0	2	2	0	0	0	0	0	0	0
TOTAL	**4,600**	**55**	**270**	**331**	**267**	**130**	**401**	**5,049**	**53**	**28**	**87**	**137**	**178**	**315**	**3,790**	**487**	**66**	**554**	**100**	**479**	**576**	**785**	**90**	**12**	**102**	**13**	**96**	**109**

TAZ	Person Trips							Auto Person-Trips							Vehicle Trips							Transit Trips						
	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total
198	558	40	9	49	20	37	57	340	29	6	33	10	22	32	269	22	4	27	8	17	26	72	5	2	6	3	5	8
199	1,102	72	14	86	31	66	97	656	52	9	60	16	41	57	520	41	7	48	13	32	45	141	9	2	11	4	9	13
200	3,193	107	136	243	151	133	284	2,079	75	94	169	99	86	185	1,649	61	74	134	77	68	148	409	13	17	31	19	17	36
201	11,157	392	358	750	443	525	968	6,905	279	243	523	284	347	631	5,480	222	193	415	225	275	502	1,429	51	46	96	57	67	124
202	1,696	81	54	135	68	85	153	1,066	58	37	94	42	53	96	845	45	28	75	33	43	76	216	10	7	17	9	11	20
203	17,015	234	184	418	458	556	1,014	8,137	133	105	238	228	273	501	6,459	105	84	190	181	217	398	2,178	30	24	53	58	71	129
204	16,306	470	374	844	555	712	1,267	9,216	325	248	573	332	440	772	7,313	259	197	455	263	349	613	2,088	60	48	108	71	92	163
205	32,719	1,682	593	2,275	1,088	2,559	3,647	19,202	1,216	398	1,614	676	1,761	2,438	15,239	966	316	1,281	536	1,398	1,935	4,188	215	77	291	140	327	467
206	9,830	887	134	1,078	270	1,064	1,401	6,580	661	96	796	182	774	1,003	5,222	525	76	632	144	615	796	1,259	113	17	138	34	136	180
211	19,720	924	726	1,650	809	1,162	1,971	13,345	680	503	1,183	549	829	1,375	10,592	539	398	939	436	658	1,092	2,523	118	93	211	104	149	253
212	9,038	277	352	629	400	377	777	5,792	198	241	438	263	250	514	4,598	158	191	348	209	199	408	1,156	35	45	80	51	48	99
213	13,473	918	430	1,348	459	1,050	1,509	9,493	685	301	986	316	769	1,085	7,535	543	239	783	251	611	861	1,725	118	55	172	60	135	192
214	9,107	189	453	642	474	307	781	6,119	132	311	445	320	206	526	4,857	106	247	353	254	165	418	1,166	24	59	82	61	39	101
215	2,835	102	115	217	130	123	253	1,832	72	79	151	85	79	164	1,454	58	62	120	66	63	131	363	13	15	27	16	16	32
216	5,243	164	218	382	241	215	456	3,398	117	149	265	158	142	300	2,697	93	118	211	125	113	238	672	21	28	49	31	28	59
217	5,147	381	131	512	174	402	576	3,428	282	91	373	114	285	400	2,721	223	73	297	91	226	318	658	49	16	65	22	51	73
218	3,150	230	112	342	125	222	347	2,221	171	78	248	85	159	244	1,762	136	62	198	67	126	193	403	30	15	43	16	29	44
219	5,194	498	127	625	173	523	696	3,672	372	91	463	120	384	503	2,913	296	72	366	96	304	400	665	64	16	80	22	67	89
229	4,041	439	65	504	110	441	551	2,836	328	48	375	75	323	397	2,251	261	37	298	59	256	316	518	56	9	64	14	56	71
230	2,247	96	77	173	93	107	200	1,421	68	53	120	59	69	126	1,127	55	41	96	46	55	101	287	12	10	22	11	14	26
231	303	17	15	32	21	23	44	200	11	10	21	12	12	25	158	9	8	16	10	10	20	38	2	1	5	2	4	6
232	2,914	252	80	332	98	237	335	2,038	187	56	243	65	171	236	1,618	148	45	192	51	136	187	374	32	11	43	12	31	43
233	1,222	74	25	99	40	71	111	749	53	16	69	23	45	67	594	42	14	55	18	35	54	156	9	4	13	5	9	13
Other	618	43	9	52	21	40	61	375	31	6	36	11	23	35	298	24	4	29	9	18	28	80	6	2	6	3	5	8
TOTAL	**177,828**	**8,569**	**4,791**	**13,417**	**6,452**	**11,037**	**17,556**	**111,100**	**6,215**	**3,269**	**9,516**	**4,124**	**7,543**	**11,712**	**88,171**	**4,937**	**2,590**	**7,558**	**3,268**	**5,989**	**9,304**	**22,764**	**1,095**	**619**	**1,713**	**825**	**1,416**	**2,249**

TAZ	Bike Trips							Ped Trips						
	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total
198	13	1	0	1	0	0	1	44	3	0	4	1	3	5
199	25	1	0	2	1	2	2	88	6	1	7	3	5	8
200	73	3	3	5	4	3	6	256	9	11	20	12	12	23
201	256	9	9	17	10	12	22	892	31	28	60	35	41	77
202	38	1	1	3	2	2	3	135	7	4	11	6	6	12
203	392	5	4	9	10	13	23	1,361	18	15	33	36	45	82
204	374	10	8	19	12	16	29	1,305	37	29	67	45	57	101
205	753	39	14	52	25	59	83	2,617	135	47	182	87	204	291
206	225	21	3	24	7	24	33	786	71	10	87	22	85	112
211	453	22	16	38	19	26	46	1,578	74	57	132	64	93	158
212	208	6	8	15	9	8	18	724	22	28	50	32	30	62
213	310	20	9	31	10	24	35	1,078	73	34	108	37	85	120
214	210	4	10	14	11	7	19	728	15	37	52	38	24	62
215	65	2	2	5	3	3	5	227	9	9	18	11	11	20
216	120	4	4	9	5	5	10	419	13	18	31	19	17	37
217	119	8	3	12	4	9	13	411	30	11	41	14	32	45
218	73	5	3	7	3	5	9	253	18	8	28	10	18	28
219	119	11	2	14	4	13	16	415	40	9	49	14	41	55
229	93	10	1	11	3	10	12	323	35	5	40	9	36	44
230	51	2	1	4	2	3	4	180	8	6	14	8	9	16
231	6	0	0	0	0	0	1	24	1	1	3	2	1	3
232	67	5	2	7	2	5	7	233	21	6	26	7	19	27
233	28	1	0	2	1	2	2	98	6	2	7	4	5	8
Other	14	1	0	1	0	0	2	49	3	0	4	1	4	5
TOTAL	**4,085**	**191**	**103**	**302**	**147**	**251**	**401**	**14,224**	**685**	**376**	**1,074**	**517**	**883**	**1,401**

TAZ	Land Use (70%)			
	DU (units)	Retail (sf)	Office (sf)	Industrial (sf)
198	0	5,237	12,219	0
199	0	11,301	26,368	0
200	318	13,181	30,756	0
201	968	76,808	179,218	0
202	78	11,333	26,444	240
203	200	297,479	34,086	482
204	890	178,783	195,611	13,809
205	948	326,001	1,324,118	1,404
206	114	48,186	680,667	2,653
211	2,377	53,290	257,202	409,119
212	1,045	44,100	102,900	1,426
213	991	21,476	50,110	795,725
214	1,552	15,876	37,045	0
215	249	13,151	30,686	449
216	558	20,430	47,671	93
217	143	24,060	220,373	5,011
218	164	5,499	100,282	0
219	125	12,311	329,660	0
229	0	13,689	289,080	0
230	135	13,781	32,156	0
231	17	1,428	3,331	0
232	90	7,534	136,474	0
233	22	11,892	27,748	3,492
Other	0	6,662	15,544	0
TOTAL	**10,983**	**1,233,488**	**4,189,749**	**1,233,901**

TAZ	Trip Generation (PERSON TRIPS)																										
	Residential							Retail							Office							Industrial						
	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total
198	0	0	0	0	0	0	0	232	5	4	9	15	19	34	264	31	4	35	3	15	18	0	0	0	0	0	0	0
199	0	0	0	0	0	0	0	501	8	5	13	22	27	49	478	57	8	65	7	32	39	0	0	0	0	0	0	0
200	1,716	22	108	130	104	51	155	584	9	6	15	23	30	53	538	64	9	73	8	38	46	0	0	0	0	0	0	0
201	4,420	54	263	317	259	128	387	3,404	35	22	57	91	115	206	2,091	263	36	299	45	222	267	0	0	0	0	0	0	0
202	520	7	35	42	33	16	49	502	8	5	13	22	27	49	479	57	8	65	7	32	39	2	0	0	0	0	0	0
203	1,157	15	75	90	71	35	106	13,184	123	79	202	323	412	735	582	70	9	79	9	42	51	3	0	0	0	0	0	0
204	4,116	50	247	297	242	119	361	7,924	76	48	124	198	253	451	2,236	282	39	321	49	242	291	96	11	2	13	2	12	14
205	4,342	53	259	312	255	125	380	14,448	135	86	221	354	450	804	9,751	1,303	178	1,481	335	1,638	1,973	10	1	0	1	0	1	1
206	715			57			67	2,136	23	15	38	60	77	137	5,842	766	104	870	172	842	1,014	18	2	0	2	0	3	3
211	9,486	111	540	651	541	267	808	2,362	25	16	41	66	83	149	2,761	351	48	399	65	318	383	2,852	331	45	376	48	353	401
212	4,717	57	280	337	276	136	412	1,955	21	14	35	56	71	127	1,364	169	23	192	26	127	153	10	1	0	1	0	1	1
213	4,509	55	268	323	264	130	394	952	12	8	20	32	41	73	784	95	13	108	13	62	75	5,546	644	88	732	94	686	780
214	6,603	79	384	463	382	188	570	704	10	6	16	26	34	60	621	75	10	85	9	46	55	0	0	0	0	0	0	0
215	1,394	18	89	107	85	42	127	583	9	6	15	23	30	53	537	64	9	73	8	38	46	3	0	0	0	0	0	0
216	2,768	35	169	204	165	81	246	905	12	8	20	31	40	71	754	92	12	104	12	59	71	1	0	0	0	0	0	0
217	870	12	57	69	54	27	81	1,066	13	9	22	35	44	79	2,451	311	42	353	56	272	328	35	4	1	5	1	4	5
218	977	13	64	77	60	30	90	244	6	4	10	15	20	35	1,337	165	23	188	25	124	149	0	0	0	0	0	0	0
219	776	11	51	62	48	24	72	546	9	5	14	22	29	51	3,343	429	58	487	83	408	491	0	0	0	0	0	0	0
229	0	0	0	0	0	0	0	607	9	6	15	24	30	54	3,021	386	53	439	73	358	431	0	0	0	0	0	0	0
230	828	11	55	66	52	25	77	611	9	6	15	24	31	55	557	67	9	76	8	40	48	0	0	0	0	0	0	0
231	143	2	11	13	9	5	14	63	4	3	7	11	14	25	97	11	1	12	1	4	5	0	0	0	0	0	0	0
232	587	8	39	47	37	18	55	334	7	4	11	18	22	40	1,695	212	29	241	35	168	203	0	0	0	0	0	0	0
233	174	3	12	15	11	6	17	527	9	5	14	22	28	50	497	59	8	67	7	34	41	24	3	0	3	0	3	3
Other	5	0	0	0	1	0	1	295	6	4	10	16	21	37	318	37	5	42	4	19	23	0	0	0	0	0	0	0
TOTAL	**50,823**	**616**	**3,006**	**3,679**	**2,949**	**1,453**	**4,469**	**54,669**	**583**	**374**	**957**	**1,529**	**1,948**	**3,477**	**42,398**	**5,416**	**738**	**6,154**	**1,060**	**5,180**	**6,240**	**8,600**	**997**	**136**	**1,133**	**145**	**1,063**	**1,208**

TAZ	Modal Split				Auto Occupancy (passengers / vehicle)				Pass-By Trips				Linked Trips			
	Auto	Transit	Bicycle	Walk	Residential	Retail	Office	Industrial	Residential	Retail	Office	Industrial	Residential	Retail	Office	Industrial
198	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
199	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
200	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
201	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
202	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
203	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
204	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
205	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
206	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
211	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
212	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
213	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
214	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
215	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
216	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
217	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
218	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
219	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
229	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
230	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
231	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
232	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
233	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
Other	76.9%	12.8%	2.3%	8.0%	1.26	1.26	1.26	1.26	100.0%	68.0%	100.0%	100.0%	89.7%	85.7%	98.1%	98.1%
TOTAL																

TAZ	Trip Generation (AUTO PERSON-TRIPS)																										
	Residential							Retail							Office							Industrial						
	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total
198	0	0	0	0	0	0	0	104	2	2	4	7	9	15	199	23	3	26	2	11	14	0	0	0	0	0	0	0
199	0	0	0	0	0	0	0	225	4	2	6	10	12	22	361	43	6	49	5	24	29	0	0	0	0	0	0	0
200	1,183	15	74	90	72	35	107	262	4	3	7	10	13	24	406	48	7	55	6	29	35	0	0	0	0	0	0	0
201	3,048	37	181	219	179	88	267	1,526	16	10	26	41	52	92	1,577	198	27	226	34	167	201	0	0	0	0	0	0	0
202	359	5	24	29	23	11	34	225	4	2	6	10	12	22	361	43	6	49	5	24	29	2	0	0	0	0	0	0
203	798	10	52	62	49	24	73	5,909	55	35	91	145	185	329	439	53	7	60	7	32	38	2	0	0	0	0	0	0
204	2,839	34	170	205	167	82	249	3,551	34	22	56	89	113	202	1,687	213	29	242	37	183	220	72	8	2	10	2	9	11
205	2,994	37	179	215	176	86	262	6,476	61	39	99	159	202	360	7,355	983	134	1,117	253	1,236	1,488	8	1	0	1	0	1	1
206	493	0	0	39	0	0	46	957	10	7	17	27	35	61	4,407	578	78	656	130	635	765	14	2	0	2	0	2	2
211	6,542	77	372	449	373	184	557	1,059	11	7	18	30	37	67	2,083	265	36	301	49	240	289	2,151	250	34	284	36	266	302
212	3,253	39	193	232	190	94	284	876	9	6	16	25	32	57	1,029	127	17	145	20	96	115	8	1	0	1	0	1	1
213	3,110	38	185	223	182	90	272	427	5	4	9	14	18	33	591	72	10	81	10	47	57	4,183	486	66	552	71	517	588
214	4,554	54	265	319	263	130	393	316	4	3	7	12	15	27	468	57	8	64	7	35	41	0	0	0	0	0	0	0
215	961	12	61	74	59	29	88	261	4	3	7	10	13	24	405	48	7	55	6	29	35	2	0	0	0	0	0	0
216	1,909	24	117	141	114	56	170	406	5	4	9	14	18	32	569	69	9	78	9	45	54	1	0	0	0	0	0	0
217	600	8	39	48	37	19	56	478	6	4	10	16	20	35	1,849	235	32	266	42	205	247	26	3	1	4	1	3	4
218	674	9	44	53	41	21	62	109	3	2	4	7	9	16	1,009	124	17	142	19	94	112	0	0	0	0	0	0	0
219	535	8	35	43	33	17	50	245	4	2	6	10	13	23	2,522	324	44	367	63	308	370	0	0	0	0	0	0	0
229	0	0	0	0	0	0	0	272	4	3	7	11	13	24	2,279	291	40	331	55	270	325	0	0	0	0	0	0	0
230	571	8	38	46	36	17	53	274	4	3	7	11	14	25	420	51	7	57	6	30	36	0	0	0	0	0	0	0
231	99	1	8	9	6	3	10	28	2	1	3	5	6	11	73	8	1	9	1	3	4	0	0	0	0	0	0	0
232	405	6	27	32	26	12	38	150	3	2	5	8	10	18	1,279	160	22	182	26	127	153	0	0	0	0	0	0	0
233	120	2	8	10	8	4	12	236	4	2	6	10	13	22	375	45	6	51	5	26	31	18	2	0	2	0	2	2
Other	3	0	0	0	1	0	1	132	3	2	4	7	9	17	240	28	4	32	3	14	17	0	0	0	0	0	0	0
TOTAL	**35,050**	**424**	**2,072**	**2,538**	**2,035**	**1,002**	**3,084**	**24,504**	**261**	**170**	**430**	**688**	**873**	**1,558**	**31,983**	**4,086**	**557**	**4,641**	**800**	**3,910**	**4,705**	**6,487**	**753**	**103**	**856**	**110**	**801**	**911**

TAZ	Trip Generation (VEHICLE TRIPS)																										
	Residential							Retail							Office							Industrial						
	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total
198	0	0	0	0	0	0	0	83	2	1	3	5	7	12	158	19	2	21	2	9	11	0	0	0	0	0	0	0
199	0	0	0	0	0	0	0	178	3	2	5	8	10	17	286	34	5	39	4	19	23	0	0	0	0	0	0	0
200	939	12	59	71	57	28	85	208	3	2	5	8	11	19	322	38	5	44	5	23	28	0	0	0	0	0	0	0
201	2,419	30	144	174	142	70	212	1,211	12	8	20	32	41	73	1,252	157	22	179	27	133	160	0	0	0	0	0	0	0
202	285	4	19	23	18	9	27	179	3	2	5	8	10	17	287	34	5	39	4	19	23	1	0	0	0	0	0	0
203	633	8	41	49	39	19	58	4,690	44	28	72	115	147	261	348	42	5	47	5	25	31	2	0	0	0	0	0	0
204	2,253	27	135	163	132	65	198	2,819	27	17	44	70	90	160	1,339	169	23	192	29	145	174	57	7	1	8	1	7	8
205	2,377	29	142	171	140	68	208	5,139	48	31	79	126	160	286	5,838	780	107	887	201	981	1,181	6	1	0	1	0	1	1
206	391	0	0	31	0	0	37	760	8	5	14	21	27	49	3,497	459	62	521	103	504	607	11	1	0	1	0	2	2
211	5,192	61	296	356	296	146	442	840	9	6	15	23	30	53	1,653	210	29	239	39	190	229	1,707	198	27	225	29	211	240
212	2,582	31	153	184	151	74	226	695	7	5	12	20	25	45	817	101	14	115	16	76	92	6	1	0	1	0	1	1
213	2,468	30	147	177	144	71	216	339	4	3	7	11	15	26	469	57	8	65	8	37	45	3,320	386	53	438	56	411	467
214	3,614	43	210	253	209	103	312	250	4	2	6	9	12	21	372	45	6	51	5	28	33	0	0	0	0	0	0	0
215	763	10	49	59	47	23	70	207	3	2	5	8	11	19	321	38	5	44	5	23	28	2	0	0	0	0	0	0
216	1,515	19	92	112	90	44	135	322	4	3	7	11	14	25	451	55	7	62	7	35	43	1	0	0	0	0	0	0
217	476	7	31	38	30	15	44	379	5	3	8	12	16	28	1,467	186	25	211	34	163	196	21	2	1	3	1	2	3
218	535	7	35	42	33	16	49	87	2	1	4	5	7	12	800	99	14	113	15	74	89	0	0	0	0	0	0	0
219	425	6	28	34	26	13	39	194	3	2	5	8	10	18	2,001	257	35	292	50	244	294	0	0	0	0	0	0	0
229	0	0	0	0	0	0	0	216	3	2	5	9	11	19	1,809	231	32	263	44	214	258	0	0	0	0	0	0	0
230	453	6	30	36	28	14	42	217	3	2	5	9	11	20	333	40	5	45	5	24	29	0	0	0	0	0	0	0
231	78	1	6	7	5	3	8	22	1	1	2	4	5	9	58	7	1	7	1	2	3	0	0	0	0	0	0	0
232	321	4	21	26	20	10	30	119	2	1	4	6	8	14	1,015	127	17	144	21	101	122	0	0	0	0	0	0	0
233	95	2	7	8	6	3	9	187	3	2	5	8	10	18	298	35	5	40	4	20	25	14	2	0	2	0	2	2
Other	3	0	0	0	1	0	1	105	2	1	4	6	7	13	190	22	3	25	2	11	14	0	0	0	0	0	0	0
TOTAL	**27,817**	**337**	**1,645**	**2,014**	**1,614**	**794**	**2,448**	**19,446**	**205**	**132**	**341**	**542**	**695**	**1,234**	**25,381**	**3,242**	**442**	**3,685**	**636**	**3,100**	**3,738**	**5,148**	**598**	**82**	**679**	**87**	**637**	**724**

TAZ	Trip Generation (TRANSIT TRIPS)																												
	Residential							Retail							Office							Industrial							
	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total
198	0	0	0	0	0	0	0	30	1	1	1	2	2	4	34	4	1	4	0	2	2	0	0	0	0	0	0	0
199	0	0	0	0	0	0	0	64	1	1	2	3	3	6	61	7	1	8	1	4	5	0	0	0	0	0	0	0
200	220	3	14	17	13	7	20	75	1	1	2	3	4	7	69	8	1	9	1	5	6	0	0	0	0	0	0	0
201	566	7	34	41	33	16	50	436	4	3	7	12	15	26	268	34	5	38	6	28	34	0	0	0	0	0	0	0
202	67	1	4	5	4	2	6	64	1	1	2	3	3	6	61	7	1	8	1	4	5	0	0	0	0	0	0	0
203	148	2	10	12	9	4	14	1,688	16	10	26	41	53	94	74	9	1	10	1	5	7	0	0	0	0	0	0	0
204	527	6	32	38	31	15	46	1,014	10	6	16	25	32	58	286	36	5	41	6	31	37	12	1	0	2	0	2	2
205	556	7	33	40	33	16	49	1,849	17	11	28	45	58	103	1,248	167	23	190	43	210	253	1	0	0	0	0	0	0
206	92	0	0	7	0	0	9	273	3	2	5	8	10	18	748	98	13	111	22	108	130	2	0	0	0	0	0	0
211	1,214	14	69	83	69	34	103	302	3	2	5	8	11	19	353	45	6	51	8	41	49	365	42	6	48	6	45	51
212	604	7	36	43	35	17	53	250	3	2	4	7	9	16	175	22	3	25	3	16	20	1	0	0	0	0	0	0
213	577	7	34	41	34	17	50	122	2	1	3	4	5	9	100	12	2	14	2	8	10	710	82	11	94	12	88	100
214	845	10	49	59	49	24	73	90	1	1	2	3	4	8	79	10	1	11	1	6	7	0	0	0	0	0	0	0
215	178	2	11	14	11	5	16	75	1	1	2	3	4	7	69	8	1	9	1	5	6	0	0	0	0	0	0	0
216	354	4	22	26	21	10	31	116	2	1	3	4	5	9	97	12	2	13	2	8	9	0	0	0	0	0	0	0
217	111	2	7	9	7	3	10	136	2	1	3	4	6	10	314	40	5	45	7	35	42	4	1	0	1	0	1	1
218	125	2	8	10	8	4	12	31	1	1	1	2	3	4	171	21	3	24	3	16	19	0	0	0	0	0	0	0
219	99	1	7	8	6	3	9	70	1	1	2	3	4	7	428	55	7	62	11	52	63	0	0	0	0	0	0	0
229	0	0	0	0	0	0	0	78	1	1	2	3	4	7	387	49	7	56	9	46	55	0	0	0	0	0	0	0
230	106	1	7	8	7	3	10	78	1	1	2	3	4	7	71	9	1	10	1	5	6	0	0	0	0	0	0	0
231	18	0	1	2	1	1	2	8	1	0	1	1	2	3	12	1	0	2	0	1	1	0	0	0	0	0	0	0
232	75	1	5	6	5	2	7	43	1	1	1	2	3	5	217	27	4	31	4	22	26	0	0	0	0	0	0	0
233	22	0	2	2	1	1	2	67	1	1	2	3	4	6	64	8	1	9	1	4	5	3	0	0	0	0	0	0
Other	1	0	0	0	0	0	0	38	1	1	1	2	3	5	41	5	1	5	1	2	3	0	0	0	0	0	0	0
TOTAL	**6,505**	**77**	**385**	**471**	**377**	**184**	**572**	**6,997**	**76**	**52**	**123**	**194**	**251**	**444**	**5,427**	**694**	**95**	**786**	**135**	**664**	**800**	**1,098**	**126**	**17**	**145**	**18**	**136**	**154**

TAZ	Trip Generation (BIKE TRIPS)																												
	Residential							Retail							Office							Industrial							
	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total
198	0	0	0	0	0	0	0	5	0	0	0	0	0	1	6	1	0	1	0	0	0	0	0	0	0	0	0	0	0
199	0	0	0	0	0	0	0	12	0	0	0	1	1	1	11	1	0	1	0	1	1	0	0	0	0	0	0	0	0
200	39	1	2	3	2	1	4	13	0	0	0	1	1	1	12	1	0	2	0	1	1	0	0	0	0	0	0	0	0
201	102	1	6	7	6	3	9	78	1	1	1	2	3	5	48	6	1	7	1	5	6	0	0	0	0	0	0	0	0
202	12	0	1	1	1	0	1	12	0	0	0	1	1	1	11	1	0	1	0	1	1	0	0	0	0	0	0	0	0
203	27	0	2	2	2	1	2	303	3	2	5	7	9	17	13	2	0	2	0	1	1	0	0	0	0	0	0	0	0
204	95	1	6	7	6	3	8	182	2	1	3	5	6	10	51	6	1	7	1	6	7	2	0	0	0	0	0	0	0
205	100	1	6	7	6	3	9	332	3	2	5	8	10	18	224	30	4	34	8	38	45	0	0	0	0	0	0	0	0
206	16	0	0	1	0	0	2	49	1	0	1	1	2	3	134	18	2	20	4	19	23	0	0	0	0	0	0	0	0
211	218	3	12	15	12	6	19	54	1	0	1	2	2	3	64	8	1	9	1	7	9	66	8	1	9	1	8	9	
212	108	1	6	8	6	3	9	45	0	0	1	1	2	3	31	4	1	4	1	3	4	0	0	0	0	0	0	0	0
213	104	1	6	7	6	3	9	22	0	0	0	1	1	2	18	2	0	2	0	1	2	128	15	2	17	2	16	18	
214	152	2	9	11	9	4	13	16	0	0	0	1	1	1	14	2	0	2	0	1	1	0	0	0	0	0	0	0	0
215	32	0	2	2	2	1	3	13	0	0	0	1	1	1	12	1	0	2	0	1	1	0	0	0	0	0	0	0	0
216	64	1	4	5	4	2	6	21	0	0	0	1	1	2	17	2	0	2	0	1	2	0	0	0	0	0	0	0	0
217	20	0	1	2	1	1	2	25	0	0	1	1	1	2	56	7	1	8	1	6	8	1	0	0	0	0	0	0	0
218	22	0	1	2	1	1	2	6	0	0	0	0	0	1	31	4	1	4	1	3	3	0	0	0	0	0	0	0	0
219	18	0	1	1	1	1	2	13	0	0	0	1	1	1	77	10	1	11	2	9	11	0	0	0	0	0	0	0	0
229	0	0	0	0	0	0	0	14	0	0	0	1	1	1	69	9	1	10	2	8	10	0	0	0	0	0	0	0	0
230	19	0	1	2	1	1	2	14	0	0	0	1	1	1	13	2	0	2	0	1	1	0	0	0	0	0	0	0	0
231	3	0	0	0	0	0	0	1	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
232	14	0	1	1	1	0	1	8	0	0	0	0	1	1	39	5	1	6	1	4	5	0	0	0	0	0	0	0	0
233	4	0	0	0	0	0	0	12	0	0	0	1	1	1	11	1	0	2	0	1	1	1	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	7	0	0	0	0	0	1	7	1	0	1	0	0	1	0	0	0	0	0	0	0	0
TOTAL	**1,169**	**12**	**67**	**84**	**67**	**34**	**103**	**1,257**	**11**	**6**	**18**	**38**	**47**	**79**	**971**	**124**	**15**	**140**	**23**	**118**	**144**	**198**	**23**	**3**	**26**	**3**	**24**	**27**	

TAZ	Trip Generation (PED TRIPS)																												
	Residential							Retail							Office							Industrial						
	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total
198	0	0	0	0	0	0	0	19	0	0	1	1	2	3	21	2	0	3	0	1	1	0	0	0	0	0	0	0
199	0	0	0	0	0	0	0	40	1	0	1	2	2	4	38	5	1	5	1	3	3	0	0	0	0	0	0	0
200	137	2	9	10	8	4	12	47	1	0	1	2	2	4	43	5	1	6	1	3	4	0	0	0	0	0	0	0
201	354	4	21	25	21	10	31	272	3	2	5	7	9	16	167	21	3	24	4	18	21	0	0	0	0	0	0	0
202	42	1	3	3	3	1	4	40	1	0	1	2	2	4	38	5	1	5	1	3	3	0	0	0	0	0	0	0
203	93	1	6	7	6	3	8	1,055	10	6	16	26	33	59	47	6	1	6	1	3	4	0	0	0	0	0	0	0
204	329	4	20	24	19	10	29	634	6	4	10	16	20	36	179	23	3	26	4	19	23	8	1	0	1	0	1	1
205	347	4	21	25	20	10	30	1,156	11	7	18	28	36	64	780	104	14	118	27	131	158	1	0	0	0	0	0	0
206	57	0	0	5	0	0	5	171	2	1	3	5	6	11	467	61	8	70	14	67	81	1	0	0	0	0	0	0
211	759	9	43	52	43	21	65	189	2	1	3	5	7	12	221	28	4	32	5	25	31	228	26	4	30	4	28	32
212	377	5	22	27	22	11	33	156	2	1	3	4	6	10	109	14	2	15	2	10	12	1	0	0	0	0	0	0
213	361	4	21	26	21	10	32	76	1	1	2	3	3	6	63	8	1	9	1	5	6	444	52	7	59	8	55	62
214	528	6	31	37	31	15	46	56	1	0	1	2	3	5	50	6	1	7	1	4	4	0	0	0	0	0	0	0
215	112	1	7	9	7	3	10	47	1	0	1	2	2	4	43	5	1	6	1	3	4	0	0	0	0	0	0	0
216	221	3	14	16	13	6	20	72	1	1	2	2	3	6	60	7	1	8	1	5	6	0	0	0	0	0	0	0
217	70	1	5	6	4	2	6	85	1	1	2	3	4	6	196	25	3	28	4	22	26	3	0	0	0	0	0	0
218	78	1	5	6	5	2	7	20	0	0	1	1	2	3	107	13	2	15	2	10	12	0	0	0	0	0	0	0
219	62	1	4	5	4	2	6	44	1	0	1	2	2	4	267	34	5	39	7	33	39	0	0	0	0	0	0	0
229	0	0	0	0	0	0	0	49	1	0	1	2	2	4	242	31	4	35	6	29	34	0	0	0	0	0	0	0
230	66	1	4	5	4	2	6	49	1	0	1	2	2	4	45	5	1	6	1	3	4	0	0	0	0	0	0	0
231	11	0	1	1	1	0	1	5	0	0	1	1	1	2	8	1	0	1	0	0	0	0	0	0	0	0	0	0
232	47	1	3	4	3	1	4	27	1	0	1	1	2	3	136	17	2	19	3	13	16	0	0	0	0	0	0	0
233	14	0	1	1	1	0	1	42	1	0	1	2	2	4	40	5	1	5	1	3	3	2	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	24	0	0	1	1	2	3	25	3	0	3	0	2	2	0	0	0	0	0	0	0
TOTAL	**4,065**	**49**	**241**	**294**	**236**	**113**	**356**	**4,375**	**49**	**25**	**78**	**122**	**155**	**277**	**3,392**	**434**	**60**	**491**	**88**	**415**	**497**	**688**	**79**	**11**	**90**	**12**	**84**	**95**

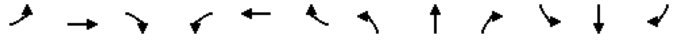
TAZ	Person Trips							Auto Person-Trips							Vehicle Trips							Transit Trips						
	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total
198	496	36	8	44	18	34	52	303	25	5	30	9	20	29	241	21	3	24	7	16	23	64	5	2	5	2	4	6
199	979	65	13	78	29	59	88	586	47	8	55	15	36	51	464	37	7	44	12	29	40	125	8	2	10	4	7	11
200	2,838	95	123	218	135	119	254	1,851	67	84	152	88	77	166	1,469	53	66	120	70	62	132	364	12	16	28	17	16	33
201	9,915	352	321	673	395	465	860	6,151	251	218	471	254	307	560	4,882	199	174	373	201	244	445	1,270	45	42	86	51	59	110
202	1,503	72	48	120	62	75	137	947	52	32	84	38	47	85	752	41	26	67	30	38	67	192	9	6	15	8	9	17
203	14,926	208	163	371	403	489	892	7,148	118	94	213	201	241	440	5,673	94	74	168	159	191	350	1,910	27	21	48	51	62	115
204	14,372	419	336	755	491	626	1,117	8,149	289	223	513	295	387	682	6,468	230	176	407	232	307	540	1,839	53	43	97	62	80	143
205	28,551	1,492	523	2,015	944	2,214	3,158	16,833	1,082	352	1,432	588	1,525	2,111	13,360	858	280	1,138	467	1,210	1,676	3,654	191	67	258	121	284	405
206	8,711	791	119	967	232	922	1,221	5,871	590	85	714	157	672	874	4,659	468	67	567	124	533	695	1,115	101	15	123	30	118	157
211	17,461	818	649	1,467	720	1,021	1,741	11,835	603	449	1,052	488	727	1,215	9,392	478	358	835	387	577	964	2,234	104	83	187	91	131	222
212	8,046	248	317	565	358	335	693	5,166	176	216	394	235	223	457	4,100	140	172	312	187	176	364	1,030	32	41	72	45	42	89
213	11,791	806	377	1,183	403	919	1,322	8,311	601	265	865	277	672	950	6,596	477	211	687	219	534	754	1,509	103	48	152	52	118	169
214	7,928	164	400	564	417	268	685	5,338	115	276	390	282	180	461	4,236	92	218	310	223	143	366	1,014	21	51	72	53	34	88
215	2,517	91	104	195	116	110	226	1,629	64	71	136	75	71	147	1,293	51	56	108	60	57	117	322	11	13	25	15	14	29
216	4,428	139	189	328	208	180	388	2,885	98	130	228	137	119	256	2,289	78	102	181	108	93	203	567	18	25	42	27	23	49
217	4,422	340	109	449	146	347	493	2,953	252	76	328	96	247	342	2,343	200	60	260	77	196	271	565	45	13	58	18	45	63
218	2,558	184	91	275	100	174	274	1,792	136	63	199	67	124	190	1,422	108	50	159	53	97	150	327	24	12	35	13	23	35
219	4,665	449	114	563	153	461	614	3,302	336	81	416	106	338	443	2,620	266	65	331	84	267	351	597	57	15	72	20	59	79
229	3,628	395	59	454	97	388	485	2,551	295	43	338	66	283	349	2,025	234	34	268	53	225	277	465	50	8	58	12	50	62
230	1,996	87	70	157	84	96	180	1,265	63	48	110	53	61	114	1,003	49	37	86	42	49	91	255	11	9	20	11	12	23
231	303	17	15	32	21	23	44	200	11	10	21	12	12	25	158	9	8	16	10	10	20	38	2	1	5	2	4	6
232	2,616	227	72	299	90	208	298	1,834	169	51	219	60	149	209	1,455	133	39	174	47	119	166	335	29	10	38	11	27	38
233	1,222	74	25	99	40	71	111	749	53	16	69	23	45	67	594	42	14	55	18	35	54	156	9	4	13	5	9	13
Other	618	43	9	52	21	40	61	375	31	6	36	11	23	35	298	24	4	29	9	18	28	80	6	2	6	3	5	8
TOTAL	**156,490**	**7,612**	**4,254**	**11,923**	**5,683**	**9,644**	**15,394**	**98,024**	**5,524**	**2,902**	**8,465**	**3,633**	**6,586**	**10,258**	**77,792**	**4,382**	**2,301**	**6,719**	**2,879**	**5,226**	**8,144**	**20,027**	**973**	**549**	**1,525**	**724**	**1,235**	**1,970**

TAZ	Bike Trips							Ped Trips						
	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total	Daily	AM in	AM out	AM Total	PM in	PM out	PM Total
198	11	1	0	1	0	0	1	40	2	0	4	1	3	4
199	23	1	0	1	1	2	2	78	6	1	6	3	5	7
200	64	2	2	5	3	3	6	227	8	10	17	11	9	20
201	228	8	8	15	9	11	20	793	28	26	54	32	37	68
202	35	1	1	2	2	2	3	120	7	4	9	6	6	11
203	343	5	4	9	9	11	20	1,195	17	13	29	33	39	71
204	330	9	8	17	12	15	25	1,150	34	27	61	39	50	89
205	656	34	12	46	22	51	72	2,284	119	42	161	75	177	252
206	199	19	2	22	5	21	28	696	63	9	78	19	73	97
211	402	20	14	34	16	23	40	1,397	65	52	117	57	81	140
212	184	5	7	13	8	8	16	643	21	25	45	28	27	55
213	272	18	8	26	9	21	31	944	65	30	96	33	73	106
214	182	4	9	13	10	6	15	634	13	32	45	34	22	55
215	57	1	2	4	3	3	5	202	7	8	16	10	8	18
216	102	3	4	7	5	4	10	353	11	16	26	16	14	32
217	102	7	2	11	3	8	12	354	27	9	36	11	28	38
218	59	4	2	6	2	4	6	205	14	7	22	8	14	22
219	108	10	2	12	4	11	14	373	36	9	45	13	37	49
229	83	9	1	10	3	9	11	291	32	4	36	8	31	38
230	46	2	1	4	2	3	4	160	7	5	12	7	7	14
231	6	0	0	0	0	0	1	24	1	1	3	2	1	3
232	61	5	2	7	2	5	7	210	19	5	24	7	16	23
233	28	1	0	2	1	2	2	98	6	2	7	4	5	8
Other	14	1	0	1	0	0	2	49	3	0	4	1	4	5
TOTAL	**3,595**	**170**	**91**	**268**	**131**	**223**	**353**	**12,520**	**611**	**337**	**953**	**458**	**767**	**1,225**

Appendix D

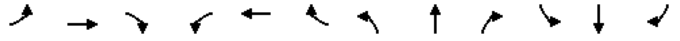
Intersection Level of Service Calculation Worksheets

Existing AM
Peak Hour Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	273	1775	0	0	0	0	0	1202	181	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0						6.0	6.0			
Lane Util. Factor		0.86						0.81	0.81			
Frpb, ped/bikes		1.00						1.00	1.00			
Flpb, ped/bikes		0.98						1.00	1.00			
Frt		1.00						1.00	0.85			
Flt Protected		0.99						1.00	1.00			
Satd. Flow (prot)		5600						5420	1154			
Flt Permitted		0.99						1.00	1.00			
Satd. Flow (perm)		5600						5420	1154			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	273	1775	0	0	0	0	0	1202	181	0	0	0
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2030	0	0	0	0	0	1220	163	0	0	0
Confl. Peds. (#/hr)	103		84				120					
Turn Type	Perm								Perm			
Protected Phases		5						4 6				
Permitted Phases	5								4 6			
Actuated Green, G (s)		51.2						56.8	56.8			
Effective Green, g (s)		51.2						56.8	56.8			
Actuated g/C Ratio		0.43						0.47	0.47			
Clearance Time (s)		6.0										
Vehicle Extension (s)		1.0										
Lane Grp Cap (vph)		2389						2565	546			
v/s Ratio Prot								c0.23				
v/s Ratio Perm		0.36							0.14			
v/c Ratio		0.85						0.48	0.30			
Uniform Delay, d1		30.9						21.5	19.4			
Progression Factor		1.00						0.10	0.10			
Incremental Delay, d2		4.0						0.0	0.1			
Delay (s)		35.0						2.1	2.1			
Level of Service		C						A	A			
Approach Delay (s)		35.0			0.0			2.1			0.0	
Approach LOS		C			A			A			A	

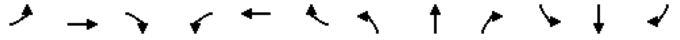
Intersection Summary			
HCM Average Control Delay	21.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	579	0	0	0	732	0	651	28	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0				6.0		6.0				
Lane Util. Factor		0.91				0.76		0.81				
Frpb, ped/bikes		1.00				1.00		1.00				
Flpb, ped/bikes		1.00				1.00		1.00				
Frt		1.00				0.85		0.99				
Flt Protected		1.00				1.00		1.00				
Satd. Flow (prot)		4577				3249		6315				
Flt Permitted		1.00				1.00		1.00				
Satd. Flow (perm)		4577				3249		6315				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	579	0	0	0	732	0	651	28	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	580	0	6	0	0	0	0
Lane Group Flow (vph)	0	579	0	0	0	153	0	673	0	0	0	0
Confl. Peds. (#/hr)									59			
Parking (#/hr)							40	40	40			
Turn Type						custom						
Protected Phases		2				6		4				
Permitted Phases												
Actuated Green, G (s)		82.2				25.0		25.8				
Effective Green, g (s)		82.2				25.0		25.8				
Actuated g/C Ratio		0.68				0.21		0.22				
Clearance Time (s)		6.0				6.0		6.0				
Vehicle Extension (s)		1.0				2.0		1.0				
Lane Grp Cap (vph)		3135				677		1358				
v/s Ratio Prot		c0.13				c0.05		c0.11				
v/s Ratio Perm												
v/c Ratio		0.18				0.23		0.50				
Uniform Delay, d1		6.8				39.5		41.4				
Progression Factor		1.00				1.00		1.00				
Incremental Delay, d2		0.1				0.1		0.1				
Delay (s)		6.9				39.5		41.5				
Level of Service		A				D		D				
Approach Delay (s)		6.9			39.5			41.5			0.0	
Approach LOS		A			D			D			A	

Intersection Summary			
HCM Average Control Delay	30.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

1020: Kapiolani Boulevard & Ward Avenue



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	389	77	294	1007	78	63	370	56	103	717	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.0	5.0	6.0	5.0	5.0	
Lane Util. Factor		0.91			0.91		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		0.98			1.00		1.00	1.00	0.87	1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.98			0.99		1.00	1.00	0.85	1.00	0.97	
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		4396			4490		1593	3185	1247	1593	3060	
Flt Permitted		1.00			0.69		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		4396			3151		1593	3185	1247	1593	3060	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	389	77	294	1007	78	63	370	56	103	717	162
RTOR Reduction (vph)	0	20	0	0	4	0	0	0	13	0	10	0
Lane Group Flow (vph)	0	446	0	0	1375	0	63	370	43	103	869	0
Confl. Peds. (#/hr)			53				36		76	76		36
Turn Type				Prot			Prot		custom	Prot		
Protected Phases		6		5	2		3	8		7	4	
Permitted Phases									2 5 6 8			
Actuated Green, G (s)		23.6			58.1		7.2	36.2	99.3	11.2	40.2	
Effective Green, g (s)		23.6			58.1		7.2	36.2	94.3	11.2	40.2	
Actuated g/C Ratio		0.19			0.48		0.06	0.30	0.78	0.09	0.33	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		5.0			5.0		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)		854			1832		94	949	968	147	1012	
v/s Ratio Prot		0.10			c0.18		0.04	0.12		c0.06	c0.28	
v/s Ratio Perm					c0.18				0.03			
v/c Ratio		0.52			0.75		0.67	0.39	0.04	0.70	0.86	
Uniform Delay, d1		43.9			25.8		56.0	33.9	3.2	53.5	38.0	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.1			2.1		13.7	0.1	0.0	11.6	7.1	
Delay (s)		45.0			27.9		69.7	34.0	3.2	65.1	45.1	
Level of Service		D			C		E	C	A	E	D	
Approach Delay (s)		45.0			27.9			35.1			47.2	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	37.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	121.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	100.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

1030: Kapiolani Boulevard & Kamakee Street

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	541	46	138	1385	81	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.91			0.91	1.00	1.00
Frpb, ped/bikes	0.99			1.00	1.00	0.97
Flpb, ped/bikes	1.00			1.00	0.97	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	4491			4541	1542	1379
Flt Permitted	1.00			0.79	0.95	1.00
Satd. Flow (perm)	4491			3607	1542	1379
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	541	46	138	1385	81	65
RTOR Reduction (vph)	5	0	0	0	0	0
Lane Group Flow (vph)	582	0	0	1523	81	65
Confl. Peds. (#/hr)		38	38		21	14
Turn Type			Perm			custom
Protected Phases	2			2		
Permitted Phases			2		4	4 2
Actuated Green, G (s)	94.8			94.8	15.2	120.0
Effective Green, g (s)	94.8			94.8	15.2	120.0
Actuated g/C Ratio	0.79			0.79	0.13	1.00
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	5.0			5.0	3.0	
Lane Grp Cap (vph)	3548			2850	195	1379
v/s Ratio Prot	0.13					
v/s Ratio Perm				c0.42	c0.05	0.05
v/c Ratio	0.16			0.53	0.42	0.05
Uniform Delay, d1	3.0			4.6	48.3	0.0
Progression Factor	1.00			1.81	1.00	1.00
Incremental Delay, d2	0.1			0.6	1.4	0.0
Delay (s)	3.1			8.9	49.7	0.0
Level of Service	A			A	D	A
Approach Delay (s)	3.1			8.9	27.6	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	8.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

1040: Kapiolani Boulevard & Pensacola Street

3/21/2008

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	460	108	86	1196	0	0	0	0	141	609	369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.91			0.91					1.00	0.95	1.00
Frpb, ped/bikes		0.99			1.00					1.00	1.00	0.94
Flpb, ped/bikes		1.00			1.00					1.00	1.00	1.00
Frt		0.97			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	1.00	1.00
Satd. Flow (prot)		4411			4561					1593	3185	942
Flt Permitted		1.00			0.83					0.95	1.00	1.00
Satd. Flow (perm)		4411			3813					1593	3185	942
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	460	108	86	1196	0	0	0	0	141	609	369
RTOR Reduction (vph)	0	17	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	551	0	0	1282	0	0	0	0	141	609	369
Confl. Peds. (#/hr)	57		20									30
Parking (#/hr)												40
Turn Type				Perm						Perm		custom
Protected Phases		6			6						4	
Permitted Phases				6						4		4 6
Actuated Green, G (s)		73.5			73.5					36.5	36.5	120.0
Effective Green, g (s)		73.5			73.5					36.5	36.5	120.0
Actuated g/C Ratio		0.61			0.61					0.30	0.30	1.00
Clearance Time (s)		5.0			5.0					5.0	5.0	
Vehicle Extension (s)		5.0			5.0					2.0	2.0	
Lane Grp Cap (vph)		2702			2335					485	969	942
v/s Ratio Prot		0.12									c0.19	
v/s Ratio Perm					c0.34					0.09		0.39
v/c Ratio		0.20			0.55					0.29	0.63	0.39
Uniform Delay, d1		10.3			13.6					31.9	35.9	0.0
Progression Factor		1.61			0.98					1.00	1.00	1.00
Incremental Delay, d2		0.2			0.8					0.1	0.9	0.1
Delay (s)		16.8			14.1					32.0	36.8	0.1
Level of Service		B			B					C	D	A
Approach Delay (s)		16.8			14.1			0.0			24.1	
Approach LOS		B			B			A			C	

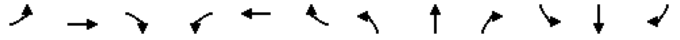
Intersection Summary				
HCM Average Control Delay	18.4	HCM Level of Service		B
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		10.0
Intersection Capacity Utilization	79.6%	ICU Level of Service		D
Analysis Period (min)	15			
c Critical Lane Group				

1050: Kapiolani Boulevard & Piikoi Street

3/21/2008

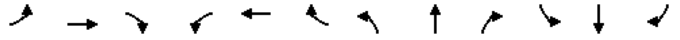
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	513	62	58	1300	167	66	838	59	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.91			0.91		1.00	0.91	1.00			
Frpb, ped/bikes		1.00			0.99		1.00	1.00	0.93			
Flpb, ped/bikes		1.00			1.00		0.96	1.00	1.00			
Frt		0.98			0.98		1.00	1.00	0.85			
Flt Protected		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		4484			4462		1535	4577	1328			
Flt Permitted		1.00			0.88		0.95	1.00	1.00			
Satd. Flow (perm)		4484			3931		1535	4577	1328			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	513	62	58	1300	167	66	838	59	0	0	0
RTOR Reduction (vph)	0	12	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	563	0	0	1524	0	66	838	59	0	0	0
Confl. Peds. (#/hr)	35		21	21		35	22		43			
Turn Type				Perm			Perm		custom			
Protected Phases		2			2			4				
Permitted Phases				2			4		2 4			
Actuated Green, G (s)		84.3			84.3		25.7	25.7	120.0			
Effective Green, g (s)		84.3			84.3		25.7	25.7	120.0			
Actuated g/C Ratio		0.70			0.70		0.21	0.21	1.00			
Clearance Time (s)		5.0			5.0		5.0	5.0				
Vehicle Extension (s)		5.0			5.0		2.0	2.0				
Lane Grp Cap (vph)		3150			2762		329	980	1328			
v/s Ratio Prot		0.13						c0.18				
v/s Ratio Perm					c0.39		0.04		0.04			
v/c Ratio		0.18			0.55		0.20	0.86	0.04			
Uniform Delay, d1		6.1			8.7		38.7	45.4	0.0			
Progression Factor		1.05			1.00		1.12	1.08	1.00			
Incremental Delay, d2		0.1			0.8		0.1	7.0	0.0			
Delay (s)		6.5			9.5		43.5	56.0	0.0			
Level of Service		A			A		D	E	A			
Approach Delay (s)		6.5			9.5			51.7			0.0	
Approach LOS		A			A			D			A	

Intersection Summary				
HCM Average Control Delay	22.2	HCM Level of Service		C
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		10.0
Intersection Capacity Utilization	86.9%	ICU Level of Service		E
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	2159	153	0	1916	110	52	53	3	13	14	59
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0			6.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91			0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00		0.90	1.00			0.95	1.00
Frt	1.00	0.99			0.99		1.00	0.99			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1486	3907			3921		1432	1663			1560	1425
Flt Permitted	0.95	1.00			1.00		0.74	1.00			0.88	1.00
Satd. Flow (perm)	1486	3907			3921		1115	1663			1402	1425
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	190	2159	153	0	1916	110	52	53	3	13	14	59
RTOR Reduction (vph)	0	4	0	0	5	0	0	2	0	0	0	0
Lane Group Flow (vph)	190	2308	0	0	2021	0	52	54	0	0	27	59
Confl. Peds. (#/hr)	8		21	21		8	70			70		
Turn Type	Prot						Perm			Perm		custom
Protected Phases	5	2			6			4			4	
Permitted Phases							4			4		4 5 6
Actuated Green, G (s)	21.9	108.7			81.8		20.3	20.3			20.3	140.0
Effective Green, g (s)	21.9	108.7			81.8		20.3	20.3			20.3	134.0
Actuated g/C Ratio	0.16	0.78			0.58		0.15	0.15			0.15	0.96
Clearance Time (s)	5.0	6.0			6.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0	5.0			5.0		4.0	4.0			4.0	
Lane Grp Cap (vph)	232	3034			2291		162	241			203	1364
v/s Ratio Prot	0.13	c0.59			c0.52			0.03				
v/s Ratio Perm							c0.05				0.02	0.04
v/c Ratio	0.82	0.76			0.88		0.32	0.23			0.13	0.04
Uniform Delay, d1	57.1	8.5			25.0		53.7	52.9			52.2	0.1
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	19.7	1.9			5.4		1.6	0.7			0.4	0.0
Delay (s)	76.8	10.4			30.3		55.2	53.5			52.6	0.2
Level of Service	E	B			C		E	D			D	A
Approach Delay (s)		15.4			30.3			54.4			16.6	
Approach LOS		B			C			D			B	

Intersection Summary				
HCM Average Control Delay	22.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	84.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	2049	19	4	2012	25	13	11	18	9	10	27
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			4.5	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.98			0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	
Frt	1.00	1.00		1.00	1.00			0.94			0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1486	3950		1481	3948			1501			1475	
Flt Permitted	0.95	1.00		1.00	1.00			0.64			0.95	
Satd. Flow (perm)	1486	3950		1559	3948			979			1408	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	165	2049	19	4	2012	25	13	11	18	9	10	27
RTOR Reduction (vph)	0	0	0	0	1	0	0	17	0	0	24	0
Lane Group Flow (vph)	165	2068	0	4	2036	0	0	25	0	0	22	0
Confl. Peds. (#/hr)	10		16	16		10	22		8	8		22
Parking (#/hr)												40
Turn Type	Prot			custom			Perm			Perm		
Protected Phases	5	2			6			3			4	
Permitted Phases				1			3			4		
Actuated Green, G (s)	23.3	97.2		2.0	75.9			7.3			13.5	
Effective Green, g (s)	23.3	97.2		2.0	75.9			7.3			13.5	
Actuated g/C Ratio	0.17	0.69		0.01	0.54			0.05			0.10	
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			4.5	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			2.0			2.0	
Lane Grp Cap (vph)	246	2733		22	2133			51			135	
v/s Ratio Prot	c0.11	c0.52			c0.52							
v/s Ratio Perm				0.00				c0.03			c0.02	
v/c Ratio	0.67	0.76		0.18	0.95			0.49			0.16	
Uniform Delay, d1	55.0	14.0		68.4	30.7			64.8			58.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	5.5	2.0		1.4	11.4			2.7			0.2	
Delay (s)	60.5	16.0		69.9	42.0			67.5			58.5	
Level of Service	E	B		E	D			E			E	
Approach Delay (s)		19.3			42.1			67.5			58.5	
Approach LOS		B			D			E			E	

Intersection Summary				
HCM Average Control Delay	30.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	140.5	Sum of lost time (s)	26.5	
Intersection Capacity Utilization	83.4%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	72	1851	87	33	1869	23	12	10	16	14	22	23
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.89
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.97			1.00	1.00
Frt	1.00	0.99		1.00	1.00			0.94			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	1.00
Satd. Flow (prot)	1486	3920		1486	3947			1500			1231	953
Flt Permitted	0.95	1.00		0.95	1.00			0.91			0.89	1.00
Satd. Flow (perm)	1486	3920		1486	3947			1386			1113	953
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	72	1851	87	33	1869	23	12	10	16	14	22	23
RTOR Reduction (vph)	0	2	0	0	1	0	0	14	0	0	0	0
Lane Group Flow (vph)	72	1936	0	33	1891	0	0	24	0	0	36	23
Confl. Peds. (#/hr)	15		12	12		15	42		3	3		42
Parking (#/hr)											30	30
Turn Type	Prot			Prot			Perm			Perm		custom
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		4 5 2
Actuated Green, G (s)	9.9	103.9		5.5	99.5			14.6			14.6	139.4
Effective Green, g (s)	9.9	103.9		5.5	99.5			14.6			14.6	133.4
Actuated g/C Ratio	0.07	0.74		0.04	0.71			0.10			0.10	0.95
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			3.0			2.0	
Lane Grp Cap (vph)	105	2909		58	2805			145			116	908
v/s Ratio Prot	c0.05	c0.49		0.02	0.48							
v/s Ratio Perm								0.02			c0.03	0.02
v/c Ratio	0.69	0.67		0.57	0.67			0.16			0.31	0.03
Uniform Delay, d1	63.5	9.2		66.1	11.2			57.1			58.0	0.2
Progression Factor	1.00	1.00		1.06	0.27			1.00			1.00	1.00
Incremental Delay, d2	13.8	1.2		5.0	0.9			0.5			0.6	0.0
Delay (s)	77.3	10.4		75.0	3.9			57.7			58.6	0.2
Level of Service	E	B		E	A			E			E	A
Approach Delay (s)		12.8			5.1			57.7			35.8	
Approach LOS		B			A			E			D	

Intersection Summary				
HCM Average Control Delay	9.9	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	76.9%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	82	1733	22	13	2019	48	21	15	3	24	25	40
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1486	3947		1486	3940			1618	1400		1632	1391
Flt Permitted	0.95	1.00		0.95	1.00			0.82	1.00		0.84	1.00
Satd. Flow (perm)	1486	3947		1486	3940			1363	1400		1409	1391
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	82	1733	22	13	2019	48	21	15	3	24	25	40
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	82	1754	0	13	2066	0	0	36	3	0	49	40
Confl. Peds. (#/hr)	17		17	17		17	6		3	3		6
Turn Type	Prot			Prot			Perm		custom	Perm		custom
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4		4 1 2	4		4 5 6
Actuated Green, G (s)	12.1	104.5		5.0	97.4			14.5	140.0		14.5	140.0
Effective Green, g (s)	12.1	104.5		5.0	97.4			14.5	134.0		14.5	134.0
Actuated g/C Ratio	0.09	0.75		0.04	0.70			0.10	0.96		0.10	0.96
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			4.0			4.0	
Lane Grp Cap (vph)	128	2946		53	2741			141	1340		146	1331
v/s Ratio Prot	c0.06	0.44		0.01	c0.52							
v/s Ratio Perm								0.03	0.00		c0.03	0.03
v/c Ratio	0.64	0.60		0.25	0.75			0.26	0.00		0.34	0.03
Uniform Delay, d1	61.8	8.1		65.7	13.6			57.8	0.1		58.3	0.1
Progression Factor	1.31	0.23		1.01	0.64			1.00	1.00		1.00	1.00
Incremental Delay, d2	6.2	0.7		0.1	0.2			1.3	0.0		1.9	0.0
Delay (s)	87.2	2.5		66.4	8.9			59.1	0.1		60.1	0.1
Level of Service	F	A		E	A			E	A		E	A
Approach Delay (s)		6.3			9.3			54.6			33.2	
Approach LOS		A			A			D			C	

Intersection Summary				
HCM Average Control Delay	8.9	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	79.2%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

1100: Ala Moana Boulevard & Ward Avenue

3/21/2008

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	209	1554	3	116	1887	176	5	17	29	125	115	238
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0		5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00		0.95	1.00	0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.96		1.00	0.93	1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	0.94	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1486	3957		1486	3958	1274		3143	1327	1368	2673	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.69	1.00	0.74	0.95	
Satd. Flow (perm)	1486	3957		1486	3958	1274		2205	1327	1068	2531	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	209	1554	3	116	1887	176	5	17	29	125	115	238
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	25	0	207	0
Lane Group Flow (vph)	209	1557	0	116	1887	176	0	22	4	112	159	0
Confl. Peds. (#/hr)	17		33	33		17	14		36	36		14
Turn Type	Prot			Prot		custom	Perm		Perm	Perm		
Protected Phases	5	2		1	6			3			4	
Permitted Phases						6 5 3 4	3		3	4		
Actuated Green, G (s)	24.2	69.8		13.5	59.1	140.0		17.6	17.6	18.1	18.1	
Effective Green, g (s)	24.2	69.8		13.5	59.1	125.0		17.6	17.6	18.1	18.1	
Actuated g/C Ratio	0.17	0.50		0.10	0.42	0.89		0.13	0.13	0.13	0.13	
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0	5.0	5.0	5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	257	1973		143	1671	1138		277	167	138	327	
v/s Ratio Prot	c0.14	0.39		0.08	c0.48							
v/s Ratio Perm						c0.14		0.01	0.00	c0.10	0.06	
v/c Ratio	0.81	0.79		0.81	1.13	0.15		0.08	0.02	0.81	0.49	
Uniform Delay, d1	55.7	29.0		62.0	40.4	0.9		54.0	53.7	59.3	56.6	
Progression Factor	1.13	0.92		1.36	0.60	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.2	2.7		22.3	64.8	0.0		0.0	0.0	27.8	0.4	
Delay (s)	77.4	29.3		106.7	89.1	1.0		54.1	53.7	87.1	57.0	
Level of Service	E	C		F	F	A		D	D	F	E	
Approach Delay (s)		35.0			82.9			53.9			64.1	
Approach LOS		D			F			D			E	

Intersection Summary				
HCM Average Control Delay	61.7	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	88.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

1110: Ala Moana Boulevard & Kewalo Basin

3/21/2008

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1488	34	0	2164	31	31
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900
Lane Width	11	10	10	11	12	12
Total Lost time (s)	6.0			6.0	5.0	
Lane Util. Factor	0.91			0.91	1.00	
Frpb, ped/bikes	1.00			1.00	0.97	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.93	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	3937			3958	1483	
Flt Permitted	1.00			1.00	0.98	
Satd. Flow (perm)	3937			3958	1483	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1488	34	0	2164	31	31
RTOR Reduction (vph)	1	0	0	0	29	0
Lane Group Flow (vph)	1521	0	0	2164	33	0
Confl. Peds. (#/hr)		27				8
Turn Type						
Protected Phases	6			2	4	
Permitted Phases						
Actuated Green, G (s)	121.4			121.4	7.6	
Effective Green, g (s)	121.4			121.4	7.6	
Actuated g/C Ratio	0.87			0.87	0.05	
Clearance Time (s)	6.0			6.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	3414			3432	81	
v/s Ratio Prot	0.39			c0.55	c0.02	
v/s Ratio Perm						
v/c Ratio	0.45			0.63	0.40	
Uniform Delay, d1	2.0			2.7	64.0	
Progression Factor	0.13			1.08	1.00	
Incremental Delay, d2	0.1			0.7	3.3	
Delay (s)	0.3			3.6	67.3	
Level of Service	A			A	E	
Approach Delay (s)	0.3			3.6	67.3	
Approach LOS	A			A	E	

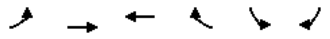
Intersection Summary				
HCM Average Control Delay	3.3	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.0	
Intersection Capacity Utilization	67.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	1433	102	19	1861	105	28	59	26	13	47	112
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	0.91		1.00	0.79
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.98	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.99	1.00
Satd. Flow (prot)	1486	3908		1486	3882			1650	1293		1633	1122
Flt Permitted	0.95	1.00		0.95	1.00			0.88	1.00		0.93	1.00
Satd. Flow (perm)	1486	3908		1486	3882			1482	1293		1533	1122
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	56	1433	102	19	1861	105	28	59	26	13	47	112
RTOR Reduction (vph)	0	3	0	0	3	0	0	0	0	0	0	0
Lane Group Flow (vph)	56	1532	0	19	1963	0	0	87	26	0	60	112
Confl. Peds. (#/hr)	112		17	17		112			45	45		112
Turn Type	Prot			Prot			Perm		custom	Perm		custom
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4		4 1 2	4		4 1 2
Actuated Green, G (s)	9.7	102.3		4.5	97.1			17.2	140.0		17.2	140.0
Effective Green, g (s)	9.7	102.3		4.5	97.1			17.2	134.0		17.2	134.0
Actuated g/C Ratio	0.07	0.73		0.03	0.69			0.12	0.96		0.12	0.96
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			2.0			2.0	
Lane Grp Cap (vph)	103	2856		48	2692			182	1238		188	1074
v/s Ratio Prot	c0.04	0.39		0.01	c0.51							
v/s Ratio Perm								c0.06	0.02		0.04	0.10
v/c Ratio	0.54	0.54		0.40	0.73			0.48	0.02		0.32	0.10
Uniform Delay, d1	63.0	8.3		66.4	13.3			57.2	0.1		56.1	0.1
Progression Factor	0.60	1.96		1.23	0.04			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.9	0.7		1.3	1.2			0.7	0.0		0.4	0.0
Delay (s)	40.9	17.1		83.0	1.7			57.9	0.1		56.4	0.2
Level of Service	D	B		F	A			E	A		E	A
Approach Delay (s)		17.9			2.5			44.6			19.8	
Approach LOS		B			A			D			B	

Intersection Summary			
HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	96.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	8	1468	1952	237	69	26
Ideal Flow (vphpl)	1900	1700	1700	1900	1900	1900
Lane Width	10	11	10	11	12	12
Total Lost time (s)	5.0	6.0	6.0		5.0	5.0
Lane Util. Factor	1.00	0.91	0.91		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1486	3958	3724		3090	1353
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1486	3958	3724		3090	1353
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	8	1468	1952	237	69	26
RTOR Reduction (vph)	0	0	6	0	0	22
Lane Group Flow (vph)	8	1468	2183	0	69	4
Confl. Peds. (#/hr)				33		28
Turn Type	Prot					Perm
Protected Phases	1	6	2		4	
Permitted Phases						4
Actuated Green, G (s)	1.6	109.5	102.9		19.5	19.5
Effective Green, g (s)	1.6	109.5	102.9		19.5	19.5
Actuated g/C Ratio	0.01	0.78	0.74		0.14	0.14
Clearance Time (s)	5.0	6.0	6.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	17	3096	2737		430	188
v/s Ratio Prot	0.01	c0.37	c0.59		c0.02	
v/s Ratio Perm						0.00
v/c Ratio	0.47	0.47	0.80		0.16	0.02
Uniform Delay, d1	68.8	5.3	11.9		53.0	52.0
Progression Factor	0.78	0.61	0.47		1.00	1.00
Incremental Delay, d2	16.8	0.5	0.2		0.2	0.0
Delay (s)	70.6	3.7	5.8		53.2	52.0
Level of Service	E	A	A		D	D
Approach Delay (s)		4.1	5.8		52.9	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	6.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	467	1148	1948	310	121	189
Ideal Flow (vphpl)	1900	1700	1700	1900	1900	1900
Lane Width	10	11	10	11	12	12
Total Lost time (s)	4.0	10.0	10.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	2884	3958	3714		1593	2508
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	2884	3958	3714		1593	2508
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	467	1148	1948	310	121	189
RTOR Reduction (vph)	0	0	13	0	0	0
Lane Group Flow (vph)	467	1148	2245	0	121	189
Confl. Peds. (#/hr)	42			42	42	
Turn Type	Prot					custom
Protected Phases	3	6	2		4	3 4
Permitted Phases						6
Actuated Green, G (s)	27.5	73.7	73.7		20.8	126.0
Effective Green, g (s)	27.5	73.7	73.7		20.8	126.0
Actuated g/C Ratio	0.20	0.53	0.53		0.15	0.90
Clearance Time (s)	4.0	10.0	10.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	567	2084	1955		237	2329
v/s Ratio Prot	c0.16	0.29	c0.60		c0.08	0.03
v/s Ratio Perm						0.05
v/c Ratio	0.82	0.55	1.15		0.51	0.08
Uniform Delay, d1	53.9	22.1	33.2		54.9	0.8
Progression Factor	0.89	1.17	1.00		1.00	1.00
Incremental Delay, d2	8.8	1.0	73.2		1.9	0.0
Delay (s)	56.6	26.8	106.3		56.8	0.8
Level of Service	E	C	F		E	A
Approach Delay (s)		35.4	106.3		22.6	
Approach LOS		D	F		C	

Intersection Summary				
HCM Average Control Delay	72.8	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.97			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	93.1%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	57	20	67	136	91	91	292	68	57	358	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00		0.99	1.00		0.97	1.00		0.98	1.00	
Frt		0.97		1.00	0.94		1.00	0.97		1.00	0.99	
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3036		1579	1091		1543	2761		1559	2649	
Flt Permitted		0.88		0.69	1.00		0.52	1.00		0.54	1.00	
Satd. Flow (perm)		2707		1151	1091		841	2761		881	2649	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	18	57	20	67	136	91	91	292	68	57	358	39
RTOR Reduction (vph)	0	15	0	0	32	0	0	16	0	0	7	0
Lane Group Flow (vph)	0	80	0	67	195	0	91	344	0	57	390	0
Confl. Peds. (#/hr)	12		8	8		12	25		27	27		25
Parking (#/hr)					40	40		20	20		40	40
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		20.5		20.5	20.5		59.5	59.5		59.5	59.5	
Effective Green, g (s)		20.5		20.5	20.5		59.5	59.5		59.5	59.5	
Actuated g/C Ratio		0.23		0.23	0.23		0.66	0.66		0.66	0.66	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0		2.0	2.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		617		262	249		556	1825		582	1751	
v/s Ratio Prot					c0.18			0.12			c0.15	
v/s Ratio Perm		0.03		0.06			0.11			0.06		
v/c Ratio		0.13		0.26	0.78		0.16	0.19		0.10	0.22	
Uniform Delay, d1		27.6		28.5	32.6		5.8	5.9		5.5	6.1	
Progression Factor		1.00		1.00	1.00		1.00	1.00		0.53	0.64	
Incremental Delay, d2		0.0		0.2	13.6		0.6	0.2		0.3	0.3	
Delay (s)		27.7		28.7	46.3		6.4	6.1		3.2	4.1	
Level of Service		C		C	D		A	A		A	A	
Approach Delay (s)		27.7			42.3			6.2			4.0	
Approach LOS		C			D			A			A	

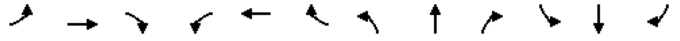
Intersection Summary				
HCM Average Control Delay	15.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	64.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	84	8	61	0	0	0	68	371	6	14	587	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0					6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00					1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98					1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00					0.99	1.00		1.00	1.00	
Frt		0.95					1.00	1.00		1.00	0.96	
Flt Protected		0.97					0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1209					1573	2860		1593	2723	
Flt Permitted		0.83					0.32	1.00		0.53	1.00	
Satd. Flow (perm)		1030					527	2860		885	2723	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	84	8	61	0	0	0	68	371	6	14	587	238
RTOR Reduction (vph)	0	34	0	0	0	0	0	1	0	0	33	0
Lane Group Flow (vph)	0	119	0	0	0	0	68	376	0	14	792	0
Confl. Peds. (#/hr)	3		40	33		17	26					3
Parking (#/hr)		20	20					20	20		20	20
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		19.0					59.0	59.0		59.0	59.0	
Effective Green, g (s)		19.0					59.0	59.0		59.0	59.0	
Actuated g/C Ratio		0.21					0.66	0.66		0.66	0.66	
Clearance Time (s)		6.0					6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0					5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		217					345	1875		580	1785	
v/s Ratio Prot								0.13			c0.29	
v/s Ratio Perm		c0.12					0.13			0.02		
v/c Ratio		0.55					0.20	0.20		0.02	0.44	
Uniform Delay, d1		31.7					6.1	6.1		5.4	7.5	
Progression Factor		1.00					1.21	1.14		0.25	0.15	
Incremental Delay, d2		2.8					1.3	0.2		0.1	0.6	
Delay (s)		34.5					8.6	7.2		1.4	1.8	
Level of Service		C					A	A		A	A	
Approach Delay (s)		34.5			0.0			7.5			1.7	
Approach LOS		C			A			A			A	

Intersection Summary				
HCM Average Control Delay	7.0	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	71.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

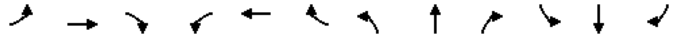
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	116	65	54	239	39	75	422	27	18	751	236
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1586	1260		1582	1310		1593	3143		1593	3022	
Flt Permitted	0.43	1.00		0.60	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	716	1260		1002	1310		1593	3143		1593	3022	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	49	116	65	54	239	39	75	422	27	18	751	236
RTOR Reduction (vph)	0	25	0	0	7	0	0	4	0	0	28	0
Lane Group Flow (vph)	49	156	0	54	271	0	75	445	0	18	959	0
Confl. Peds. (#/hr)	7		9	9		7	30		34	34		30
Parking (#/hr)		20	20		20	20						
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)	23.0	23.0		23.0	23.0		7.4	47.3		2.7	42.6	
Effective Green, g (s)	23.0	23.0		23.0	23.0		7.4	47.3		2.7	42.6	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.08	0.53		0.03	0.47	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	183	322		256	335		131	1652		48	1430	
v/s Ratio Prot		0.12			c0.21		c0.05	c0.14		0.01	c0.32	
v/s Ratio Perm	0.07			0.05								
v/c Ratio	0.27	0.49		0.21	0.81		0.57	0.27		0.38	0.67	
Uniform Delay, d1	26.8	28.5		26.4	31.4		39.8	11.8		42.8	18.3	
Progression Factor	1.00	1.00		1.00	1.00		1.01	0.94		1.00	1.00	
Incremental Delay, d2	0.8	1.2		0.4	13.4		3.7	0.4		1.8	2.5	
Delay (s)	27.6	29.6		26.8	44.9		43.8	11.4		44.6	20.8	
Level of Service	C	C		C	D		D	B		D	C	
Approach Delay (s)		29.2			41.9			16.1			21.2	
Approach LOS		C			D			B			C	

Intersection Summary				
HCM Average Control Delay	24.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	23.0	
Intersection Capacity Utilization	82.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	6	10	8	0	10	4	734	39	19	370	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1614	1425		1593	1425	1593	4542		1593	4577	
Flt Permitted		0.79	1.00		0.74	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1328	1425		1241	1425	1593	4542		1593	4577	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	6	10	8	0	10	4	734	39	19	370	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	26	10	0	8	10	4	771	0	19	370	0
Turn Type	Perm		custom	Perm		custom	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		1 2 4	8		5 6 8						
Actuated Green, G (s)		12.0	122.4		12.0	122.4	1.9	91.6		3.8	93.5	
Effective Green, g (s)		12.0	122.4		12.0	122.4	1.9	91.6		3.8	93.5	
Actuated g/C Ratio		0.10	1.00		0.10	1.00	0.02	0.75		0.03	0.76	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		130	1425		122	1425	25	3399		49	3496	
v/s Ratio Prot							0.00	c0.17		c0.01	0.08	
v/s Ratio Perm		c0.02	c0.01		0.01	0.01						
v/c Ratio		0.20	0.01		0.07	0.01	0.16	0.23		0.39	0.11	
Uniform Delay, d1		50.8	0.0		50.1	0.0	59.5	4.7		58.2	3.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.8	0.0		0.2	0.0	1.1	0.2		1.8	0.1	
Delay (s)		51.5	0.0		50.3	0.0	60.6	4.8		60.0	3.8	
Level of Service		D	A		D	A	E	A		E	A	
Approach Delay (s)		37.2			22.4			5.1			6.5	
Approach LOS		D			C			A			A	

Intersection Summary				
HCM Average Control Delay	6.8	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.23			
Actuated Cycle Length (s)	122.4	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	37.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	290	157	206	0	0	52	0	752	81	0	183	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			5.0		5.0			5.0	
Lane Util. Factor	1.00	0.95	1.00			0.88		0.86			0.95	
Frpb, ped/bikes	1.00	1.00	0.93			0.99		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00			1.00		1.00			1.00	
Frt	1.00	1.00	0.85			0.85		0.99			1.00	
Flt Protected	0.95	1.00	1.00			1.00		1.00			1.00	
Satd. Flow (prot)	1593	3185	931			2471		5683			3185	
Flt Permitted	0.95	1.00	1.00			1.00		1.00			1.00	
Satd. Flow (perm)	1593	3185	931			2471		5683			3185	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	290	157	206	0	0	52	0	752	81	0	183	0
RTOR Reduction (vph)	0	0	159	0	0	47	0	15	0	0	0	0
Lane Group Flow (vph)	290	157	47	0	0	5	0	818	0	0	183	0
Confl. Peds. (#/hr)			43			1	35					
Parking (#/hr)			40									
Turn Type	custom		Perm			custom						
Protected Phases	7	4						2			2	
Permitted Phases	8		4			8						
Actuated Green, G (s)	22.1	27.1	27.1			12.1		82.9			82.9	
Effective Green, g (s)	22.1	27.1	27.1			12.1		82.9			82.9	
Actuated g/C Ratio	0.18	0.23	0.23			0.10		0.69			0.69	
Clearance Time (s)	5.0	5.0	5.0			5.0		5.0			5.0	
Vehicle Extension (s)	2.0	3.0	3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)	360	719	210			249		3926			2200	
v/s Ratio Prot	c0.07	0.05						c0.14			0.06	
v/s Ratio Perm	0.11		0.05			0.00						
v/c Ratio	0.81	0.22	0.22			0.02		0.21			0.08	
Uniform Delay, d1	48.8	37.8	37.9			48.6		6.7			6.1	
Progression Factor	1.00	1.00	1.00			1.00		1.00			1.59	
Incremental Delay, d2	11.7	0.2	0.5			0.0		0.1			0.1	
Delay (s)	60.5	38.0	38.4			48.6		6.8			9.8	
Level of Service	E	D	D			D		A			A	
Approach Delay (s)		48.1			48.6			6.8			9.8	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM Average Control Delay	24.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.36			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	51.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	54	3	77	66	93	35	884	157	0	100	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0	5.0		5.0			5.0	
Lane Util. Factor		1.00		0.95	0.95	1.00		0.86			0.95	
Frpb, ped/bikes		1.00		1.00	1.00	0.97		0.99			0.99	
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00			1.00	
Frt		0.99		1.00	1.00	0.85		0.98			0.98	
Flt Protected		1.00		0.95	0.99	1.00		1.00			1.00	
Satd. Flow (prot)		1661		1507	1582	1377		5545			3109	
Flt Permitted		1.00		0.75	0.96	1.00		0.92			1.00	
Satd. Flow (perm)		1657		1193	1536	1377		5104			3109	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	54	3	77	66	93	35	884	157	0	100	12
RTOR Reduction (vph)	0	2	0	0	0	0	0	18	0	0	2	0
Lane Group Flow (vph)	0	56	0	68	75	93	0	1058	0	0	110	0
Confl. Peds. (#/hr)	14		3	3		14	23		34			23
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm		custom	Perm					
Protected Phases		4			4			2			2	
Permitted Phases	4			4		4 2	2					
Actuated Green, G (s)		14.9		14.9	14.9	120.0		95.1			95.1	
Effective Green, g (s)		14.9		14.9	14.9	120.0		95.1			95.1	
Actuated g/C Ratio		0.12		0.12	0.12	1.00		0.79			0.79	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			5.0			5.0	
Lane Grp Cap (vph)		206		148	191	1377		4045			2464	
v/s Ratio Prot											0.04	
v/s Ratio Perm		0.03		c0.06	0.05	0.07		c0.21				
v/c Ratio		0.27		0.46	0.39	0.07		0.26			0.04	
Uniform Delay, d1		47.6		48.8	48.4	0.0		3.3			2.7	
Progression Factor		1.00		1.00	1.00	1.00		0.88			0.86	
Incremental Delay, d2		0.7		2.3	1.3	0.0		0.1			0.0	
Delay (s)		48.4		51.1	49.7	0.0		3.0			2.3	
Level of Service		D		D	D	A		A			A	
Approach Delay (s)		48.4			30.5			3.0			2.3	
Approach LOS		D			C			A			A	

Intersection Summary				
HCM Average Control Delay	9.1	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.29			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	51.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	247	23	0	0	0	28	0	67	340	31	387
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0					5.0		5.0	5.0	5.0	5.0
Lane Util. Factor		0.95					1.00		1.00	0.95	0.95	1.00
Frpb, ped/bikes		0.99					1.00		1.00	1.00	1.00	0.97
Flpb, ped/bikes		1.00					0.99		1.00	1.00	1.00	1.00
Frt		0.99					1.00		0.85	1.00	1.00	0.85
Flt Protected		1.00					0.95		1.00	0.95	0.96	1.00
Satd. Flow (prot)		2656					1576		1425	1513	1529	1383
Flt Permitted		1.00					0.28		1.00	0.95	0.96	1.00
Satd. Flow (perm)		2656					464		1425	1513	1529	1383
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	247	23	0	0	0	28	0	67	340	31	387
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	26	72	61	0
Lane Group Flow (vph)	0	265	0	0	0	0	28	0	41	112	126	387
Confl. Peds. (#/hr)			19				13					13
Parking (#/hr)		40										
Turn Type							custom		custom	Split		custom
Protected Phases		4								2	2	
Permitted Phases							1		2			2 1 4
Actuated Green, G (s)		19.3					14.3		75.6	75.6	75.6	124.2
Effective Green, g (s)		19.3					14.3		75.6	75.6	75.6	124.2
Actuated g/C Ratio		0.16					0.12		0.61	0.61	0.61	1.00
Clearance Time (s)		5.0					5.0		5.0	5.0	5.0	
Vehicle Extension (s)		3.0					2.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		413					53		867	921	931	1383
v/s Ratio Prot		c0.10								0.07	0.08	
v/s Ratio Perm							c0.06		0.03			c0.28
v/c Ratio		0.64					0.53		0.05	0.12	0.14	0.28
Uniform Delay, d1		49.2					51.8		9.8	10.3	10.4	0.0
Progression Factor		1.00					1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2		3.4					4.3		0.1	0.3	0.3	0.0
Delay (s)		52.6					56.1		9.9	10.5	10.7	0.0
Level of Service		D					E		A	B	B	A
Approach Delay (s)		52.6			0.0			23.5			5.2	
Approach LOS		D			A			C			A	

Intersection Summary				
HCM Average Control Delay	18.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	124.2	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	64.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

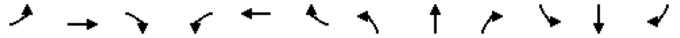
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	28	84	12	195	187	12	49	79	66	57	129	180
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	28	84	12	195	187	12	49	79	66	57	129	180

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	28	96	195	199	89	106	122	245
Volume Left (vph)	28	0	195	0	49	0	57	0
Volume Right (vph)	0	12	0	12	0	66	0	180
Hadj (s)	0.53	-0.05	0.53	-0.01	0.31	-0.40	0.27	-0.48
Departure Headway (s)	7.2	6.6	6.7	6.2	6.8	6.1	6.5	5.8
Degree Utilization, x	0.06	0.18	0.37	0.34	0.17	0.18	0.22	0.39
Capacity (veh/h)	467	510	510	555	498	553	523	594
Control Delay (s)	9.4	9.8	12.4	11.2	10.0	9.2	10.2	11.3
Approach Delay (s)	9.7		11.8		9.6		10.9	
Approach LOS	A		B		A		B	

Intersection Summary				
Delay	10.9			
HCM Level of Service	B			
Intersection Capacity Utilization	54.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	46	52	3	145	90	52	92	23	63	136	201
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.97	1.00	1.00
Frt	1.00	0.92		1.00	0.94		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1593	2606		1593	2669		1588	3061		1544	1676	1403
Flt Permitted	0.95	1.00		0.95	1.00		0.62	1.00		0.68	1.00	1.00
Satd. Flow (perm)	1593	2606		1593	2669		1030	3061		1104	1676	1403
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	6	46	52	3	145	90	52	92	23	63	136	201
RTOR Reduction (vph)	0	18	0	0	36	0	0	19	0	0	0	0
Lane Group Flow (vph)	6	80	0	3	199	0	52	96	0	63	136	201
Confl. Peds. (#/hr)	14		8	8		14	3		29	29		3
Parking (#/hr)		20	20		20	20						
Turn Type	Prot			Prot			Perm			Perm		custom
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		4 1 2
Actuated Green, G (s)	5.3	58.7		1.0	54.4		14.7	14.7		14.7	14.7	90.4
Effective Green, g (s)	5.3	58.7		1.0	54.4		14.7	14.7		14.7	14.7	84.4
Actuated g/C Ratio	0.06	0.65		0.01	0.60		0.16	0.16		0.16	0.16	0.93
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	93	1692		18	1606		167	498		180	273	1310
v/s Ratio Prot	0.00	0.03		0.00	0.07			0.03			c0.08	
v/s Ratio Perm							0.05			0.06		c0.14
v/c Ratio	0.06	0.05		0.17	0.12		0.31	0.19		0.35	0.50	0.15
Uniform Delay, d1	40.2	5.7		44.3	7.7		33.4	32.7		33.6	34.5	0.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1		1.6	0.2		1.1	0.2		1.2	1.4	0.1
Delay (s)	40.3	5.8		45.9	7.9		34.5	32.9		34.8	35.9	0.3
Level of Service	D	A		D	A		C	C		C	D	A
Approach Delay (s)		7.8			8.4			33.4			17.8	
Approach LOS		A			A			C			B	

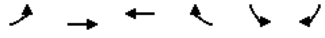
Intersection Summary					
HCM Average Control Delay	17.1	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.21				
Actuated Cycle Length (s)	90.4	Sum of lost time (s)		5.0	
Intersection Capacity Utilization	50.4%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	189	0	0	413	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0							
Lane Util. Factor		0.95			0.95							
Frt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		2707			2867							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		2707			2867							
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	189	0	0	413	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	189	0	0	413	0	0	0	0	0	0	0
Parking (#/hr)	40	40			20	20						
Turn Type	Perm			Perm								
Protected Phases		2			2							
Permitted Phases	2			2								
Actuated Green, G (s)		76.6			76.6							
Effective Green, g (s)		76.6			76.6							
Actuated g/C Ratio		0.82			0.82							
Clearance Time (s)		5.0			5.0							
Vehicle Extension (s)		3.0			3.0							
Lane Grp Cap (vph)		2230			2361							
v/s Ratio Prot		0.07			c0.14							
v/s Ratio Perm												
v/c Ratio		0.08			0.17							
Uniform Delay, d1		1.6			1.7							
Progression Factor		1.00			1.00							
Incremental Delay, d2		0.1			0.2							
Delay (s)		1.6			1.9							
Level of Service		A			A							
Approach Delay (s)		1.6			1.9			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary				
HCM Average Control Delay	1.8	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.17			
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	16.4	
Intersection Capacity Utilization	20.8%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	150	390	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0			
Lane Util. Factor		0.95	0.95			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		2867	2867			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		2867	2867			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	150	390	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	150	390	0	0	0
Parking (#/hr)		20	20	20		
Turn Type	Perm					
Protected Phases		4	8			
Permitted Phases	4					
Actuated Green, G (s)		8.5	8.5			
Effective Green, g (s)		8.5	8.5			
Actuated g/C Ratio		0.46	0.46			
Clearance Time (s)		5.0	5.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		1317	1317			
v/s Ratio Prot		0.05	c0.14			
v/s Ratio Perm						
v/c Ratio		0.11	0.30			
Uniform Delay, d1		2.9	3.1			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.0	0.1			
Delay (s)		2.9	3.3			
Level of Service		A	A			
Approach Delay (s)		2.9	3.3		0.0	
Approach LOS		A	A		A	

Intersection Summary				
HCM Average Control Delay	3.2	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.30			
Actuated Cycle Length (s)	18.5	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	16.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

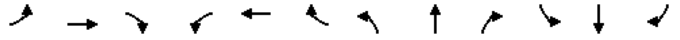
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	121	119	89	59	80	131	44	258	25	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0		6.0				
Lane Util. Factor		0.95			1.00	1.00		0.95				
Frpb, ped/bikes		0.99			1.00	1.00		1.00				
Flpb, ped/bikes		0.98			1.00	1.00		1.00				
Frt		0.96			1.00	0.85		0.99				
Flt Protected		0.98			0.98	1.00		0.99				
Satd. Flow (prot)		2905			1272	1104		3102				
Flt Permitted		0.80			0.72	1.00		0.99				
Satd. Flow (perm)		2353			932	1104		3102				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	121	119	89	59	80	131	44	258	25	0	0	0
RTOR Reduction (vph)	0	52	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	277	0	0	139	131	0	322	0	0	0	0
Confl. Peds. (#/hr)	72		31				34		36			
Parking (#/hr)					25	25						
Turn Type	Perm			Perm		custom	Perm					
Protected Phases		4			4			2				
Permitted Phases	4			4		2 4	2					
Actuated Green, G (s)		17.3			17.3	73.7		44.4				
Effective Green, g (s)		17.3			17.3	73.7		44.4				
Actuated g/C Ratio		0.23			0.23	1.00		0.60				
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			4.0				
Lane Grp Cap (vph)		552			219	1104		1869				
v/s Ratio Prot												
v/s Ratio Perm		0.12			c0.15	0.12		0.10				
v/c Ratio		0.50			0.63	0.12		0.17				
Uniform Delay, d1		24.5			25.4	0.0		6.5				
Progression Factor		1.00			1.00	1.00		1.00				
Incremental Delay, d2		0.7			5.9	0.0		0.2				
Delay (s)		25.2			31.3	0.0		6.7				
Level of Service		C			C	A		A				
Approach Delay (s)		25.2			16.1			6.7			0.0	
Approach LOS		C			B			A			A	

Intersection Summary				
HCM Average Control Delay	16.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.30			
Actuated Cycle Length (s)	73.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	62.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	213	198	0	0	81	73	33	365	17	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95	1.00			
Frpb, ped/bikes		1.00			1.00	0.92	1.00	1.00	0.91			
Flpb, ped/bikes		0.97			1.00	1.00	0.89	1.00	1.00			
Frt		1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected		0.97			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)		3001			1425	1111	1060	2787	975			
Flt Permitted		0.77			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)		2364			1425	1111	1060	2787	975			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	213	198	0	0	81	73	33	365	17	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	13	0	0	0
Lane Group Flow (vph)	0	411	0	0	81	73	33	365	4	0	0	0
Confl. Peds. (#/hr)	78		80			78	64		73			
Parking (#/hr)					10	10	30	30	30			
Turn Type	Perm					custom	Perm		Perm			
Protected Phases		2			2			8				
Permitted Phases	2					2 8	8		8			
Actuated Green, G (s)		45.2			45.2	73.8	18.6	18.6	18.6			
Effective Green, g (s)		45.2			45.2	73.8	18.6	18.6	18.6			
Actuated g/C Ratio		0.61			0.61	1.00	0.25	0.25	0.25			
Clearance Time (s)		5.0			5.0		5.0	5.0	5.0			
Vehicle Extension (s)		3.0			3.0		5.0	5.0	5.0			
Lane Grp Cap (vph)		1448			873	1111	267	702	246			
v/s Ratio Prot					0.06			c0.13				
v/s Ratio Perm		c0.17				0.07	0.03		0.00			
v/c Ratio		0.28			0.09	0.07	0.12	0.52	0.02			
Uniform Delay, d1		6.7			5.9	0.0	21.3	23.8	20.7			
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		0.5			0.2	0.1	0.4	1.3	0.1			
Delay (s)		7.2			6.1	0.1	21.7	25.1	20.8			
Level of Service		A			A	A	C	C	C			
Approach Delay (s)		7.2			3.2			24.6			0.0	
Approach LOS		A			A			C			A	

Intersection Summary				
HCM Average Control Delay	14.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.35			
Actuated Cycle Length (s)	73.8	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	69.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

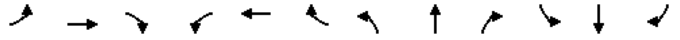
1280: Queen Street & South Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	104	355	0	0	614	68	110	560	30	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.95			0.95		1.00	0.91	1.00			
Frpb, ped/bikes		1.00			0.99		1.00	1.00	0.95			
Flpb, ped/bikes		1.00			1.00		0.89	1.00	1.00			
Frt		1.00			0.99		1.00	1.00	0.85			
Flt Protected		0.99			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		3143			3114		1059	4195	1015			
Flt Permitted		0.68			1.00		0.95	1.00	1.00			
Satd. Flow (perm)		2164			3114		1059	4195	1015			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	104	355	0	0	614	68	110	560	30	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	23	0	0	0
Lane Group Flow (vph)	0	459	0	0	674	0	110	560	7	0	0	0
Confl. Peds. (#/hr)	37		44	37		44	105		36			
Parking (#/hr)							30	30	30			
Turn Type	Prot						Perm		Perm			
Protected Phases	1	6			2			4				
Permitted Phases							4		4			
Actuated Green, G (s)		54.0			38.3		18.6	18.6	18.6			
Effective Green, g (s)		54.0			38.3		18.6	18.6	18.6			
Actuated g/C Ratio		0.65			0.46		0.23	0.23	0.23			
Clearance Time (s)		5.0			5.0		5.0	5.0	5.0			
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0			
Lane Grp Cap (vph)		1542			1444		238	945	229			
v/s Ratio Prot		c0.04			c0.22			c0.13				
v/s Ratio Perm		0.16					0.10		0.01			
v/c Ratio		0.30			0.47		0.46	0.59	0.03			
Uniform Delay, d1		6.1			15.2		27.7	28.6	25.0			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.1			1.1		1.4	1.0	0.1			
Delay (s)		6.3			16.2		29.1	29.6	25.0			
Level of Service		A			B		C	C	C			
Approach Delay (s)		6.3			16.2			29.3			0.0	
Approach LOS		A			B			C			A	

Intersection Summary				
HCM Average Control Delay	18.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	82.6	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	65.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

1290: Queen Street & Emily Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	288	24	15	557	6	30	8	37	10	7	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.98			0.94	
Flpb, ped/bikes		1.00			1.00			0.98			1.00	
Frt		0.99			1.00			0.93			0.89	
Flt Protected		1.00			1.00			0.98			1.00	
Satd. Flow (prot)		3130			3173			1181			1108	
Flt Permitted		0.91			0.94			0.83			0.93	
Satd. Flow (perm)		2868			2993			996			1034	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	17	288	24	15	557	6	30	8	37	10	7	93
RTOR Reduction (vph)	0	3	0	0	0	0	0	31	0	0	80	0
Lane Group Flow (vph)	0	326	0	0	578	0	0	44	0	0	30	0
Confl. Peds. (#/hr)	24		10	10		24	50		18	18		50
Parking (#/hr)								20	20		20	20
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			2	
Permitted Phases	1			1			3			2		
Actuated Green, G (s)		54.5			54.5			11.4			13.2	
Effective Green, g (s)		54.5			54.5			11.4			13.2	
Actuated g/C Ratio		0.57			0.57			0.12			0.14	
Clearance Time (s)		7.0			7.0			5.0			5.0	
Vehicle Extension (s)		4.0			4.0			2.0			3.0	
Lane Grp Cap (vph)		1626			1697			118			142	
v/s Ratio Prot												
v/s Ratio Perm		0.11			c0.19			c0.04			c0.03	
v/c Ratio		0.20			0.34			0.37			0.21	
Uniform Delay, d1		10.2			11.2			39.1			36.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.3			0.5			0.7			0.7	
Delay (s)		10.4			11.7			39.8			37.6	
Level of Service		B			B			D			D	
Approach Delay (s)		10.4			11.7			39.8			37.6	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	15.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.32			
Actuated Cycle Length (s)	96.1	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	57.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	185	59	77	439	27	17	279	36	13	226	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0			6.0	6.0		6.0	
Lane Util. Factor		1.00	1.00		0.95			1.00	1.00		0.95	
Frt		1.00	0.85		0.99			1.00	0.85		0.95	
Flt Protected		0.99	1.00		0.99			1.00	1.00		1.00	
Satd. Flow (prot)		1332	1140		2668			1337	1140		3013	
Flt Permitted		0.90	1.00		0.87			0.96	1.00		0.94	
Satd. Flow (perm)		1209	1140		2342			1294	1140		2833	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	28	185	59	77	439	27	17	279	36	13	226	128
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	25	0	88	0
Lane Group Flow (vph)	0	213	59	0	539	0	0	296	11	0	279	0
Parking (#/hr)		20	20		40	40		20	20			
Turn Type	Perm		custom	Perm			Perm		Perm	Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2		2 4	2			4		4	4		
Actuated Green, G (s)		40.4	76.4		40.4			24.0	24.0		24.0	
Effective Green, g (s)		40.4	76.4		40.4			24.0	24.0		24.0	
Actuated g/C Ratio		0.53	1.00		0.53			0.31	0.31		0.31	
Clearance Time (s)		6.0			6.0			6.0	6.0		6.0	
Vehicle Extension (s)		5.0			5.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		639	1140		1238			406	358		890	
v/s Ratio Prot												
v/s Ratio Perm		0.18	0.05		c0.23			c0.23	0.01		0.10	
v/c Ratio		0.33	0.05		0.44			0.73	0.03		0.31	
Uniform Delay, d1		10.3	0.0		11.0			23.3	18.1		19.9	
Progression Factor		1.00	1.00		1.00			1.00	1.00		1.00	
Incremental Delay, d2		1.4	0.0		1.1			6.4	0.0		0.2	
Delay (s)		11.7	0.0		12.1			29.7	18.2		20.1	
Level of Service		B	A		B			C	B		C	
Approach Delay (s)		9.2			12.1			28.5			20.1	
Approach LOS		A			B			C			C	

Intersection Summary				
HCM Average Control Delay	17.1	HCM Level of Service		B
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	76.4	Sum of lost time (s)		12.0
Intersection Capacity Utilization	76.2%	ICU Level of Service		D
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	34	83	28	51	106	35	23	201	5	31	229	60
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	34	83	28	51	106	35	23	201	5	31	229	60

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	145	192	224	5	260	60
Volume Left (vph)	34	51	23	0	31	0
Volume Right (vph)	28	35	0	5	0	60
Hadj (s)	-0.03	-0.02	0.09	-0.67	0.09	-0.67
Departure Headway (s)	5.7	5.6	6.0	5.3	5.9	5.2
Degree Utilization, x	0.23	0.30	0.38	0.01	0.43	0.09
Capacity (veh/h)	564	582	553	631	576	656
Control Delay (s)	10.4	11.0	11.4	7.1	12.1	7.5
Approach Delay (s)	10.4	11.0	11.3		11.2	
Approach LOS	B	B	B		B	

Intersection Summary				
Delay	11.1			
HCM Level of Service	B			
Intersection Capacity Utilization	55.4%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	49	68	18	28	185	58	13	157	22	36	156	118
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	49	68	18	28	185	58	13	157	22	36	156	118

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	135	271	170	22	114	196
Volume Left (vph)	49	28	13	0	36	0
Volume Right (vph)	18	58	0	22	0	118
Hadj (s)	0.03	-0.07	0.07	-0.67	0.19	-0.39
Departure Headway (s)	5.7	5.4	6.2	5.5	6.2	5.6
Degree Utilization, x	0.21	0.41	0.29	0.03	0.20	0.30
Capacity (veh/h)	569	624	531	605	547	605
Control Delay (s)	10.3	12.0	10.5	7.4	9.5	9.8
Approach Delay (s)	10.3	12.0	10.2		9.7	
Approach LOS	B	B	B		A	

Intersection Summary				
Delay		10.6		
HCM Level of Service		B		
Intersection Capacity Utilization		52.6%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	41	23	16	2	11	20	22	144	15	20	100	54
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	41	23	16	2	11	20	22	144	15	20	100	54
Pedestrians		9			7			7			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								424				
pX, platoon unblocked												
vC, conflicting volume	398	386	93	320	398	159	163			166		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	398	386	93	320	398	159	163			166		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	96	98	100	98	98	98			99		
cM capacity (veh/h)	492	523	933	554	515	847	1403			1401		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	80	33	166	15	70	104
Volume Left	41	2	22	0	20	0
Volume Right	16	20	0	15	0	54
cSH	554	680	1403	1700	1401	1700
Volume to Capacity	0.14	0.05	0.02	0.01	0.01	0.06
Queue Length 95th (ft)	13	4	1	0	1	0
Control Delay (s)	12.6	10.6	1.1	0.0	2.3	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	12.6	10.6	1.0		0.9	
Approach LOS	B	B				

Intersection Summary				
Average Delay		3.6		
Intersection Capacity Utilization		40.5%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection Level of Service Calculation Worksheets

Existing PM
Peak Hour Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	1779	0	0	0	0	0	1361	696	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0						6.0	6.0			
Lane Util. Factor		0.86						0.81	0.81			
Frpb, ped/bikes		1.00						1.00	1.00			
Flpb, ped/bikes		1.00						1.00	1.00			
Frt		1.00						0.97	0.85			
Flt Protected		1.00						1.00	1.00			
Satd. Flow (prot)		5751						5274	1154			
Flt Permitted		1.00						1.00	1.00			
Satd. Flow (perm)		5751						5274	1154			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	103	1779	0	0	0	0	0	1361	696	0	0	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1875	0	0	0	0	0	1688	369	0	0	0
Confl. Peds. (#/hr)			55	55			148					148
Turn Type	Perm								Perm			
Protected Phases		5						4 6				
Permitted Phases	5								4 6			
Actuated Green, G (s)		42.0						66.0	66.0			
Effective Green, g (s)		42.0						66.0	66.0			
Actuated g/C Ratio		0.35						0.55	0.55			
Clearance Time (s)		6.0										
Vehicle Extension (s)		1.0										
Lane Grp Cap (vph)		2013						2901	635			
v/s Ratio Prot								c0.32				
v/s Ratio Perm		0.33							0.32			
v/c Ratio		0.93						0.58	0.58			
Uniform Delay, d1		37.6						17.9	17.8			
Progression Factor		1.00						0.12	0.21			
Incremental Delay, d2		9.3						0.2	0.7			
Delay (s)		46.9						2.4	4.4			
Level of Service		D						A	A			
Approach Delay (s)		46.9			0.0			2.7			0.0	
Approach LOS		D			A			A			A	

Intersection Summary				
HCM Average Control Delay	23.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	72.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	772	0	0	0	746	0	1311	50	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	10	12	12	12	12	12	12
Total Lost time (s)		6.0				6.0		6.0				
Lane Util. Factor		0.91				0.76		0.81				
Frpb, ped/bikes		1.00				1.00		0.99				
Flpb, ped/bikes		1.00				1.00		1.00				
Frt		1.00				0.85		0.99				
Flt Protected		1.00				1.00		1.00				
Satd. Flow (prot)		4424				3032		6718				
Flt Permitted		1.00				1.00		1.00				
Satd. Flow (perm)		4424				3032		6718				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	772	0	0	0	746	0	1311	50	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	591	0	5	0	0	0	0
Lane Group Flow (vph)	0	772	0	0	0	155	0	1356	0	0	0	0
Confl. Peds. (#/hr)			118	118			94		79	79		94
Turn Type						custom						
Protected Phases		2				6		4				
Permitted Phases												
Actuated Green, G (s)		73.0				25.0		35.0				
Effective Green, g (s)		73.0				25.0		35.0				
Actuated g/C Ratio		0.61				0.21		0.29				
Clearance Time (s)		6.0				6.0		6.0				
Vehicle Extension (s)		1.0				2.0		1.0				
Lane Grp Cap (vph)		2691				632		1959				
v/s Ratio Prot		c0.17				0.05		c0.20				
v/s Ratio Perm												
v/c Ratio		0.29				0.25		0.69				
Uniform Delay, d1		11.2				39.6		37.7				
Progression Factor		1.00				1.00		1.00				
Incremental Delay, d2		0.3				0.1		0.9				
Delay (s)		11.4				39.7		38.6				
Level of Service		B				D		D				
Approach Delay (s)		11.4			39.7			38.6			0.0	
Approach LOS		B			D			D			A	

Intersection Summary				
HCM Average Control Delay	31.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	47.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	745	92	257	693	146	93	752	152	173	669	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	12	12
Total Lost time (s)		6.0			6.0		5.0	5.0	6.0	5.0	5.0	
Lane Util. Factor		0.91			0.91		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		0.98			0.98		1.00	1.00	0.82	1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.98			0.98		1.00	1.00	0.85	1.00	0.98	
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		4132			4029		1593	3185	1169	1593	3098	
Flt Permitted		1.00			0.65		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		4132			2638		1593	3185	1169	1593	3098	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	745	92	257	693	146	93	752	152	173	669	119
RTOR Reduction (vph)	0	9	0	0	12	0	0	0	35	0	8	0
Lane Group Flow (vph)	0	828	0	0	1084	0	93	752	117	173	780	0
Confl. Peds. (#/hr)	83		71	71		83	10		87	87		10
Turn Type				Prot			Prot		custom	Prot		
Protected Phases		6		5	2		3	8		7	4	
Permitted Phases									2 5 6 8			
Actuated Green, G (s)		46.2			81.4		12.7	40.3	126.7	19.8	47.4	
Effective Green, g (s)		46.2			81.4		12.7	40.3	121.7	19.8	47.4	
Actuated g/C Ratio		0.29			0.52		0.08	0.26	0.77	0.13	0.30	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		5.0			5.0		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)		1212			1630		128	815	903	200	932	
v/s Ratio Prot		0.20			c0.13		0.06	c0.24		c0.11	0.25	
v/s Ratio Perm					c0.22				0.10			
v/c Ratio		0.68			0.89dl		0.73	0.92	0.13	0.86	0.84	
Uniform Delay, d1		49.2			28.0		70.7	57.1	4.5	67.5	51.4	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.1			1.4		15.9	15.6	0.1	29.1	6.3	
Delay (s)		51.2			29.4		86.6	72.7	4.7	96.7	57.8	
Level of Service		D			C		F	E	A	F	E	
Approach Delay (s)		51.2			29.4			63.6			64.8	
Approach LOS		D			C			E			E	

Intersection Summary			
HCM Average Control Delay	51.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	157.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	97.0%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1115	61	149	880	148	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	12	12	10	12	12
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.91			0.91	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	0.97
Flpb, ped/bikes	1.00			1.00	0.90	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	4228			4237	1437	1381
Flt Permitted	1.00			0.66	0.95	1.00
Satd. Flow (perm)	4228			2821	1437	1381
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1115	61	149	880	148	207
RTOR Reduction (vph)	4	0	0	0	0	0
Lane Group Flow (vph)	1172	0	0	1029	148	207
Confl. Peds. (#/hr)		18	18		65	13
Turn Type			Perm			custom
Protected Phases	2			2		
Permitted Phases			2		4	4 2
Actuated Green, G (s)	91.7			91.7	18.3	120.0
Effective Green, g (s)	91.7			91.7	18.3	120.0
Actuated g/C Ratio	0.76			0.76	0.15	1.00
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	5.0			5.0	3.0	
Lane Grp Cap (vph)	3231			2156	219	1381
v/s Ratio Prot	0.28					
v/s Ratio Perm				c0.36	c0.10	0.15
v/c Ratio	0.36			0.48	0.68	0.15
Uniform Delay, d1	4.6			5.3	48.0	0.0
Progression Factor	1.00			0.36	1.00	1.00
Incremental Delay, d2	0.3			0.7	8.0	0.1
Delay (s)	4.9			2.6	56.0	0.1
Level of Service	A			A	E	A
Approach Delay (s)	4.9			2.6	23.4	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	6.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	989	179	54	805	0	0	0	0	174	741	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.91			0.91					1.00	0.95	1.00
Frpb, ped/bikes		0.99			1.00					1.00	1.00	0.94
Flpb, ped/bikes		1.00			1.00					1.00	1.00	1.00
Frt		0.98			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	1.00	1.00
Satd. Flow (prot)		4111			4255					1593	3185	937
Flt Permitted		1.00			0.78					0.95	1.00	1.00
Satd. Flow (perm)		4111			3336					1593	3185	937
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	989	179	54	805	0	0	0	0	174	741	234
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1156	0	0	859	0	0	0	0	174	741	234
Confl. Peds. (#/hr)	63		58	58		63						33
Parking (#/hr)												40
Turn Type				Perm						Perm		custom
Protected Phases		6			6						4	
Permitted Phases				6						4		4 6
Actuated Green, G (s)		70.2			70.2					39.8	39.8	120.0
Effective Green, g (s)		70.2			70.2					39.8	39.8	120.0
Actuated g/C Ratio		0.59			0.59					0.33	0.33	1.00
Clearance Time (s)		5.0			5.0					5.0	5.0	
Vehicle Extension (s)		5.0			5.0					2.0	2.0	
Lane Grp Cap (vph)		2405			1952					528	1056	937
v/s Ratio Prot		c0.28									c0.23	
v/s Ratio Perm					0.26					0.11		0.25
v/c Ratio		0.48			0.44					0.33	0.70	0.25
Uniform Delay, d1		14.4			13.9					30.1	34.9	0.0
Progression Factor		0.93			1.39					1.00	1.00	1.00
Incremental Delay, d2		0.7			0.7					0.1	1.7	0.1
Delay (s)		14.1			20.1					30.2	36.7	0.1
Level of Service		B			C					C	D	A
Approach Delay (s)		14.1			20.1			0.0			28.2	
Approach LOS		B			C			A			C	

Intersection Summary				
HCM Average Control Delay	20.8	HCM Level of Service		C
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		10.0
Intersection Capacity Utilization	81.6%	ICU Level of Service		D
Analysis Period (min)	15			

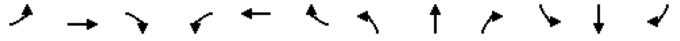
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1117	96	17	466	215	141	1171	156	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.91			0.91		1.00	0.91	1.00			
Frpb, ped/bikes		0.99			0.97		1.00	1.00	0.83			
Flpb, ped/bikes		1.00			1.00		0.86	1.00	1.00			
Frt		0.99			0.95		1.00	1.00	0.85			
Flt Protected		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		4186			3928		1369	4577	1188			
Flt Permitted		1.00			0.89		0.95	1.00	1.00			
Satd. Flow (perm)		4186			3501		1369	4577	1188			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1117	96	17	466	215	141	1171	156	0	0	0
RTOR Reduction (vph)	0	8	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1205	0	0	697	0	141	1171	156	0	0	0
Confl. Peds. (#/hr)	76		71	71		76	86		118	118		86
Turn Type				Perm			Perm		custom			
Protected Phases		2			2			4				
Permitted Phases				2			4		2 4			
Actuated Green, G (s)		72.2			72.2		37.8	37.8	120.0			
Effective Green, g (s)		72.2			72.2		37.8	37.8	120.0			
Actuated g/C Ratio		0.60			0.60		0.32	0.32	1.00			
Clearance Time (s)		5.0			5.0		5.0	5.0				
Vehicle Extension (s)		5.0			5.0		2.0	2.0				
Lane Grp Cap (vph)		2519			2106		431	1442	1188			
v/s Ratio Prot		c0.29						c0.26				
v/s Ratio Perm					0.20		0.10		0.13			
v/c Ratio		0.48			0.33		0.33	0.81	0.13			
Uniform Delay, d1		13.4			11.9		31.4	37.8	0.0			
Progression Factor		1.16			1.00		0.98	0.98	1.00			
Incremental Delay, d2		0.6			0.4		0.2	3.3	0.0			
Delay (s)		16.2			12.3		30.9	40.2	0.0			
Level of Service		B			B		C	D	A			
Approach Delay (s)		16.2			12.3			35.0			0.0	
Approach LOS		B			B			D			A	

Intersection Summary				
HCM Average Control Delay	23.6	HCM Level of Service		C
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		10.0
Intersection Capacity Utilization	64.6%	ICU Level of Service		C
Analysis Period (min)	15			

c Critical Lane Group

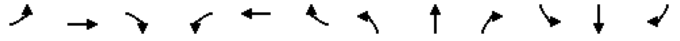
1060: Ala Moana Boulevard & South Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	214	2228	59	0	1990	47	136	63	6	34	11	222
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0			6.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91			0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	0.90
Flpb, ped/bikes	1.00	1.00			1.00		0.92	1.00			1.00	1.00
Frt	1.00	1.00			1.00		1.00	0.99			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1593	4073			3939		1460	1655			1615	1284
Flt Permitted	0.95	1.00			1.00		0.73	1.00			0.77	1.00
Satd. Flow (perm)	1593	4073			3939		1119	1655			1295	1284
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	214	2228	59	0	1990	47	136	63	6	34	11	222
RTOR Reduction (vph)	0	2	0	0	2	0	0	2	0	0	0	0
Lane Group Flow (vph)	214	2285	0	0	2035	0	136	67	0	0	45	222
Confl. Peds. (#/hr)	32		28	28		32	59					59
Turn Type	Prot						Perm			Perm		custom
Protected Phases	5	2			6			4			4	
Permitted Phases							4			4		4 5 6
Actuated Green, G (s)	19.6	105.6			81.0		23.4	23.4			23.4	140.0
Effective Green, g (s)	19.6	105.6			81.0		23.4	23.4			23.4	134.0
Actuated g/C Ratio	0.14	0.75			0.58		0.17	0.17			0.17	0.96
Clearance Time (s)	5.0	6.0			6.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0	5.0			5.0		4.0	4.0			4.0	
Lane Grp Cap (vph)	223	3072			2279		187	277			216	1229
v/s Ratio Prot	c0.13	0.56			c0.52			0.04				
v/s Ratio Perm							c0.12				0.03	0.17
v/c Ratio	0.96	0.74			0.89		0.73	0.24			0.21	0.18
Uniform Delay, d1	59.8	9.6			25.7		55.3	50.6			50.3	0.2
Progression Factor	1.00	1.00			0.30		1.00	1.00			1.00	1.00
Incremental Delay, d2	48.3	1.7			0.6		14.0	0.6			0.7	0.1
Delay (s)	108.1	11.3			8.2		69.3	51.2			51.0	0.3
Level of Service	F	B			A		E	D			D	A
Approach Delay (s)		19.6			8.2			63.2			8.8	
Approach LOS		B			A			E			A	

Intersection Summary				
HCM Average Control Delay	16.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	97.0%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

1070: Ala Moana Boulevard & Keawe Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	1974	29	6	2219	75	63	14	4	20	3	147
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.95	
Flpb, ped/bikes	1.00	1.00		0.99	1.00			0.98			0.99	
Frt	1.00	1.00		1.00	1.00			0.99			0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1486	3944		1479	3932			1568			1380	
Flt Permitted	0.95	1.00		1.00	1.00			0.20			0.95	
Satd. Flow (perm)	1486	3944		1557	3932			330			1321	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	48	1974	29	6	2219	75	63	14	4	20	3	147
RTOR Reduction (vph)	0	1	0	0	2	0	0	2	0	0	132	0
Lane Group Flow (vph)	48	2002	0	6	2292	0	0	79	0	0	38	0
Confl. Peds. (#/hr)	9		22	22		9	26		42	42		26
Parking (#/hr)												40
Turn Type	Prot			custom			Perm			Perm		
Protected Phases	5	2			6			3			4	
Permitted Phases				1			3			4		
Actuated Green, G (s)	8.0	82.2		2.4	76.6			20.0			14.4	
Effective Green, g (s)	8.0	82.2		2.4	76.6			20.0			14.4	
Actuated g/C Ratio	0.06	0.59		0.02	0.55			0.14			0.10	
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			2.0			2.0	
Lane Grp Cap (vph)	85	2316		27	2151			47			136	
v/s Ratio Prot	c0.03	c0.51			c0.58							
v/s Ratio Perm				0.00				c0.24			c0.03	
v/c Ratio	0.56	0.86		0.22	1.07			1.69			0.28	
Uniform Delay, d1	64.3	24.2		67.9	31.7			60.0			58.0	
Progression Factor	1.34	0.56		1.12	0.96			1.00			1.00	
Incremental Delay, d2	3.4	3.1		1.4	38.8			384.7			0.4	
Delay (s)	89.6	16.7		77.3	69.2			444.7			58.4	
Level of Service	F	B		E	E			F			E	
Approach Delay (s)		18.4			69.2			444.7			58.4	
Approach LOS		B			E			F			E	

Intersection Summary				
HCM Average Control Delay	52.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.10			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	27.0	
Intersection Capacity Utilization	86.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	2517	10	13	1704	47	49	45	24	15	29	49
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.89
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.96			1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	1.00
Satd. Flow (prot)	1486	3953		1486	3943			1524			1232	946
Flt Permitted	0.95	1.00		0.95	1.00			0.85			0.89	1.00
Satd. Flow (perm)	1486	3953		1486	3943			1315			1110	946
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	23	2517	10	13	1704	47	49	45	24	15	29	49
RTOR Reduction (vph)	0	0	0	0	1	0	0	7	0	0	0	0
Lane Group Flow (vph)	23	2527	0	13	1750	0	0	111	0	0	44	49
Confl. Peds. (#/hr)			42	42			45		7	7		45
Parking (#/hr)											30	30
Turn Type	Prot			Prot			Perm			Perm		custom
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		4 5 2
Actuated Green, G (s)	5.9	102.8		2.9	99.8			18.3			18.3	138.0
Effective Green, g (s)	5.9	102.8		2.9	99.8			18.3			18.3	132.0
Actuated g/C Ratio	0.04	0.73		0.02	0.71			0.13			0.13	0.94
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			3.0			2.0	
Lane Grp Cap (vph)	63	2903		31	2811			172			145	892
v/s Ratio Prot	c0.02	c0.64		0.01	0.44							
v/s Ratio Perm								c0.08			0.04	0.05
v/c Ratio	0.37	0.87		0.42	0.62			0.65			0.30	0.05
Uniform Delay, d1	65.2	13.7		67.7	10.4			57.8			55.1	0.2
Progression Factor	1.25	0.44		1.06	0.18			1.00			1.00	1.00
Incremental Delay, d2	1.0	3.0		3.0	0.9			8.1			0.4	0.0
Delay (s)	82.6	9.0		74.8	2.8			65.8			55.5	0.3
Level of Service	F	A		E	A			E			E	A
Approach Delay (s)		9.7			3.3			65.8			26.4	
Approach LOS		A			A			E			C	

Intersection Summary			
HCM Average Control Delay	9.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	1930	13	5	1512	41	16	36	6	39	33	90
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.97	1.00
Satd. Flow (prot)	1486	3950		1486	3935			1637	1400		1627	1366
Flt Permitted	0.95	1.00		0.95	1.00			0.90	1.00		0.81	1.00
Satd. Flow (perm)	1486	3950		1486	3935			1495	1400		1349	1366
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	1930	13	5	1512	41	16	36	6	39	33	90
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	40	1943	0	5	1552	0	0	52	6	0	72	90
Confl. Peds. (#/hr)	25		37	37		25	15		3	3		15
Turn Type	Prot			Prot			Perm		custom	Perm		custom
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4		4 1 2	4		4 5 6
Actuated Green, G (s)	7.3	102.3		5.2	100.2			16.5	140.0		16.5	140.0
Effective Green, g (s)	7.3	102.3		5.2	100.2			16.5	134.0		16.5	134.0
Actuated g/C Ratio	0.05	0.73		0.04	0.72			0.12	0.96		0.12	0.96
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			4.0			4.0	
Lane Grp Cap (vph)	77	2886		55	2816			176	1340		159	1307
v/s Ratio Prot	c0.03	c0.49		0.00	0.39							
v/s Ratio Perm								0.03	0.00		c0.05	c0.07
v/c Ratio	0.52	0.67		0.09	0.55			0.30	0.00		0.45	0.07
Uniform Delay, d1	64.6	10.0		65.1	9.3			56.4	0.1		57.5	0.1
Progression Factor	1.21	0.16		1.04	0.13			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.3	0.7		0.1	0.4			1.3	0.0		2.8	0.0
Delay (s)	79.8	2.2		67.6	1.6			57.7	0.1		60.3	0.2
Level of Service	E	A		E	A			E	A		E	A
Approach Delay (s)		3.8			1.8			51.8			26.9	
Approach LOS		A			A			D			C	

Intersection Summary			
HCM Average Control Delay	4.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

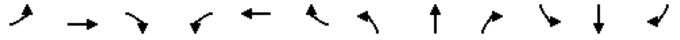
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	224	1861	3	67	1494	170	7	134	92	265	72	321
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0		5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00		0.95	1.00	0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.93		1.00	0.91	1.00	0.95	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	0.93	0.99	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (prot)	1486	3957		1486	3958	1233		3175	1295	1353	2549	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.68	1.00	0.66	0.88	
Satd. Flow (perm)	1486	3957		1486	3958	1233		2165	1295	944	2267	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	224	1861	3	67	1494	170	7	134	92	265	72	321
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	79	0	258	0
Lane Group Flow (vph)	224	1864	0	67	1494	170	0	141	13	209	191	0
Confl. Peds. (#/hr)	34		43	43		34	30		50	50		30
Turn Type	Prot			Prot		custom	Perm		Perm	Perm		
Protected Phases	5	2		1	6			3			4	
Permitted Phases						6 5 3 4	3		3	4		
Actuated Green, G (s)	15.0	62.6		9.4	57.0	140.0		19.5	19.5	27.5	27.5	
Effective Green, g (s)	15.0	62.6		9.4	57.0	125.0		19.5	19.5	27.5	27.5	
Actuated g/C Ratio	0.11	0.45		0.07	0.41	0.89		0.14	0.14	0.20	0.20	
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0	5.0	5.0	5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	159	1769		100	1611	1101		302	180	185	445	
v/s Ratio Prot	c0.15	c0.47		0.05	0.38							
v/s Ratio Perm						0.14		c0.07	0.01	c0.22	0.08	
v/c Ratio	1.41	1.05		0.67	0.93	0.15		0.47	0.07	1.13	0.43	
Uniform Delay, d1	62.5	38.7		63.8	39.5	0.9		55.5	52.4	56.2	49.4	
Progression Factor	1.13	0.95		1.40	0.46	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	210.5	34.9		12.0	10.0	0.0		0.4	0.1	105.3	0.2	
Delay (s)	281.0	71.8		101.6	28.2	1.0		55.9	52.4	161.6	49.6	
Level of Service	F	E		F	C	A		E	D	F	D	
Approach Delay (s)		94.3			28.4			54.5			85.2	
Approach LOS		F			C			D			F	

Intersection Summary			
HCM Average Control Delay	66.8	HCM Level of Service	E
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	102.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2071	29	0	1544	35	78
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900
Lane Width	11	10	10	11	12	12
Total Lost time (s)	6.0			6.0	5.0	
Lane Util. Factor	0.91			0.91	1.00	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	3950			3958	1497	
Flt Permitted	1.00			1.00	0.98	
Satd. Flow (perm)	3950			3958	1497	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2071	29	0	1544	35	78
RTOR Reduction (vph)	1	0	0	0	22	0
Lane Group Flow (vph)	2099	0	0	1544	91	0
Confl. Peds. (#/hr)					45	
Turn Type						
Protected Phases	6			2	4	
Permitted Phases						
Actuated Green, G (s)	115.2			115.2	13.8	
Effective Green, g (s)	115.2			115.2	13.8	
Actuated g/C Ratio	0.82			0.82	0.10	
Clearance Time (s)	6.0			6.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	3250			3257	148	
v/s Ratio Prot	c0.53			0.39	c0.06	
v/s Ratio Perm						
v/c Ratio	0.65			0.47	0.62	
Uniform Delay, d1	4.7			3.6	60.6	
Progression Factor	0.72			0.94	1.00	
Incremental Delay, d2	0.0			0.4	7.4	
Delay (s)	3.4			3.8	68.0	
Level of Service	A			A	E	
Approach Delay (s)	3.4			3.8	68.0	
Approach LOS	A			A	E	

Intersection Summary			
HCM Average Control Delay	5.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

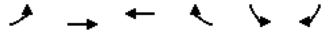
1120: Ala Moana Boulevard & Kamakee Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	2051	183	22	1449	69	54	34	20	57	79	113
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.87		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.96	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1486	3884		1486	3922			1627	1240		1571	1425
Flt Permitted	0.95	1.00		0.95	1.00			0.55	1.00		0.77	1.00
Satd. Flow (perm)	1486	3884		1486	3922			927	1240		1241	1425
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	52	2051	183	22	1449	69	54	34	20	57	79	113
RTOR Reduction (vph)	0	4	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	52	2230	0	22	1516	0	0	88	20	0	136	113
Confl. Peds. (#/hr)	24		39	39		24			66	66		
Turn Type	Prot			Prot			Perm		custom	Perm		custom
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4		4 1 2	4		4 1 2
Actuated Green, G (s)	9.3	99.7		4.7	95.1			19.6	140.0		19.6	140.0
Effective Green, g (s)	9.3	99.7		4.7	95.1			19.6	134.0		19.6	134.0
Actuated g/C Ratio	0.07	0.71		0.03	0.68			0.14	0.96		0.14	0.96
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			2.0			2.0	
Lane Grp Cap (vph)	99	2766		50	2664			130	1187		174	1364
v/s Ratio Prot	c0.03	c0.57		0.01	0.39							
v/s Ratio Perm								0.09	0.02		c0.11	0.08
v/c Ratio	0.53	0.81		0.44	0.57			0.68	0.02		0.78	0.08
Uniform Delay, d1	63.2	13.6		66.4	11.7			57.2	0.1		58.1	0.1
Progression Factor	0.65	1.53		1.31	0.06			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.9	2.1		1.6	0.6			10.4	0.0		18.7	0.0
Delay (s)	42.9	23.0		88.6	1.4			67.6	0.1		76.8	0.1
Level of Service	D	C		F	A			E	A		E	A
Approach Delay (s)		23.4			2.6			55.1			42.0	
Approach LOS		C			A			E			D	

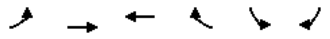
Intersection Summary			
HCM Average Control Delay	17.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

1130: Ala Moana Boulevard & Queen Street



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	13	1911	1684	195	292	52
Ideal Flow (vphpl)	1900	1700	1700	1900	1900	1900
Lane Width	10	11	11	10	12	12
Total Lost time (s)	5.0	6.0	6.0		5.0	5.0
Lane Util. Factor	1.00	0.91	0.91		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1486	3958	3818		3090	1349
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1486	3958	3818		3090	1349
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	13	1911	1684	195	292	52
RTOR Reduction (vph)	0	0	7	0	0	43
Lane Group Flow (vph)	13	1911	1872	0	292	9
Confl. Peds. (#/hr)				84		30
Turn Type	Prot					Perm
Protected Phases	1	6	2		4	
Permitted Phases						4
Actuated Green, G (s)	3.3	105.0	96.7		24.0	24.0
Effective Green, g (s)	3.3	105.0	96.7		24.0	24.0
Actuated g/C Ratio	0.02	0.75	0.69		0.17	0.17
Clearance Time (s)	5.0	6.0	6.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	35	2969	2637		530	231
v/s Ratio Prot	0.01	c0.48	c0.49		c0.09	
v/s Ratio Perm						0.01
v/c Ratio	0.37	0.64	0.71		0.55	0.04
Uniform Delay, d1	67.3	8.5	13.1		53.1	48.4
Progression Factor	0.73	1.19	0.19		1.00	1.00
Incremental Delay, d2	4.0	0.7	0.9		1.2	0.1
Delay (s)	52.9	10.7	3.5		54.3	48.4
Level of Service	D	B	A		D	D
Approach Delay (s)		11.0	3.5		53.4	
Approach LOS		B	A		D	

Intersection Summary			
HCM Average Control Delay	11.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	561	1857	1458	320	213	361
Ideal Flow (vphpl)	1900	1700	1700	1900	1900	1900
Lane Width	10	11	10	11	12	12
Total Lost time (s)	4.0	10.0	10.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.97		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	2884	3958	3617		1593	2508
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	2884	3958	3617		1593	2508
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	561	1857	1458	320	213	361
RTOR Reduction (vph)	0	0	23	0	0	0
Lane Group Flow (vph)	561	1857	1755	0	213	361
Confl. Peds. (#/hr)	130			130	68	
Turn Type	Prot					custom
Protected Phases	3	6	2		4	3 4
Permitted Phases						6
Actuated Green, G (s)	30.5	68.1	68.1		23.4	126.0
Effective Green, g (s)	30.5	68.1	68.1		23.4	126.0
Actuated g/C Ratio	0.22	0.49	0.49		0.17	0.90
Clearance Time (s)	4.0	10.0	10.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	628	1925	1759		266	2329
v/s Ratio Prot	c0.19	0.47	c0.49		c0.13	0.06
v/s Ratio Perm						0.08
v/c Ratio	0.89	0.96	1.00		0.80	0.16
Uniform Delay, d1	53.2	34.8	35.9		56.1	0.8
Progression Factor	0.95	0.92	1.00		1.00	1.00
Incremental Delay, d2	13.0	12.1	20.9		15.7	0.0
Delay (s)	63.6	44.1	56.8		71.8	0.8
Level of Service	E	D	E		E	A
Approach Delay (s)		48.6	56.8		27.2	
Approach LOS		D	E		C	

Intersection Summary				
HCM Average Control Delay	49.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	90.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	225	79	96	147	182	66	376	139	252	537	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	0.95		0.91	0.91	
Frpb, ped/bikes		0.99		1.00	0.97		1.00	0.98		1.00	0.99	
Flpb, ped/bikes		1.00		0.98	1.00		0.96	1.00		0.97	1.00	
Frt		0.97		1.00	0.92		1.00	0.96		1.00	0.99	
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3021		1566	1040		1528	2688		1399	2510	
Flt Permitted		0.82		0.50	1.00		0.36	1.00		0.45	0.87	
Satd. Flow (perm)		2486		825	1040		583	2688		661	2183	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	43	225	79	96	147	182	66	376	139	252	537	59
RTOR Reduction (vph)	0	33	0	0	54	0	0	37	0	0	7	0
Lane Group Flow (vph)	0	314	0	96	275	0	66	478	0	197	644	0
Confl. Peds. (#/hr)	40		23	23		40	52		57	57		52
Parking (#/hr)					40	40		20	20		40	40
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		26.9		26.9	26.9		53.1	53.1		53.1	53.1	
Effective Green, g (s)		26.9		26.9	26.9		53.1	53.1		53.1	53.1	
Actuated g/C Ratio		0.30		0.30	0.30		0.59	0.59		0.59	0.59	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0		2.0	2.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		743		247	311		344	1586		390	1288	
v/s Ratio Prot					c0.26			0.18				
v/s Ratio Perm		0.13		0.12			0.11			c0.30	0.30	
v/c Ratio		0.42		0.39	0.88		0.19	0.30		0.51	0.50	
Uniform Delay, d1		25.3		25.0	30.1		8.5	9.2		10.8	10.7	
Progression Factor		1.00		1.00	1.00		1.00	1.00		0.99	0.97	
Incremental Delay, d2		0.1		0.4	23.8		1.2	0.5		4.1	1.2	
Delay (s)		25.5		25.4	53.9		9.8	9.7		14.7	11.6	
Level of Service		C		C	D		A	A		B	B	
Approach Delay (s)		25.5			47.4			9.7			12.3	
Approach LOS		C			D			A			B	

Intersection Summary				
HCM Average Control Delay	20.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	90.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	244	16	69	0	0	0	26	589	5	19	680	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0					6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00					1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99					1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00					0.98	1.00		1.00	1.00	
Frt		0.97					1.00	1.00		1.00	0.98	
Flt Protected		0.96					0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1239					1559	2863		1593	2789	
Flt Permitted		0.78					0.31	1.00		0.40	1.00	
Satd. Flow (perm)		1004					510	2863		670	2789	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	244	16	69	0	0	0	26	589	5	19	680	88
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	0	318	0	0	0	0	26	594	0	19	757	0
Confl. Peds. (#/hr)			61	61			43					43
Parking (#/hr)		20	20					20	20		20	20
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		31.1					46.9	46.9		46.9	46.9	
Effective Green, g (s)		31.1					46.9	46.9		46.9	46.9	
Actuated g/C Ratio		0.35					0.52	0.52		0.52	0.52	
Clearance Time (s)		6.0					6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0					5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		347					266	1492		349	1453	
v/s Ratio Prot								0.21			c0.27	
v/s Ratio Perm		c0.32					0.05			0.03		
v/c Ratio		0.92					0.10	0.40		0.05	0.52	
Uniform Delay, d1		28.2					10.9	13.0		10.6	14.2	
Progression Factor		1.00					1.39	1.21		0.40	0.46	
Incremental Delay, d2		27.9					0.7	0.7		0.2	0.8	
Delay (s)		56.1					15.7	16.5		4.4	7.4	
Level of Service		E					B	B		A	A	
Approach Delay (s)		56.1			0.0			16.4			7.3	
Approach LOS		E			A			B			A	

Intersection Summary				
HCM Average Control Delay	19.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	58.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	116	338	140	40	221	60	75	721	110	48	816	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.97		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1574	1271		1582	1290		1593	3083		1593	3073	
Flt Permitted	0.47	1.00		0.20	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	783	1271		338	1290		1593	3083		1593	3073	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	116	338	140	40	221	60	75	721	110	48	816	145
RTOR Reduction (vph)	0	17	0	0	11	0	0	12	0	0	15	0
Lane Group Flow (vph)	116	461	0	40	270	0	75	819	0	48	946	0
Confl. Peds. (#/hr)	20		19	19		20	41		48	48		41
Parking (#/hr)		20	20		20	20						
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			4		1	6		5	2	
Permitted Phases	4			4								
Actuated Green, G (s)	28.0	28.0		28.0	28.0		7.4	39.9		5.1	37.6	
Effective Green, g (s)	28.0	28.0		28.0	28.0		7.4	39.9		5.1	37.6	
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.08	0.44		0.06	0.42	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	244	395		105	401		131	1367		90	1284	
v/s Ratio Prot		c0.36			0.21		c0.05	0.27		0.03	c0.31	
v/s Ratio Perm	0.15			0.12								
v/c Ratio	0.48	1.17		0.38	0.67		0.57	0.60		0.53	0.74	
Uniform Delay, d1	25.1	31.0		24.2	27.0		39.8	19.0		41.3	22.0	
Progression Factor	1.00	1.00		1.00	1.00		1.06	1.25		1.00	1.00	
Incremental Delay, d2	1.5	99.7		2.3	4.4		3.3	1.7		3.0	3.8	
Delay (s)	26.5	130.7		26.5	31.4		45.6	25.5		44.3	25.8	
Level of Service	C	F		C	C		D	C		D	C	
Approach Delay (s)		110.4			30.8			27.2			26.7	
Approach LOS		F			C			C			C	

Intersection Summary				
HCM Average Control Delay	44.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	92.6%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	4	7	108	3	140	11	674	150	167	430	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00	0.98		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		0.94	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.97		1.00	1.00	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1615	1389		1507	1425	1593	4361		1593	4577	
Flt Permitted		0.81	1.00		0.72	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1356	1389		1137	1425	1593	4361		1593	4577	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	13	4	7	108	3	140	11	674	150	167	430	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	17	0	0	0	0
Lane Group Flow (vph)	0	17	7	0	111	140	11	807	0	167	430	0
Confl. Peds. (#/hr)			44	44			25		30	30		25
Turn Type	Perm		custom	Perm		custom	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		1 2 4	8		5 6 8						
Actuated Green, G (s)		22.4	137.0		22.4	137.0	5.8	80.9		18.7	93.8	
Effective Green, g (s)		22.4	137.0		22.4	137.0	5.8	80.9		18.7	93.8	
Actuated g/C Ratio		0.16	1.00		0.16	1.00	0.04	0.59		0.14	0.68	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		222	1389		186	1425	67	2575		217	3134	
v/s Ratio Prot							0.01	c0.18		c0.10	0.09	
v/s Ratio Perm		0.01	0.01		c0.10	0.10						
v/c Ratio		0.08	0.01		0.60	0.10	0.16	0.31		0.77	0.14	
Uniform Delay, d1		48.5	0.0		53.1	0.0	63.3	14.1		57.1	7.5	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1	0.0		5.1	0.0	0.4	0.3		13.7	0.1	
Delay (s)		48.7	0.0		58.2	0.0	63.7	14.4		70.8	7.6	
Level of Service		D	A		E	A	E	B		E	A	
Approach Delay (s)		34.5			25.7			15.1			25.3	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	20.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	137.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	441	465	335	0	0	387	0	817	107	0	262	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			5.0		5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95	1.00			0.88		0.91	1.00		0.95	
Frpb, ped/bikes	1.00	1.00	0.84			0.99		1.00	0.87		1.00	
Flpb, ped/bikes	1.00	1.00	1.00			1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85			0.85		1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00			1.00		1.00	1.00		1.00	
Satd. Flow (prot)	1591	3185	833			2474		4577	1243		3185	
Flt Permitted	0.95	1.00	1.00			1.00		1.00	1.00		1.00	
Satd. Flow (perm)	1591	3185	833			2474		4577	1243		3185	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	441	465	335	0	0	387	0	817	107	0	262	0
RTOR Reduction (vph)	0	0	225	0	0	170	0	0	26	0	0	0
Lane Group Flow (vph)	441	465	110	0	0	217	0	817	81	0	262	0
Confl. Peds. (#/hr)	1		121	121		1	67		82	82		67
Parking (#/hr)			40									
Turn Type	custom		Perm			custom			Perm			
Protected Phases	7	4						2			2	
Permitted Phases	8		4			8			2			
Actuated Green, G (s)	34.5	39.5	39.5			24.5		70.5	70.5		70.5	
Effective Green, g (s)	34.5	39.5	39.5			24.5		70.5	70.5		70.5	
Actuated g/C Ratio	0.29	0.33	0.33			0.20		0.59	0.59		0.59	
Clearance Time (s)	5.0	5.0	5.0			5.0		5.0	5.0		5.0	
Vehicle Extension (s)	2.0	3.0	3.0			3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	524	1048	274			505		2689	730		1871	
v/s Ratio Prot	c0.07	0.15						c0.18			0.08	
v/s Ratio Perm	0.21		0.13			0.09			0.06			
v/c Ratio	0.84	0.44	0.40			0.43		0.30	0.11		0.14	
Uniform Delay, d1	42.1	31.6	31.1			41.6		12.4	10.9		11.1	
Progression Factor	1.00	1.00	1.00			1.00		1.00	1.00		1.42	
Incremental Delay, d2	11.2	0.3	1.0			0.6		0.3	0.3		0.1	
Delay (s)	53.4	31.9	32.1			42.2		12.7	11.2		16.0	
Level of Service	D	C	C			D		B	B		B	
Approach Delay (s)		39.6			42.2			12.5			16.0	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	154	16	119	99	192	65	1242	154	0	116	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0	5.0		5.0			5.0	
Lane Util. Factor		1.00		0.95	0.95	1.00		0.86			0.95	
Frpb, ped/bikes		1.00		1.00	1.00	0.90		0.98			0.99	
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00			1.00	
Frt		0.99		1.00	1.00	0.85		0.98			0.98	
Flt Protected		1.00		0.95	0.99	1.00		1.00			1.00	
Satd. Flow (prot)		1651		1512	1579	1285		5506			3088	
Flt Permitted		1.00		0.42	0.90	1.00		0.91			1.00	
Satd. Flow (perm)		1648		660	1435	1285		5008			3088	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2	154	16	119	99	192	65	1242	154	0	116	16
RTOR Reduction (vph)	0	3	0	0	0	0	0	15	0	0	4	0
Lane Group Flow (vph)	0	169	0	99	119	192	0	1446	0	0	128	0
Confl. Peds. (#/hr)	56		1	1		56	36		91	91		36
Turn Type	Perm			Perm		custom	Perm					
Protected Phases		4			4			2			2	
Permitted Phases	4			4		4 2	2					
Actuated Green, G (s)		20.1		20.1	20.1	120.0		89.9			89.9	
Effective Green, g (s)		20.1		20.1	20.1	120.0		89.9			89.9	
Actuated g/C Ratio		0.17		0.17	0.17	1.00		0.75			0.75	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			5.0			5.0	
Lane Grp Cap (vph)		276		111	240	1285		3752			2313	
v/s Ratio Prot											0.04	
v/s Ratio Perm		0.10		c0.15	0.08	0.15		c0.29				
v/c Ratio		0.61		0.89	0.50	0.15		0.39			0.06	
Uniform Delay, d1		46.3		48.9	45.3	0.0		5.3			3.9	
Progression Factor		1.00		1.00	1.00	1.00		0.51			2.54	
Incremental Delay, d2		4.0		52.8	1.6	0.1		0.3			0.0	
Delay (s)		50.3		101.7	47.0	0.1		2.9			10.0	
Level of Service		D		F	D	A		A			B	
Approach Delay (s)		50.3			38.2			2.9			10.0	
Approach LOS		D			D			A			B	

Intersection Summary				
HCM Average Control Delay	13.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	89.8%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	600	32	0	0	0	33	0	36	556	43	496
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0					5.0		5.0	5.0	5.0	5.0
Lane Util. Factor		0.95					1.00		1.00	0.95	0.95	1.00
Frpb, ped/bikes		0.99					1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes		1.00					1.00		1.00	1.00	1.00	1.00
Frt		0.99					1.00		0.85	1.00	1.00	0.85
Flt Protected		1.00					0.95		1.00	0.95	0.96	1.00
Satd. Flow (prot)		2668					1586		1425	1513	1527	1395
Flt Permitted		1.00					0.25		1.00	0.95	0.96	1.00
Satd. Flow (perm)		2668					410		1425	1513	1527	1395
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	600	32	0	0	0	33	0	36	556	43	496
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	32	135	115	0
Lane Group Flow (vph)	0	630	0	0	0	0	33	0	4	165	184	496
Confl. Peds. (#/hr)	16		39	39		16	6					6
Parking (#/hr)		40										
Turn Type							custom		custom	Split		custom
Protected Phases		4								2	2	
Permitted Phases							1		1			2 1 4
Actuated Green, G (s)		30.0					16.3		16.3	75.1	75.1	136.4
Effective Green, g (s)		30.0					16.3		16.3	75.1	75.1	136.4
Actuated g/C Ratio		0.22					0.12		0.12	0.55	0.55	1.00
Clearance Time (s)		5.0					5.0		5.0	5.0	5.0	
Vehicle Extension (s)		3.0					2.0		2.0	3.0	3.0	
Lane Grp Cap (vph)		587					49		170	833	841	1395
v/s Ratio Prot		c0.24								0.11	0.12	
v/s Ratio Perm							c0.08		0.00			c0.36
v/c Ratio		1.07					0.67		0.03	0.20	0.22	0.36
Uniform Delay, d1		53.2					57.5		53.0	15.5	15.7	0.0
Progression Factor		1.00					1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2		58.2					25.0		0.0	0.5	0.6	0.1
Delay (s)		111.4					82.5		53.1	16.0	16.3	0.1
Level of Service		F					F		D	B	B	A
Approach Delay (s)		111.4			0.0			67.1			8.8	
Approach LOS		F			A			E			A	

Intersection Summary				
HCM Average Control Delay	47.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	136.4	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	58.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	111	325	52	247	162	12	42	164	140	34	176	66
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	111	325	52	247	162	12	42	164	140	34	176	66

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	111	377	247	174	124	222	122	154
Volume Left (vph)	111	0	247	0	42	0	34	0
Volume Right (vph)	0	52	0	12	0	140	0	66
Hadj (s)	0.53	-0.06	0.53	-0.01	0.20	-0.41	0.17	-0.27
Departure Headway (s)	7.8	7.2	7.9	7.4	7.9	7.3	8.1	7.6
Degree Utilization, x	0.24	0.76	0.55	0.36	0.27	0.45	0.27	0.33
Capacity (veh/h)	442	483	431	468	432	459	422	447
Control Delay (s)	12.1	28.3	18.9	13.3	12.7	15.1	12.9	13.1
Approach Delay (s)	24.6		16.5		14.2		13.0	
Approach LOS	C		C		B		B	

Intersection Summary				
Delay	17.9			
HCM Level of Service	C			
Intersection Capacity Utilization	76.8%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	308	70	16	211	141	94	122	50	128	175	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.94		1.00	0.94		1.00	0.96		1.00	1.00	0.84
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.89	1.00		0.89	1.00	1.00
Frt	1.00	0.97		1.00	0.94		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1593	2617		1593	2538		1415	2918		1422	1676	1190
Flt Permitted	0.95	1.00		0.95	1.00		0.53	1.00		0.64	1.00	1.00
Satd. Flow (perm)	1593	2617		1593	2538		787	2918		963	1676	1190
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	308	70	16	211	141	94	122	50	128	175	122
RTOR Reduction (vph)	0	10	0	0	67	0	0	38	0	0	0	0
Lane Group Flow (vph)	125	368	0	16	285	0	94	134	0	128	175	122
Confl. Peds. (#/hr)	83		255	255		83	110		96	96		110
Parking (#/hr)		20	20		20	20						
Turn Type	Prot			Prot			Perm			Perm		custom
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		4 1 2
Actuated Green, G (s)	12.4	64.2		2.4	54.2		21.2	21.2		21.2	21.2	103.8
Effective Green, g (s)	12.4	64.2		2.4	54.2		21.2	21.2		21.2	21.2	97.8
Actuated g/C Ratio	0.12	0.62		0.02	0.52		0.20	0.20		0.20	0.20	0.94
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	190	1619		37	1325		161	596		197	342	1121
v/s Ratio Prot	c0.08	c0.14		0.01	0.11			0.05			0.10	
v/s Ratio Perm							0.12			c0.13		0.10
v/c Ratio	0.66	0.23		0.43	0.21		0.58	0.22		0.65	0.51	0.11
Uniform Delay, d1	43.7	8.8		50.0	13.3		37.3	34.4		37.9	36.7	0.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.1	0.3		2.9	0.4		5.3	0.2		7.2	1.3	0.0
Delay (s)	49.8	9.1		53.0	13.7		42.6	34.6		45.1	38.0	0.2
Level of Service	D	A		D	B		D	C		D	D	A
Approach Delay (s)		19.2			15.4			37.5			29.3	
Approach LOS		B			B			D			C	

Intersection Summary				
HCM Average Control Delay	24.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	103.8	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	66.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

1240: Auahi Street & Ward Entertainment Center

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	497	0	0	426	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0							
Lane Util. Factor		0.95			0.95							
Frpb, ped/bikes		1.00			1.00							
Flpb, ped/bikes		1.00			1.00							
Frt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		2707			2867							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		2707			2867							
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	497	0	0	426	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	497	0	0	426	0	0	0	0	0	0	0
Confl. Peds. (#/hr)			70				171					
Parking (#/hr)	40	40			20	20						
Turn Type	Perm			Perm								
Protected Phases		2			2							
Permitted Phases	2			2								
Actuated Green, G (s)		75.0			75.0							
Effective Green, g (s)		75.0			75.0							
Actuated g/C Ratio		0.69			0.69							
Clearance Time (s)		5.0			5.0							
Vehicle Extension (s)		3.0			3.0							
Lane Grp Cap (vph)		1880			1991							
v/s Ratio Prot		c0.18			0.15							
v/s Ratio Perm												
v/c Ratio		0.26			0.21							
Uniform Delay, d1		6.2			5.9							
Progression Factor		1.00			1.00							
Incremental Delay, d2		0.3			0.2							
Delay (s)		6.5			6.2							
Level of Service		A			A							
Approach Delay (s)		6.5			6.2			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	6.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	33.0
Intersection Capacity Utilization	20.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

1250: Auahi Street & Ward Warehouse

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	538	468	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0			
Lane Util. Factor		0.95	0.95			
Frpb, ped/bikes		1.00	1.00			
Flpb, ped/bikes		1.00	1.00			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		2867	2867			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		2867	2867			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	538	468	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	538	468	0	0	0
Confl. Peds. (#/hr)						77
Parking (#/hr)		20	20	20		
Turn Type	Perm					
Protected Phases		4	8			
Permitted Phases	4					
Actuated Green, G (s)		15.2	15.2			
Effective Green, g (s)		15.2	15.2			
Actuated g/C Ratio		0.45	0.45			
Clearance Time (s)		5.0	5.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		1293	1293			
v/s Ratio Prot		c0.19	0.16			
v/s Ratio Perm						
v/c Ratio		0.42	0.36			
Uniform Delay, d1		6.3	6.1			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.2	0.2			
Delay (s)		6.5	6.2			
Level of Service		A	A			
Approach Delay (s)		6.5	6.2		0.0	
Approach LOS		A	A		A	

Intersection Summary			
HCM Average Control Delay	6.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	33.7	Sum of lost time (s)	18.5
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	132	150	133	71	71	127	26	412	55	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0		6.0				
Lane Util. Factor		0.95			1.00	1.00		0.95				
Frpb, ped/bikes		0.99			1.00	0.93		1.00				
Flpb, ped/bikes		0.98			0.99	1.00		1.00				
Frt		0.95			1.00	0.85		0.98				
Flt Protected		0.98			0.98	1.00		1.00				
Satd. Flow (prot)		2900			1257	1025		3107				
Flt Permitted		0.81			0.60	1.00		1.00				
Satd. Flow (perm)		2380			771	1025		3107				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	132	150	133	71	71	127	26	412	55	0	0	0
RTOR Reduction (vph)	0	75	0	0	0	0	0	9	0	0	0	0
Lane Group Flow (vph)	0	340	0	0	142	127	0	484	0	0	0	0
Confl. Peds. (#/hr)	59		30	30		59	25		23	23		25
Parking (#/hr)					25	25						
Turn Type	Perm			Perm		custom	Perm					
Protected Phases		4			4			2				
Permitted Phases	4			4		2 4	2					
Actuated Green, G (s)		19.6			19.6	76.1		44.5				
Effective Green, g (s)		19.6			19.6	76.1		44.5				
Actuated g/C Ratio		0.26			0.26	1.00		0.58				
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			4.0				
Lane Grp Cap (vph)		613			199	1025		1817				
v/s Ratio Prot												
v/s Ratio Perm		0.14			c0.18	0.12		0.16				
v/c Ratio		0.55			0.71	0.12		0.27				
Uniform Delay, d1		24.5			25.7	0.0		7.8				
Progression Factor		1.00			1.00	1.00		1.00				
Incremental Delay, d2		1.1			11.5	0.1		0.4				
Delay (s)		25.6			37.2	0.1		8.1				
Level of Service		C			D	A		A				
Approach Delay (s)		25.6			19.6			8.1			0.0	
Approach LOS		C			B			A			A	

Intersection Summary				
HCM Average Control Delay	16.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	76.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	69.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	361	291	0	0	56	130	29	770	38	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0	5.0		5.0				
Lane Util. Factor		0.95			1.00	1.00		0.86				
Frpb, ped/bikes		1.00			1.00	0.93		1.00				
Flpb, ped/bikes		0.97			1.00	1.00		1.00				
Frt		1.00			1.00	0.85		0.99				
Flt Protected		0.97			1.00	1.00		1.00				
Satd. Flow (prot)		3012			1425	1132		5665				
Flt Permitted		0.77			1.00	1.00		1.00				
Satd. Flow (perm)		2387			1425	1132		5665				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	361	291	0	0	56	130	29	770	38	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	652	0	0	56	130	0	829	0	0	0	0
Confl. Peds. (#/hr)	52		101	101		52	69		74	74		69
Parking (#/hr)					10	10						
Turn Type	Perm					custom	Perm					
Protected Phases		2			2			8				
Permitted Phases	2					2 8	8					
Actuated Green, G (s)		45.5			45.5	84.5		29.0				
Effective Green, g (s)		45.5			45.5	84.5		29.0				
Actuated g/C Ratio		0.54			0.54	1.00		0.34				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			5.0				
Lane Grp Cap (vph)		1285			767	1132		1944				
v/s Ratio Prot					0.04							
v/s Ratio Perm		c0.27				0.11		0.15				
v/c Ratio		0.51			0.07	0.11		0.43				
Uniform Delay, d1		12.4			9.4	0.0		21.4				
Progression Factor		1.00			1.00	1.00		1.00				
Incremental Delay, d2		1.4			0.2	0.1		0.3				
Delay (s)		13.8			9.6	0.1		21.7				
Level of Service		B			A	A		C				
Approach Delay (s)		13.8			2.9			21.7			0.0	
Approach LOS		B			A			C			A	

Intersection Summary				
HCM Average Control Delay	16.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	84.5	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	71.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	194	495	0	0	389	111	176	1083	55	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0				
Lane Util. Factor		0.95			0.95			0.81				
Frpb, ped/bikes		1.00			0.98			1.00				
Flpb, ped/bikes		1.00			1.00			0.99				
Frt		1.00			0.97			0.99				
Flt Protected		0.99			1.00			0.99				
Satd. Flow (prot)		3129			3030			6616				
Flt Permitted		0.63			1.00			0.99				
Satd. Flow (perm)		1984			3030			6616				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	194	495	0	0	389	111	176	1083	55	0	0	0
RTOR Reduction (vph)	0	0	0	0	27	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	689	0	0	473	0	0	1306	0	0	0	0
Confl. Peds. (#/hr)	37		3	3		37	54		69	69		54
Turn Type	Prot						Perm					
Protected Phases	1	6			2			4				
Permitted Phases							4					
Actuated Green, G (s)		56.0			38.1			28.4				
Effective Green, g (s)		56.0			38.1			28.4				
Actuated g/C Ratio		0.59			0.40			0.30				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		1333			1223			1990				
v/s Ratio Prot		c0.07			0.16							
v/s Ratio Perm		c0.24						0.20				
v/c Ratio		0.89dl			0.39			0.66				
Uniform Delay, d1		11.3			19.9			28.7				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		0.3			0.9			0.8				
Delay (s)		11.6			20.8			29.5				
Level of Service		B			C			C				
Approach Delay (s)		11.6			20.8			29.5			0.0	
Approach LOS		B			C			C			A	

Intersection Summary			
HCM Average Control Delay	22.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	94.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	527	28	18	384	11	26	8	56	27	1	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.97			0.93	
Flpb, ped/bikes		1.00			1.00			0.98			0.99	
Frt		0.99			1.00			0.92			0.91	
Flt Protected		1.00			1.00			0.99			0.98	
Satd. Flow (prot)		3140			3157			1150			1116	
Flt Permitted		0.91			0.92			0.88			0.63	
Satd. Flow (perm)		2880			2906			1028			720	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	527	28	18	384	11	26	8	56	27	1	53
RTOR Reduction (vph)	0	2	0	0	1	0	0	49	0	0	47	0
Lane Group Flow (vph)	0	583	0	0	412	0	0	41	0	0	34	0
Confl. Peds. (#/hr)	27		20	20		27	72		27	27		72
Parking (#/hr)								20	20		20	20
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			2	
Permitted Phases	1			1			3			2		
Actuated Green, G (s)		55.5			55.5			11.1			11.3	
Effective Green, g (s)		55.5			55.5			11.1			11.3	
Actuated g/C Ratio		0.58			0.58			0.12			0.12	
Clearance Time (s)		7.0			7.0			5.0			5.0	
Vehicle Extension (s)		4.0			4.0			2.0			3.0	
Lane Grp Cap (vph)		1684			1700			120			86	
v/s Ratio Prot												
v/s Ratio Perm		c0.20			0.14			c0.04			c0.05	
v/c Ratio		0.35			0.24			0.34			0.40	
Uniform Delay, d1		10.3			9.5			38.5			38.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.6			0.3			0.6			3.0	
Delay (s)		10.8			9.9			39.1			41.7	
Level of Service		B			A			D			D	
Approach Delay (s)		10.8			9.9			39.1			41.7	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM Average Control Delay	14.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	94.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	83	393	56	64	397	60	41	304	44	16	180	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0			6.0			6.0	
Lane Util. Factor		1.00	1.00		0.95			0.95			0.95	
Frpb, ped/bikes		1.00	0.98		0.99			1.00			0.99	
Flpb, ped/bikes		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.98			0.98			0.96	
Flt Protected		0.99	1.00		0.99			0.99			1.00	
Satd. Flow (prot)		1326	1120		2629			3092			3022	
Flt Permitted		0.84	1.00		0.85			0.88			0.91	
Satd. Flow (perm)		1117	1120		2239			2748			2766	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	83	393	56	64	397	60	41	304	44	16	180	64
RTOR Reduction (vph)	0	0	0	0	9	0	0	14	0	0	46	0
Lane Group Flow (vph)	0	476	56	0	512	0	0	375	0	0	214	0
Confl. Peds. (#/hr)	29		5	5		29	28		12	12		28
Parking (#/hr)		20	20		40	40						
Turn Type	Perm		custom	Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2		2 4	2			4			4		
Actuated Green, G (s)		40.2	68.6		40.2			16.4			16.4	
Effective Green, g (s)		40.2	68.6		40.2			16.4			16.4	
Actuated g/C Ratio		0.59	1.00		0.59			0.24			0.24	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		5.0			5.0			3.0			3.0	
Lane Grp Cap (vph)		655	1120		1312			657			661	
v/s Ratio Prot												
v/s Ratio Perm		c0.43	0.05		0.23			c0.14			0.08	
v/c Ratio		0.73	0.05		0.39			0.57			0.32	
Uniform Delay, d1		10.2	0.0		7.6			23.0			21.5	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		6.9	0.0		0.9			1.2			0.3	
Delay (s)		17.2	0.0		8.5			24.2			21.8	
Level of Service		B	A		A			C			C	
Approach Delay (s)		15.4			8.5			24.2			21.8	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	68.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	111	182	52	20	73	57	16	300	18	16	222	40
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	111	182	52	20	73	57	16	300	18	16	222	40

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	345	150	166	168	127	151
Volume Left (vph)	111	20	16	0	16	0
Volume Right (vph)	52	57	0	18	0	40
Hadj (s)	0.01	-0.17	0.08	-0.04	0.10	-0.15
Departure Headway (s)	5.9	6.1	6.6	6.5	6.7	6.5
Degree Utilization, x	0.56	0.26	0.31	0.30	0.24	0.27
Capacity (veh/h)	580	523	501	519	495	515
Control Delay (s)	16.2	11.2	11.3	11.1	10.6	10.7
Approach Delay (s)	16.2	11.2	11.2		10.6	
Approach LOS	C	B	B		B	

Intersection Summary			
Delay	12.6		
HCM Level of Service	B		
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	161	203	32	44	142	41	9	160	32	73	210	73
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	161	203	32	44	142	41	9	160	32	73	210	73

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	396	227	89	112	178	178
Volume Left (vph)	161	44	9	0	73	0
Volume Right (vph)	32	41	0	32	0	73
Hadj (s)	0.07	-0.04	0.08	-0.17	0.24	-0.25
Departure Headway (s)	6.1	6.4	7.3	7.1	7.2	6.7
Degree Utilization, x	0.67	0.40	0.18	0.22	0.35	0.33
Capacity (veh/h)	568	509	437	458	469	504
Control Delay (s)	20.6	13.6	10.7	10.8	12.9	11.7
Approach Delay (s)	20.6	13.6	10.8		12.3	
Approach LOS	C	B	B		B	

Intersection Summary						
Delay			15.1			
HCM Level of Service			C			
Intersection Capacity Utilization			72.2%	ICU Level of Service		C
Analysis Period (min)			15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	64	33	21	11	35	26	7	130	12	15	156	39
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	64	33	21	11	35	26	7	130	12	15	156	39
Pedestrians		10			6			4			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								424				
pX, platoon unblocked												
vC, conflicting volume	348	378	112	306	391	87	205			148		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	348	378	112	306	391	87	205			148		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	94	98	98	93	97	99			99		
cM capacity (veh/h)	517	537	910	564	528	942	1352			1424		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	118	72	72	77	93	117
Volume Left	64	11	7	0	15	0
Volume Right	21	26	0	12	0	39
cSH	566	635	1352	1700	1424	1700
Volume to Capacity	0.21	0.11	0.01	0.05	0.01	0.07
Queue Length 95th (ft)	19	10	0	0	1	0
Control Delay (s)	13.0	11.4	0.8	0.0	1.3	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	13.0	11.4	0.4		0.6	
Approach LOS	B	B				

Intersection Summary						
Average Delay			4.6			
Intersection Capacity Utilization			39.0%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection Level of Service Calculation Worksheets

No Action Alternative AM
Peak Hour Conditions

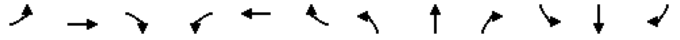
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	314	2954	0	0	0	0	0	1804	367	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0						6.0	6.0			
Lane Util. Factor		0.86						0.81	0.81			
Frpb, ped/bikes		1.00						1.00	1.00			
Flpb, ped/bikes		0.98						1.00	1.00			
Frt		1.00						1.00	0.85			
Flt Protected		1.00						1.00	1.00			
Satd. Flow (prot)		5608						5416	1154			
Flt Permitted		1.00						1.00	1.00			
Satd. Flow (perm)		5608						5416	1154			
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	320	3014	0	0	0	0	0	1841	374	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	3334	0	0	0	0	0	1878	337	0	0	0
Confl. Peds. (#/hr)	103		84				120					
Turn Type	Perm								Perm			
Protected Phases		5						4 6				
Permitted Phases	5								4 6			
Actuated Green, G (s)		98.0						60.0	60.0			
Effective Green, g (s)		98.0						60.0	60.0			
Actuated g/C Ratio		0.58						0.35	0.35			
Clearance Time (s)		6.0										
Vehicle Extension (s)		1.0										
Lane Grp Cap (vph)		3233						1912	407			
v/s Ratio Prot								c0.35				
v/s Ratio Perm		0.59							0.29			
v/c Ratio		1.03						0.98	0.83			
Uniform Delay, d1		36.0						54.5	50.3			
Progression Factor		1.00						0.75	0.69			
Incremental Delay, d2		24.6						11.6	7.4			
Delay (s)		60.6						52.3	41.9			
Level of Service		E						D	D			
Approach Delay (s)		60.6			0.0			50.8			0.0	
Approach LOS		E			A			D			A	

Intersection Summary			
HCM Average Control Delay	56.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1054	0	0	0	1005	0	1166	74	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0				6.0		6.0				
Lane Util. Factor		0.91				0.76		0.81				
Frpb, ped/bikes		1.00				1.00		0.99				
Flpb, ped/bikes		1.00				1.00		1.00				
Frt		1.00				0.85		0.99				
Flt Protected		1.00				1.00		1.00				
Satd. Flow (prot)		4577				3249		6269				
Flt Permitted		1.00				1.00		1.00				
Satd. Flow (perm)		4577				3249		6269				
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1076	0	0	0	1026	0	1190	76	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	893	0	6	0	0	0	0
Lane Group Flow (vph)	0	1076	0	0	0	133	0	1260	0	0	0	0
Confl. Peds. (#/hr)									59			
Parking (#/hr)							40	40	40			
Turn Type						custom						
Protected Phases		2				6		4				
Permitted Phases												
Actuated Green, G (s)		126.0				22.0		32.0				
Effective Green, g (s)		126.0				22.0		32.0				
Actuated g/C Ratio		0.74				0.13		0.19				
Clearance Time (s)		6.0				6.0		6.0				
Vehicle Extension (s)		1.0				2.0		1.0				
Lane Grp Cap (vph)		3392				420		1180				
v/s Ratio Prot		c0.24				0.04		c0.20				
v/s Ratio Perm												
v/c Ratio		0.32				0.32		1.07				
Uniform Delay, d1		7.4				67.2		69.0				
Progression Factor		1.00				1.00		1.00				
Incremental Delay, d2		0.2				0.2		46.2				
Delay (s)		7.7				67.3		115.2				
Level of Service		A				E		F				
Approach Delay (s)		7.7			67.3			115.2			0.0	
Approach LOS		A			E			F			A	

Intersection Summary			
HCM Average Control Delay	66.3	HCM Level of Service	E
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

1020: Kapiolani Boulevard & Ward Avenue

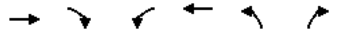


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	698	222	606	1732	175	124	826	110	249	1820	371
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.0	5.0	6.0	5.0	19.0	
Lane Util. Factor		0.91			0.91		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		0.97			1.00		1.00	1.00	0.85	1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.96			0.99		1.00	1.00	0.85	1.00	0.97	
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		4298			4475		1593	3185	1216	1593	3064	
Flt Permitted		1.00			0.69		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		4298			3108		1593	3185	1216	1593	3064	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	712	227	618	1767	179	127	843	112	254	1857	379
RTOR Reduction (vph)	0	40	0	0	6	0	0	0	32	0	4	0
Lane Group Flow (vph)	0	899	0	0	2558	0	127	843	80	254	2232	0
Confl. Peds. (#/hr)			53				36		76	76		36
Turn Type				Prot			Prot		custom	Prot		
Protected Phases		6		5	2		3	8		7	4	
Permitted Phases									2 5 6 8			
Actuated Green, G (s)		28.0			53.0		7.0	51.1	109.1	24.9	55.0	
Effective Green, g (s)		28.0			53.0		7.0	51.1	104.1	24.9	55.0	
Actuated g/C Ratio		0.19			0.37		0.05	0.35	0.72	0.17	0.38	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	19.0	
Vehicle Extension (s)		5.0			5.0		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)		830			1325		77	1122	873	274	1162	
v/s Ratio Prot		0.21			c0.27		c0.08	0.26		0.16	c0.73	
v/s Ratio Perm					c0.44				0.07			
v/c Ratio		1.08			2.85dl		1.65	0.75	0.09	0.93	1.92	
Uniform Delay, d1		58.5			46.0		69.0	41.4	6.2	59.2	45.0	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		56.4			421.7		342.8	2.6	0.1	34.7	417.4	
Delay (s)		114.9			467.7		411.8	43.9	6.3	93.9	462.4	
Level of Service		F			F		F	D	A	F	F	
Approach Delay (s)		114.9			467.7			83.2			424.8	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	347.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.90		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	183.9%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

1030: Kapiolani Boulevard & Kamakee Street



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	994	149	375	2544	120	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.91			0.91	1.00	1.00
Frpb, ped/bikes	0.98			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	0.96	1.00
Frt	0.98			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	4419			4537	1526	1369
Flt Permitted	1.00			0.66	0.95	1.00
Satd. Flow (perm)	4419			3023	1526	1369
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	1014	152	383	2596	122	151
RTOR Reduction (vph)	11	0	0	0	0	0
Lane Group Flow (vph)	1155	0	0	2979	122	151
Confl. Peds. (#/hr)		38	38		21	14
Turn Type			Perm			custom
Protected Phases	2			2		
Permitted Phases			2		4	4 2
Actuated Green, G (s)	130.3			130.3	19.7	160.0
Effective Green, g (s)	130.3			130.3	19.7	160.0
Actuated g/C Ratio	0.81			0.81	0.12	1.00
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	5.0			5.0	3.0	
Lane Grp Cap (vph)	3599			2462	188	1369
v/s Ratio Prot	0.26					
v/s Ratio Perm				c0.99	c0.08	0.11
v/c Ratio	0.32			1.26dl	0.65	0.11
Uniform Delay, d1	3.7			14.8	66.9	0.0
Progression Factor	1.00			0.85	1.00	1.00
Incremental Delay, d2	0.2			94.9	7.5	0.0
Delay (s)	4.0			107.5	74.4	0.0
Level of Service	A			F	E	A
Approach Delay (s)	4.0			107.5	33.2	
Approach LOS	A			F	C	

Intersection Summary			
HCM Average Control Delay	75.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	113.1%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	935	135	166	2205	0	0	0	0	209	1090	695
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.91			0.91					1.00	0.95	1.00
Frpb, ped/bikes		0.99			1.00					1.00	1.00	0.93
Flpb, ped/bikes		1.00			1.00					1.00	1.00	1.00
Frt		0.98			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	1.00	1.00
Satd. Flow (prot)		4461			4561					1593	3185	927
Flt Permitted		1.00			0.70					0.95	1.00	1.00
Satd. Flow (perm)		4461			3190					1593	3185	927
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	954	138	169	2250	0	0	0	0	213	1112	709
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1091	0	0	2419	0	0	0	0	213	1112	709
Confl. Peds. (#/hr)	57		20									30
Parking (#/hr)												40
Turn Type				Perm						Perm		custom
Protected Phases		6			6						4	
Permitted Phases				6						4		4 6
Actuated Green, G (s)		104.0			104.0					46.0	46.0	160.0
Effective Green, g (s)		104.0			104.0					46.0	46.0	160.0
Actuated g/C Ratio		0.65			0.65					0.29	0.29	1.00
Clearance Time (s)		5.0			5.0					5.0	5.0	
Vehicle Extension (s)		5.0			5.0					2.0	2.0	
Lane Grp Cap (vph)		2900			2074					458	916	927
v/s Ratio Prot		0.24									c0.35	
v/s Ratio Perm					c0.76					0.13		0.76
v/c Ratio		0.38			1.17					0.47	1.21	0.76
Uniform Delay, d1		13.0			28.0					46.9	57.0	0.0
Progression Factor		0.88			0.46					1.00	1.00	1.00
Incremental Delay, d2		0.4			75.4					0.3	106.4	3.4
Delay (s)		11.8			88.3					47.2	163.4	3.4
Level of Service		B			F					D	F	A
Approach Delay (s)		11.8			88.3			0.0			95.5	
Approach LOS		B			F			A			F	

Intersection Summary			
HCM Average Control Delay	75.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	120.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1030	103	67	2416	249	89	1069	95	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.91			0.91		1.00	0.91	1.00			
Frpb, ped/bikes		1.00			0.99		1.00	1.00	0.91			
Flpb, ped/bikes		1.00			1.00		0.95	1.00	1.00			
Frt		0.99			0.99		1.00	1.00	0.85			
Flt Protected		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		4494			4478		1516	4577	1301			
Flt Permitted		1.00			0.82		0.95	1.00	1.00			
Satd. Flow (perm)		4494			3674		1516	4577	1301			
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1051	105	68	2465	254	91	1091	97	0	0	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1149	0	0	2787	0	91	1091	97	0	0	0
Confl. Peds. (#/hr)	35		21	21		35	22		43			
Turn Type				Perm			Perm		custom			
Protected Phases		2			2			4				
Permitted Phases				2			4		2 4			
Actuated Green, G (s)		116.0			116.0		34.0	34.0	160.0			
Effective Green, g (s)		116.0			116.0		34.0	34.0	160.0			
Actuated g/C Ratio		0.72			0.72		0.21	0.21	1.00			
Clearance Time (s)		5.0			5.0		5.0	5.0				
Vehicle Extension (s)		5.0			5.0		2.0	2.0				
Lane Grp Cap (vph)		3258			2664		322	973	1301			
v/s Ratio Prot		0.26						c0.24				
v/s Ratio Perm					c0.76		0.06		0.07			
v/c Ratio		0.35			1.05		0.28	1.12	0.07			
Uniform Delay, d1		8.1			22.0		52.8	63.0	0.0			
Progression Factor		0.78			1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.3			31.0		0.2	68.3	0.0			
Delay (s)		6.6			53.0		53.0	131.3	0.0			
Level of Service		A			D		D	F	A			
Approach Delay (s)		6.6			53.0			115.7			0.0	
Approach LOS		A			D			F			A	

Intersection Summary			
HCM Average Control Delay	58.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	120.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	286	4072	316	5	3005	102	65	71	8	48	16	93
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0			6.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91			0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00		0.88	1.00			0.92	1.00
Frt	1.00	0.99			1.00		1.00	0.98			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1486	3900			3935		1409	1651			1481	1425
Flt Permitted	0.95	1.00			0.83		0.70	1.00			0.66	1.00
Satd. Flow (perm)	1486	3900			3272		1032	1651			1018	1425
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	292	4155	322	5	3066	104	66	72	8	49	16	95
RTOR Reduction (vph)	0	4	0	0	2	0	0	0	0	0	0	0
Lane Group Flow (vph)	292	4473	0	0	3173	0	66	80	0	0	65	95
Confl. Peds. (#/hr)	8		21	21		8	70			70		
Turn Type	Prot			Perm			Perm			Perm		custom
Protected Phases	5	2			6			4			4	
Permitted Phases				6			4			4		4 5 6
Actuated Green, G (s)	26.6	137.6			106.0		21.4	21.4			21.4	170.0
Effective Green, g (s)	26.6	137.6			106.0		21.4	21.4			21.4	164.0
Actuated g/C Ratio	0.16	0.81			0.62		0.13	0.13			0.13	0.96
Clearance Time (s)	5.0	6.0			6.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0	5.0			5.0		4.0	4.0			4.0	
Lane Grp Cap (vph)	233	3157			2040		130	208			128	1375
v/s Ratio Prot	0.20	c1.15						0.05				
v/s Ratio Perm					c0.97		c0.06				0.06	0.07
v/c Ratio	1.25	1.42			1.56		0.51	0.38			0.51	0.07
Uniform Delay, d1	71.7	16.2			32.0		69.4	68.3			69.4	0.1
Progression Factor	1.00	1.00			0.16		1.00	1.00			1.00	1.00
Incremental Delay, d2	144.2	189.4			250.1		4.2	1.6			4.3	0.0
Delay (s)	215.9	205.6			255.3		73.6	69.9			73.7	0.1
Level of Service	F	F			F		E	E			E	A
Approach Delay (s)		206.3			255.3			71.5			30.0	
Approach LOS		F			F			E			C	

Intersection Summary				
HCM Average Control Delay	219.3	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.42			
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	206.5%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	221	3820	122	30	3193	35	15	13	21	43	12	57
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			4.5	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.94			0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Frt	1.00	1.00		1.00	1.00			0.94			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1486	3928		1486	3949			1440			1471	
Flt Permitted	0.95	1.00		0.55	1.00			0.90			0.85	
Satd. Flow (perm)	1486	3928		857	3949			1323			1278	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	226	3898	124	31	3258	36	15	13	21	44	12	58
RTOR Reduction (vph)	0	2	0	0	1	0	0	16	0	0	23	0
Lane Group Flow (vph)	226	4020	0	31	3293	0	0	33	0	0	91	0
Confl. Peds. (#/hr)	10		16	16		10	22		8	8		22
Parking (#/hr)												40
Turn Type	Prot			custom			Perm			Perm		
Protected Phases	5	2			6			3			4	
Permitted Phases				1			3			4		
Actuated Green, G (s)	21.6	122.3		7.3	108.0			3.0			16.9	
Effective Green, g (s)	21.6	122.3		7.3	108.0			3.0			16.9	
Actuated g/C Ratio	0.13	0.72		0.04	0.64			0.02			0.10	
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			4.5	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			2.0			2.0	
Lane Grp Cap (vph)	189	2826		37	2509			23			127	
v/s Ratio Prot	c0.15	c1.02			0.83							
v/s Ratio Perm				0.04				c0.03			c0.07	
v/c Ratio	1.20	1.42		0.84	1.31			1.45			0.72	
Uniform Delay, d1	74.2	23.9		80.8	31.0			83.5			74.3	
Progression Factor	1.18	0.50		1.09	0.45			1.00			1.00	
Incremental Delay, d2	93.1	190.4		13.3	140.9			347.7			15.6	
Delay (s)	180.9	202.4		101.1	155.0			431.2			89.9	
Level of Service	F	F		F	F			F			F	
Approach Delay (s)		201.2			154.5			431.2			89.9	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	181.0	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.35			
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	20.5	
Intersection Capacity Utilization	126.0%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	114	3378	270	58	3022	31	19	16	18	40	45	52
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00			0.99			1.00	0.87
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.97			1.00	1.00
Frt	1.00	0.99		1.00	1.00			0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	1.00
Satd. Flow (prot)	1486	3892		1486	3949			1507			1225	931
Flt Permitted	0.95	1.00		0.95	1.00			0.87			0.81	1.00
Satd. Flow (perm)	1486	3892		1486	3949			1338			1021	931
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	116	3447	276	59	3084	32	19	16	18	41	46	53
RTOR Reduction (vph)	0	5	0	0	1	0	0	12	0	0	0	0
Lane Group Flow (vph)	116	3718	0	59	3115	0	0	41	0	0	87	53
Confl. Peds. (#/hr)	15		12	12		15	42		3	3		42
Parking (#/hr)											30	30
Turn Type	Prot			Prot			Perm			Perm		custom
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		4 5 2
Actuated Green, G (s)	14.9	127.0		8.9	121.0			18.1			18.1	170.0
Effective Green, g (s)	14.9	127.0		8.9	121.0			18.1			18.1	164.0
Actuated g/C Ratio	0.09	0.75		0.05	0.71			0.11			0.11	0.96
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			3.0			2.0	
Lane Grp Cap (vph)	130	2908		78	2811			142			109	898
v/s Ratio Prot	c0.08	c0.96		0.04	0.79							
v/s Ratio Perm								0.03			c0.09	0.06
v/c Ratio	0.89	1.28		0.76	1.11			0.29			0.80	0.06
Uniform Delay, d1	76.8	21.5		79.5	24.5			70.0			74.2	0.1
Progression Factor	1.22	0.32		1.12	0.21			1.00			1.00	1.00
Incremental Delay, d2	7.2	125.6		3.4	49.3			1.1			30.3	0.0
Delay (s)	100.7	132.5		92.5	54.5			71.2			104.5	0.1
Level of Service	F	F		F	D			E			F	A
Approach Delay (s)		131.6			55.2			71.2			65.0	
Approach LOS		F			E			E			E	

Intersection Summary				
HCM Average Control Delay	96.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.21			
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	118.6%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	3098	60	180	3216	65	29	37	18	41	74	117
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.98	1.00
Satd. Flow (prot)	1486	3940		1486	3942			1633	1398		1643	1388
Flt Permitted	0.95	1.00		0.95	1.00			0.64	1.00		0.81	1.00
Satd. Flow (perm)	1486	3940		1486	3942			1062	1398		1357	1388
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	204	3161	61	184	3282	66	30	38	18	42	76	119
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	204	3221	0	184	3347	0	0	68	18	0	118	119
Confl. Peds. (#/hr)	17		17	17		17	6		3	3		6
Turn Type	Prot			Prot			Perm		custom	Perm		custom
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4		4 1 2	4		4 5 6
Actuated Green, G (s)	21.3	116.0		19.3	114.0			18.7	170.0		18.7	170.0
Effective Green, g (s)	21.3	116.0		19.3	114.0			18.7	164.0		18.7	164.0
Actuated g/C Ratio	0.13	0.68		0.11	0.67			0.11	0.96		0.11	0.96
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			4.0			4.0	
Lane Grp Cap (vph)	186	2688		169	2643			117	1349		149	1339
v/s Ratio Prot	c0.14	0.82		0.12	c0.85							
v/s Ratio Perm								0.06	0.01		c0.09	c0.09
v/c Ratio	1.10	1.20		1.09	1.27			0.58	0.01		0.79	0.09
Uniform Delay, d1	74.4	27.0		75.4	28.0			71.9	0.1		73.8	0.1
Progression Factor	1.19	0.42		1.19	0.59			1.00	1.00		1.00	1.00
Incremental Delay, d2	51.8	89.5		49.4	120.1			8.4	0.0		25.5	0.0
Delay (s)	140.2	101.0		139.0	136.7			80.3	0.1		99.3	0.2
Level of Service	F	F		F	F			F	A		F	A
Approach Delay (s)		103.3			136.8			63.6			49.5	
Approach LOS		F			F			E			D	

Intersection Summary				
HCM Average Control Delay	117.3	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.19			
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	118.9%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	407	2595	13	308	3084	214	16	30	58	170	152	840
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0		5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00		0.95	1.00	0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.95		1.00	0.92	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	0.93	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00	
Satd. Flow (prot)	1486	3954		1486	3958	1265		3127	1309	1353	2600	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.57	1.00	0.72	0.95	
Satd. Flow (perm)	1486	3954		1486	3958	1265		1820	1309	1033	2472	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	415	2648	13	314	3147	218	16	31	59	173	155	857
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	53	0	291	0
Lane Group Flow (vph)	415	2660	0	314	3147	218	0	47	6	156	738	0
Confl. Peds. (#/hr)	17		33	33		17	14		36	36		14
Turn Type	Prot			Prot		custom	Perm		Perm	Perm		
Protected Phases	5	2		1	6			3			4	
Permitted Phases						6 5 3 4	3		3	4		
Actuated Green, G (s)	20.0	73.0		17.0	70.0	170.0		18.0	18.0	41.0	41.0	
Effective Green, g (s)	20.0	73.0		17.0	70.0	155.0		18.0	18.0	41.0	41.0	
Actuated g/C Ratio	0.12	0.43		0.10	0.41	0.91		0.11	0.11	0.24	0.24	
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0	5.0	5.0	5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	175	1698		149	1630	1153		193	139	249	596	
v/s Ratio Prot	c0.28	c0.67		0.21	c0.79							
v/s Ratio Perm						0.17		c0.03	0.00	0.15	c0.30	
v/c Ratio	2.37	1.57		2.11	1.93	0.19		0.24	0.04	0.63	1.41dr	
Uniform Delay, d1	75.0	48.5		76.5	50.0	0.8		69.8	68.3	57.7	64.5	
Progression Factor	0.93	1.14		1.07	0.98	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	618.7	255.3		500.4	419.0	0.0		0.2	0.0	3.5	120.8	
Delay (s)	688.3	310.6		582.6	468.0	0.8		70.0	68.3	61.2	185.3	
Level of Service	F	F		F	F	A		E	E	E	F	
Approach Delay (s)		361.5			450.1			69.1			169.0	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM Average Control Delay	369.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.66		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	144.8%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2600	42	0	3720	41	36
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900
Lane Width	11	10	10	11	12	12
Total Lost time (s)	6.0			6.0	5.0	
Lane Util. Factor	0.91			0.91	1.00	
Frpb, ped/bikes	1.00			1.00	0.96	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.94	
Flt Protected	1.00			1.00	0.97	
Satd. Flow (prot)	3942			3958	1464	
Flt Permitted	1.00			1.00	0.97	
Satd. Flow (perm)	3942			3958	1464	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	2653	43	0	3796	42	37
RTOR Reduction (vph)	1	0	0	0	18	0
Lane Group Flow (vph)	2695	0	0	3796	61	0
Confl. Peds. (#/hr)		27				8
Turn Type						
Protected Phases	6			2	4	
Permitted Phases						
Actuated Green, G (s)	154.0			154.0	5.0	
Effective Green, g (s)	154.0			154.0	5.0	
Actuated g/C Ratio	0.91			0.91	0.03	
Clearance Time (s)	6.0			6.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	3571			3585	43	
v/s Ratio Prot	0.68			c0.96	c0.04	
v/s Ratio Perm						
v/c Ratio	0.75			1.06	1.41	
Uniform Delay, d1	2.4			8.0	82.5	
Progression Factor	7.28			2.48	1.00	
Incremental Delay, d2	0.1			27.3	278.9	
Delay (s)	17.4			47.1	361.4	
Level of Service	B			D	F	
Approach Delay (s)	17.4			47.1	361.4	
Approach LOS	B			D	F	

Intersection Summary			
HCM Average Control Delay	38.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	105.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

1120: Ala Moana Boulevard & Kamakee Street

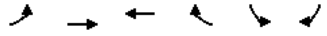
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	168	2416	125	22	3244	145	37	68	30	53	54	172
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	0.89		1.00	0.74
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.96	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.98	1.00
Satd. Flow (prot)	1486	3920		1486	3890			1647	1269		1573	1061
Flt Permitted	0.95	1.00		0.95	1.00			0.69	1.00		0.62	1.00
Satd. Flow (perm)	1486	3920		1486	3890			1158	1269		994	1061
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	171	2465	128	22	3310	148	38	69	31	54	55	176
RTOR Reduction (vph)	0	3	0	0	3	0	0	0	0	0	0	0
Lane Group Flow (vph)	171	2590	0	22	3455	0	0	107	31	0	109	176
Confl. Peds. (#/hr)	112		17	17		112			45	45		112
Turn Type	Prot			Prot			Perm		custom	Perm		custom
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4		4 1 2	4		4 1 2
Actuated Green, G (s)	17.6	130.6		3.0	116.0			20.4	170.0		20.4	170.0
Effective Green, g (s)	17.6	130.6		3.0	116.0			20.4	164.0		20.4	164.0
Actuated g/C Ratio	0.10	0.77		0.02	0.68			0.12	0.96		0.12	0.96
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			2.0			2.0	
Lane Grp Cap (vph)	154	3011		26	2654			139	1224		119	1024
v/s Ratio Prot	c0.12	0.66		0.01	c0.89							
v/s Ratio Perm								0.09	0.02		c0.11	0.17
v/c Ratio	1.11	0.86		0.85	1.30			0.77	0.03		0.92	0.17
Uniform Delay, d1	76.2	13.5		83.3	27.0			72.5	0.1		74.0	0.1
Progression Factor	0.90	0.75		0.73	0.79			1.00	1.00		1.00	1.00
Incremental Delay, d2	91.4	2.3		19.1	136.1			20.3	0.0		55.8	0.0
Delay (s)	159.8	12.5		80.2	157.5			92.8	0.1		129.8	0.2
Level of Service	F	B		F	F			F	A		F	A
Approach Delay (s)		21.6			157.0			72.0			49.7	
Approach LOS		C			F			E			D	

Intersection Summary			
HCM Average Control Delay	94.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	130.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

1130: Ala Moana Boulevard & Queen Street

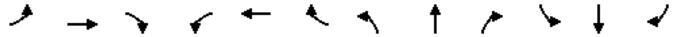
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	38	2490	3524	500	221	41
Ideal Flow (vphpl)	1900	1700	1700	1900	1900	1900
Lane Width	10	11	10	11	12	12
Total Lost time (s)	5.0	6.0	6.0		5.0	5.0
Lane Util. Factor	1.00	0.91	0.91		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1486	3958	3722		3090	1341
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1486	3958	3722		3090	1341
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	39	2541	3596	510	226	42
RTOR Reduction (vph)	0	0	10	0	0	36
Lane Group Flow (vph)	39	2541	4096	0	226	6
Confl. Peds. (#/hr)				33		28
Turn Type	Prot					Perm
Protected Phases	1	6	2		4	
Permitted Phases						4
Actuated Green, G (s)	6.6	135.3	123.7		23.7	23.7
Effective Green, g (s)	6.6	135.3	123.7		23.7	23.7
Actuated g/C Ratio	0.04	0.80	0.73		0.14	0.14
Clearance Time (s)	5.0	6.0	6.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	58	3150	2708		431	187
v/s Ratio Prot	0.03	c0.64	c1.10		c0.07	
v/s Ratio Perm						0.00
v/c Ratio	0.67	0.81	1.51		0.52	0.03
Uniform Delay, d1	80.6	9.9	23.2		67.9	63.2
Progression Factor	1.20	0.05	0.50		1.00	1.00
Incremental Delay, d2	15.2	1.3	230.9		1.2	0.1
Delay (s)	111.8	1.8	242.3		69.1	63.3
Level of Service	F	A	F		E	E
Approach Delay (s)		3.5	242.3		68.2	
Approach LOS		A	F		E	

Intersection Summary			
HCM Average Control Delay	147.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	125.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	595	2081	3704	394	156	300
Ideal Flow (vphpl)	1900	1700	1700	1900	1900	1900
Lane Width	10	11	10	11	12	12
Total Lost time (s)	4.0	10.0	10.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	2884	3958	3743		1593	2508
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	2884	3958	3743		1593	2508
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	607	2123	3780	402	159	306
RTOR Reduction (vph)	0	0	7	0	0	0
Lane Group Flow (vph)	607	2123	4175	0	159	306
Confl. Peds. (#/hr)	42			42	42	
Turn Type	Prot					custom
Protected Phases	3	6	2		4	3 4
Permitted Phases						6
Actuated Green, G (s)	21.0	108.1	108.1		22.9	156.0
Effective Green, g (s)	21.0	108.1	108.1		22.9	156.0
Actuated g/C Ratio	0.12	0.64	0.64		0.13	0.92
Clearance Time (s)	4.0	10.0	10.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	356	2517	2380		215	2360
v/s Ratio Prot	c0.21	0.54	c1.12		c0.10	0.04
v/s Ratio Perm						0.09
v/c Ratio	1.71	0.84	1.75		0.74	0.13
Uniform Delay, d1	74.5	24.3	31.0		70.7	0.7
Progression Factor	0.87	1.02	1.00		1.00	1.00
Incremental Delay, d2	324.5	2.3	341.2		12.5	0.0
Delay (s)	389.6	27.2	372.1		83.2	0.7
Level of Service	F	C	F		F	A
Approach Delay (s)		107.7	372.1		28.9	
Approach LOS		F	F		C	

Intersection Summary			
HCM Average Control Delay	252.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.59		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	143.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	126	203	156	97	159	133	156	361	161	262	870	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.98		1.00	0.98		1.00	0.99	
Flpb, ped/bikes		1.00		0.99	1.00		1.00	1.00		0.97	1.00	
Frt		0.95		1.00	0.93		1.00	0.95		1.00	0.98	
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		2959		1584	1076		1593	2679		1552	2618	
Flt Permitted		0.63		0.32	1.00		0.95	1.00		0.45	1.00	
Satd. Flow (perm)		1889		542	1076		1593	2679		742	2618	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	129	207	159	99	162	136	159	368	164	267	888	160
RTOR Reduction (vph)	0	42	0	0	22	0	0	34	0	0	10	0
Lane Group Flow (vph)	0	453	0	99	276	0	159	498	0	267	1038	0
Confl. Peds. (#/hr)	12		8	8		12	25		27	27		25
Parking (#/hr)					40	40		20	20		40	40
Turn Type	Perm			Perm			Prot			Perm		
Protected Phases		4			4		5	2			6	
Permitted Phases	4			4						6		
Actuated Green, G (s)		39.0		39.0	39.0		16.8	91.0		69.2	69.2	
Effective Green, g (s)		39.0		39.0	39.0		16.8	91.0		69.2	69.2	
Actuated g/C Ratio		0.28		0.28	0.28		0.12	0.65		0.49	0.49	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0		2.0	2.0		3.0	5.0		3.0	3.0	
Lane Grp Cap (vph)		526		151	300		191	1741		367	1294	
v/s Ratio Prot					c0.26		c0.10	0.19			c0.40	
v/s Ratio Perm		0.24		0.18						0.36		
v/c Ratio		0.86		0.66	0.92		0.83	0.29		0.73	0.80	
Uniform Delay, d1		47.9		44.6	49.0		60.2	10.5		28.0	29.7	
Progression Factor		1.00		1.00	1.00		1.00	1.00		0.36	0.34	
Incremental Delay, d2		13.1		7.6	30.8		25.5	0.4		0.7	0.3	
Delay (s)		61.1		52.1	79.8		85.7	10.9		10.7	10.5	
Level of Service		E		D	E		F	B		B	B	
Approach Delay (s)		61.1			72.9			28.2			10.5	
Approach LOS		E			E			C			B	

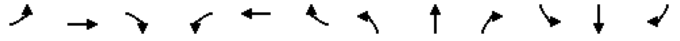
Intersection Summary			
HCM Average Control Delay	31.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	119	545	170	214	509	0	0	1607	575
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0		5.0	6.0			5.0	5.0
Lane Util. Factor					0.91		1.00	0.95			0.95	1.00
Frpb, ped/bikes					0.99		1.00	1.00			1.00	0.98
Flpb, ped/bikes					0.99		1.00	1.00			1.00	1.00
Frt					0.97		1.00	1.00			1.00	0.85
Flt Protected					0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)					4344		1593	2867			2867	1118
Flt Permitted					0.99		0.95	1.00			1.00	1.00
Satd. Flow (perm)					4344		1593	2867			2867	1118
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	121	556	173	218	519	0	0	1640	587
RTOR Reduction (vph)	0	0	0	0	33	0	0	0	0	0	0	27
Lane Group Flow (vph)	0	0	0	0	817	0	218	519	0	0	1640	560
Confl. Peds. (#/hr)	3		40	33		17	26					3
Parking (#/hr)		0	0					20	20		20	20
Turn Type				Perm			Prot					Perm
Protected Phases					4		5	2			6	
Permitted Phases				4								6
Actuated Green, G (s)					28.8		18.2	99.2			77.0	77.0
Effective Green, g (s)					28.8		18.2	99.2			77.0	77.0
Actuated g/C Ratio					0.21		0.13	0.71			0.55	0.55
Clearance Time (s)					6.0		5.0	6.0			5.0	5.0
Vehicle Extension (s)					3.0		3.0	5.0			3.0	3.0
Lane Grp Cap (vph)					894		207	2031			1577	615
v/s Ratio Prot							c0.14	0.18			c0.57	
v/s Ratio Perm					0.19							0.50
v/c Ratio					0.91		1.05	0.26			1.04	0.91
Uniform Delay, d1					54.4		60.9	7.3			31.5	28.4
Progression Factor					1.00		0.97	0.84			0.98	1.02
Incremental Delay, d2					13.6		74.4	0.3			26.9	9.3
Delay (s)					68.0		133.7	6.4			57.6	38.2
Level of Service					E		F	A			E	D
Approach Delay (s)		0.0			68.0			44.0			52.5	
Approach LOS		A			E			D			D	

Intersection Summary				
HCM Average Control Delay	54.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	98.3%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

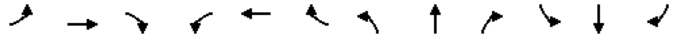
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	238	194	212	0	0	0	0	764	34	90	2099	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0						6.0		5.0	6.0	
Lane Util. Factor	1.00	0.91						0.91		1.00	0.95	
Frpb, ped/bikes	1.00	0.99						1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00						1.00		1.00	1.00	
Frt	1.00	0.92						0.99		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1576	3886						4535		1593	3185	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1576	3886						4535		1593	3185	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	243	198	216	0	0	0	0	780	35	92	2142	0
RTOR Reduction (vph)	0	13	0	0	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	243	401	0	0	0	0	0	812	0	92	2142	0
Confl. Peds. (#/hr)	7		9	9		7	30		34	34		30
Parking (#/hr)		20	20		20	20						
Turn Type	Perm									Prot		
Protected Phases		4						6		5	2	
Permitted Phases	4											
Actuated Green, G (s)	25.4	25.4						85.5		12.1	102.6	
Effective Green, g (s)	25.4	25.4						85.5		12.1	102.6	
Actuated g/C Ratio	0.18	0.18						0.61		0.09	0.73	
Clearance Time (s)	6.0	6.0						6.0		5.0	6.0	
Vehicle Extension (s)	3.0	3.0						5.0		2.0	5.0	
Lane Grp Cap (vph)	286	705						2770		138	2334	
v/s Ratio Prot		0.10						0.18		0.06	c0.67	
v/s Ratio Perm	c0.15											
v/c Ratio	0.85	1.00dr						0.29		0.67	0.92	
Uniform Delay, d1	55.5	52.3						12.9		62.0	15.3	
Progression Factor	1.00	1.00						1.53		1.00	1.00	
Incremental Delay, d2	20.3	1.1						0.3		9.1	7.2	
Delay (s)	75.8	53.4						20.0		71.0	22.5	
Level of Service	E	D						C		E	C	
Approach Delay (s)		61.7			0.0			20.0			24.5	
Approach LOS		E			A			C			C	

Intersection Summary				
HCM Average Control Delay	30.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	89.1%	ICU Level of Service	E	
Analysis Period (min)	15			
dr Defacto Right Lane. Recode with 1 though lane as a right lane.				
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	7	17	10	0	11	31	911	47	22	520	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1612	1425		1593	1425	1593	4543		1593	4544	
Flt Permitted		0.80	1.00		0.73	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1346	1425		1232	1425	1593	4543		1593	4544	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	27	7	17	10	0	11	32	930	48	22	531	27
RTOR Reduction (vph)	0	0	0	0	0	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	34	17	0	10	11	32	974	0	22	554	0
Turn Type	Perm		custom	Perm		custom	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		1 2 4	8		5 6 8						
Actuated Green, G (s)		13.5	80.0		13.5	80.0	3.6	48.4		3.1	47.9	
Effective Green, g (s)		13.5	80.0		13.5	80.0	3.6	48.4		3.1	47.9	
Actuated g/C Ratio		0.17	1.00		0.17	1.00	0.04	0.60		0.04	0.60	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		227	1425		208	1425	72	2749		62	2721	
v/s Ratio Prot							c0.02	c0.21		0.01	0.12	
v/s Ratio Perm		c0.03	c0.01		0.01	0.01						
v/c Ratio		0.15	0.01		0.05	0.01	0.44	0.35		0.35	0.20	
Uniform Delay, d1		28.4	0.0		27.9	0.0	37.2	7.9		37.5	7.3	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		0.97	0.82	
Incremental Delay, d2		0.3	0.0		0.1	0.0	1.6	0.4		1.2	0.2	
Delay (s)		28.7	0.0		28.0	0.0	38.8	8.3		37.7	6.2	
Level of Service		C	A		C	A	D	A		D	A	
Approach Delay (s)		19.1			13.3			9.3			7.4	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM Average Control Delay	9.0	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.30			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	45.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	418	181	297	0	0	60	0	904	93	0	244	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			5.0		5.0			5.0	
Lane Util. Factor	1.00	0.95	1.00			0.88		0.86			0.95	
Frpb, ped/bikes	1.00	1.00	0.95			0.98		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00			1.00		1.00			1.00	
Frt	1.00	1.00	0.85			0.85		0.99			1.00	
Flt Protected	0.95	1.00	1.00			1.00		1.00			1.00	
Satd. Flow (prot)	1593	3185	950			2469		5686			3185	
Flt Permitted	0.95	1.00	1.00			1.00		1.00			1.00	
Satd. Flow (perm)	1593	3185	950			2469		5686			3185	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	427	185	303	0	0	61	0	922	95	0	249	0
RTOR Reduction (vph)	0	0	174	0	0	56	0	19	0	0	0	0
Lane Group Flow (vph)	427	185	129	0	0	5	0	998	0	0	249	0
Confl. Peds. (#/hr)			43			1	35					
Parking (#/hr)			40									
Turn Type	custom		Perm			custom						
Protected Phases	7	4						2			2	
Permitted Phases	8		4			8						
Actuated Green, G (s)	29.1	34.1	34.1			6.7		35.9			35.9	
Effective Green, g (s)	29.1	34.1	34.1			6.7		35.9			35.9	
Actuated g/C Ratio	0.36	0.43	0.43			0.08		0.45			0.45	
Clearance Time (s)	5.0	5.0	5.0			5.0		5.0			5.0	
Vehicle Extension (s)	2.0	3.0	3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)	679	1358	405			207		2552			1429	
v/s Ratio Prot	c0.18	0.06						c0.18			0.08	
v/s Ratio Perm	0.09		0.14			0.00						
v/c Ratio	0.63	0.14	0.32			0.02		0.39			0.17	
Uniform Delay, d1	22.1	14.0	15.2			33.7		14.7			13.2	
Progression Factor	1.00	1.00	1.00			1.00		0.42			1.00	
Incremental Delay, d2	1.3	0.0	0.5			0.0		0.4			0.3	
Delay (s)	23.4	14.0	15.7			33.7		6.7			13.5	
Level of Service	C	B	B			C		A			B	
Approach Delay (s)		19.0			33.7			6.7			13.5	
Approach LOS		B			C			A			B	

Intersection Summary				
HCM Average Control Delay	13.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	59.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	62	5	89	76	107	47	1133	181	0	147	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0	5.0		5.0			5.0	
Lane Util. Factor		1.00		0.95	0.95	1.00		0.86			0.95	
Frpb, ped/bikes		1.00		1.00	1.00	0.97		0.99			0.99	
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00			1.00	
Frt		0.99		1.00	1.00	0.85		0.98			0.99	
Flt Protected		0.99		0.95	0.99	1.00		1.00			1.00	
Satd. Flow (prot)		1637		1507	1582	1377		5562			3125	
Flt Permitted		0.92		0.64	0.96	1.00		0.91			1.00	
Satd. Flow (perm)		1521		1021	1527	1377		5088			3125	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	19	63	5	91	78	109	48	1156	185	0	150	14
RTOR Reduction (vph)	0	2	0	0	0	0	0	17	0	0	3	0
Lane Group Flow (vph)	0	85	0	80	89	109	0	1372	0	0	161	0
Confl. Peds. (#/hr)	14		3	3		14	23		34			23
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm		custom	Perm					
Protected Phases		4			4			2			2	
Permitted Phases	4			4		4 2	2					
Actuated Green, G (s)		15.7		15.7	15.7	120.0		94.3			94.3	
Effective Green, g (s)		15.7		15.7	15.7	120.0		94.3			94.3	
Actuated g/C Ratio		0.13		0.13	0.13	1.00		0.79			0.79	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			5.0			5.0	
Lane Grp Cap (vph)		199		134	200	1377		3998			2456	
v/s Ratio Prot											0.05	
v/s Ratio Perm		0.06		c0.08	0.06	0.08		c0.27				
v/c Ratio		0.43		0.60	0.44	0.08		0.34			0.07	
Uniform Delay, d1		48.0		49.2	48.1	0.0		3.8			2.9	
Progression Factor		1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2		1.5		7.0	1.6	0.0		0.2			0.1	
Delay (s)		49.5		56.1	49.7	0.0		4.0			3.0	
Level of Service		D		E	D	A		A			A	
Approach Delay (s)		49.5			32.1			4.0			3.0	
Approach LOS		D			C			A			A	

Intersection Summary				
HCM Average Control Delay	10.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	69.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	413	26	0	0	0	0	0	0	476	608	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0								5.0	5.0	
Lane Util. Factor		0.91								0.86	0.86	
Frpb, ped/bikes		1.00								1.00	1.00	
Flpb, ped/bikes		1.00								1.00	1.00	
Frt		0.99								1.00	1.00	
Flt Protected		1.00								0.95	0.99	
Satd. Flow (prot)		4076								1370	4270	
Flt Permitted		1.00								0.95	0.99	
Satd. Flow (perm)		4076								1370	4270	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	421	27	0	0	0	0	0	0	486	620	0
RTOR Reduction (vph)	0	14	0	0	0	0	0	0	0	107	88	0
Lane Group Flow (vph)	0	434	0	0	0	0	0	0	0	160	751	0
Confl. Peds. (#/hr)			19				13					13
Parking (#/hr)		40										
Turn Type										Split		
Protected Phases		4								2	2	
Permitted Phases												
Actuated Green, G (s)		12.2								28.2	28.2	
Effective Green, g (s)		12.2								28.2	28.2	
Actuated g/C Ratio		0.24								0.56	0.56	
Clearance Time (s)		5.0								5.0	5.0	
Vehicle Extension (s)		3.0								3.0	3.0	
Lane Grp Cap (vph)		987								767	2389	
v/s Ratio Prot		c0.11								0.12	c0.18	
v/s Ratio Perm												
v/c Ratio		0.44								0.21	0.31	
Uniform Delay, d1		16.2								5.5	5.9	
Progression Factor		1.00								1.00	1.00	
Incremental Delay, d2		0.3								0.6	0.3	
Delay (s)		16.5								6.1	6.3	
Level of Service		B								A	A	
Approach Delay (s)		16.5			0.0			0.0			6.2	
Approach LOS		B			A			A			A	

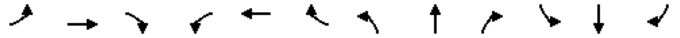
Intersection Summary				
HCM Average Control Delay	9.2	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.35			
Actuated Cycle Length (s)	50.4	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	28.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	103	23	0	0	0	0	155	191	87	550	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0						5.0			5.0	
Lane Util. Factor	1.00	0.91						0.95			0.95	
Frpb, ped/bikes	1.00	1.00						0.99			1.00	
Flpb, ped/bikes	1.00	1.00						1.00			1.00	
Frt	1.00	0.97						0.92			1.00	
Flt Protected	0.95	1.00						1.00			0.99	
Satd. Flow (prot)	1593	4453						2880			3160	
Flt Permitted	0.95	1.00						1.00			0.85	
Satd. Flow (perm)	1593	4453						2880			2710	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	46	105	23	0	0	0	0	158	195	89	561	0
RTOR Reduction (vph)	0	17	0	0	0	0	0	111	0	0	0	0
Lane Group Flow (vph)	46	111	0	0	0	0	0	242	0	0	650	0
Confl. Peds. (#/hr)	10					10	16		26	26		16
Parking (#/hr)			20									
Turn Type	Split									Perm		
Protected Phases	6	6						4			8	
Permitted Phases										8		
Actuated Green, G (s)	8.1	8.1						13.8			13.8	
Effective Green, g (s)	8.1	8.1						13.8			13.8	
Actuated g/C Ratio	0.25	0.25						0.43			0.43	
Clearance Time (s)	5.0	5.0						5.0			5.0	
Vehicle Extension (s)	3.0	3.0						3.0			3.0	
Lane Grp Cap (vph)	404	1131						1246			1172	
v/s Ratio Prot	c0.03	0.02						0.08				
v/s Ratio Perm											c0.24	
v/c Ratio	0.11	0.10						0.19			0.55	
Uniform Delay, d1	9.1	9.1						5.6			6.8	
Progression Factor	1.00	1.00						1.00			1.00	
Incremental Delay, d2	0.1	0.0						0.1			0.6	
Delay (s)	9.3	9.1						5.7			7.3	
Level of Service	A	A						A			A	
Approach Delay (s)		9.2			0.0			5.7			7.3	
Approach LOS		A			A			A			A	

Intersection Summary					
HCM Average Control Delay	7.1	HCM Level of Service		A	
HCM Volume to Capacity ratio	0.39				
Actuated Cycle Length (s)	31.9	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	49.7%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	39	182	90	7	256	185	77	33	54	174	183	227
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.98		1.00	1.00	0.99
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		0.98	1.00	1.00
Frt	1.00	0.95		1.00	0.94		1.00	0.91		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1582	2707		1593	2658		1590	2828		1560	1676	1405
Flt Permitted	0.49	1.00		0.95	1.00		0.64	1.00		0.70	1.00	1.00
Satd. Flow (perm)	819	2707		1593	2658		1070	2828		1144	1676	1405
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	40	186	92	7	261	189	79	34	55	178	187	232
RTOR Reduction (vph)	0	58	0	0	120	0	0	40	0	0	0	0
Lane Group Flow (vph)	40	220	0	7	330	0	79	49	0	178	187	232
Confl. Peds. (#/hr)	14		8	8		14	3		29	29		3
Parking (#/hr)		20	20		20	20						
Turn Type	Perm			Prot			Perm			Perm		custom
Protected Phases		2!		5!	2			4			4	
Permitted Phases	2						4			4		4 1 2
Actuated Green, G (s)	21.2	21.2		32.2	21.2		15.9	15.9		15.9	15.9	58.1
Effective Green, g (s)	21.2	21.2		32.2	21.2		15.9	15.9		15.9	15.9	52.1
Actuated g/C Ratio	0.36	0.36		0.55	0.36		0.27	0.27		0.27	0.27	0.90
Clearance Time (s)	6.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	4.0	4.0		2.0	4.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	299	988		883	970		293	774		313	459	1260
v/s Ratio Prot		0.08		0.00	c0.12			0.02			0.11	
v/s Ratio Perm	0.05						0.07			c0.16		c0.17
v/c Ratio	0.13	0.22		0.01	0.34		0.27	0.06		0.57	0.41	0.18
Uniform Delay, d1	12.3	12.8		5.8	13.4		16.5	15.6		18.2	17.2	0.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	0.5		0.0	1.0		0.5	0.0		2.4	0.6	0.1
Delay (s)	13.2	13.3		5.8	14.3		17.0	15.6		20.5	17.8	0.4
Level of Service	B	B		A	B		B	B		C	B	A
Approach Delay (s)		13.3			14.2			16.3			11.9	
Approach LOS		B			B			B			B	

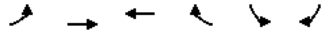
Intersection Summary					
HCM Average Control Delay	13.3	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.38				
Actuated Cycle Length (s)	58.1	Sum of lost time (s)		11.0	
Intersection Capacity Utilization	67.1%	ICU Level of Service		C	
Analysis Period (min)	15				
! Phase conflict between lane groups.					
c Critical Lane Group					



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	482	0	0	527	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0							
Lane Util. Factor		0.95			0.95							
Frt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		2707			2867							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		2707			2867							
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	492	0	0	538	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	492	0	0	538	0	0	0	0	0	0	0
Parking (#/hr)	40	40			20	20						
Turn Type	Perm			Perm								
Protected Phases		2			2							
Permitted Phases	2			2								
Actuated Green, G (s)		38.6			38.6							
Effective Green, g (s)		38.6			38.6							
Actuated g/C Ratio		0.77			0.77							
Clearance Time (s)		5.0			5.0							
Vehicle Extension (s)		3.0			3.0							
Lane Grp Cap (vph)		2090			2213							
v/s Ratio Prot		0.18			c0.19							
v/s Ratio Perm												
v/c Ratio		0.24			0.24							
Uniform Delay, d1		1.6			1.6							
Progression Factor		1.00			1.00							
Incremental Delay, d2		0.3			0.3							
Delay (s)		1.9			1.9							
Level of Service		A			A							
Approach Delay (s)		1.9			1.9			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary				
HCM Average Control Delay	1.9	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.24			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	11.4	
Intersection Capacity Utilization	20.8%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	520	420	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0			
Lane Util. Factor		0.95	0.95			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		2867	2867			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		2867	2867			
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	531	429	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	531	429	0	0	0
Parking (#/hr)		20	20	20		
Turn Type	Perm					
Protected Phases		4	8			
Permitted Phases	4					
Actuated Green, G (s)		12.0	12.0			
Effective Green, g (s)		12.0	12.0			
Actuated g/C Ratio		0.55	0.55			
Clearance Time (s)		5.0	5.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		1571	1571			
v/s Ratio Prot		c0.19	0.15			
v/s Ratio Perm						
v/c Ratio		0.34	0.27			
Uniform Delay, d1		2.7	2.6			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.1	0.1			
Delay (s)		2.9	2.7			
Level of Service		A	A			
Approach Delay (s)		2.9	2.7		0.0	
Approach LOS		A	A		A	

Intersection Summary				
HCM Average Control Delay	2.8	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	21.9	Sum of lost time (s)	9.9	
Intersection Capacity Utilization	20.1%	ICU Level of Service	A	
Analysis Period (min)	15			

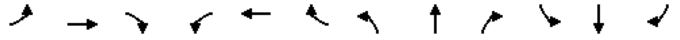
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	386	566	164	80	125	159	53	383	45	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0		6.0				
Lane Util. Factor		0.95			1.00	1.00		0.95				
Frpb, ped/bikes		0.99			1.00	1.00		1.00				
Flpb, ped/bikes		0.98			1.00	1.00		1.00				
Frt		0.98			1.00	0.85		0.99				
Flt Protected		0.98			0.98	1.00		0.99				
Satd. Flow (prot)		2993			1274	1104		3099				
Flt Permitted		0.77			0.44	1.00		0.99				
Satd. Flow (perm)		2337			572	1104		3099				
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	394	578	167	82	128	162	54	391	46	0	0	0
RTOR Reduction (vph)	0	20	0	0	0	0	0	11	0	0	0	0
Lane Group Flow (vph)	0	1119	0	0	210	162	0	480	0	0	0	0
Confl. Peds. (#/hr)	72		31				34		36			
Parking (#/hr)					25	25						
Turn Type	Perm			Perm		custom	Perm					
Protected Phases		4			4			2				
Permitted Phases	4			4		2 4	2					
Actuated Green, G (s)		35.6			35.6	69.6		22.0				
Effective Green, g (s)		35.6			35.6	69.6		22.0				
Actuated g/C Ratio		0.51			0.51	1.00		0.32				
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			4.0				
Lane Grp Cap (vph)		1195			293	1104		980				
v/s Ratio Prot												
v/s Ratio Perm		c0.48			0.37	0.15		0.15				
v/c Ratio		0.94			0.72	0.15		0.49				
Uniform Delay, d1		15.9			13.1	0.0		19.3				
Progression Factor		1.00			1.00	1.00		1.00				
Incremental Delay, d2		13.4			8.1	0.1		1.8				
Delay (s)		29.3			21.2	0.1		21.0				
Level of Service		C			C	A		C				
Approach Delay (s)		29.3			12.0			21.0			0.0	
Approach LOS		C			B			C			A	

Intersection Summary				
HCM Average Control Delay	24.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	69.6	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

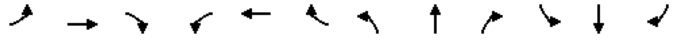
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	1120	365	120	666	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0	5.0	5.0				
Lane Util. Factor					0.86	0.86	1.00	0.95				
Frpb, ped/bikes					1.00	0.94	1.00	1.00				
Flpb, ped/bikes					1.00	1.00	0.95	1.00				
Frt					1.00	0.85	1.00	1.00				
Flt Protected					1.00	1.00	0.95	1.00				
Satd. Flow (prot)					4153	1033	1135	2787				
Flt Permitted					1.00	1.00	0.95	1.00				
Satd. Flow (perm)					4153	1033	1135	2787				
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	0	1143	372	122	680	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	6	0	20	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1174	335	102	680	0	0	0	0
Confl. Peds. (#/hr)	78		80			78	64		73			
Parking (#/hr)					0	0	30	30	30			
Turn Type						custom	Perm		Perm			
Protected Phases					2			8				
Permitted Phases						2 8	8		8			
Actuated Green, G (s)					24.0	54.1	20.1	20.1				
Effective Green, g (s)					24.0	54.1	20.1	20.1				
Actuated g/C Ratio					0.44	1.00	0.37	0.37				
Clearance Time (s)					5.0		5.0	5.0				
Vehicle Extension (s)					3.0		5.0	5.0				
Lane Grp Cap (vph)					1842	1033	422	1035				
v/s Ratio Prot					c0.28			c0.24				
v/s Ratio Perm						0.32	0.09					
v/c Ratio					0.64	0.32	0.24	0.66				
Uniform Delay, d1					11.7	0.0	11.7	14.1				
Progression Factor					1.00	1.00	1.00	1.00				
Incremental Delay, d2					1.7	0.4	0.6	2.0				
Delay (s)					13.4	0.4	12.4	16.2				
Level of Service					B	A	B	B				
Approach Delay (s)		0.0			10.5			15.6			0.0	
Approach LOS		A			B			B			A	

Intersection Summary				
HCM Average Control Delay	12.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	54.1	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	56.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



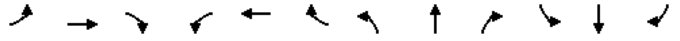
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	861	0	0	0	0	0	1064	44	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0	5.0			
Lane Util. Factor		0.95						0.91	1.00			
Frpb, ped/bikes		1.00						1.00	0.96			
Flpb, ped/bikes		1.00						1.00	1.00			
Frt		1.00						1.00	0.85			
Flt Protected		0.99						1.00	1.00			
Satd. Flow (prot)		3162						4195	1025			
Flt Permitted		0.99						1.00	1.00			
Satd. Flow (perm)		3162						4195	1025			
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	153	879	0	0	0	0	0	1086	45	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	29	0	0	0
Lane Group Flow (vph)	0	1032	0	0	0	0	0	1086	16	0	0	0
Confl. Peds. (#/hr)	37		44	37		44	105		36			
Parking (#/hr)							30	30	30			
Turn Type	Prot						Perm		Perm			
Protected Phases	1	6						4				
Permitted Phases							4		4			
Actuated Green, G (s)		22.0						18.0	18.0			
Effective Green, g (s)		22.0						18.0	18.0			
Actuated g/C Ratio		0.44						0.36	0.36			
Clearance Time (s)		5.0						5.0	5.0			
Vehicle Extension (s)		3.0						3.0	3.0			
Lane Grp Cap (vph)		1391						1510	369			
v/s Ratio Prot		c0.33						c0.26				
v/s Ratio Perm									0.02			
v/c Ratio		0.74						0.72	0.04			
Uniform Delay, d1		11.6						13.8	10.4			
Progression Factor		1.00						1.00	1.00			
Incremental Delay, d2		2.2						3.0	0.2			
Delay (s)		13.8						16.8	10.6			
Level of Service		B						B	B			
Approach Delay (s)		13.8			0.0			16.6			0.0	
Approach LOS		B			A			B			A	

Intersection Summary				
HCM Average Control Delay	15.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	65.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	760	42	0	0	0	0	57	73	12	125	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0						5.0			5.0	
Lane Util. Factor		0.91						1.00			1.00	
Frpb, ped/bikes		1.00						0.98			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		0.99						0.92			1.00	
Flt Protected		1.00						1.00			1.00	
Satd. Flow (prot)		4524						1219			1335	
Flt Permitted		1.00						1.00			0.45	
Satd. Flow (perm)		4524						1219			601	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	20	776	43	0	0	0	0	58	74	12	128	0
RTOR Reduction (vph)	0	6	0	0	0	0	0	59	0	0	0	0
Lane Group Flow (vph)	0	833	0	0	0	0	0	73	0	0	140	0
Confl. Peds. (#/hr)	24		10	10		24	50		18	18		50
Parking (#/hr)								20	20		20	20
Turn Type	Perm									Perm		
Protected Phases		1						3			2	
Permitted Phases	1									2		
Actuated Green, G (s)		27.3						11.3			20.2	
Effective Green, g (s)		27.3						11.3			20.2	
Actuated g/C Ratio		0.36						0.15			0.27	
Clearance Time (s)		7.0						5.0			5.0	
Vehicle Extension (s)		4.0						2.0			3.0	
Lane Grp Cap (vph)		1629						182			160	
v/s Ratio Prot								c0.06				
v/s Ratio Perm		0.18									c0.23	
v/c Ratio		0.51						0.40			0.88	
Uniform Delay, d1		19.0						29.2			26.6	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		1.2						0.5			37.4	
Delay (s)		20.2						29.7			64.0	
Level of Service		C						C			E	
Approach Delay (s)		20.2			0.0			29.7			64.0	
Approach LOS		C			A			C			E	

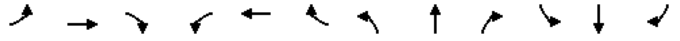
Intersection Summary				
HCM Average Control Delay	26.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	75.8	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	49.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	491	83	0	0	0	0	398	74	73	372	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0					6.0	6.0		6.0	
Lane Util. Factor		0.95	1.00					1.00	1.00		0.95	
Frt		1.00	0.85					1.00	0.85		1.00	
Flt Protected		0.99	1.00					1.00	1.00		0.99	
Satd. Flow (prot)		2834	1140					1341	1140		3160	
Flt Permitted		0.99	1.00					1.00	1.00		0.80	
Satd. Flow (perm)		2834	1140					1341	1140		2560	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	152	501	85	0	0	0	0	406	76	74	380	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	46	0	0	0
Lane Group Flow (vph)	0	653	85	0	0	0	0	406	30	0	454	0
Parking (#/hr)		20	20		40	40		20	20			
Turn Type	Perm		custom						Perm	Perm		
Protected Phases		2						4			4	
Permitted Phases	2		2 4						4	4		
Actuated Green, G (s)		19.2	51.5					20.3	20.3		20.3	
Effective Green, g (s)		19.2	51.5					20.3	20.3		20.3	
Actuated g/C Ratio		0.37	1.00					0.39	0.39		0.39	
Clearance Time (s)		6.0						6.0	6.0		6.0	
Vehicle Extension (s)		5.0						3.0	3.0		3.0	
Lane Grp Cap (vph)		1057	1140					529	449		1009	
v/s Ratio Prot								c0.30				
v/s Ratio Perm		0.23	0.07						0.03		0.18	
v/c Ratio		0.62	0.07					0.77	0.07		0.45	
Uniform Delay, d1		13.2	0.0					13.6	9.7		11.5	
Progression Factor		1.00	1.00					1.00	1.00		1.00	
Incremental Delay, d2		2.7	0.0					6.6	0.1		0.3	
Delay (s)		15.9	0.0					20.1	9.8		11.8	
Level of Service		B	A					C	A		B	
Approach Delay (s)		14.0			0.0			18.5			11.8	
Approach LOS		B			A			B			B	

Intersection Summary				
HCM Average Control Delay	14.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	51.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	71.9%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	172	362	146	56	238	0	0	245	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0			5.0			5.0	5.0
Lane Util. Factor					0.91			1.00			1.00	1.00
Frpb, ped/bikes					0.99			1.00			1.00	0.98
Flpb, ped/bikes					1.00			1.00			1.00	1.00
Frt					0.97			1.00			1.00	0.85
Flt Protected					0.99			0.99			1.00	1.00
Satd. Flow (prot)					4197			1328			1341	1122
Flt Permitted					0.99			0.88			1.00	1.00
Satd. Flow (perm)					4197			1184			1341	1122
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	176	369	149	57	243	0	0	250	139
RTOR Reduction (vph)	0	0	0	0	89	0	0	0	0	0	0	95
Lane Group Flow (vph)	0	0	0	0	605	0	0	300	0	0	250	44
Confl. Peds. (#/hr)	27		10	10		27	7		20	20		7
Parking (#/hr)		0	0		0	0		20	20		20	20
Turn Type				Perm			Perm		Perm	Perm		Perm
Protected Phases					2			4			8	
Permitted Phases				2			4		4	8		8
Actuated Green, G (s)					14.5			11.3			11.3	11.3
Effective Green, g (s)					14.5			11.3			11.3	11.3
Actuated g/C Ratio					0.41			0.32			0.32	0.32
Clearance Time (s)					5.0			5.0			5.0	5.0
Vehicle Extension (s)					3.0			3.0			3.0	3.0
Lane Grp Cap (vph)					1700			374			423	354
v/s Ratio Prot											0.19	
v/s Ratio Perm					0.14			c0.25				0.04
v/c Ratio					0.36			0.80			0.59	0.12
Uniform Delay, d1					7.4			11.2			10.3	8.7
Progression Factor					1.00			1.00			1.00	1.00
Incremental Delay, d2					0.1			11.7			2.2	0.2
Delay (s)					7.5			22.9			12.5	8.9
Level of Service					A			C			B	A
Approach Delay (s)		0.0			7.5			22.9			11.2	
Approach LOS		A			A			C			B	

Intersection Summary				
HCM Average Control Delay	11.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	35.8	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	62.4%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	77	286	108	25	194	78	20	181	59	41	231	145
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	79	292	110	26	198	80	20	185	60	42	236	148

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	481	303	205	60	160	266
Volume Left (vph)	79	26	20	0	42	0
Volume Right (vph)	110	80	0	60	0	148
Hadj (s)	-0.07	-0.11	0.08	-0.67	0.16	-0.36
Departure Headway (s)	7.0	7.5	8.6	7.8	8.4	7.8
Degree Utilization, x	0.94	0.64	0.49	0.13	0.37	0.58
Capacity (veh/h)	501	459	401	444	423	445
Control Delay (s)	53.0	22.8	18.4	10.8	15.0	19.8
Approach Delay (s)	53.0	22.8	16.7		18.0	
Approach LOS	F	C	C		C	

Intersection Summary					
Delay	30.2				
HCM Level of Service	D				
Intersection Capacity Utilization	84.3%	ICU Level of Service		E	
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	47	26	24	42	14	46	31	243	71	23	223	62
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	48	27	24	43	14	47	32	248	72	23	228	63
Pedestrians		9			7			7			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								424				
pX, platoon unblocked												
vC, conflicting volume	688	706	161	524	665	263	300			327		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	688	706	161	524	665	263	300			327		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	83	92	97	89	96	94	97			98		
cM capacity (veh/h)	284	339	844	377	358	726	1249			1222		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	99	104	280	72	137	177
Volume Left	48	43	32	0	23	0
Volume Right	24	47	0	72	0	63
cSH	359	477	1249	1700	1222	1700
Volume to Capacity	0.28	0.22	0.03	0.04	0.02	0.10
Queue Length 95th (ft)	28	21	2	0	1	0
Control Delay (s)	18.8	14.6	1.1	0.0	1.5	0.0
Lane LOS	C	B	A		A	
Approach Delay (s)	18.8	14.6	0.9		0.7	
Approach LOS	C	B				

Intersection Summary					
Average Delay	4.5				
Intersection Capacity Utilization	46.5%	ICU Level of Service		A	
Analysis Period (min)	15				

Intersection Level of Service Calculation Worksheets

No Action Alternative PM
Peak Hour Conditions

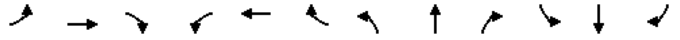
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	118	2834	0	0	0	0	0	2694	1096	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0						6.0	6.0			
Lane Util. Factor		0.86						0.81	0.81			
Frpb, ped/bikes		1.00						1.00	1.00			
Flpb, ped/bikes		1.00						1.00	1.00			
Frt		1.00						0.98	0.85			
Flt Protected		1.00						1.00	1.00			
Satd. Flow (prot)		5756						5323	1154			
Flt Permitted		1.00						1.00	1.00			
Satd. Flow (perm)		5756						5323	1154			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	118	2834	0	0	0	0	0	2694	1096	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2952	0	0	0	0	0	3110	680	0	0	0
Confl. Peds. (#/hr)			55	55			148					148
Turn Type	Perm								Perm			
Protected Phases		5						4 6				
Permitted Phases	5								4 6			
Actuated Green, G (s)		80.0						88.0	88.0			
Effective Green, g (s)		80.0						88.0	88.0			
Actuated g/C Ratio		0.44						0.49	0.49			
Clearance Time (s)		6.0										
Vehicle Extension (s)		1.0										
Lane Grp Cap (vph)		2558						2602	564			
v/s Ratio Prot								0.58				
v/s Ratio Perm		0.51							c0.59			
v/c Ratio		1.15						1.20	1.21			
Uniform Delay, d1		50.0						46.0	46.0			
Progression Factor		1.00						0.63	0.60			
Incremental Delay, d2		74.2						88.2	94.2			
Delay (s)		124.2						117.0	122.0			
Level of Service		F						F	F			
Approach Delay (s)		124.2			0.0			117.9			0.0	
Approach LOS		F			A			F			A	

Intersection Summary			
HCM Average Control Delay	120.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	107.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1288	0	0	0	1279	0	2511	134	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	10	12	12	12	12	12	12
Total Lost time (s)		6.0				6.0		6.0				
Lane Util. Factor		0.91				0.76		0.81				
Frpb, ped/bikes		1.00				1.00		0.99				
Flpb, ped/bikes		1.00				1.00		1.00				
Frt		1.00				0.85		0.99				
Flt Protected		1.00				1.00		1.00				
Satd. Flow (prot)		4424				3032		6669				
Flt Permitted		1.00				1.00		1.00				
Satd. Flow (perm)		4424				3032		6669				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1288	0	0	0	1279	0	2511	134	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	1123	0	5	0	0	0	0
Lane Group Flow (vph)	0	1288	0	0	0	156	0	2640	0	0	0	0
Confl. Peds. (#/hr)			118	118			94		79	79		94
Turn Type						custom						
Protected Phases		2				6		4				
Permitted Phases												
Actuated Green, G (s)		108.0				22.0		60.0				
Effective Green, g (s)		108.0				22.0		60.0				
Actuated g/C Ratio		0.60				0.12		0.33				
Clearance Time (s)		6.0				6.0		6.0				
Vehicle Extension (s)		1.0				2.0		1.0				
Lane Grp Cap (vph)		2654				371		2223				
v/s Ratio Prot		c0.29				0.05		c0.40				
v/s Ratio Perm												
v/c Ratio		0.49				0.42		1.19				
Uniform Delay, d1		20.3				73.1		60.0				
Progression Factor		1.00				1.00		1.00				
Incremental Delay, d2		0.6				0.3		89.2				
Delay (s)		21.0				73.4		149.2				
Level of Service		C				E		F				
Approach Delay (s)		21.0			73.4			149.2			0.0	
Approach LOS		C			E			F			A	

Intersection Summary			
HCM Average Control Delay	98.9	HCM Level of Service	F
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

1020: Kapiolani Boulevard & Ward Avenue

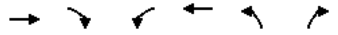


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1306	200	440	1266	326	285	1923	270	271	1466	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	12	12
Total Lost time (s)		6.0			6.0		5.0	5.0	6.0	5.0	14.0	
Lane Util. Factor		0.91			0.91		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		0.98			0.97		1.00	1.00	0.83	1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.98			0.98		1.00	1.00	0.85	1.00	0.98	
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		4107			4015		1593	3185	1180	1593	3115	
Flt Permitted		1.00			0.69		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		4107			2814		1593	3185	1180	1593	3115	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1306	200	440	1266	326	285	1923	270	271	1466	205
RTOR Reduction (vph)	0	13	0	0	19	0	0	0	4	0	7	0
Lane Group Flow (vph)	0	1493	0	0	2013	0	285	1923	266	271	1664	0
Confl. Peds. (#/hr)	83		71	71		83	10		87	87		10
Turn Type				Prot			Prot		custom	Prot		
Protected Phases		6		5	2		3	8		7	4	
Permitted Phases									2 5 6 8			
Actuated Green, G (s)		39.0			62.0		15.0	58.0	125.0	14.0	48.0	
Effective Green, g (s)		39.0			62.0		15.0	58.0	120.0	14.0	48.0	
Actuated g/C Ratio		0.26			0.41		0.10	0.39	0.80	0.09	0.32	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	14.0	
Vehicle Extension (s)		5.0			5.0		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)		1068			1307		159	1232	944	149	997	
v/s Ratio Prot		0.36			c0.18		c0.18	c0.60		0.17	0.53	
v/s Ratio Perm					c0.45				0.23			
v/c Ratio		1.40			2.29dl		1.79	1.56	0.28	1.82	1.67	
Uniform Delay, d1		55.5			44.0		67.5	46.0	3.9	68.0	51.0	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		184.7			247.0		380.6	256.4	0.3	393.6	305.3	
Delay (s)		240.2			291.0		448.1	302.4	4.2	461.6	356.3	
Level of Service		F			F		F	F	A	F	F	
Approach Delay (s)		240.2			291.0			286.7			371.0	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	299.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.52		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	175.5%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

1030: Kapiolani Boulevard & Kamakee Street



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1952	129	338	1718	265	469
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	12	12	10	12	12
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.91			0.91	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	0.97
Flpb, ped/bikes	1.00			1.00	0.91	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	4220			4237	1450	1383
Flt Permitted	1.00			0.64	0.95	1.00
Satd. Flow (perm)	4220			2740	1450	1383
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1952	129	338	1718	265	469
RTOR Reduction (vph)	7	0	0	0	0	0
Lane Group Flow (vph)	2074	0	0	2056	265	469
Confl. Peds. (#/hr)		18	18		65	13
Turn Type			Perm			custom
Protected Phases	2			2		
Permitted Phases			2		4	4 2
Actuated Green, G (s)	77.4			77.4	22.6	110.0
Effective Green, g (s)	77.4			77.4	22.6	110.0
Actuated g/C Ratio	0.70			0.70	0.21	1.00
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	5.0			5.0	3.0	
Lane Grp Cap (vph)	2969			1928	298	1383
v/s Ratio Prot	0.49					
v/s Ratio Perm				c0.75	c0.18	0.34
v/c Ratio	0.70			4.69dl	0.89	0.34
Uniform Delay, d1	9.5			16.3	42.5	0.0
Progression Factor	1.00			0.24	1.00	1.00
Incremental Delay, d2	1.4			35.1	25.8	0.1
Delay (s)	10.9			39.0	68.3	0.1
Level of Service	B			D	E	A
Approach Delay (s)	10.9			39.0	24.8	
Approach LOS	B			D	C	

Intersection Summary			
HCM Average Control Delay	24.8	HCM Level of Service	C
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	119.8%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1986	214	119	1492	0	0	0	0	267	1094	549
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.91			0.91					1.00	0.95	1.00
Frpb, ped/bikes		0.99			1.00					1.00	1.00	0.94
Flpb, ped/bikes		1.00			1.00					1.00	1.00	1.00
Frt		0.99			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	1.00	1.00
Satd. Flow (prot)		4172			4256					1593	3185	941
Flt Permitted		1.00			0.63					0.95	1.00	1.00
Satd. Flow (perm)		4172			2690					1593	3185	941
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1986	214	119	1492	0	0	0	0	267	1094	549
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2197	0	0	1611	0	0	0	0	267	1094	549
Confl. Peds. (#/hr)	63		58	58		63						33
Parking (#/hr)												40
Turn Type				Perm						Perm		custom
Protected Phases		6			6						4	
Permitted Phases				6						4		4 6
Actuated Green, G (s)		64.0			64.0					36.0	36.0	110.0
Effective Green, g (s)		64.0			64.0					36.0	36.0	110.0
Actuated g/C Ratio		0.58			0.58					0.33	0.33	1.00
Clearance Time (s)		5.0			5.0					5.0	5.0	
Vehicle Extension (s)		5.0			5.0					2.0	2.0	
Lane Grp Cap (vph)		2427			1565					521	1042	941
v/s Ratio Prot		0.53									c0.34	
v/s Ratio Perm					c0.60					0.17		0.58
v/c Ratio		0.91			2.12dl					0.51	1.05	0.58
Uniform Delay, d1		20.3			23.0					29.9	37.0	0.0
Progression Factor		1.03			0.68					1.00	1.00	1.00
Incremental Delay, d2		4.9			29.3					0.4	41.9	0.6
Delay (s)		25.9			44.8					30.3	78.9	0.6
Level of Service		C			D					C	E	A
Approach Delay (s)		25.9			44.8			0.0			49.6	
Approach LOS		C			D			A			D	

Intersection Summary				
HCM Average Control Delay	39.1	HCM Level of Service		D
HCM Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		10.0
Intersection Capacity Utilization	129.2%	ICU Level of Service		H
Analysis Period (min)	15			

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

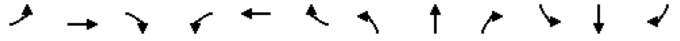
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	2234	121	20	1011	302	192	1682	273	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.91			0.91		1.00	0.91	1.00			
Frpb, ped/bikes		1.00			0.98		1.00	1.00	0.85			
Flpb, ped/bikes		1.00			1.00		0.87	1.00	1.00			
Frt		0.99			0.97		1.00	1.00	0.85			
Flt Protected		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		4218			4027		1387	4577	1206			
Flt Permitted		1.00			0.82		0.95	1.00	1.00			
Satd. Flow (perm)		4218			3294		1387	4577	1206			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2234	121	20	1011	302	192	1682	273	0	0	0
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2350	0	0	1333	0	192	1682	273	0	0	0
Confl. Peds. (#/hr)	76		71	71		76	86		118	118		86
Turn Type				Perm			Perm		custom			
Protected Phases		2			2			4				
Permitted Phases				2			4		2 4			
Actuated Green, G (s)		62.0			62.0		38.0	38.0	110.0			
Effective Green, g (s)		62.0			62.0		38.0	38.0	110.0			
Actuated g/C Ratio		0.56			0.56		0.35	0.35	1.00			
Clearance Time (s)		5.0			5.0		5.0	5.0				
Vehicle Extension (s)		5.0			5.0		2.0	2.0				
Lane Grp Cap (vph)		2377			1857		479	1581	1206			
v/s Ratio Prot		c0.56						c0.37				
v/s Ratio Perm					0.40		0.14		0.23			
v/c Ratio		0.99			0.72		0.40	1.06	0.23			
Uniform Delay, d1		23.6			17.6		27.4	36.0	0.0			
Progression Factor		0.94			1.00		0.58	0.65	1.00			
Incremental Delay, d2		11.2			2.4		0.2	40.3	0.0			
Delay (s)		33.5			20.0		15.9	63.7	0.0			
Level of Service		C			C		B	E	A			
Approach Delay (s)		33.5			20.0			51.3			0.0	
Approach LOS		C			C			D			A	

Intersection Summary				
HCM Average Control Delay	37.0	HCM Level of Service		D
HCM Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		10.0
Intersection Capacity Utilization	95.6%	ICU Level of Service		F
Analysis Period (min)	15			

c Critical Lane Group

1060: Ala Moana Boulevard & South Street

3/21/2008

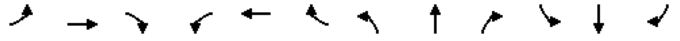


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	286	3735	133	10	3778	102	221	212	42	84	13	293
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0			6.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91			0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	0.88
Flpb, ped/bikes	1.00	1.00			1.00		0.91	1.00			1.00	1.00
Frt	1.00	0.99			1.00		1.00	0.98			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1593	4064			3934		1444	1635			1607	1249
Flt Permitted	0.95	1.00			0.78		0.62	1.00			0.25	1.00
Satd. Flow (perm)	1593	4064			3084		947	1635			417	1249
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	286	3735	133	10	3778	102	221	212	42	84	13	293
RTOR Reduction (vph)	0	2	0	0	1	0	0	1	0	0	0	0
Lane Group Flow (vph)	286	3866	0	0	3889	0	221	253	0	0	97	293
Confl. Peds. (#/hr)	32		28	28		32	59					59
Turn Type	Prot			Perm			Perm			Perm		custom
Protected Phases	5	2			6			4			4	
Permitted Phases				6			4			4		4 5 6
Actuated Green, G (s)	18.0	136.0			113.0		33.0	33.0			33.0	180.0
Effective Green, g (s)	18.0	136.0			113.0		33.0	33.0			33.0	174.0
Actuated g/C Ratio	0.10	0.76			0.63		0.18	0.18			0.18	0.97
Clearance Time (s)	5.0	6.0			6.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0	5.0			5.0		4.0	4.0			4.0	
Lane Grp Cap (vph)	159	3071			1936		174	300			76	1207
v/s Ratio Prot	c0.18	0.95						0.15				
v/s Ratio Perm					c1.26		c0.23				0.23	0.23
v/c Ratio	1.80	1.26			2.01		1.27	0.84			1.28	0.24
Uniform Delay, d1	81.0	22.0			33.5		73.5	71.0			73.5	0.1
Progression Factor	1.00	1.00			0.14		1.00	1.00			1.00	1.00
Incremental Delay, d2	383.3	119.3			454.0		158.8	19.7			194.3	0.1
Delay (s)	464.3	141.3			458.7		232.3	90.7			267.8	0.3
Level of Service	F	F			F		F	F			F	A
Approach Delay (s)		163.5			458.7			156.6			66.8	
Approach LOS		F			F			F			E	

Intersection Summary				
HCM Average Control Delay	287.8	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.84			
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	241.6%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

1070: Ala Moana Boulevard & Keawe Street

3/21/2008



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	84	3389	68	22	4168	62	127	16	15	68	3	208
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.94	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.98	
Frt	1.00	1.00		1.00	1.00			0.99			0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1486	3936		1485	3946			1577			1374	
Flt Permitted	0.95	1.00		1.00	1.00			0.29			0.87	
Satd. Flow (perm)	1486	3936		1563	3946			479			1207	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	84	3389	68	22	4168	62	127	16	15	68	3	208
RTOR Reduction (vph)	0	1	0	0	1	0	0	2	0	0	58	0
Lane Group Flow (vph)	84	3456	0	22	4229	0	0	156	0	0	221	0
Confl. Peds. (#/hr)	9		22	22		9	26		42	42		26
Parking (#/hr)												40
Turn Type	Prot			custom			Perm			Perm		
Protected Phases	5	2			6			3			4	
Permitted Phases				1			3			4		
Actuated Green, G (s)	5.0	105.6		2.4	103.0			28.0			23.0	
Effective Green, g (s)	5.0	105.6		2.4	103.0			28.0			23.0	
Actuated g/C Ratio	0.03	0.59		0.01	0.57			0.16			0.13	
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			2.0			2.0	
Lane Grp Cap (vph)	41	2309		21	2258			75			154	
v/s Ratio Prot	c0.06	c0.88			c1.07							
v/s Ratio Perm				0.01				c0.33			c0.18	
v/c Ratio	2.05	1.50		1.05	1.87			2.08			1.43	
Uniform Delay, d1	87.5	37.2		88.8	38.5			76.0			78.5	
Progression Factor	1.19	0.64		1.23	0.62			1.00			1.00	
Incremental Delay, d2	479.5	223.7		72.0	393.0			530.3			227.6	
Delay (s)	584.0	247.6		181.4	416.8			606.3			306.1	
Level of Service	F	F		F	F			F			F	
Approach Delay (s)		255.6			415.6			606.3			306.1	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	346.7	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.93			
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	27.0	
Intersection Capacity Utilization	137.7%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	4140	62	20	3334	41	176	67	43	56	38	95
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	0.86
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.93			1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.97	1.00
Satd. Flow (prot)	1486	3936		1486	3951			1480			1221	915
Flt Permitted	0.95	1.00		0.95	1.00			0.69			0.72	1.00
Satd. Flow (perm)	1486	3936		1486	3951			1057			909	915
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	55	4140	62	20	3334	41	176	67	43	56	38	95
RTOR Reduction (vph)	0	1	0	0	1	0	0	3	0	0	0	0
Lane Group Flow (vph)	55	4201	0	20	3374	0	0	283	0	0	94	95
Confl. Peds. (#/hr)			42	42			45		7	7		45
Parking (#/hr)											30	30
Turn Type	Prot			Prot			Perm			Perm		custom
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		4 5 2
Actuated Green, G (s)	5.0	126.6		2.4	124.0			35.0			35.0	177.6
Effective Green, g (s)	5.0	126.6		2.4	124.0			35.0			35.0	171.6
Actuated g/C Ratio	0.03	0.70		0.01	0.69			0.19			0.19	0.95
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			3.0			2.0	
Lane Grp Cap (vph)	41	2768		20	2722			206			177	872
v/s Ratio Prot	c0.04	c1.07		0.01	0.85							
v/s Ratio Perm								c0.27			0.10	0.10
v/c Ratio	1.34	1.52		1.00	1.24			1.37			0.53	0.11
Uniform Delay, d1	87.5	26.7		88.8	28.0			72.5			65.1	0.2
Progression Factor	1.11	0.45		1.15	0.14			1.00			1.00	1.00
Incremental Delay, d2	167.9	233.2		60.4	108.2			195.3			1.5	0.0
Delay (s)	264.9	245.1		162.2	111.9			267.8			66.7	0.2
Level of Service	F	F		F	F			F			E	A
Approach Delay (s)		245.4			112.2			267.8			33.3	
Approach LOS		F			F			F			C	

Intersection Summary				
HCM Average Control Delay	185.6	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.50			
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	134.7%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	123	3264	30	51	2946	67	48	176	132	56	178	228
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.95
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00
Satd. Flow (prot)	1486	3945		1486	3937			1653	1397		1655	1354
Flt Permitted	0.95	1.00		0.95	1.00			0.57	1.00		0.56	1.00
Satd. Flow (perm)	1486	3945		1486	3937			951	1397		931	1354
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	123	3264	30	51	2946	67	48	176	132	56	178	228
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	123	3293	0	51	3012	0	0	224	132	0	234	228
Confl. Peds. (#/hr)	25		37	37		25	15		3	3		15
Turn Type	Prot			Prot			Perm		custom	Perm		custom
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4		4 1 2	4		4 5 6
Actuated Green, G (s)	12.0	123.0		4.0	115.0			37.0	180.0		37.0	180.0
Effective Green, g (s)	12.0	123.0		4.0	115.0			37.0	174.0		37.0	174.0
Actuated g/C Ratio	0.07	0.68		0.02	0.64			0.21	0.97		0.21	0.97
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			4.0			4.0	
Lane Grp Cap (vph)	99	2696		33	2515			195	1350		191	1309
v/s Ratio Prot	c0.08	c0.83		0.03	0.76							
v/s Ratio Perm								0.24	0.09		c0.25	0.17
v/c Ratio	1.24	1.22		1.55	1.20			1.15	0.10		1.23	0.17
Uniform Delay, d1	84.0	28.5		88.0	32.5			71.5	0.1		71.5	0.1
Progression Factor	1.20	0.35		0.59	1.90			1.00	1.00		1.00	1.00
Incremental Delay, d2	116.9	100.0		258.7	89.2			110.2	0.0		138.8	0.1
Delay (s)	217.8	110.1		310.9	150.9			181.7	0.2		210.3	0.2
Level of Service	F	F		F	F			F	A		F	A
Approach Delay (s)		114.0			153.6			114.4			106.6	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	130.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.20			
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	128.9%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	496	3386	68	177	2621	254	73	224	271	328	153	796
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0		5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00		0.95	1.00	0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.91		1.00	0.89	1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	0.93	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1486	3938		1486	3958	1210		3140	1263	1350	2555	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.56	1.00	0.57	0.93	
Satd. Flow (perm)	1486	3938		1486	3958	1210		1783	1263	810	2370	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	496	3386	68	177	2621	254	73	224	271	328	153	796
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	112	0	265	0
Lane Group Flow (vph)	496	3453	0	177	2621	254	0	297	159	295	717	0
Confl. Peds. (#/hr)	34		43	43		34	30		50	50		30
Turn Type	Prot			Prot		custom	Perm		Perm	Perm		
Protected Phases	5	2		1	6			3			4	
Permitted Phases						6 5 3 4	3		3	4		
Actuated Green, G (s)	27.0	84.0		10.0	67.0	180.0		26.0	26.0	39.0	39.0	
Effective Green, g (s)	27.0	84.0		10.0	67.0	165.0		26.0	26.0	39.0	39.0	
Actuated g/C Ratio	0.15	0.47		0.06	0.37	0.92		0.14	0.14	0.22	0.22	
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0	5.0	5.0	5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	223	1838		83	1473	1109		258	182	176	514	
v/s Ratio Prot	c0.33	c0.88		0.12	0.66							
v/s Ratio Perm						0.21		c0.17	0.13	c0.36	0.30	
v/c Ratio	2.22	1.88		2.13	1.78	0.23		1.97dl	0.87	1.68	1.46dr	
Uniform Delay, d1	76.5	48.0		85.0	56.5	0.8		77.0	75.4	70.5	70.5	
Progression Factor	1.03	0.62		0.97	0.91	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	552.2	395.6		530.3	352.2	0.0		103.1	33.0	327.8	189.5	
Delay (s)	630.7	425.3		612.7	403.5	0.8		180.1	108.4	398.3	260.0	
Level of Service	F	F		F	F	A		F	F	F	F	
Approach Delay (s)		451.1			382.1			145.9			292.0	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	384.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.73		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	161.8%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	3958	42	0	2918	46	90
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900
Lane Width	11	10	10	11	12	12
Total Lost time (s)	6.0			6.0	5.0	
Lane Util. Factor	0.91			0.91	1.00	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	3952			3958	1501	
Flt Permitted	1.00			1.00	0.98	
Satd. Flow (perm)	3952			3958	1501	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3958	42	0	2918	46	90
RTOR Reduction (vph)	1	0	0	0	2	0
Lane Group Flow (vph)	3999	0	0	2918	134	0
Confl. Peds. (#/hr)					45	
Turn Type						
Protected Phases	6			2	4	
Permitted Phases						
Actuated Green, G (s)	156.0			156.0	13.0	
Effective Green, g (s)	156.0			156.0	13.0	
Actuated g/C Ratio	0.87			0.87	0.07	
Clearance Time (s)	6.0			6.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	3425			3430	108	
v/s Ratio Prot	c1.01			0.74	c0.09	
v/s Ratio Perm						
v/c Ratio	1.17			0.85	1.24	
Uniform Delay, d1	12.0			6.1	83.5	
Progression Factor	2.96			1.41	1.00	
Incremental Delay, d2	75.8			0.3	165.3	
Delay (s)	111.4			8.9	248.8	
Level of Service	F			A	F	
Approach Delay (s)	111.4			8.9	248.8	
Approach LOS	F			A	F	

Intersection Summary			
HCM Average Control Delay	71.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	114.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

1120: Ala Moana Boulevard & Kamakee Street

3/21/2008

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	3822	263	25	2636	84	71	39	23	224	91	276
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.94		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.86	1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1486	2711		1486	2737		1593	2825		1366	1676	1425
Flt Permitted	0.95	1.00		0.95	1.00		0.63	1.00		0.71	1.00	1.00
Satd. Flow (perm)	1486	2711		1486	2737		1059	2825		1027	1676	1425
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	120	3822	263	25	2636	84	71	39	23	224	91	276
RTOR Reduction (vph)	0	3	0	0	1	0	0	19	0	0	0	0
Lane Group Flow (vph)	120	4082	0	25	2719	0	71	43	0	224	91	276
Confl. Peds. (#/hr)	24		39	39		24			66	66		
Turn Type	Prot			Prot			Perm			Perm		custom
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		4 1 2
Actuated Green, G (s)	10.0	129.0		4.0	123.0		31.0	31.0		31.0	31.0	180.0
Effective Green, g (s)	10.0	129.0		4.0	123.0		31.0	31.0		31.0	31.0	174.0
Actuated g/C Ratio	0.06	0.72		0.02	0.68		0.17	0.17		0.17	0.17	0.97
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	83	1943		33	1870		182	487		177	289	1378
v/s Ratio Prot	c0.08	c1.51		0.02	0.99			0.02			0.05	
v/s Ratio Perm							0.07			c0.22		0.19
v/c Ratio	1.45	2.10		0.76	1.45		0.39	0.09		1.27	0.31	0.20
Uniform Delay, d1	85.0	25.5		87.5	28.5		66.1	62.6		74.5	65.2	0.1
Progression Factor	1.07	0.65		0.79	0.74		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	206.7	495.6		7.7	204.5		0.5	0.0		156.5	0.2	0.0
Delay (s)	297.8	512.1		77.2	225.5		66.6	62.6		231.0	65.4	0.2
Level of Service	F	F		E	F		E	E		F	E	A
Approach Delay (s)		506.0			224.1			64.8			97.7	
Approach LOS		F			F			E			F	

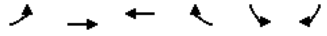
Intersection Summary				
HCM Average Control Delay	366.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.95			
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	171.4%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

1130: Ala Moana Boulevard & Queen Street

3/21/2008

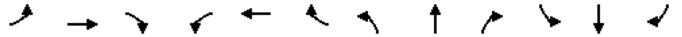
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	27	3832	2995	424	630	125
Ideal Flow (vphpl)	1900	1700	1700	1900	1900	1900
Lane Width	10	11	11	10	12	12
Total Lost time (s)	5.0	6.0	6.0		5.0	5.0
Lane Util. Factor	1.00	0.91	0.91		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1486	3958	3814		3090	1332
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1486	3958	3814		3090	1332
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	27	3832	2995	424	630	125
RTOR Reduction (vph)	0	0	10	0	0	36
Lane Group Flow (vph)	27	3832	3409	0	630	89
Confl. Peds. (#/hr)				84		30
Turn Type	Prot					Perm
Protected Phases	1	6	2		4	
Permitted Phases						4
Actuated Green, G (s)	4.0	138.0	129.0		31.0	31.0
Effective Green, g (s)	4.0	138.0	129.0		31.0	31.0
Actuated g/C Ratio	0.02	0.77	0.72		0.17	0.17
Clearance Time (s)	5.0	6.0	6.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	33	3034	2733		532	229
v/s Ratio Prot	0.02	c0.97	0.89		c0.20	
v/s Ratio Perm						0.07
v/c Ratio	0.82	1.26	1.25		1.18	0.39
Uniform Delay, d1	87.6	21.0	25.5		74.5	66.1
Progression Factor	1.15	0.22	0.80		1.00	1.00
Incremental Delay, d2	13.2	118.6	111.6		100.8	1.1
Delay (s)	114.1	123.2	132.1		175.3	67.2
Level of Service	F	F	F		F	E
Approach Delay (s)		123.2	132.1		157.4	
Approach LOS		F	F		F	

Intersection Summary			
HCM Average Control Delay	130.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	124.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	841	3850	2715	399	288	497
Ideal Flow (vphpl)	1900	1700	1700	1900	1900	1900
Lane Width	10	11	10	11	12	12
Total Lost time (s)	4.0	10.0	10.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	2884	3958	3656		1593	2508
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	2884	3958	3656		1593	2508
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	841	3850	2715	399	288	497
RTOR Reduction (vph)	0	0	11	0	0	0
Lane Group Flow (vph)	841	3850	3103	0	288	497
Confl. Peds. (#/hr)	130			130	68	
Turn Type	Prot					custom
Protected Phases	3	6	2		4	3 4
Permitted Phases						6
Actuated Green, G (s)	34.0	96.0	96.0		32.0	166.0
Effective Green, g (s)	34.0	96.0	96.0		32.0	166.0
Actuated g/C Ratio	0.19	0.53	0.53		0.18	0.92
Clearance Time (s)	4.0	10.0	10.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	545	2111	1950		283	2369
v/s Ratio Prot	c0.29	c0.97	0.85		c0.18	0.08
v/s Ratio Perm						0.12
v/c Ratio	1.54	1.82	1.59		1.02	0.21
Uniform Delay, d1	73.0	42.0	42.0		74.0	0.7
Progression Factor	0.90	0.94	1.00		1.00	1.00
Incremental Delay, d2	245.2	370.9	268.6		58.1	0.0
Delay (s)	310.6	410.3	310.6		132.1	0.7
Level of Service	F	F	F		F	A
Approach Delay (s)		392.4	310.6		48.9	
Approach LOS		F	F		D	

Intersection Summary				
HCM Average Control Delay	331.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.61			
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	136.4%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	437	268	165	153	350	120	481	223	483	907	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	0.95		1.00	0.97		1.00	0.99	
Flpb, ped/bikes		1.00		0.99	1.00		0.99	1.00		0.97	1.00	
Frt		0.96		1.00	0.90		1.00	0.95		1.00	0.98	
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		2963		1584	1003		1577	2651		1553	2611	
Flt Permitted		0.57		0.16	1.00		0.18	1.00		0.33	1.00	
Satd. Flow (perm)		1695		271	1003		300	2651		538	2611	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	220	437	268	165	153	350	120	481	223	483	907	163
RTOR Reduction (vph)	0	44	0	0	82	0	0	54	0	0	15	0
Lane Group Flow (vph)	0	881	0	165	421	0	120	650	0	483	1055	0
Confl. Peds. (#/hr)	40		23	23		40	52		57	57		52
Parking (#/hr)					40	40		20	20		40	40
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		38.0		38.0	38.0		52.0	52.0		52.0	52.0	
Effective Green, g (s)		38.0		38.0	38.0		52.0	52.0		52.0	52.0	
Actuated g/C Ratio		0.38		0.38	0.38		0.52	0.52		0.52	0.52	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0		2.0	2.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		644		103	381		156	1379		280	1358	
v/s Ratio Prot					0.42			0.25			0.40	
v/s Ratio Perm		0.52		c0.61			0.40			c0.90		
v/c Ratio		1.37		1.60	1.10		0.77	0.47		1.72	0.78	
Uniform Delay, d1		31.0		31.0	31.0		19.2	15.3		24.0	19.3	
Progression Factor		1.00		1.00	1.00		1.00	1.00		0.43	0.34	
Incremental Delay, d2		175.4		311.3	77.1		29.9	1.2		334.3	2.4	
Delay (s)		206.4		342.3	108.1		49.1	16.4		344.6	9.0	
Level of Service		F		F	F		D	B		F	A	
Approach Delay (s)		206.4			166.0			21.2			113.4	
Approach LOS		F			F			C			F	

Intersection Summary				
HCM Average Control Delay	124.8	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.67			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	136.4%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	179	575	431	238	1175	0	0	1373	319
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0		6.0	6.0			6.0	6.0
Lane Util. Factor					0.91		1.00	0.95			0.95	1.00
Frpb, ped/bikes					1.00		1.00	1.00			1.00	0.94
Flpb, ped/bikes					0.99		1.00	1.00			1.00	1.00
Frt					0.95		1.00	1.00			1.00	0.85
Flt Protected					0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)					4254		1586	2867			2867	1075
Flt Permitted					0.99		0.13	1.00			1.00	1.00
Satd. Flow (perm)					4254		209	2867			2867	1075
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	179	575	431	238	1175	0	0	1373	319
RTOR Reduction (vph)	0	0	0	0	55	0	0	0	0	0	0	32
Lane Group Flow (vph)	0	0	0	0	1130	0	238	1175	0	0	1373	287
Confl. Peds. (#/hr)			61	61			43					43
Parking (#/hr)		20	20					20	20		20	20
Turn Type				Perm			Perm					Perm
Protected Phases					4			2			2	
Permitted Phases				4			2					2
Actuated Green, G (s)					29.0		59.0	59.0			59.0	59.0
Effective Green, g (s)					29.0		59.0	59.0			59.0	59.0
Actuated g/C Ratio					0.29		0.59	0.59			0.59	0.59
Clearance Time (s)					6.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)					3.0		5.0	5.0			5.0	5.0
Lane Grp Cap (vph)					1234		123	1692			1692	634
v/s Ratio Prot								0.41			0.48	
v/s Ratio Perm					0.27		c1.14					0.27
v/c Ratio					0.92		1.93	0.69			0.81	0.45
Uniform Delay, d1					34.3		20.5	14.2			16.1	11.5
Progression Factor					1.00		0.75	0.69			0.25	0.22
Incremental Delay, d2					10.6		442.6	1.8			1.4	0.7
Delay (s)					44.9		458.0	11.6			5.4	3.2
Level of Service					D		F	B			A	A
Approach Delay (s)		0.0			44.9			86.8			4.9	
Approach LOS		A			D			F			A	

Intersection Summary				
HCM Average Control Delay	43.0	HCM Level of Service		D
HCM Volume to Capacity ratio	1.60			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	101.2%	ICU Level of Service		G
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	615	458	290	0	0	0	0	1661	134	102	1685	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0						6.0		5.0	6.0	
Lane Util. Factor	1.00	0.91						0.91		1.00	0.95	
Frpb, ped/bikes	1.00	0.99						1.00		1.00	1.00	
Flpb, ped/bikes	0.98	1.00						1.00		1.00	1.00	
Frt	1.00	0.94						0.99		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1559	3973						4504		1593	3185	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1559	3973						4504		1593	3185	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	615	458	290	0	0	0	0	1661	134	102	1685	0
RTOR Reduction (vph)	0	6	0	0	0	0	0	9	0	0	0	0
Lane Group Flow (vph)	615	742	0	0	0	0	0	1786	0	102	1685	0
Confl. Peds. (#/hr)	20		19	19		20	41		48	48		41
Parking (#/hr)		20	20		20	20						
Turn Type	Perm									Prot		
Protected Phases		4						6		5	2	
Permitted Phases	4											
Actuated Green, G (s)	37.0	37.0						39.0		7.0	51.0	
Effective Green, g (s)	37.0	37.0						39.0		7.0	51.0	
Actuated g/C Ratio	0.37	0.37						0.39		0.07	0.51	
Clearance Time (s)	6.0	6.0						6.0		5.0	6.0	
Vehicle Extension (s)	3.0	3.0						5.0		2.0	5.0	
Lane Grp Cap (vph)	577	1470						1757		112	1624	
v/s Ratio Prot		0.19						0.40		0.06	c0.53	
v/s Ratio Perm	c0.39											
v/c Ratio	1.07	0.50						1.02		0.91	1.04	
Uniform Delay, d1	31.5	24.4						30.5		46.2	24.5	
Progression Factor	1.00	1.00						0.82		1.00	1.00	
Incremental Delay, d2	56.2	0.3						22.5		56.9	32.7	
Delay (s)	87.7	24.7						47.4		103.1	57.2	
Level of Service	F	C						D		F	E	
Approach Delay (s)		53.1			0.0			47.4			59.8	
Approach LOS		D			A			D			E	

Intersection Summary				
HCM Average Control Delay	53.5	HCM Level of Service		D
HCM Volume to Capacity ratio	1.05			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	99.6%	ICU Level of Service		F
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	40	134	3	161	22	967	198	192	578	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00	0.98		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		0.96	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.97		1.00	1.00	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1604	1389		1528	1425	1593	4389		1593	4564	
Flt Permitted		0.69	1.00		0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1157	1389		1112	1425	1593	4389		1593	4564	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	45	5	40	134	3	161	22	967	198	192	578	7
RTOR Reduction (vph)	0	0	0	0	0	0	0	22	0	0	1	0
Lane Group Flow (vph)	0	50	40	0	137	161	22	1143	0	192	584	0
Confl. Peds. (#/hr)			44	44			25		30	30		25
Turn Type	Perm		custom	Perm		custom	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		1 2 4	8		5 6 8						
Actuated Green, G (s)		20.9	110.0		20.9	110.0	5.6	56.8		17.3	68.5	
Effective Green, g (s)		20.9	110.0		20.9	110.0	5.6	56.8		17.3	68.5	
Actuated g/C Ratio		0.19	1.00		0.19	1.00	0.05	0.52		0.16	0.62	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		220	1389		211	1425	81	2266		251	2842	
v/s Ratio Prot							0.01	c0.26		c0.12	0.13	
v/s Ratio Perm		0.04	0.03		c0.12	0.11						
v/c Ratio		0.23	0.03		0.65	0.11	0.27	0.50		0.76	0.21	
Uniform Delay, d1		37.7	0.0		41.2	0.0	50.2	17.4		44.4	9.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		0.99	0.57	
Incremental Delay, d2		0.5	0.0		6.7	0.0	0.7	0.8		10.2	0.1	
Delay (s)		38.2	0.0		47.9	0.0	50.9	18.2		54.1	5.3	
Level of Service		D	A		D	A	D	B		D	A	
Approach Delay (s)		21.2			22.0			18.8			17.4	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	18.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	71.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	794	535	424	0	0	445	0	1051	123	0	314	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			5.0		5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95	1.00			0.88		0.91	1.00		0.95	
Frpb, ped/bikes	1.00	1.00	0.85			0.99		1.00	0.88		1.00	
Flpb, ped/bikes	1.00	1.00	1.00			1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85			0.85		1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00			1.00		1.00	1.00		1.00	
Satd. Flow (prot)	1592	3185	846			2473		4577	1257		3185	
Flt Permitted	0.95	1.00	1.00			1.00		1.00	1.00		1.00	
Satd. Flow (perm)	1592	3185	846			2473		4577	1257		3185	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	794	535	424	0	0	445	0	1051	123	0	314	0
RTOR Reduction (vph)	0	0	53	0	0	167	0	0	86	0	0	0
Lane Group Flow (vph)	794	535	371	0	0	278	0	1051	37	0	314	0
Confl. Peds. (#/hr)	1		121	121		1	67		82	82		67
Parking (#/hr)			40									
Turn Type	custom		Perm			custom			Perm			
Protected Phases	7	4						2			2	
Permitted Phases	8		4			8			2			
Actuated Green, G (s)	61.9	66.9	66.9			15.9		33.1	33.1		33.1	
Effective Green, g (s)	61.9	66.9	66.9			15.9		33.1	33.1		33.1	
Actuated g/C Ratio	0.56	0.61	0.61			0.14		0.30	0.30		0.30	
Clearance Time (s)	5.0	5.0	5.0			5.0		5.0	5.0		5.0	
Vehicle Extension (s)	2.0	3.0	3.0			3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	968	1937	515			357		1377	378		958	
v/s Ratio Prot	c0.34	0.17						c0.23			0.10	
v/s Ratio Perm	0.16		0.44			0.11			0.03			
v/c Ratio	0.82	0.28	0.72			0.78		0.76	0.10		0.33	
Uniform Delay, d1	21.0	10.1	15.0			45.4		34.9	27.7		29.8	
Progression Factor	1.00	1.00	1.00			1.00		0.59	0.31		1.15	
Incremental Delay, d2	5.4	0.1	4.9			10.3		3.7	0.5		0.9	
Delay (s)	26.4	10.2	20.0			55.6		24.3	9.2		35.2	
Level of Service	C	B	B			E		C	A		D	
Approach Delay (s)		19.9			55.6			22.7			35.2	
Approach LOS		B			E			C			D	

Intersection Summary				
HCM Average Control Delay	26.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	101.3%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	177	21	137	114	221	80	1821	177	0	144	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0	5.0		5.0			5.0	
Lane Util. Factor		1.00		0.95	0.95	1.00		0.86			0.95	
Frpb, ped/bikes		1.00		1.00	1.00	0.91		0.98			0.99	
Flpb, ped/bikes		0.99		1.00	1.00	1.00		1.00			1.00	
Frt		0.99		1.00	1.00	0.85		0.99			0.98	
Flt Protected		0.99		0.95	0.99	1.00		1.00			1.00	
Satd. Flow (prot)		1619		1512	1578	1296		5564			3098	
Flt Permitted		0.91		0.43	0.90	1.00		0.91			1.00	
Satd. Flow (perm)		1482		692	1430	1296		5058			3098	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	49	177	21	137	114	221	80	1821	177	0	144	18
RTOR Reduction (vph)	0	3	0	0	0	0	0	11	0	0	6	0
Lane Group Flow (vph)	0	244	0	112	139	221	0	2067	0	0	156	0
Confl. Peds. (#/hr)	56		1	1		56	36		91	91		36
Turn Type	Perm			Perm		custom	Perm					
Protected Phases		4			4			2			2	
Permitted Phases	4			4		4 2	2					
Actuated Green, G (s)		25.0		25.0	25.0	110.0		75.0			75.0	
Effective Green, g (s)		25.0		25.0	25.0	110.0		75.0			75.0	
Actuated g/C Ratio		0.23		0.23	0.23	1.00		0.68			0.68	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			5.0			5.0	
Lane Grp Cap (vph)		337		157	325	1296		3449			2112	
v/s Ratio Prot											0.05	
v/s Ratio Perm		c0.16		0.16	0.10	0.17		c0.41				
v/c Ratio		0.72		0.71	0.43	0.17		0.60			0.07	
Uniform Delay, d1		39.3		39.2	36.4	0.0		9.4			5.9	
Progression Factor		1.00		1.00	1.00	1.00		0.48			0.25	
Incremental Delay, d2		7.5		14.2	0.9	0.1		0.4			0.0	
Delay (s)		46.8		53.4	37.3	0.1		4.9			1.5	
Level of Service		D		D	D	A		A			A	
Approach Delay (s)		46.8			23.7			4.9			1.5	
Approach LOS		D			C			A			A	

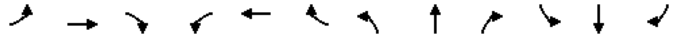
Intersection Summary				
HCM Average Control Delay	11.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	89.2%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	941	37	0	0	0	0	0	0	742	588	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0								5.0	5.0	
Lane Util. Factor		0.91								0.86	0.86	
Frpb, ped/bikes		1.00								1.00	1.00	
Flpb, ped/bikes		1.00								1.00	1.00	
Frt		0.99								1.00	1.00	
Flt Protected		1.00								0.95	0.98	
Satd. Flow (prot)		4089								1370	4243	
Flt Permitted		1.00								0.95	0.98	
Satd. Flow (perm)		4089								1370	4243	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	941	37	0	0	0	0	0	0	742	588	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	0	16	16	0
Lane Group Flow (vph)	0	971	0	0	0	0	0	0	0	355	943	0
Confl. Peds. (#/hr)	16		39	39		16	6					6
Parking (#/hr)		40										
Turn Type										Split		
Protected Phases		4								2	2	
Permitted Phases												
Actuated Green, G (s)		20.2								28.1	28.1	
Effective Green, g (s)		20.2								28.1	28.1	
Actuated g/C Ratio		0.35								0.48	0.48	
Clearance Time (s)		5.0								5.0	5.0	
Vehicle Extension (s)		3.0								3.0	3.0	
Lane Grp Cap (vph)		1417								660	2045	
v/s Ratio Prot		c0.24								c0.26	0.22	
v/s Ratio Perm												
v/c Ratio		0.69								0.54	0.46	
Uniform Delay, d1		16.3								10.6	10.1	
Progression Factor		1.00								1.00	1.00	
Incremental Delay, d2		1.4								3.1	0.8	
Delay (s)		17.7								13.7	10.8	
Level of Service		B								B	B	
Approach Delay (s)		17.7			0.0			0.0			11.6	
Approach LOS		B			A			A			B	

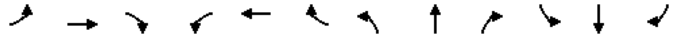
Intersection Summary				
HCM Average Control Delay	14.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	58.3	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	35.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group



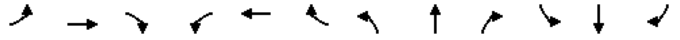
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	171	386	94	0	0	0	0	432	255	45	415	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0						5.0			5.0	
Lane Util. Factor	1.00	0.91						0.95			0.95	
Frpb, ped/bikes	1.00	1.00						0.99			1.00	
Flpb, ped/bikes	1.00	1.00						1.00			1.00	
Frt	1.00	0.97						0.94			1.00	
Flt Protected	0.95	1.00						1.00			1.00	
Satd. Flow (prot)	1593	4442						2983			3169	
Flt Permitted	0.95	1.00						1.00			0.84	
Satd. Flow (perm)	1593	4442						2983			2686	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	171	386	94	0	0	0	0	432	255	45	415	0
RTOR Reduction (vph)	0	63	0	0	0	0	0	161	0	0	0	0
Lane Group Flow (vph)	171	417	0	0	0	0	0	526	0	0	460	0
Confl. Peds. (#/hr)	19					19	72		19	19		72
Parking (#/hr)			20									
Turn Type	Split									Perm		
Protected Phases	6	6						4			8	
Permitted Phases										8		
Actuated Green, G (s)	11.2	11.2						12.4			12.4	
Effective Green, g (s)	11.2	11.2						12.4			12.4	
Actuated g/C Ratio	0.33	0.33						0.37			0.37	
Clearance Time (s)	5.0	5.0						5.0			5.0	
Vehicle Extension (s)	3.0	3.0						3.0			3.0	
Lane Grp Cap (vph)	531	1481						1101			991	
v/s Ratio Prot	c0.11	0.09						c0.18				
v/s Ratio Perm											0.17	
v/c Ratio	0.32	0.28						0.48			0.46	
Uniform Delay, d1	8.4	8.2						8.1			8.1	
Progression Factor	1.00	1.00						1.00			1.00	
Incremental Delay, d2	0.4	0.1						0.3			0.3	
Delay (s)	8.7	8.3						8.4			8.4	
Level of Service	A	A						A			A	
Approach Delay (s)		8.4			0.0			8.4			8.4	
Approach LOS		A			A			A			A	

Intersection Summary				
HCM Average Control Delay	8.4	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	33.6	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	61.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



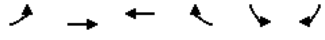
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	287	556	214	51	340	239	79	51	66	245	318	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.91		1.00	0.95		1.00	0.93		1.00	1.00	0.86
Flpb, ped/bikes	0.95	1.00		1.00	1.00		0.93	1.00		0.90	1.00	1.00
Frt	1.00	0.96		1.00	0.94		1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1516	2505		1593	2549		1484	2708		1435	1676	1221
Flt Permitted	0.41	1.00		0.95	1.00		0.34	1.00		0.68	1.00	1.00
Satd. Flow (perm)	647	2505		1593	2549		534	2708		1024	1676	1221
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	287	556	214	51	340	239	79	51	66	245	318	132
RTOR Reduction (vph)	0	44	0	0	118	0	0	49	0	0	0	0
Lane Group Flow (vph)	287	726	0	51	461	0	79	68	0	245	318	132
Confl. Peds. (#/hr)	83		255	255		83	110		96	96		110
Parking (#/hr)		20	20		20	20						
Turn Type	Perm			Prot			Perm			Perm		custom
Protected Phases		2!		5!	2			4			4	
Permitted Phases	2						4			4		4 1 2
Actuated Green, G (s)	45.0	45.0		56.0	45.0		23.0	23.0		23.0	23.0	89.0
Effective Green, g (s)	45.0	45.0		56.0	45.0		23.0	23.0		23.0	23.0	83.0
Actuated g/C Ratio	0.51	0.51		0.63	0.51		0.26	0.26		0.26	0.26	0.93
Clearance Time (s)	6.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	4.0	4.0		2.0	4.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	327	1267		1002	1289		138	700		265	433	1139
v/s Ratio Prot		0.29		0.03	0.18			0.03			0.19	
v/s Ratio Perm	c0.44						0.15			c0.24		c0.11
v/c Ratio	0.88	0.57		0.05	0.36		0.57	0.10		0.92	0.73	0.12
Uniform Delay, d1	19.6	15.3		6.3	13.3		28.7	25.1		32.2	30.2	0.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	26.6	1.9		0.0	0.8		5.6	0.1		35.5	6.4	0.0
Delay (s)	46.2	17.2		6.3	14.1		34.4	25.2		67.6	36.6	0.3
Level of Service	D	B		A	B		C	C		E	D	A
Approach Delay (s)		25.1			13.4			28.9			40.6	
Approach LOS		C			B			C			D	

Intersection Summary				
HCM Average Control Delay	26.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	11.0	
Intersection Capacity Utilization	90.2%	ICU Level of Service	E	
Analysis Period (min)	15			
! Phase conflict between lane groups.				
c Critical Lane Group				



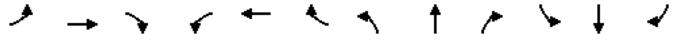
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1092	0	0	563	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0							
Lane Util. Factor		0.95			0.95							
Frpb, ped/bikes		1.00			1.00							
Flpb, ped/bikes		1.00			1.00							
Frt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		2707			2867							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		2707			2867							
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1092	0	0	563	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1092	0	0	563	0	0	0	0	0	0	0
Confl. Peds. (#/hr)			70				171					
Parking (#/hr)	40	40			20	20						
Turn Type	Perm			Perm								
Protected Phases		2			2							
Permitted Phases	2			2								
Actuated Green, G (s)		43.5			43.5							
Effective Green, g (s)		43.5			43.5							
Actuated g/C Ratio		0.62			0.62							
Clearance Time (s)		5.0			5.0							
Vehicle Extension (s)		3.0			3.0							
Lane Grp Cap (vph)		1682			1782							
v/s Ratio Prot		c0.40			0.20							
v/s Ratio Perm												
v/c Ratio		0.65			0.32							
Uniform Delay, d1		8.4			6.2							
Progression Factor		1.00			1.00							
Incremental Delay, d2		2.0			0.5							
Delay (s)		10.4			6.7							
Level of Service		B			A							
Approach Delay (s)		10.4			6.7			0.0			0.0	
Approach LOS		B			A			A			A	

Intersection Summary				
HCM Average Control Delay	9.1	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	26.5	
Intersection Capacity Utilization	37.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



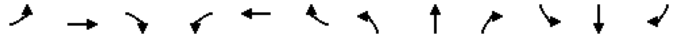
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	943	660	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0			
Lane Util. Factor		0.95	0.95			
Frpb, ped/bikes		1.00	1.00			
Flpb, ped/bikes		1.00	1.00			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		2867	2867			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		2867	2867			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	943	660	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	943	660	0	0	0
Confl. Peds. (#/hr)						77
Parking (#/hr)		20	20	20		
Turn Type	Perm					
Protected Phases		4	8			
Permitted Phases	4					
Actuated Green, G (s)		20.5	20.5			
Effective Green, g (s)		20.5	20.5			
Actuated g/C Ratio		0.52	0.52			
Clearance Time (s)		5.0	5.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		1496	1496			
v/s Ratio Prot		c0.33	0.23			
v/s Ratio Perm						
v/c Ratio		0.63	0.44			
Uniform Delay, d1		6.7	5.8			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.9	0.2			
Delay (s)		7.6	6.0			
Level of Service		A	A			
Approach Delay (s)		7.6	6.0		0.0	
Approach LOS		A	A		A	

Intersection Summary			
HCM Average Control Delay	6.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	39.3	Sum of lost time (s)	18.8
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



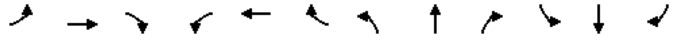
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	569	544	203	90	141	164	42	797	128	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0		6.0				
Lane Util. Factor		0.95			1.00	1.00		0.95				
Frpb, ped/bikes		0.99			1.00	0.91		0.99				
Flpb, ped/bikes		0.98			1.00	1.00		1.00				
Frt		0.98			1.00	0.85		0.98				
Flt Protected		0.98			0.98	1.00		1.00				
Satd. Flow (prot)		2949			1273	1004		3093				
Flt Permitted		0.73			0.35	1.00		1.00				
Satd. Flow (perm)		2190			459	1004		3093				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	569	544	203	90	141	164	42	797	128	0	0	0
RTOR Reduction (vph)	0	15	0	0	0	0	0	12	0	0	0	0
Lane Group Flow (vph)	0	1301	0	0	231	164	0	955	0	0	0	0
Confl. Peds. (#/hr)	59		30	30		59	25		23	23		25
Parking (#/hr)					25	25						
Turn Type	Perm			Perm		custom	Perm					
Protected Phases		4			4			2				
Permitted Phases	4			4		2 4	2					
Actuated Green, G (s)		58.0			58.0	100.0		30.0				
Effective Green, g (s)		58.0			58.0	100.0		30.0				
Actuated g/C Ratio		0.58			0.58	1.00		0.30				
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			4.0				
Lane Grp Cap (vph)		1270			266	1004		928				
v/s Ratio Prot												
v/s Ratio Perm		c0.59			0.50	0.16		0.31				
v/c Ratio		1.02			0.87	0.16		1.03				
Uniform Delay, d1		21.0			17.8	0.0		35.0				
Progression Factor		1.00			1.00	1.00		1.00				
Incremental Delay, d2		31.6			24.5	0.1		37.3				
Delay (s)		52.6			42.3	0.1		72.3				
Level of Service		D			D	A		E				
Approach Delay (s)		52.6			24.8			72.3			0.0	
Approach LOS		D			C			E			A	

Intersection Summary			
HCM Average Control Delay	55.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	110.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



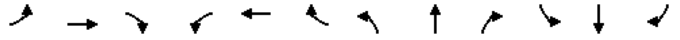
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	1069	494	174	1579	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0	5.0		5.0				
Lane Util. Factor					0.86	0.86		0.86				
Frpb, ped/bikes					0.99	0.95		1.00				
Flpb, ped/bikes					1.00	1.00		0.99				
Frt					0.98	0.85		1.00				
Flt Protected					1.00	1.00		1.00				
Satd. Flow (prot)					4014	993		5708				
Flt Permitted					1.00	1.00		1.00				
Satd. Flow (perm)					4014	993		5708				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	0	1069	494	174	1579	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	13	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1211	351	0	1740	0	0	0	0
Confl. Peds. (#/hr)	52		101	101		52	69		74	74		69
Parking (#/hr)					10	10						
Turn Type						custom	Perm					
Protected Phases					2			8				
Permitted Phases						2 8	8					
Actuated Green, G (s)					24.0	55.0		21.0				
Effective Green, g (s)					24.0	55.0		21.0				
Actuated g/C Ratio					0.44	1.00		0.38				
Clearance Time (s)					5.0			5.0				
Vehicle Extension (s)					3.0			5.0				
Lane Grp Cap (vph)					1752	993		2179				
v/s Ratio Prot					c0.30							
v/s Ratio Perm						0.35		0.30				
v/c Ratio					0.69	0.35		0.80				
Uniform Delay, d1					12.5	0.0		15.1				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					2.3	0.5		2.5				
Delay (s)					14.8	0.5		17.6				
Level of Service					B	A		B				
Approach Delay (s)		0.0			11.6			17.6			0.0	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	261	1119	0	0	0	0	0	2090	97	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0				
Lane Util. Factor		0.95						0.81				
Frpb, ped/bikes		1.00						1.00				
Flpb, ped/bikes		1.00						1.00				
Frt		1.00						0.99				
Flt Protected		0.99						1.00				
Satd. Flow (prot)		3155						6725				
Flt Permitted		0.99						1.00				
Satd. Flow (perm)		3155						6725				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	261	1119	0	0	0	0	0	2090	97	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	13	0	0	0	0
Lane Group Flow (vph)	0	1380	0	0	0	0	0	2174	0	0	0	0
Confl. Peds. (#/hr)	37		3	3		37	54		69	69		54
Turn Type	Prot						Perm					
Protected Phases	1	6						4				
Permitted Phases							4					
Actuated Green, G (s)		27.0						23.0				
Effective Green, g (s)		27.0						23.0				
Actuated g/C Ratio		0.45						0.38				
Clearance Time (s)		5.0						5.0				
Vehicle Extension (s)		3.0						3.0				
Lane Grp Cap (vph)		1420						2578				
v/s Ratio Prot		c0.44						c0.32				
v/s Ratio Perm												
v/c Ratio		0.97						0.84				
Uniform Delay, d1		16.1						16.9				
Progression Factor		1.00						1.00				
Incremental Delay, d2		17.5						2.7				
Delay (s)		33.6						19.6				
Level of Service		C						B				
Approach Delay (s)		33.6			0.0			19.6			0.0	
Approach LOS		C			A			B			A	

Intersection Summary				
HCM Average Control Delay	25.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	79.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	34	1109	65	0	0	0	0	48	84	31	72	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0						5.0			5.0	
Lane Util. Factor		0.91						1.00			1.00	
Frpb, ped/bikes		1.00						0.97			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		0.99						0.91			1.00	
Flt Protected		1.00						1.00			0.99	
Satd. Flow (prot)		4514						1194			1321	
Flt Permitted		1.00						1.00			0.30	
Satd. Flow (perm)		4514						1194			402	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	34	1109	65	0	0	0	0	48	84	31	72	0
RTOR Reduction (vph)	0	6	0	0	0	0	0	70	0	0	0	0
Lane Group Flow (vph)	0	1202	0	0	0	0	0	62	0	0	103	0
Confl. Peds. (#/hr)	27		20	20		27	72		27	27		72
Parking (#/hr)								20	20		20	20
Turn Type	Perm									Perm		
Protected Phases		1						3			2	
Permitted Phases	1									2		
Actuated Green, G (s)		27.1						13.6			25.1	
Effective Green, g (s)		27.1						13.6			25.1	
Actuated g/C Ratio		0.33						0.16			0.30	
Clearance Time (s)		7.0						5.0			5.0	
Vehicle Extension (s)		4.0						2.0			3.0	
Lane Grp Cap (vph)		1477						196			122	
v/s Ratio Prot								c0.05				
v/s Ratio Perm		0.27									c0.26	
v/c Ratio		0.81						0.32			0.84	
Uniform Delay, d1		25.5						30.5			27.0	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		5.0						0.3			38.4	
Delay (s)		30.6						30.8			65.5	
Level of Service		C						C			E	
Approach Delay (s)		30.6			0.0			30.8			65.5	
Approach LOS		C			A			C			E	

Intersection Summary				
HCM Average Control Delay	33.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	82.8	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	73.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	272	792	118	0	0	0	0	445	87	47	316	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0					6.0			6.0	
Lane Util. Factor		0.95	1.00					0.95			0.95	
Frpb, ped/bikes		1.00	0.98					1.00			1.00	
Flpb, ped/bikes		0.99	1.00					1.00			1.00	
Frt		1.00	0.85					0.98			1.00	
Flt Protected		0.99	1.00					1.00			0.99	
Satd. Flow (prot)		2811	1121					3095			3163	
Flt Permitted		0.99	1.00					1.00			0.82	
Satd. Flow (perm)		2811	1121					3095			2611	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	272	792	118	0	0	0	0	445	87	47	316	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	31	0	0	0	0
Lane Group Flow (vph)	0	1064	118	0	0	0	0	501	0	0	363	0
Confl. Peds. (#/hr)	29		5	5		29	28		12	12		28
Parking (#/hr)		20	20		40	40						
Turn Type	Perm		custom							Perm		
Protected Phases		2						4			4	
Permitted Phases	2		2 4							4		
Actuated Green, G (s)		26.1	53.1					15.0			15.0	
Effective Green, g (s)		26.1	53.1					15.0			15.0	
Actuated g/C Ratio		0.49	1.00					0.28			0.28	
Clearance Time (s)		6.0						6.0			6.0	
Vehicle Extension (s)		5.0						3.0			3.0	
Lane Grp Cap (vph)		1382	1121					874			738	
v/s Ratio Prot								c0.16				
v/s Ratio Perm		0.38	0.11								0.14	
v/c Ratio		0.77	0.11					0.57			0.49	
Uniform Delay, d1		11.0	0.0					16.3			15.9	
Progression Factor		1.00	1.00					1.00			1.00	
Incremental Delay, d2		4.2	0.0					0.9			0.5	
Delay (s)		15.2	0.0					17.2			16.4	
Level of Service		B	A					B			B	
Approach Delay (s)		13.7			0.0			17.2			16.4	
Approach LOS		B			A			B			B	

Intersection Summary				
HCM Average Control Delay	15.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	53.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	179	320	199	89	393	0	0	295	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0			5.0			5.0	5.0
Lane Util. Factor					0.91			1.00			1.00	1.00
Frpb, ped/bikes					0.99			1.00			1.00	0.98
Flpb, ped/bikes					1.00			1.00			1.00	1.00
Frt					0.96			1.00			1.00	0.85
Flt Protected					0.99			0.99			1.00	1.00
Satd. Flow (prot)					4008			1659			1676	1393
Flt Permitted					0.99			0.88			1.00	1.00
Satd. Flow (perm)					4008			1477			1676	1393
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	179	320	199	89	393	0	0	295	92
RTOR Reduction (vph)	0	0	0	0	137	0	0	0	0	0	0	50
Lane Group Flow (vph)	0	0	0	0	561	0	0	482	0	0	295	42
Confl. Peds. (#/hr)	15		6	6		15	16		6	6		16
Parking (#/hr)		20	20		20	20						
Turn Type				Perm			Perm		Perm	Perm		Perm
Protected Phases					2			4			8	
Permitted Phases				2			4		4	8		8
Actuated Green, G (s)					12.0			18.1			18.1	18.1
Effective Green, g (s)					12.0			18.1			18.1	18.1
Actuated g/C Ratio					0.30			0.45			0.45	0.45
Clearance Time (s)					5.0			5.0			5.0	5.0
Vehicle Extension (s)					3.0			3.0			3.0	3.0
Lane Grp Cap (vph)					1199			667			756	629
v/s Ratio Prot											0.18	
v/s Ratio Perm					0.14			c0.33				0.03
v/c Ratio					0.47			0.72			0.39	0.07
Uniform Delay, d1					11.4			9.0			7.3	6.2
Progression Factor					1.00			1.00			1.00	1.00
Incremental Delay, d2					0.3			3.9			0.3	0.0
Delay (s)					11.7			12.8			7.7	6.3
Level of Service					B			B			A	A
Approach Delay (s)		0.0			11.7			12.8			7.3	
Approach LOS		A			B			B			A	

Intersection Summary				
HCM Average Control Delay	11.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	40.1	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	76.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	204	482	122	51	165	69	25	243	82	84	376	87
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	204	482	122	51	165	69	25	243	82	84	376	87

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	808	285	268	82	272	275
Volume Left (vph)	204	51	25	0	84	0
Volume Right (vph)	122	69	0	82	0	87
Hadj (s)	-0.01	-0.08	0.08	-0.67	0.19	-0.19
Departure Headway (s)	7.8	8.3	8.8	8.0	8.6	8.2
Degree Utilization, x	1.75	0.65	0.65	0.18	0.65	0.63
Capacity (veh/h)	464	420	397	434	402	424
Control Delay (s)	365.9	25.6	25.7	11.6	24.9	22.9
Approach Delay (s)	365.9	25.6	22.4		23.9	
Approach LOS	F	D	C		C	

Intersection Summary				
Delay	162.7			
HCM Level of Service	F			
Intersection Capacity Utilization	113.4%	ICU Level of Service	H	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	74	38	40	62	41	54	17	292	93	17	417	45
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	74	38	40	62	41	54	17	292	93	17	417	45
Pedestrians		10			6			4			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								424				
pX, platoon unblocked												
vC, conflicting volume	748	908	245	684	884	208	472			391		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	748	908	245	684	884	208	472			391		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	69	85	95	77	85	93	98			99		
cM capacity (veh/h)	236	262	747	270	270	787	1077			1158		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	152	157	163	239	226	254
Volume Left	74	62	17	0	17	0
Volume Right	40	54	0	93	0	45
cSH	297	349	1077	1700	1158	1700
Volume to Capacity	0.51	0.45	0.02	0.14	0.01	0.15
Queue Length 95th (ft)	68	56	1	0	1	0
Control Delay (s)	29.2	23.5	1.0	0.0	0.7	0.0
Lane LOS	D	C	A		A	
Approach Delay (s)	29.2	23.5	0.4		0.3	
Approach LOS	D	C				

Intersection Summary				
Average Delay	7.1			
Intersection Capacity Utilization	48.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection Level of Service Calculation Worksheets

Preferred Alternative AM
Peak Hour Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	308	2924	0	0	0	0	0	1734	348	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0						6.0	6.0			
Lane Util. Factor		0.86						0.81	0.81			
Frpb, ped/bikes		1.00						1.00	1.00			
Flpb, ped/bikes		0.98						1.00	1.00			
Frt		1.00						1.00	0.85			
Flt Protected		1.00						1.00	1.00			
Satd. Flow (prot)		5625						5416	1154			
Flt Permitted		1.00						1.00	1.00			
Satd. Flow (perm)		5625						5416	1154			
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	314	2984	0	0	0	0	0	1769	355	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	3298	0	0	0	0	0	1805	319	0	0	0
Confl. Peds. (#/hr)	103		84				120					
Turn Type	Perm								Perm			
Protected Phases		5						4 6				
Permitted Phases	5								4 6			
Actuated Green, G (s)		82.0						56.0	56.0			
Effective Green, g (s)		82.0						56.0	56.0			
Actuated g/C Ratio		0.55						0.37	0.37			
Clearance Time (s)		6.0										
Vehicle Extension (s)		1.0										
Lane Grp Cap (vph)		3075						2022	431			
v/s Ratio Prot								c0.33				
v/s Ratio Perm		0.59							0.28			
v/c Ratio		1.07						0.89	0.74			
Uniform Delay, d1		34.0						44.2	40.7			
Progression Factor		1.00						0.78	0.73			
Incremental Delay, d2		39.7						3.4	3.7			
Delay (s)		73.7						38.0	33.3			
Level of Service		E						D	C			
Approach Delay (s)		73.7			0.0			37.3			0.0	
Approach LOS		E			A			D			A	

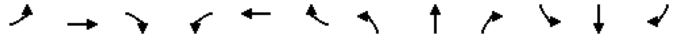
Intersection Summary			
HCM Average Control Delay	59.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1032	0	0	0	973	0	1109	70	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0				6.0		6.0				
Lane Util. Factor		0.91				0.76		0.81				
Frpb, ped/bikes		1.00				1.00		0.99				
Flpb, ped/bikes		1.00				1.00		1.00				
Frt		1.00				0.85		0.99				
Flt Protected		1.00				1.00		1.00				
Satd. Flow (prot)		4577				3249		6277				
Flt Permitted		1.00				1.00		1.00				
Satd. Flow (perm)		4577				3249		6277				
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1053	0	0	0	993	0	1132	71	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	847	0	7	0	0	0	0
Lane Group Flow (vph)	0	1053	0	0	0	146	0	1196	0	0	0	0
Confl. Peds. (#/hr)									59			
Parking (#/hr)							40	40	40			
Turn Type						custom						
Protected Phases		2				6		4				
Permitted Phases												
Actuated Green, G (s)		110.0				22.0		28.0				
Effective Green, g (s)		110.0				22.0		28.0				
Actuated g/C Ratio		0.73				0.15		0.19				
Clearance Time (s)		6.0				6.0		6.0				
Vehicle Extension (s)		1.0				2.0		1.0				
Lane Grp Cap (vph)		3356				477		1172				
v/s Ratio Prot		c0.23				0.04		c0.19				
v/s Ratio Perm												
v/c Ratio		0.31				0.31		1.02				
Uniform Delay, d1		6.9				57.2		61.0				
Progression Factor		1.00				1.00		1.00				
Incremental Delay, d2		0.2				0.1		31.5				
Delay (s)		7.2				57.3		92.5				
Level of Service		A				E		F				
Approach Delay (s)		7.2			57.3			92.5			0.0	
Approach LOS		A			E			F			A	

Intersection Summary			
HCM Average Control Delay	54.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

1020: Kapiolani Boulevard & Ward Avenue

3/21/2008



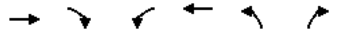
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	684	207	578	1706	165	118	774	103	233	1709	349
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.0	5.0	6.0	5.0	5.0	
Lane Util. Factor		0.91			0.91		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		0.97			1.00		1.00	1.00	0.85	1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.97			0.99		1.00	1.00	0.85	1.00	0.97	
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		4305			4478		1593	3185	1209	1593	3063	
Flt Permitted		1.00			0.68		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		4305			3086		1593	3185	1209	1593	3063	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	698	211	590	1741	168	120	790	105	238	1744	356
RTOR Reduction (vph)	0	36	0	0	5	0	0	0	28	0	6	0
Lane Group Flow (vph)	0	873	0	0	2494	0	120	790	77	238	2094	0
Confl. Peds. (#/hr)			53				36		76	76		36
Turn Type				Prot			Prot		custom	Prot		
Protected Phases		6		5	2		3	8		7	4	
Permitted Phases									2 5 6 8			
Actuated Green, G (s)		29.0			62.0		7.0	47.9	114.9	24.1	65.0	
Effective Green, g (s)		29.0			62.0		7.0	47.9	109.9	24.1	65.0	
Actuated g/C Ratio		0.19			0.41		0.05	0.32	0.73	0.16	0.43	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		5.0			5.0		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)		832			1535		74	1017	886	256	1327	
v/s Ratio Prot		0.20			c0.30		c0.08	0.25		0.15	c0.68	
v/s Ratio Perm					c0.37				0.06			
v/c Ratio		1.05			2.01dl		1.62	0.78	0.09	0.93	1.58	
Uniform Delay, d1		60.5			44.0		71.5	46.2	5.7	62.1	42.5	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		44.8			284.1		333.0	3.5	0.1	36.8	263.9	
Delay (s)		105.3			328.1		404.5	49.7	5.8	98.9	306.4	
Level of Service		F			F		F	D	A	F	F	
Approach Delay (s)		105.3			328.1			87.1			285.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	247.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.59		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	165.5%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

1030: Kapiolani Boulevard & Kamakee Street

3/21/2008



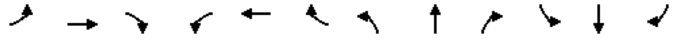
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	972	138	348	2492	116	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.91			0.91	1.00	1.00
Frpb, ped/bikes	0.99			1.00	1.00	0.97
Flpb, ped/bikes	1.00			1.00	0.97	1.00
Frt	0.98			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	4441			4540	1542	1379
Flt Permitted	1.00			0.67	0.95	1.00
Satd. Flow (perm)	4441			3062	1542	1379
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	992	141	355	2543	118	141
RTOR Reduction (vph)	12	0	0	0	0	0
Lane Group Flow (vph)	1121	0	0	2898	118	141
Confl. Peds. (#/hr)		38	38		21	14
Turn Type			Perm			custom
Protected Phases	2			2		
Permitted Phases			2		4	4 2
Actuated Green, G (s)	93.3			93.3	16.7	120.0
Effective Green, g (s)	93.3			93.3	16.7	120.0
Actuated g/C Ratio	0.78			0.78	0.14	1.00
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	5.0			5.0	3.0	
Lane Grp Cap (vph)	3453			2381	215	1379
v/s Ratio Prot	0.25					
v/s Ratio Perm				c0.95	c0.08	0.10
v/c Ratio	0.32			1.22	0.55	0.10
Uniform Delay, d1	4.0			13.4	48.1	0.0
Progression Factor	1.00			0.72	1.00	1.00
Incremental Delay, d2	0.3			98.1	2.9	0.0
Delay (s)	4.2			107.7	51.0	0.0
Level of Service	A			F	D	A
Approach Delay (s)	4.2			107.7	23.2	
Approach LOS	A			F	C	

Intersection Summary			
HCM Average Control Delay	75.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	110.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

1040: Kapiolani Boulevard & Pensacola Street

3/21/2008

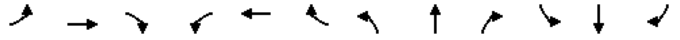


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	897	99	157	2478	24	35	78	35	202	517	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.91			0.91			1.00			0.95	
Frpb, ped/bikes		1.00			1.00			1.00			0.98	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			1.00			0.97			0.95	
Flt Protected		1.00			1.00			0.99			0.99	
Satd. Flow (prot)		4490			4557			1604			2953	
Flt Permitted		1.00			0.72			0.36			0.82	
Satd. Flow (perm)		4490			3304			578			2456	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	915	101	160	2529	24	36	80	36	206	528	337
RTOR Reduction (vph)	0	11	0	0	1	0	0	9	0	0	2	0
Lane Group Flow (vph)	0	1005	0	0	2712	0	0	143	0	0	1069	0
Confl. Peds. (#/hr)	57		20									30
Parking (#/hr)									40	40		40
Turn Type				Perm			Perm			Perm		
Protected Phases		6			6			8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)		71.0			71.0			39.0			39.0	
Effective Green, g (s)		71.0			71.0			39.0			39.0	
Actuated g/C Ratio		0.59			0.59			0.32			0.32	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		5.0			5.0			3.0			2.0	
Lane Grp Cap (vph)		2657			1955			188			798	
v/s Ratio Prot		0.22										
v/s Ratio Perm					c0.82			0.25			c0.44	
v/c Ratio		0.38			1.39			0.76			1.34	
Uniform Delay, d1		12.9			24.5			36.3			40.5	
Progression Factor		0.95			0.33			1.00			1.00	
Incremental Delay, d2		0.4			174.6			16.0			161.2	
Delay (s)		12.6			182.6			52.3			201.7	
Level of Service		B			F			D			F	
Approach Delay (s)		12.6			182.6			52.3			201.7	
Approach LOS		B			F			D			F	

Intersection Summary				
HCM Average Control Delay	147.8	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.37			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	133.7%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

1050: Kapiolani Boulevard & Piikoi Street

3/21/2008



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1000	132	66	2386	216	77	937	82	0	518	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0		5.0	
Lane Util. Factor		0.91			0.91		1.00	0.95	1.00		1.00	
Frpb, ped/bikes		1.00			1.00		1.00	1.00	0.93		1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00		1.00	
Frt		0.98			0.99		1.00	1.00	0.85		0.95	
Flt Protected		1.00			1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		4476			4494		1593	3185	1328		1588	
Flt Permitted		1.00			0.82		0.09	1.00	1.00		1.00	
Satd. Flow (perm)		4476			3679		146	3185	1328		1588	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1020	135	67	2435	220	79	956	84	0	529	337
RTOR Reduction (vph)	0	14	0	0	8	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	1141	0	0	2714	0	79	956	84	0	865	0
Confl. Peds. (#/hr)	35		21	21		35	22		43			
Parking (#/hr)												20
Turn Type				Perm			Perm		custom			
Protected Phases		2			2			4			4	
Permitted Phases				2			4		2 4			
Actuated Green, G (s)		64.0			64.0		46.0	46.0	120.0		46.0	
Effective Green, g (s)		64.0			64.0		46.0	46.0	120.0		46.0	
Actuated g/C Ratio		0.53			0.53		0.38	0.38	1.00		0.38	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Vehicle Extension (s)		5.0			5.0		2.0	2.0			2.0	
Lane Grp Cap (vph)		2387			1962		56	1221	1328		609	
v/s Ratio Prot		0.25						0.30			c0.54	
v/s Ratio Perm					c0.74		0.54		0.06			
v/c Ratio		0.48			1.38		1.41	0.78	0.06		1.42	
Uniform Delay, d1		17.5			28.0		37.0	32.6	0.0		37.0	
Progression Factor		0.89			1.00		0.74	0.73	1.00		1.00	
Incremental Delay, d2		0.6			175.6		261.2	3.0	0.0		198.9	
Delay (s)		16.3			203.6		288.7	26.9	0.0		235.9	
Level of Service		B			F		F	C	A		F	
Approach Delay (s)		16.3			203.6			43.4			235.9	
Approach LOS		B			F			D			F	

Intersection Summary				
HCM Average Control Delay	140.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.40			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	157.3%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	278	4018	313	5	2980	96	64	70	8	44	16	89
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0			6.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91			0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00		0.88	1.00			0.92	1.00
Frt	1.00	0.99			1.00		1.00	0.98			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1486	3900			3936		1407	1651			1485	1425
Flt Permitted	0.95	1.00			0.83		0.71	1.00			0.69	1.00
Satd. Flow (perm)	1486	3900			3274		1052	1651			1058	1425
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	284	4100	319	5	3041	98	65	71	8	45	16	91
RTOR Reduction (vph)	0	4	0	0	2	0	0	1	0	0	0	0
Lane Group Flow (vph)	284	4415	0	0	3142	0	65	78	0	0	61	91
Confl. Peds. (#/hr)	8		21	21		8	70			70		
Turn Type	Prot			Perm			Perm			Perm		custom
Protected Phases	5	2			6			4			4	
Permitted Phases				6			4			4		4 5 6
Actuated Green, G (s)	25.6	137.6			107.0		21.4	21.4			21.4	170.0
Effective Green, g (s)	25.6	137.6			107.0		21.4	21.4			21.4	164.0
Actuated g/C Ratio	0.15	0.81			0.63		0.13	0.13			0.13	0.96
Clearance Time (s)	5.0	6.0			6.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0	5.0			5.0		4.0	4.0			4.0	
Lane Grp Cap (vph)	224	3157			2061		132	208			133	1375
v/s Ratio Prot	0.19	c1.13						0.05				
v/s Ratio Perm					c0.96		c0.06				0.06	0.06
v/c Ratio	1.27	1.40			1.52		0.49	0.38			0.46	0.07
Uniform Delay, d1	72.2	16.2			31.5		69.2	68.2			68.9	0.1
Progression Factor	1.00	1.00			0.09		1.00	1.00			1.00	1.00
Incremental Delay, d2	150.9	181.2			236.3		3.9	1.6			3.4	0.0
Delay (s)	223.1	197.4			239.3		73.1	69.7			72.3	0.1
Level of Service	F	F			F		E	E			E	A
Approach Delay (s)		199.0			239.3			71.3			29.1	
Approach LOS		F			F			E			C	

Intersection Summary				
HCM Average Control Delay	209.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.39			
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	204.3%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	214	3768	121	30	3164	32	15	12	20	39	11	55
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			4.5	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.94			0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Frt	1.00	1.00		1.00	1.00			0.94			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1486	3928		1486	3950			1439			1468	
Flt Permitted	0.95	1.00		0.50	1.00			0.90			0.86	
Satd. Flow (perm)	1486	3928		782	3950			1315			1283	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	218	3845	123	31	3229	33	15	12	20	40	11	56
RTOR Reduction (vph)	0	2	0	0	1	0	0	16	0	0	24	0
Lane Group Flow (vph)	218	3966	0	31	3261	0	0	31	0	0	83	0
Confl. Peds. (#/hr)	10		16	16		10	22		8	8		22
Parking (#/hr)												40
Turn Type	Prot			custom			Perm			Perm		
Protected Phases	5	2			6			3			4	
Permitted Phases				1			3			4		
Actuated Green, G (s)	22.0	122.0		8.0	108.0			3.0			16.5	
Effective Green, g (s)	22.0	122.0		8.0	108.0			3.0			16.5	
Actuated g/C Ratio	0.13	0.72		0.05	0.64			0.02			0.10	
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			4.5	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			2.0			2.0	
Lane Grp Cap (vph)	192	2819		37	2509			23			125	
v/s Ratio Prot	c0.15	c1.01			0.83							
v/s Ratio Perm				0.04				c0.02			c0.06	
v/c Ratio	1.14	1.41		0.84	1.30			1.36			0.66	
Uniform Delay, d1	74.0	24.0		80.4	31.0			83.5			74.1	
Progression Factor	1.20	0.53		1.09	0.45			1.00			1.00	
Incremental Delay, d2	67.3	183.3		13.3	135.2			314.4			9.7	
Delay (s)	156.1	196.1		100.6	149.0			397.9			83.8	
Level of Service	F	F		F	F			F			F	
Approach Delay (s)		194.0			148.6			397.9			83.8	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	174.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.33			
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	20.5	
Intersection Capacity Utilization	124.2%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	109	3326	268	57	2990	29	19	16	18	37	45	50
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00			0.99			1.00	0.87
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.96			1.00	1.00
Frt	1.00	0.99		1.00	1.00			0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	1.00
Satd. Flow (prot)	1486	3891		1486	3949			1506			1226	931
Flt Permitted	0.95	1.00		0.95	1.00			0.87			0.82	1.00
Satd. Flow (perm)	1486	3891		1486	3949			1338			1034	931
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	111	3394	273	58	3051	30	19	16	18	38	46	51
RTOR Reduction (vph)	0	5	0	0	1	0	0	12	0	0	0	0
Lane Group Flow (vph)	111	3662	0	58	3080	0	0	41	0	0	84	51
Confl. Peds. (#/hr)	15		12	12		15	42		3	3		42
Parking (#/hr)											30	30
Turn Type	Prot			Prot			Perm			Perm		custom
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		4 5 2
Actuated Green, G (s)	15.1	127.0		9.1	121.0			17.9			17.9	170.0
Effective Green, g (s)	15.1	127.0		9.1	121.0			17.9			17.9	164.0
Actuated g/C Ratio	0.09	0.75		0.05	0.71			0.11			0.11	0.96
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			3.0			2.0	
Lane Grp Cap (vph)	132	2907		80	2811			141			109	898
v/s Ratio Prot	c0.07	c0.94		0.04	0.78							
v/s Ratio Perm								0.03			c0.08	0.05
v/c Ratio	0.84	1.26		0.72	1.10			0.29			0.77	0.06
Uniform Delay, d1	76.3	21.5		79.2	24.5			70.2			74.1	0.1
Progression Factor	1.23	0.35		1.10	0.15			1.00			1.00	1.00
Incremental Delay, d2	4.4	117.1		2.5	43.8			1.2			25.8	0.0
Delay (s)	97.9	124.6		89.5	47.5			71.4			99.8	0.1
Level of Service	F	F		F	D			E			F	A
Approach Delay (s)		123.8			48.3			71.4			62.1	
Approach LOS		F			D			E			E	

Intersection Summary				
HCM Average Control Delay	88.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.19			
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	117.2%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	187	3056	60	180	3188	60	29	37	18	37	73	109
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.98	1.00
Satd. Flow (prot)	1486	3939		1486	3943			1632	1398		1645	1388
Flt Permitted	0.95	1.00		0.95	1.00			0.65	1.00		0.83	1.00
Satd. Flow (perm)	1486	3939		1486	3943			1087	1398		1390	1388
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	191	3118	61	184	3253	61	30	38	18	38	74	111
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	191	3178	0	184	3313	0	0	68	18	0	112	111
Confl. Peds. (#/hr)	17		17	17		17	6		3	3		6
Turn Type	Prot			Prot			Perm		custom	Perm		custom
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4		4 1 2	4		4 5 6
Actuated Green, G (s)	19.7	116.0		19.7	116.0			18.3	170.0		18.3	170.0
Effective Green, g (s)	19.7	116.0		19.7	116.0			18.3	164.0		18.3	164.0
Actuated g/C Ratio	0.12	0.68		0.12	0.68			0.11	0.96		0.11	0.96
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			4.0			4.0	
Lane Grp Cap (vph)	172	2688		172	2691			117	1349		150	1339
v/s Ratio Prot	c0.13	0.81		0.12	c0.84							
v/s Ratio Perm								0.06	0.01		c0.08	0.08
v/c Ratio	1.11	1.18		1.07	1.23			0.58	0.01		0.75	0.08
Uniform Delay, d1	75.2	27.0		75.2	27.0			72.2	0.1		73.6	0.1
Progression Factor	1.20	0.39		1.26	0.68			1.00	1.00		1.00	1.00
Incremental Delay, d2	57.8	82.4		42.2	104.3			8.4	0.0		19.2	0.0
Delay (s)	148.1	92.8		136.9	122.7			80.6	0.1		92.8	0.2
Level of Service	F	F		F	F			F	A		F	A
Approach Delay (s)		96.0			123.4			63.8			46.7	
Approach LOS		F			F			E			D	

Intersection Summary				
HCM Average Control Delay	107.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.16			
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	117.0%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

1100: Ala Moana Boulevard & Ward Avenue

3/21/2008

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	387	2563	13	306	3060	205	16	29	58	163	150	780
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0		5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00		0.95	1.00	0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.95		1.00	0.92	1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	0.93	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00	
Satd. Flow (prot)	1486	3954		1486	3958	1265		3125	1309	1353	2569	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.57	1.00	0.73	0.95	
Satd. Flow (perm)	1486	3954		1486	3958	1265		1823	1309	1033	2442	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	395	2615	13	312	3122	209	16	30	59	166	153	796
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	53	0	291	0
Lane Group Flow (vph)	395	2627	0	312	3122	209	0	46	6	149	675	0
Confl. Peds. (#/hr)	17		33	33		17	14		36	36		14
Turn Type	Prot			Prot		custom	Perm		Perm	Perm		
Protected Phases	5	2		1	6			3			4	
Permitted Phases						6 5 3 4	3		3	4		
Actuated Green, G (s)	20.0	73.0		17.0	70.0	170.0		18.0	18.0	41.0	41.0	
Effective Green, g (s)	20.0	73.0		17.0	70.0	155.0		18.0	18.0	41.0	41.0	
Actuated g/C Ratio	0.12	0.43		0.10	0.41	0.91		0.11	0.11	0.24	0.24	
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0	5.0	5.0	5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	175	1698		149	1630	1153		193	139	249	589	
v/s Ratio Prot	c0.27	c0.66		0.21	c0.79							
v/s Ratio Perm						0.17		c0.03	0.00	0.14	c0.28	
v/c Ratio	2.26	1.55		2.09	1.92	0.18		0.24	0.04	0.60	1.32dr	
Uniform Delay, d1	75.0	48.5		76.5	50.0	0.8		69.7	68.3	57.2	64.5	
Progression Factor	0.87	1.19		1.07	0.98	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	567.4	246.6		494.4	412.1	0.0		0.2	0.0	2.6	84.1	
Delay (s)	632.3	304.1		576.4	461.1	0.8		69.9	68.3	59.8	148.6	
Level of Service	F	F		F	F	A		E	E	E	F	
Approach Delay (s)		347.0			444.6			69.0			136.8	
Approach LOS		F			F			E			F	

Intersection Summary				
HCM Average Control Delay	358.6	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.61			
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	27.0	
Intersection Capacity Utilization	141.3%	ICU Level of Service	H	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

1110: Ala Moana Boulevard & Kewalo Basin

3/21/2008

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2563	41	0	3687	40	35
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900
Lane Width	11	10	10	11	12	12
Total Lost time (s)	6.0			6.0	5.0	
Lane Util. Factor	0.91			0.91	1.00	
Frpb, ped/bikes	1.00			1.00	0.96	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.94	
Flt Protected	1.00			1.00	0.97	
Satd. Flow (prot)	3942			3958	1464	
Flt Permitted	1.00			1.00	0.97	
Satd. Flow (perm)	3942			3958	1464	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	2615	42	0	3762	41	36
RTOR Reduction (vph)	1	0	0	0	18	0
Lane Group Flow (vph)	2656	0	0	3762	59	0
Confl. Peds. (#/hr)		27				8
Turn Type						
Protected Phases	6			2	4	
Permitted Phases						
Actuated Green, G (s)	154.0			154.0	5.0	
Effective Green, g (s)	154.0			154.0	5.0	
Actuated g/C Ratio	0.91			0.91	0.03	
Clearance Time (s)	6.0			6.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	3571			3585	43	
v/s Ratio Prot	0.67			c0.95	c0.04	
v/s Ratio Perm						
v/c Ratio	0.74			1.05	1.36	
Uniform Delay, d1	2.3			8.0	82.5	
Progression Factor	7.22			2.44	1.00	
Incremental Delay, d2	0.1			23.1	261.1	
Delay (s)	16.7			42.6	343.6	
Level of Service	B			D	F	
Approach Delay (s)	16.7			42.6	343.6	
Approach LOS	B			D	F	

Intersection Summary				
HCM Average Control Delay	35.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.06			
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	11.0	
Intersection Capacity Utilization	104.8%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

1120: Ala Moana Boulevard & Kamakee Street

3/21/2008

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	157	2388	123	21	3212	1	37	67	29	48	53	168
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.89		1.00	0.74
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.96	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.98	1.00
Satd. Flow (prot)	1486	3920		1486	3958			1647	1269		1577	1061
Flt Permitted	0.95	1.00		0.95	1.00			0.70	1.00		0.62	1.00
Satd. Flow (perm)	1486	3920		1486	3958			1171	1269		997	1061
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	160	2437	126	21	3278	1	38	68	30	49	54	171
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	160	2560	0	21	3279	0	0	106	30	0	103	171
Confl. Peds. (#/hr)	112		17	17		112			45	45		112
Turn Type	Prot			Prot			Perm		custom	Perm		custom
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4		4 1 2	4		4 1 2
Actuated Green, G (s)	18.3	131.3		3.0	116.0			19.7	170.0		19.7	170.0
Effective Green, g (s)	18.3	131.3		3.0	116.0			19.7	164.0		19.7	164.0
Actuated g/C Ratio	0.11	0.77		0.02	0.68			0.12	0.96		0.12	0.96
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			2.0			2.0	
Lane Grp Cap (vph)	160	3028		26	2701			136	1224		116	1024
v/s Ratio Prot	c0.11	0.65		0.01	c0.83							
v/s Ratio Perm								0.09	0.02		c0.10	0.16
v/c Ratio	1.00	0.85		0.81	1.21			0.78	0.02		0.89	0.17
Uniform Delay, d1	75.8	12.7		83.2	27.0			73.0	0.1		74.1	0.1
Progression Factor	0.89	0.74		0.73	0.79			1.00	1.00		1.00	1.00
Incremental Delay, d2	58.0	2.1		14.4	96.6			22.2	0.0		48.9	0.0
Delay (s)	125.7	11.5		75.0	117.9			95.2	0.1		123.0	0.2
Level of Service	F	B		E	F			F	A		F	A
Approach Delay (s)		18.3			117.7			74.2			46.3	
Approach LOS		B			F			E			D	

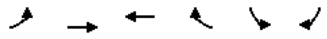
Intersection Summary			
HCM Average Control Delay	71.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	125.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

1130: Ala Moana Boulevard & Queen Street

3/21/2008

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	35	2460	3475	488	217	39
Ideal Flow (vphpl)	1900	1700	1700	1900	1900	1900
Lane Width	10	11	10	11	12	12
Total Lost time (s)	5.0	6.0	6.0		5.0	5.0
Lane Util. Factor	1.00	0.91	0.91		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1486	3958	3704		3090	1341
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1486	3958	3704		3090	1341
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	36	2510	3546	498	221	40
RTOR Reduction (vph)	0	0	9	0	0	34
Lane Group Flow (vph)	36	2510	4035	0	221	6
Confl. Peds. (#/hr)				33		28
Turn Type	Prot					Perm
Protected Phases	1	6	2		4	
Permitted Phases						4
Actuated Green, G (s)	4.9	135.4	125.5		23.6	23.6
Effective Green, g (s)	4.9	135.4	125.5		23.6	23.6
Actuated g/C Ratio	0.03	0.80	0.74		0.14	0.14
Clearance Time (s)	5.0	6.0	6.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	43	3152	2734		429	186
v/s Ratio Prot	0.02	c0.63	c1.09		c0.07	
v/s Ratio Perm						0.00
v/c Ratio	0.84	0.80	1.48		0.52	0.03
Uniform Delay, d1	82.2	9.6	22.2		67.9	63.3
Progression Factor	1.21	0.08	0.53		1.00	1.00
Incremental Delay, d2	51.3	1.2	214.3		1.0	0.1
Delay (s)	150.5	2.0	226.0		68.9	63.4
Level of Service	F	A	F		E	E
Approach Delay (s)		4.1	226.0		68.1	
Approach LOS		A	F		E	

Intersection Summary			
HCM Average Control Delay	137.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	124.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	583	2052	3650	385	152	291
Ideal Flow (vphpl)	1900	1700	1700	1900	1900	1900
Lane Width	10	11	10	11	12	12
Total Lost time (s)	4.0	10.0	10.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	2884	3958	3743		1593	2508
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	2884	3958	3743		1593	2508
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	595	2094	3724	393	155	297
RTOR Reduction (vph)	0	0	7	0	0	0
Lane Group Flow (vph)	595	2094	4110	0	155	297
Confl. Peds. (#/hr)	42			42	42	
Turn Type	Prot					custom
Protected Phases	3	6	2		4	3 4
Permitted Phases						6
Actuated Green, G (s)	20.0	109.3	109.3		22.7	156.0
Effective Green, g (s)	20.0	109.3	109.3		22.7	156.0
Actuated g/C Ratio	0.12	0.64	0.64		0.13	0.92
Clearance Time (s)	4.0	10.0	10.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	339	2545	2407		213	2360
v/s Ratio Prot	c0.21	0.53	c1.10		c0.10	0.03
v/s Ratio Perm						0.08
v/c Ratio	1.76	0.82	1.71		0.73	0.13
Uniform Delay, d1	75.0	23.0	30.4		70.7	0.7
Progression Factor	0.88	1.04	1.00		1.00	1.00
Incremental Delay, d2	347.3	2.0	320.2		11.7	0.0
Delay (s)	413.1	26.0	350.5		82.4	0.7
Level of Service	F	C	F		F	A
Approach Delay (s)		111.7	350.5		28.7	
Approach LOS		F	F		C	

Intersection Summary				
HCM Average Control Delay	242.0	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.57			
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	141.4%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	265	42	142	277	205	148	388	111	146	872	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00		0.99	1.00		1.00	1.00		0.99	1.00	
Frt		0.98		1.00	0.94		1.00	0.97		1.00	0.98	
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3095		1582	1085		1593	2738		1584	2619	
Flt Permitted		0.72		0.50	1.00		0.12	1.00		0.36	1.00	
Satd. Flow (perm)		2234		831	1085		205	2738		594	2619	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	58	270	43	145	283	209	151	396	113	149	890	146
RTOR Reduction (vph)	0	9	0	0	24	0	0	24	0	0	12	0
Lane Group Flow (vph)	0	362	0	145	468	0	151	485	0	149	1024	0
Confl. Peds. (#/hr)	12		8	8		12	25		27	27		25
Parking (#/hr)					40	40		20	20		40	40
Turn Type	Perm			Perm			pm+pt			pm+pt		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		46.0		46.0	46.0		46.5	39.5		51.5	42.0	
Effective Green, g (s)		46.0		46.0	46.0		46.5	39.5		51.5	42.0	
Actuated g/C Ratio		0.42		0.42	0.42		0.42	0.36		0.47	0.38	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0		2.0	2.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)		934		348	454		175	983		364	1000	
v/s Ratio Prot					c0.43		c0.05	0.18		0.04	c0.39	
v/s Ratio Perm		0.16		0.17			0.31			0.16		
v/c Ratio		0.39		0.42	1.03		0.86	0.49		0.41	1.02	
Uniform Delay, d1		22.2		22.5	32.0		23.5	27.5		17.7	34.0	
Progression Factor		1.00		1.00	1.00		1.00	1.00		0.47	0.80	
Incremental Delay, d2		0.1		0.3	50.1		32.8	1.8		0.1	15.7	
Delay (s)		22.3		22.8	82.1		56.3	29.2		8.4	42.9	
Level of Service		C		C	F		E	C		A	D	
Approach Delay (s)		22.3			68.6			35.4			38.6	
Approach LOS		C			E			D			D	

Intersection Summary				
HCM Average Control Delay	42.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.96			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	101.7%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	152	85	165	68	116	63	132	571	44	107	1393	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.96		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.98	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.95		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1589	1164		1557	1571		1592	2836		1593	2763	
Flt Permitted	0.54	1.00		0.39	1.00		0.15	1.00		0.41	1.00	
Satd. Flow (perm)	904	1164		638	1571		246	2836		693	2763	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	155	87	168	69	118	64	135	583	45	109	1421	372
RTOR Reduction (vph)	0	70	0	0	20	0	0	5	0	0	18	0
Lane Group Flow (vph)	155	185	0	69	162	0	135	623	0	109	1775	0
Confl. Peds. (#/hr)	3		40	33		17	26					3
Parking (#/hr)		20	20					20	20		20	20
Turn Type	Perm			Perm			pm+pt			pm+pt		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	23.5	23.5		23.5	23.5		37.5	37.5		59.2	59.2	
Effective Green, g (s)	23.5	23.5		23.5	23.5		37.5	37.5		59.2	59.2	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.34	0.34		0.54	0.54	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	193	249		136	336		210	967		627	1487	
v/s Ratio Prot		0.16			0.10		0.06	c0.22		0.05	c0.64	
v/s Ratio Perm	c0.17			0.11			0.16			0.04		
v/c Ratio	0.80	0.74		0.51	0.48		0.64	0.64		0.17	1.19	
Uniform Delay, d1	41.1	40.4		38.1	37.9		28.8	30.6		13.9	25.4	
Progression Factor	1.00	1.00		1.00	1.00		0.91	0.92		1.00	1.00	
Incremental Delay, d2	20.9	11.3		3.0	1.1		5.5	2.7		0.3	93.9	
Delay (s)	62.0	51.8		41.1	39.0		31.7	30.9		14.2	119.3	
Level of Service	E	D		D	D		C	C		B	F	
Approach Delay (s)		55.6			39.6			31.0			113.3	
Approach LOS		E			D			C			F	

Intersection Summary				
HCM Average Control Delay	81.8	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.06			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	114.1%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	72	132	103	63	234	52	139	789	31	74	1815	366
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1589	1240		1589	1300		1593	3155		1587	3060	
Flt Permitted	0.43	1.00		0.37	1.00		0.06	1.00		0.25	1.00	
Satd. Flow (perm)	715	1240		614	1300		107	3155		424	3060	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	73	135	105	64	239	53	142	805	32	76	1852	373
RTOR Reduction (vph)	0	18	0	0	6	0	0	2	0	0	10	0
Lane Group Flow (vph)	73	222	0	64	286	0	142	835	0	76	2215	0
Confl. Peds. (#/hr)	7		9	9		7	30		34	34		30
Parking (#/hr)		20	20		20	20						
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	34.4	29.8		42.2	34.2		67.8	62.7		68.0	62.8	
Effective Green, g (s)	34.4	29.8		42.2	34.2		67.8	62.7		68.0	62.8	
Actuated g/C Ratio	0.27	0.23		0.33	0.27		0.53	0.49		0.53	0.49	
Clearance Time (s)	5.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	222	287		262	345		115	1537		271	1493	
v/s Ratio Prot	0.01	0.18		c0.02	c0.22		c0.05	0.26		0.01	c0.72	
v/s Ratio Perm	0.08			0.06			0.60			0.14		
v/c Ratio	0.33	0.77		0.24	0.83		1.23	0.54		0.28	1.48	
Uniform Delay, d1	36.5	46.3		31.1	44.5		32.1	23.0		16.1	32.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	12.1		0.5	15.1		160.0	0.7		0.2	221.2	
Delay (s)	37.3	58.4		31.5	59.6		192.1	23.7		16.3	254.1	
Level of Service	D	E		C	E		F	C		B	F	
Approach Delay (s)		53.5			54.5			48.1			246.3	
Approach LOS		D			D			D			F	

Intersection Summary				
HCM Average Control Delay	164.6	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.16			
Actuated Cycle Length (s)	128.7	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	122.5%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	7	16	10	0	11	28	894	46	22	506	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1613	1425		1593	1425	1593	4543		1593	4547	
Flt Permitted		0.81	1.00		0.74	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1360	1425		1233	1425	1593	4543		1593	4547	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	26	7	16	10	0	11	29	912	47	22	516	23
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	33	16	0	10	11	29	956	0	22	536	0
Turn Type	Perm		custom	Perm		custom	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		1 2 4	8		5 6 8						
Actuated Green, G (s)		19.4	120.0		19.4	120.0	4.7	81.3		4.3	80.9	
Effective Green, g (s)		19.4	120.0		19.4	120.0	4.7	81.3		4.3	80.9	
Actuated g/C Ratio		0.16	1.00		0.16	1.00	0.04	0.68		0.04	0.67	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		220	1425		199	1425	62	3078		57	3065	
v/s Ratio Prot							c0.02	c0.21		0.01	0.12	
v/s Ratio Perm		c0.02	c0.01		0.01	0.01						
v/c Ratio		0.15	0.01		0.05	0.01	0.47	0.31		0.39	0.18	
Uniform Delay, d1		43.2	0.0		42.5	0.0	56.4	7.9		56.6	7.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.09	0.74	
Incremental Delay, d2		0.3	0.0		0.1	0.0	2.0	0.3		1.6	0.1	
Delay (s)		43.5	0.0		42.6	0.0	58.4	8.2		63.0	5.5	
Level of Service		D	A		D	A	E	A		E	A	
Approach Delay (s)		29.3			20.3			9.6			7.7	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM Average Control Delay	9.7	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	42.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	273	177	144	0	0	59	0	885	92	0	380	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			5.0		5.0			5.0	
Lane Util. Factor	1.00	0.95	1.00			0.88		0.86			0.95	
Frpb, ped/bikes	1.00	1.00	0.93			0.98		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00			1.00		1.00			1.00	
Frt	1.00	1.00	0.85			0.85		0.99			1.00	
Flt Protected	0.95	1.00	1.00			1.00		1.00			1.00	
Satd. Flow (prot)	1593	3185	931			2464		5685			3185	
Flt Permitted	0.95	1.00	1.00			1.00		1.00			1.00	
Satd. Flow (perm)	1593	3185	931			2464		5685			3185	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	279	181	147	0	0	60	0	903	94	0	388	0
RTOR Reduction (vph)	0	0	104	0	0	57	0	9	0	0	0	0
Lane Group Flow (vph)	279	181	43	0	0	3	0	988	0	0	388	0
Confl. Peds. (#/hr)			43			1	35					
Parking (#/hr)			40									
Turn Type	custom		Perm			custom						
Protected Phases	7	4						2			2	
Permitted Phases	8		4			8						
Actuated Green, G (s)	30.5	35.5	35.5			6.5		74.5			74.5	
Effective Green, g (s)	30.5	35.5	35.5			6.5		74.5			74.5	
Actuated g/C Ratio	0.25	0.30	0.30			0.05		0.62			0.62	
Clearance Time (s)	5.0	5.0	5.0			5.0		5.0			5.0	
Vehicle Extension (s)	2.0	3.0	3.0			3.0		3.0			3.0	
Lane Grp Cap (vph)	471	942	275			133		3529			1977	
v/s Ratio Prot	c0.12	0.06						c0.17			0.12	
v/s Ratio Perm	0.06		0.05			0.00						
v/c Ratio	0.59	0.19	0.16			0.02		0.28			0.20	
Uniform Delay, d1	40.5	31.5	31.2			53.7		10.4			9.8	
Progression Factor	1.00	1.00	1.00			1.00		0.32			0.85	
Incremental Delay, d2	1.3	0.1	0.3			0.1		0.2			0.2	
Delay (s)	41.8	31.6	31.5			53.8		3.6			8.6	
Level of Service	D	C	C			D		A			A	
Approach Delay (s)		36.3			53.8			3.6			8.6	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM Average Control Delay	15.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	50.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	61	5	87	75	105	47	992	177	0	608	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0	5.0		5.0			5.0	
Lane Util. Factor		1.00		0.95	0.95	1.00		0.86			0.95	
Frpb, ped/bikes		1.00		1.00	1.00	0.97		0.99			0.99	
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00			1.00	
Frt		0.99		1.00	1.00	0.85		0.98			0.99	
Flt Protected		0.99		0.95	0.99	1.00		1.00			1.00	
Satd. Flow (prot)		1647		1507	1582	1377		5548			3116	
Flt Permitted		0.97		0.68	0.96	1.00		0.87			1.00	
Satd. Flow (perm)		1601		1078	1529	1377		4847			3116	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	8	62	5	89	77	107	48	1012	181	0	620	67
RTOR Reduction (vph)	0	3	0	0	0	0	0	19	0	0	5	0
Lane Group Flow (vph)	0	72	0	78	88	107	0	1222	0	0	682	0
Confl. Peds. (#/hr)	14		3	3		14	23		34			23
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm		custom	Perm					
Protected Phases		4			4			2			2	
Permitted Phases	4			4		4 2	2					
Actuated Green, G (s)		15.5		15.5	15.5	120.0		94.5			94.5	
Effective Green, g (s)		15.5		15.5	15.5	120.0		94.5			94.5	
Actuated g/C Ratio		0.13		0.13	0.13	1.00		0.79			0.79	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			5.0			5.0	
Lane Grp Cap (vph)		207		139	197	1377		3817			2454	
v/s Ratio Prot											0.22	
v/s Ratio Perm		0.05		c0.07	0.06	0.08		c0.25				
v/c Ratio		0.35		0.56	0.45	0.08		0.32			0.28	
Uniform Delay, d1		47.7		49.1	48.3	0.0		3.6			3.5	
Progression Factor		1.00		1.00	1.00	1.00		0.61			0.82	
Incremental Delay, d2		1.0		5.1	1.6	0.0		0.2			0.3	
Delay (s)		48.7		54.2	49.9	0.0		2.4			3.1	
Level of Service		D		D	D	A		A			A	
Approach Delay (s)		48.7			31.6			2.4			3.1	
Approach LOS		D			C			A			A	

Intersection Summary				
HCM Average Control Delay	7.7	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.35			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	68.9%	ICU Level of Service	C	
Analysis Period (min)	15			

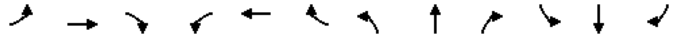
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	195	26	0	0	0	32	0	76	275	35	648
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0						5.0	5.0	5.0	5.0	
Lane Util. Factor		0.95						1.00	1.00	0.95	0.95	
Frpb, ped/bikes		1.00						1.00	1.00	1.00	0.98	
Flpb, ped/bikes		1.00						1.00	1.00	1.00	1.00	
Frt		0.99						1.00	0.85	1.00	0.86	
Flt Protected		0.98						0.95	1.00	0.95	1.00	
Satd. Flow (prot)		2620						1589	1425	1362	1348	
Flt Permitted		0.98						0.22	1.00	0.95	1.00	
Satd. Flow (perm)		2620						365	1425	1362	1348	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	133	199	27	0	0	0	33	0	78	281	36	661
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	35	0	296	0
Lane Group Flow (vph)	0	347	0	0	0	0	0	33	43	253	429	0
Confl. Peds. (#/hr)			19				13					13
Parking (#/hr)		40								0		20
Turn Type	Perm						Perm		Perm	Split		
Protected Phases		4						2!		2!	2	
Permitted Phases	4						2		2			
Actuated Green, G (s)		12.9						28.2	28.2	28.2	28.2	
Effective Green, g (s)		12.9						28.2	28.2	28.2	28.2	
Actuated g/C Ratio		0.25						0.55	0.55	0.55	0.55	
Clearance Time (s)		5.0						5.0	5.0	5.0	5.0	
Vehicle Extension (s)		3.0						3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		661						201	786	752	744	
v/s Ratio Prot										0.19	c0.32	
v/s Ratio Perm		0.13						0.09	0.03			
v/c Ratio		0.53						0.16	0.05	0.34	0.58	
Uniform Delay, d1		16.5						5.6	5.3	6.3	7.5	
Progression Factor		1.00						1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.8						1.8	0.1	1.2	3.2	
Delay (s)		17.2						7.4	5.4	7.5	10.8	
Level of Service		B						A	A	A	B	
Approach Delay (s)		17.2			0.0			6.0			9.9	
Approach LOS		B			A			A			A	

Intersection Summary				
HCM Average Control Delay	11.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	51.1	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	76.3%	ICU Level of Service	D	
Analysis Period (min)	15			

! Phase conflict between lane groups.

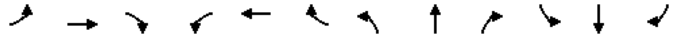
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	44	76	17	214	241	17	79	145	133	83	294	229
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	45	78	17	218	246	17	81	148	136	85	300	234

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	45	95	218	263	155	210	235	384
Volume Left (vph)	45	0	218	0	81	0	85	0
Volume Right (vph)	0	17	0	17	0	136	0	234
Hadj (s)	0.53	-0.09	0.53	-0.01	0.29	-0.42	0.21	-0.39
Departure Headway (s)	8.6	8.0	8.0	7.4	7.8	7.1	7.4	6.8
Degree Utilization, x	0.11	0.21	0.48	0.54	0.34	0.41	0.48	0.72
Capacity (veh/h)	390	420	438	463	444	488	476	518
Control Delay (s)	11.5	11.9	16.9	17.6	13.5	13.8	15.8	24.0
Approach Delay (s)	11.8		17.3		13.7		20.9	
Approach LOS	B		C		B		C	

Intersection Summary				
Delay	17.4			
HCM Level of Service	C			
Intersection Capacity Utilization	65.6%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	180	43	7	578	240	71	172	51	163	220	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		0.98	1.00	1.00
Frt	1.00	0.97		1.00	0.96		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1593	3081		1584	3022		1590	3051		1563	1676	1404
Flt Permitted	0.95	1.00		0.95	1.00		0.55	1.00		0.61	1.00	1.00
Satd. Flow (perm)	1593	3081		1584	3022		926	3051		1003	1676	1404
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	18	184	44	7	590	245	72	176	52	166	224	217
RTOR Reduction (vph)	0	23	0	0	62	0	0	39	0	0	0	0
Lane Group Flow (vph)	18	205	0	7	773	0	72	189	0	166	224	217
Confl. Peds. (#/hr)	14		8	8		14	3		29	29		3
Turn Type	Prot			Prot			Perm			Perm		custom
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		4 1 2
Actuated Green, G (s)	5.0	30.4		0.9	26.3		16.4	16.4		16.4	16.4	63.7
Effective Green, g (s)	5.0	30.4		0.9	26.3		16.4	16.4		16.4	16.4	57.7
Actuated g/C Ratio	0.08	0.48		0.01	0.41		0.26	0.26		0.26	0.26	0.91
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	125	1470		22	1248		238	786		258	431	1272
v/s Ratio Prot	0.01	0.07		0.00	c0.26			0.06			0.13	
v/s Ratio Perm							0.08			c0.17		c0.15
v/c Ratio	0.14	0.14		0.32	0.62		0.30	0.24		0.64	0.52	0.17
Uniform Delay, d1	27.4	9.3		31.1	14.8		19.0	18.7		21.0	20.3	0.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2		3.0	2.3		0.7	0.2		5.4	1.1	0.1
Delay (s)	27.5	9.5		34.1	17.1		19.8	18.9		26.5	21.3	0.4
Level of Service	C	A		C	B		B	B		C	C	A
Approach Delay (s)		10.8			17.2			19.1			15.3	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM Average Control Delay	16.1	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.54				
Actuated Cycle Length (s)	63.7	Sum of lost time (s)		11.0	
Intersection Capacity Utilization	64.3%	ICU Level of Service		C	
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	380	0	0	799	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0							
Lane Util. Factor		0.95			0.95							
Frt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		3185			3185							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		3185			3185							
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	388	0	0	815	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	388	0	0	815	0	0	0	0	0	0	0
Turn Type	Perm			Perm								
Protected Phases		2			2							
Permitted Phases	2			2								
Actuated Green, G (s)		38.6			38.6							
Effective Green, g (s)		38.6			38.6							
Actuated g/C Ratio		0.77			0.77							
Clearance Time (s)		5.0			5.0							
Vehicle Extension (s)		3.0			3.0							
Lane Grp Cap (vph)		2459			2459							
v/s Ratio Prot		0.12			c0.26							
v/s Ratio Perm												
v/c Ratio		0.16			0.33							
Uniform Delay, d1		1.5			1.7							
Progression Factor		1.00			1.00							
Incremental Delay, d2		0.1			0.4							
Delay (s)		1.6			2.1							
Level of Service		A			A							
Approach Delay (s)		1.6			2.1			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary				
HCM Average Control Delay	2.0	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	11.4	
Intersection Capacity Utilization	28.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	402	654	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0			
Lane Util. Factor		0.95	0.95			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		3185	3185			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		3185	3185			
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	410	667	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	410	667	0	0	0
Turn Type	Perm					
Protected Phases		4	8			
Permitted Phases	4					
Actuated Green, G (s)		13.1	13.1			
Effective Green, g (s)		13.1	13.1			
Actuated g/C Ratio		0.57	0.57			
Clearance Time (s)		5.0	5.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		1806	1806			
v/s Ratio Prot		0.13	c0.21			
v/s Ratio Perm						
v/c Ratio		0.23	0.37			
Uniform Delay, d1		2.5	2.7			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.1	0.1			
Delay (s)		2.5	2.9			
Level of Service		A	A			
Approach Delay (s)		2.5	2.9		0.0	
Approach LOS		A	A		A	

Intersection Summary			
HCM Average Control Delay	2.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	23.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	24.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	137	536	156	78	247	303	52	374	34	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0		6.0				
Lane Util. Factor		0.95			1.00	1.00		0.95				
Frpb, ped/bikes		0.99			1.00	1.00		1.00				
Flpb, ped/bikes		0.99			1.00	1.00		1.00				
Frt		0.97			1.00	0.85		0.99				
Flt Protected		0.99			0.99	1.00		0.99				
Satd. Flow (prot)		3032			1284	1104		3113				
Flt Permitted		0.79			0.64	1.00		0.99				
Satd. Flow (perm)		2413			826	1104		3113				
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	140	547	159	80	252	309	53	382	35	0	0	0
RTOR Reduction (vph)	0	33	0	0	0	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	813	0	0	332	309	0	460	0	0	0	0
Confl. Peds. (#/hr)	72		31				34		36			
Parking (#/hr)					25	25						
Turn Type	Perm			Perm		custom	Perm					
Protected Phases		4			4			2				
Permitted Phases	4			4		2 4	2					
Actuated Green, G (s)		25.9			25.9	59.9		22.0				
Effective Green, g (s)		25.9			25.9	59.9		22.0				
Actuated g/C Ratio		0.43			0.43	1.00		0.37				
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			4.0				
Lane Grp Cap (vph)		1043			357	1104		1143				
v/s Ratio Prot												
v/s Ratio Perm		0.34			c0.40	0.28		0.15				
v/c Ratio		0.78			0.93	0.28		0.40				
Uniform Delay, d1		14.6			16.1	0.0		14.1				
Progression Factor		1.00			1.00	1.00		1.00				
Incremental Delay, d2		3.7			29.9	0.1		1.1				
Delay (s)		18.3			46.1	0.1		15.1				
Level of Service		B			D	A		B				
Approach Delay (s)		18.3			23.9			15.1			0.0	
Approach LOS		B			C			B			A	

Intersection Summary				
HCM Average Control Delay	19.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	59.9	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	243	224	0	0	311	158	38	635	19	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95	1.00			
Frpb, ped/bikes		1.00			1.00	0.94	1.00	1.00	0.93			
Flpb, ped/bikes		0.98			1.00	1.00	0.92	1.00	1.00			
Frt		1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected		0.97			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)		3052			1425	1135	1097	2787	997			
Flt Permitted		0.67			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)		2103			1425	1135	1097	2787	997			
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	248	229	0	0	317	161	39	648	19	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	12	0	0	0
Lane Group Flow (vph)	0	477	0	0	317	161	39	648	7	0	0	0
Confl. Peds. (#/hr)	78		80			78	64		73			
Parking (#/hr)					10	10	30	30	30			
Turn Type	Perm					custom	Perm		Perm			
Protected Phases		2			2			8				
Permitted Phases	2					2 8	8		8			
Actuated Green, G (s)		24.1			24.1	53.5	19.4	19.4	19.4			
Effective Green, g (s)		24.1			24.1	53.5	19.4	19.4	19.4			
Actuated g/C Ratio		0.45			0.45	1.00	0.36	0.36	0.36			
Clearance Time (s)		5.0			5.0		5.0	5.0	5.0			
Vehicle Extension (s)		3.0			3.0		5.0	5.0	5.0			
Lane Grp Cap (vph)		947			642	1135	398	1011	362			
v/s Ratio Prot					0.22			c0.23				
v/s Ratio Perm		c0.23				0.14	0.04		0.01			
v/c Ratio		0.50			0.49	0.14	0.10	0.64	0.02			
Uniform Delay, d1		10.4			10.4	0.0	11.3	14.2	10.9			
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		1.9			2.7	0.1	0.2	1.9	0.0			
Delay (s)		12.4			13.1	0.1	11.5	16.1	11.0			
Level of Service		B			B	A	B	B	B			
Approach Delay (s)		12.4			8.7			15.7			0.0	
Approach LOS		B			A			B			A	

Intersection Summary				
HCM Average Control Delay	12.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	53.5	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	72.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	598	0	0	647	106	155	905	34	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.95			0.95		1.00	0.91	1.00			
Frpb, ped/bikes		1.00			0.99		1.00	1.00	0.96			
Flpb, ped/bikes		1.00			1.00		0.92	1.00	1.00			
Frt		1.00			0.98		1.00	1.00	0.85			
Flt Protected		0.99			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		3152			3094		1101	4195	1028			
Flt Permitted		0.56			1.00		0.95	1.00	1.00			
Satd. Flow (perm)		1785			3094		1101	4195	1028			
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	148	610	0	0	660	108	158	923	35	0	0	0
RTOR Reduction (vph)	0	0	0	0	21	0	0	0	23	0	0	0
Lane Group Flow (vph)	0	758	0	0	747	0	158	923	12	0	0	0
Confl. Peds. (#/hr)	37		44	37		44	105		36			
Parking (#/hr)							30	30	30			
Turn Type	Prot						Perm		Perm			
Protected Phases	1	6			2			4				
Permitted Phases							4		4			
Actuated Green, G (s)		27.1			18.1		20.3	20.3	20.3			
Effective Green, g (s)		27.1			18.1		20.3	20.3	20.3			
Actuated g/C Ratio		0.47			0.32		0.35	0.35	0.35			
Clearance Time (s)		5.0			5.0		5.0	5.0	5.0			
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0			
Lane Grp Cap (vph)		938			976		389	1484	364			
v/s Ratio Prot		c0.06			0.24			c0.22				
v/s Ratio Perm		c0.33					0.14		0.01			
v/c Ratio		1.33dl			0.77		0.41	0.62	0.03			
Uniform Delay, d1		12.9			17.7		14.0	15.4	12.1			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		5.2			5.7		0.7	0.8	0.0			
Delay (s)		18.1			23.4		14.7	16.2	12.2			
Level of Service		B			C		B	B	B			
Approach Delay (s)		18.1			23.4			15.9			0.0	
Approach LOS		B			C			B			A	

Intersection Summary			
HCM Average Control Delay	18.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	57.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	369	29	22	604	5	46	9	68	11	8	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.98			0.95	
Flpb, ped/bikes		1.00			1.00			0.99			1.00	
Frt		0.99			1.00			0.93			0.88	
Flt Protected		1.00			1.00			0.98			1.00	
Satd. Flow (prot)		3137			3174			1182			1122	
Flt Permitted		0.93			0.93			0.82			0.93	
Satd. Flow (perm)		2908			2957			987			1049	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	14	377	30	22	616	5	47	9	69	11	8	116
RTOR Reduction (vph)	0	5	0	0	1	0	0	56	0	0	98	0
Lane Group Flow (vph)	0	416	0	0	642	0	0	69	0	0	37	0
Confl. Peds. (#/hr)	24		10	10		24	50		18	18		50
Parking (#/hr)								20	20		20	20
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			2	
Permitted Phases	1			1			3			2		
Actuated Green, G (s)		31.9			31.9			10.8			10.8	
Effective Green, g (s)		31.9			31.9			10.8			10.8	
Actuated g/C Ratio		0.45			0.45			0.15			0.15	
Clearance Time (s)		7.0			7.0			5.0			5.0	
Vehicle Extension (s)		4.0			4.0			2.0			3.0	
Lane Grp Cap (vph)		1316			1338			151			161	
v/s Ratio Prot												
v/s Ratio Perm		0.14			c0.22			c0.07			c0.04	
v/c Ratio		0.32			0.48			0.46			0.23	
Uniform Delay, d1		12.3			13.5			27.2			26.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.6			1.2			0.8			0.7	
Delay (s)		13.0			14.7			28.0			26.9	
Level of Service		B			B			C			C	
Approach Delay (s)		13.0			14.7			28.0			26.9	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	70.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	239	85	69	475	26	48	434	42	15	279	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0			6.0	6.0		6.0	
Lane Util. Factor		1.00	1.00		0.95			1.00	1.00		0.95	
Frt		1.00	0.85		0.99			1.00	0.85		0.95	
Flt Protected		0.99	1.00		0.99			1.00	1.00		1.00	
Satd. Flow (prot)		1329	1140		2673			1335	1140		3007	
Flt Permitted		0.81	1.00		0.87			0.91	1.00		0.93	
Satd. Flow (perm)		1088	1140		2329			1226	1140		2815	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	56	244	87	70	485	27	49	443	43	15	285	171
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	24	0	95	0
Lane Group Flow (vph)	0	300	87	0	577	0	0	492	19	0	376	0
Parking (#/hr)		20	20		40	40		20	20			
Turn Type	Perm		custom	Perm			Perm		Perm	Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2		2 4	2			4		4	4		
Actuated Green, G (s)		23.1	63.2		23.1			28.1	28.1		28.1	
Effective Green, g (s)		23.1	63.2		23.1			28.1	28.1		28.1	
Actuated g/C Ratio		0.37	1.00		0.37			0.44	0.44		0.44	
Clearance Time (s)		6.0			6.0			6.0	6.0		6.0	
Vehicle Extension (s)		5.0			5.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		398	1140		851			545	507		1252	
v/s Ratio Prot												
v/s Ratio Perm		c0.28	0.08		0.25			c0.40	0.02		0.13	
v/c Ratio		0.75	0.08		0.68			0.90	0.04		0.30	
Uniform Delay, d1		17.6	0.0		16.9			16.3	9.9		11.2	
Progression Factor		1.00	1.00		1.00			1.00	1.00		1.00	
Incremental Delay, d2		12.4	0.0		4.3			18.2	0.0		0.1	
Delay (s)		30.0	0.0		21.2			34.5	9.9		11.4	
Level of Service		C	A		C			C	A		B	
Approach Delay (s)		23.3			21.2			32.5			11.4	
Approach LOS		C			C			C			B	

Intersection Summary				
HCM Average Control Delay	22.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	98.5%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	83	174	68	97	298	58	29	299	58	54	238	70
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	85	178	69	99	304	59	30	305	59	55	243	71

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	332	462	335	59	298	71
Volume Left (vph)	85	99	30	0	55	0
Volume Right (vph)	69	59	0	59	0	71
Hadj (s)	-0.04	0.00	0.08	-0.67	0.13	-0.67
Departure Headway (s)	8.4	8.2	8.8	8.1	9.0	8.2
Degree Utilization, x	0.78	1.05	0.82	0.13	0.74	0.16
Capacity (veh/h)	412	423	389	433	387	424
Control Delay (s)	35.0	85.8	40.4	11.1	32.8	11.6
Approach Delay (s)	35.0	85.8	36.0		28.7	
Approach LOS	E	F	E		D	

Intersection Summary				
Delay	48.8			
HCM Level of Service	E			
Intersection Capacity Utilization	81.3%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	74	332	25	48	382	148	19	204	27	41	222	141
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	76	339	26	49	390	151	19	208	28	42	227	144

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	440	590	228	28	155	257
Volume Left (vph)	76	49	19	0	42	0
Volume Right (vph)	26	151	0	28	0	144
Hadj (s)	0.03	-0.10	0.08	-0.67	0.17	-0.36
Departure Headway (s)	7.8	7.7	9.1	8.3	8.9	8.3
Degree Utilization, x	0.95	1.27	0.57	0.06	0.38	0.60
Capacity (veh/h)	453	470	380	416	394	413
Control Delay (s)	59.4	160.1	22.4	10.7	16.0	21.7
Approach Delay (s)	59.4	160.1	21.1		19.6	
Approach LOS	F	F	C		C	

Intersection Summary				
Delay		79.0		
HCM Level of Service		F		
Intersection Capacity Utilization	80.6%	ICU Level of Service	D	
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	46	26	24	38	13	44	31	230	65	23	160	61
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	47	27	24	39	13	45	32	235	66	23	163	62
Pedestrians		9			7			7			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								424				
pX, platoon unblocked												
vC, conflicting volume	608	622	129	478	586	250	235			308		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	608	622	129	478	586	250	235			308		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	93	97	91	97	94	98			98		
cM capacity (veh/h)	328	379	885	410	397	741	1320			1242		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	98	97	266	66	105	144
Volume Left	47	39	32	0	23	0
Volume Right	24	45	0	66	0	62
cSH	407	514	1320	1700	1242	1700
Volume to Capacity	0.24	0.19	0.02	0.04	0.02	0.08
Queue Length 95th (ft)	23	17	2	0	1	0
Control Delay (s)	16.6	13.6	1.1	0.0	1.9	0.0
Lane LOS	C	B	A		A	
Approach Delay (s)	16.6	13.6	0.9		0.8	
Approach LOS	C	B				

Intersection Summary				
Average Delay		4.4		
Intersection Capacity Utilization	44.3%	ICU Level of Service		A
Analysis Period (min)		15		

Intersection Level of Service Calculation Worksheets

Preferred Alternative PM
Peak Hour Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	116	2814	0	0	0	0	0	2536	1050	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0						6.0	6.0			
Lane Util. Factor		0.86						0.81	0.81			
Frpb, ped/bikes		1.00						1.00	1.00			
Flpb, ped/bikes		1.00						1.00	1.00			
Frt		1.00						0.98	0.85			
Flt Protected		1.00						1.00	1.00			
Satd. Flow (prot)		5756						5318	1154			
Flt Permitted		1.00						1.00	1.00			
Satd. Flow (perm)		5756						5318	1154			
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	118	2871	0	0	0	0	0	2588	1071	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2989	0	0	0	0	0	3006	653	0	0	0
Confl. Peds. (#/hr)			55	55			148					148
Turn Type	Perm								Perm			
Protected Phases		5						4 6				
Permitted Phases	5								4 6			
Actuated Green, G (s)		76.0						82.0	82.0			
Effective Green, g (s)		76.0						82.0	82.0			
Actuated g/C Ratio		0.45						0.48	0.48			
Clearance Time (s)		6.0										
Vehicle Extension (s)		1.0										
Lane Grp Cap (vph)		2573						2565	557			
v/s Ratio Prot								0.57				
v/s Ratio Perm		0.52							c0.57			
v/c Ratio		1.16						1.17	1.17			
Uniform Delay, d1		47.0						44.0	44.0			
Progression Factor		1.00						0.69	0.66			
Incremental Delay, d2		77.5						77.8	79.5			
Delay (s)		124.5						108.3	108.7			
Level of Service		F						F	F			
Approach Delay (s)		124.5			0.0			108.4			0.0	
Approach LOS		F			A			F			A	

Intersection Summary			
HCM Average Control Delay	115.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	105.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1271	0	0	0	1212	0	2374	124	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	12	10	12	12	12	12	12	12
Total Lost time (s)		6.0				6.0		6.0				
Lane Util. Factor		0.91				0.76		0.81				
Frpb, ped/bikes		1.00				1.00		0.99				
Flpb, ped/bikes		1.00				1.00		1.00				
Frt		1.00				0.85		0.99				
Flt Protected		1.00				1.00		1.00				
Satd. Flow (prot)		4424				3032		6675				
Flt Permitted		1.00				1.00		1.00				
Satd. Flow (perm)		4424				3032		6675				
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1297	0	0	0	1237	0	2422	127	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	1077	0	5	0	0	0	0
Lane Group Flow (vph)	0	1297	0	0	0	160	0	2544	0	0	0	0
Confl. Peds. (#/hr)			118	118			94		79	79		94
Turn Type						custom						
Protected Phases		2				6		4				
Permitted Phases												
Actuated Green, G (s)		104.0				22.0		54.0				
Effective Green, g (s)		104.0				22.0		54.0				
Actuated g/C Ratio		0.61				0.13		0.32				
Clearance Time (s)		6.0				6.0		6.0				
Vehicle Extension (s)		1.0				2.0		1.0				
Lane Grp Cap (vph)		2706				392		2120				
v/s Ratio Prot		c0.29				0.05		c0.38				
v/s Ratio Perm												
v/c Ratio		0.48				0.41		1.20				
Uniform Delay, d1		18.1				68.0		58.0				
Progression Factor		1.00				1.00		1.00				
Incremental Delay, d2		0.6				0.3		94.7				
Delay (s)		18.7				68.3		152.7				
Level of Service		B				E		F				
Approach Delay (s)		18.7			68.3			152.7			0.0	
Approach LOS		B			E			F			A	

Intersection Summary			
HCM Average Control Delay	98.0	HCM Level of Service	F
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	170.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

1020: Kapiolani Boulevard & Ward Avenue

3/21/2008

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1282	187	420	1238	304	260	1774	254	258	1377	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	12	12
Total Lost time (s)		6.0			6.0		5.0	5.0	6.0	5.0	14.0	
Lane Util. Factor		0.91			0.91		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		0.98			0.97		1.00	1.00	0.83	1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.98			0.98		1.00	1.00	0.85	1.00	0.98	
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		4114			4023		1593	3185	1180	1593	3115	
Flt Permitted		1.00			0.69		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		4114			2816		1593	3185	1180	1593	3115	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1308	191	429	1263	310	265	1810	259	263	1405	197
RTOR Reduction (vph)	0	13	0	0	18	0	0	0	5	0	8	0
Lane Group Flow (vph)	0	1486	0	0	1984	0	265	1810	254	263	1594	0
Confl. Peds. (#/hr)	83		71	71		83	10		87	87		10
Turn Type				Prot			Prot		custom	Prot		
Protected Phases		6		5	2		3	8		7	4	
Permitted Phases									2 5 6 8			
Actuated Green, G (s)		39.0			64.0		14.0	56.0	125.0	14.0	47.0	
Effective Green, g (s)		39.0			64.0		14.0	56.0	120.0	14.0	47.0	
Actuated g/C Ratio		0.26			0.43		0.09	0.37	0.80	0.09	0.31	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	14.0	
Vehicle Extension (s)		5.0			5.0		1.0	2.0		1.0	2.0	
Lane Grp Cap (vph)		1070			1362		149	1189	944	149	976	
v/s Ratio Prot		0.36			c0.19		c0.17	c0.57		0.17	0.51	
v/s Ratio Perm					c0.43				0.22			
v/c Ratio		1.39			2.03dl		1.78	1.52	0.27	1.77	1.63	
Uniform Delay, d1		55.5			43.0		68.0	47.0	3.8	68.0	51.5	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		180.9			209.7		376.0	239.4	0.3	370.2	289.8	
Delay (s)		236.4			252.7		444.0	286.4	4.1	438.2	341.3	
Level of Service		F			F		F	F	A	F	F	
Approach Delay (s)		236.4			252.7			272.9			355.0	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	280.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.51		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	168.3%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

1030: Kapiolani Boulevard & Kamakee Street

3/21/2008

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1914	121	315	1671	250	434
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	12	12	10	12	12
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.91			0.91	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	0.97
Flpb, ped/bikes	1.00			1.00	0.92	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	4223			4238	1463	1385
Flt Permitted	1.00			0.64	0.95	1.00
Satd. Flow (perm)	4223			2748	1463	1385
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	1953	123	321	1705	255	443
RTOR Reduction (vph)	6	0	0	0	0	0
Lane Group Flow (vph)	2070	0	0	2026	255	443
Confl. Peds. (#/hr)		18	18		65	13
Turn Type			Perm			custom
Protected Phases	2			2		
Permitted Phases			2		4	4 2
Actuated Green, G (s)	68.9			68.9	21.1	100.0
Effective Green, g (s)	68.9			68.9	21.1	100.0
Actuated g/C Ratio	0.69			0.69	0.21	1.00
Clearance Time (s)	5.0			5.0	5.0	
Vehicle Extension (s)	5.0			5.0	3.0	
Lane Grp Cap (vph)	2910			1893	309	1385
v/s Ratio Prot	0.49					
v/s Ratio Perm				c0.74	c0.17	0.32
v/c Ratio	0.71			4.59dl	0.83	0.32
Uniform Delay, d1	9.5			15.5	37.7	0.0
Progression Factor	1.00			1.04	1.00	1.00
Incremental Delay, d2	1.5			32.9	16.2	0.1
Delay (s)	11.0			49.0	53.9	0.1
Level of Service	B			D	D	A
Approach Delay (s)	11.0			49.0	19.8	
Approach LOS	B			D	B	

Intersection Summary			
HCM Average Control Delay	28.3	HCM Level of Service	C
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	116.7%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1895	157	111	1695	29	88	206	95	257	524	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.91			0.91			1.00			0.95	
Frpb, ped/bikes		0.99			1.00			1.00			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			1.00			0.97			0.96	
Flt Protected		1.00			1.00			0.99			0.99	
Satd. Flow (prot)		4196			4238			1603			2991	
Flt Permitted		1.00			0.63			0.39			0.69	
Satd. Flow (perm)		4196			2692			631			2098	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1934	160	113	1730	30	90	210	97	262	535	261
RTOR Reduction (vph)	0	9	0	0	2	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	2085	0	0	1871	0	0	395	0	0	1055	0
Confl. Peds. (#/hr)	63		58	58		63						33
Parking (#/hr)												40
Turn Type				Perm			Perm			Perm		
Protected Phases		6			6			8			4	
Permitted Phases				6			8			4		
Actuated Green, G (s)		48.0			48.0			42.0			42.0	
Effective Green, g (s)		48.0			48.0			42.0			42.0	
Actuated g/C Ratio		0.48			0.48			0.42			0.42	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		5.0			5.0			3.0			2.0	
Lane Grp Cap (vph)		2014			1292			265			881	
v/s Ratio Prot		0.50										
v/s Ratio Perm					c0.70			c0.63			0.50	
v/c Ratio		1.04			1.77dl			1.49			1.20	
Uniform Delay, d1		26.0			26.0			29.0			29.0	
Progression Factor		0.79			1.22			1.00			1.00	
Incremental Delay, d2		27.4			204.9			240.2			99.9	
Delay (s)		47.9			236.5			269.2			128.9	
Level of Service		D			F			F			F	
Approach Delay (s)		47.9			236.5			269.2			128.9	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM Average Control Delay	145.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.47		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	159.3%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	2162	170	19	1001	263	167	1454	232	0	525	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	12	12	10	12	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0		5.0	
Lane Util. Factor		0.91			0.91		1.00	0.95	1.00		1.00	
Frpb, ped/bikes		0.99			0.98		1.00	1.00	0.86		0.96	
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00		1.00	
Frt		0.99			0.97		1.00	1.00	0.85		0.96	
Flt Protected		1.00			1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		4198			4057		1593	3185	1225		1536	
Flt Permitted		1.00			0.76		0.95	1.00	1.00		1.00	
Satd. Flow (perm)		4198			3080		1593	3185	1225		1536	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	2206	173	19	1021	268	170	1484	237	0	536	261
RTOR Reduction (vph)	0	9	0	0	4	0	0	0	0	0	18	0
Lane Group Flow (vph)	0	2370	0	0	1304	0	170	1484	237	0	779	0
Confl. Peds. (#/hr)	76		71	71		76	86		118	118		86
Turn Type				Perm			Prot		custom			
Protected Phases		2			2		7	4			8	
Permitted Phases				2					2 4			
Actuated Green, G (s)		43.0			43.0		7.0	47.0	100.0		35.0	
Effective Green, g (s)		43.0			43.0		7.0	47.0	100.0		35.0	
Actuated g/C Ratio		0.43			0.43		0.07	0.47	1.00		0.35	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Vehicle Extension (s)		5.0			5.0		3.0	2.0			2.0	
Lane Grp Cap (vph)		1805			1324		112	1497	1225		538	
v/s Ratio Prot		c0.56					c0.11	0.47			c0.51	
v/s Ratio Perm					0.42				0.19			
v/c Ratio		1.31			0.98		1.52	0.99	0.19		1.45	
Uniform Delay, d1		28.5			28.2		46.5	26.3	0.0		32.5	
Progression Factor		0.43			1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		141.2			21.4		273.2	21.1	0.0		212.2	
Delay (s)		153.5			49.6		319.7	47.4	0.0		244.7	
Level of Service		F			D		F	D	A		F	
Approach Delay (s)		153.5			49.6			65.9			244.7	
Approach LOS		F			D			E			F	

Intersection Summary			
HCM Average Control Delay	117.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.39		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	123.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	278	3698	132	10	3698	99	219	211	42	78	12	284
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0			6.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	0.91			0.91		1.00	1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	0.88
Flpb, ped/bikes	1.00	1.00			1.00		0.91	1.00			1.00	1.00
Frt	1.00	0.99			1.00		1.00	0.98			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1593	4063			3934		1441	1635			1607	1249
Flt Permitted	0.95	1.00			0.78		0.64	1.00			0.24	1.00
Satd. Flow (perm)	1593	4063			3084		965	1635			401	1249
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	284	3773	135	10	3773	101	223	215	43	80	12	290
RTOR Reduction (vph)	0	2	0	0	1	0	0	1	0	0	0	0
Lane Group Flow (vph)	284	3906	0	0	3883	0	223	257	0	0	92	290
Confl. Peds. (#/hr)	32		28	28		32	59					59
Turn Type	Prot			Perm			Perm			Perm		custom
Protected Phases	5	2			6			4			4	
Permitted Phases				6			4			4		4 5 6
Actuated Green, G (s)	18.0	136.0			113.0		33.0	33.0			33.0	180.0
Effective Green, g (s)	18.0	136.0			113.0		33.0	33.0			33.0	174.0
Actuated g/C Ratio	0.10	0.76			0.63		0.18	0.18			0.18	0.97
Clearance Time (s)	5.0	6.0			6.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0	5.0			5.0		4.0	4.0			4.0	
Lane Grp Cap (vph)	159	3070			1936		177	300			74	1207
v/s Ratio Prot	c0.18	0.96						0.16				
v/s Ratio Perm					c1.26		c0.23				0.23	0.23
v/c Ratio	1.79	1.27			2.01		1.26	0.86			1.24	0.24
Uniform Delay, d1	81.0	22.0			33.5		73.5	71.2			73.5	0.1
Progression Factor	1.00	1.00			0.62		1.00	1.00			1.00	1.00
Incremental Delay, d2	377.9	125.2			452.6		154.3	21.4			183.6	0.1
Delay (s)	458.9	147.2			473.4		227.8	92.6			257.1	0.3
Level of Service	F	F			F		F	F			F	A
Approach Delay (s)		168.3			473.4			155.3			62.1	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM Average Control Delay	295.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.83		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	238.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	79	3350	68	22	4088	60	126	16	15	63	3	200
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.94	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.98	
Frt	1.00	1.00		1.00	1.00			0.99			0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1486	3936		1485	3946			1577			1373	
Flt Permitted	0.95	1.00		1.00	1.00			0.28			0.87	
Satd. Flow (perm)	1486	3936		1563	3946			465			1210	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	81	3418	69	22	4171	61	129	16	15	64	3	204
RTOR Reduction (vph)	0	1	0	0	1	0	0	2	0	0	61	0
Lane Group Flow (vph)	81	3486	0	22	4231	0	0	158	0	0	210	0
Confl. Peds. (#/hr)	9		22	22		9	26		42	42		26
Parking (#/hr)												40
Turn Type	Prot			custom			Perm			Perm		
Protected Phases	5	2			6			3			4	
Permitted Phases				1			3			4		
Actuated Green, G (s)	5.0	105.6		2.4	103.0			28.0			23.0	
Effective Green, g (s)	5.0	105.6		2.4	103.0			28.0			23.0	
Actuated g/C Ratio	0.03	0.59		0.01	0.57			0.16			0.13	
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			2.0			2.0	
Lane Grp Cap (vph)	41	2309		21	2258			72			155	
v/s Ratio Prot	c0.05	c0.89			c1.07							
v/s Ratio Perm				0.01				c0.34			c0.17	
v/c Ratio	1.98	1.51		1.05	1.87			2.20			1.35	
Uniform Delay, d1	87.5	37.2		88.8	38.5			76.0			78.5	
Progression Factor	1.11	0.64		1.16	0.68			1.00			1.00	
Incremental Delay, d2	446.9	229.5		72.0	393.4			582.0			195.7	
Delay (s)	544.3	253.4		174.9	419.7			658.0			274.2	
Level of Service	F	F		F	F			F			F	
Approach Delay (s)		260.0			418.5			658.0			274.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	349.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.93		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	136.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	4098	61	20	3255	39	175	66	42	52	38	89
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	0.86
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.93			1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.97	1.00
Satd. Flow (prot)	1486	3936		1486	3951			1479			1222	915
Flt Permitted	0.95	1.00		0.95	1.00			0.70			0.73	1.00
Satd. Flow (perm)	1486	3936		1486	3951			1062			924	915
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	52	4182	62	20	3321	40	179	67	43	53	39	91
RTOR Reduction (vph)	0	1	0	0	1	0	0	3	0	0	0	0
Lane Group Flow (vph)	52	4243	0	20	3360	0	0	286	0	0	92	91
Confl. Peds. (#/hr)			42	42			45		7	7		45
Parking (#/hr)											30	30
Turn Type	Prot			Prot			Perm			Perm		custom
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		4 5 2
Actuated Green, G (s)	4.0	126.6		2.4	125.0			35.0			35.0	176.6
Effective Green, g (s)	4.0	126.6		2.4	125.0			35.0			35.0	170.6
Actuated g/C Ratio	0.02	0.70		0.01	0.69			0.19			0.19	0.95
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			3.0			2.0	
Lane Grp Cap (vph)	33	2768		20	2744			207			180	867
v/s Ratio Prot	c0.03	c1.08		0.01	0.85							
v/s Ratio Perm								c0.27			0.10	0.10
v/c Ratio	1.58	1.53		1.00	1.22			1.38			0.51	0.10
Uniform Delay, d1	88.0	26.7		88.8	27.5			72.5			64.8	0.3
Progression Factor	1.15	0.34		1.03	0.31			1.00			1.00	1.00
Incremental Delay, d2	271.9	240.0		60.4	101.4			198.5			1.0	0.0
Delay (s)	373.3	249.1		152.1	110.0			271.0			65.9	0.3
Level of Service	F	F		F	F			F			E	A
Approach Delay (s)		250.6			110.2			271.0			33.3	
Approach LOS		F			F			F			C	

Intersection Summary				
HCM Average Control Delay	188.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.46			
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	133.5%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	3226	30	51	2878	62	48	176	132	51	177	212
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.95
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00
Satd. Flow (prot)	1486	3945		1486	3939			1653	1397		1657	1354
Flt Permitted	0.95	1.00		0.95	1.00			0.57	1.00		0.56	1.00
Satd. Flow (perm)	1486	3945		1486	3939			949	1397		943	1354
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	115	3292	31	52	2937	63	49	180	135	52	181	216
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	115	3322	0	52	2999	0	0	229	135	0	233	216
Confl. Peds. (#/hr)	25		37	37		25	15		3	3		15
Turn Type	Prot			Prot			Perm		custom	Perm		custom
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4		4 1 2	4		4 5 6
Actuated Green, G (s)	11.0	123.0		4.0	116.0			37.0	180.0		37.0	180.0
Effective Green, g (s)	11.0	123.0		4.0	116.0			37.0	174.0		37.0	174.0
Actuated g/C Ratio	0.06	0.68		0.02	0.64			0.21	0.97		0.21	0.97
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			4.0			4.0	
Lane Grp Cap (vph)	91	2696		33	2538			195	1350		194	1309
v/s Ratio Prot	c0.08	c0.84		0.03	0.76							
v/s Ratio Perm								0.24	0.10		c0.25	0.16
v/c Ratio	1.26	1.23		1.58	1.18			1.17	0.10		1.20	0.17
Uniform Delay, d1	84.5	28.5		88.0	32.0			71.5	0.1		71.5	0.1
Progression Factor	1.29	0.18		0.61	1.90			1.00	1.00		1.00	1.00
Incremental Delay, d2	126.7	104.9		271.9	82.1			119.3	0.0		129.3	0.1
Delay (s)	235.5	110.0		325.7	142.8			190.8	0.2		200.8	0.2
Level of Service	F	F		F	F			F	A		F	A
Approach Delay (s)		114.2			145.9			120.1			104.3	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	127.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.20			
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	127.8%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	480	3350	68	176	2576	244	73	221	269	315	151	665
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0		5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00		0.95	1.00	0.95	0.91	0.95
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.91		1.00	0.89	1.00	0.95	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	0.93	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.91	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1486	3938		1486	3958	1210		3146	1263	1409	1310	1354
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.56	1.00	0.57	0.95	1.00
Satd. Flow (perm)	1486	3938		1486	3958	1210		1787	1263	844	1249	1354
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	490	3418	69	180	2629	249	74	226	274	321	154	679
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	115	0	28	355
Lane Group Flow (vph)	490	3486	0	180	2629	249	0	300	159	289	416	66
Confl. Peds. (#/hr)	34		43	43		34	30		50	50		30
Turn Type	Prot			Prot		custom	Perm		Perm	Perm		Over
Protected Phases	5	2		1	6			3			4	5
Permitted Phases						6 5 3 4	3		3	4		
Actuated Green, G (s)	28.0	85.0		11.0	68.0	180.0		26.0	26.0	37.0	37.0	28.0
Effective Green, g (s)	28.0	85.0		11.0	68.0	165.0		26.0	26.0	37.0	37.0	28.0
Actuated g/C Ratio	0.16	0.47		0.06	0.38	0.92		0.14	0.14	0.21	0.21	0.16
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.0	5.0		2.0	5.0			2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	231	1860		91	1495	1109		258	182	173	257	211
v/s Ratio Prot	c0.33	c0.89		0.12	0.66							0.05
v/s Ratio Perm						0.21		c0.17	0.13	c0.34	0.33	
v/c Ratio	2.12	1.87		1.98	1.76	0.22		2.00dl	0.88	1.67	1.62	0.31
Uniform Delay, d1	76.0	47.5		84.5	56.0	0.8		77.0	75.4	71.5	71.5	67.5
Progression Factor	1.06	0.53		1.23	0.81	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	505.9	393.6		460.2	342.8	0.0		107.3	33.4	325.7	296.0	0.3
Delay (s)	586.1	418.5		563.9	388.3	0.8		184.3	108.8	397.2	367.5	67.8
Level of Service	F	F		F	F	A		F	F	F	F	E
Approach Delay (s)		439.2			367.1			148.3			265.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	372.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.72		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	152.5%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	3912	42	0	2863	46	88
Ideal Flow (vphpl)	1700	1900	1900	1700	1900	1900
Lane Width	11	10	10	11	12	12
Total Lost time (s)	6.0			6.0	5.0	
Lane Util. Factor	0.91			0.91	1.00	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	3952			3958	1502	
Flt Permitted	1.00			1.00	0.98	
Satd. Flow (perm)	3952			3958	1502	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	3992	43	0	2921	47	90
RTOR Reduction (vph)	1	0	0	0	2	0
Lane Group Flow (vph)	4034	0	0	2921	135	0
Confl. Peds. (#/hr)					45	
Turn Type						
Protected Phases	6			2	4	
Permitted Phases						
Actuated Green, G (s)	156.0			156.0	13.0	
Effective Green, g (s)	156.0			156.0	13.0	
Actuated g/C Ratio	0.87			0.87	0.07	
Clearance Time (s)	6.0			6.0	5.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	3425			3430	108	
v/s Ratio Prot	c1.02			0.74	c0.09	
v/s Ratio Perm						
v/c Ratio	1.18			0.85	1.25	
Uniform Delay, d1	12.0			6.1	83.5	
Progression Factor	2.93			1.30	1.00	
Incremental Delay, d2	80.4			0.7	168.7	
Delay (s)	115.5			8.6	252.2	
Level of Service	F			A	F	
Approach Delay (s)	115.5			8.6	252.2	
Approach LOS	F			A	F	

Intersection Summary			
HCM Average Control Delay	74.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	113.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

1120: Ala Moana Boulevard & Kamakee Street

3/21/2008

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	3782	260	25	2596	1	70	38	23	199	89	258
Ideal Flow (vphpl)	1900	1700	1900	1900	1700	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	10	10	11	10	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.84		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.92	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1486	3895		1486	3958			1624	1192		1485	1425
Flt Permitted	0.95	1.00		0.95	1.00			0.27	1.00		0.65	1.00
Satd. Flow (perm)	1486	3895		1486	3958			460	1192		991	1425
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	115	3859	265	26	2649	1	71	39	23	203	91	263
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	115	4120	0	26	2650	0	0	110	23	0	294	263
Confl. Peds. (#/hr)	24		39	39		24			66	66		
Turn Type	Prot			Prot			Perm		custom	Perm		custom
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4		4 1 2	4		4 1 2
Actuated Green, G (s)	13.0	122.0		4.0	113.0			38.0	180.0		38.0	180.0
Effective Green, g (s)	13.0	122.0		4.0	113.0			38.0	174.0		38.0	174.0
Actuated g/C Ratio	0.07	0.68		0.02	0.63			0.21	0.97		0.21	0.97
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0			2.0			2.0	
Lane Grp Cap (vph)	107	2640		33	2485			97	1152		209	1378
v/s Ratio Prot	c0.08	c1.06		0.02	0.67							
v/s Ratio Perm								0.24	0.02		c0.30	0.18
v/c Ratio	1.07	1.56		0.79	1.07			1.13	0.02		1.41	0.19
Uniform Delay, d1	83.5	29.0		87.6	33.5			71.0	0.1		71.0	0.1
Progression Factor	1.11	0.81		0.74	0.91			1.00	1.00		1.00	1.00
Incremental Delay, d2	48.7	252.4		9.9	30.9			132.0	0.0		209.1	0.0
Delay (s)	141.4	276.0		74.3	61.3			203.0	0.1		280.1	0.1
Level of Service	F	F		E	E			F	A		F	A
Approach Delay (s)		272.3			61.4			167.9			147.9	
Approach LOS		F			E			F			F	

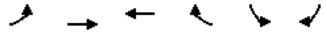
Intersection Summary			
HCM Average Control Delay	187.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.53		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	146.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

1130: Ala Moana Boulevard & Queen Street

3/21/2008

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	26	3764	2953	412	608	116
Ideal Flow (vphpl)	1900	1700	1700	1900	1900	1900
Lane Width	10	11	11	10	12	12
Total Lost time (s)	5.0	6.0	6.0		5.0	5.0
Lane Util. Factor	1.00	0.91	0.91		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.97		1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1486	3958	3770		3090	1332
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1486	3958	3770		3090	1332
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	27	3841	3013	420	620	118
RTOR Reduction (vph)	0	0	10	0	0	36
Lane Group Flow (vph)	27	3841	3423	0	620	82
Confl. Peds. (#/hr)				84		30
Turn Type	Prot					Perm
Protected Phases	1	6	2		4	
Permitted Phases						4
Actuated Green, G (s)	4.0	138.0	129.0		31.0	31.0
Effective Green, g (s)	4.0	138.0	129.0		31.0	31.0
Actuated g/C Ratio	0.02	0.77	0.72		0.17	0.17
Clearance Time (s)	5.0	6.0	6.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	33	3034	2702		532	229
v/s Ratio Prot	0.02	c0.97	0.91		c0.20	
v/s Ratio Perm						0.06
v/c Ratio	0.82	1.27	1.27		1.17	0.36
Uniform Delay, d1	87.6	21.0	25.5		74.5	65.7
Progression Factor	1.25	0.33	0.70		1.00	1.00
Incremental Delay, d2	13.2	119.9	120.4		93.4	1.0
Delay (s)	123.0	126.9	138.2		167.9	66.7
Level of Service	F	F	F		F	E
Approach Delay (s)		126.9	138.2		151.7	
Approach LOS		F	F		F	

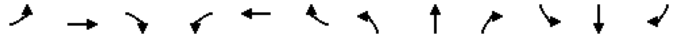
Intersection Summary			
HCM Average Control Delay	134.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	122.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	822	3774	2677	389	279	485
Ideal Flow (vphpl)	1900	1700	1700	1900	1900	1900
Lane Width	10	11	10	11	12	12
Total Lost time (s)	4.0	10.0	10.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	2884	3958	3657		1593	2508
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	2884	3958	3657		1593	2508
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	839	3851	2732	397	285	495
RTOR Reduction (vph)	0	0	11	0	0	0
Lane Group Flow (vph)	839	3851	3118	0	285	495
Confl. Peds. (#/hr)	130			130	68	
Turn Type	Prot					custom
Protected Phases	3	6	2		4	3 4
Permitted Phases						6
Actuated Green, G (s)	34.0	96.0	96.0		32.0	166.0
Effective Green, g (s)	34.0	96.0	96.0		32.0	166.0
Actuated g/C Ratio	0.19	0.53	0.53		0.18	0.92
Clearance Time (s)	4.0	10.0	10.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	545	2111	1950		283	2369
v/s Ratio Prot	c0.29	c0.97	0.85		c0.18	0.08
v/s Ratio Perm						0.12
v/c Ratio	1.54	1.82	1.60		1.01	0.21
Uniform Delay, d1	73.0	42.0	42.0		74.0	0.7
Progression Factor	0.90	0.95	1.00		1.00	1.00
Incremental Delay, d2	243.6	371.1	272.0		55.3	0.0
Delay (s)	309.3	411.0	314.0		129.3	0.7
Level of Service	F	F	F		F	A
Approach Delay (s)		392.8	314.0		47.7	
Approach LOS		F	F		D	

Intersection Summary				
HCM Average Control Delay	332.8	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.60			
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	134.1%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	489	87	227	260	498	115	522	159	279	877	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00		1.00	0.96		1.00	0.98		1.00	0.98	
Flpb, ped/bikes		1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frt		0.98		1.00	0.90		1.00	0.97		1.00	0.98	
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3086		1580	1457		1589	3020		1590	3062	
Flt Permitted		0.51		0.31	1.00		0.19	1.00		0.16	1.00	
Satd. Flow (perm)		1581		521	1457		319	3020		273	3062	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	102	499	89	232	265	508	117	533	162	285	895	154
RTOR Reduction (vph)	0	14	0	0	86	0	0	35	0	0	17	0
Lane Group Flow (vph)	0	676	0	232	687	0	117	660	0	285	1032	0
Confl. Peds. (#/hr)	40		23	23		40	52		57	57		52
Turn Type	Perm			Perm			pm+pt			pm+pt		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		34.0		34.0	34.0		25.0	21.0		36.0	27.0	
Effective Green, g (s)		34.0		34.0	34.0		25.0	21.0		36.0	27.0	
Actuated g/C Ratio		0.42		0.42	0.42		0.31	0.26		0.45	0.34	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0		2.0	2.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)		672		221	619		163	793		287	1033	
v/s Ratio Prot					c0.47		0.04	0.22		c0.12	c0.34	
v/s Ratio Perm		0.43		0.45			0.19			0.32		
v/c Ratio		1.04dl		1.05	1.11		0.72	0.83		0.99	1.00	
Uniform Delay, d1		23.0		23.0	23.0		22.4	27.8		18.0	26.5	
Progression Factor		1.00		1.00	1.00		1.00	1.00		0.79	0.79	
Incremental Delay, d2		36.0		74.2	70.0		14.0	9.9		14.3	8.1	
Delay (s)		59.0		97.2	93.0		36.4	37.8		28.4	29.0	
Level of Service		E		F	F		D	D		C	C	
Approach Delay (s)		59.0			94.0			37.6			28.9	
Approach LOS		E			F			D			C	

Intersection Summary				
HCM Average Control Delay	53.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	129.6%	ICU Level of Service	H	
Analysis Period (min)	15			

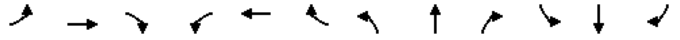
dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	417	252	206	89	132	176	56	1321	59	195	1034	176
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.97		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.98	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.91		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	1216		1559	1533		1592	2848		1593	2771	
Flt Permitted	0.48	1.00		0.30	1.00		0.14	1.00		0.13	1.00	
Satd. Flow (perm)	808	1216		500	1533		231	2848		219	2771	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	426	257	210	91	135	180	57	1348	60	199	1055	180
RTOR Reduction (vph)	0	37	0	0	60	0	0	4	0	0	17	0
Lane Group Flow (vph)	426	430	0	91	255	0	57	1404	0	199	1218	0
Confl. Peds. (#/hr)			61	61			43					43
Parking (#/hr)		20	20					20	20		20	20
Turn Type	Perm			Perm			pm+pt			pm+pt		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)	30.0	30.0		30.0	30.0		31.4	29.0		34.6	30.6	
Effective Green, g (s)	30.0	30.0		30.0	30.0		31.4	29.0		34.6	30.6	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.39	0.36		0.43	0.38	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	303	456		188	575		131	1032		163	1060	
v/s Ratio Prot		0.35			0.17		0.01	c0.49		c0.06	0.44	
v/s Ratio Perm	c0.53			0.18			0.16			0.47		
v/c Ratio	1.41	0.94		0.48	0.44		0.44	1.36		1.22	1.15	
Uniform Delay, d1	25.0	24.2		19.1	18.7		18.1	25.5		23.0	24.7	
Progression Factor	1.00	1.00		1.00	1.00		0.74	0.86		1.00	1.00	
Incremental Delay, d2	201.3	28.2		2.0	0.5		1.5	166.4		142.1	78.4	
Delay (s)	226.3	52.4		21.0	19.3		14.9	188.3		165.1	103.1	
Level of Service	F	D		C	B		B	F		F	F	
Approach Delay (s)		135.4			19.7			181.6			111.7	
Approach LOS		F			B			F			F	

Intersection Summary				
HCM Average Control Delay	132.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.37			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	119.2%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

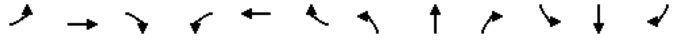
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	166	320	151	39	271	111	316	1740	129	85	1490	246
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	1260		1593	1267		1593	3120		1593	3061	
Flt Permitted	0.20	1.00		0.14	1.00		0.06	1.00		0.06	1.00	
Satd. Flow (perm)	330	1260		241	1267		96	3120		103	3061	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	169	327	154	40	277	113	322	1776	132	87	1520	251
RTOR Reduction (vph)	0	11	0	0	9	0	0	3	0	0	9	0
Lane Group Flow (vph)	169	470	0	40	381	0	322	1905	0	87	1762	0
Confl. Peds. (#/hr)	20		19	19		20	41		48	48		41
Parking (#/hr)		20	20		20	20						
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	51.8	44.8		44.2	41.0		86.0	76.0		70.0	65.0	
Effective Green, g (s)	51.8	44.8		44.2	41.0		86.0	76.0		70.0	65.0	
Actuated g/C Ratio	0.34	0.30		0.29	0.27		0.57	0.50		0.46	0.43	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	172	374		99	344		213	1570		97	1318	
v/s Ratio Prot	c0.05	c0.37		0.01	0.30		c0.16	0.61		0.03	0.58	
v/s Ratio Perm	0.29			0.11			c0.70			0.39		
v/c Ratio	0.98	1.26		0.40	1.11		1.51	1.21		0.90	1.34	
Uniform Delay, d1	49.6	53.1		41.7	55.0		51.9	37.5		36.0	43.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	63.1	135.3		2.7	80.2		253.0	102.0		57.7	156.8	
Delay (s)	112.7	188.4		44.3	135.2		304.9	139.5		93.7	199.8	
Level of Service	F	F		D	F		F	F		F	F	
Approach Delay (s)		168.7			126.8			163.4			194.8	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	172.3	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.39			
Actuated Cycle Length (s)	151.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	126.9%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				



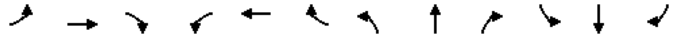
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	5	36	132	3	158	20	944	194	189	564	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		0.97	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.97		1.00	1.00	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1605	1389		1547	1425	1593	4404		1593	4567	
Flt Permitted		0.72	1.00		0.70	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1199	1389		1129	1425	1593	4404		1593	4567	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	42	5	37	135	3	161	20	963	198	193	576	6
RTOR Reduction (vph)	0	0	0	0	0	0	0	32	0	0	1	0
Lane Group Flow (vph)	0	47	37	0	138	161	20	1129	0	193	581	0
Confl. Peds. (#/hr)			44	44			25		30	30		25
Turn Type	Perm		custom	Perm		custom	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		1 2 4	8		5 6 8						
Actuated Green, G (s)		19.1	80.0		19.1	80.0	5.1	33.6		12.3	40.8	
Effective Green, g (s)		19.1	80.0		19.1	80.0	5.1	33.6		12.3	40.8	
Actuated g/C Ratio		0.24	1.00		0.24	1.00	0.06	0.42		0.15	0.51	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		286	1389		270	1425	102	1850		245	2329	
v/s Ratio Prot							0.01	c0.26		c0.12	0.13	
v/s Ratio Perm		0.04	0.03		c0.12	0.11						
v/c Ratio		0.16	0.03		0.51	0.11	0.20	0.61		0.79	0.25	
Uniform Delay, d1		24.1	0.0		26.4	0.0	35.5	18.1		32.6	11.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.02	1.21	
Incremental Delay, d2		0.3	0.0		1.6	0.0	0.3	1.5		13.6	0.2	
Delay (s)		24.4	0.0		28.0	0.0	35.9	19.6		46.8	13.5	
Level of Service		C	A		C	A	D	B		D	B	
Approach Delay (s)		13.7			12.9			19.9			21.8	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	405	525	207	0	0	437	0	1020	121	0	514	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			5.0		5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95	1.00			0.88		0.91	1.00		0.95	
Frpb, ped/bikes	1.00	1.00	0.89			0.99		1.00	0.91		1.00	
Flpb, ped/bikes	1.00	1.00	1.00			1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85			0.85		1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00			1.00		1.00	1.00		1.00	
Satd. Flow (prot)	1593	3185	884			2473		4577	1298		3185	
Flt Permitted	0.95	1.00	1.00			1.00		1.00	1.00		1.00	
Satd. Flow (perm)	1593	3185	884			2473		4577	1298		3185	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	413	536	211	0	0	446	0	1041	123	0	524	0
RTOR Reduction (vph)	0	0	55	0	0	237	0	0	69	0	0	0
Lane Group Flow (vph)	413	536	156	0	0	209	0	1041	54	0	524	0
Confl. Peds. (#/hr)	1		121	121		1	67		82	82		67
Parking (#/hr)			40									
Turn Type	custom		Perm			custom			Perm			
Protected Phases	7 8	4						2			2	
Permitted Phases	8		4			8			2			
Actuated Green, G (s)	35.2	35.2	35.2			12.2		34.8	34.8		34.8	
Effective Green, g (s)	35.2	35.2	35.2			12.2		34.8	34.8		34.8	
Actuated g/C Ratio	0.44	0.44	0.44			0.15		0.43	0.43		0.43	
Clearance Time (s)		5.0	5.0			5.0		5.0	5.0		5.0	
Vehicle Extension (s)		3.0	3.0			3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	701	1401	389			377		1991	565		1385	
v/s Ratio Prot	c0.26	0.17						c0.23			0.16	
v/s Ratio Perm			0.18			0.08			0.04			
v/c Ratio	0.59	0.38	0.40			0.55		0.52	0.09		0.38	
Uniform Delay, d1	16.9	15.1	15.2			31.4		16.5	13.3		15.3	
Progression Factor	1.00	1.00	1.00			1.00		0.27	0.01		0.87	
Incremental Delay, d2	0.8	0.2	0.7			1.8		0.8	0.3		0.8	
Delay (s)	17.8	15.3	15.9			33.1		5.2	0.4		14.1	
Level of Service	B	B	B			C		A	A		B	
Approach Delay (s)		16.3			33.1			4.7			14.1	
Approach LOS		B			C			A			B	

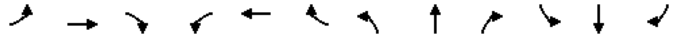
Intersection Summary			
HCM Average Control Delay	14.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	174	21	134	112	217	78	1571	174	0	613	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0	5.0		5.0			5.0	
Lane Util. Factor		1.00		0.95	0.95	1.00		0.86			0.95	
Frpb, ped/bikes		1.00		1.00	1.00	0.93		0.98			0.99	
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00			1.00	
Frt		0.99		1.00	1.00	0.85		0.99			0.98	
Flt Protected		1.00		0.95	0.99	1.00		1.00			1.00	
Satd. Flow (prot)		1637		1512	1578	1326		5579			3111	
Flt Permitted		0.96		0.48	0.92	1.00		0.86			1.00	
Satd. Flow (perm)		1583		764	1469	1326		4808			3111	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	21	178	21	137	114	221	80	1603	178	0	626	72
RTOR Reduction (vph)	0	5	0	0	0	0	0	18	0	0	9	0
Lane Group Flow (vph)	0	215	0	112	139	221	0	1843	0	0	689	0
Confl. Peds. (#/hr)	56		1	1		56	36		91	91		36
Turn Type	Perm			Perm		custom	Perm					
Protected Phases		4			4			2			2	
Permitted Phases	4			4		4 2	2					
Actuated Green, G (s)		17.7		17.7	17.7	80.0		52.3			52.3	
Effective Green, g (s)		17.7		17.7	17.7	80.0		52.3			52.3	
Actuated g/C Ratio		0.22		0.22	0.22	1.00		0.65			0.65	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			5.0			5.0	
Lane Grp Cap (vph)		350		169	325	1326		3143			2034	
v/s Ratio Prot											0.22	
v/s Ratio Perm		0.14		c0.15	0.09	0.17		c0.38				
v/c Ratio		0.61		0.66	0.43	0.17		0.59			0.34	
Uniform Delay, d1		28.1		28.4	26.8	0.0		7.8			6.2	
Progression Factor		1.00		1.00	1.00	1.00		0.61			1.00	
Incremental Delay, d2		3.2		9.4	0.9	0.1		0.7			0.5	
Delay (s)		31.2		37.8	27.7	0.1		5.5			6.6	
Level of Service		C		D	C	A		A			A	
Approach Delay (s)		31.2			17.2			5.5			6.6	
Approach LOS		C			B			A			A	

Intersection Summary				
HCM Average Control Delay	9.2	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	90.9%	ICU Level of Service	E	
Analysis Period (min)	15			

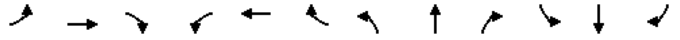
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	344	517	36	0	0	0	37	0	41	431	49	620
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0					5.0		5.0	5.0	5.0	
Lane Util. Factor		0.95					1.00		1.00	0.95	0.95	
Frpb, ped/bikes		1.00					1.00		1.00	1.00	0.99	
Flpb, ped/bikes		0.99					1.00		1.00	1.00	1.00	
Frt		0.99					1.00		0.85	1.00	0.87	
Flt Protected		0.98					0.95		1.00	0.95	1.00	
Satd. Flow (prot)		2604					1590		1425	1513	1360	
Flt Permitted		0.98					1.00		1.00	0.95	1.00	
Satd. Flow (perm)		2604					1674		1425	1513	1360	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	351	528	37	0	0	0	38	0	42	440	50	633
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	40	0	321	0
Lane Group Flow (vph)	0	912	0	0	0	0	38	0	2	396	406	0
Confl. Peds. (#/hr)	16		39	39		16	6					6
Parking (#/hr)		40										
Turn Type	Perm						custom		custom	Split		
Protected Phases		4								2	2	
Permitted Phases	4						1		1			
Actuated Green, G (s)		27.1					3.1		3.1	29.1	29.1	
Effective Green, g (s)		27.1					3.1		3.1	29.1	29.1	
Actuated g/C Ratio		0.36					0.04		0.04	0.39	0.39	
Clearance Time (s)		5.0					5.0		5.0	5.0	5.0	
Vehicle Extension (s)		3.0					2.0		2.0	3.0	3.0	
Lane Grp Cap (vph)		950					70		59	593	533	
v/s Ratio Prot										0.26	c0.30	
v/s Ratio Perm		0.35					c0.02		0.00			
v/c Ratio		0.96					0.54		0.03	0.67	0.76	
Uniform Delay, d1		23.1					34.9		34.2	18.6	19.6	
Progression Factor		1.00					1.00		1.00	1.00	1.00	
Incremental Delay, d2		20.1					4.5		0.1	5.9	9.9	
Delay (s)		43.2					39.4		34.2	24.5	29.5	
Level of Service		D					D		C	C	C	
Approach Delay (s)		43.2			0.0			36.7			27.7	
Approach LOS		D			A			D			C	

Intersection Summary				
HCM Average Control Delay	34.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	74.3	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	82.9%	ICU Level of Service	E	
Analysis Period (min)	15			

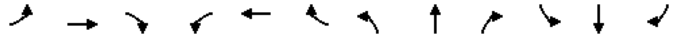
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	163	283	66	198	203	35	63	396	299	43	295	99
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	166	289	67	202	207	36	64	404	305	44	301	101

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	166	356	202	243	266	507	194	252
Volume Left (vph)	166	0	202	0	64	0	44	0
Volume Right (vph)	0	67	0	36	0	305	0	101
Hadj (s)	0.53	-0.10	0.53	-0.07	0.15	-0.39	0.15	-0.25
Departure Headway (s)	9.3	8.7	9.5	8.9	8.8	8.3	9.2	8.8
Degree Utilization, x	0.43	0.86	0.53	0.60	0.65	1.17	0.50	0.62
Capacity (veh/h)	377	406	364	389	396	436	375	394
Control Delay (s)	18.1	45.8	21.7	23.4	25.9	124.7	19.7	23.8
Approach Delay (s)	37.0		22.6		90.6		22.0	
Approach LOS	E		C		F		C	

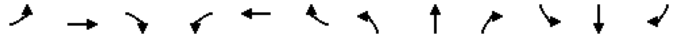
Intersection Summary				
Delay	50.0			
HCM Level of Service	E			
Intersection Capacity Utilization	87.2%	ICU Level of Service	E	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	132	548	97	47	577	267	75	203	64	232	396	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.96		1.00	0.97		1.00	0.98		1.00	1.00	0.89
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.95	1.00		0.94	1.00	1.00
Frt	1.00	0.98		1.00	0.95		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1593	2987		1593	2943		1520	3001		1499	1676	1271
Flt Permitted	0.95	1.00		0.95	1.00		0.31	1.00		0.58	1.00	1.00
Satd. Flow (perm)	1593	2987		1593	2943		503	3001		922	1676	1271
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	135	559	99	48	589	272	77	207	65	237	404	126
RTOR Reduction (vph)	0	20	0	0	79	0	0	45	0	0	0	0
Lane Group Flow (vph)	135	638	0	48	782	0	77	227	0	237	404	126
Confl. Peds. (#/hr)	83		255	255		83	110		96	96		110
Turn Type	Prot			Prot			Perm			Perm		custom
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		4 1 2
Actuated Green, G (s)	6.9	26.2		2.9	22.2		20.1	20.1		20.1	20.1	65.2
Effective Green, g (s)	6.9	26.2		2.9	22.2		20.1	20.1		20.1	20.1	59.2
Actuated g/C Ratio	0.11	0.40		0.04	0.34		0.31	0.31		0.31	0.31	0.91
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	169	1200		71	1002		155	925		284	517	1154
v/s Ratio Prot	c0.08	c0.21		0.03	c0.27			0.08			0.24	
v/s Ratio Perm							0.15			c0.26		0.10
v/c Ratio	0.80	0.53		0.68	0.78		0.50	0.25		0.83	0.78	0.11
Uniform Delay, d1	28.5	14.8		30.7	19.3		18.4	16.9		21.0	20.5	0.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	21.2	1.7		18.2	6.0		2.5	0.1		18.6	7.5	0.0
Delay (s)	49.7	16.5		48.8	25.3		20.9	17.0		39.6	28.1	0.3
Level of Service	D	B		D	C		C	B		D	C	A
Approach Delay (s)		22.2			26.6			17.9			27.1	
Approach LOS		C			C			B			C	

Intersection Summary					
HCM Average Control Delay	24.4	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.91				
Actuated Cycle Length (s)	65.2	Sum of lost time (s)		22.0	
Intersection Capacity Utilization	86.8%	ICU Level of Service		E	
Analysis Period (min)	15				

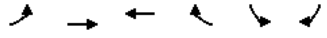
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	830	0	0	825	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0							
Lane Util. Factor		0.95			0.95							
Frpb, ped/bikes		1.00			1.00							
Flpb, ped/bikes		1.00			1.00							
Frt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		3185			3185							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		3185			3185							
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	847	0	0	842	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	847	0	0	842	0	0	0	0	0	0	0
Confl. Peds. (#/hr)			70				171					
Turn Type	Perm			Perm								
Protected Phases		2			2							
Permitted Phases	2			2								
Actuated Green, G (s)		38.6			38.6							
Effective Green, g (s)		38.6			38.6							
Actuated g/C Ratio		0.59			0.59							
Clearance Time (s)		5.0			5.0							
Vehicle Extension (s)		3.0			3.0							
Lane Grp Cap (vph)		1891			1891							
v/s Ratio Prot		c0.27			0.26							
v/s Ratio Perm												
v/c Ratio		0.45			0.45							
Uniform Delay, d1		7.3			7.3							
Progression Factor		1.00			1.00							
Incremental Delay, d2		0.8			0.8							
Delay (s)		8.1			8.1							
Level of Service		A			A							
Approach Delay (s)		8.1			8.1			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary				
HCM Average Control Delay	8.1	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	26.4	
Intersection Capacity Utilization	29.7%	ICU Level of Service	A	
Analysis Period (min)	15			

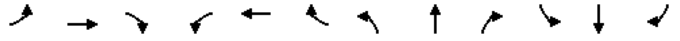
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	738	956	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0			
Lane Util. Factor		0.95	0.95			
Frpb, ped/bikes		1.00	1.00			
Flpb, ped/bikes		1.00	1.00			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		3185	3185			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		3185	3185			
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	753	976	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	753	976	0	0	0
Confl. Peds. (#/hr)						77
Turn Type	Perm					
Protected Phases		4	8			
Permitted Phases	4					
Actuated Green, G (s)		20.4	20.4			
Effective Green, g (s)		20.4	20.4			
Actuated g/C Ratio		0.52	0.52			
Clearance Time (s)		5.0	5.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		1658	1658			
v/s Ratio Prot		0.24	c0.31			
v/s Ratio Perm						
v/c Ratio		0.45	0.59			
Uniform Delay, d1		5.9	6.5			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.2	0.5			
Delay (s)		6.1	7.0			
Level of Service		A	A			
Approach Delay (s)		6.1	7.0		0.0	
Approach LOS		A	A		A	

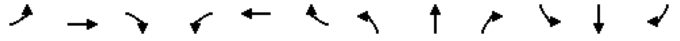
Intersection Summary			
HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	39.2	Sum of lost time (s)	18.8
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



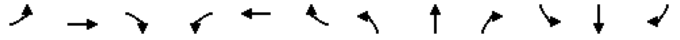
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	518	195	87	275	313	41	791	99	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0		6.0				
Lane Util. Factor		0.95			1.00	1.00		0.95				
Frpb, ped/bikes		0.99			1.00	0.93		1.00				
Flpb, ped/bikes		0.99			1.00	1.00		1.00				
Frt		0.97			1.00	0.85		0.98				
Flt Protected		0.99			0.99	1.00		1.00				
Satd. Flow (prot)		3009			1282	1031		3113				
Flt Permitted		0.76			0.63	1.00		1.00				
Satd. Flow (perm)		2303			811	1031		3113				
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	152	529	199	89	281	319	42	807	101	0	0	0
RTOR Reduction (vph)	0	39	0	0	0	0	0	13	0	0	0	0
Lane Group Flow (vph)	0	841	0	0	370	319	0	937	0	0	0	0
Confl. Peds. (#/hr)	59		30	30		59	25		23	23		25
Parking (#/hr)					25	25						
Turn Type	Perm			Perm		custom	Perm					
Protected Phases		4			4			2				
Permitted Phases	4			4		2 4	2					
Actuated Green, G (s)		33.6			33.6	69.6		24.0				
Effective Green, g (s)		33.6			33.6	69.6		24.0				
Actuated g/C Ratio		0.48			0.48	1.00		0.34				
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			4.0				
Lane Grp Cap (vph)		1112			392	1031		1073				
v/s Ratio Prot												
v/s Ratio Perm		0.37			c0.46	0.31		0.30				
v/c Ratio		0.76			0.94	0.31		0.87				
Uniform Delay, d1		14.7			17.1	0.0		21.4				
Progression Factor		1.00			1.00	1.00		1.00				
Incremental Delay, d2		3.0			31.2	0.2		9.8				
Delay (s)		17.7			48.3	0.2		31.2				
Level of Service		B			D	A		C				
Approach Delay (s)		17.7			26.0			31.2			0.0	
Approach LOS		B			C			C			A	

Intersection Summary				
HCM Average Control Delay	25.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	69.6	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	98.6%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				



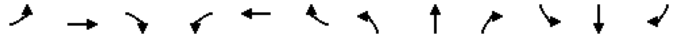
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	410	329	0	0	264	242	40	1421	52	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0	5.0		5.0				
Lane Util. Factor		0.95			1.00	1.00		0.86				
Frpb, ped/bikes		1.00			1.00	0.95		1.00				
Flpb, ped/bikes		0.99			1.00	1.00		1.00				
Frt		1.00			1.00	0.85		0.99				
Flt Protected		0.97			1.00	1.00		1.00				
Satd. Flow (prot)		3057			1425	1154		5702				
Flt Permitted		0.69			1.00	1.00		1.00				
Satd. Flow (perm)		2166			1425	1154		5702				
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	418	336	0	0	269	247	41	1450	53	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	9	0	0	0	0
Lane Group Flow (vph)	0	754	0	0	269	247	0	1535	0	0	0	0
Confl. Peds. (#/hr)	52		101	101		52	69		74	74		69
Parking (#/hr)					10	10						
Turn Type	Perm					custom	Perm					
Protected Phases		2			2			8				
Permitted Phases	2					2 8	8					
Actuated Green, G (s)		24.0			24.0	55.0		21.0				
Effective Green, g (s)		24.0			24.0	55.0		21.0				
Actuated g/C Ratio		0.44			0.44	1.00		0.38				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			5.0				
Lane Grp Cap (vph)		945			622	1154		2177				
v/s Ratio Prot					0.19							
v/s Ratio Perm		c0.35				0.21		0.27				
v/c Ratio		0.99dl			0.43	0.21		0.71				
Uniform Delay, d1		13.4			10.8	0.0		14.4				
Progression Factor		1.00			1.00	1.00		1.00				
Incremental Delay, d2		7.0			2.2	0.2		1.3				
Delay (s)		20.4			13.0	0.2		15.7				
Level of Service		C			B	A		B				
Approach Delay (s)		20.4			6.8			15.7			0.0	
Approach LOS		C			A			B			A	

Intersection Summary				
HCM Average Control Delay	15.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	84.1%	ICU Level of Service	E	
Analysis Period (min)	15			
dl Defacto Left Lane. Recode with 1 though lane as a left lane.				
c Critical Lane Group				



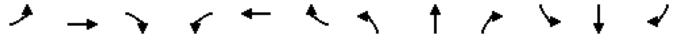
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	253	747	0	0	600	205	260	1806	70	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0				
Lane Util. Factor		0.95			0.95			0.81				
Frpb, ped/bikes		1.00			0.98			1.00				
Flpb, ped/bikes		1.00			1.00			0.99				
Frt		1.00			0.96			1.00				
Flt Protected		0.99			1.00			0.99				
Satd. Flow (prot)		3146			3014			6652				
Flt Permitted		0.53			1.00			0.99				
Satd. Flow (perm)		1702			3014			6652				
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	258	762	0	0	612	209	265	1843	71	0	0	0
RTOR Reduction (vph)	0	0	0	0	42	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	1020	0	0	779	0	0	2172	0	0	0	0
Confl. Peds. (#/hr)	37		3	3		37	54		69	69		54
Turn Type	Prot						Perm					
Protected Phases	1	6			2			4				
Permitted Phases							4					
Actuated Green, G (s)		44.0			23.0			26.0				
Effective Green, g (s)		44.0			23.0			26.0				
Actuated g/C Ratio		0.55			0.29			0.32				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		1225			867			2162				
v/s Ratio Prot		c0.17			0.26							
v/s Ratio Perm		c0.29						0.33				
v/c Ratio		0.83			0.90			1.00				
Uniform Delay, d1		14.9			27.4			27.0				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		5.0			14.0			20.5				
Delay (s)		19.9			41.4			47.5				
Level of Service		B			D			D				
Approach Delay (s)		19.9			41.4			47.5			0.0	
Approach LOS		B			D			D			A	

Intersection Summary			
HCM Average Control Delay	39.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



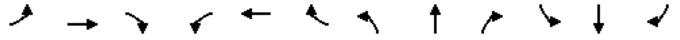
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	539	46	37	683	9	37	9	80	31	1	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.98			0.95	
Flpb, ped/bikes		1.00			1.00			0.98			1.00	
Frt		0.99			1.00			0.91			0.91	
Flt Protected		1.00			1.00			0.99			0.98	
Satd. Flow (prot)		3129			3167			1160			1131	
Flt Permitted		0.90			0.89			0.87			0.66	
Satd. Flow (perm)		2816			2829			1022			761	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	27	550	47	38	697	9	38	9	82	32	1	70
RTOR Reduction (vph)	0	5	0	0	1	0	0	69	0	0	59	0
Lane Group Flow (vph)	0	619	0	0	743	0	0	60	0	0	44	0
Confl. Peds. (#/hr)	27		20	20		27	72		27	27		72
Parking (#/hr)								20	20		20	20
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			3			2	
Permitted Phases	1			1			3			2		
Actuated Green, G (s)		31.9			31.9			10.8			10.8	
Effective Green, g (s)		31.9			31.9			10.8			10.8	
Actuated g/C Ratio		0.45			0.45			0.15			0.15	
Clearance Time (s)		7.0			7.0			5.0			5.0	
Vehicle Extension (s)		4.0			4.0			2.0			3.0	
Lane Grp Cap (vph)		1274			1280			157			117	
v/s Ratio Prot												
v/s Ratio Perm		0.22			c0.26			c0.06			c0.06	
v/c Ratio		0.49			0.58			0.38			0.37	
Uniform Delay, d1		13.5			14.3			26.8			26.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.3			1.9			0.6			2.0	
Delay (s)		14.9			16.3			27.4			28.8	
Level of Service		B			B			C			C	
Approach Delay (s)		14.9			16.3			27.4			28.8	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	17.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	70.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	89	400	76	64	644	56	110	527	60	18	249	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0			6.0			6.0	
Lane Util. Factor		1.00	1.00		0.95			0.95			0.95	
Frpb, ped/bikes		1.00	0.98		1.00			1.00			0.98	
Flpb, ped/bikes		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.99			0.99			0.95	
Flt Protected		0.99	1.00		1.00			0.99			1.00	
Satd. Flow (prot)		1326	1118		2656			3096			2987	
Flt Permitted		0.75	1.00		0.87			0.78			0.90	
Satd. Flow (perm)		1010	1118		2309			2443			2702	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	91	408	78	65	657	57	112	538	61	18	254	117
RTOR Reduction (vph)	0	0	0	0	7	0	0	9	0	0	60	0
Lane Group Flow (vph)	0	499	78	0	772	0	0	702	0	0	330	0
Confl. Peds. (#/hr)	29		5	5		29	28		12	12		28
Parking (#/hr)		20	20		40	40						
Turn Type	Perm		custom	Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2		2 4	2			4			4		
Actuated Green, G (s)		44.0	80.0		44.0			24.0			24.0	
Effective Green, g (s)		44.0	80.0		44.0			24.0			24.0	
Actuated g/C Ratio		0.55	1.00		0.55			0.30			0.30	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		5.0			5.0			3.0			3.0	
Lane Grp Cap (vph)		556	1118		1270			733			811	
v/s Ratio Prot												
v/s Ratio Perm		c0.49	0.07		0.33			c0.29			0.12	
v/c Ratio		0.90	0.07		0.61			0.96			0.41	
Uniform Delay, d1		16.0	0.0		12.2			27.5			22.3	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		19.8	0.0		2.2			23.1			0.3	
Delay (s)		35.8	0.0		14.3			50.6			22.7	
Level of Service		D	A		B			D			C	
Approach Delay (s)		31.0			14.3			50.6			22.7	
Approach LOS		C			B			D			C	

Intersection Summary			
HCM Average Control Delay	30.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	108.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	171	339	103	80	339	104	28	483	49	27	270	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frpb, ped/bikes		1.00			0.99			1.00			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.97			0.99			0.98	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		1286			1287			3123			3079	
Flt Permitted		0.74			0.84			0.92			0.81	
Satd. Flow (perm)		967			1090			2870			2491	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	174	346	105	82	346	106	29	493	50	28	276	51
RTOR Reduction (vph)	0	9	0	0	11	0	0	9	0	0	17	0
Lane Group Flow (vph)	0	616	0	0	523	0	0	563	0	0	338	0
Confl. Peds. (#/hr)	15		6	6		15	16		6	6		16
Parking (#/hr)		20	20		20	20						
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		51.4			51.4			17.5			17.5	
Effective Green, g (s)		51.4			51.4			17.5			17.5	
Actuated g/C Ratio		0.65			0.65			0.22			0.22	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		630			710			637			553	
v/s Ratio Prot												
v/s Ratio Perm		c0.64			0.48			c0.20			0.14	
v/c Ratio		0.98			0.74			0.88			0.61	
Uniform Delay, d1		13.2			9.2			29.7			27.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		29.9			4.0			13.7			2.0	
Delay (s)		43.1			13.2			43.4			29.6	
Level of Service		D			B			D			C	
Approach Delay (s)		43.1			13.2			43.4			29.6	
Approach LOS		D			B			D			C	

Intersection Summary			
HCM Average Control Delay	33.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	78.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	107.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	199	509	36	97	322	130	23	264	55	82	354	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frpb, ped/bikes		1.00			0.99			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			0.98			0.98	
Flt Protected		0.99			0.99			1.00			0.99	
Satd. Flow (prot)		1311			1279			3073			3053	
Flt Permitted		0.73			0.79			0.87			0.77	
Satd. Flow (perm)		966			1018			2686			2378	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	203	519	37	99	329	133	23	269	56	84	361	87
RTOR Reduction (vph)	0	2	0	0	14	0	0	20	0	0	20	0
Lane Group Flow (vph)	0	757	0	0	547	0	0	328	0	0	512	0
Confl. Peds. (#/hr)	8		13	13		8	11		12	12		11
Bus Blockages (#/hr)	0	0	20	0	0	0	0	0	0	0	0	0
Parking (#/hr)		20	20		20	20						
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		52.0			52.0			18.0			18.0	
Effective Green, g (s)		52.0			52.0			18.0			18.0	
Actuated g/C Ratio		0.65			0.65			0.22			0.22	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		628			662			604			535	
v/s Ratio Prot												
v/s Ratio Perm		c0.78			0.54			0.12			c0.22	
v/c Ratio		1.20			0.83			0.54			0.96	
Uniform Delay, d1		14.0			10.6			27.4			30.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		106.7			8.3			1.0			28.0	
Delay (s)		120.7			18.9			28.4			58.7	
Level of Service		F			B			C			E	
Approach Delay (s)		120.7			18.9			28.4			58.7	
Approach LOS		F			B			C			E	

Intersection Summary			
HCM Average Control Delay	65.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	111.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	72	37	40	56	41	51	17	284	86	17	356	44
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	73	38	41	57	42	52	17	290	88	17	363	45
Pedestrians		10			6			4			10	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								424			578	
pX, platoon unblocked												
vC, conflicting volume	693	849	218	654	827	205	418			384		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	693	849	218	654	827	205	418			384		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	72	87	95	80	86	93	98			99		
cM capacity (veh/h)	261	284	777	287	292	791	1128			1166		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	152	151	162	233	199	227
Volume Left	73	57	17	0	17	0
Volume Right	41	52	0	88	0	45
cSH	326	370	1128	1700	1166	1700
Volume to Capacity	0.47	0.41	0.02	0.14	0.01	0.13
Queue Length 95th (ft)	59	48	1	0	1	0
Control Delay (s)	25.4	21.3	1.0	0.0	0.8	0.0
Lane LOS	D	C	A		A	
Approach Delay (s)	25.4	21.3	0.4		0.4	
Approach LOS	D	C				

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix E

Traffic Simulation Output

Existing AM
Peak Hour Conditions

Arterial Level of Service: NB South Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1060	41.9	53.6	0.1	6
	2040	1.3	14.2	0.1	22
Pohukaina Street	1260	10.6	23.6	0.1	14
	2030	1.6	8.3	0.0	19
Halekauwila Street	1270	18.1	25.1	0.1	7
	2020	1.5	9.0	0.1	20
Queen Street	1280	26.3	36.2	0.1	7
	2010	2.1	11.2	0.1	19
Kapiolani Boulevard	1012	42.9	52.6	0.1	5
King Street	1011	3.4	8.8	0.0	16
Total		149.7	242.6	0.7	10

Arterial Level of Service: SB South Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2040	0.8	15.7	0.1	21
Ala Moana Boulevard	1060	55.6	66.9	0.1	5
Total		56.4	82.6	0.2	8

Arterial Level of Service: EB Kapiolani Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
South Street	1012	7.5	28.5	0.1	11
Cooke Street	2119	28.5	60.6	0.2	13
	2160	3.1	20.1	0.1	20
Ward Avenue	1020	41.4	57.1	0.1	7
	2260	1.8	19.8	0.1	22
Kamakee Street	1030	4.0	20.0	0.1	21
	2330	1.0	12.7	0.1	21
Pensacola Street	1040	19.6	32.1	0.1	10
	2380	1.5	11.1	0.1	19
Piikoi Street	1050	4.4	12.4	0.1	17
Total		112.8	274.3	1.1	14

Existing AM
Simulation #1
Kakaako Mauka SEIS
2/5/2008

Arterial Level of Service: WB Kapiolani Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1050	12.5	64.2	0.4	21
	2380	1.5	11.2	0.1	19
Pensacola Street	1040	22.4	31.4	0.1	7
	2330	2.1	15.3	0.1	22
Kamakee Street	1030	7.7	18.7	0.1	14
	2260	2.5	19.2	0.1	22
Ward Avenue	1020	32.3	49.2	0.1	9
	2160	3.7	20.8	0.1	20
Cooke Street	2119	23.6	40.0	0.1	10
South Street	1012	10.1	43.9	0.2	19
Total		118.5	313.9	1.3	15

Arterial Level of Service: NB Ward Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1100	52.4	65.8	0.1	5
	2230	1.8	9.9	0.0	17
Auahi Street	1150	5.7	11.9	0.0	14
	2220	0.9	11.3	0.1	22
Halekauwila Street	1160	8.6	13.8	0.0	9
	2210	0.8	7.3	0.0	22
Queen Street	1170	9.9	16.6	0.0	10
Waimanu Street	2200	1.0	14.3	0.1	23
Kapiolani Boulevard	1020	38.7	45.3	0.0	4
Total		119.7	196.3	0.5	10

Arterial Level of Service: SB Ward Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	1020	73.5	89.6	0.1	5
Waimanu Street	2200	2.6	10.4	0.0	17
Queen Street	1170	24.8	38.0	0.1	9
	2210	2.2	9.3	0.0	19
Halekauwila Street	1160	5.1	11.6	0.0	14
	2220	1.0	6.3	0.0	21
Auahi Street	1150	3.1	13.2	0.1	19
	2230	1.6	8.7	0.0	20
Ala Moana Boulevard	1100	62.1	69.7	0.1	3
Total		176.1	256.8	0.6	8

Arterial Level of Service: NB Kamakee Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1120	51.0	63.1	0.1	5
	2320	1.6	6.7	0.0	16
Auahi Street	1230	27.3	32.7	0.0	4
	2310	1.6	13.5	0.1	21
Queen Street	1220	6.8	11.6	0.0	11
Waimanu Street	2300	6.5	19.6	0.1	17
	49	1.6	6.6	0.0	19
Kapiolani Boulevard	1030	53.8	61.9	0.1	3
Total		150.2	215.6	0.5	8

Arterial Level of Service: SB Kamakee Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	49	0.3	9.1	0.1	21
Waimanu Street	2300	5.0	9.8	0.0	12
Queen Street	1220	8.8	22.3	0.1	15
	2310	2.0	7.2	0.0	17
Auahi Street	1230	25.0	35.9	0.1	8
	2320	6.0	13.3	0.0	13
Ala Moana Boulevard	1120	59.9	63.4	0.0	2
Total		107.0	161.0	0.4	8

Arterial Level of Service: NB Pensacola Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Waimanu Street	1210	58.3	67.5	0.1	3
Total		58.3	67.5	0.1	3

Arterial Level of Service: SB Pensacola Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	1040	32.3	52.5	0.1	10
Kona Street	2379	4.8	17.6	0.1	17
Waimanu Street	1210	5.3	10.8	0.0	14
Total		42.4	80.9	0.3	12

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Arterial Level of Service: NB Piikoi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2440	0.3	10.0	0.1	21
Hawaiki Tower	1180	8.5	17.0	0.1	13
	2430	1.1	8.4	0.0	21
Waimanu Street	1190	4.3	9.5	0.0	16
	2420	0.7	5.7	0.0	18
Kona Street	1200	4.3	8.3	0.0	12
	2410	2.0	6.8	0.0	17
Kapiolani Boulevard	1050	55.3	62.9	0.1	3
Total		76.5	128.6	0.4	10

Arterial Level of Service: SB Piikoi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2410	0.4	11.1	0.1	18
Kona Street	1200	3.1	6.8	0.0	14
	2420	0.4	4.8	0.0	21
Waimanu Street	1190	7.1	11.2	0.0	9
	2430	1.0	6.2	0.0	21
	1180	4.1	9.3	0.0	14
	2440	0.6	9.3	0.1	23
Ala Moana Boulevard	1140	55.0	63.4	0.1	3
Total		71.7	122.2	0.3	10

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Arterial Level of Service: EB Ala Moana Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
South Street	1060	41.0	83.7	0.4	19
	2050	4.7	10.0	0.0	18
Keawe Street	1070	13.3	18.3	0.0	10
	2090	4.9	8.7	0.0	15
Coral Street	1080	12.6	16.5	0.0	8
	2110	3.1	6.6	0.0	19
Cooke Street	1090	10.8	14.8	0.0	9
	2190	13.7	25.8	0.1	16
Ward Avenue	1100	37.0	47.4	0.1	8
	2250	5.0	16.9	0.1	23
Kewalo Basin	1110	1.6	5.8	0.0	26
	2290	2.2	9.0	0.1	26
Kamakee Street	1120	17.8	24.0	0.1	10
	2370	2.7	14.6	0.1	27
Queen Street	1130	3.6	14.9	0.1	27
	2400	1.4	11.1	0.1	29
Piikoi Street	1140	31.1	43.4	0.1	10
Total		206.4	371.7	1.6	16

Arterial Level of Service: WB Ala Moana Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1140	56.4	96.7	0.4	15
	2400	9.1	22.0	0.1	19
Queen Street	1130	20.0	29.0	0.1	11
	2370	31.2	43.1	0.1	9
Kamakee Street	1120	65.7	76.8	0.1	5
	2290	28.7	35.7	0.1	6
Kewalo Basin	1110	40.0	46.8	0.1	5
	2250	21.5	25.7	0.0	6
Ward Avenue	1100	96.0	106.5	0.1	4
	2190	25.7	37.2	0.1	10
Cooke Street	1090	88.8	100.6	0.1	4
	2110	23.9	28.2	0.0	5
Coral Street	1080	31.5	35.0	0.0	4
	2090	18.3	22.2	0.0	6
Keawe Street	1070	25.5	29.3	0.0	5
	2050	13.5	18.6	0.0	9
South Street	1060	23.6	28.4	0.0	6
Total		619.5	781.7	1.6	7

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Arterial Level of Service: NB Cooke Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1090	63.6	75.9	0.1	4
	2150	10.8	16.6	0.0	8
Auahi Street	1330	0.6	6.7	0.0	23
	2140	0.2	7.1	0.0	25
Pohukaina Street	1320	7.7	16.5	0.1	13
	2130	2.0	8.8	0.0	20
Halekauwila Street	1310	7.8	14.5	0.0	12
	2120	2.1	8.8	0.0	19
Queen Street	1300	24.7	31.7	0.0	6
Kapiolani Boulevard	2119	17.6	39.1	0.2	14
Total		137.1	225.7	0.6	10

Arterial Level of Service: SB Cooke Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	2119	16.1	23.7	0.1	9
Queen Street	1300	23.1	45.5	0.2	12
	2120	1.9	9.3	0.0	19
Halekauwila Street	1310	12.0	18.6	0.0	9
	2130	2.0	8.7	0.0	19
Pohukaina Street	1320	6.6	13.5	0.0	13
	2140	1.7	10.5	0.1	21
Auahi Street	1330	0.3	7.2	0.0	24
	2150	17.9	24.0	0.0	6
Ala Moana Boulevard	1090	64.3	68.8	0.0	2
Total		145.7	229.8	0.6	9

Arterial Level of Service: EB Queen Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
South Street	1280	17.8	28.9	0.1	9
Keawe Street	2060	1.3	17.0	0.1	23
Coral Street	1290	14.8	20.6	0.0	7
	2100	2.2	8.1	0.0	18
Cooke Street	1300	13.5	17.7	0.0	7
	2170	1.5	18.6	0.1	22
Ward Avenue	1170	24.1	40.9	0.1	11
	2270	1.8	18.3	0.1	22
Kamakee Street	1220	8.2	25.9	0.1	17
Total		85.3	195.9	0.8	14

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Arterial Level of Service: WB Queen Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kamakee Street	1220	8.3	15.3	0.0	12
	2270	2.3	20.5	0.1	22
Ward Avenue	1170	33.1	48.2	0.1	8
	2170	2.0	20.1	0.1	22
Cooke Street	1300	17.5	33.7	0.1	12
	2100	2.3	7.6	0.0	16
Emily Street	1290	13.2	17.8	0.0	8
	2060	1.1	8.3	0.0	17
South Street	1280	19.4	34.1	0.1	12
Total		99.2	205.5	0.7	13

Arterial Level of Service: EB Auahi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ward Avenue	1150	28.8	39.3	0.1	7
	2240	1.8	8.6	0.0	17
Ward Warehouse	1250	2.1	8.2	0.0	17
	2280	0.4	5.7	0.0	26
	1240	3.3	8.4	0.0	14
	2285	0.6	5.1	0.0	22
Kamakee Street	1230	6.9	17.7	0.1	15
	29	1.0	10.4	0.1	21
	58	0.1	6.0	0.0	24
	2360	0.2	5.7	0.0	25
	59	0.2	9.2	0.1	25
Total		45.4	124.3	0.5	16

Arterial Level of Service: WB Auahi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2360	0.3	9.3	0.1	25
	58	0.2	6.2	0.0	23
	29	0.1	6.0	0.0	24
Kamakee Street	1230	8.5	17.0	0.1	13
	2285	1.2	12.8	0.1	21
Ward Entertainment C	1240	3.0	7.6	0.0	15
	2280	0.5	5.2	0.0	24
Ward Warehouse	1250	4.0	9.9	0.0	15
	2240	2.9	8.7	0.0	16
Ward Avenue	1150	39.7	45.1	0.0	3
Total		60.5	127.7	0.5	13

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Arterial Level of Service: EB Halekauwila Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	89	2.6	10.6	0.1	21
South Street	1270	10.2	13.7	0.0	6
Keawe Street	2070	6.6	20.3	0.1	17
	3002	1.6	6.7	0.0	19
Coral Street	2071	0.0	5.2	0.0	24
Cooke Street	1310	7.1	16.1	0.1	15
	2180	1.9	17.5	0.1	22
Ward Avenue	1160	21.9	39.1	0.1	11
Total		52.0	129.2	0.5	15

Arterial Level of Service: WB Halekauwila Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2180	1.2	19.9	0.1	22
Cooke Street	1310	8.4	23.5	0.1	16
Coral Street	2071	1.9	11.4	0.1	20
	3002	0.1	5.3	0.0	24
Keawe Street	2070	5.1	10.2	0.0	13
South Street	1270	10.2	23.6	0.1	15
	89	0.8	4.7	0.0	17
Total		27.8	98.7	0.5	18

Arterial Level of Service: EB Waimanu Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kamakee Street	2300	4.0	15.1	0.1	16
	64	0.3	7.0	0.0	18
Pensacola Street	1210	39.5	52.6	0.1	6
	2390	1.4	9.2	0.0	19
Piikoi Street	1190	51.0	59.7	0.1	4
Total		96.1	143.6	0.3	8

Arterial Level of Service: WB Waimanu Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1190	6.8	23.2	0.1	17
	64	0.0	0.0	0.1	
	2340	2.3	7.3	0.0	17
Kamakee Street	2300	3.4	18.3	0.1	18
Total		12.5	48.9	0.3	24

Arterial Level of Service: EB Kona Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Pensacola Street	2379	13.6	21.3	0.1	10
Piikoi Street	1200	49.5	66.9	0.1	6
Total		63.1	88.2	0.2	7

Arterial Level of Service: WB Kona Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1200	40.2	52.2	0.1	6
Pensacola Street	2379	27.1	44.5	0.1	9
Total		67.3	96.7	0.2	8

Arterial Level of Service: EB Pohukaina Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	87	0.2	4.3	0.0	28
South Street	1260	26.6	33.7	0.0	5
Keawe Street	2080	7.3	21.5	0.1	16
	3003	1.7	8.2	0.0	20
Coral Street	2081	0.0	4.8	0.0	25
Cooke Street	1320	6.8	15.6	0.1	14
Total		42.6	88.1	0.3	13

Arterial Level of Service: WB Pohukaina Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cooke Street	1320	9.0	31.7	0.2	19
Coral Street	2081	1.9	11.3	0.1	20
	3003	0.1	4.8	0.0	25
Keawe Street	2080	5.4	11.9	0.0	14
South Street	1260	23.5	36.9	0.1	10
	87	1.1	8.4	0.0	21
Total		41.0	105.0	0.5	16

Traffic Simulation Output

Existing PM
Peak Hour Conditions

Arterial Level of Service: NB South Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1060	47.5	59.0	0.1	5
	2040	1.3	14.5	0.1	21
Pohukaina Street	1260	12.9	26.0	0.1	13
	2030	1.0	7.7	0.0	21
Halekauwila Street	1270	16.6	23.6	0.1	8
	2020	1.4	8.9	0.1	20
Queen Street	1280	27.0	36.9	0.1	7
	2010	2.1	11.3	0.1	19
Kapiolani Boulevard	1012	38.6	48.3	0.1	5
King Street	1011	4.7	10.2	0.0	14
Total		153.2	246.6	0.7	10

Arterial Level of Service: SB South Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2040	0.5	15.6	0.1	21
Ala Moana Boulevard	1060	48.8	59.3	0.1	5
Total		49.3	74.9	0.2	9

Arterial Level of Service: EB Kapiolani Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
South Street	1012	10.1	31.0	0.1	10
Cooke Street	2119	34.5	67.0	0.2	12
	2160	2.0	19.0	0.1	22
Ward Avenue	1020	46.7	62.6	0.1	6
	2260	2.5	20.6	0.1	21
Kamakee Street	1030	10.1	26.4	0.1	16
	2330	2.5	14.1	0.1	19
Pensacola Street	1040	28.6	41.2	0.1	8
	2380	2.2	11.6	0.1	18
Piikoi Street	1050	11.7	19.4	0.1	10
Total		150.8	312.7	1.1	12

Arterial Level of Service: WB Kapiolani Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1050	12.5	53.2	0.3	20
	2380	1.2	10.4	0.1	19
Pensacola Street	1040	34.1	42.9	0.1	5
	2330	1.8	15.0	0.1	22
Kamakee Street	1030	8.6	19.7	0.1	14
	2260	1.1	17.6	0.1	24
Ward Avenue	1020	27.2	44.1	0.1	10
	2160	2.0	19.1	0.1	21
Cooke Street	2119	25.8	42.3	0.1	10
South Street	1012	10.9	44.6	0.2	18
Total		125.2	308.8	1.3	15

Arterial Level of Service: NB Ward Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1100	52.9	66.3	0.1	5
	2230	1.6	8.5	0.0	18
Auahi Street	1150	8.7	15.0	0.0	11
	2220	1.4	11.9	0.1	21
Halekauwila Street	1160	12.3	17.5	0.0	7
	2210	2.1	8.6	0.0	19
Queen Street	1170	21.3	28.2	0.0	6
Waimanu Street	2200	52.3	65.8	0.1	5
Kapiolani Boulevard	1020	57.8	64.4	0.0	3
Total		210.5	286.2	0.5	7

Arterial Level of Service: SB Ward Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	1020	56.9	72.9	0.1	6
Waimanu Street	2200	2.2	10.0	0.0	18
Queen Street	1170	28.4	41.6	0.1	8
	2210	2.5	9.6	0.0	18
Halekauwila Street	1160	6.4	13.0	0.0	12
	2220	0.9	6.1	0.0	21
Auahi Street	1150	11.2	21.2	0.1	12
	2230	4.6	12.5	0.1	15
Ala Moana Boulevard	1100	42.3	48.0	0.0	4
Total		155.3	235.0	0.6	9

Arterial Level of Service: NB Kamakee Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1120	59.0	71.6	0.1	4
	2320	1.3	6.3	0.0	16
Auahi Street	1230	26.2	31.2	0.0	4
	2310	1.8	13.5	0.1	21
Queen Street	1220	10.9	15.9	0.0	8
Waimanu Street	2300	7.0	20.4	0.1	16
	49	1.7	6.6	0.0	18
Kapiolani Boulevard	1030	48.9	57.0	0.1	3
Total		156.8	222.6	0.4	7

Arterial Level of Service: SB Kamakee Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	49	0.2	9.2	0.1	21
Waimanu Street	2300	5.1	9.9	0.0	12
Queen Street	1220	14.3	27.1	0.1	12
	2310	2.3	7.7	0.0	17
Auahi Street	1230	32.0	42.7	0.1	6
	2320	15.2	21.3	0.0	6
Ala Moana Boulevard	1120	55.0	59.2	0.0	2
Total		124.1	177.1	0.4	7

Arterial Level of Service: NB Pensacola Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Waimanu Street	1210	52.2	61.1	0.1	3
Total		52.2	61.1	0.1	3

Arterial Level of Service: SB Pensacola Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	1040	33.1	53.3	0.1	10
Kona Street	2379	9.9	22.7	0.1	13
Waimanu Street	1210	19.5	24.9	0.0	6
Total		62.5	101.0	0.3	10

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Arterial Level of Service: NB Piikoi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2440	0.7	10.4	0.1	20
Hawaiki Tower	1180	22.0	30.4	0.1	7
	2430	2.9	10.2	0.0	17
Waimanu Street	1190	11.9	16.2	0.0	8
	2420	1.3	5.2	0.0	15
Kona Street	1200	5.3	9.0	0.0	10
	2410	1.5	5.5	0.0	17
Kapiolani Boulevard	1050	33.4	40.9	0.1	5
Total		79.0	127.8	0.3	9

Arterial Level of Service: SB Piikoi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2410	0.5	10.3	0.1	20
Kona Street	1200	8.1	11.1	0.0	7
	2420	5.7	10.0	0.0	10
Waimanu Street	1190	25.0	28.1	0.0	3
	2430	2.4	7.0	0.0	16
	1180	6.7	12.7	0.0	12
	2440	1.1	9.8	0.1	22
Ala Moana Boulevard	1140	56.0	64.5	0.1	3
Total		105.5	153.7	0.3	8

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Arterial Level of Service: EB Ala Moana Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
South Street	1060	25.0	62.2	0.4	21
	2050	3.4	9.0	0.1	21
Keawe Street	1070	11.2	16.1	0.0	10
	2090	2.4	6.9	0.0	23
Coral Street	1080	3.4	8.0	0.0	20
	2110	1.9	5.5	0.0	23
Cooke Street	1090	2.3	6.4	0.0	22
	2190	9.3	21.4	0.1	20
Ward Avenue	1100	32.9	43.5	0.1	9
	2250	4.2	16.1	0.1	24
Kewalo Basin	1110	1.5	5.7	0.0	26
	2290	2.2	9.0	0.1	25
Kamakee Street	1120	16.7	22.9	0.1	10
	2370	3.3	15.2	0.1	26
Queen Street	1130	7.1	18.4	0.1	22
	2400	2.2	12.0	0.1	27
Piikoi Street	1140	32.7	44.9	0.1	9
Total		161.8	323.0	1.5	17

Arterial Level of Service: WB Ala Moana Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1140	42.6	79.1	0.4	16
	2400	6.6	19.5	0.1	22
Queen Street	1130	4.3	13.3	0.1	25
	2370	2.6	14.4	0.1	28
Kamakee Street	1120	4.9	16.0	0.1	25
	2290	1.9	9.0	0.1	25
Kewalo Basin	1110	2.5	9.3	0.1	25
	2250	1.2	5.4	0.0	28
Ward Avenue	1100	25.5	36.1	0.1	11
	2190	5.3	16.8	0.1	23
Cooke Street	1090	4.5	16.4	0.1	26
	2110	1.0	5.4	0.0	26
Coral Street	1080	5.3	8.9	0.0	14
	2090	2.5	6.4	0.0	21
Keawe Street	1070	16.8	20.6	0.0	6
	2050	2.5	7.4	0.0	23
South Street	1060	5.4	10.4	0.1	18
Total		135.6	294.4	1.5	19

Arterial Level of Service: NB Cooke Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1090	40.3	53.2	0.1	6
	2150	1.5	7.4	0.0	18
Auahi Street	1330	0.2	6.5	0.0	24
	2140	0.1	7.1	0.0	25
Pohukaina Street	1320	6.6	15.5	0.1	14
	2130	1.8	8.8	0.0	20
Halekauwila Street	1310	6.1	12.8	0.0	13
	2120	2.0	8.8	0.0	19
Queen Street	1300	21.8	28.9	0.0	6
Kapiolani Boulevard	2119	20.0	42.0	0.2	13
Total		100.5	191.1	0.6	12

Arterial Level of Service: SB Cooke Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	2119	14.8	22.5	0.1	9
Queen Street	1300	18.4	40.9	0.2	14
	2120	1.4	9.0	0.0	20
Halekauwila Street	1310	6.8	13.5	0.0	12
	2130	1.8	8.6	0.0	20
Pohukaina Street	1320	7.7	14.8	0.0	12
	2140	2.0	11.0	0.1	20
Auahi Street	1330	0.4	7.5	0.0	23
	2150	0.2	6.6	0.0	23
Ala Moana Boulevard	1090	53.8	58.2	0.0	2
Total		107.3	192.5	0.6	11

Arterial Level of Service: EB Queen Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
South Street	1280	1804.2	1814.9	0.1	3
Keawe Street	2060	2.4	18.2	0.1	22
Coral Street	1290	19.9	25.7	0.0	6
	2100	6.4	12.3	0.0	12
Cooke Street	1300	13.6	18.0	0.0	7
	2170	2.2	19.4	0.1	21
Ward Avenue	1170	62.3	79.3	0.1	5
	2270	1.5	18.2	0.1	22
Kamakee Street	1220	25.2	43.0	0.1	10
Total		1937.7	2049.0	0.8	8

Arterial Level of Service: WB Queen Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kamakee Street	1220	10.1	17.1	0.0	11
	2270	2.2	20.5	0.1	22
Ward Avenue	1170	34.5	49.7	0.1	8
	2170	2.0	20.5	0.1	21
Cooke Street	1300	17.2	33.3	0.1	12
	2100	1.5	6.8	0.0	17
Emily Street	1290	15.6	20.1	0.0	7
	2060	1.1	8.1	0.0	18
South Street	1280	15.9	30.6	0.1	13
Total		100.2	206.7	0.7	13

Arterial Level of Service: EB Auahi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ward Avenue	1150	29.2	39.3	0.1	7
	2240	1.7	8.6	0.0	17
Ward Warehouse	1250	9.8	15.6	0.0	8
	2280	2.3	7.7	0.0	19
	1240	7.1	12.2	0.0	10
	2285	1.0	5.5	0.0	21
Kamakee Street	1230	14.9	25.6	0.1	11
	29	1.0	10.5	0.1	22
	58	0.4	6.3	0.0	23
	2360	1.3	6.7	0.0	21
	59	0.5	9.5	0.1	25
Total		69.1	147.6	0.5	13

Arterial Level of Service: WB Auahi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2360	0.3	9.4	0.1	25
	58	0.2	6.2	0.0	23
	29	0.1	5.9	0.0	25
Kamakee Street	1230	16.6	25.0	0.1	9
	2285	1.2	12.7	0.1	21
Ward Entertainment C	1240	6.2	10.8	0.0	10
	2280	0.8	5.4	0.0	22
Ward Warehouse	1250	9.0	14.9	0.0	10
	2240	3.1	8.6	0.0	15
Ward Avenue	1150	32.5	38.3	0.0	4
Total		70.1	137.2	0.5	12

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Arterial Level of Service: EB Halekauwila Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	89	43.6	51.7	0.1	5
South Street	1270	21.3	24.9	0.0	3
Keawe Street	2070	9.1	22.8	0.1	15
	3002	1.7	6.9	0.0	19
Coral Street	2071	0.1	5.3	0.0	24
Cooke Street	1310	9.1	18.1	0.1	13
	2180	2.0	17.8	0.1	22
Ward Avenue	1160	32.1	48.5	0.1	9
Total		118.8	195.9	0.5	11

Arterial Level of Service: WB Halekauwila Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2180	0.7	8.9	0.1	49
Cooke Street	1310	7.2	22.4	0.1	17
Coral Street	2071	1.8	11.4	0.1	21
	3002	0.1	5.2	0.0	24
Keawe Street	2070	4.9	10.0	0.0	13
South Street	1270	14.1	27.2	0.1	13
	89	0.9	5.2	0.0	16
Total		29.7	90.3	0.5	19

Arterial Level of Service: EB Waimanu Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kamakee Street	2300	3.0	13.9	0.1	17
	64	0.0	0.0	0.0	
Pensacola Street	1210	151.1	163.9	0.1	2
	2390	11.0	18.7	0.0	10
Piikoi Street	1190	29.3	37.8	0.1	6
Total		194.3	234.3	0.3	5

Arterial Level of Service: WB Waimanu Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1190	15.1	32.1	0.1	12
	64	0.9	15.5	0.1	21
	2340	2.3	7.3	0.0	17
Kamakee Street	2300	3.7	18.3	0.1	18
Total		22.1	73.1	0.3	16

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Arterial Level of Service: EB Kona Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Pensacola Street	2379	98.7	106.4	0.1	3
Piikoi Street	1200	37.4	54.0	0.1	8
Total		136.1	160.4	0.2	5

Arterial Level of Service: WB Kona Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1200	59.2	71.8	0.1	5
Pensacola Street	2379	47.3	65.7	0.1	6
Total		106.4	137.4	0.2	5

Arterial Level of Service: EB Pohukaina Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	87	0.4	4.6	0.0	26
South Street	1260	25.6	32.7	0.0	5
Keawe Street	2080	7.2	21.8	0.1	16
	3003	2.0	8.6	0.0	19
Coral Street	2081	0.3	5.1	0.0	24
Cooke Street	1320	10.4	19.5	0.1	12
Total		45.9	92.3	0.3	13

Arterial Level of Service: WB Pohukaina Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cooke Street	1320	9.1	31.7	0.2	19
Coral Street	2081	1.9	11.4	0.1	20
	3003	0.0	4.8	0.0	25
Keawe Street	2080	5.4	11.9	0.0	14
South Street	1260	24.0	37.3	0.1	9
	87	1.1	8.9	0.0	20
Total		41.6	105.9	0.5	15

Traffic Simulation Output

No Action Alternative AM Peak Hour Conditions

Arterial Level of Service: NB South Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1060	86.1	98.4	0.1	3
	2040	1.3	14.1	0.1	22
Pohukaina Street	1260	10.2	23.8	0.1	14
	2030	1.9	8.2	0.0	20
Halekauwila Street	1270	18.6	25.5	0.1	7
	2020	2.2	9.8	0.1	18
Queen Street	1280	3.2	12.9	0.1	20
	2010	2.5	12.0	0.1	18
Kapiolani Boulevard	1012	70.6	80.4	0.1	3
King Street	1011	11.3	16.8	0.0	9
Total		207.9	301.9	0.7	8

Arterial Level of Service: SB South Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2040	0.6	15.7	0.1	21
Ala Moana Boulevard	1060	129.0	140.3	0.1	2
Total		129.6	156.0	0.2	4

Arterial Level of Service: EB Kapiolani Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
South Street	1012	27.7	48.8	0.1	6
Cooke Street	2119	181.3	213.5	0.2	4
	2160	143.8	160.6	0.1	3
Ward Avenue	1020	286.4	302.3	0.1	1
	2260	3.0	21.1	0.1	21
Kamakee Street	1030	6.9	23.0	0.1	18
	2330	1.6	13.3	0.1	20
Pensacola Street	1040	13.5	26.2	0.1	13
	2380	1.1	10.7	0.1	20
Piikoi Street	1050	5.6	13.6	0.1	15
Total		670.9	833.1	1.1	5

No Action Alternative AM
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Arterial Level of Service: WB Kapiolani Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1050	944.1	995.4	0.4	4
	2380	28.0	37.6	0.1	6
Pensacola Street	1040	46.2	55.1	0.1	4
	2330	43.2	56.2	0.1	6
Kamakee Street	1030	49.5	60.4	0.1	4
	2260	81.3	97.8	0.1	4
Ward Avenue	1020	98.9	115.7	0.1	4
	2160	4.6	21.5	0.1	19
Cooke Street	2119	13.7	30.0	0.1	14
South Street	1012	14.8	48.3	0.2	17
Total		1324.2	1518.0	1.3	6

Arterial Level of Service: NB Ward Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1100	73.1	86.6	0.1	4
	2230	1.9	11.4	0.1	19
Auahi Street	1150	8.4	16.7	0.1	12
	2220	2.1	8.4	0.0	19
Halekauwila Street	1160	15.7	20.9	0.0	6
	2210	1.1	7.7	0.0	21
Queen Street	1170	8.1	14.3	0.0	12
Waimanu Street	2200	56.4	70.5	0.1	5
Kapiolani Boulevard	1020	36.1	42.6	0.0	4
Total		202.9	279.1	0.5	7

Arterial Level of Service: SB Ward Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	1020	6628.5	6644.3	0.1	2
Waimanu Street	2200	10.2	17.9	0.0	10
Queen Street	1170	79.7	93.3	0.1	4
	2210	29.7	36.5	0.0	5
Halekauwila Street	1160	36.6	43.1	0.0	4
	2220	5.8	11.0	0.0	12
Auahi Street	1150	18.3	24.1	0.0	7
	2230	38.3	47.5	0.1	4
Ala Moana Boulevard	1100	89.1	96.9	0.1	2
Total		6936.2	7014.5	0.5	3

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Arterial Level of Service: NB Kamakee Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1120	798.3	810.8	0.1	0
	2320	46.5	51.7	0.0	2
Auahi Street	1230	43.9	50.0	0.0	3
	2310	4.8	16.1	0.1	18
Queen Street	1220	7.6	11.6	0.0	10
Waimanu Street	2300	6.2	19.9	0.1	16
	49	1.7	6.6	0.0	18
Kapiolani Boulevard	1030	153.8	162.0	0.1	1
Total		1062.6	1128.7	0.5	2

Arterial Level of Service: SB Kamakee Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	49	0.4	9.2	0.1	21
Waimanu Street	2300	5.8	10.6	0.0	12
Queen Street	1220	17.3	30.8	0.1	11
	2310	5.5	10.2	0.0	12
Auahi Street	1230	56.7	67.5	0.1	4
	2320	104.0	111.3	0.0	2
Ala Moana Boulevard	1120	238.9	242.3	0.0	0
Total		428.5	482.0	0.4	3

Arterial Level of Service: SB Pensacola Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	1040	3884.8	3905.1	0.1	3
Kona Street	2379	8.0	20.7	0.1	14
Waimanu Street	1210	6.9	13.3	0.0	12
	78	0.8	16.5	0.1	25
Total		3900.6	3955.7	0.4	6

Arterial Level of Service: NB Piikoi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2440	0.2	9.9	0.1	22
Hawaiki Tower	1180	5.8	14.1	0.1	15
	2430	1.0	8.2	0.0	22
Waimanu Street	1190	6.5	11.7	0.0	13
	2420	1.0	5.9	0.0	17
Kona Street	1200	5.3	9.2	0.0	11
	2410	2.5	7.2	0.0	16
Kapiolani Boulevard	1050	54.6	62.2	0.1	3
Total		77.0	128.4	0.4	10

Arterial Level of Service: SB Piikoi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2410	0.4	10.7	0.1	19
Kona Street	1200	3.9	7.5	0.0	13
	2420	0.5	4.8	0.0	21
Waimanu Street	1190	7.1	11.2	0.0	9
	2430	1.0	6.1	0.0	21
	1180	7.8	13.1	0.0	10
	2440	22.5	31.2	0.1	7
Ala Moana Boulevard	1140	99.1	107.4	0.1	2
Total		142.3	192.0	0.3	6

Arterial Level of Service: EB Ala Moana Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
South Street	1060	2482.0	2525.0	0.4	5
	2050	22.0	27.4	0.0	6
Keawe Street	1070	31.4	36.4	0.0	5
	2090	13.0	16.8	0.0	8
Coral Street	1080	20.8	24.7	0.0	6
	2110	12.9	16.4	0.0	8
Cooke Street	1090	24.0	28.0	0.0	5
	2190	68.7	80.8	0.1	5
Ward Avenue	1100	119.5	129.9	0.1	3
	2250	60.0	72.0	0.1	5
Kewalo Basin	1110	33.8	38.0	0.0	4
	2290	26.3	33.0	0.1	7
Kamakee Street	1120	18.3	24.5	0.1	9
	2370	2.8	14.6	0.1	27
Queen Street	1130	10.4	21.7	0.1	19
	2400	10.8	20.6	0.1	16
Piikoi Street	1140	12.0	24.3	0.1	17
Total		2968.4	3134.0	1.6	6

Arterial Level of Service: WB Ala Moana Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1140	3407.2	3448.0	0.4	3
	2400	104.2	117.1	0.1	4
Queen Street	1130	90.2	99.3	0.1	3
	2370	87.5	99.4	0.1	4
Kamakee Street	1120	102.8	113.9	0.1	3
	2290	36.0	43.0	0.1	5
Kewalo Basin	1110	45.0	51.7	0.1	4
	2250	21.0	25.2	0.0	6
Ward Avenue	1100	82.2	92.7	0.1	4
	2190	7.0	18.5	0.1	20
Cooke Street	1090	7.8	19.6	0.1	22
	2110	1.5	5.9	0.0	24
Coral Street	1080	2.5	6.1	0.0	20
	2090	0.8	4.7	0.0	29
Keawe Street	1070	8.6	12.5	0.0	11
	2050	1.2	6.3	0.0	28
South Street	1060	7.0	11.8	0.0	15
Total		4012.6	4175.5	1.6	5

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Arterial Level of Service: NB Cooke Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1090	203.6	217.0	0.1	2
	2150	1.7	7.4	0.0	18
Auahi Street	1330	0.6	6.8	0.0	22
	2140	0.3	7.2	0.0	24
Pohukaina Street	1320	9.0	18.2	0.1	12
	2130	4.3	11.0	0.0	16
Halekauwila Street	1310	21.9	28.6	0.0	6
	2120	17.7	24.4	0.0	7
Queen Street	1300	37.5	44.0	0.0	4
Kapiolani Boulevard	2119	123.0	145.3	0.2	4
Total		419.7	509.8	0.6	4

Arterial Level of Service: SB Cooke Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	2119	16.2	23.9	0.1	9
Queen Street	1300	57.0	80.4	0.2	7
	2120	9.9	16.8	0.0	11
Halekauwila Street	1310	27.6	34.2	0.0	5
	2130	5.2	12.0	0.0	14
Pohukaina Street	1320	14.2	20.5	0.0	8
	2140	21.7	31.3	0.1	7
Auahi Street	1330	50.6	57.6	0.0	3
	2150	118.4	124.6	0.0	1
Ala Moana Boulevard	1090	159.7	164.3	0.0	1
Total		480.4	565.6	0.6	4

Arterial Level of Service: NB Queen Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2361	7.4	21.5	0.1	14
Total		7.4	21.5	0.1	14

Arterial Level of Service: SB Queen Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1130	75.6	88.6	0.1	3
Total		75.6	88.6	0.1	3

Arterial Level of Service: WB Auahi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2360	1.5	10.1	0.1	23
Kamakee Street	1230	45.2	65.1	0.1	8
	2285	38.0	49.9	0.1	5
Ward Entertainment C	1240	18.2	22.9	0.0	5
	2280	16.0	20.4	0.0	6
Ward Warehouse	1250	23.2	28.1	0.0	4
	2240	28.6	34.9	0.0	4
Ward Avenue	1150	55.3	60.9	0.0	3
	2181	1.4	15.3	0.1	22
Cooke Street	1320	7.1	24.9	0.1	18
Total		234.6	332.3	0.7	7

Arterial Level of Service: EB Halekauwila Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	89	407.7	415.6	0.1	5
South Street	1270	18.5	22.1	0.0	4
Keawe Street	2070	8.6	22.4	0.1	15
	3002	1.6	6.8	0.0	19
Coral Street	2071	0.1	5.3	0.0	24
Cooke Street	1310	19.2	28.2	0.1	8
	2180	37.8	53.5	0.1	7
Ward Avenue	1160	116.7	133.1	0.1	3
Total		610.2	686.9	0.5	6

Arterial Level of Service: WB Halekauwila Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2180	0.1	8.2	0.1	54
Cooke Street	1310	22.4	37.5	0.1	10
Coral Street	2071	2.7	12.2	0.1	19
	3002	0.4	5.6	0.0	22
Keawe Street	2070	6.5	11.6	0.0	11
South Street	1270	11.5	24.7	0.1	14
	89	0.7	4.6	0.0	18
Total		44.3	104.4	0.5	17

Arterial Level of Service: EB Waimanu Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kamakee Street	2300	4.0	15.1	0.1	16
	2340	0.2	16.0	0.1	20
	2350	7.9	14.5	0.0	9
Pensacola Street	1210	37.3	49.7	0.1	7
	2390	1.6	9.7	0.0	19
Piikoi Street	1190	18.3	26.8	0.1	9
Total		69.3	131.8	0.4	11

Arterial Level of Service: WB Waimanu Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1190	5.3	22.0	0.1	18
Total		5.3	22.0	0.1	18

Arterial Level of Service: EB Kona Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Pensacola Street	2379	13.6	21.0	0.1	10
Piikoi Street	1200	50.9	67.6	0.1	6
Total		64.6	88.5	0.2	7

Arterial Level of Service: WB Kona Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1200	52.7	65.2	0.1	5
Pensacola Street	2379	27.1	45.1	0.1	9
Total		79.8	110.3	0.2	7

Arterial Level of Service: WB Pohukaina Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2181	1.4	15.3	0.1	22
Total		1.4	15.3	0.1	22

Traffic Simulation Output

No Action Alternative PM Peak Hour Conditions

Arterial Level of Service: NB South Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1060	398.3	409.7	0.1	2
	2040	1.8	15.2	0.1	20
Pohukaina Street	1260	16.2	29.8	0.1	11
	2030	1.3	7.5	0.0	21
Halekauwila Street	1270	14.3	21.3	0.1	8
	2020	2.0	9.5	0.1	19
Queen Street	1280	16.0	25.6	0.1	10
	2010	7.6	17.1	0.1	13
Kapiolani Boulevard	1012	51.7	61.6	0.1	4
King Street	1011	7.2	12.6	0.0	12
Total		516.3	609.9	0.7	6

Arterial Level of Service: SB South Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2040	0.0	0.0	0.1	
Ala Moana Boulevard	1060	724.1	739.9	0.1	0
Total		724.1	739.9	0.2	1

Arterial Level of Service: EB Kapiolani Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
South Street	1012	15.4	36.2	0.1	9
Cooke Street	2119	176.5	208.4	0.2	4
	2160	164.0	181.0	0.1	2
Ward Avenue	1020	193.1	209.1	0.1	2
	2260	35.6	53.7	0.1	8
Kamakee Street	1030	55.9	72.2	0.1	6
	2330	30.5	42.2	0.1	6
Pensacola Street	1040	60.4	73.2	0.1	5
	2380	1.7	11.0	0.1	19
Piikoi Street	1050	12.7	21.1	0.1	10
Total		746.0	908.1	1.1	4

No Action Alternative PM
Simulation #1
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2/8/2008

Arterial Level of Service: WB Kapiolani Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1050	507.0	547.3	0.3	2
	2380	87.6	97.4	0.1	2
Pensacola Street	1040	79.5	88.1	0.1	2
	2330	53.1	66.3	0.1	5
Kamakee Street	1030	22.6	33.6	0.1	8
	2260	43.2	59.7	0.1	7
Ward Avenue	1020	41.5	58.3	0.1	7
	2160	2.9	19.9	0.1	20
Cooke Street	2119	12.9	29.2	0.1	14
South Street	1012	42.7	75.9	0.2	11
Total		892.9	1075.5	1.3	5

Arterial Level of Service: NB Ward Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1100	63.0	76.7	0.1	5
	2230	1.8	8.9	0.0	17
Auahi Street	1150	15.5	22.9	0.0	8
	2220	13.6	23.4	0.1	11
Halekauwila Street	1160	28.2	33.4	0.0	4
	2210	22.7	29.2	0.0	6
Queen Street	1170	41.2	47.4	0.0	4
Waimanu Street	2200	74.6	88.7	0.1	4
Kapiolani Boulevard	1020	41.0	47.6	0.0	4
Total		301.5	378.1	0.5	5

Arterial Level of Service: SB Ward Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	1020	4139.7	4155.4	0.1	2
Waimanu Street	2200	3.2	11.0	0.0	16
Queen Street	1170	23.8	37.3	0.1	9
	2210	9.6	16.4	0.0	11
Halekauwila Street	1160	24.3	30.8	0.0	5
	2220	1.4	6.6	0.0	20
Auahi Street	1150	5.8	15.0	0.1	17
	2230	7.9	16.1	0.0	11
Ala Moana Boulevard	1100	43.8	49.6	0.0	3
Total		4259.5	4338.3	0.6	5

Arterial Level of Service: NB Kamakee Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1120	3682.4	3693.5	0.1	0
	2320	16.2	21.1	0.0	5
Auahi Street	1230	18.6	24.2	0.0	6
	2310	12.1	22.8	0.1	12
Queen Street	1220	16.6	21.1	0.0	6
Waimanu Street	2300	31.0	43.5	0.1	8
	49	11.1	16.1	0.0	8
Kapiolani Boulevard	1030	77.0	85.0	0.1	2
Total		3865.1	3927.2	0.4	1

Arterial Level of Service: SB Kamakee Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	49	5.0	14.0	0.1	14
Waimanu Street	2300	86.3	91.0	0.0	1
Queen Street	1220	98.0	110.6	0.1	3
	2310	28.2	33.3	0.0	4
Auahi Street	1230	261.4	271.8	0.1	1
	2320	107.9	114.2	0.0	1
Ala Moana Boulevard	1120	72.9	76.9	0.0	2
Total		659.7	711.8	0.4	2

Arterial Level of Service: SB Pensacola Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	1040	2828.2	2848.7	0.1	2
Kona Street	2379	39.8	52.6	0.1	6
Waimanu Street	1210	18.6	25.0	0.0	6
	78	1.5	17.4	0.1	23
Total		2888.2	2943.7	0.4	4

No Action Alternative PM
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Arterial Level of Service: NB Piikoi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2440	25.4	34.7	0.1	6
Hawaiki Tower	1180	80.1	88.4	0.1	2
	2430	60.4	67.7	0.0	3
Waimanu Street	1190	65.5	69.9	0.0	2
	2420	1.5	5.3	0.0	14
Kona Street	1200	16.7	20.7	0.0	5
	2410	10.4	15.2	0.0	8
Kapiolani Boulevard	1050	33.3	40.9	0.1	5
Total		293.3	342.8	0.3	4

Arterial Level of Service: SB Piikoi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2410	0.3	9.9	0.1	21
Kona Street	1200	27.2	31.5	0.0	4
	2420	13.7	17.9	0.0	7
Waimanu Street	1190	92.1	95.2	0.0	1
	2430	1.6	6.3	0.0	18
	1180	6.1	12.2	0.0	13
	2440	13.5	22.3	0.1	10
Ala Moana Boulevard	1140	88.1	96.5	0.1	2
Total		242.6	291.8	0.3	4

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Arterial Level of Service: EB Ala Moana Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
South Street	1060	2818.2	2855.8	0.4	5
	2050	19.6	25.2	0.1	7
Keawe Street	1070	30.6	35.4	0.0	5
	2090	11.8	16.3	0.0	10
Coral Street	1080	20.9	25.4	0.0	6
	2110	10.9	14.5	0.0	9
Cooke Street	1090	32.2	36.3	0.0	4
	2190	88.0	100.1	0.1	4
Ward Avenue	1100	102.2	112.7	0.1	3
	2250	22.9	34.8	0.1	11
Kewalo Basin	1110	16.3	20.5	0.0	7
	2290	22.8	29.6	0.1	8
Kamakee Street	1120	20.2	26.4	0.1	9
	2370	4.7	16.6	0.1	24
Queen Street	1130	2.6	13.9	0.1	29
	2400	2.3	12.1	0.1	27
Piikoi Street	1140	31.0	43.3	0.1	10
Total		3257.3	3418.7	1.5	7

Arterial Level of Service: WB Ala Moana Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1140	2636.2	2673.0	0.4	3
	2400	83.5	96.5	0.1	4
Queen Street	1130	87.5	96.6	0.1	3
	2370	87.3	99.2	0.1	4
Kamakee Street	1120	119.2	130.4	0.1	3
	2290	52.3	59.4	0.1	4
Kewalo Basin	1110	75.0	81.7	0.1	3
	2250	32.5	36.8	0.0	4
Ward Avenue	1100	130.4	140.9	0.1	3
	2190	6.7	18.2	0.1	21
Cooke Street	1090	11.0	22.9	0.1	18
	2110	2.0	6.4	0.0	22
Coral Street	1080	3.8	7.4	0.0	17
	2090	3.1	7.1	0.0	19
Keawe Street	1070	11.4	15.3	0.0	9
	2050	3.2	8.0	0.0	21
South Street	1060	19.8	24.8	0.1	7
Total		3365.0	3524.5	1.5	4

No Action Alternative PM
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Kakaako Mauka SEIS
2/8/2008

Arterial Level of Service: NB Cooke Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1090	73.5	86.7	0.1	4
	2150	1.3	7.5	0.0	18
Auahi Street	1330	0.8	7.0	0.0	22
	2140	0.4	7.5	0.0	23
Pohukaina Street	1320	7.0	16.1	0.1	14
	2130	2.2	9.0	0.0	19
Halekauwila Street	1310	14.3	21.1	0.0	8
	2120	2.2	9.0	0.0	19
Queen Street	1300	16.0	22.5	0.0	8
Kapiolani Boulevard	2119	26.0	48.5	0.2	11
Total		143.7	235.0	0.6	10

Arterial Level of Service: SB Cooke Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	2119	11.0	18.8	0.1	12
Queen Street	1300	10.8	34.0	0.2	16
	2120	1.4	8.2	0.0	22
Halekauwila Street	1310	20.7	27.3	0.0	6
	2130	2.1	8.8	0.0	19
Pohukaina Street	1320	9.2	15.5	0.0	11
	2140	63.7	73.2	0.1	3
Auahi Street	1330	55.0	62.0	0.0	3
	2150	68.6	74.8	0.0	2
Ala Moana Boulevard	1090	85.0	89.5	0.0	2
Total		327.4	412.2	0.6	5

Arterial Level of Service: NB Queen Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2361	7.0	21.0	0.1	14
Total		7.0	21.0	0.1	14

Arterial Level of Service: SB Queen Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1130	0.0	0.0	0.1	
Total		0.0	0.0	0.1	

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SimTraffic Report

Arterial Level of Service: WB Auahi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2360	8.3	16.9	0.1	14
Kamakee Street	1230	52.6	72.0	0.1	7
	2285	35.2	46.8	0.1	6
Ward Entertainment C	1240	21.0	25.5	0.0	4
	2280	20.0	24.6	0.0	5
Ward Warehouse	1250	26.9	32.3	0.0	4
	2240	13.7	19.9	0.0	7
Ward Avenue	1150	34.7	40.4	0.0	4
	2181	1.3	17.1	0.1	22
Cooke Street	1320	7.3	23.5	0.1	17
Total		221.2	318.9	0.7	8

Arterial Level of Service: EB Halekauwila Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	89	2942.6	2950.5	0.1	4
South Street	1270	25.3	28.9	0.0	3
Keawe Street	2070	15.1	28.9	0.1	12
	3002	10.9	16.1	0.0	8
Coral Street	2071	22.2	27.4	0.0	5
Cooke Street	1310	59.3	68.3	0.1	3
	2180	84.1	100.4	0.1	4
Ward Avenue	1160	180.7	197.0	0.1	2
Total		3340.3	3417.4	0.5	4

Arterial Level of Service: WB Halekauwila Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2180	2.3	21.2	0.1	20
Cooke Street	1310	56.2	71.4	0.1	6
Coral Street	2071	2.2	11.8	0.1	20
	3002	0.4	5.6	0.0	22
Keawe Street	2070	6.3	11.4	0.0	11
South Street	1270	7.3	20.4	0.1	17
	89	0.7	5.0	0.0	16
Total		75.3	146.9	0.5	12

Arterial Level of Service: EB Waimanu Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kamakee Street	2300	262.1	273.1	0.1	1
	2350	0.0	0.0	0.0	
Pensacola Street	1210	26.7	37.9	0.1	9
	2390	20.4	28.6	0.0	6
Piikoi Street	1190	5.5	14.1	0.1	16
Total		314.7	353.6	0.3	5

Arterial Level of Service: WB Waimanu Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1190	595.3	612.2	0.1	1
Kamakee Street	2300	0.0	0.0	0.1	
Total		595.3	612.2	0.2	2

Arterial Level of Service: EB Kona Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Pensacola Street	2379	308.9	316.5	0.1	2
Piikoi Street	1200	233.3	250.6	0.1	2
Total		542.2	567.1	0.2	2

Arterial Level of Service: WB Kona Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1200	140.4	152.7	0.1	7
Pensacola Street	2379	206.9	224.3	0.1	2
Total		347.2	376.9	0.2	3

Traffic Simulation Output

Preferred Alternative AM Peak Hour Conditions

Arterial Level of Service: NB South Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1060	58.0	70.1	0.1	4
	2040	1.5	15.6	0.1	20
Pohukaina Street	1260	15.1	28.2	0.1	12
	2030	2.0	8.7	0.0	18
Halekauwila Street	1270	13.7	20.7	0.1	9
	2020	1.6	9.2	0.1	20
Queen Street	1280	20.9	30.9	0.1	8
	2010	3.3	12.6	0.1	17
Kapiolani Boulevard	1012	63.2	72.9	0.1	3
King Street	1011	12.7	18.2	0.0	8
Total		192.0	287.1	0.7	8

Arterial Level of Service: SB South Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2040	0.6	15.5	0.1	21
Ala Moana Boulevard	1060	54.2	66.1	0.1	5
Total		54.8	81.7	0.2	8

Arterial Level of Service: EB Kapiolani Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
South Street	1012	7.4	28.2	0.1	11
Cooke Street	2119	135.1	167.4	0.2	5
	2160	104.6	121.6	0.1	3
Ward Avenue	1020	252.2	267.9	0.1	2
	2260	3.0	20.9	0.1	21
Kamakee Street	1030	8.1	24.1	0.1	17
	2330	1.7	13.3	0.1	20
Pensacola Street	1040	16.1	29.1	0.1	11
	2380	1.1	10.2	0.1	21
Piikoi Street	1050	11.2	19.1	0.1	11
Total		540.4	701.7	1.1	5

Arterial Level of Service: WB Kapiolani Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1050	1536.9	1589.1	0.4	3
	2380	28.6	37.7	0.1	6
Pensacola Street	1040	52.6	61.3	0.1	4
	2330	50.4	63.7	0.1	5
Kamakee Street	1030	49.5	60.5	0.1	4
	2260	88.5	105.0	0.1	4
Ward Avenue	1020	103.1	119.9	0.1	4
	2160	4.9	21.9	0.1	18
Cooke Street	2119	11.6	27.9	0.1	15
South Street	1012	35.2	68.9	0.2	12
Total		1961.2	2155.9	1.3	5

Arterial Level of Service: NB Ward Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1100	67.0	79.9	0.1	4
	2230	1.9	9.5	0.0	18
Auahi Street	1150	13.3	19.6	0.0	9
	2220	0.9	11.3	0.1	22
Halekauwila Street	1160	5.1	10.8	0.0	13
	2210	3.8	9.9	0.0	15
Queen Street	1170	17.3	24.1	0.0	7
Waimanu Street	2200	6.1	19.5	0.1	17
Kapiolani Boulevard	1020	32.0	38.5	0.0	5
Total		147.3	223.2	0.5	9

Arterial Level of Service: SB Ward Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	1020	3367.9	3383.6	0.1	3
Waimanu Street	2200	5.3	13.1	0.0	13
Queen Street	1170	40.7	53.9	0.1	6
	2210	2.5	9.7	0.0	18
Halekauwila Street	1160	6.3	12.3	0.0	12
	2220	1.3	7.0	0.0	20
Auahi Street	1150	9.0	19.0	0.1	13
	2230	4.4	11.5	0.0	15
Ala Moana Boulevard	1100	104.3	112.0	0.1	2
Total		3541.7	3622.1	0.6	5

Arterial Level of Service: NB Kamakee Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1120	192.3	205.1	0.1	2
	2320	1.4	6.6	0.0	17
Auahi Street	1230	12.0	17.4	0.0	8
	2310	2.0	14.0	0.1	20
Queen Street	1220	10.8	15.5	0.0	8
Waimanu Street	2300	6.7	19.9	0.1	17
	49	2.1	7.0	0.0	17
Kapiolani Boulevard	1030	70.1	78.0	0.1	2
Total		297.3	363.5	0.5	4

Arterial Level of Service: SB Kamakee Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	49	0.4	9.2	0.1	21
Waimanu Street	2300	5.4	10.2	0.0	12
Queen Street	1220	13.6	26.7	0.1	12
	2310	2.2	7.4	0.0	16
Auahi Street	1230	22.7	33.7	0.1	8
	2320	36.7	44.3	0.0	4
Ala Moana Boulevard	1120	104.5	108.1	0.0	1
Total		185.5	239.6	0.4	6

Arterial Level of Service: NB Pensacola Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Waimanu Street	1210	9.0	17.5	0.1	12
Kona Street	2379	0.5	8.3	0.0	18
Kapiolani Boulevard	1040	56.6	68.0	0.1	4
Total		66.0	93.8	0.2	7

Arterial Level of Service: SB Pensacola Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	1040	2060.9	2081.1	0.1	4
Kona Street	2379	3.1	15.8	0.1	19
Waimanu Street	1210	10.4	16.1	0.0	10
Total		2074.4	2113.0	0.3	6

Preferred Alternative AM
Simulation #1
Kakaako Mauka SEIS
2/10/2008

Arterial Level of Service: NB Piikoi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2440	0.2	10.0	0.1	21
Hawaiki Tower	1180	10.8	19.1	0.1	11
	2430	2.0	9.3	0.0	19
Waimanu Street	1190	5.3	10.4	0.0	14
	2420	2.7	7.6	0.0	13
Kona Street	1200	7.6	11.5	0.0	9
	2410	5.0	10.6	0.0	13
Kapiolani Boulevard	1050	38.8	45.4	0.1	4
Total		72.4	124.1	0.4	10

Arterial Level of Service: SB Piikoi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	1050	670.6	688.9	0.1	2
	2410	1.0	9.1	0.1	20
Kona Street	1200	1.1	4.8	0.0	20
	2420	0.2	4.6	0.0	22
Waimanu Street	1190	2.4	6.5	0.0	16
	2430	0.7	5.9	0.0	22
	1180	8.9	14.2	0.0	10
	2440	27.4	36.1	0.1	6
Ala Moana Boulevard	1140	128.8	137.3	0.1	2
Total		841.1	907.2	0.5	4

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SimTraffic Report

Arterial Level of Service: EB Ala Moana Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
South Street	1060	1351.8	1394.8	0.4	9
	2050	7.9	13.3	0.0	13
Keawe Street	1070	15.5	20.5	0.0	9
	2090	6.5	10.3	0.0	13
Coral Street	1080	9.4	13.3	0.0	10
	2110	6.1	9.7	0.0	13
Cooke Street	1090	9.8	13.8	0.0	10
	2190	27.3	39.3	0.1	11
Ward Avenue	1100	70.4	80.9	0.1	5
	2250	8.1	19.4	0.1	20
Kewalo Basin	1110	2.8	7.6	0.0	20
	2290	2.0	8.7	0.1	26
Kamakee Street	1120	7.3	13.5	0.1	17
	2370	14.8	26.7	0.1	15
Queen Street	1130	44.7	56.0	0.1	7
	2400	29.3	39.0	0.1	8
Piikoi Street	1140	15.8	27.6	0.1	15
Total		1629.6	1794.6	1.6	10

Arterial Level of Service: WB Ala Moana Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1140	3618.5	3659.2	0.4	3
	2400	65.9	78.7	0.1	5
Queen Street	1130	66.7	75.7	0.1	4
	2370	68.1	79.9	0.1	5
Kamakee Street	1120	91.5	102.6	0.1	4
	2290	25.8	32.8	0.1	7
Kewalo Basin	1110	38.9	45.6	0.1	5
	2250	18.7	22.5	0.0	7
Ward Avenue	1100	89.8	100.8	0.1	4
	2190	6.9	18.3	0.1	21
Cooke Street	1090	6.9	18.8	0.1	22
	2110	2.4	6.8	0.0	21
Coral Street	1080	3.5	7.0	0.0	18
	2090	0.7	4.6	0.0	29
Keawe Street	1070	6.6	10.4	0.0	13
	2050	1.1	6.1	0.0	29
South Street	1060	6.3	11.1	0.0	16
Total		4118.5	4280.9	1.6	5

Preferred Alternative AM
Simulation #1
Kakaako Mauka SEIS
2/10/2008

Arterial Level of Service: NB Cooke Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1090	64.3	77.8	0.1	4
	2150	1.5	7.6	0.0	18
Auahi Street	1330	17.0	23.2	0.0	7
	2140	34.3	41.2	0.0	4
Pohukaina Street	1320	64.5	73.4	0.1	3
	2130	26.9	34.0	0.0	5
Halekauwila Street	1310	43.1	49.9	0.0	3
	2120	31.8	38.6	0.0	4
Queen Street	1300	57.5	64.6	0.0	3
Kapiolani Boulevard	2119	92.9	115.1	0.2	5
Total		433.7	525.4	0.6	4

Arterial Level of Service: SB Cooke Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	2119	75.5	83.0	0.1	5
Queen Street	1300	66.3	89.1	0.2	6
	2120	10.6	18.2	0.0	10
Halekauwila Street	1310	21.7	28.4	0.0	6
	2130	2.4	9.2	0.0	18
Pohukaina Street	1320	13.5	20.4	0.0	9
	2140	2.2	11.0	0.1	20
Auahi Street	1330	1.9	8.9	0.0	20
	2150	11.3	17.4	0.0	9
Ala Moana Boulevard	1090	85.5	90.0	0.0	2
Total		290.8	375.8	0.6	6

Arterial Level of Service: EB Queen Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
South Street	1280	413.1	423.7	0.1	3
Keawe Street	2060	110.5	126.2	0.1	3
Coral Street	1290	54.9	60.7	0.0	2
	2100	23.6	29.5	0.0	5
Cooke Street	1300	35.5	39.8	0.0	3
	2170	17.2	34.2	0.1	12
Ward Avenue	1170	94.0	110.9	0.1	4
	2270	1.8	18.1	0.1	22
Kamakee Street	1220	9.5	26.7	0.1	17
Total		760.2	869.9	0.8	5

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Arterial Level of Service: WB Queen Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kamakee Street	1220	12.3	19.4	0.0	9
Cummins St	2270	2.9	20.9	0.1	21
Ward Avenue	1170	59.0	74.4	0.1	5
	2170	6.3	24.7	0.1	18
Cooke Street	1300	57.9	74.2	0.1	6
	2100	7.4	12.6	0.0	9
Emily Street	1290	20.1	24.7	0.0	6
	2060	1.6	8.8	0.0	16
South Street	1280	32.0	46.7	0.1	9
Total		199.5	306.5	0.7	9

Arterial Level of Service: EB Auahi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ward Avenue	1150	53.8	64.4	0.1	4
	2240	1.5	8.3	0.0	17
Ward Warehouse	1250	3.0	9.0	0.0	15
	2280	0.4	5.5	0.0	27
	1240	2.5	7.9	0.0	15
	2285	0.5	5.0	0.0	23
Kamakee Street	1230	8.9	19.7	0.1	14
	29	1.1	10.4	0.1	21
	58	0.2	6.0	0.0	24
	2360	0.9	6.2	0.0	23
	59	0.3	9.1	0.1	26
Total		73.1	151.6	0.5	13

Arterial Level of Service: WB Auahi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2360	0.7	9.6	0.1	24
	58	0.2	6.1	0.0	23
	29	0.0	5.8	0.0	25
Kamakee Street	1230	13.3	21.3	0.1	10
	2285	1.8	13.2	0.1	21
Ward Entertainment C	1240	3.0	7.6	0.0	15
Cummins St	2280	0.8	5.4	0.0	23
Ward Warehouse	1250	4.3	10.2	0.0	14
	2240	8.4	14.1	0.0	10
Ward Avenue	1150	50.2	55.5	0.0	3
Total		82.7	148.9	0.5	11

Preferred Alternative AM
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2/10/2008

Arterial Level of Service: EB Halekauwila Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	89	3.8	11.9	0.1	18
South Street	1270	14.1	17.6	0.0	5
Keawe Street	2070	7.4	21.0	0.1	17
	3002	1.7	6.7	0.0	19
Coral Street	2071	0.1	5.1	0.0	24
Cooke Street	1310	36.3	45.1	0.1	5
	2180	2.1	17.6	0.1	22
Ward Avenue	1160	106.1	122.4	0.1	4
Total		171.5	247.5	0.5	8

Arterial Level of Service: WB Halekauwila Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2180	1.2	19.9	0.1	22
Cooke Street	1310	13.8	29.0	0.1	13
Coral Street	2071	3.5	13.1	0.1	18
	3002	0.1	5.3	0.0	24
Keawe Street	2070	4.9	9.9	0.0	13
South Street	1270	13.5	27.3	0.1	13
	89	1.1	5.1	0.0	16
Total		38.0	109.6	0.5	16

Arterial Level of Service: EB Waimanu Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kamakee Street	2300	3.5	14.6	0.1	16
	64	0.3	7.1	0.0	18
Pensacola Street	1210	14.1	27.3	0.1	12
	2390	1.2	8.7	0.0	21
Piikoi Street	1190	40.9	49.4	0.1	5
Total		60.0	107.1	0.3	10

Arterial Level of Service: WB Waimanu Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1190	9.9	26.5	0.1	15
	64	0.8	15.6	0.1	21
	2340	1.8	6.9	0.0	18
Kamakee Street	2300	3.4	18.2	0.1	18
Total		16.0	67.2	0.3	18

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Arterial Level of Service: EB Kona Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Pensacola Street	2379	19.0	27.1	0.1	8
Piikoi Street	1200	39.1	55.5	0.1	7
Total		58.1	82.6	0.2	7

Arterial Level of Service: WB Kona Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1200	52.0	64.5	0.1	5
Pensacola Street	2379	12.9	30.3	0.1	13
Total		64.8	94.8	0.2	8

Arterial Level of Service: EB Pohukaina Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	87	0.4	4.6	0.0	27
South Street	1260	14.7	21.8	0.0	8
Keawe Street	2080	8.3	22.6	0.1	16
	3003	3.3	9.8	0.0	16
Coral Street	2081	12.4	17.2	0.0	7
Cooke Street	1320	44.2	53.2	0.1	4
Total		83.4	129.1	0.3	9

Arterial Level of Service: WB Pohukaina Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cooke Street	1320	89.8	113.3	0.2	5
Coral Street	2081	3.2	12.8	0.1	18
	3003	0.1	5.0	0.0	25
Keawe Street	2080	6.0	12.6	0.0	13
South Street	1260	18.2	32.9	0.1	11
	87	0.9	8.7	0.0	20
Total		118.2	185.3	0.5	9

Traffic Simulation Output

Preferred Alternative PM Peak Hour Conditions

Arterial Level of Service: NB South Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1060	968.0	979.5	0.1	1
	2040	99.3	112.8	0.1	3
Pohukaina Street	1260	130.1	143.2	0.1	2
	2030	4.2	11.0	0.0	15
Halekauwila Street	1270	13.4	20.4	0.1	9
	2020	4.7	12.3	0.1	15
Queen Street	1280	44.0	54.0	0.1	5
	2010	5.6	14.9	0.1	15
Kapiolani Boulevard	1012	46.0	55.7	0.1	5
King Street	1011	5.7	11.2	0.0	13
Total		1321.0	1415.0	0.7	3

Arterial Level of Service: SB South Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2040	0.1	6.3	0.1	54
Ala Moana Boulevard	1060	98.6	110.9	0.1	3
Total		98.7	117.2	0.2	6

Arterial Level of Service: EB Kapiolani Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
South Street	1012	16.3	37.2	0.1	8
Cooke Street	2119	21.4	53.7	0.2	15
	2160	59.5	76.6	0.1	5
Ward Avenue	1020	185.1	201.0	0.1	2
	2260	3.3	21.5	0.1	20
Kamakee Street	1030	13.6	29.8	0.1	14
	2330	3.2	14.9	0.1	18
Pensacola Street	1040	31.4	44.5	0.1	7
	2380	2.0	10.8	0.1	19
Piikoi Street	1050	10.5	18.7	0.1	12
Total		346.3	508.6	1.1	8

Arterial Level of Service: WB Kapiolani Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1050	843.9	885.0	0.3	2
	2380	92.9	102.2	0.1	2
Pensacola Street	1040	107.4	115.8	0.1	2
	2330	61.2	74.6	0.1	4
Kamakee Street	1030	42.0	53.0	0.1	5
	2260	105.3	122.0	0.1	3
Ward Avenue	1020	42.1	59.0	0.1	7
	2160	2.3	19.4	0.1	21
Cooke Street	2119	11.5	27.9	0.1	15
South Street	1012	36.7	70.3	0.2	12
Total		1345.2	1529.2	1.3	4

Arterial Level of Service: NB Ward Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1100	100.4	113.9	0.1	3
	2230	12.7	20.5	0.0	9
Auahi Street	1150	51.0	57.2	0.0	3
	2220	25.9	36.6	0.1	7
Halekauwila Street	1160	27.8	33.0	0.0	4
	2210	15.0	21.6	0.0	7
Queen Street	1170	35.0	41.8	0.0	4
Waimanu Street	2200	54.5	67.9	0.1	5
Kapiolani Boulevard	1020	34.8	41.4	0.0	4
Total		357.1	433.8	0.5	4

Arterial Level of Service: SB Ward Avenue

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	1020	3199.5	3215.3	0.1	3
Waimanu Street	2200	6.0	13.8	0.0	13
Queen Street	1170	56.7	69.8	0.1	5
	2210	2.6	9.8	0.0	18
Halekauwila Street	1160	12.8	19.3	0.0	8
	2220	0.8	6.0	0.0	22
Auahi Street	1150	35.0	45.1	0.1	6
	2230	12.4	20.3	0.1	9
Ala Moana Boulevard	1100	81.8	87.5	0.0	2
Total		3407.5	3486.7	0.6	5

Arterial Level of Service: NB Kamakee Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1120	45.9	58.0	0.1	5
	2320	1.2	6.3	0.0	16
Auahi Street	1230	16.7	21.8	0.0	6
	2310	1.6	13.3	0.1	21
Queen Street	1220	12.6	17.7	0.0	7
Waimanu Street	2300	7.2	20.7	0.1	16
	49	1.7	6.7	0.0	18
Kapiolani Boulevard	1030	66.7	74.7	0.1	3
Total		153.5	219.1	0.4	7

Arterial Level of Service: SB Kamakee Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	49	0.3	9.4	0.1	21
Waimanu Street	2300	5.1	9.9	0.0	12
Queen Street	1220	63.3	76.4	0.1	4
	2310	56.8	62.3	0.0	2
Auahi Street	1230	242.1	252.8	0.1	1
	2320	46.6	52.8	0.0	3
Ala Moana Boulevard	1120	54.4	58.5	0.0	2
Total		468.6	522.2	0.4	3

Arterial Level of Service: NB Pensacola Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Waimanu Street	1210	10.3	18.9	0.1	11
Kona Street	2379	2.1	9.8	0.0	16
Kapiolani Boulevard	1040	74.6	85.8	0.1	3
Total		87.0	114.5	0.2	6

Arterial Level of Service: SB Pensacola Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	1040	1099.8	1120.4	0.1	4
Kona Street	2379	10.8	23.6	0.1	13
Waimanu Street	1210	23.6	29.3	0.0	5
Total		1134.2	1173.2	0.3	5

Preferred Alternative PM
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Arterial Level of Service: NB Piikoi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2440	17.5	27.2	0.1	8
Hawaiki Tower	1180	71.7	80.1	0.1	3
	2430	11.0	18.3	0.0	10
Waimanu Street	1190	17.1	21.5	0.0	6
	2420	1.7	6.6	0.0	15
Kona Street	1200	8.5	12.5	0.0	8
	2410	1.9	6.8	0.0	17
Kapiolani Boulevard	1050	22.0	29.2	0.1	7
Total		151.4	202.2	0.3	6

Arterial Level of Service: SB Piikoi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	1050	21.8	40.3	0.1	12
	2410	1.9	10.4	0.1	19
Kona Street	1200	5.4	9.8	0.0	12
	2420	5.3	9.6	0.0	11
Waimanu Street	1190	15.1	18.6	0.0	5
	2430	3.6	8.3	0.0	14
	1180	17.2	23.2	0.0	7
	2440	21.6	30.4	0.1	7
Ala Moana Boulevard	1140	82.4	90.9	0.1	2
Total		174.3	241.6	0.5	7

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SimTraffic Report

Arterial Level of Service: EB Ala Moana Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
South Street	1060	1803.1	1840.4	0.4	6
	2050	16.1	21.7	0.1	9
Keawe Street	1070	17.8	22.7	0.0	7
	2090	5.3	9.7	0.0	16
Coral Street	1080	9.5	14.0	0.0	11
	2110	7.6	11.2	0.0	11
Cooke Street	1090	21.5	25.5	0.0	5
	2190	50.0	62.0	0.1	7
Ward Avenue	1100	55.9	66.4	0.1	6
	2250	8.0	19.8	0.1	20
Kewalo Basin	1110	3.5	7.7	0.0	20
	2290	3.4	10.2	0.1	23
Kamakee Street	1120	12.2	18.3	0.1	13
	2370	3.3	15.1	0.1	26
Queen Street	1130	2.0	13.3	0.1	30
	2400	2.0	11.7	0.1	28
Piikoi Street	1140	35.1	46.9	0.1	9
Total		2056.4	2216.5	1.5	9

Arterial Level of Service: WB Ala Moana Boulevard

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1140	1054.2	1091.3	0.4	3
	2400	21.7	34.4	0.1	12
Queen Street	1130	52.1	61.2	0.1	5
	2370	74.0	85.8	0.1	5
Kamakee Street	1120	118.3	129.3	0.1	3
	2290	27.7	34.7	0.1	7
Kewalo Basin	1110	63.3	70.1	0.1	3
	2250	28.9	33.1	0.0	5
Ward Avenue	1100	120.3	130.8	0.1	3
	2190	6.6	18.1	0.1	21
Cooke Street	1090	20.1	31.9	0.1	13
	2110	4.5	8.8	0.0	16
Coral Street	1080	8.8	12.3	0.0	10
	2090	7.1	11.0	0.0	12
Keawe Street	1070	21.6	25.4	0.0	5
	2050	7.4	12.3	0.0	14
South Street	1060	26.0	31.0	0.1	6
Total		1662.5	1821.4	1.5	5

Arterial Level of Service: NB Cooke Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ala Moana Boulevard	1090	59.4	72.4	0.1	5
	2150	1.0	7.1	0.0	19
Auahi Street	1330	0.5	6.7	0.0	23
	2140	0.3	7.4	0.0	24
Pohukaina Street	1320	8.9	17.7	0.1	12
	2130	2.0	9.0	0.0	19
Halekauwila Street	1310	13.6	20.3	0.0	8
	2120	23.2	30.1	0.0	6
Queen Street	1300	68.6	75.7	0.0	2
Kapiolani Boulevard	2119	18.1	40.1	0.2	14
Total		195.8	286.6	0.6	8

Arterial Level of Service: SB Cooke Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kapiolani Boulevard	2119	14.0	21.8	0.1	10
Queen Street	1300	238.6	261.7	0.2	2
	2120	91.6	99.2	0.0	2
Halekauwila Street	1310	151.8	158.5	0.0	1
	2130	114.0	120.8	0.0	1
Pohukaina Street	1320	154.1	161.1	0.0	1
	2140	135.8	144.9	0.1	2
Auahi Street	1330	100.4	107.3	0.0	2
	2150	102.6	108.9	0.0	1
Ala Moana Boulevard	1090	95.6	100.0	0.0	1
Total		1198.3	1284.3	0.6	2

Arterial Level of Service: EB Queen Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
South Street	1280	2562.8	2573.6	0.1	2
Keawe Street	2060	128.0	143.8	0.1	3
Coral Street	1290	54.4	60.2	0.0	2
	2100	19.0	25.0	0.0	6
Cooke Street	1300	27.3	31.6	0.0	4
	2170	88.2	105.4	0.1	4
Ward Avenue	1170	165.0	182.6	0.1	2
	2270	34.2	51.2	0.1	8
Kamakee Street	1220	181.9	199.8	0.1	2
Total		3260.8	3373.3	0.8	3

Arterial Level of Service: WB Queen Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Kamakee Street	1220	3232.0	3238.6	0.0	7
	2270	26.0	44.3	0.1	10
Ward Avenue	1170	138.6	153.7	0.1	3
	2170	32.5	51.0	0.1	9
Cooke Street	1300	69.8	86.1	0.1	5
	2100	7.8	13.0	0.0	9
Emily Street	1290	20.9	25.5	0.0	6
	2060	2.0	8.9	0.0	16
South Street	1280	32.9	47.6	0.1	8
Total		3562.4	3668.6	0.7	6

Arterial Level of Service: EB Auahi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Ward Avenue	1150	55.8	65.7	0.1	5
	2240	1.6	8.7	0.0	17
Ward Warehouse	1250	9.4	15.2	0.0	9
	2280	5.3	10.7	0.0	14
	1240	16.0	21.1	0.0	6
	2285	16.5	21.0	0.0	5
Kamakee Street	1230	25.4	35.7	0.1	8
	29	1.3	11.1	0.1	20
	58	0.3	6.2	0.0	23
	2360	0.7	6.1	0.0	23
	59	0.5	9.5	0.1	25
Total		132.8	211.1	0.5	10

Arterial Level of Service: WB Auahi Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2360	0.4	9.4	0.1	25
	58	0.2	6.2	0.0	23
	29	0.1	5.9	0.0	25
Kamakee Street	1230	22.6	31.0	0.1	7
	2285	3.8	15.2	0.1	18
Ward Entertainment C	1240	10.5	15.1	0.0	7
Cummins Street	2280	12.0	16.6	0.0	7
Ward Warehouse	1250	25.4	31.3	0.0	5
	2240	11.1	16.5	0.0	8
Ward Avenue	1150	34.6	40.2	0.0	4
Total		120.7	187.4	0.5	9

Preferred Alternative PM
Simulation #1
Kakaako Mauka SEIS
2/10/2008

Arterial Level of Service: EB Halekauwila Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	89	2151.2	2159.1	0.1	2
South Street	1270	44.7	48.2	0.0	2
Keawe Street	2070	197.6	211.2	0.1	2
	3002	63.4	68.5	0.0	2
Coral Street	2071	102.0	107.1	0.0	1
Cooke Street	1310	148.1	157.0	0.1	1
	2180	5.8	21.7	0.1	18
Ward Avenue	1160	36.3	53.6	0.1	8
Total		2749.1	2826.3	0.5	3

Arterial Level of Service: WB Halekauwila Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	2180	0.1	8.7	0.1	51
Cooke Street	1310	197.6	212.6	0.1	2
Coral Street	2071	2.0	11.6	0.1	20
	3002	0.1	5.4	0.0	23
Keawe Street	2070	5.2	10.3	0.0	12
South Street	1270	9.3	23.0	0.1	15
	89	0.8	5.3	0.0	15
Total		215.1	277.0	0.5	6

Arterial Level of Service: EB Waimanu Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	64	21.9	28.5	0.0	4
Pensacola Street	1210	164.4	177.9	0.1	2
	2390	31.4	38.8	0.0	5
Piikoi Street	1190	14.1	22.6	0.1	10
Total		231.8	267.8	0.2	3

Arterial Level of Service: WB Waimanu Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1190	9592.7	9609.3	0.1	1
	64	0.0	0.0	0.1	
	2340	2.2	7.3	0.0	17
Kamakee Street	2300	4.1	18.8	0.1	17
Total		9599.0	9635.3	0.3	2

DMJM Harris
SimTraffic Report

Arterial Level of Service: EB Kona Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Pensacola Street	2379	1759.9	1767.1	0.1	2
Piikoi Street	1200	40.8	57.1	0.1	7
Total		1800.6	1824.3	0.2	4

Arterial Level of Service: WB Kona Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Piikoi Street	1200	34.3	46.7	0.1	7
Pensacola Street	2379	35.6	53.2	0.1	8
Total		69.9	99.9	0.2	7

Arterial Level of Service: EB Pohukaina Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	87	5840.5	5844.9	0.0	0
South Street	1260	465.9	473.0	0.0	0
Keawe Street	2080	747.2	759.7	0.1	0
	3003	144.3	150.8	0.0	1
Coral Street	2081	125.6	130.4	0.0	1
Cooke Street	1320	170.6	179.4	0.1	1
Total		7494.2	7538.3	0.3	1

Arterial Level of Service: WB Pohukaina Street

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Cooke Street	1320	2060.6	2083.1	0.2	1
Coral Street	2081	2.0	11.6	0.1	19
	3003	1.7	6.5	0.0	19
Keawe Street	2080	19.0	25.6	0.0	6
South Street	1260	78.0	91.3	0.1	4
	87	1.2	9.1	0.0	19
Total		2162.5	2227.2	0.5	2

Appendix F

Transit Analysis

Existing Conditions

Screenline	Ridership Demand		Capacity		Capacity Utilization	
	AM	PM	AM	PM	AM	PM
West	4,635	4,645	10,500	10,590	44%	44%
East	2,943	2,915	6,720	6,300	44%	46%
North	351	440	480	660	73%	67%
Total	**7,929**	**8,001**	**17,700**	**17,550**	**45%**	**46%**

Cumulative - No Action Alternative

Screenline	Ridership Demand		Capacity		Capacity Utilization	
	AM	PM	AM	PM	AM	PM
West	9,732	9,954	15,680	16,490	62%	60%
East	5,771	6,194	13,850	15,440	42%	40%
North	1,198	1,341	2,280	2,220	53%	60%
Total	**16,701**	**17,489**	**31,810**	**34,150**	**53%**	**51%**

Cumulative - Preferred Alternative

Screenline	Ridership Demand		Capacity		Capacity Utilization	
	AM	PM	AM	PM	AM	PM
West	9,677	9,873	15,680	16,490	62%	60%
East	5,713	6,108	13,850	15,440	41%	40%
North	1,195	1,338	2,280	2,220	52%	60%
Total	**16,585**	**17,319**	**31,810**	**34,150**	**52%**	**51%**

AM Peak Period - Inbound Ridership

Screenline / Route	Existing (2007)							Cumulative (2030)					
	2004 Daily Boardings		Growth Factor	2007 Daily Inbound Boardings	Adjustment Factors		MLP Ridership	Growth Factor	MLP Ridership (Base)	Service Status After Fixed Guideway	Fixed Guideway Switch		MLP Ridership (with Fixed Guideway)
	Both Dir.	Inbound			Peak Hour	MLP					Factor	Passengers	
West Screenline													
1/1L	24,985	12,493	1.07	13,367	0.10	0.35	468	1.53	716				716
2	13,785	6,893	1.07	7,375	0.10	0.50	369	1.53	564				564
3	13,785	6,893	1.07	7,375	0.25	0.25	461	1.53	705				705
6	5,459	2,730	1.07	2,921	0.25	0.25	183	1.53	279				279
9	6,698	3,349	1.07	3,583	0.25	0.25	224	1.53	343	Modified	0.90	-308	0
13	13,785	6,893	1.07	7,375	0.10	0.50	369	1.53	564				564
19	3,638	1,819	1.07	1,946	0.15	0.20	58	1.53	89	Modified	0.90	-80	0
20	3,638	1,819	1.07	1,946	0.15	0.20	58	1.53	89	Discontinued	1.00	-89	0
40	8,714	4,357	1.07	4,662	0.25	0.10	117	1.53	178				178
42	9,167	4,584	1.07	4,904	0.10	0.40	196	1.53	300	Discontinued	0.75	-225	0
43	2,108	1,054	1.07	1,128	0.25	0.25	70	1.53	108	Discontinued	1.00	-108	0
52	4,038	2,019	1.07	2,160	0.15	0.10	32	1.53	50				50
53	3,123	1,562	1.07	1,671	0.25	0.25	104	1.53	160	No service	0.90	-144	0
54	3,425	1,713	1.07	1,832	0.25	0.40	183	1.53	280		0.90	-252	0
55	4,038	2,019	1.07	2,160	0.10	0.25	54	1.53	83	No service	0.05	-4	0
56	2,648	1,324	1.07	1,417	0.15	0.20	43	1.53	65	No service	0.05	-3	0
57/57A	3,132	1,566	1.07	1,676	0.15	0.80	201	1.53	308	No service	0.05	-15	0
62	4,038	2,019	1.07	2,160	0.15	0.10	32	1.53	50	No service	0.90	-45	0
65	4,038	2,019	1.07	2,160	0.20	0.10	43	1.53	66				66
83	360	180	1.07	193	0.50	0.80	77	1.53	118	Modified	0.90	-106	0
84	393	197	1.07	210	0.50	0.80	84	1.53	129	Modified	0.90	-116	0
84A	393	197	1.07	210	0.50	0.80	84	1.53	129	Modified	0.90	-116	0
85	319	160	1.07	171	0.50	0.80	68	1.53	104				104
85A	319	160	1.07	171	0.50	0.80	68	1.53	104				104
88	134	67	1.07	72	0.45	0.80	26	1.53	39				39
89	113	57	1.07	60	0.50	0.80	24	1.53	37				37
90	147	74	1.07	79	0.50	0.80	31	1.53	48	No service	0.75	-36	0
98	214	107	1.07	114	0.50	0.80	46	1.53	70	Modified	0.90	-63	0
98A	200	100	1.07	107	0.50	0.80	43	1.53	65	No service	0.90	-59	0
201	526	263	1.07	281	0.20	0.80	45	1.53	69	No service	0.80	-55	0
202	260	130	1.07	139	0.50	0.80	56	1.53	85	No service	0.85	-72	0
A	10,931	5,466	1.07	5,848	0.10	0.50	292	1.53	447	Modified	1.00	-447	0
B	6,832	3,416	1.07	3,655	0.15	0.45	247	1.53	377	No service	0.65	-245	0
C	4,422	2,211	1.07	2,366	0.15	0.50	177	1.53	271				271
E	--	--								No service			
F2	--	--											
F3	--	--											
Fixed Guideway					0.25	0.25			47,500			2,591	5,559
						Total	**4,635**					**Total**	**9,239**

Existing Ridership	**4,635**

No Action Alternative Added Ridership	493
No Action Alternative Total Ridership	**9,732**

Preferred Alternative Added Ridership	438
Preferred Alternative Total Ridership	**9,677**

AM Peak Period - Inbound Ridership

Screenline / Route	Existing (2007)							Cumulative (2030)					
	2004 Daily Boardings		Growth Factor	2007 Daily Inbound Boardings	Adjustment Factors		MLP Ridership	Growth Factor	MLP Ridership (Base)	Service Status After Fixed Guideway	Fixed Guideway Switch		MLP Ridership (with Fixed Guideway)
	Both Dir.	Inbound			Peak Hour	MLP					Factor	Passengers	
East Screenline													
1/1L	24,985	12,493	1.07	13,367	0.10	0.50	668	1.53	1,023				1,023
2	13,785	6,892	1.07	7,375	0.10	0.40	295	1.53	451				451
3	10,967	5,484	1.07	5,867	0.25	0.10	147	1.53	224				224
6	5,459	2,730	1.07	2,921	0.25	0.25	183	1.53	279				279
8	7,625	3,813	1.07	4,079	0.25	0.25	255	1.53	390	No service			
9	6,698	3,349	1.07	3,583	0.25	0.25	224	1.53	343	No service	0.80	-274	0
13	13,785	6,892	1.07	7,375	0.10	0.40	295	1.53	451				451
19	3,638	1,819	1.07	1,946	0.15	0.40	117	1.53	179	Modified	0.70	-125	0
20	3,638	1,819	1.07	1,946	0.15	0.40	117	1.53	179	No service	0.90	-161	0
23	--	--											
42	9,167	4,584	1.07	4,904	0.25	0.10	123	1.53	188	Discontinued	0.70	-131	0
80	246	123	1.07	131	0.50	0.80	53	1.53	80				80
80A/B	198	99	1.07	106	0.50	0.80	42	1.53	65	No service	0.10	-6	0
82	246	123	1.07	131	0.50	0.80	53	1.53	80	Modified	0.10	-8	80
A	10,931	5,466	1.07	5,848	0.10	0.20	117	1.53	179	Modified	1.00	-179	0
B	6,832	3,416	1.07	3,655	0.10	0.70	256	1.53	391	No service			
E	--	--								No service			
Fixed Guideway					0.25	0.15			47,500			885	2,666
						Total	**2,943**					**Total**	**5,256**

Existing Ridership	**2,943**

No Action Alternative Added Ridership	515
No Action Alternative Total Ridership	**5,771**

Preferred Alternative Added Ridership	457
Preferred Alternative Total Ridership	**5,713**

North Screenline													
15	647	324	1.07	346	0.40	1.00	138	1.53	212				212
17	1116	558	1.07	597	0.25	1.00	149	1.53	228				228
18	589	295	1.07	315	0.20	1.00	63	1.53	96				96
4	7,856	3,928	1.07	4,203	0.25	0.25		1.53	402				402
Fixed Guideway					0.25	0.02			47,500				238
						Total	**351**					**Total**	**1,176**

Existing Ridership	**351**

No Action Alternative Added Ridership	22
No Action Alternative Total Ridership	**1,198**

Preferred Alternative Added Ridership	19
Preferred Alternative Total Ridership	**1,195**

All Screenlines

Existing Ridership	**7,929**

No Action Alternative Added Ridership	1,030
No Action Alternative Total Ridership	**16,701**

Preferred Alternative Added Ridership	914
Preferred Alternative Total Ridership	**16,585**

AM Peak Period - Inbound Capacity

Screenline / Route	Existing (2007) Runs	Vehicle Capacity	MLP Capacity	Capacity Utilization	Service Status After Fixed Guideway	Cumulative (2030) Runs (5:30-9:00 Both Dir.)	Runs (7:00-9:00 Inbound)	Vehicle Capacity	MLP Capacity	Capacity Utilization
West Screenline										
1/1L	18	60	1,080	43%		76	22	60	1,320	54%
2	8	60	480	77%		42	12	60	720	78%
3	8	60	480	96%		42	12	60	720	98%
6	4	60	240	76%		21	6	60	360	78%
9	8	60	480	47%	Modified					
13	8	60	480	77%		66	19	60	1,140	49%
19	3	60	180	32%	Modified					
20	3	60	180	32%	Discontinued					
40	4	60	240	49%		40	12	90	1,080	17%
42	4	60	240	82%	Discontinued					
43	4	60	240	29%	Discontinued					
52	4	60	240	14%		16	5	90	450	11%
53	4	60	240	44%	No service					
54	5	60	300	61%						
55	4	60	240	23%	No service					
56	4	60	240	18%	No service					
57/57A	9	60	540	37%	No service					
62	4	60	240	14%	No service					
65	7	60	420	10%		18	6	60	360	18%
83	6	60	360	21%	Modified					
84	4	60	240	35%	Modified					
84A	4	60	240	35%	Modified					
85	8	60	480	14%		3	4	60	240	44%
85A	4	60	240	28%		3	4	60	240	44%
88	2	60	120	22%		2	2	60	120	33%
89	1	60	60	40%		2	2	60	120	31%
90	1	60	60	52%	No service					
201	1	60	60	75%	No service					
202	1	60	60	93%	No service					
A	8	90	720	41%	Modified					
B	8	90	720	34%	No service					
C	4	90	360	49%		29	9	90	810	34%
E					No service					
F2										
F3										
Fixed Guideway									8,000	
		Total	**10,500**					**Total**	**15,680**	

Existing Capacity	**10,500**

No Action Alternative Capacity	**15,680**

Preferred Alternative Capacity Capacity	**15,680**

AM Peak Period - Inbound Capacity

Screenline / Route	Existing (2007) Runs	Vehicle Capacity	MLP Capacity	Capacity Utilization	Service Status After Fixed Guideway	Cumulative (2030) Runs (5:30-9:00 Both Dir.)	Runs (7:00-9:00 Inbound)	Vehicle Capacity	MLP Capacity	Capacity Utilization
East Screenline										
1/1L	20	60	1,200	56%		76	22	90	1,980	52%
2	8	90	720	41%		42	12	60	720	63%
3	8	60	480	31%		42	12	60	720	31%
6	6	60	360	51%		21	6	60	360	78%
8	6	60	360	71%	No service					
9	8	60	480	47%	No service					
13	8	60	480	61%		66	19	90	1,710	26%
19	3	60	180	65%	Modified					
20	3	60	180	65%	No service					
23										
42	4	90	360	34%	Discontinued					
80	4	60	240	22%		6	4	60	240	33%
80A/B	2	60	120	35%	No service					
82	2	60	120	44%	Modified	3	2	60	120	67%
A	8	90	720	16%	Modified					
B	8	90	720	36%	No service					
E					No service					
Fixed Guideway									8,000	
		Total	**6,720**					**Total**	**13,850**	

Existing Capacity	**6,720**
No Action Alternative Capacity	**13,850**
Preferred Alternative Capacity Capacity	**13,850**

North Screenline										
15	3	60	180	77%		26	8	45	360	59%
17	3	60	180	83%		42	12	60	720	32%
18	2	60	120	53%		28	8	60	480	20%
4						42	12	60	720	56%
		Total	**480**					**Total**	**2,280**	

Existing Capacity	**480**
No Action Alternative Capacity	**2,280**
Preferred Alternative Capacity Capacity	**2,280**

All Screenlines

Existing Capacity	**17,700**
No Action Alternative Capacity	**0**
Preferred Alternative Capacity Capacity	**0**

PM Peak Period - Outbound Ridership

Screenline / Route	Existing (2007)							Cumulative (2030)					
	2004 Daily Boardings		Growth Factor	2007 Daily Outbound Boardings	Adjustment Factors		MLP Ridership	Growth Factor	MLP Ridership (Base)	Service Status After Fixed Guideway	Fixed Guideway Switch		MLP Ridership (with Fixed Guideway)
	Both Dir.	Outbound			Peak Hour	MLP					Factor	Passengers	
West Screenline													
1/1L	24,985	12,493	1.07	13,367	0.10	0.35	468	1.53	716				716
2	13,785	6,892	1.07	7,375	0.10	0.50	369	1.53	564				564
3	10,967	5,484	1.07	5,867	0.25	0.25	367	1.53	561				561
6	5,459	2,730	1.07	2,921	0.25	0.25	183	1.53	279				279
9	6,698	3,349	1.07	3,583	0.25	0.25	224	1.53	343	Modified	0.90	-308	0
13	13,785	6,892	1.07	7,375	0.10	0.50	369	1.53	564				564
19	3,638	1,819	1.07	1,946	0.15	0.20	58	1.53	89	Modified	1.00	-89	0
20	3,638	1,819	1.07	1,946	0.15	0.20	58	1.53	89	Discontinued	1.00	-89	0
40	8,714	4,357	1.07	4,662	0.25	0.10	117	1.53	178				178
42	9,167	4,584	1.07	4,904	0.10	0.40	196	1.53	300		0.75	-225	0
43	2,108	1,054	1.07	1,128	0.25	0.25	70	1.53	108	Discontinued	0.85	-92	0
52	4,038	2,019	1.07	2,160	0.15	0.10	32	1.53	50				50
53	3,123	1,562	1.07	1,671	0.25	0.25	104	1.53	160	No service	0.80	-128	0
54	3,425	1,713	1.07	1,832	0.25	0.40	183	1.53	280		0.90	-252	0
55	4,038	2,019	1.07	2,160	0.10	0.25	54	1.53	83	No service	0.05	-4	0
56	2,648	1,324	1.07	1,417	0.15	0.20	43	1.53	65	No service	0.05	-3	0
57/57A	3,132	1,566	1.07	1,675	0.15	0.80	201	1.53	308	No service	0.05	-15	0
62	4,038	2,019	1.07	2,160	0.15	0.10	32	1.53	50	No service	0.75	-37	0
65	4,038	2,019	1.07	2,160	0.20	0.10	43	1.53	66		0.60	-40	26
83	360	180	1.07	193	0.50	0.80	77	1.53	118	Modified	0.85	-100	118
84	393	197	1.07	210	0.50	0.80	84	1.53	129	Modified	1.00	-129	0
84A	393	197	1.07	210	0.50	0.80	84	1.53	129	Modified	1.00	-129	0
85	319	160	1.07	171	0.50	0.80	68	1.53	104		0.90	-94	0
85A	319	160	1.07	171	0.50	0.80	68	1.53	104		1.00	-104	0
88	134	67	1.07	72	0.75	0.80	43	1.53	66				66
88A	175	88	1.07	94	1.00	0.40	37	1.53	57				57
89	113	57	1.07	60	0.50	0.80	24	1.53	37				37
90	147	74	1.07	79	0.50	0.80	31	1.53	48	No service	0.75	-36	0
98	214	107	1.07	114	0.50	0.80	46	1.53	70	Modified	0.80	-56	70
98A	200	100	1.07	107	0.50	0.80	43	1.53	65	No service	0.80	-52	0
201	526	263	1.07	281	0.50	0.80	113	1.53	172	No service	0.90	-155	0
202	260	130	1.07	139	0.50	0.80	56	1.53	85	No service	0.75	-64	0
A	10,931	5,466	1.07	5,848	0.10	0.50	292	1.53	447	Modified	1.00	-447	0
B	6,832	3,416	1.07	3,655	0.25	0.25	228	1.53	350	No service	0.40	-140	0
C	4,422	2,211	1.07	2,366	0.15	0.50	177	1.53	271				271
E	--	--				0.10				No service	1.00		
F2	--	--				0.25							
F3	--	--				0.25							
Fixed Guideway					0.25	0.25			47,500			2,790	5,759
						Total	**4,645**					**Total**	**9,317**

Existing Ridership	**4,645**

No Action Alternative Added Ridership	637
No Action Alternative Total Ridership	**9,954**

Preferred Alternative Added Ridership	556
Preferred Alternative Total Ridership	**9,873**

PM Peak Period - Outbound Ridership

Screenline / Route	Existing (2007)							Cumulative (2030)					
	2004 Daily Boardings		Growth Factor	2007 Daily Outbound Boardings	Adjustment Factors		MLP Ridership	Growth Factor	MLP Ridership (Base)	Service Status After Fixed Guideway	Fixed Guideway Switch		MLP Ridership (with Fixed Guideway)
	Both Dir.	Outbound			Peak Hour	MLP					Factor	Passengers	
East Screenline													
1/1L	24,985	12,493	1.07	13,367	0.10	0.50	668	1.53	1,023				1,023
2	13,785	6,892	1.07	7,375	0.10	0.40	295	1.53	451				451
3	10,967	5,484	1.07	5,867	0.25	0.10	147	1.53	224				224
6	5,459	2,730	1.07	2,921	0.25	0.25	183	1.53	279				279
8	7,625	3,813	1.07	4,079	0.25	0.25	255	1.53	390	No service			
9	6,698	3,349	1.07	3,583	0.25	0.25	224	1.53	343	No service	0.80	-274	0
13	13,785	6,892	1.07	7,375	0.10	0.40	295	1.53	451				451
19	3,638	1,819	1.07	1,946	0.15	0.40	117	1.53	179	Modified			179
20	3,638	1,819	1.07	1,946	0.15	0.40	117	1.53	179	No service	0.90	-161	0
23	--	--											
42	9,167	4,584	1.07	4,904	0.10	0.25	123	1.53	188	Discontinued	0.75	-141	0
80	246	123	1.07	131	0.50	0.80	53	1.53	80				80
80A/B	198	99	1.07	106	0.50	0.80	42	1.53	65	No service	0.10	-6	0
82	246	123	1.07	131	0.50	0.80	53	1.53	80		0.10	-8	80
A	10,931	5,466	1.07	5,848	0.10	0.20	117	1.53	179	Modified	1.00	-179	0
B	6,832	3,416	1.07	3,655	0.25	0.25	228	1.53	350	No service	0.60	-210	0
E	--	--								No service	0.95		
Fixed Guideway					0.25	0.15			47,500			979	2,760
						Total	**2,915**					**Total**	**5,528**

Existing Ridership	**2,915**

No Action Alternative Added Ridership	666
No Action Alternative Total Ridership	**6,194**

Preferred Alternative Added Ridership	580
Preferred Alternative Total Ridership	**6,108**

North Screenline													
15	647	324	1.07	346	0.40	1.00	138	1.53	212				212
17	1116	558	1.07	597	0.40	1.00	239	1.53	365				365
18	589	295	1.07	315	0.20	1.00	63	1.53	96				96
4	7,856	3,928	1.07	4,203	0.25	0.25		1.53	402				402
Fixed Guideway					0.25	0.02			47,500				238
						Total	**440**					**Total**	**1,313**

Existing Ridership	**440**

No Action Alternative Added Ridership	28
No Action Alternative Total Ridership	**1,341**

Preferred Alternative Added Ridership	25
Preferred Alternative Total Ridership	**1,338**

All Screenlines

Existing Ridership	**8,001**

No Action Alternative Added Ridership	1,331
No Action Alternative Total Ridership	**17,489**

Preferred Alternative Added Ridership	1,161
Preferred Alternative Total Ridership	**17,319**

PM Peak Period - Outbound Capacity

Screenline / Route	Existing (2007) Runs	Vehicle Capacity	MLP Capacity	Capacity Utilization	Service Status After Fixed Guideway	Cumulative (2030) Runs (3:00-6:00 Both Dir.)	Runs (4:00-6:00 Outbound)	Vehicle Capacity	MLP Capacity	Capacity Utilization
West Screenline										
1/1L	12	60	720	65%		66	22	60	1,320	54%
2	9	60	540	68%		36	12	60	720	78%
3	8	60	480	76%		36	12	60	720	98%
6	6	60	360	51%		17	6	60	360	78%
9	8	60	480	47%	Modified					
13	9	60	540	68%		60	20	60	1,200	47%
19	5	60	270	22%	Modified					
20	3	60	180	32%	Discontinued					
40	3	60	180	65%		54	18	90	1,620	11%
42	4	60	240	82%						
43	4	60	240	29%	Discontinued					
52	3	60	180	18%		13	5	90	450	11%
53	4	60	240	44%	No service					
54	8	60	480	38%						
55	4	60	240	23%	No service					
56	4	60	240	18%	No service					
57/57A	9	60	540	37%	No service					
62	4	60	240	14%	No service					
65	4	60	240	18%		12	4	60	240	11%
83	4	60	240	32%	Modified	7	5	90	450	26%
84	4	60	240	35%	Modified					
84A	4	60	240	35%	Modified					
85	4	60	240	28%						
85A	4	60	240	28%						
88	3	60	180	24%		2	2	60	120	55%
88A	2	60	120	31%		2	2	60	120	48%
89	2	60	120	31%		2	2	60	120	31%
90	2	60	120	20%	No service					
98	3	60	180	17%	Modified	6	4	60	240	29%
98A	2	60	120	38%	No service					
201	3	60	180	63%	No service					
202	2	60	120	46%	No service					
A	6	90	540	54%	Modified					
B	8	90	720	32%	No service					
C	4	90	360	49%		27	9	90	810	34%
E					No service					
F2										
F3										
Fixed Guideway									8,000	
		Total	**10,590**					**Total**	**16,490**	

Existing Capacity	**10,590**

No Action Alternative Capacity	**16,490**

Preferred Alternative Capacity Capacity	**16,490**

PM Peak Period - Outbound Capacity

Screenline / Route	Existing (2007) Runs	Vehicle Capacity	MLP Capacity	Capacity Utilization	Cumulative (2030) Service Status After Fixed Guideway	Runs (3:00-6:00 Both Dir.)	Runs (4:00-6:00 Outbound)	Vehicle Capacity	MLP Capacity	Capacity Utilization
East Screenline										
1/1L	15	60	900	74%		66	22	90	1,980	52%
2	5	90	450	66%		36	12	60	720	63%
3	8	60	480	31%		36	12	60	720	31%
6	6	60	360	51%		17	6	60	360	78%
8	8	60	480	53%	No service					
9	8	60	480	47%	No service					
13	8	60	480	61%		60	20	90	1,800	25%
19	5	60	270	43%	Modified	18	6	90	540	33%
20	3	60	180	65%	No service					
23						12	4	60	240	
42	4	90	360	34%	Discontinued	24	8	90	720	
80	5	60	300	18%		5	4	60	240	33%
80A/B	2	60	120	35%	No service					
82	3	60	180	29%		3	2	60	120	67%
A	6	90	540	22%	Modified					
B	8	90	720	32%	No service					
E					No service					
Fixed Guideway									8,000	
		Total	**6,300**					**Total**	**15,440**	

Existing Capacity	**6,300**

No Action Alternative Capacity	**15,440**
Preferred Alternative Capacity Capacity	**15,440**

North Screenline										
15	4	60	240	58%		24	8	45	360	59%
17	5	60	300	80%		36	12	60	720	51%
18	2	60	120	53%		24	8	60	480	20%
4						36	11	60	660	61%
		Total	**660**					**Total**	**2,220**	

Existing Capacity	**660**

No Action Alternative Capacity	**2,220**
Preferred Alternative Capacity Capacity	**2,220**

All Screenlines

Existing Capacity	**17,550**

No Action Alternative Capacity	**34,150**
Preferred Alternative Capacity Capacity	**34,150**

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