Traffic Impact Report

Kakaako Block I

Prepared for:
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Prepared by:
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March 2022

TRAFFIC IMPACT REPORT

FOR THE

KAKAAKO BLOCK I DEVELOPMENT

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I. INTRODUCTION

A. Purpose of Study

The purpose of this study is to identify and assess the traffic impacts resulting from the Kakaako Block I development which entails redevelopment of the existing light industrial uses with a new mixed-use development with residential and retail uses. This development is part of the overall Kaiāulu ʻo Kakaʻako Master Plan (KKMP) planned by Kamehameha Schools in Honolulu on the island of Oahu. Increment 1 of the KKMP included the completed developments of Keauhou Place, Keauhou Lane, 400 Keawe, the Flats at Puunui, The Collection, SALT, and Six Eighty. Increment 2 of the KKMP is the next phase of the Master Plan of which includes the Kakaako Block I development.

B. Scope of Study

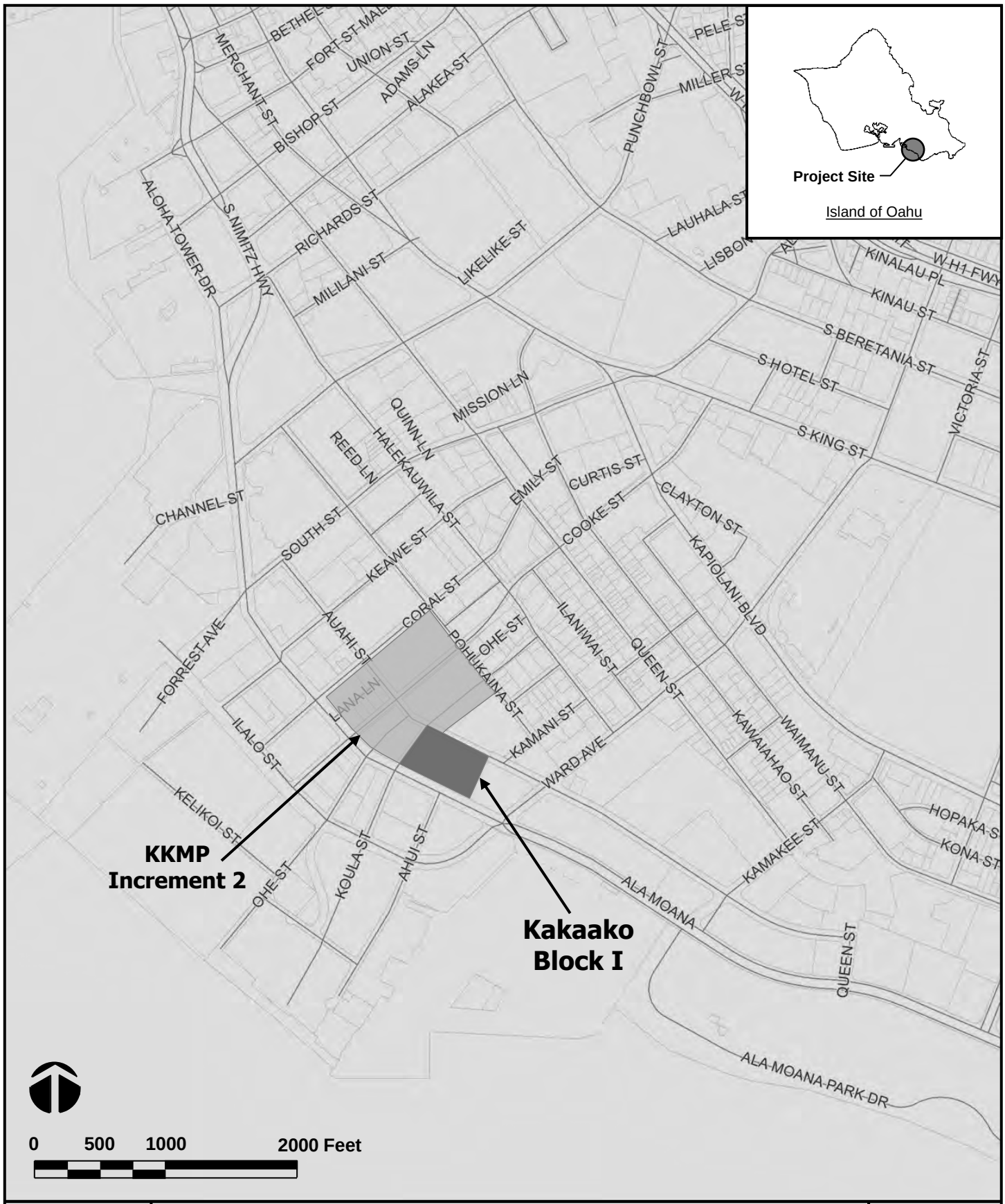
This report presents the findings and conclusions of the traffic study, the scope of which includes:

1. Description of the proposed project.
2. Evaluation of existing roadway and traffic operations in the vicinity.
3. Analysis of future roadway and traffic conditions without the proposed project.
4. Analysis and development of trip generation characteristics for the proposed project.
5. Superimposition of site-generated traffic over future traffic conditions.
6. The identification and analysis of traffic impacts resulting from the proposed project.
7. Recommendations of improvements, if appropriate, that would mitigate the traffic impacts resulting from the proposed project.

II. PROJECT DESCRIPTION

A. Location

The Kakaako Block I development of the KKMP Increment 2 is located adjacent to Ala Moana Boulevard and is bounded by Ala Moana Boulevard to the south, Auahi Street to the north, Koula Street to the west and an at-grade parking lot to the east (see Figure 1). Based on information provided by the project developer,



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KAKAAKO BLOCK I

LOCATION AND VICINITY MAP

FIGURE 1

access to the project site will be provided via driveways off Ala Moana Boulevard and Auahi Street.

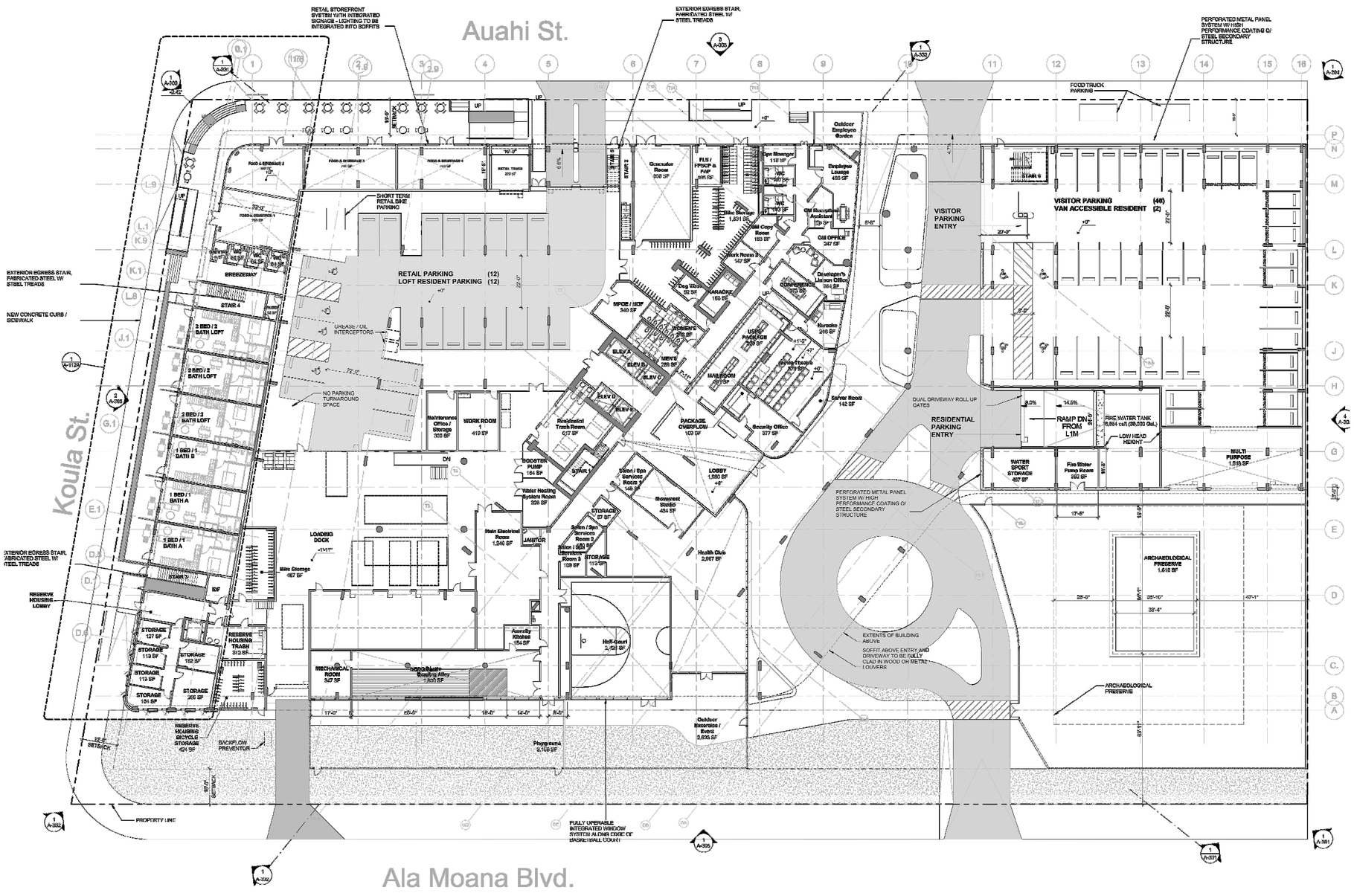
B. Project Characteristics

The Kakaako Block I development entails the redevelopment of existing uses to include approximately 482 residential units and 3,500 square feet (sf) of retail uses. Parking for the proposed project will be provided on-site with access provided via driveways off Ala Moana Boulevard and Auahi Street. Along Ala Moana Boulevard, the east driveway is expected to be a right-turn-in, right-turn-out driveway that will serve the development's primary access through the project site between Ala Moana Boulevard and Auahi Street providing connections to a porte cochere as well as residential and visitor parking areas. The west driveway along Ala Moana Boulevard is expected to be a secondary driveway (also right-turn-in, right-turn-out) providing access to the development's service loading area. Along Auahi Street, the east driveway is connected to the development's primary access as previously mentioned, while the west driveway on Auahi Street provides access to a separate parking area for on-site retail uses. The proposed multi-use development is expected to be completed by Year 2026. Figure 2 shows the project site plan.

III. BASELINE TRAFFIC CONDITIONS

A. Area Roadway System

East-west traffic through the Kakaako area is served by several existing major roadways including Ala Moana Boulevard supported by a network of roadways including Auahi Street, Pohukaina Street, and Halekauwila Street providing alternate east-west routes through the surrounding areas. North-south traffic through the area is served by a number of major roadways including Ward Avenue supported by a network of smaller connector roadways including Cooke Street and Koula Street providing alternate north-south routes through the surrounding areas.



KAKAAKO BLOCK I

PROJECT SITE PLAN

FIGURE 2

B. Traffic Volumes and Conditions

1. General

a. Traffic Data

The traffic data used for the purpose of analysis is based available turning movement in the vicinity collected between Years 2013-2019. The manual turning movement count surveys were conducted during the morning peak hours between 6:00 AM and 9:00 AM, and the afternoon peak hours between 3:00 PM and 6:00 PM at the following intersections:

- Ala Moana Boulevard and Ward Avenue
- Ala Moana Boulevard and Koula Street
- Ala Moana Boulevard and Cooke Street
- Ward Avenue and Auahi Street
- Cooke Street and Auahi Street
- Cooke Street and Pohukaina Street
- Cooke Street and Halekauwila Street

More recent traffic data is not available and could not be collected at this time due to the ongoing COVID-19 pandemic that has resulted in significantly decreased traffic volumes and shifted travel patterns. It should be noted that the State of Hawaii Department of Transportation (HDOT) has been tracking traffic volumes along the major roadways and their traffic data indicates that, in general as of September 2021, traffic volumes in the vicinity of the project are still less than Year 2019 pre-COVID volumes. In addition, an assessment of the available traffic data indicates that traffic volumes in the vicinity of the project have remained relatively stable prior to the onset of the COVID-19 pandemic. As such, the available traffic data was utilized to develop baseline traffic counts that are considered to represent Year 2021 baseline conditions. Appendix A includes the traffic count data used for this report.

b. Capacity Analysis Methodology

The highway capacity analysis performed in this study is based upon procedures presented in the "Highway Capacity Manual" (HCM), Transportation Research Board, 2000, and the "Synchro" software, developed by Trafficware. It should be noted that the HCM 2010 and HCM 6 methodologies are available with the Synchro software; however, analysis conducted using those methodologies is unable to accommodate all of the exclusive and shared-use lane configurations in the study area. As such, for the purpose of this report, the HCM 2000 methodology output was used for the analysis of vehicular mode of travel. The analysis is based on the concept of Level of Service (LOS) to identify the traffic impacts associated with traffic demands during the peak periods of traffic.

LOS is a quantitative and qualitative assessment of traffic operations. Levels of Service are defined by LOS "A" through "F"; LOS "A" representing ideal or free-flow traffic operating conditions and LOS "F" unacceptable or potentially congested traffic operating conditions.

"Volume-to-Capacity" (v/c) ratio is another measure indicating the relative traffic demand to the road carrying capacity. A v/c ratio of one (1.00) indicates that the roadway is operating at or near capacity. A v/c ratio of greater than 1.00 indicates that the traffic demand exceeds the road's carrying capacity. The LOS definitions are included in Appendix B.

2. Baseline Peak Hour Traffic

a. General

The baseline intersection lane uses and peak hour traffic operating conditions at key locations within the study area are shown in Figures 3 and 4. The morning peak hour of traffic generally occurs between 7:15 AM and 8:15 AM while the afternoon peak hour of traffic generally occurs between the hours of 4:30 PM and 5:30 PM.

KAKAAKO BLOCK I

BASELINE LANE CONFIGURATIONS

FIGURE 3

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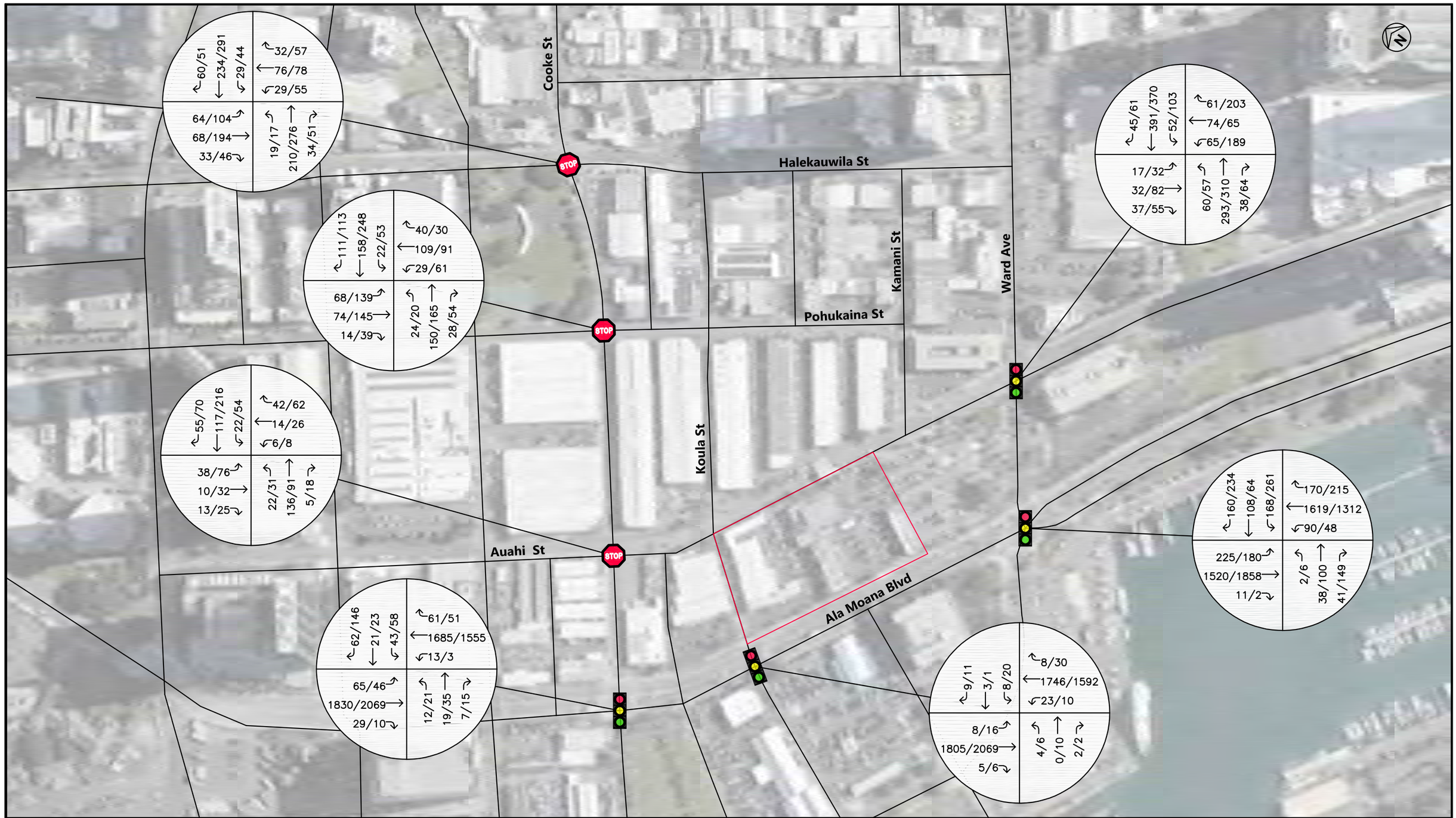

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KAKAAKO BLOCK I

BASELINE PEAK HOURS OF TRAFFIC

FIGURE 4

Although the peak hours of traffic generally occur around the same time periods at each of the individual study intersections, the absolute commuter peak hour time periods for each intersection may differ slightly. The analysis is based on these absolute commuter peak hour time periods to identify the traffic impacts resulting from the proposed project. LOS calculations are included in Appendix C.

b. Ala Moana Boulevard and Ward Avenue

At the intersection with Ward Avenue, Ala Moana Boulevard carries 1,756 vehicles eastbound and 1,879 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is similar with 2,040 vehicles traveling eastbound and 1,575 vehicles traveling westbound. The eastbound approach operates at LOS "C" and LOS "D" during the AM and PM peak periods, respectively, while the westbound approach operates at LOS "D" during both peak periods. Traffic queues periodically form on both approaches of Ala Moana Boulevard with the most significant queues observed during the PM peak period. Average queues of 16-18 vehicles were observed on the westbound approach with eastbound queues extending to the upstream intersection with Koula Street.

The Ward Avenue approaches of the intersection carry 81 vehicles northbound and 436 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are higher with 255 vehicles traveling northbound and 559 vehicles traveling southbound. The northbound approach operates at LOS "D" during both peak periods while the southbound approach operates at LOS "D" and LOS "E" during the AM and PM peak periods, respectively. Traffic queues periodically form on the Ward Avenue approaches of the intersection with the most significant queueing observed on the during the PM peak period. Average queues of 2-3 vehicles were observed on the northbound approach with average queues of 4-6

vehicles observed on the southbound approach during the PM peak period.

c. Ala Moana Boulevard and Koula Street

At the intersection with Koula Street, Ala Moana Boulevard carries 1,818 vehicles eastbound and 1,777 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is similar with 2,091 vehicles traveling eastbound and 1,632 vehicles traveling westbound. Both approaches operate at LOS "A" during the AM and PM peak periods. Traffic queues periodically form on both approaches of Ala Moana Boulevard. As previously discussed, queues from the adjacent intersection with Ward Avenue occasionally extend to this intersection during the PM peak period. During the PM peak period, average queues of 6-10 vehicles were observed on the westbound approach of the intersection with average queues of 5-7 vehicles observed on the eastbound approach.

The Koula Street approaches of the intersection carry 6 vehicles northbound and 20 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are higher with 18 vehicles traveling northbound and 32 vehicles traveling southbound. Both approaches operate at LOS "D" during the AM and PM peak periods. Minimal traffic queues were observed on both approaches of Koula Street with average queues of 1-2 vehicles observed during both peak periods.

d. Ala Moana Boulevard and Cooke Street

At the intersection with Cooke Street, Ala Moana Boulevard carries 1,924 vehicles eastbound and 1,759 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is similar with 2,125 vehicles traveling eastbound and 1,609 vehicles traveling westbound. Both approaches operate at LOS "A" during the AM peak period and LOS "B" during the PM peak period. Traffic queues periodically formed on the Ala Moana Boulevard

approaches of the intersection with the most significant queuing observed during the PM peak period. During this peak period, average queues of 8-10 vehicles were observed on the westbound approach of the intersection with average queues of 10-12 vehicles observed on the eastbound approach.

The Cooke Street approaches of the intersection carry 38 vehicles northbound and 126 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are higher with 71 vehicles traveling northbound and 227 vehicles traveling southbound. Both approaches operate at LOS "D" during the AM and PM peak periods. Traffic queues occasionally formed on the northbound and southbound approaches of the intersection with the most significant queueing observed during the PM peak period. During this peak period, average queues of 2-4 vehicles were observed on the southbound approach with average queues of 2-3 vehicles on the northbound approach. These queues cleared the intersection after every signal cycle.

e. Ward Avenue and Auahi Street

At the intersection with Auahi Street, Ward Avenue carries 391 vehicles northbound and 488 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes on Ward Avenue are higher with 431 vehicles traveling northbound and 534 vehicles traveling southbound. Both approaches of Ward Avenue operate at LOS "A" and LOS "B" during the AM and PM peak periods, respectively. Traffic queues periodically formed on the Ward Avenue approaches of the intersection with the most significant queueing observed during the PM peak period. Average queues of 3-5 vehicles were observed on both approaches of the intersection during this peak period.

The Auahi Street approaches of the intersection carry 86 vehicles eastbound and 200 vehicles westbound during the AM peak

period. During the PM peak period, traffic volumes are higher with 169 vehicles traveling eastbound and 457 vehicles traveling westbound. The eastbound approach of Auahi Street approach operates at LOS "A" and LOS "B" during the AM and PM peak periods, respectively, while the westbound approach operates at LOS "B" during both peak periods. Traffic queues occasionally formed on the Auahi Street approaches of the intersection with the most significant queueing occurring on the westbound approach. Average queues of 2-4 vehicles were observed on that approach during both peak periods. Minimal traffic queues were observed on the eastbound approach with average queues of 1-3 vehicles observed during both peak periods.

f. Cooke Street and Auahi Street

At the intersection with Auahi Street, Cooke Street carries 163 vehicles northbound and 194 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are higher with 140 vehicles traveling northbound and 340 vehicles traveling southbound. Both approaches of Cooke Street operate at LOS "A" during both peak periods.

Auahi Street carries 61 vehicles eastbound and 62 vehicles westbound during the AM peak period. During the PM peak period, the traffic volume is higher with 133 vehicles traveling eastbound and 96 vehicles traveling westbound. The eastbound approach of Auahi Street operates at LOS "A" and LOS "B" during the AM and PM peak periods, respectively, while the westbound approach operates at LOS "A" during both peak periods. Minimal traffic queues were observed on the Auahi Street approaches of the intersection with average queues of 1-2 vehicles observed during both peak periods.

g. Cooke Street and Pohukaina Street

At the intersection with Pohukaina Street, Cooke Street carries 202 vehicles northbound and 291 vehicles southbound during the AM

peak period. During the PM peak period, traffic volumes are higher with 239 vehicles traveling northbound and 414 vehicles traveling southbound. Both approaches operate at LOS "A" during the AM peak period and LOS "B" during the PM peak period. Traffic queues occasionally formed on the Cooke Street approaches of the intersection with the most significant queueing occurring during the PM peak period. Average queues of 2-3 vehicles were observed on both approaches during this peak period.

Pohukaina Street carries 156 vehicles eastbound and 178 vehicles westbound during the AM peak period. During the PM peak period, the traffic volume is higher with 323 vehicles traveling eastbound and 182 vehicles traveling westbound. The eastbound approach of Pohukaina Street operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively, while the westbound operates at LOS "B" during both peak periods. Minimal queues were observed on the eastbound and westbound approaches of Pohukaina Street with average queues of 1-2 vehicles observed during both peak periods.

h. Cooke Street and Halekauwila Street

At the intersection with Halekauwila Street, Cooke Street carries 263 vehicles northbound and 323 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are higher with 344 vehicles traveling northbound and 386 vehicles traveling southbound. Both approaches operate at LOS "A" during the AM peak period and LOS "B" during the PM peak period. Traffic queues occasionally form on the Cooke Street approaches of the intersection with the most significant queueing occurring during the PM peak period. Average queues of 2-3 vehicles were observed on both approaches during this peak period.

Halekauwila Street carries 165 vehicles eastbound and 137 vehicles westbound during the AM peak period. During the PM peak

period, the traffic volume is higher with 344 vehicles traveling eastbound and 190 vehicles traveling westbound. The eastbound approach of Halekauwila Street operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively, while the westbound approach operates at LOS "B" during both peak periods. Minimal queues were observed on the eastbound and westbound approaches of Pohukaina Street with average queues of 1-2 vehicles observed during both peak periods.

IV. PROJECTED TRAFFIC CONDITIONS

A. Site-Generated Traffic

1. Trip Generation Methodology

The trip generation methodology used in this study is based upon generally accepted techniques developed by the Institute of Transportation Engineers (ITE) and published in "Trip Generation, 10th Edition," 2017. The ITE trip generation rates are developed empirically by correlating the vehicle trip generation data with various land use characteristics such as the number of vehicle trips generated per dwelling unit or 1,000 sf of development. Table 1 summarizes the proposed trip generation characteristics for the project.

Table 1: Peak Hour Trip Generation

HIGH-RISE APARTMENT INDEPENDENT VARIABALE: Dwelling Units = 482		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	36
	EXIT	113
	TOTAL	149
PM PEAK	ENTER	106
	EXIT	68
	TOTAL	174

Table 1: Peak Hour Trip Generation (Cont'd)

RETAIL INDEPENDENT VARIABALE: 1,000 sf of development = 3.5		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	2
	EXIT	1
	TOTAL	3
PM PEAK	ENTER	6
	EXIT	7
	TOTAL	13
TOTALS		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	38
	EXIT	114
	TOTAL	152
PM PEAK	ENTER	112
	EXIT	75
	TOTAL	187

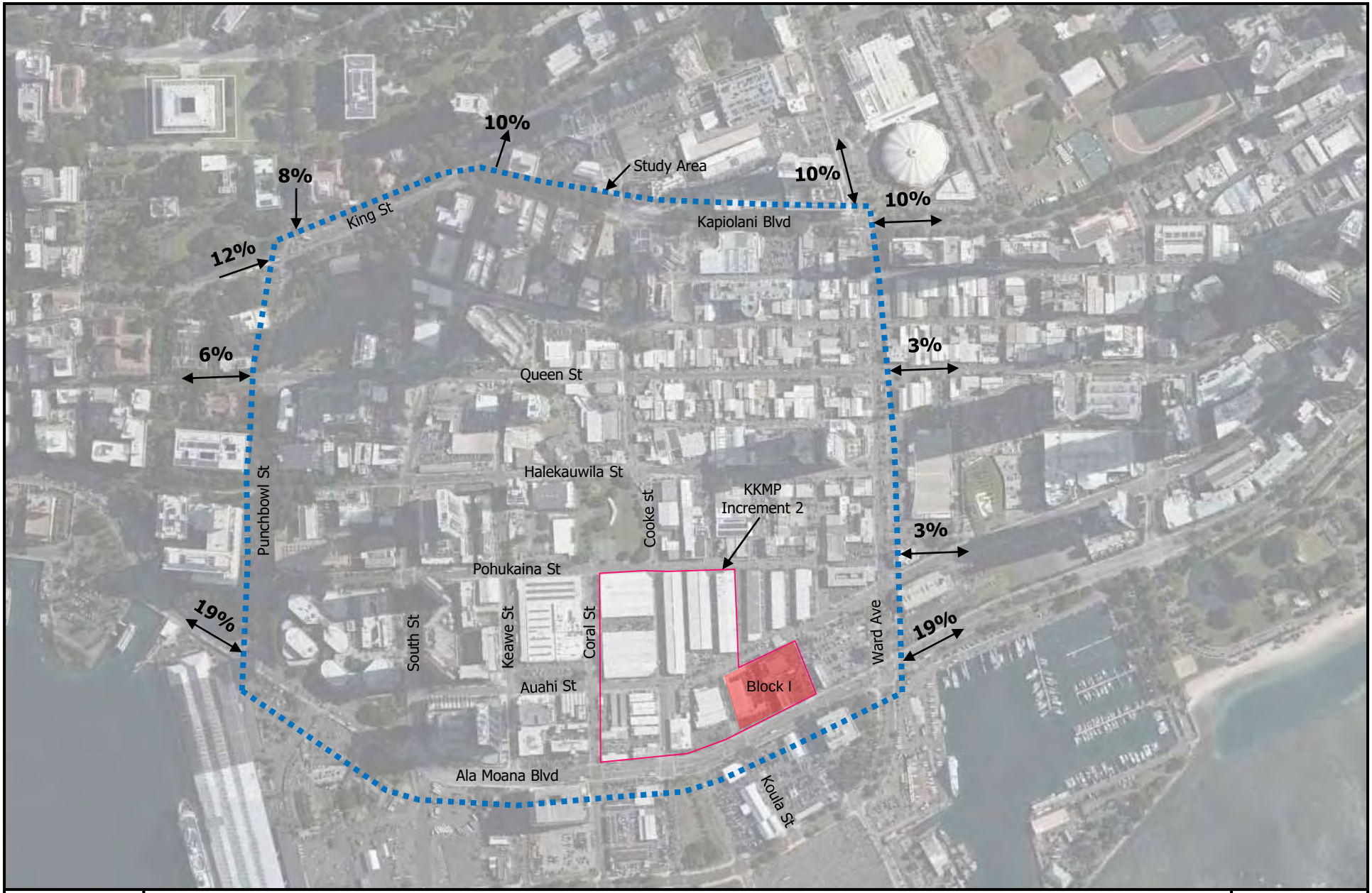
The trip generation methodology developed by ITE also includes provisions for internal capture of trips and multi-modal trips. Internal capture of trips accounts for vehicles that visit more than one destination within the same area without adding external vehicular trips to the surrounding major roadways. Multi-modal trips are trips made utilizing non-motorized modes of travel such as walking and biking, as well as trips made using transit. The project vicinity is currently served by established and convenient transit routes that may reduce the number of vehicular trips on the surrounding major roadways with improved sidewalk facilities such as sidewalks and marked crosswalks within the study area. As such, the trip generation characteristics for the proposed project were adjusted to account for the influence of internal capture of trips and multi-modal trips. It should be noted that the analysis conservatively assumes all trips to be new to the project vicinity with no reductions incorporated to account for the existing uses of the project site. Table 2 summarizes the adjusted proposed trip generation characteristics for the project.

Table 2: Adjusted Peak Hour Trip Generation

		PROJECTED TRIP ENDS
AM PEAK	ENTER	33
	EXIT	97
	TOTAL	130
PM PEAK	ENTER	95
	EXIT	64
	TOTAL	159

2. Trip Distribution and Through Traffic Forecasting Methodology

The directional distribution of site-generated trips was based on the relative distribution of traffic along the regional roadways in the vicinity of the project. These percentages are generally consistent with the regional forecasting model developed by the Oahu Metropolitan Planning Organization (OMPO) since the project is located within a developed, well-established area in Honolulu. The OMPO model provides a macro level forecast of the anticipated overall travel demand for the island of Oahu utilizing Socio-Economic Data (SED) representing population distribution within a multitude of traffic analysis zones to forecast individual vehicle trips between destinations within the model. The model by OMPO provides a general framework of travel demand, however a more finite, micro-level approach was utilized to complete the specific distribution of site-generated trips at the study intersections based on their assumed origin/destination, allowed turning movements, and the relative convenience of available routes. In addition, taking into the account the project's location within a well-developed area and anticipated development in the vicinity of the project, a growth rate of approximately 1.5% growth rate per year was assumed along the project roadways. This is generally in line with OMPO's forecasting model which estimates population growth to be relatively linear to the Year 2035. As such, using Year 2021 as the Base Year, a growth factor of 1.075 was applied to the baseline through traffic demands along the regional roadways in the project vicinity. Figures 5 and 6 show the trip distribution percentages and the distribution of site-generated traffic during the AM and PM peak periods.



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KAKAAKO BLOCK I

DISTRIBUTION PERCENTAGES

FIGURE 5

KAKAAKO BLOCK I

DISTRIBUTION OF SITE-GENERATED TRIPS

FIGURE 6

B. Other Considerations

1. Kaiāulu ʻo Kakaʻako Master Plan (KKMP) Increment 2

The Kakaako Block I development is the first project within Increment 2 of the Kaiāulu ʻo Kakaʻako Master Plan (KKMP). As previously mentioned, Increment 1 of the KKMP includes the completed developments of Keauhou Place, Keauhou Lane, 400 Keawe, the Flats at Puunui, The Collection, SALT, Six Eighty, and H-Mart. In addition to the Kakaako Block I development, Increment 2 also includes the development of Blocks C, D, G, and H, in the project vicinity. It should be noted that H-Mart was completed after the traffic data used as the baseline for this study was conducted and, as such, trips from this retail use were incorporated into without project conditions. In conjunction with the KKMP Increment 2 Master Plan, there are a number of roadway and intersection improvements planned including the following:

- Modification of the laneage along Cooke Street between Ala Moana Boulevard and north of Pohukaina Street to reduce the number of travel lanes to one-lane in each direction with left-turn bays provided at the intersections with Auahi Street and Pohukaina Street.
- Installation of bike lanes along Cooke Street between Ala Moana Boulevard and Halekauwila Street.
- Installation of bike lanes along Auahi Street from South Street to Cooke Street.
- Installation of bike lanes along Pohukaina Street from South Street to Cooke Street.
- Installation of a traffic signal system at the intersection of Cooke Street with Pohukaina Street.
- Provision of enhanced pedestrian facilities fronting each of the individual block developments along the adjacent roadways.

Since the Kakaako Block I development is expected to be the first project within the KKMP Increment 2 development plan, these improvements are not expected to be completed prior to the completion this development. However, these improvements are expected to be developed soon thereafter as additional development progresses and absorbs within the KKMP Increment 2 region.

2. Ward Village Development

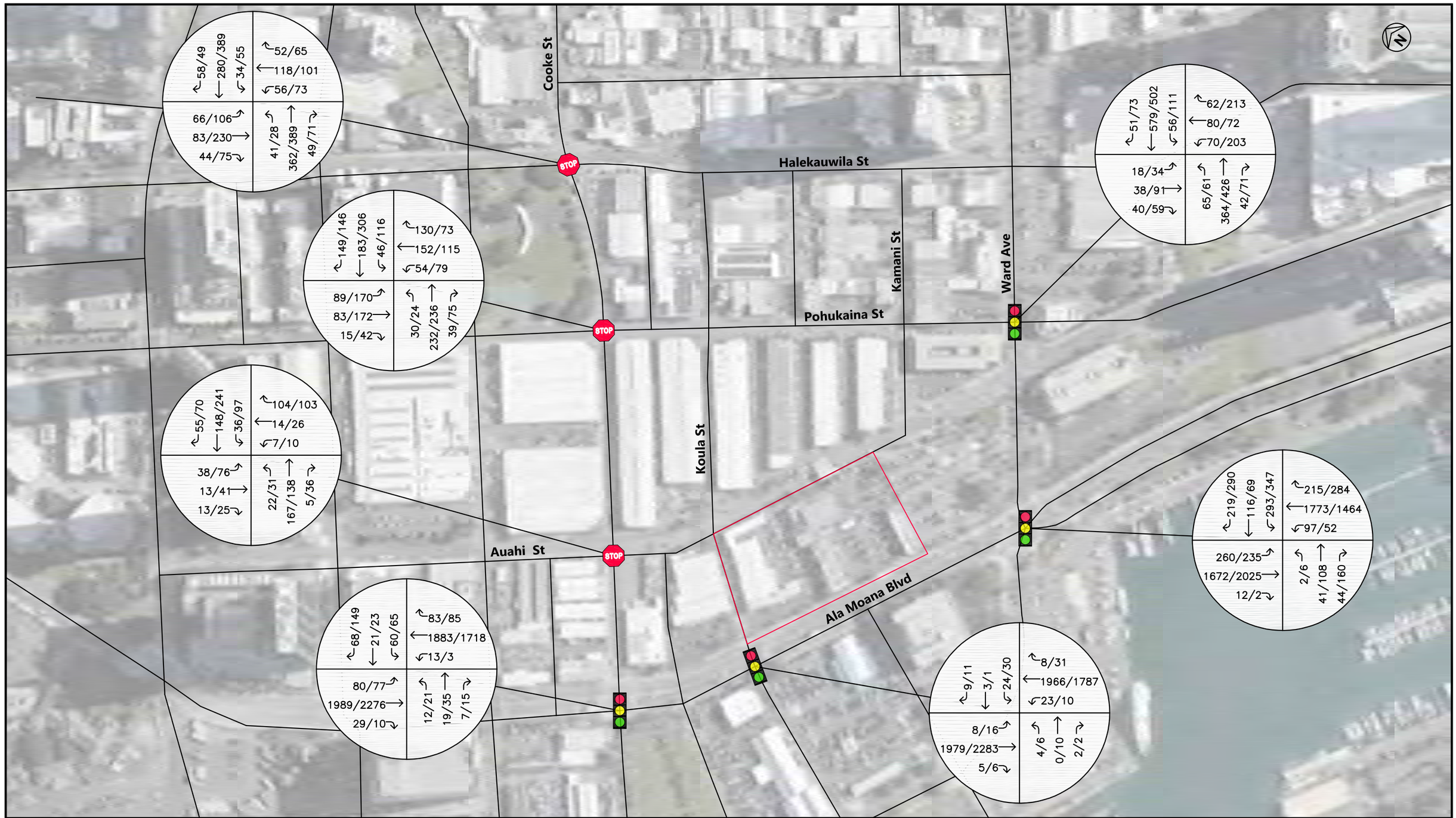
The proposed project is also located in the vicinity of Ward Village which is currently undergoing redevelopment. The Ward Village Master Plan entails the replacement of the site's existing uses and the construction of several mixed-use developments that are expected to be implemented in multiple phases. At the time of this report, Phase 1 of the master plan has been completed and occupied with Phases 2 and 3 under construction or under development. In conjunction with the development phases of the Ward Village Master Plan, a number of roadway improvements are planned in the project vicinity to provide additional alternate east-west routes through the Kakaako area. These include completion of the Halekauwila Street Extension east of Ward Avenue and the realignment of Auahi Street to connect to Pohukaina Street west of Ward Avenue. The Ward Village Master Plan is expected to be completed by Year 2027. As such, the trips associated with Ward Village as detailed in the Transportation Master Plan and Assessment for the Ward Villages Master Plan (dated October 2020) were incorporated into without project conditions.

3. City and County of Honolulu Baseyard

There is a City and County of Honolulu baseyard located west of Ward Avenue bisecting the two segments of Auahi Street in the vicinity of the Kakaako Block I development. At the time of this study, this baseyard is expected to be relocated by the end of Year 2022 and the two segments of Auahi Street reconnected to provide a continuous east-west roadway. As such, the relocation of the baseyard and opening of the affected segment of Auahi Street are incorporated into without project conditions.

C. Total Traffic Volumes Without Project

The projected Year 2026 AM and PM peak period traffic volumes and operating conditions without the development of Kakaako Block I development are shown in Figure 7 and summarized in Table 3. The analysis incorporates other developments in the vicinity, as well as ambient growth of traffic. In addition, as previously mentioned, there are a number of roadway improvements expected to be



KAKAAKO BLOCK I

YEAR 2026 PEAK HOURS OF TRAFFIC WITHOUT PROJECT

FIGURE 7

implemented in conjunction with the Ward Village Master Plan incorporated into without project conditions which include the realignment of Auahi Street west of Ward Avenue to connect with Pohukaina Street and completion of the Halekauwila Extension east of Ward Avenue. The baseline levels of service are provided for comparison purposes. LOS calculations are included in Appendix D.

Table 3: Baseline and Projected Year 2026 (Without Project) LOS Traffic Operating Conditions

Intersection	Approach/ Critical Movement	AM		PM	
		Base-line	Year 2026 w/out Proj	Base-line	Year 2026 w/out Proj
Ala Moana Blvd/ Ward Ave/	Eastbound	C	D	D	D
	Westbound	D	D	D	D
	Northbound	D	D	D	E
	Southbound	D	D	E	E
Ala Moana Blvd/ Koula St/	Eastbound	A	A	A	A
	Westbound	A	A	A	A
	Northbound	D	D	D	D
	Southbound	D	D	D	D
Ala Moana Blvd/ Cooke St/	Eastbound	A	B	B	B
	Westbound	A	B	B	B
	Northbound	D	D	D	D
	Southbound	D	D	D	D
Ward Ave/ Auahi St/ Pohukaina St*	Eastbound	A	B	B	B
	Westbound	B	B	B	B
	Northbound	A	A	B	B
	Southbound	A	A	B	B
Cooke St/ Auahi St	Eastbound	A	B	B	B
	Westbound	A	B	A	A
	Northbound	A	A	A	A
	Southbound	A	A	A	A
Cooke St/ Pohukaina St	Eastbound	B	B	C	E
	Westbound	B	C	B	C
	Northbound	A	B	B	C
	Southbound	A	B	B	C
Cooke St/ Halekauwila St	Eastbound	B	B	C	E
	Westbound	B	B	B	C
	Northbound	A	B	B	C
	Southbound	A	B	B	C

**Auahi Street east of Ward Avenue realigned with Pohukaina Street west of Ward Avenue*

Under Year 2026 without project conditions, traffic operations in the project vicinity are expected to deteriorate slightly due to ambient growth in traffic along the major roadways. Along Ala Moana Boulevard, traffic operations at the intersection with Ward Avenue are expected to operate at LOS "D" or better during the AM peak period and LOS "E" or better during the PM peak period while those at the intersections with Koula Street and Cooke Street are expected to operate at LOS "D" or better during both peak periods. Traffic operations at the intersections of Ward Avenue with Auahi Street/Pohukaina Street and Cooke Street with Auahi Street are expected to operate at LOS "B" or better during both peak periods. At the remaining study intersections along Cooke Street, traffic operations are expected to operate at LOS "C" or better during the AM peak period and LOS "E" or better during the PM peak period. It should be noted that the lower levels of service at the intersections with Pohukaina Street and Halekauwila Street are primarily due to the operations of the relatively balanced distribution of traffic at the intersecting roadways and the all-way stop control operation at both intersections. In addition, a traffic signal system is expected to be installed at the intersection with Pohukaina Street in the future in conjunction with the continued development of KKMP Increment 2.

D. Traffic Signal Warrant

As detailed in the previous section, traffic operations at the intersections of Cooke Street with Pohukaina Street and Halekauwila Street are expected to operate at LOS "E" or better during the PM peak period under without project conditions. As such, cursory traffic signal warrant analyses were conducted for these intersections, currently all-way stop controlled intersections, to verify the need and timing of traffic signal systems at these locations.

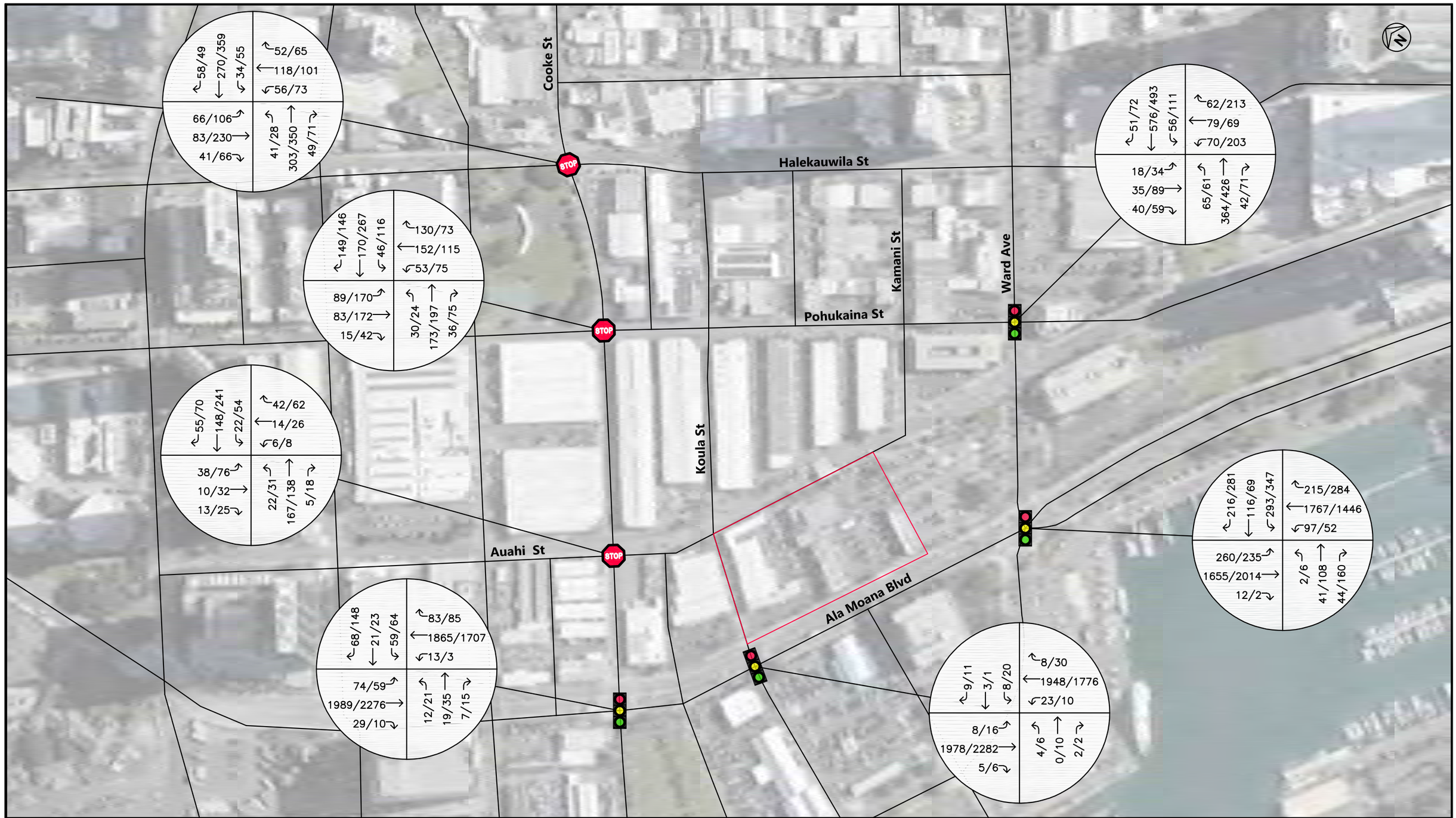
The installation of a traffic signal at an intersection may be justified by one or more of the nine warrants outlined in the "Manual on Uniform Traffic Control Devices for Streets and Highways", 2009 Edition (MUTCD). These warrants take into account factors such as eight-hour vehicular volumes (Warrant 1), four-hour vehicular volumes (Warrant 2), peak hour volumes (Warrant 3), pedestrian volumes (Warrant 4), the presence of a school crossing or coordinated signal system (Warrants 5 and 6), crash experience (Warrant 7), other characteristics of the roadway network

(Warrant 8), and the presence of railroad crossings (Warrant 9). Data was collected during the peak periods of traffic and as such, for the purpose of these cursory assessments, Warrant 3 was applied to the intersections to determine whether or not a traffic signal system might be justified.

Warrant 3, the "Peak Hour Warrant," consists of several conditions that may justify the installation of a traffic signal at an intersection where vehicles experience high traffic delay due to large volumes of intersection traffic during the peak hour periods. One of the conditions is based upon the relationship between the traffic volumes along the major and minor streets. If the traffic volumes along the minor street exceed the threshold shown in Figure 4C-3 of the MUTCD, a traffic signal system may be warranted. Based on projected traffic conditions with completion of the Kakaako Block I development, traffic volumes at the intersection with Pohukaina Street only satisfy Warrant 3 under with project conditions during the PM peak period (see Appendix E). However, as development of the other blocks associated with the KKMP progresses, traffic volumes at this intersection are expected to satisfy Warrant 3 during both peak periods. As such, that intersection is assumed to be signalized in the future in conjunction with the development of the remaining blocks in the region. It should be noted that the traffic volumes at the intersection with Halekauwila Street also only satisfies Warrant 3 under with project conditions during the PM peak period. However, even with the development of the other blocks associated with the KKMP, traffic volumes at the intersection of Cooke Street and Halekauwila Street only satisfy Warrant 3 during the PM peak period. As such, a signal may not be warranted at that intersection, but traffic conditions should be monitored as development progresses to verify future projections and the need for a traffic signal system at that intersection.

E. Total Traffic Volumes With Project

Figure 8 show the Year 2026 cumulative peak hour traffic conditions resulting from the development of the Kakaako Block I development. The cumulative volumes consist of site-generated traffic superimposed over Year 2026 projected traffic demands. The traffic impacts resulting from the proposed project are addressed in the following section.



WILSON OKAMOTO CORPORATION

KAKAAKO BLOCK I

YEAR 2026 PEAK HOURS OF TRAFFIC WITH PROJECT

FIGURE 8

V. TRAFFIC IMPACT ANALYSIS

The Year 2026 cumulative AM and PM peak hour traffic conditions with the development of the Kakaako Block I development are summarized in Table 4. The projected Year 2026 (Without Project) operating conditions are provided for comparison purposes. LOS calculations are included in Appendix F.

Table 4: Projected Year 2026 (Without and With Project) LOS Traffic Operating Conditions

Intersection	Approach/ Critical Movement	AM		PM	
		Year 2026		Year 2026	
		w/out Proj	w/ Proj	w/out Proj	w/ Proj
Ala Moana Blvd/ Ward Ave/	Eastbound	D	D	D	D
	Westbound	D	D	D	D
	Northbound	D	D	E	E
	Southbound	D	D	E	E
Ala Moana Blvd/ Koula St/	Eastbound	A	A	A	A
	Westbound	A	A	A	A
	Northbound	D	D	D	D
	Southbound	D	D	D	D
Ala Moana Blvd/ Cooke St/	Eastbound	B	B	B	B
	Westbound	B	B	B	B
	Northbound	D	D	D	D
	Southbound	D	D	D	D
Ward Ave/ Auahi St/ Pohukaina St*	Eastbound	B	B	B	B
	Westbound	B	B	B	B
	Northbound	A	A	B	B
	Southbound	A	A	B	B
Cooke St/ Auahi St	Eastbound	B	B	B	B
	Westbound	B	B	A	A
	Northbound	A	A	A	A
	Southbound	A	A	A	A
Cooke St/ Pohukaina St**	Eastbound	B	B	E	E
	Westbound	C	C	C	D
	Northbound	B	B	C	C
	Southbound	B	B	C	D

**Auahi Street east of Ward Avenue realigned with Pohukaina Street west of Ward Avenue*
***Traffic signal system expected to be installed in the future in conjunction with KKMP Increment 2.*

Table 4: Projected Year 2026 (Without and With Project) LOS Traffic Operating Conditions (Cont'd)

Intersection	Approach/ Critical Movement	AM		PM	
		Year 2026		Year 2026	
		w/out Proj	w/ Proj	w/out Proj	w/ Proj
Cooke St/ Halekauwila St	Eastbound	B	B	E	E
	Westbound	B	B	C	C
	Northbound	B	B	C	C
	Southbound	B	B	C	C

Under Year 2026 with project conditions, traffic operations within the project vicinity are generally expected to remain similar to without project conditions with the exception of the intersection of Cooke Street with Pohukaina Street. Traffic operations at the intersection of Cooke Street with Pohukaina Street are expected to operate at slightly lower levels of service during the PM peak period with the addition of site-generated vehicles. However, as noted previously a traffic signal system is expected to be installed at that intersection in the near future along with other roadway and intersection improvements in conjunction with the further development of KKMP Increment 2. The provision of a traffic signal system and modification of the laneage at this intersection to accommodate other multimodal facilities is expected to mitigate future operating conditions at this intersection. In addition, it should be noted that traffic operations at the intersection of Cooke Street and Halekauwila Street should be monitored as development within KKMP Increment 2 progresses to verify if future improvements at this intersection are necessary to improve operating conditions (for all modes).

VI. MULTIMODAL FACILITIES

A. Pedestrian Facilities

1. Methodology

The quality of service assessment performed for pedestrian facilities in this study is based upon the procedures presented in the "Highway Capacity Manual", Transportation Research Board, 2010. Similar to vehicular levels of service, the pedestrian quality of service is based on the concept of Level of Service (LOS) which incorporates performance measures such as speed and

other basic descriptors relating to the characteristics of the intersection including walk time and cycle length at signalized intersections and crosswalk length and conflicting vehicular traffic for unsignalized intersections. The LOS ranges from LOS "A" through "F" with LOS "A" representing the best operating conditions and LOS "F" the worst operating conditions. LOS definitions for pedestrian mode are included in Appendix B.

2. Existing Conditions and Pedestrian LOS

The proposed project is located within the Kakaako neighborhood where there is generally a well-connected grid of sidewalks with marked crosswalks and designated pedestrian phases at most of the intersections within the study area to facilitate pedestrian crossings. The availability of these pedestrian facilities provides connectivity and facilitates access to the various attractions within Kakaako; however, the overall pedestrian environment varies by location. In the immediate vicinity of the Kakaako Block I development, the recently completed developments associated with Increment 1 of the KKMP have incorporated urban design elements to promote pedestrian-oriented spaces including wider pedestrian zones, sidewalk furniture, and other landscaping features to enhance the overall pedestrian environment along the project frontages on Auahi Street, Pohukaina Street, and Keawe Street. Similar elements are expected to be incorporated with the proposed project and discussed later in this report.

East of Cooke Street, along Auahi Street, Pohukaina Street, and Halekauwila Street, the shoulder areas of these roadways outside of the vehicular travel way are generally unimproved. In addition, the presence of perpendicular on-street parking along sections of those roadways further reduces the overall attractiveness and walkability of these areas with pedestrians occasionally needing to utilize the vehicle travel way.

Along the southern perimeter of the study area is Ala Moana Boulevard. Although pedestrian facilities are provided along this regional roadway, the overall pedestrian environment is influenced by the high volume of vehicular traffic along this multi-lane roadway and minimal presence of

trees or other landscaping features, as well as the lack of buffer available between the pedestrian sidewalk and the vehicular travel way.

Table 5 below summarizes the baseline pedestrian levels of service at the intersections within the core study area. LOS calculations are included in Appendix G.

Table 5: Baseline Pedestrian Levels of Service

Intersection	Approach/ Critical Movement	Baseline	
		AM Peak	PM Peak
Ala Moana Blvd/ Ward Ave	Eastbound	C	C
	Westbound	C	C
	Northbound	B	B
	Southbound	B	B
Ala Moana Blvd/ Koula St	Eastbound	C	C
	Westbound	C	C
	Northbound	A	A
Ala Moana Blvd/ Cooke St	Eastbound	C	C
	Westbound	C	C
	Northbound	A	B
	Southbound	B	B
Ward Ave/ Auahi St	Eastbound	B	B
	Westbound	B	B
	Northbound	B	B
	Southbound	B	B
Cooke St/ Auahi St	Northbound	C	D
	Southbound	C	D

It should be noted that a Pedestrian LOS (PLOS) is not provided for the intersections along Cooke Street at Pohukaina Street and Halekauwila Street since these intersections are all-way stop controlled. Motorists at all the approaches of these intersection must come to a complete stop and yield the right-of-way to pedestrians waiting to cross the street. Similarly, PLOS are not provided for the eastbound and westbound approaches of the intersection of Cooke Street with Auahi Street since these approaches are stop-controlled and motorists must yield to pedestrians. As shown in Table 5, the majority of the intersections within the core study area operate at PLOS "C" or better during both peak periods. The PLOS at Cooke Street and Auahi Street is

lower at PLOS "D" since pedestrians at this intersection must wait for sufficient gaps in the traffic stream to cross.

3. With Project Conditions

The projected pedestrian levels of service (PLOS) at the intersections within the core study area are generally expected to remain similar to baseline conditions with the exception of the intersection of Cooke Street and Auahi Street. LOS calculations are included in Appendix H. However, as previously mentioned, there are improvements planned in conjunction with KKMP Increment 2 along Auahi Street and Cooke Street to provide north-south and east-west pedestrian-oriented corridors along with urban design elements to improve the overall pedestrian environment. In addition, in conjunction with the Kakaako Block I development, pedestrian improvements are expected to be implemented on the project frontage along Ala Moana Boulevard, Auahi Street, and Koula Street that are expected to improve connectivity in the immediate vicinity of the project.

4. Other Considerations

The Oahu Pedestrian Plan published by the City and County of Honolulu provides a general framework to create vibrant, safe, and accessible streets on Oahu. The plan includes an inventory of existing pedestrian facilities identifying pedestrian safety issues found along those facilities and a proposed list of walkway improvements. The plan also identifies city streets and off-street paths that provide important connections to transit, schools, employment and commercial centers, and other major destinations which are collectively referred to as the Pedestrian Priority Network. Within the study area of the project, the roadways included in the City's Pedestrian Priority Network include Auahi Street, Cooke Street, Halekauwila Street, Pohukaina Street, and Ward Avenue. The Oahu Pedestrian Plan does not include any focus areas to prioritize the implementation walkway improvements within the study area.

B. Bicycle Facilities

1. Methodology

Bicycle Level of Traffic Stress (LTS) is a metric developed by the Mineta Transportation Institute used to classify a roadway segment or intersection. The LTS ranking system is based on the amount of traffic stress imposed on cyclists based on variables such as street width, the presence of bike lanes and parking lanes, prevailing vehicle speed, and average daily traffic volumes. The Level of Traffic Stress ranges from 1 to 4 and can be assessed for a given segment or intersection via six tables provided by the Mineta Transportation Institute. The general descriptions of the LTS levels are as follows:

- LTS 1: Characterized by strong separation from all except low speed, low volume traffic. Simple crossings. Suitable for children.
- LTS 2: Except in low speed/low volume traffic situations, cyclists have their own place to ride that keeps them from having to interact with traffic except at formal crossings. There is a physical separation from higher speed and multilane traffic. Crossings are easy for an adult to navigate. This refers to a level of traffic stress that most adults can tolerate, particularly those sometimes classified as interested but concerned.
- LTS 3: Involves interaction with moderate speed or multilane traffic, or close proximity to higher speed traffic. Refers to a level of traffic stress acceptable to those classified as enthused and confident.
- LTS 4: Involves interaction with higher speed traffic or close proximity to high-speed traffic. Refers to a level of stress acceptable only to those classified as strong and fearless.

It should be noted that current LTS methodology assumes no traffic stress is imposed on cyclists at signalized intersections. Guidance provided by the Mineta Transportation Institute includes categorizing signalized intersections as a LTS 2.

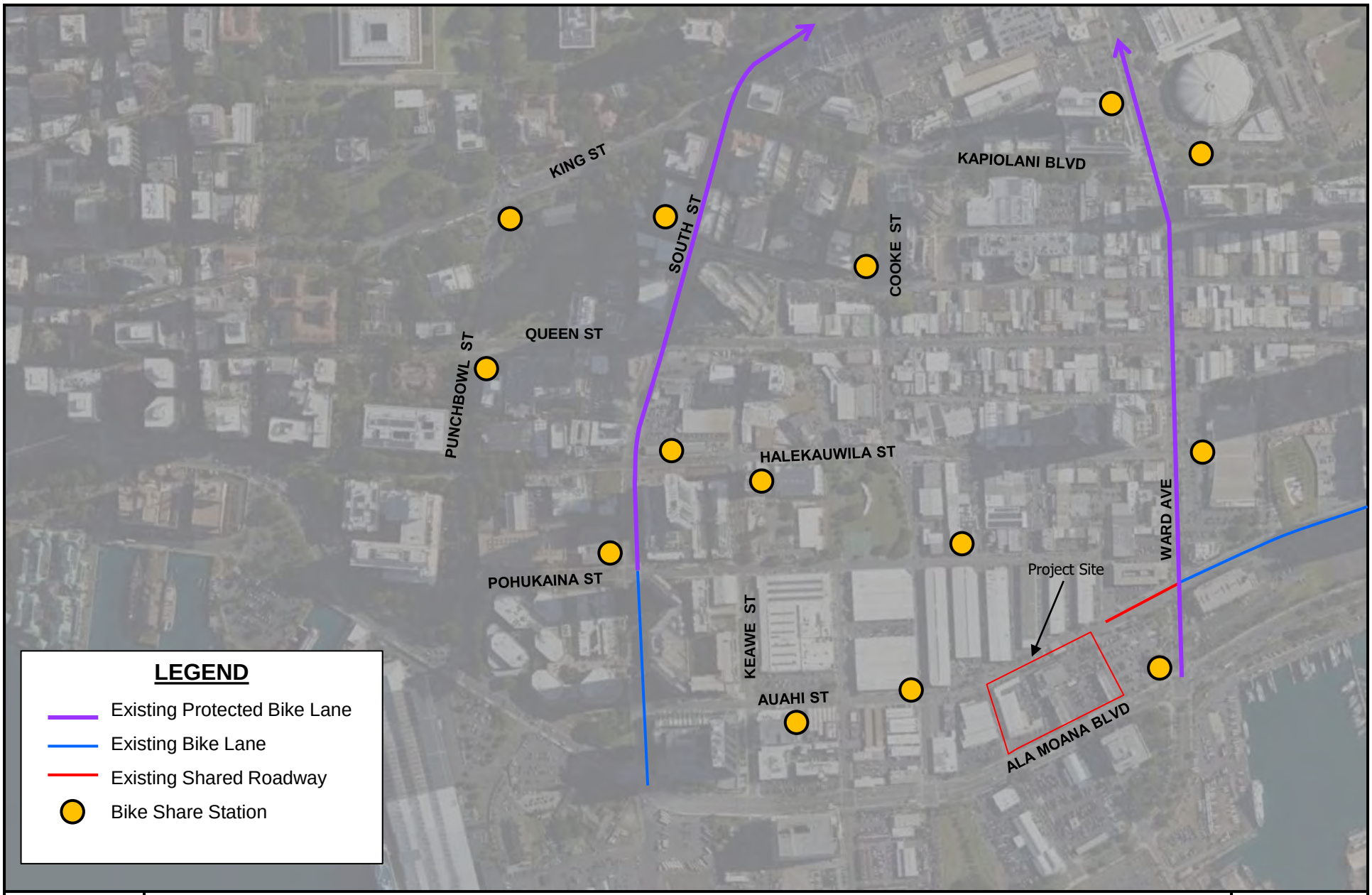
2. Existing Conditions and Bicycle Level of Traffic Stress

The project site is located in close proximity to a number of Biki bike share stations which are operated by Bikeshare Hawaii. A total of 5 bike share stations are located within the KKMP with the nearest bike share stations to Kakaako Block I located along Ala Moana Boulevard near Ward

Avenue and along Auahi Street near Cooke Street. Additionally, there are also several bicycle parking racks provided within the developed blocks of the KKMP. However, bicycle facilities along the study roadways are generally limited. Currently, the existing bike facilities within the study area include protected bike lanes along Ward Avenue between South King Street and Ala Moana Boulevard (see Figure 9). Bicyclists along the remaining study roadways must share the travel way with vehicular traffic. A lack of dedicated or separated facilities could dissuade some bicyclists from utilizing shared facilities. As such, roadways within the project study area were assessed to determine the level of stress imposed upon bicyclists based upon the prevailing speed and geometric characteristics of the roadway.

Along the south edge of the study area, Ala Moana Boulevard is rated LTS 4 due to the lack of dedicated bicycle facilities along this two-directional, multi-lane, high volume roadways, thereby requiring bicyclists to share the travel way with vehicular traffic. West of the proposed project, Cooke Street is rated at LTS 3. Although the prevailing speed along Cooke Street is relatively lower, this roadway also lacks dedicated bicycle facilities with more than one lane of travel along both directions. Similarly, Halekauwila Street and Pohukaina Street are also rated at LTS 3. To the east of the project site, Ward Avenue is rated at LTS 1. The provision of protected bike lanes along this roadway provides physical separation for bicyclists from vehicular traffic making it suitable for bicyclists of at all levels even though these roadways have relatively higher volumes of vehicular traffic. The LTS for the roadways within the study area are depicted in Figure 10.

In general, bicycle connectivity within the study area is influenced by the limited availability of dedicated bicycle facilities in the vicinity. With the exception of Ward Avenue, the majority of the roadways in the vicinity of the project is rated at LTS 3 or 4 which indicate that conditions along these roadways would be suited only for more experienced bicyclists. Although there are protected bike lanes along Ward Avenue, bicyclists must traverse roadways with higher levels of traffic stress in order to access these facilities.



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KAKAAKO BLOCK I

EXISTING BICYCLE FACILITIES

FIGURE 9

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KAKAAKO BLOCK I

EXISTING BICYCLE LEVEL OF TRAFFIC STRESS

FIGURE 10

3. Projected Conditions

The City and County of Honolulu has proposed bikeway projects to enhance existing bicycling conditions in the project area. These improvements are included in the "Oahu Bike Plan" (Updated 2019), published by the City and County of Honolulu Department of Transportation Services. The proposed bikeways adjacent to the project site are shown in Figure 11 and include the following:

- Buffered bike lanes on Auahi Street from South Street to Cooke Street (it should be noted that with the realignment of Auahi Street east of Ward Avenue, the provision of buffered bike lanes should be considered along Pohukaina Street instead to provide a continuous buffered facility)
- Bike lanes on Cooke Street from Ilalo Street to King Street
- Protected bike lanes on Halekauwila Street from Ala Moana Boulevard to Ward Avenue
- Bike lanes on Pohukaina Street from Kamani Street to Punchbowl Street
- Bike lanes on Ala Moana Boulevard from Kalakaua Avenue to Fort Street Mall

Of these proposed bikeways within the City's plan, the KKMP Increment 2 Master Plan is expected to implement the following:

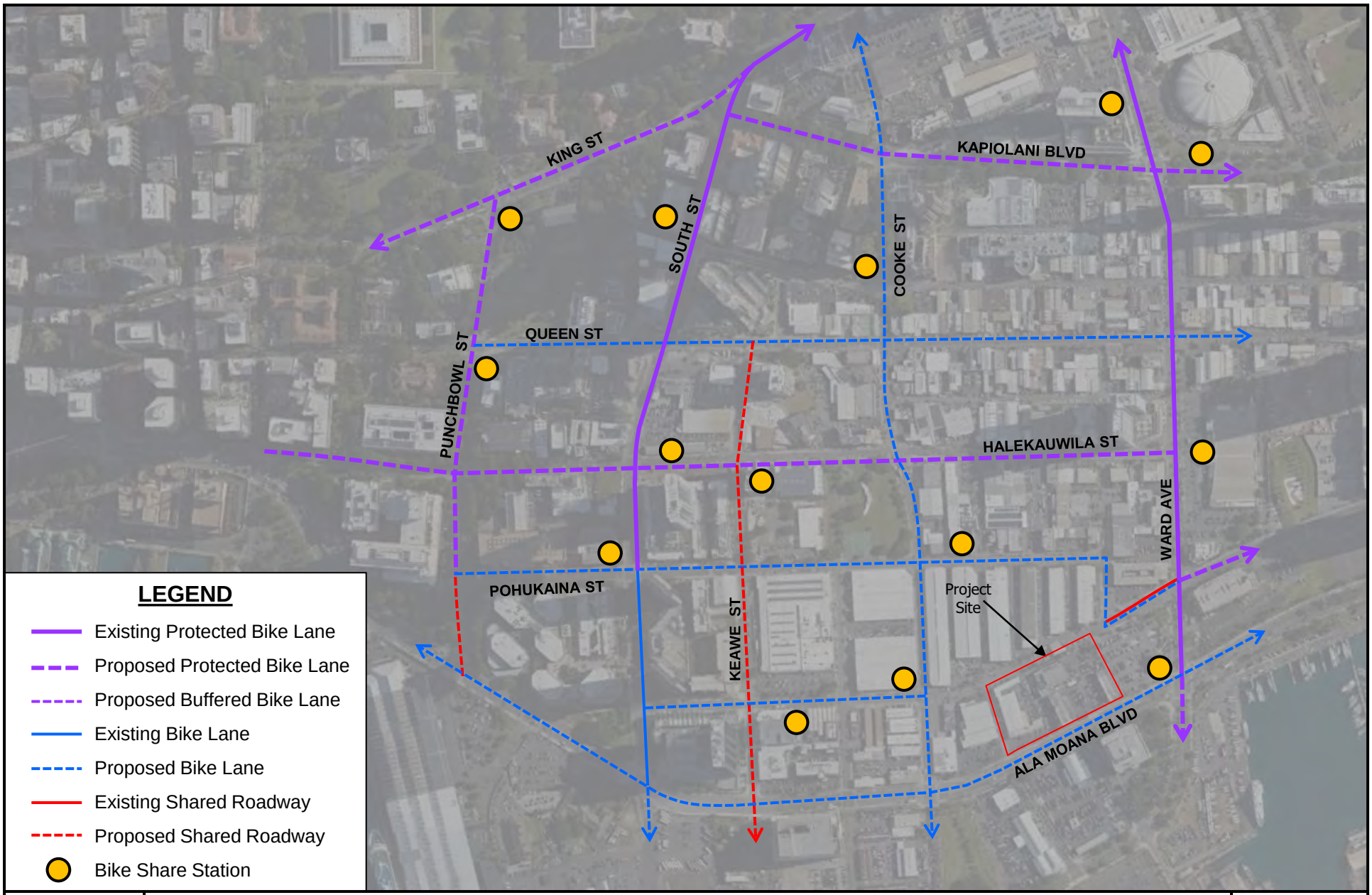
- Bike lanes on Cooke Street from Ala Moana Boulevard to Halekauwila Street
- Bike lanes along Auahi Street from South Street to Cooke Street
- Bike lanes along Pohukaina Street from South Street to Cooke Street

The incorporation of the proposed bicycle facilities—in addition to the other multimodal improvements in the project vicinity—are expected to increase access to dedicated bicycle facilities and reduce the level of traffic stress for bicyclists along the roadways in the project area.

C. Transit Facilities

1. Methodology

Transit Capacity and Quality of Service is a metric used to measure transit availability, comfort, and convenience from both the passenger and transit service provider's points of view. The framework for this metric is outlined in the Transit Cooperative Research Program (TCRP) Report 165: Transit Capacity and Quality of Service Manual (TCQSM), 3rd Edition published in 2013 which provides research-based guidance on public transit



WILSON OKAMOTO CORPORATION

KAKAAKO BLOCK I

EXISTING AND PROPOSED BICYCLE FACILITIES

FIGURE 11

capacity and quality of service. The quality of service concepts and methods contained in the TCQSM address real-world transit operations, comprehensive planning, and design needs. The research for and development of the TCQSM has also directly supported the development of the Multimodal Level of Service (LOS) analysis methodologies introduced in the Highway Capacity Manual (HCM) 2010 and subsequently refined in HCM 6. Multimodal LOS analyzes a roadway corridor comprised of street segments which are defined as a length of street between intersections where traffic may have to stop due to traffic control. Transit LOS can be directly compared to other transportation modes with LOS "A" representing the best quality of service and the letter "F" used to represent the worst quality of service. The assessment evaluates the quality of transit operations incorporating factors that bear all aspect of a transit trip including the pedestrian environment along the street, service frequency and reliability, and the availability of transit amenities at those stop locations.

2. Existing Conditions and Transit LOS

Transit service in the project vicinity is provided by "TheBus" which is operated by the Oahu Transit Services (OTS) for the City and County of Honolulu Department of Transportation Services. The project vicinity is served by several fixed route bus services in the project area which consist of regional routes along Ala Moana Boulevard supplemented by local routes along Pohukaina Street and Ward Avenue. The routes in the project vicinity are summarized in Table 6 below:

Table 6: Transit Routes in the Vicinity of the Project

Route Number	Description
6	Local route that services Nuuanu, Downtown, Kakaako, Moiliili, and Manoa
20	Regional route between Aiea and Waikiki with stops in Kakaako
42	Regional route between Ewa Beach and Waikiki with stops in Kakaako
60	Regional route between Haleiwa-Kaneohe and Downtown with stops in Kakaako

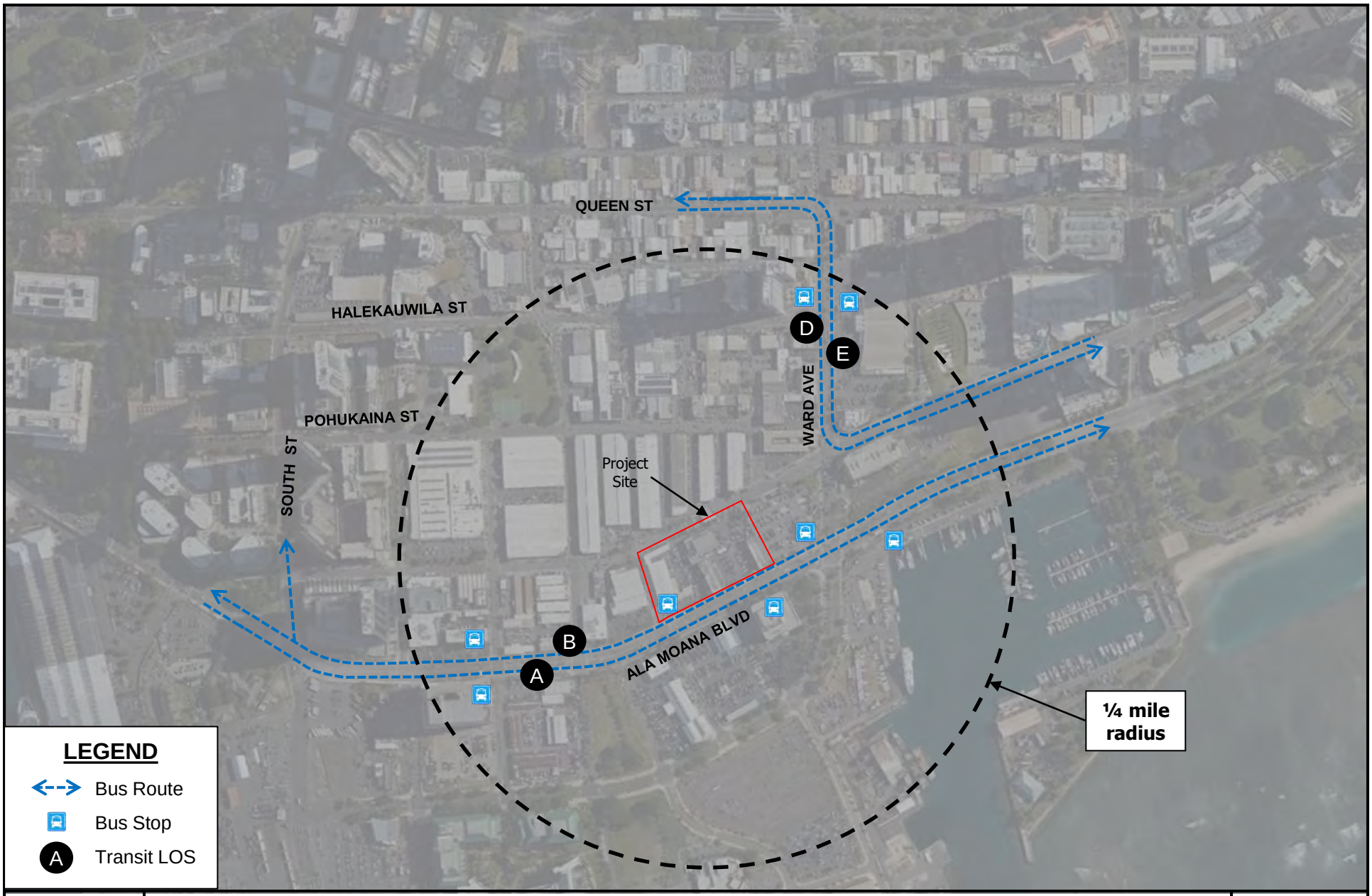
Table 6: Transit Routes in the Vicinity of the Project (Cont'd)

Route Number	Description
65	Regional route between Kaneohe and Downtown with stops in Kakaako
67	Regional route between Waimanalo-Kailua and Downtown with stops in Kakaako

There are approximately 8 transit stops that are served by 6 bus routes within the study area (see Figure 12). Based on the Transit Capacity and Quality of Service Manual (TCQSM), a quarter mile represents the maximum distance that people will walk to a transit stop which is equivalent to approximately 5 minutes of walking time. To verify the existing quality of service for the transit facilities in the project vicinity, an assessment of these facilities was conducted based on the methodology outlined by the TCQSM. Transit service on Ala Moana Boulevard is rated at LOS "B" or better as this roadway is frequently served by local, regional, and express routes. Along Ward Avenue, transit service along that roadway is rated at a LOS "E" in the northbound direction and LOS "D" in the southbound direction since it is only served by single local bus route with headways of 1 hour. Transit LOS calculations are included in Appendix I.

3. Projected Conditions

The City and County of Honolulu is currently constructing a fixed guideway transit system that will extend from East Kapolei to Ala Moana Center or to Kakaako thereby providing an alternate mode of travel through the area. Within the proposed study area, the guideway alignment is expected to run along Halekauwila Street with the Civic Center transit station (Kaakaukukui) to be located in close proximity to the project site between South Street and Keawe Street. In conjunction with the planned transit system, bus routes will be modified to provide connections to/from the transit station. At this writing, the planned transit system is expected to be completed by Year 2031 or later, several years after the completion of the proposed Block I project.



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KAKAAKO BLOCK I

TRANSIT FACILITIES AND TRANSIT LOS

FIGURE 12

VII. RECOMMENDATIONS

Based on the analysis of the traffic data, the following are the recommendations of this study to be implemented in conjunction with the proposed project.

1. Provide sufficient sight distances for motorists to safely enter and exit the project driveways to ensure pedestrians, bicyclists, and motorists are aware of the presence of each other at these conflict points.

2. Provide adequate on-site loading and off-loading service areas and prohibit off-site loading operations on the public roadways.

3. Provide adequate turn-around areas for service, delivery, and refuse collection vehicles to maneuver on-site and prohibit vehicle-reversing maneuvers onto Ala Moana Boulevard or any public street. Consider monitoring the loading area to assist vehicles navigating in and out of the loading area and further minimize any potential conflict between vehicles, bicyclists, and pedestrians.

4. Provide sufficient turning radii at all project driveways to avoid or minimize vehicle encroachments to oncoming traffic lanes.

5. Restrict the project driveways off Ala Moana Boulevard to right-turn in right-turn out movements only. Provide adequate channelization to direct vehicles entering and exiting the driveway. The specific configuration shall be determined during the design phase.

6. Provide a right-turn pullout lane along Ala Moana Boulevard at the primary project driveway to facilitate turning vehicles entering the project site and minimize impact to through traffic flow along Ala Moana Boulevard. The specific configuration shall be determined during the design phase.

7. If access to the parking garage is restricted or controlled, provide sufficient storage for entering vehicles at the parking area access controls (i.e. automatic gate, etc.) to ensure that queues do not extend onto the adjacent roadways.

8. Provide signage to indicate the designation of vehicular access points for the residential, retail, and delivery/service uses.

9. Restrict parking along the project frontages of adjacent roadways to facilitate through traffic movements and to ensure adequate sight distances for entering and exiting vehicles at driveways along these roadways.

10. Provide sufficient sidewalk width along the project frontage on Ala Moana Boulevard, as well as urban design elements such as landscaping treatments, trees that provide shade, and other amenities to improve the overall pedestrian environment in the vicinity of the project. The specific sidewalk width shall be determined during the design phase.

11. Locate the pedestrian crossing of the main access driveway on Ala Moana Boulevard a sufficient distance away from the roadway to minimize conflict with vehicular turning movements. The specific configuration shall be determined during the design phase.

12. Provide improved pedestrian facilities along Koula Street and Auahi Street to facilitate pedestrian access to and from the surrounding uses. In addition, provide adequate pedestrian connections between the on-site uses and off-site facilities. All pedestrian facilities and connections should be made accessible in conformance with the American with Disabilities Act (ADA).

13. Coordinate with the developers of the adjacent Ward Village Development (Howard Hughes) to the east and the KKMP Increment 2 development (Kamehameha Schools) to the west with regards to the planned pedestrian facilities along Auahi Street to ensure connectivity of improved pedestrian facilities between these developments.

14. Coordinate with Kamehameha Schools and the KKMP Increment 2 development with regards to connectivity of their planned multimodal improvements along Cooke Street. As previously discussed, these improvements include modification of Cooke Street between Pohukaina Street and Auahi Street to reduce the number of travel lanes in each direction with left turn-bays at the intersections with Auahi Street and Pohukaina Street; installation of bike lanes; and provision of enhanced pedestrian facilities.

15. Coordinate with the developers of KKMP Increment 2 to determine the project's fair share of the intersection improvements planned at Cooke Street and Pohukaina Street. As previously discussed, a traffic signal system is expected to be installed at that intersection to accommodate projected traffic conditions as result of the development of the overall KKMP Increment 2.

16. Coordinate with the City and County of Honolulu Department of Transportation Services and the State of Hawaii Department of Transportation to assist with their development of other bicycle facilities proposed by the City and State bike plans. In addition, provide bicycle facilities within the project boundaries including designated and secured bicycle parking to encourage the use of alternate modes of travel.

17. Coordinate with the City and County of Honolulu Department of Transportation Services and Oahu Transit Services to ensure the smooth continuation of public transportation services within the project vicinity including the nearest bus stop located on Ala Moana Boulevard near the intersection with Koula Street. Consideration should be given to the provision of enhanced amenities at that bus stop location such as a bus shelter and other sidewalk furniture to encourage the use of this alternative mode of transportation.

18. Coordinate with the State of Hawaii Department of Transportation to incorporate any potential roadway setback requirements and access locations along Ala Moana Boulevard fronting the project site. The roadway setback and access driveway locations may impact maneuverability at the project driveways, as well as other transportation systems and travel modes.

19. Prepare a Transportation Management Plan which includes traffic circulation, parking, loading, and traffic demand management strategies to minimize the impact of the project on the surrounding roadway network. Consideration should be given to coordinating the Transportation Demand Management (TDM) Plan with the other developments associated with the overall KKMP Increment 2.

20. Prepare a Construction Management Plan (CMP) for the project given that the anticipated completion dates of a number of developments and other improvements associated with the KKMP Increment 2 may overlap. The CMP should include discussions regarding the anticipated construction schedule and phasing to minimize overlapping closures, as well as traffic circulation, traffic control, and parking for all transportation modes during the construction period.

VIII. CONCLUSION

The Kakaako Block I development is part of the overall Kaiāulu ʻo Kakaʻako Master Plan Increment 2 and entails the replacement of existing uses to include residential and retail uses. The Kakaako Block I development is expected to be completed by Year 2026 with access provided via driveways off Ala Moana Boulevard and Auahi Street. In conjunction with the overall Master Plan, a number of improvements are planned to alleviate projected traffic conditions including laneage modifications along Cooke Street, installation of a traffic signal system at the intersection with Pohukaina Street and multimodal improvements to provide enhanced pedestrian and bicycle facilities in the vicinity of the project and promote alternative modes of travel. As such, with the implementation of the aforementioned recommendations, traffic operations with the Kakaako Block I development are generally expected to remain similar to without project conditions. Although traffic conditions are expected to remain similar to without project conditions, the proposed project is located within an area that is currently undergoing redevelopment with higher density mixed-used developments expected in the vicinity of the project. As such, coordination with the adjacent developments, as well as with the appropriate State of Hawaii and City and County agencies, with the regards to the planned multimodal improvements is recommended to ensure connectivity of the planned multimodal facilities and to promote the use of alternative modes

of transportation. In addition, the preparation of Transportation Management Plan that includes traffic circulation, parking, loading, and traffic demand management strategies is also recommended to further minimize the effect of the project on the surrounding roadways.

APPENDIX A

BASELINE TRAFFIC COUNT DATA

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: DY, YS
Counters: D4-3890, D4-5671
Weather: CLEAR

File Name : ALA WAR AM
Site Code : 00000004
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted

	Ward Avenue Southbound					Ala Moana Boulevard Westbound					Ward Avenue Northbound					Ala Moana Boulevard Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	38	17	15	0	70	13	157	11	5	186	0	3	3	0	6	62	358	0	4	424	686
06:15 AM	21	22	9	3	55	6	188	11	5	210	0	2	4	5	11	93	342	0	3	438	714
06:30 AM	28	23	12	2	65	10	256	22	6	294	0	3	4	5	12	55	375	2	5	437	808
06:45 AM	36	30	28	1	95	10	301	29	2	342	0	4	3	1	8	66	542	1	3	612	1057
Total	123	92	64	6	285	39	902	73	18	1032	0	12	14	11	37	276	1617	3	15	1911	3265
07:00 AM	44	30	28	6	108	10	343	26	4	383	0	6	12	7	25	108	469	1	5	583	1099
07:15 AM	29	25	35	3	92	19	427	37	2	485	0	14	10	4	28	79	418	6	1	504	1109
07:30 AM	50	33	42	5	130	21	386	46	7	460	0	8	7	6	21	76	495	1	4	576	1187
07:45 AM	39	34	40	2	115	31	415	42	1	489	2	7	14	1	24	88	496	1	1	586	1214
Total	162	122	145	16	445	81	1571	151	14	1817	2	35	43	18	98	351	1878	9	11	2249	4609
08:00 AM	34	14	34	4	86	18	358	37	3	416	0	8	9	2	19	129	591	3	5	728	1249
08:15 AM	39	42	10	3	94	21	365	47	8	441	1	15	9	2	27	76	412	1	6	495	1057
08:30 AM	30	43	34	2	109	30	293	47	3	373	0	11	6	4	21	129	585	1	2	717	1220
08:45 AM	0	0	0	0	0	18	291	33	4	346	0	14	15	0	29	3	0	0	0	3	378
Total	103	99	78	9	289	87	1307	164	18	1576	1	48	39	8	96	337	1588	5	13	1943	3904
Grand Total	388	313	287	31	1019	207	3780	388	50	4425	3	95	96	37	231	964	5083	17	39	6103	11778
Apprch %	38.1	30.7	28.2	3		4.7	85.4	8.8	1.1		1.3	41.1	41.6	16		15.8	83.3	0.3	0.6		
Total %	3.3	2.7	2.4	0.3	8.7	1.8	32.1	3.3	0.4	37.6	0	0.8	0.8	0.3	2	8.2	43.2	0.1	0.3	51.8	

	Ward Avenue Southbound				Ala Moana Boulevard Westbound				Ward Avenue Northbound				Ala Moana Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	29	25	35	89	19	427	37	483	0	14	10	24	79	418	6	503	1099
07:30 AM	50	33	42	125	21	386	46	453	0	8	7	15	76	495	1	572	1165
07:45 AM	39	34	40	113	31	415	42	488	2	7	14	23	88	496	1	585	1209
08:00 AM	34	14	34	82	18	358	37	413	0	8	9	17	129	591	3	723	1235
Total Volume	152	106	151	409	89	1586	162	1837	2	37	40	79	372	2000	11	2383	4708
% App. Total	37.2	25.9	36.9		4.8	86.3	8.8		2.5	46.8	50.6		15.6	83.9	0.5		
PHF	.760	.779	.899	.818	.718	.929	.880	.941	.250	.661	.714	.823	.721	.846	.458	.824	.953

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: DY, HM
Counters: D4-3890, D4-5671
Weather: CLEAR

File Name : ALA WAR PM
Site Code : 00000004
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted

	Ward Avenue Southbound					Ala Moana Boulevard Westbound					Ward Avenue Northbound					Ala Moana Boulevard Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	29	16	73	6	124	17	304	43	3	367	0	17	11	5	33	61	350	1	2	414	938
03:15 PM	46	10	88	13	157	12	384	35	6	437	0	21	10	8	39	47	415	0	3	465	1098
03:30 PM	49	13	94	6	162	15	330	48	3	396	2	22	23	1	48	70	439	0	2	511	1117
03:45 PM	45	20	56	4	125	8	250	102	6	366	1	18	19	5	43	40	435	1	4	480	1014
Total	169	59	311	29	568	52	1268	228	18	1566	3	78	63	19	163	218	1639	2	11	1870	4167
04:00 PM	49	10	39	5	103	5	290	49	8	352	1	18	23	10	52	45	467	0	8	520	1027
04:15 PM	47	15	44	4	110	12	346	32	7	397	1	19	28	5	53	56	469	0	5	530	1090
04:30 PM	71	19	55	6	151	13	287	81	11	392	3	32	38	3	76	45	427	2	8	482	1101
04:45 PM	48	14	54	16	132	12	311	50	6	379	1	19	34	12	66	36	498	0	10	544	1121
Total	215	58	192	31	496	42	1234	212	32	1520	6	88	123	30	247	182	1861	2	31	2076	4339
05:00 PM	68	11	63	8	150	16	279	44	15	354	4	27	51	7	89	53	366	0	2	421	1014
05:15 PM	68	20	53	8	149	13	355	51	7	426	1	34	36	10	81	35	451	0	4	490	1146
05:30 PM	63	18	56	3	140	6	309	54	6	375	0	19	26	12	57	43	486	2	3	534	1106
05:45 PM	69	11	59	5	144	10	301	37	12	360	0	16	24	10	50	43	420	0	1	464	1018
Total	268	60	231	24	583	45	1244	186	40	1515	5	96	137	39	277	174	1723	2	10	1909	4284
Grand Total	652	177	734	84	1647	139	3746	626	90	4601	14	262	323	88	687	574	5223	6	52	5855	12790
Apprch %	39.6	10.7	44.6	5.1		3	81.4	13.6	2		2	38.1	47	12.8		9.8	89.2	0.1	0.9		
Total %	5.1	1.4	5.7	0.7	12.9	1.1	29.3	4.9	0.7	36	0.1	2	2.5	0.7	5.4	4.5	40.8	0	0.4	45.8	

	Ward Avenue Southbound				Ala Moana Boulevard Westbound				Ward Avenue Northbound				Ala Moana Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	48	14	54	116	12	311	50	373	1	19	34	54	36	498	0	534	1077
05:00 PM	68	11	63	142	16	279	44	339	4	27	51	82	53	366	0	419	982
05:15 PM	68	20	53	141	13	355	51	419	1	34	36	71	35	451	0	486	1117
05:30 PM	63	18	56	137	6	309	54	369	0	19	26	45	43	486	2	531	1082
Total Volume	247	63	226	536	47	1254	199	1500	6	99	147	252	167	1801	2	1970	4258
% App. Total	46.1	11.8	42.2		3.1	83.6	13.3		2.4	39.3	58.3		8.5	91.4	0.1		
PHF	.908	.788	.897	.944	.734	.883	.921	.895	.375	.728	.721	.768	.788	.904	.250	.922	.953

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:DY, CY
Counters:TU-0652, TU-0651
Weather:Clear

File Name : KouAla AM
Site Code : 00000002
Start Date : 3/5/2015
Page No : 1

Groups Printed- Unshifted

	Koula Street Southbound					Ala Moana Boulevard Westbound					Koula Street Northbound					Ala Moana Boulevard Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	2	1	0	2	5	3	188	2	2	195	1	0	0	3	4	1	254	4	0	259	463
06:15 AM	1	0	2	6	9	2	235	1	4	242	2	0	1	2	5	3	310	5	0	318	574
06:30 AM	1	1	0	4	6	1	282	2	2	287	1	0	0	2	3	2	320	1	0	323	619
06:45 AM	1	0	4	10	15	3	319	2	7	331	0	0	0	4	4	4	368	3	0	375	725
Total	5	2	6	22	35	9	1024	7	15	1055	4	0	1	11	16	10	1252	13	0	1275	2381
07:00 AM	0	2	1	7	10	5	381	2	2	390	0	0	0	3	3	1	380	2	0	383	786
07:15 AM	2	0	1	7	10	4	409	1	3	417	0	0	0	3	3	1	413	3	0	417	847
07:30 AM	2	2	3	6	13	2	389	1	11	403	0	0	0	6	6	2	404	1	0	407	829
07:45 AM	3	1	3	1	8	11	462	3	3	479	3	0	1	3	7	3	356	1	0	360	854
Total	7	5	8	21	41	22	1641	7	19	1689	3	0	1	15	19	7	1553	7	0	1567	3316
08:00 AM	1	0	2	4	7	6	422	3	3	434	1	0	1	7	9	2	385	0	0	387	837
08:15 AM	3	1	4	7	15	4	421	4	7	436	1	0	0	2	3	5	305	4	0	314	768
08:30 AM	2	0	4	5	11	1	351	5	3	360	1	0	1	3	5	3	274	2	0	279	655
08:45 AM	1	0	6	9	16	3	280	6	3	292	0	0	0	3	3	3	285	3	0	291	602
Total	7	1	16	25	49	14	1474	18	16	1522	3	0	2	15	20	13	1249	9	0	1271	2862
Grand Total	19	8	30	68	125	45	4139	32	50	4266	10	0	4	41	55	30	4054	29	0	4113	8559
Apprch %	15.2	6.4	24	54.4		1.1	97	0.8	1.2		18.2	0	7.3	74.5		0.7	98.6	0.7	0		
Total %	0.2	0.1	0.4	0.8	1.5	0.5	48.4	0.4	0.6	49.8	0.1	0	0	0.5	0.6	0.4	47.4	0.3	0	48.1	

	Koula Street Southbound				Ala Moana Boulevard Westbound				Koula Street Northbound				Ala Moana Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	2	0	1	3	4	409	1	414	0	0	0	0	1	**413**	**3**	**417**	834
07:30 AM	2	**2**	**3**	**7**	2	389	1	392	0	0	0	0	2	404	1	407	806
07:45 AM	**3**	1	3	7	**11**	**462**	**3**	**476**	**3**	0	**1**	**4**	**3**	356	1	360	**847**
08:00 AM	1	0	2	3	6	422	3	431	1	0	1	2	2	385	0	387	823
Total Volume	8	3	9	20	23	1682	8	1713	4	0	2	6	8	1558	5	1571	3310
% App. Total	40	15	45		1.3	98.2	0.5		66.7	0	33.3		0.5	99.2	0.3		
PHF	.667	.375	.750	.714	.523	.910	.667	.900	.333	.000	.500	.375	.667	.943	.417	.942	.977

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, Hi 96826

Counted By:DY, CY
Counters:TU-0651, TU-0652
Weather:Clear

File Name : KouAla PM
Site Code : 00000002
Start Date : 3/5/2015
Page No : 1

Groups Printed- Unshifted

	Koula Street Southbound					Ala Moana Boulevard Westbound					Koula Street Northbound					Ala Moana Boulevard Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	6	0	1	3	10	2	358	2	0	362	0	0	1	6	7	4	451	8	0	463	842
03:15 PM	6	2	6	2	16	1	372	1	3	377	2	0	1	3	6	6	421	0	0	427	826
03:30 PM	3	0	2	8	13	3	390	7	2	402	1	1	0	5	7	1	528	1	0	530	952
03:45 PM	5	0	2	6	13	3	430	6	5	444	1	0	0	5	6	2	525	1	0	528	991
Total	20	2	11	19	52	9	1550	16	10	1585	4	1	2	19	26	13	1925	10	0	1948	3611
04:00 PM	6	0	4	6	16	1	372	11	6	390	4	5	1	6	16	6	486	4	0	496	918
04:15 PM	6	1	3	15	25	3	479	6	2	490	0	4	1	1	6	7	461	0	0	468	989
04:30 PM	4	0	4	7	15	0	366	11	4	381	4	1	0	7	12	0	512	1	0	513	921
04:45 PM	9	0	5	5	19	3	334	4	3	344	0	0	0	0	0	3	470	1	0	474	837
Total	25	1	16	33	75	7	1551	32	15	1605	8	10	2	14	34	16	1929	6	0	1951	3665
05:00 PM	8	4	3	7	22	0	371	5	3	379	1	3	1	8	13	4	516	1	0	521	935
05:15 PM	6	0	1	8	15	3	370	6	8	387	0	0	0	7	7	6	534	2	0	542	951
05:30 PM	2	1	3	5	11	1	361	5	5	372	5	0	0	8	13	13	501	3	0	517	913
05:45 PM	4	0	7	12	23	17	364	8	11	400	1	0	0	2	3	4	534	2	0	540	966
Total	20	5	14	32	71	21	1466	24	27	1538	7	3	1	25	36	27	2085	8	0	2120	3765
Grand Total	65	8	41	84	198	37	4567	72	52	4728	19	14	5	58	96	56	5939	24	0	6019	11041
Apprch %	32.8	4	20.7	42.4		0.8	96.6	1.5	1.1		19.8	14.6	5.2	60.4		0.9	98.7	0.4	0		
Total %	0.6	0.1	0.4	0.8	1.8	0.3	41.4	0.7	0.5	42.8	0.2	0.1	0	0.5	0.9	0.5	53.8	0.2	0	54.5	

	Koula Street Southbound				Ala Moana Boulevard Westbound				Koula Street Northbound				Ala Moana Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:30 PM																	
03:30 PM	3	0	2	5	**3**	390	7	400	1	1	0	2	1	**528**	1	**530**	937
03:45 PM	5	0	2	7	3	430	6	439	1	0	0	1	2	525	1	528	**975**
04:00 PM	**6**	0	**4**	**10**	1	372	**11**	384	**4**	**5**	**1**	**10**	6	486	**4**	496	900
04:15 PM	6	**1**	3	10	3	**479**	6	**488**	0	4	1	5	**7**	461	0	468	971
Total Volume	20	1	11	32	10	1671	30	1711	6	10	2	18	16	2000	6	2022	3783
% App. Total	62.5	3.1	34.4		0.6	97.7	1.8		33.3	55.6	11.1		0.8	98.9	0.3		
PHF	.833	.250	.688	.800	.833	.872	.682	.877	.375	.500	.500	.450	.571	.947	.375	.954	.970

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: MM, DY
Counters: D4-5675, D4-5674
Weather: CLEAR

File Name : ALA COO AM
Site Code : 00000005
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted

	Cooke Street Southbound					Ala Moana Boulevard Westbound					Cooke Street Northbound					Ala Moana Boulevard Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	4	1	6	1	12	0	140	3	0	143	0	0	0	3	3	7	237	2	1	247	405
06:15 AM	5	3	10	5	23	1	196	6	0	203	3	3	0	3	9	18	294	4	1	317	552
06:30 AM	7	7	9	4	27	6	248	8	3	265	3	4	0	6	13	21	323	7	0	351	656
06:45 AM	6	2	9	2	19	2	296	13	1	312	2	3	1	4	10	22	447	4	6	479	820
Total	22	13	34	12	81	9	880	30	4	923	8	10	1	16	35	68	1301	17	8	1394	2433
07:00 AM	4	3	12	2	21	1	378	16	1	396	4	4	0	4	12	10	412	8	0	430	859
07:15 AM	3	6	13	1	23	4	348	9	1	362	3	6	1	2	12	19	428	4	2	453	850
07:30 AM	13	0	21	4	38	2	448	10	3	463	2	3	1	3	9	15	426	6	1	448	958
07:45 AM	6	10	17	3	36	4	416	12	0	432	5	4	3	1	13	23	458	7	1	489	970
Total	26	19	63	10	118	11	1590	47	5	1653	14	17	5	10	46	67	1724	25	4	1820	3637
08:00 AM	11	4	10	4	29	3	455	21	0	479	0	6	1	3	10	17	453	7	0	477	995
08:15 AM	12	7	13	0	32	4	325	17	0	346	5	6	2	2	15	9	450	9	3	471	864
08:30 AM	8	7	20	3	38	2	286	14	0	302	7	7	1	6	21	21	414	10	4	449	810
08:45 AM	8	5	14	8	35	6	337	9	3	355	2	4	1	1	8	20	444	9	1	474	872
Total	39	23	57	15	134	15	1403	61	3	1482	14	23	5	12	54	67	1761	35	8	1871	3541
Grand Total	87	55	154	37	333	35	3873	138	12	4058	36	50	11	38	135	202	4786	77	20	5085	9611
Apprch %	26.1	16.5	46.2	11.1		0.9	95.4	3.4	0.3		26.7	37	8.1	28.1		4	94.1	1.5	0.4		
Total %	0.9	0.6	1.6	0.4	3.5	0.4	40.3	1.4	0.1	42.2	0.4	0.5	0.1	0.4	1.4	2.1	49.8	0.8	0.2	52.9	

	Cooke Street Southbound				Ala Moana Boulevard Westbound				Cooke Street Northbound				Ala Moana Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	13	0	21	34	2	448	10	460	2	3	1	6	15	426	6	447	947
07:45 AM	6	10	17	33	4	416	12	432	5	4	3	12	23	458	7	488	965
08:00 AM	11	4	10	25	3	455	21	479	0	6	1	7	17	453	7	477	988
08:15 AM	12	7	13	32	4	325	17	346	5	6	2	13	9	450	9	468	859
Total Volume	42	21	61	124	13	1644	60	1717	12	19	7	38	64	1787	29	1880	3759
% App. Total	33.9	16.9	49.2		0.8	95.7	3.5		31.6	50	18.4		3.4	95.1	1.5		
PHF	.808	.525	.726	.912	.813	.903	.714	.896	.600	.792	.583	.731	.696	.975	.806	.963	.951

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: GH, DY
Counters: D4-5675, D4-5674
Weather: CLEAR

File Name : ALA COO PM
Site Code : 00000005
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted

	Cooke Street Southbound					Ala Moana Boulevard Westbound					Cooke Street Northbound					Ala Moana Boulevard Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	3	4	34	3	44	3	417	15	0	435	5	7	7	3	22	13	430	5	0	448	949
03:15 PM	5	6	34	5	50	1	394	15	7	417	7	10	1	7	25	15	462	7	4	488	980
03:30 PM	9	1	40	5	55	1	340	12	5	358	13	7	2	9	31	11	504	7	5	527	971
03:45 PM	8	7	34	7	56	2	358	18	2	380	10	5	6	6	27	9	483	4	7	503	966
Total	25	18	142	20	205	7	1509	60	14	1590	35	29	16	25	105	48	1879	23	16	1966	3866
04:00 PM	17	2	22	3	44	0	319	8	3	330	5	9	2	5	21	5	509	3	6	523	918
04:15 PM	13	12	39	2	66	0	431	12	3	446	8	9	5	2	24	13	527	3	7	550	1086
04:30 PM	14	3	44	9	70	1	358	11	2	372	6	7	4	8	25	12	480	2	8	502	969
04:45 PM	13	6	39	3	61	2	381	19	3	405	2	9	4	8	23	15	483	2	7	507	996
Total	57	23	144	17	241	3	1489	50	11	1553	21	34	15	23	93	45	1999	10	28	2082	3969
05:00 PM	12	7	40	14	73	0	315	20	2	337	5	9	1	8	23	9	471	4	8	492	925
05:15 PM	15	6	34	7	62	2	379	12	1	394	5	15	4	13	37	10	480	1	17	508	1001
05:30 PM	11	3	26	10	50	0	334	17	5	356	6	9	3	11	29	7	527	6	4	544	979
05:45 PM	12	6	24	8	50	1	273	17	2	293	4	7	2	9	22	11	502	6	1	520	885
Total	50	22	124	39	235	3	1301	66	10	1380	20	40	10	41	111	37	1980	17	30	2064	3790
Grand Total	132	63	410	76	681	13	4299	176	35	4523	76	103	41	89	309	130	5858	50	74	6112	11625
Apprch %	19.4	9.3	60.2	11.2		0.3	95	3.9	0.8		24.6	33.3	13.3	28.8		2.1	95.8	0.8	1.2		
Total %	1.1	0.5	3.5	0.7	5.9	0.1	37	1.5	0.3	38.9	0.7	0.9	0.4	0.8	2.7	1.1	50.4	0.4	0.6	52.6	

	Cooke Street Southbound				Ala Moana Boulevard Westbound				Cooke Street Northbound				Ala Moana Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	17	2	22	41	0	319	8	327	5	9	2	16	5	509	3	517	901
04:15 PM	13	12	39	64	0	431	12	443	8	9	5	22	13	527	3	543	1072
04:30 PM	14	3	44	61	1	358	11	370	6	7	4	17	12	480	2	494	942
04:45 PM	13	6	39	58	2	381	19	402	2	9	4	15	15	483	2	500	975
Total Volume	57	23	144	224	3	1489	50	1542	21	34	15	70	45	1999	10	2054	3890
% App. Total	25.4	10.3	64.3		0.2	96.6	3.2		30	48.6	21.4		2.2	97.3	0.5		
PHF	.838	.479	.818	.875	.375	.864	.658	.870	.656	.944	.750	.795	.750	.948	.833	.946	.907

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: MM, EV
Counters: D4-3888, D4-5675
Weather: CLEAR

File Name : WAR AUA AM
Site Code : 00000003
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted

	Ward Avenue Southbound					Auahi Street Westbound					Ward Avenue Northbound					Auahi Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	29	65	5	5	104	5	9	8	14	36	4	30	15	2	51	2	2	5	10	19	210
06:15 AM	28	48	8	4	88	3	4	10	10	27	6	26	24	10	66	2	4	4	11	21	202
06:30 AM	17	58	5	12	92	11	3	9	14	37	9	35	20	3	67	2	5	8	8	23	219
06:45 AM	19	78	8	3	108	5	8	9	7	29	14	48	12	6	80	1	9	4	8	22	239
Total	93	249	26	24	392	24	24	36	45	129	33	139	71	21	264	7	20	21	37	85	870
07:00 AM	16	63	3	3	85	18	11	11	8	48	19	54	5	3	81	3	9	4	5	21	235
07:15 AM	12	85	14	1	112	11	22	15	6	54	18	69	12	2	101	4	9	7	1	21	288
07:30 AM	9	105	11	3	128	15	14	10	6	45	18	73	6	1	98	6	5	17	2	30	301
07:45 AM	15	90	12	5	122	26	18	14	6	64	12	75	6	3	96	3	12	7	2	24	306
Total	52	343	40	12	447	70	65	50	26	211	67	271	29	9	376	16	35	35	10	96	1130
08:00 AM	15	85	7	5	112	12	17	17	5	51	11	61	13	1	86	4	6	5	5	20	269
08:15 AM	18	78	8	3	107	13	11	11	11	46	17	69	14	0	100	4	8	3	2	17	270
08:30 AM	11	67	13	6	97	13	8	16	3	40	19	92	12	0	123	6	18	10	3	37	297
08:45 AM	18	84	11	7	120	11	15	9	7	42	11	67	21	3	102	5	19	6	5	35	299
Total	62	314	39	21	436	49	51	53	26	179	58	289	60	4	411	19	51	24	15	109	1135
Grand Total	207	906	105	57	1275	143	140	139	97	519	158	699	160	34	1051	42	106	80	62	290	3135
Apprch %	16.2	71.1	8.2	4.5		27.6	27	26.8	18.7		15	66.5	15.2	3.2		14.5	36.6	27.6	21.4		
Total %	6.6	28.9	3.3	1.8	40.7	4.6	4.5	4.4	3.1	16.6	5	22.3	5.1	1.1	33.5	1.3	3.4	2.6	2	9.3	

	Ward Avenue Southbound				Auahi Street Westbound				Ward Avenue Northbound				Auahi Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	12	85	14	111	11	22	15	48	18	69	12	99	4	9	7	20	278
07:30 AM	9	105	11	125	15	14	10	39	18	73	6	97	6	5	17	28	289
07:45 AM	15	90	12	117	26	18	14	58	12	75	6	93	3	12	7	22	290
08:00 AM	15	85	7	107	12	17	17	46	11	61	13	85	4	6	5	15	253
Total Volume	51	365	44	460	64	71	56	191	59	278	37	374	17	32	36	85	1110
% App. Total	11.1	79.3	9.6		33.5	37.2	29.3		15.8	74.3	9.9		20	37.6	42.4		
PHF	.850	.869	.786	.920	.615	.807	.824	.823	.819	.927	.712	.944	.708	.667	.529	.759	.957

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: BE, EV
Counters: D4-3889, D4-5675
Weather: CLEAR

File Name : WAR AUA PM
Site Code : 00000003
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted

	Ward Avenue Southbound					Auahi Street Westbound					Ward Avenue Northbound					Auahi Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	27	90	16	35	168	41	22	45	8	116	14	77	14	1	106	6	19	11	2	38	428
03:15 PM	26	91	16	23	156	59	14	55	13	141	11	57	15	3	86	9	19	15	4	47	430
03:30 PM	26	86	15	29	156	57	14	54	26	151	15	86	22	13	136	8	21	15	14	58	501
03:45 PM	22	83	13	5	123	29	11	41	9	90	16	63	12	4	95	9	22	13	8	52	360
Total	101	350	60	92	603	186	61	195	56	498	56	283	63	21	423	32	81	54	28	195	1719
04:00 PM	34	82	11	15	142	19	25	35	7	86	9	74	14	3	100	9	20	19	9	57	385
04:15 PM	34	87	19	11	151	27	13	33	6	79	10	77	11	3	101	7	17	9	6	39	370
04:30 PM	30	115	13	28	186	16	16	15	18	65	3	81	16	3	103	10	33	11	13	67	421
04:45 PM	40	94	12	21	167	23	12	20	16	71	6	73	17	3	99	9	22	10	7	48	385
Total	138	378	55	75	646	85	66	103	47	301	28	305	58	12	403	35	92	49	35	211	1561
05:00 PM	44	92	12	14	162	30	19	9	10	68	5	90	14	2	111	10	37	19	7	73	414
05:15 PM	33	110	11	17	171	15	17	13	7	52	15	61	17	6	99	6	33	20	4	63	385
05:30 PM	53	112	8	6	179	19	12	16	1	48	10	85	17	2	114	6	26	13	5	50	391
05:45 PM	46	99	12	16	173	16	18	32	9	75	6	49	17	0	72	4	17	13	3	37	357
Total	176	413	43	53	685	80	66	70	27	243	36	285	65	10	396	26	113	65	19	223	1547
Grand Total	415	1141	158	220	1934	351	193	368	130	1042	120	873	186	43	1222	93	286	168	82	629	4827
Apprch %	21.5	59	8.2	11.4		33.7	18.5	35.3	12.5		9.8	71.4	15.2	3.5		14.8	45.5	26.7	13		
Total %	8.6	23.6	3.3	4.6	40.1	7.3	4	7.6	2.7	21.6	2.5	18.1	3.9	0.9	25.3	1.9	5.9	3.5	1.7	13	

	Ward Avenue Southbound				Auahi Street Westbound				Ward Avenue Northbound				Auahi Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:00 PM																	
03:00 PM	27	90	16	133	41	22	45	108	14	77	14	105	6	19	11	36	382
03:15 PM	26	91	16	133	59	14	55	128	11	57	15	83	9	19	15	43	387
03:30 PM	26	86	15	127	57	14	54	125	15	86	22	123	8	21	15	44	419
03:45 PM	22	83	13	118	29	11	41	81	16	63	12	91	9	22	13	44	334
Total Volume	101	350	60	511	186	61	195	442	56	283	63	402	32	81	54	167	1522
% App. Total	19.8	68.5	11.7		42.1	13.8	44.1		13.9	70.4	15.7		19.2	48.5	32.3		
PHF	.935	.962	.938	.961	.788	.693	.886	.863	.875	.823	.716	.817	.889	.920	.900	.949	.908

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: BE, LF
Counters: D4-5672, D4-3888
Weather: CLEAR

File Name : COO AUA AM
Site Code : 00000004
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted

	Cooke Street Southbound					Auahi Street Westbound					Cooke Street Northbound					Auahi Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	1	16	5	0	22	0	4	10	1	15	1	12	1	1	15	7	0	0	1	8	60
06:15 AM	4	17	5	1	27	1	2	6	1	10	3	21	1	2	27	1	2	0	2	5	69
06:30 AM	4	22	1	1	28	0	2	10	1	13	1	32	1	2	36	5	1	1	2	9	86
06:45 AM	3	18	7	3	31	0	4	10	0	14	3	37	0	0	40	13	2	4	1	20	105
Total	12	73	18	5	108	1	12	36	3	52	8	102	3	5	118	26	5	5	6	42	320
07:00 AM	3	22	7	4	36	0	5	8	2	15	8	22	2	2	34	10	0	0	2	12	97
07:15 AM	4	25	8	2	39	1	4	8	2	15	8	29	0	4	41	10	2	1	4	17	112
07:30 AM	5	28	9	3	45	0	3	8	2	13	2	35	0	1	38	16	2	4	1	23	119
07:45 AM	1	30	18	2	51	1	5	7	0	13	7	30	1	2	40	8	0	1	2	11	115
Total	13	105	42	11	171	2	17	31	6	56	25	116	3	9	153	44	4	6	9	63	443
08:00 AM	8	22	13	0	43	0	3	8	1	12	7	34	1	0	42	15	1	4	0	20	117
08:15 AM	6	31	9	4	50	2	1	12	0	15	6	28	0	0	34	6	7	3	2	18	117
08:30 AM	7	32	14	4	57	3	5	14	1	23	2	42	3	0	47	8	2	5	0	15	142
08:45 AM	9	25	12	3	49	1	2	9	2	14	2	27	4	2	35	6	2	1	5	14	112
Total	30	110	48	11	199	6	11	43	4	64	17	131	8	2	158	35	12	13	7	67	488
Grand Total	55	288	108	27	478	9	40	110	13	172	50	349	14	16	429	105	21	24	22	172	1251
Apprch %	11.5	60.3	22.6	5.6		5.2	23.3	64	7.6		11.7	81.4	3.3	3.7		61	12.2	14	12.8		
Total %	4.4	23	8.6	2.2	38.2	0.7	3.2	8.8	1	13.7	4	27.9	1.1	1.3	34.3	8.4	1.7	1.9	1.8	13.7	

	Cooke Street Southbound				Auahi Street Westbound				Cooke Street Northbound				Auahi Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	1	30	18	49	1	5	7	13	7	30	1	38	8	0	1	9	109
08:00 AM	8	22	13	43	0	3	8	11	7	34	1	42	15	1	4	20	116
08:15 AM	6	31	9	46	2	1	12	15	6	28	0	34	6	7	3	16	111
08:30 AM	7	32	14	53	3	5	14	22	2	42	3	47	8	2	5	15	137
Total Volume	22	115	54	191	6	14	41	61	22	134	5	161	37	10	13	60	473
% App. Total	11.5	60.2	28.3		9.8	23	67.2		13.7	83.2	3.1		61.7	16.7	21.7		
PHF	.688	.898	.750	.901	.500	.700	.732	.693	.786	.798	.417	.856	.617	.357	.650	.750	.863

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: BE, LF
Counters: D4-5672, D4-3888
Weather: CLEAR

File Name : COO AUA PM
Site Code : 00000004
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted

	Cooke Street Southbound					Auahi Street Westbound					Cooke Street Northbound					Auahi Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	10	39	22	14	85	1	8	15	1	25	5	28	1	11	45	10	4	3	11	28	183
03:15 PM	5	40	17	7	69	3	8	9	0	20	9	25	4	4	42	14	3	6	11	34	165
03:30 PM	13	49	15	2	79	2	8	14	0	24	4	23	2	6	35	11	4	2	14	31	169
03:45 PM	14	40	21	6	81	1	3	18	4	26	6	19	3	12	40	18	2	8	12	40	187
Total	42	168	75	29	314	7	27	56	5	95	24	95	10	33	162	53	13	19	48	133	704
04:00 PM	10	38	12	8	68	1	4	15	0	20	3	16	2	9	30	10	8	6	7	31	149
04:15 PM	11	56	26	6	99	1	4	12	1	18	7	22	3	2	34	20	5	5	0	30	181
04:30 PM	15	52	13	10	90	4	4	12	0	20	8	16	3	9	36	13	12	7	1	33	179
04:45 PM	13	52	18	3	86	3	13	18	1	35	7	28	10	4	49	26	11	6	4	47	217
Total	49	198	69	27	343	9	25	57	2	93	25	82	18	24	149	69	36	24	12	141	726
05:00 PM	14	53	12	9	88	0	5	19	0	24	9	24	2	5	40	16	4	7	6	33	185
05:15 PM	12	54	9	16	91	0	5	10	5	20	7	24	3	9	43	18	6	11	8	43	197
05:30 PM	7	36	17	12	72	4	4	7	4	19	3	28	1	2	34	13	4	7	1	25	150
05:45 PM	12	31	17	1	61	1	4	7	2	14	5	32	2	16	55	21	7	7	13	48	178
Total	45	174	55	38	312	5	18	43	11	77	24	108	8	32	172	68	21	32	28	149	710
Grand Total	136	540	199	94	969	21	70	156	18	265	73	285	36	89	483	190	70	75	88	423	2140
Apprch %	14	55.7	20.5	9.7		7.9	26.4	58.9	6.8		15.1	59	7.5	18.4		44.9	16.5	17.7	20.8		
Total %	6.4	25.2	9.3	4.4	45.3	1	3.3	7.3	0.8	12.4	3.4	13.3	1.7	4.2	22.6	8.9	3.3	3.5	4.1	19.8	

	Cooke Street Southbound				Auahi Street Westbound				Cooke Street Northbound				Auahi Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	11	56	26	93	1	4	12	17	7	22	3	32	20	5	5	30	172
04:30 PM	15	52	13	80	4	4	12	20	8	16	3	27	13	12	7	32	159
04:45 PM	13	52	18	83	3	13	18	34	7	28	10	45	26	11	6	43	205
05:00 PM	14	53	12	79	0	5	19	24	9	24	2	35	16	4	7	27	165
Total Volume	53	213	69	335	8	26	61	95	31	90	18	139	75	32	25	132	701
% App. Total	15.8	63.6	20.6		8.4	27.4	64.2		22.3	64.7	12.9		56.8	24.2	18.9		
PHF	.883	.951	.663	.901	.500	.500	.803	.699	.861	.804	.450	.772	.721	.667	.893	.767	.855

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: WL
Counters: D4-5677
Weather: CLEAR

File Name : COO POH AM
Site Code : 00000003
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted

	Cooke Street Southbound					Pohukaina Street Westbound					Cooke Street Northbound					Pohukaina Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	3	14	6	2	25	5	3	2	4	14	4	21	6	3	34	3	5	2	2	12	85
06:15 AM	8	20	6	3	37	3	7	4	5	19	0	25	6	4	35	3	5	2	3	13	104
06:30 AM	6	21	12	1	40	4	10	4	3	21	1	31	10	4	46	6	9	2	2	19	126
06:45 AM	10	21	10	3	44	5	10	9	4	28	4	34	9	4	51	6	8	2	5	21	144
Total	27	76	34	9	146	17	30	19	16	82	9	111	31	15	166	18	27	8	12	65	459
07:00 AM	10	24	24	2	60	4	23	13	4	44	4	39	6	9	58	8	7	4	3	22	184
07:15 AM	9	28	17	3	57	5	41	7	2	55	3	39	9	1	52	9	12	3	0	24	188
07:30 AM	5	33	26	2	66	9	27	11	5	52	5	36	8	5	54	16	10	3	6	35	207
07:45 AM	6	38	22	6	72	8	25	7	3	43	5	39	6	2	52	15	17	2	3	37	204
Total	30	123	89	13	255	26	116	38	14	194	17	153	29	17	216	48	46	12	12	118	783
08:00 AM	2	38	24	2	66	7	29	12	4	52	8	39	5	5	57	14	16	3	0	33	208
08:15 AM	9	38	34	2	83	6	29	4	3	42	4	32	7	0	43	7	24	5	1	37	205
08:30 AM	5	42	23	2	72	8	22	16	1	47	7	38	10	3	58	25	16	4	1	46	223
08:45 AM	8	34	21	12	75	7	15	10	5	37	0	43	8	3	54	15	22	3	5	45	211
Total	24	152	102	18	296	28	95	42	13	178	19	152	30	11	212	61	78	15	7	161	847
Grand Total	81	351	225	40	697	71	241	99	43	454	45	416	90	43	594	127	151	35	31	344	2089
Apprch %	11.6	50.4	32.3	5.7		15.6	53.1	21.8	9.5		7.6	70	15.2	7.2		36.9	43.9	10.2	9		
Total %	3.9	16.8	10.8	1.9	33.4	3.4	11.5	4.7	2.1	21.7	2.2	19.9	4.3	2.1	28.4	6.1	7.2	1.7	1.5	16.5	

	Cooke Street Southbound				Pohukaina Street Westbound				Cooke Street Northbound				Pohukaina Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	6	38	22	66	8	25	7	40	5	39	6	50	15	17	2	34	190
08:00 AM	2	38	24	64	7	29	12	48	8	39	5	52	14	16	3	33	197
08:15 AM	9	38	34	81	6	29	4	39	4	32	7	43	7	24	5	36	199
08:30 AM	5	42	23	70	8	22	16	46	7	38	10	55	25	16	4	45	216
Total Volume	22	156	103	281	29	105	39	173	24	148	28	200	61	73	14	148	802
% App. Total	7.8	55.5	36.7		16.8	60.7	22.5		12	74	14		41.2	49.3	9.5		
PHF	.611	.929	.757	.867	.906	.905	.609	.901	.750	.949	.700	.909	.610	.760	.700	.822	.928

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: WL
Counters: D4-5677
Weather: CLEAR

File Name : COO POH PM
Site Code : 00000003
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted

	Cooke Street Southbound					Pohukaina Street Westbound					Cooke Street Northbound					Pohukaina Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	10	55	23	3	91	12	26	15	3	56	7	33	12	7	59	23	18	7	16	64	270
03:15 PM	17	43	20	9	89	13	21	8	13	55	3	37	13	7	60	22	20	6	8	56	260
03:30 PM	14	58	20	5	97	16	24	9	4	53	3	34	10	16	63	15	34	3	9	61	274
03:45 PM	8	51	23	8	90	15	20	6	4	45	8	33	16	16	73	32	30	11	7	80	288
Total	49	207	86	25	367	56	91	38	24	209	21	137	51	46	255	92	102	27	40	261	1092
04:00 PM	18	48	22	10	98	9	20	11	5	45	3	44	6	13	66	30	33	6	5	74	283
04:15 PM	14	75	29	5	123	17	17	8	2	44	3	38	14	5	60	32	30	7	7	76	303
04:30 PM	16	52	20	11	99	10	29	11	3	53	3	31	11	13	58	35	36	12	6	89	299
04:45 PM	8	60	29	16	113	17	22	5	14	58	6	54	15	21	96	17	43	12	12	84	351
Total	56	235	100	42	433	53	88	35	24	200	15	167	46	52	280	114	142	37	30	323	1236
05:00 PM	14	57	28	15	114	16	19	6	9	50	8	40	13	15	76	40	34	7	16	97	337
05:15 PM	8	55	19	12	94	11	16	11	20	58	3	41	14	20	78	40	27	10	10	87	317
05:30 PM	13	46	16	14	89	9	20	7	21	57	3	39	10	24	76	27	26	10	12	75	297
05:45 PM	11	38	22	12	83	13	25	13	9	60	9	38	12	23	82	12	24	13	6	55	280
Total	46	196	85	53	380	49	80	37	59	225	23	158	49	82	312	119	111	40	44	314	1231
Grand Total	151	638	271	120	1180	158	259	110	107	634	59	462	146	180	847	325	355	104	114	898	3559
Apprch %	12.8	54.1	23	10.2		24.9	40.9	17.4	16.9		7	54.5	17.2	21.3		36.2	39.5	11.6	12.7		
Total %	4.2	17.9	7.6	3.4	33.2	4.4	7.3	3.1	3	17.8	1.7	13	4.1	5.1	23.8	9.1	10	2.9	3.2	25.2	

	Cooke Street Southbound				Pohukaina Street Westbound				Cooke Street Northbound				Pohukaina Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	14	75	29	118	17	17	8	42	3	38	14	55	32	30	7	69	284
04:30 PM	16	52	20	88	10	29	11	50	3	31	11	45	35	36	12	83	266
04:45 PM	8	60	29	97	17	22	5	44	6	54	15	75	17	43	12	72	288
05:00 PM	14	57	28	99	16	19	6	41	8	40	13	61	40	34	7	81	282
Total Volume	52	244	106	402	60	87	30	177	20	163	53	236	124	143	38	305	1120
% App. Total	12.9	60.7	26.4		33.9	49.2	16.9		8.5	69.1	22.5		40.7	46.9	12.5		
PHF	.813	.813	.914	.852	.882	.750	.682	.885	.625	.755	.883	.787	.775	.831	.792	.919	.972

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: EV
Counters: D4-3889
Weather: CLEAR

File Name : COO HAL AM
Site Code : 00000002
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted

	Cooke Street Southbound					Halekauwila Street Westbound					Cooke Street Northbound					Halekauwila Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	8	19	4	2	33	2	2	2	4	10	1	20	5	2	28	4	6	1	5	16	87
06:15 AM	7	29	4	3	43	1	8	3	6	18	2	19	9	1	31	5	8	5	2	20	112
06:30 AM	7	30	6	2	45	7	7	9	4	27	3	21	16	1	41	5	16	1	1	23	136
06:45 AM	11	38	12	3	64	3	14	6	6	29	2	37	11	3	53	10	14	4	2	30	176
Total	33	116	26	10	185	13	31	20	20	84	8	97	41	7	153	24	44	11	10	89	511
07:00 AM	7	45	15	2	69	9	16	3	5	33	5	51	7	5	68	8	14	6	8	36	206
07:15 AM	14	48	13	5	80	4	17	6	4	31	4	39	8	2	53	17	16	2	2	37	201
07:30 AM	4	50	21	3	78	5	14	13	6	38	7	50	7	5	69	11	15	6	8	40	225
07:45 AM	10	56	14	4	84	9	21	8	3	41	6	47	10	3	66	13	22	6	4	45	236
Total	35	199	63	14	311	27	68	30	18	143	22	187	32	15	256	49	67	20	22	158	868
08:00 AM	4	54	13	3	74	9	12	7	2	30	5	49	9	4	67	14	14	3	2	33	204
08:15 AM	5	64	15	2	86	6	16	9	2	33	4	40	3	1	48	18	16	15	2	51	218
08:30 AM	7	55	12	5	79	2	17	8	7	34	4	68	9	4	85	16	10	9	1	36	234
08:45 AM	7	49	13	4	73	8	6	7	2	23	1	57	9	4	71	11	12	10	7	40	207
Total	23	222	53	14	312	25	51	31	13	120	14	214	30	13	271	59	52	37	12	160	863
Grand Total	91	537	142	38	808	65	150	81	51	347	44	498	103	35	680	132	163	68	44	407	2242
Apprch %	11.3	66.5	17.6	4.7		18.7	43.2	23.3	14.7		6.5	73.2	15.1	5.1		32.4	40	16.7	10.8		
Total %	4.1	24	6.3	1.7	36	2.9	6.7	3.6	2.3	15.5	2	22.2	4.6	1.6	30.3	5.9	7.3	3	2	18.2	

	Cooke Street Southbound				Halekauwila Street Westbound				Cooke Street Northbound				Halekauwila Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	10	56	14	80	9	21	8	38	6	47	10	63	13	22	6	41	222
08:00 AM	4	54	13	71	9	12	7	28	5	49	9	63	14	14	3	31	193
08:15 AM	5	64	15	84	6	16	9	31	4	40	3	47	18	16	15	49	211
08:30 AM	7	55	12	74	2	17	8	27	4	68	9	81	16	10	9	35	217
Total Volume	26	229	54	309	26	66	32	124	19	204	31	254	61	62	33	156	843
% App. Total	8.4	74.1	17.5		21	53.2	25.8		7.5	80.3	12.2		39.1	39.7	21.2		
PHF	.650	.895	.900	.920	.722	.786	.889	.816	.792	.750	.775	.784	.847	.705	.550	.796	.949

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: EV
Counters: D4-3889
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File Name : COO HAL PM
Site Code : 00000002
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted

	Cooke Street Southbound					Halekauwila Street Westbound					Cooke Street Northbound					Halekauwila Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	17	65	11	3	96	15	26	14	7	62	7	62	6	0	75	11	13	6	4	34	267
03:15 PM	12	68	9	12	101	6	24	10	23	63	3	70	1	1	75	18	17	7	7	49	288
03:30 PM	9	62	14	1	86	16	27	16	12	71	4	48	2	6	60	10	22	14	2	48	265
03:45 PM	11	69	9	4	93	11	15	11	3	40	1	64	7	0	72	18	32	6	2	58	263
Total	49	264	43	20	376	48	92	51	45	236	15	244	16	7	282	57	84	33	15	189	1083
04:00 PM	5	66	11	7	89	13	17	10	4	44	5	63	14	4	86	14	27	10	1	52	271
04:15 PM	3	86	8	4	101	11	21	5	2	39	7	63	11	2	83	18	32	17	12	79	302
04:30 PM	6	67	14	0	87	11	14	11	5	41	5	60	13	5	83	22	59	10	1	92	303
04:45 PM	14	76	10	3	103	12	18	18	4	52	1	66	8	6	81	24	56	9	9	98	334
Total	28	295	43	14	380	47	70	44	15	176	18	252	46	17	333	78	174	46	23	321	1210
05:00 PM	10	75	9	5	99	13	17	15	5	50	7	72	11	5	95	25	31	18	7	81	325
05:15 PM	11	67	13	1	92	15	19	12	5	51	4	67	13	5	89	24	39	8	14	85	317
05:30 PM	11	50	11	5	77	15	18	16	5	54	4	61	12	7	84	16	34	10	9	69	284
05:45 PM	8	51	11	5	75	6	18	10	4	38	7	48	6	3	64	17	37	11	12	77	254
Total	40	243	44	16	343	49	72	53	19	193	22	248	42	20	332	82	141	47	42	312	1180
Grand Total	117	802	130	50	1099	144	234	148	79	605	55	744	104	44	947	217	399	126	80	822	3473
Apprch %	10.6	73	11.8	4.5		23.8	38.7	24.5	13.1		5.8	78.6	11	4.6		26.4	48.5	15.3	9.7		
Total %	3.4	23.1	3.7	1.4	31.6	4.1	6.7	4.3	2.3	17.4	1.6	21.4	3	1.3	27.3	6.2	11.5	3.6	2.3	23.7	

	Cooke Street Southbound				Halekauwila Street Westbound				Cooke Street Northbound				Halekauwila Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	6	67	14	87	11	14	11	36	5	60	13	78	22	59	10	91	292
04:45 PM	14	76	10	100	12	18	18	48	1	66	8	75	24	56	9	89	312
05:00 PM	10	75	9	94	13	17	15	45	7	72	11	90	25	31	18	74	303
05:15 PM	11	67	13	91	15	19	12	46	4	67	13	84	24	39	8	71	292
Total Volume	41	285	46	372	51	68	56	175	17	265	45	327	95	185	45	325	1199
% App. Total	11	76.6	12.4		29.1	38.9	32		5.2	81	13.8		29.2	56.9	13.8		
PHF	.732	.938	.821	.930	.850	.895	.778	.911	.607	.920	.865	.908	.950	.784	.625	.893	.961

APPENDIX B

LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

Level of Service (LOS) for signalized intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average control delay per vehicle, typically a 15-min analysis period. The criteria are given in the following table.

Table 1: Level-of-Service Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (sec/veh)
A	≤10.0
B	>10.0 and ≤20.0
C	>20.0 and ≤35.0
D	>35.0 and ≤55.0
E	>55.0 and ≤80.0
F	>80.0

Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group.

Level of Service A describes operations with low control delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.

Level of Service B describes operations with control delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.

Level of Service C describes operations with control delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from only fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. Cycle failure occurs when a given green phase does not serve queued vehicles and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

Level of Service D describes operations with control delay greater than 35 and up to 55 sec per vehicle. At level of service D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

"Highway Capacity Manual," Transportation Research Board, 2000.

Level of Service E describes operation with control delay greater than 55 and up to 80 sec per vehicle. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent.

Level of Service F describes operations with control delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity lane groups. It may also occur at high v/c ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delay levels.

"Highway Capacity Manual," Transportation Research Board, 2000.

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

Level of Service (LOS) criteria are given in Table 1. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue to the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in the queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. If the degree of saturation is greater than about 0.9, average control delay is significantly affected by the length of the analysis period.

Table 1: Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (Sec/Veh)
A	≤10.0
B	>10.0 and ≤15.0
C	>15.0 and ≤25.0
D	>25.0 and ≤35.0
E	>35.0 and ≤50.0
F	>50.0

"Highway Capacity Manual," Transportation Research Board, 2000.

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR PEDESTRIANS

Signalized Intersections

Pedestrian LOS at a signalized intersection is based on a unitless score that combines performance measures such as speed and basic descriptors relating to characteristics of the intersection. The association between score value and LOS is based on traveler perception research with the letter "A" used to represent the best quality of service, and the letter "F" used to represent the worst quality of service. The following are general qualitative descriptors:

At LOS A, pedestrians freely move in the desired path without needing to adjust their movements in response to pedestrians. Walking speeds are freely selected and conflicts between pedestrians are unlikely.

At LOS B there is sufficient area for pedestrians to select walking speeds freely to bypass other pedestrians and avoid crossing conflicts. At this level, pedestrians must occasionally adjust his/her path to avoid conflicts.

At LOS C there is sufficient space for normal walking speeds, and for bypassing other pedestrians. Crossing movements may cause minor conflicts and pedestrian must frequently adjust his/her path to avoid conflicts.

At LOS D the pedestrian's speed and ability to pass slower pedestrians are restricted. There is a high probability of conflict requiring frequent changes in speed and position.

At LOS E the pedestrian's speed is restricted, resulting in a limited ability and capacity to pass slower pedestrians.

At LOS F the pedestrian's speed is severely restricted, resulting in frequent contact with other users.

"Highway Capacity Manual," Transportation Research Board, 2010.

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR PEDESTRIANS

Two-Way Stop-Controlled Intersections

The Level of Service (LOS) for a Two-Way Stop-Controlled (TWSC) intersection is determined by the computed or measured control delay. It should be noted that Pedestrian LOS at TWSC intersections is defined for pedestrians crossing a traffic stream not controlled by a STOP sign.

LOS A describes operations with a control delay between 0 and 5s/pedestrian. This level describes operations that typically experience no conflicting traffic.

LOS B describes operations with a control delay between 5 and 10s/pedestrian. This level describes operations that occasionally experience delay due to conflicting traffic.

LOS C describes operations with a control delay between 10 and 20s/pedestrian. This level describes operations where the delay is noticeable but not inconvenient to pedestrians.

LOS D describes operations with a control delay between 20 and 30s/pedestrian. This level describes operations where the delay is noticeable and irritating to pedestrians, resulting in an increased likelihood of a pedestrian engaging in high-risk behavior.

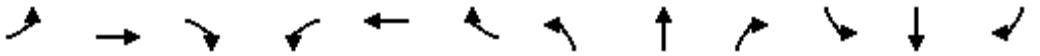
LOS E describes operations with a control delay between 30 and 40s/pedestrian. This level describes operations where the delay approaches max tolerance level, resulting in an increased likelihood of a pedestrian engaging in high-risk behavior.

LOS F describes operations with a control delay between 40 and 50s/pedestrian. This level describes operations where the delay exceeds max tolerance level, resulting in a high likelihood of a pedestrian engaging in high-risk behavior.

"Highway Capacity Manual," Transportation Research Board, 2010.

APPENDIX C

CAPACITY ANALYSIS CALCULATIONS
BASELINE PEAK PERIOD TRAFFIC ANALYSIS

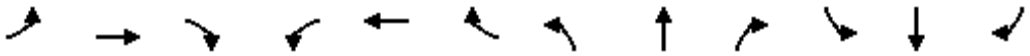


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	1520	11	90	1619	170	2	38	41	168	108	160
Future Volume (vph)	225	1520	11	90	1619	170	2	38	41	168	108	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0	5.0	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	0.86		1.00	0.93	1.00	0.95	
Flpb, ped/bikes	1.00	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	0.85		1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5078		1770	5085	1362		3531	1475	1610	2927	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5078		1770	5085	1362		3531	1475	1610	2927	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	237	1600	12	95	1704	179	2	40	43	177	114	168
RTOR Reduction (vph)	0	1	0	0	0	75	0	0	0	0	142	0
Lane Group Flow (vph)	237	1611	0	95	1704	104	0	42	43	158	159	0
Confl. Peds. (#/hr)			13			94			51			73
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	19.7	57.1		10.4	47.8	47.8		14.1	14.1	18.9	18.9	
Effective Green, g (s)	19.7	57.1		10.4	47.8	47.8		14.1	14.1	18.9	18.9	
Actuated g/C Ratio	0.16	0.47		0.09	0.40	0.40		0.12	0.12	0.16	0.16	
Clearance Time (s)	5.0	5.0		5.0	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	3.0	3.0	3.0	
Lane Grp Cap (vph)	289	2406		152	2017	540		413	172	252	459	
v/s Ratio Prot	c0.13	0.32		0.05	c0.34			0.01		c0.10	0.05	
v/s Ratio Perm						0.08			c0.03			
v/c Ratio	0.82	0.67		0.62	0.84	0.19		0.10	0.25	0.63	0.35	
Uniform Delay, d1	48.7	24.4		53.2	33.0	23.7		47.5	48.4	47.5	45.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	16.7	0.7		7.8	3.4	0.2		0.1	0.8	4.8	0.5	
Delay (s)	65.4	25.2		60.9	36.4	23.9		47.6	49.2	52.3	45.8	
Level of Service	E	C		E	D	C		D	D	D	D	
Approach Delay (s)		30.3			36.5			48.4			48.0	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	88.8%	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												
Traffic Volume (vph)	180	1858	2	48	1312	215	6	100	149	261	64	234
Future Volume (vph)	180	1858	2	48	1312	215	6	100	149	261	64	234
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	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	0.80		1.00	0.87	1.00	0.96	
Flpb, ped/bikes	1.00	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	0.85		1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (prot)	1770	5084		1770	5085	1270		3530	1372	1610	2923	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (perm)	1770	5084		1770	5085	1270		3530	1372	1610	2923	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	189	1956	2	51	1381	226	6	105	157	275	67	246
RTOR Reduction (vph)	0	0	0	0	0	124	0	0	0	0	203	0
Lane Group Flow (vph)	189	1958	0	51	1381	102	0	111	157	203	182	0
Confl. Peds. (#/hr)			41			107			94			31
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	19.4	66.4		5.3	52.3	52.3		35.4	35.4	26.6	26.6	
Effective Green, g (s)	19.4	66.4		5.3	52.3	52.3		35.4	35.4	26.6	26.6	
Actuated g/C Ratio	0.13	0.43		0.03	0.34	0.34		0.23	0.23	0.17	0.17	
Clearance Time (s)	5.0	5.0		5.0	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	3.0	3.0	3.0	
Lane Grp Cap (vph)	223	2196		61	1730	432		813	315	278	505	
v/s Ratio Prot	c0.11	c0.39		0.03	0.27			0.03		c0.13	0.06	
v/s Ratio Perm						0.08			c0.11			
v/c Ratio	0.85	0.89		0.84	0.80	0.24		0.14	0.50	0.73	0.36	
Uniform Delay, d1	65.7	40.3		73.8	45.9	36.4		47.0	51.4	60.2	56.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	24.6	5.0		60.3	2.7	0.3		0.1	1.2	9.5	0.4	
Delay (s)	90.3	45.4		134.1	48.6	36.7		47.1	52.7	69.6	56.5	
Level of Service	F	D		F	D	D		D	D	E	E	
Approach Delay (s)		49.3			49.6			50.4			61.0	
Approach LOS		D			D			D			E	

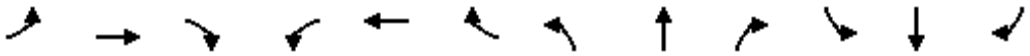
Intersection Summary			
HCM 2000 Control Delay	50.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	153.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	97.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	1805	5	23	1746	8	4	0	2	8	3	9
Future Volume (vph)	8	1805	5	23	1746	8	4	0	2	8	3	9
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	0.91		1.00	0.91			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.95			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	
Satd. Flow (prot)	1770	5083		1770	5082			1722			1713	
Flt Permitted	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (perm)	1770	5083		1770	5082			1779			1748	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	1962	5	25	1898	9	4	0	2	9	3	10
RTOR Reduction (vph)	0	0	0	0	0	0	0	6	0	0	10	0
Lane Group Flow (vph)	9	1967	0	25	1907	0	0	0	0	0	12	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	1.1	63.0		3.9	65.8			2.4			2.4	
Effective Green, g (s)	1.1	63.0		3.9	65.8			2.4			2.4	
Actuated g/C Ratio	0.01	0.75		0.05	0.78			0.03			0.03	
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)	23	3798		81	3966			50			49	
v/s Ratio Prot	0.01	c0.39		c0.01	c0.38							
v/s Ratio Perm								0.00			c0.01	
v/c Ratio	0.39	0.52		0.31	0.48			0.00			0.25	
Uniform Delay, d1	41.3	4.4		38.9	3.2			39.8			40.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	10.7	0.1		2.2	0.1			0.0			2.7	
Delay (s)	51.9	4.5		41.1	3.3			39.8			42.8	
Level of Service	D	A		D	A			D			D	
Approach Delay (s)		4.7			3.8			39.8			42.8	
Approach LOS		A			A			D			D	

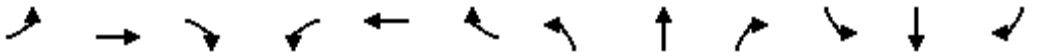
Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	84.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



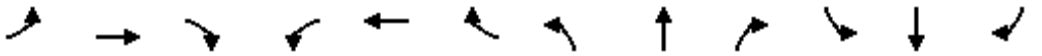
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	2069	6	10	1592	30	6	10	2	20	1	11
Future Volume (vph)	16	2069	6	10	1592	30	6	10	2	20	1	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Frt	1.00	1.00		1.00	1.00			0.98			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1770	5082		1766	5060			1799			1706	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.83	
Satd. Flow (perm)	1770	5082		1766	5060			1688			1457	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	16	2133	6	10	1641	31	6	10	2	21	1	11
RTOR Reduction (vph)	0	0	0	0	1	0	0	2	0	0	10	0
Lane Group Flow (vph)	16	2139	0	10	1671	0	0	16	0	0	23	0
Confl. Peds. (#/hr)	35		17	17		35			15	15		
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	2.1	81.0		0.8	79.7			13.7			13.7	
Effective Green, g (s)	2.1	81.0		0.8	79.7			13.7			13.7	
Actuated g/C Ratio	0.02	0.73		0.01	0.72			0.12			0.12	
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)	33	3725		12	3649			209			180	
v/s Ratio Prot	c0.01	c0.42		0.01	0.33							
v/s Ratio Perm								0.01			c0.02	
v/c Ratio	0.48	0.57		0.83	0.46			0.08			0.13	
Uniform Delay, d1	53.7	6.8		54.8	6.4			42.8			43.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	10.8	0.2		168.3	0.1			0.2			0.3	
Delay (s)	64.5	7.0		223.1	6.5			43.0			43.4	
Level of Service	E	A		F	A			D			D	
Approach Delay (s)		7.4			7.8			43.0			43.4	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	110.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



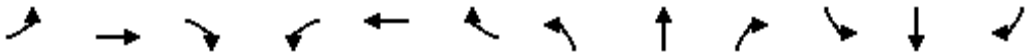
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	1830	29	13	1685	61	12	19	7	43	21	62
Future Volume (vph)	65	1830	29	13	1685	61	12	19	7	43	21	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	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			1.00	1.00		1.00	1.00
Frt	1.00	1.00		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		0.97	1.00
Satd. Flow (prot)	1770	5071		1770	5055			1823	1558		1798	1554
Flt Permitted	0.95	1.00		0.95	1.00			0.87	1.00		0.78	1.00
Satd. Flow (perm)	1770	5071		1770	5055			1616	1558		1446	1554
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	68	1926	31	14	1774	64	13	20	7	45	22	65
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	6	0	0	58
Lane Group Flow (vph)	68	1956	0	14	1836	0	0	33	1	0	67	7
Confl. Peds. (#/hr)			9			11	5		3	3		5
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	7.7	67.3		2.1	61.7			10.7	10.7		10.7	10.7
Effective Green, g (s)	7.7	67.3		2.1	61.7			10.7	10.7		10.7	10.7
Actuated g/C Ratio	0.08	0.71		0.02	0.65			0.11	0.11		0.11	0.11
Clearance Time (s)	5.0	5.0		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		3.0	3.0
Lane Grp Cap (vph)	143	3588		39	3279			181	175		162	174
v/s Ratio Prot	c0.04	c0.39		0.01	0.36							
v/s Ratio Perm								0.02	0.00		c0.05	0.00
v/c Ratio	0.48	0.55		0.36	0.56			0.18	0.00		0.41	0.04
Uniform Delay, d1	41.8	6.6		45.8	9.2			38.2	37.5		39.3	37.6
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.5	0.2		5.6	0.2			0.5	0.0		1.7	0.1
Delay (s)	44.3	6.8		51.4	9.4			38.7	37.5		41.0	37.7
Level of Service	D	A		D	A			D	D		D	D
Approach Delay (s)		8.0			9.7			38.5			39.4	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	95.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



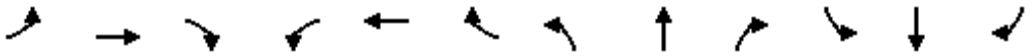
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	2069	10	3	1555	51	21	35	15	58	23	146
Future Volume (vph)	46	2069	10	3	1555	51	21	35	15	58	23	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	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	0.97		1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		0.99	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)	1770	5079		1770	5054			1807	1543		1782	1485
Flt Permitted	0.95	1.00		0.95	1.00			0.88	1.00		0.75	1.00
Satd. Flow (perm)	1770	5079		1770	5054			1611	1543		1381	1485
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	51	2274	11	3	1709	56	23	38	16	64	25	160
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	13	0	0	79
Lane Group Flow (vph)	51	2285	0	3	1763	0	0	61	3	0	89	81
Confl. Peds. (#/hr)			23			17	28		11	11		28
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	7.3	79.2		0.6	72.5			18.7	18.7		18.7	18.7
Effective Green, g (s)	7.3	79.2		0.6	72.5			18.7	18.7		18.7	18.7
Actuated g/C Ratio	0.06	0.70		0.01	0.64			0.16	0.16		0.16	0.16
Clearance Time (s)	5.0	5.0		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		3.0	3.0
Lane Grp Cap (vph)	113	3544		9	3228			265	254		227	244
v/s Ratio Prot	c0.03	c0.45		0.00	0.35							
v/s Ratio Perm								0.04	0.00		c0.06	0.05
v/c Ratio	0.45	0.64		0.33	0.55			0.23	0.01		0.39	0.33
Uniform Delay, d1	51.2	9.4		56.3	11.4			41.2	39.7		42.3	41.9
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.8	0.4		20.6	0.2			0.4	0.0		1.1	0.8
Delay (s)	54.0	9.8		76.8	11.6			41.6	39.7		43.4	42.7
Level of Service	D	A		E	B			D	D		D	D
Approach Delay (s)		10.8			11.7			41.2			43.0	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	113.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



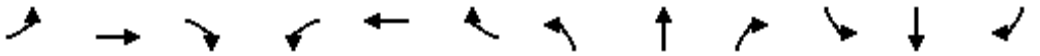
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	32	37	65	74	61	60	293	38	52	391	45
Future Volume (vph)	17	32	37	65	74	61	60	293	38	52	391	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0		5.0	5.0	
Lane Util. Factor		0.95		1.00	1.00			0.95		1.00	0.95	
Frpb, ped/bikes		1.00		1.00	0.99			1.00		1.00	1.00	
Flpb, ped/bikes		1.00		0.98	1.00			1.00		0.99	1.00	
Frt		0.94		1.00	0.93			0.99		1.00	0.98	
Flt Protected		0.99		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)		3276		1736	1723			3449		1750	3484	
Flt Permitted		0.87		0.70	1.00			0.83		0.51	1.00	
Satd. Flow (perm)		2874		1271	1723			2901		942	3484	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.92	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	18	33	39	68	77	64	65	305	40	54	407	47
RTOR Reduction (vph)	0	31	0	0	42	0	0	10	0	0	11	0
Lane Group Flow (vph)	0	59	0	68	99	0	0	400	0	54	443	0
Confl. Peds. (#/hr)				67		14			63	63		
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		6.0		6.0	6.0			13.0		13.0	13.0	
Effective Green, g (s)		6.0		6.0	6.0			13.0		13.0	13.0	
Actuated g/C Ratio		0.21		0.21	0.21			0.45		0.45	0.45	
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)		594		262	356			1300		422	1561	
v/s Ratio Prot					c0.06						0.13	
v/s Ratio Perm		0.02		0.05				c0.14		0.06		
v/c Ratio		0.10		0.26	0.28			0.31		0.13	0.28	
Uniform Delay, d1		9.3		9.6	9.7			5.1		4.7	5.1	
Progression Factor		1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.1		0.5	0.4			0.1		0.1	0.1	
Delay (s)		9.4		10.2	10.1			5.3		4.8	5.2	
Level of Service		A		B	B			A		A	A	
Approach Delay (s)		9.4			10.1			5.3			5.1	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	29.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	61.8%	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												
Traffic Volume (vph)	32	82	55	189	65	203	57	310	64	103	370	61
Future Volume (vph)	32	82	55	189	65	203	57	310	64	103	370	61
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			0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.94		1.00	0.98		1.00	1.00	
Flpb, ped/bikes		1.00			0.96		1.00	1.00		0.93	1.00	
Frt		0.95			0.93		1.00	0.97		1.00	0.98	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3334			2941		1770	3373		1649	3465	
Flt Permitted		0.84			0.76		0.47	1.00		0.51	1.00	
Satd. Flow (perm)		2815			2272		874	3373		887	3465	
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.92	0.91	0.92	0.91	0.91	0.91	0.91	0.92
Adj. Flow (vph)	35	89	60	208	71	223	62	341	70	113	407	66
RTOR Reduction (vph)	0	34	0	0	72	0	0	21	0	0	16	0
Lane Group Flow (vph)	0	150	0	0	430	0	62	390	0	113	457	0
Confl. Peds. (#/hr)				122		200			194	194		
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		24.7			24.7		23.1	23.1		23.1	23.1	
Effective Green, g (s)		24.7			24.7		23.1	23.1		23.1	23.1	
Actuated g/C Ratio		0.43			0.43		0.40	0.40		0.40	0.40	
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)		1202			970		349	1348		354	1384	
v/s Ratio Prot								0.12			c0.13	
v/s Ratio Perm		0.05			c0.19		0.07			0.13		
v/c Ratio		0.12			0.44		0.18	0.29		0.32	0.33	
Uniform Delay, d1		10.0			11.7		11.2	11.8		11.9	12.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.3		0.2	0.1		0.5	0.1	
Delay (s)		10.1			12.0		11.5	11.9		12.5	12.1	
Level of Service		B			B		B	B		B	B	
Approach Delay (s)		10.1			12.0			11.8			12.2	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	57.8	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			

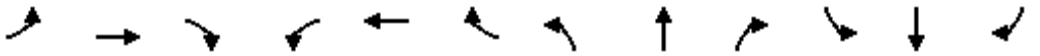


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	10	13	6	14	42	22	136	5	22	117	55
Future Volume (Veh/h)	38	10	13	6	14	42	22	136	5	22	117	55
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	11	14	7	15	46	24	148	5	24	127	60
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								450				
pX, platoon unblocked												
vC, conflicting volume	380	406	94	330	434	76	187			153		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	380	406	94	330	434	76	187			153		
tC, single (s)	*6.5	*5.5	*5.9	*6.5	*5.5	*5.9	*3.1			*3.1		
tC, 2 stage (s)												
tF (s)	*2.5	*2.0	*2.3	*2.5	*3.0	*2.3	2.2			2.2		
p0 queue free %	95	99	99	99	98	97	98			98		
cM capacity (veh/h)	765	1046	1383	851	713	1415	1462			1490		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	66	68	98	79	88	124
Volume Left	41	7	24	0	24	0
Volume Right	14	46	0	5	0	60
cSH	890	1101	1462	1700	1490	1700
Volume to Capacity	0.07	0.06	0.02	0.05	0.02	0.07
Queue Length 95th (ft)	6	5	1	0	1	0
Control Delay (s)	9.4	8.5	1.9	0.0	2.1	0.0
Lane LOS	A	A	A		A	
Approach Delay (s)	9.4	8.5	1.1		0.9	
Approach LOS	A	A				

Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	30.3%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value

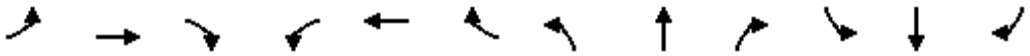


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	32	25	8	26	62	31	91	18	54	216	70
Future Volume (Veh/h)	76	32	25	8	26	62	31	91	18	54	216	70
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	83	35	27	9	28	67	34	99	20	59	235	76
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								419				
pX, platoon unblocked												
vC, conflicting volume	590	578	156	457	606	60	311			119		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	590	578	156	457	606	60	311			119		
tC, single (s)	*6.5	*5.5	*5.9	*6.5	*5.5	*5.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	*2.5	*3.0	*2.3	*2.5	*3.0	*2.3	2.2			2.2		
p0 queue free %	84	94	98	99	95	95	97			96		
cM capacity (veh/h)	527	584	1274	653	565	1447	1246			1467		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	145	104	84	70	176	194
Volume Left	83	9	34	0	59	0
Volume Right	27	67	0	20	0	76
cSH	608	949	1246	1700	1467	1700
Volume to Capacity	0.24	0.11	0.03	0.04	0.04	0.11
Queue Length 95th (ft)	23	9	2	0	3	0
Control Delay (s)	12.8	9.3	3.4	0.0	2.7	0.0
Lane LOS	B	A	A		A	
Approach Delay (s)	12.8	9.3	1.8		1.3	
Approach LOS	B	A				

Intersection Summary				
Average Delay	4.6			
Intersection Capacity Utilization	37.8%	ICU Level of Service	A	
Analysis Period (min)	15			

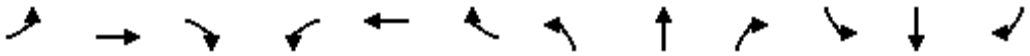
* User Entered Value



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	68	74	14	29	109	40	24	150	28	22	158	111
Future Volume (vph)	68	74	14	29	109	40	24	150	28	22	158	111
Peak Hour Factor	0.93	0.92	0.93	0.92	0.92	0.92	0.93	0.93	0.92	0.92	0.93	0.93
Hourly flow rate (vph)	73	80	15	32	118	43	26	161	30	24	170	119

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	168	193	107	111	109	204
Volume Left (vph)	73	32	26	0	24	0
Volume Right (vph)	15	43	0	30	0	119
Hadj (s)	0.07	-0.07	0.16	-0.16	0.14	-0.37
Departure Headway (s)	5.6	5.5	6.1	5.8	6.0	5.5
Degree Utilization, x	0.26	0.29	0.18	0.18	0.18	0.31
Capacity (veh/h)	585	605	548	575	563	619
Control Delay (s)	10.7	10.7	9.3	8.9	9.1	9.7
Approach Delay (s)	10.7	10.7	9.1		9.5	
Approach LOS	B	B	A		A	

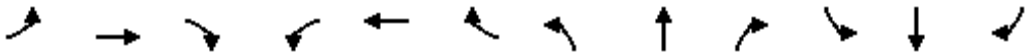
Intersection Summary				
Delay	9.9			
Level of Service	A			
Intersection Capacity Utilization	44.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	139	145	39	61	91	30	20	165	54	53	248	113
Future Volume (vph)	139	145	39	61	91	30	20	165	54	53	248	113
Peak Hour Factor	0.97	0.92	0.97	0.92	0.92	0.92	0.97	0.97	0.92	0.92	0.97	0.97
Hourly flow rate (vph)	143	158	40	66	99	33	21	170	59	58	256	116

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	341	198	106	144	186	244
Volume Left (vph)	143	66	21	0	58	0
Volume Right (vph)	40	33	0	59	0	116
Hadj (s)	0.05	0.00	0.13	-0.25	0.19	-0.30
Departure Headway (s)	6.3	6.6	7.3	6.9	7.0	6.5
Degree Utilization, x	0.60	0.36	0.21	0.27	0.36	0.44
Capacity (veh/h)	545	496	448	480	487	527
Control Delay (s)	18.1	13.3	11.0	11.2	12.7	13.3
Approach Delay (s)	18.1	13.3	11.1		13.0	
Approach LOS	C	B	B		B	

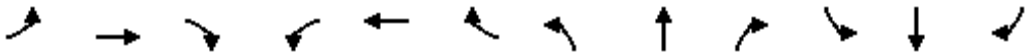
Intersection Summary				
Delay	14.1			
Level of Service	B			
Intersection Capacity Utilization	56.4%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	64	68	33	29	76	32	19	210	34	29	234	60
Future Volume (vph)	64	68	33	29	76	32	19	210	34	29	234	60
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	67	72	35	31	80	34	20	221	36	31	246	63

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	174	145	131	147	154	186
Volume Left (vph)	67	31	20	0	31	0
Volume Right (vph)	35	34	0	36	0	63
Hadj (s)	-0.01	-0.06	0.11	-0.14	0.13	-0.20
Departure Headway (s)	5.7	5.7	6.0	5.8	6.0	5.6
Degree Utilization, x	0.27	0.23	0.22	0.24	0.26	0.29
Capacity (veh/h)	581	575	563	587	572	606
Control Delay (s)	10.8	10.4	9.5	9.3	9.8	9.7
Approach Delay (s)	10.8	10.4	9.4		9.8	
Approach LOS	B	B	A		A	

Intersection Summary				
Delay	10.0			
Level of Service	A			
Intersection Capacity Utilization	46.2%	ICU Level of Service	A	
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	
Traffic Volume (vph)	104	194	46	55	78	57	17	276	51	44	291	51
Future Volume (vph)	104	194	46	55	78	57	17	276	51	44	291	51
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	108	202	48	57	81	59	18	288	53	46	303	53

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	358	197	162	197	198	205
Volume Left (vph)	108	57	18	0	46	0
Volume Right (vph)	48	59	0	53	0	53
Hadj (s)	0.01	-0.09	0.09	-0.15	0.15	-0.15
Departure Headway (s)	6.6	6.9	7.4	7.1	7.3	7.0
Degree Utilization, x	0.65	0.38	0.33	0.39	0.40	0.40
Capacity (veh/h)	514	460	450	464	462	482
Control Delay (s)	21.1	14.1	12.8	13.4	14.0	13.4
Approach Delay (s)	21.1	14.1	13.1		13.7	
Approach LOS	C	B	B		B	

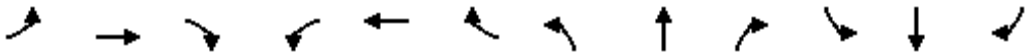
Intersection Summary				
Delay	15.6			
Level of Service	C			
Intersection Capacity Utilization	58.9%	ICU Level of Service	B	
Analysis Period (min)	15			

APPENDIX D

CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2026 PEAK PERIOD TRAFFIC
ANALYSIS WITHOUT PROJECT

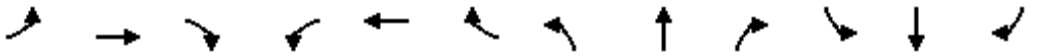
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	260	1655	12	97	1767	215	2	41	44	293	116	216
Future Volume (vph)	260	1655	12	97	1767	215	2	41	44	293	116	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0	5.0	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	0.86		1.00	0.93	1.00	0.95	
Flpb, ped/bikes	1.00	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	0.85		1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (prot)	1770	5078		1770	5085	1357		3531	1473	1610	2931	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (perm)	1770	5078		1770	5085	1357		3531	1473	1610	2931	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	274	1742	13	102	1860	226	2	43	46	308	122	227
RTOR Reduction (vph)	0	1	0	0	0	87	0	0	0	0	136	0
Lane Group Flow (vph)	274	1754	0	102	1860	139	0	45	46	225	296	0
Confl. Peds. (#/hr)			13			94			51			73
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	18.5	57.6		9.3	48.4	48.4		14.4	14.4	21.9	21.9	
Effective Green, g (s)	18.5	57.6		9.3	48.4	48.4		14.4	14.4	21.9	21.9	
Actuated g/C Ratio	0.15	0.47		0.08	0.39	0.39		0.12	0.12	0.18	0.18	
Clearance Time (s)	5.0	5.0		5.0	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	3.0	3.0	3.0	
Lane Grp Cap (vph)	265	2374		133	1997	533		412	172	286	521	
v/s Ratio Prot	c0.15	0.35		0.06	c0.37			0.01		c0.14	0.10	
v/s Ratio Perm						0.10			c0.03			
v/c Ratio	1.03	0.74		0.77	0.93	0.26		0.11	0.27	0.79	0.57	
Uniform Delay, d1	52.4	26.7		55.9	35.8	25.3		48.7	49.6	48.4	46.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	64.4	1.2		22.8	8.5	0.3		0.1	0.8	13.3	1.4	
Delay (s)	116.7	27.9		78.7	44.3	25.6		48.8	50.4	61.7	47.7	
Level of Service	F	C		E	D	C		D	D	E	D	
Approach Delay (s)		39.9			44.0			49.6			52.5	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	43.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	123.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	91.8%	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												
Traffic Volume (vph)	235	2014	2	52	1446	284	6	108	160	347	69	281
Future Volume (vph)	235	2014	2	52	1446	284	6	108	160	347	69	281
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	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	0.81		1.00	0.87	1.00	0.96	
Flpb, ped/bikes	1.00	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	0.85		1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (prot)	1770	5084		1770	5085	1277		3530	1377	1610	2933	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (perm)	1770	5084		1770	5085	1277		3530	1377	1610	2933	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	247	2120	2	55	1522	299	6	114	168	365	73	296
RTOR Reduction (vph)	0	0	0	0	0	143	0	0	0	0	186	0
Lane Group Flow (vph)	247	2122	0	55	1522	156	0	120	168	255	293	0
Confl. Peds. (#/hr)			41			107			94			31
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	23.2	69.4		6.0	52.2	52.2		27.0	27.0	27.4	27.4	
Effective Green, g (s)	23.2	69.4		6.0	52.2	52.2		27.0	27.0	27.4	27.4	
Actuated g/C Ratio	0.15	0.46		0.04	0.35	0.35		0.18	0.18	0.18	0.18	
Clearance Time (s)	5.0	5.0		5.0	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	3.0	3.0	3.0	
Lane Grp Cap (vph)	274	2355		70	1771	444		636	248	294	536	
v/s Ratio Prot	c0.14	c0.42		0.03	0.30			0.03		c0.16	0.10	
v/s Ratio Perm						0.12			c0.12			
v/c Ratio	0.90	0.90		0.79	0.86	0.35		0.19	0.68	0.87	0.55	
Uniform Delay, d1	62.2	37.0		71.3	45.4	36.2		52.1	57.3	59.4	55.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	30.1	5.2		42.6	4.4	0.5		0.1	7.1	22.5	1.1	
Delay (s)	92.3	42.3		113.9	49.8	36.7		52.2	64.5	82.0	56.7	
Level of Service	F	D		F	D	D		D	E	F	E	
Approach Delay (s)		47.5			49.6			59.4			65.5	
Approach LOS		D			D			E			E	

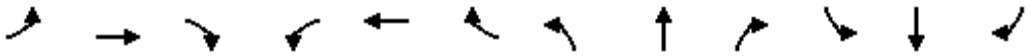
Intersection Summary			
HCM 2000 Control Delay	51.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	149.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	101.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	1978	5	23	1948	8	4	0	2	8	3	9
Future Volume (vph)	8	1978	5	23	1948	8	4	0	2	8	3	9
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	0.91		1.00	0.91			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.95			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	
Satd. Flow (prot)	1770	5084		1770	5082			1722			1713	
Flt Permitted	0.95	1.00		0.95	1.00			0.95			0.86	
Satd. Flow (perm)	1770	5084		1770	5082			1694			1511	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	2150	5	25	2117	9	4	0	2	9	3	10
RTOR Reduction (vph)	0	0	0	0	0	0	0	6	0	0	10	0
Lane Group Flow (vph)	9	2155	0	25	2126	0	0	0	0	0	12	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	1.1	74.5		3.9	77.3			3.5			3.5	
Effective Green, g (s)	1.1	74.5		3.9	77.3			3.5			3.5	
Actuated g/C Ratio	0.01	0.77		0.04	0.80			0.04			0.04	
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)	20	3908		71	4054			61			54	
v/s Ratio Prot	0.01	c0.42		c0.01	c0.42							
v/s Ratio Perm								0.00			c0.01	
v/c Ratio	0.45	0.55		0.35	0.52			0.00			0.23	
Uniform Delay, d1	47.6	4.5		45.3	3.4			45.0			45.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	15.3	0.2		3.0	0.1			0.0			2.2	
Delay (s)	62.9	4.7		48.3	3.5			45.0			47.6	
Level of Service	E	A		D	A			D			D	
Approach Delay (s)		4.9			4.1			45.0			47.6	
Approach LOS		A			A			D			D	

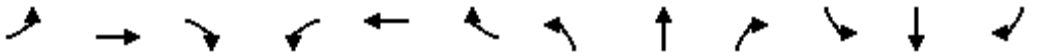
Intersection Summary			
HCM 2000 Control Delay	4.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	96.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



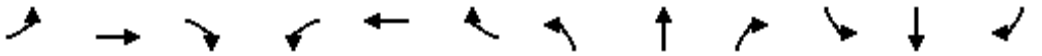
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	2282	6	10	1776	30	6	10	2	20	1	11
Future Volume (vph)	16	2282	6	10	1776	30	6	10	2	20	1	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Frt	1.00	1.00		1.00	1.00			0.98			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1770	5082		1770	5062			1799			1704	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.82	
Satd. Flow (perm)	1770	5082		1770	5062			1685			1449	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	16	2353	6	10	1831	31	6	10	2	21	1	11
RTOR Reduction (vph)	0	0	0	0	1	0	0	2	0	0	10	0
Lane Group Flow (vph)	16	2359	0	10	1861	0	0	16	0	0	23	0
Confl. Peds. (#/hr)	35		17	17		35			15	15		
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	2.1	93.0		1.5	92.4			13.9			13.9	
Effective Green, g (s)	2.1	93.0		1.5	92.4			13.9			13.9	
Actuated g/C Ratio	0.02	0.75		0.01	0.75			0.11			0.11	
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)	30	3830		21	3790			189			163	
v/s Ratio Prot	c0.01	c0.46		0.01	0.37							
v/s Ratio Perm								0.01			c0.02	
v/c Ratio	0.53	0.62		0.48	0.49			0.09			0.14	
Uniform Delay, d1	60.2	7.0		60.6	6.2			49.1			49.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	17.0	0.3		16.0	0.1			0.2			0.4	
Delay (s)	77.2	7.3		76.6	6.3			49.3			49.8	
Level of Service	E	A		E	A			D			D	
Approach Delay (s)		7.8			6.6			49.3			49.8	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	123.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



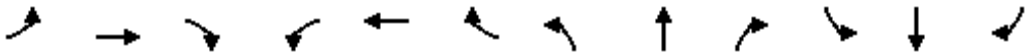
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	1989	29	13	1865	83	12	19	7	59	21	68
Future Volume (vph)	74	1989	29	13	1865	83	12	19	7	59	21	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	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			1.00	1.00		1.00	1.00
Frt	1.00	1.00		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		0.96	1.00
Satd. Flow (prot)	1770	5071		1770	5048			1822	1557		1791	1552
Flt Permitted	0.95	1.00		0.95	1.00			0.88	1.00		0.76	1.00
Satd. Flow (perm)	1770	5071		1770	5048			1641	1557		1414	1552
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	2094	31	14	1963	87	13	20	7	62	22	72
RTOR Reduction (vph)	0	1	0	0	3	0	0	0	6	0	0	62
Lane Group Flow (vph)	78	2124	0	14	2047	0	0	33	1	0	84	10
Confl. Peds. (#/hr)			9			11	5		3	3		5
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	8.9	80.8		2.3	74.2			15.9	15.9		15.9	15.9
Effective Green, g (s)	8.9	80.8		2.3	74.2			15.9	15.9		15.9	15.9
Actuated g/C Ratio	0.08	0.71		0.02	0.65			0.14	0.14		0.14	0.14
Clearance Time (s)	5.0	5.0		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		3.0	3.0
Lane Grp Cap (vph)	138	3594		35	3285			228	217		197	216
v/s Ratio Prot	c0.04	c0.42		0.01	c0.41							
v/s Ratio Perm								0.02	0.00		c0.06	0.01
v/c Ratio	0.57	0.59		0.40	0.62			0.14	0.00		0.43	0.05
Uniform Delay, d1	50.7	8.3		55.2	11.7			43.1	42.2		44.9	42.5
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	5.2	0.3		7.3	0.4			0.3	0.0		1.5	0.1
Delay (s)	55.9	8.6		62.5	12.1			43.4	42.2		46.4	42.6
Level of Service	E	A		E	B			D	D		D	D
Approach Delay (s)		10.3			12.4			43.2			44.6	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	114.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



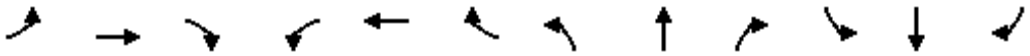
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	2276	10	3	1707	85	21	35	15	64	23	148
Future Volume (vph)	59	2276	10	3	1707	85	21	35	15	64	23	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	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	0.97		1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		0.99	1.00
Frt	1.00	1.00		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		0.96	1.00
Satd. Flow (prot)	1770	5080		1770	5040			1807	1542		1779	1483
Flt Permitted	0.95	1.00		0.95	1.00			0.88	1.00		0.75	1.00
Satd. Flow (perm)	1770	5080		1770	5040			1614	1542		1375	1483
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	62	2396	11	3	1797	89	22	37	16	67	24	156
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	13	0	0	91
Lane Group Flow (vph)	62	2407	0	3	1883	0	0	59	3	0	91	65
Confl. Peds. (#/hr)			23			17	28		11	11		28
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	8.2	88.3		0.6	80.7			19.9	19.9		19.9	19.9
Effective Green, g (s)	8.2	88.3		0.6	80.7			19.9	19.9		19.9	19.9
Actuated g/C Ratio	0.07	0.71		0.00	0.65			0.16	0.16		0.16	0.16
Clearance Time (s)	5.0	5.0		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		3.0	3.0
Lane Grp Cap (vph)	117	3623		8	3285			259	247		221	238
v/s Ratio Prot	c0.04	c0.47		0.00	0.37							
v/s Ratio Perm								0.04	0.00		c0.07	0.04
v/c Ratio	0.53	0.66		0.38	0.57			0.23	0.01		0.41	0.27
Uniform Delay, d1	55.9	9.7		61.4	12.0			45.3	43.7		46.7	45.6
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	4.3	0.5		27.1	0.2			0.5	0.0		1.2	0.6
Delay (s)	60.2	10.1		88.5	12.2			45.7	43.7		47.9	46.2
Level of Service	E	B		F	B			D	D		D	D
Approach Delay (s)		11.4			12.3			45.3			46.8	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	123.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



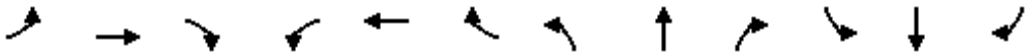
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	35	40	70	79	62	65	364	42	56	576	51
Future Volume (vph)	18	35	40	70	79	62	65	364	42	56	576	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (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	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.97		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		0.96	1.00		0.97	1.00		0.96	1.00	
Frt	1.00	0.92		1.00	0.93		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1757	1664		1705	1724		1715	3454		1706	3469	
Flt Permitted	0.66	1.00		0.71	1.00		0.40	1.00		0.51	1.00	
Satd. Flow (perm)	1227	1664		1267	1724		729	3454		907	3469	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	19	36	42	73	82	65	68	379	44	58	600	53
RTOR Reduction (vph)	0	34	0	0	39	0	0	11	0	0	8	0
Lane Group Flow (vph)	19	44	0	73	108	0	68	412	0	58	645	0
Confl. Peds. (#/hr)	14		67	67		14	75		63	63		75
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	6.4	6.4		6.4	6.4		16.2	16.2		16.2	16.2	
Effective Green, g (s)	6.4	6.4		6.4	6.4		16.2	16.2		16.2	16.2	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.50	0.50		0.50	0.50	
Clearance Time (s)	5.0	5.0		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		3.0	3.0	
Lane Grp Cap (vph)	240	326		248	338		362	1716		450	1723	
v/s Ratio Prot		0.03			c0.06			0.12			c0.19	
v/s Ratio Perm	0.02			0.06			0.09			0.06		
v/c Ratio	0.08	0.14		0.29	0.32		0.19	0.24		0.13	0.37	
Uniform Delay, d1	10.7	10.8		11.2	11.2		4.5	4.7		4.4	5.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.2		0.7	0.6		0.3	0.1		0.1	0.1	
Delay (s)	10.8	11.0		11.8	11.8		4.8	4.8		4.5	5.2	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		11.0			11.8			4.8			5.2	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	32.6	Sum of lost time (s)	10.0
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												
Traffic Volume (vph)	34	89	59	203	69	213	61	426	71	111	493	72
Future Volume (vph)	34	89	59	203	69	213	61	426	71	111	493	72
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	1.00		1.00	1.00			0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.90			0.97		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		0.89	1.00			1.00		0.91	1.00	
Frt	1.00	0.94		1.00	0.89			0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1770	1752		1573	1488			3354		1617	3472	
Flt Permitted	0.52	1.00		0.66	1.00			0.83		0.38	1.00	
Satd. Flow (perm)	973	1752		1084	1488			2793		644	3472	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	97	64	221	75	232	66	463	77	121	536	78
RTOR Reduction (vph)	0	27	0	0	56	0	0	14	0	0	14	0
Lane Group Flow (vph)	37	134	0	221	251	0	0	592	0	121	600	0
Confl. Peds. (#/hr)				122		200			194	194		
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	25.5	25.5		25.5	25.5			25.3		25.3	25.3	
Effective Green, g (s)	25.5	25.5		25.5	25.5			25.3		25.3	25.3	
Actuated g/C Ratio	0.42	0.42		0.42	0.42			0.42		0.42	0.42	
Clearance Time (s)	5.0	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	3.0	
Lane Grp Cap (vph)	408	734		454	624			1162		267	1444	
v/s Ratio Prot		0.08			0.17						0.17	
v/s Ratio Perm	0.04			c0.20				c0.21		0.19		
v/c Ratio	0.09	0.18		0.49	0.40			0.51		0.45	0.42	
Uniform Delay, d1	10.7	11.1		12.9	12.3			13.2		12.8	12.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.8	0.4			0.4		1.2	0.2	
Delay (s)	10.7	11.2		13.7	12.7			13.5		14.0	12.7	
Level of Service	B	B		B	B			B		B	B	
Approach Delay (s)		11.1			13.1			13.5			12.9	
Approach LOS		B			B			B			B	

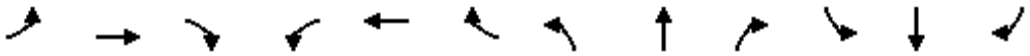
Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	60.8	Sum of lost time (s)	10.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	10	13	6	14	42	22	167	5	22	148	55
Future Volume (Veh/h)	38	10	13	6	14	42	22	167	5	22	148	55
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	11	14	7	15	46	24	182	5	24	161	60
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								450				
pX, platoon unblocked												
vC, conflicting volume	432	474	110	380	502	94	221			187		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	432	474	110	380	502	94	221			187		
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 %	91	98	98	99	97	95	98			98		
cM capacity (veh/h)	458	471	922	520	454	945	1345			1385		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	66	68	115	96	104	140
Volume Left	41	7	24	0	24	0
Volume Right	14	46	0	5	0	60
cSH	516	714	1345	1700	1385	1700
Volume to Capacity	0.13	0.10	0.02	0.06	0.02	0.08
Queue Length 95th (ft)	11	8	1	0	1	0
Control Delay (s)	13.0	10.6	1.7	0.0	1.9	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	13.0	10.6	0.9		0.8	
Approach LOS	B	B				

Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	32.0%	ICU Level of Service		A
Analysis Period (min)	15			

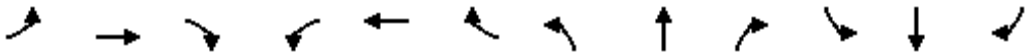


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	32	25	8	26	62	31	138	18	54	241	70
Future Volume (Veh/h)	76	32	25	8	26	62	31	138	18	54	241	70
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	80	34	26	8	27	65	33	145	19	57	254	74
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								419				
pX, platoon unblocked												
vC, conflicting volume	622	635	164	504	662	82	328			164		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	622	635	164	504	662	82	328			164		
tC, single (s)	*6.5	*5.5	*5.9	*6.5	*5.5	*5.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	*2.5	*2.0	*2.3	*2.5	*2.0	*2.3	2.2			2.2		
p0 queue free %	84	96	98	99	96	95	97			96		
cM capacity (veh/h)	508	756	1260	617	730	1405	1228			1412		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	140	100	106	92	184	201
Volume Left	80	8	33	0	57	0
Volume Right	26	65	0	19	0	74
cSH	627	1039	1228	1700	1412	1700
Volume to Capacity	0.22	0.10	0.03	0.05	0.04	0.12
Queue Length 95th (ft)	21	8	2	0	3	0
Control Delay (s)	12.4	8.8	2.7	0.0	2.6	0.0
Lane LOS	B	A	A		A	
Approach Delay (s)	12.4	8.8	1.4		1.2	
Approach LOS	B	A				

Intersection Summary				
Average Delay	4.1			
Intersection Capacity Utilization	39.8%	ICU Level of Service		A
Analysis Period (min)	15			

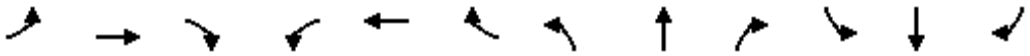
* User Entered Value



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	89	83	15	53	152	130	30	173	36	46	170	149
Future Volume (vph)	89	83	15	53	152	130	30	173	36	46	170	149
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	96	89	16	57	163	140	32	186	39	49	183	160

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	201	360	125	132	141	252
Volume Left (vph)	96	57	32	0	49	0
Volume Right (vph)	16	140	0	39	0	160
Hadj (s)	0.08	-0.17	0.16	-0.17	0.21	-0.41
Departure Headway (s)	6.6	6.0	7.2	6.9	7.1	6.4
Degree Utilization, x	0.37	0.60	0.25	0.25	0.28	0.45
Capacity (veh/h)	493	567	449	477	479	519
Control Delay (s)	13.5	17.8	11.5	11.0	11.5	13.3
Approach Delay (s)	13.5	17.8	11.2		12.7	
Approach LOS	B	C	B		B	

Intersection Summary				
Delay	14.0			
Level of Service	B			
Intersection Capacity Utilization	54.8%	ICU Level of Service	A	
Analysis Period (min)	15			



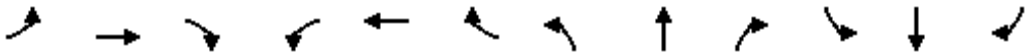
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	170	172	42	75	115	73	24	197	75	116	267	146
Future Volume (vph)	170	172	42	75	115	73	24	197	75	116	267	146
Peak Hour Factor	0.97	0.92	0.97	0.92	0.92	0.92	0.97	0.97	0.92	0.92	0.97	0.97
Hourly flow rate (vph)	175	187	43	82	125	79	25	203	82	126	275	151

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	405	286	127	184	264	289
Volume Left (vph)	175	82	25	0	126	0
Volume Right (vph)	43	79	0	82	0	151
Hadj (s)	0.06	-0.07	0.13	-0.28	0.27	-0.33
Departure Headway (s)	7.5	7.8	8.7	8.2	8.3	7.7
Degree Utilization, x	0.84	0.62	0.30	0.42	0.61	0.62
Capacity (veh/h)	467	430	378	396	418	446
Control Delay (s)	38.9	22.5	14.2	15.8	22.3	21.1
Approach Delay (s)	38.9	22.5	15.2		21.7	
Approach LOS	E	C	C		C	

Intersection Summary				
Delay	25.0			
Level of Service	D			
Intersection Capacity Utilization	69.3%	ICU Level of Service	C	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
11: Cooke St & Halekauwila St

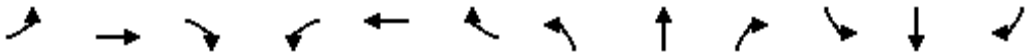
03/11/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	66	83	41	56	118	52	41	303	49	34	270	58
Future Volume (vph)	66	83	41	56	118	52	41	303	49	34	270	58
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	69	87	43	59	124	55	43	319	52	36	284	61

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	199	238	203	212	178	203
Volume Left (vph)	69	59	43	0	36	0
Volume Right (vph)	43	55	0	52	0	61
Hadj (s)	-0.03	-0.06	0.14	-0.14	0.14	-0.18
Departure Headway (s)	6.6	6.4	6.8	6.5	6.9	6.5
Degree Utilization, x	0.36	0.42	0.38	0.38	0.34	0.37
Capacity (veh/h)	500	516	495	525	497	521
Control Delay (s)	13.2	14.1	12.8	12.3	12.1	12.1
Approach Delay (s)	13.2	14.1	12.5		12.1	
Approach LOS	B	B	B		B	

Intersection Summary				
Delay	12.8			
Level of Service	B			
Intersection Capacity Utilization	49.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	106	230	66	73	101	65	28	350	71	55	359	49
Future Volume (vph)	106	230	66	73	101	65	28	350	71	55	359	49
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	110	240	69	76	105	68	29	365	74	57	374	51

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	419	249	212	257	244	238
Volume Left (vph)	110	76	29	0	57	0
Volume Right (vph)	69	68	0	74	0	51
Hadj (s)	-0.01	-0.07	0.10	-0.17	0.15	-0.12
Departure Headway (s)	7.6	8.3	8.6	8.3	8.6	8.3
Degree Utilization, x	0.89	0.57	0.50	0.59	0.58	0.55
Capacity (veh/h)	460	416	398	412	396	410
Control Delay (s)	46.5	21.7	18.7	21.3	21.6	19.7
Approach Delay (s)	46.5	21.7	20.1		20.7	
Approach LOS	E	C	C		C	

Intersection Summary				
Delay	27.3			
Level of Service	D			
Intersection Capacity Utilization	64.4%	ICU Level of Service	C	
Analysis Period (min)	15			

APPENDIX E

TRAFFIC SIGNAL WARRANT ANALYSIS
WARRANT 3

Warrant 3: Peak-Hour Volumes and Delay

City and County of Honolulu
Cooke St & Pohukaina

Kakaako Block I

	Major Street	Minor Street
Street Name	Cooke St	Pohukaina
Direction	N-S	E-W
Number of Lanes	2	1
Approach Speed	25	25

Population less than 10,000? No
Date of Count:
Scenario: AM Year 2026 + Project

Warrant 3 Met?: Met when either Condition A or B is met — **No**

Condition A: Met when conditions A1, A2, and A3 are met — Not Met

Condition A1 — Not Met

The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one lane approach, or five vehicle-hours for a two-lane approach

Minor Approach Delay: 1.37 vehicle-hours

Condition A2 — Met

The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic of 150 vph for two moving lanes

Minor Approach Volume: 336 vph

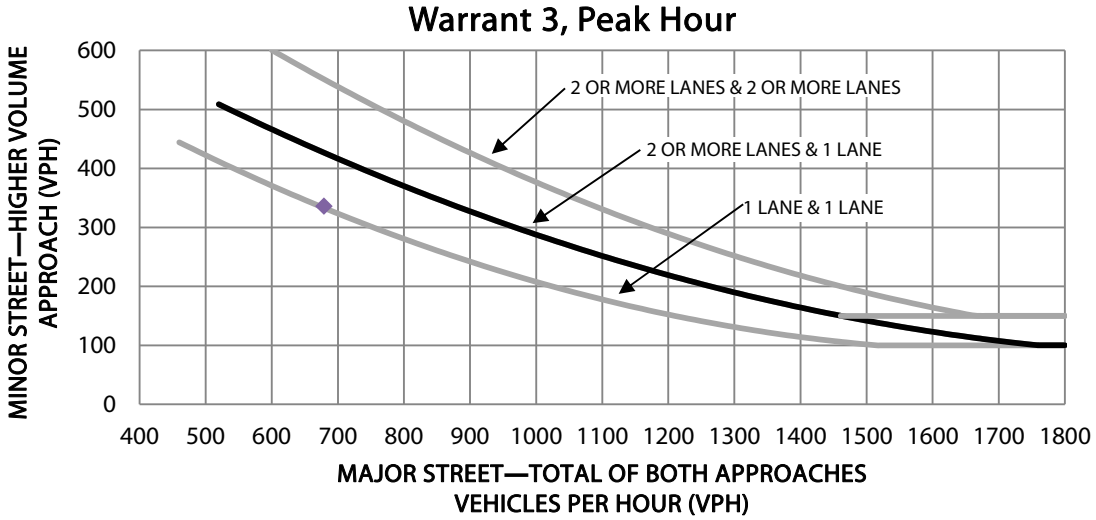
Condition A3 — Met

The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more appraches or 650 vph for intersections with three approaches

Total Entering Volume: 1202 vph

Condition B — Not Met

The plotted point falls above the curve



Warrant 3: Peak-Hour Volumes and Delay

City and County of Honolulu
Cooke St & Pohukaina

Kakaako Block I

	Major Street	Minor Street
Street Name	Cooke St	Pohukaina
Direction	N-S	E-W
Number of Lanes	2	1
Approach Speed	25	25

Population less than 10,000? No
Date of Count:
Scenario: PM Year 2026 + Project

Warrant 3 Met?: Met when either Condition A or B is met — **Yes**

Condition A: Met when conditions A1, A2, and A3 are met — Not Met

Condition A1 — Not Met

The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one lane approach, or five vehicle-hours for a two-lane approach

Minor Approach Delay: 4.84 vehicle-hours

Condition A2 — Met

The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic of 150 vph for two moving lanes

Minor Approach Volume: 384 vph

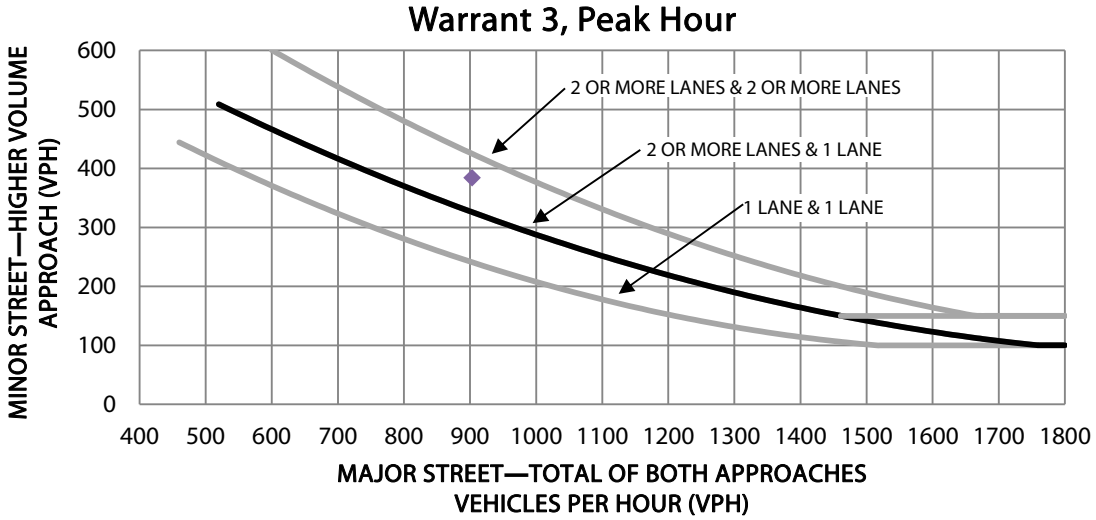
Condition A3 — Met

The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more appraches or 650 vph for intersections with three approaches

Total Entering Volume: 1554 vph

Condition B — Met

The plotted point falls above the curve



Warrant 3: Peak-Hour Volumes and Delay

City and County of Honolulu
Cooke St & Halekauwila St

Kakaako Block I

	Major Street	Minor Street
Street Name	Cooke St	Halekauwila St
Direction	N-S	E-W
Number of Lanes	2	1
Approach Speed	25	25

Population less than 10,000? No
Date of Count:
Scenario: AM + Project

Warrant 3 Met?: Met when either Condition A or B is met — **No**

Condition A: Met when conditions A1, A2, and A3 are met — Not Met

Condition A1 — Not Met

The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one lane approach, or five vehicle-hours for a two-lane approach

Minor Approach Delay: 0.92 vehicle-hours

Condition A2 — Met

The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic of 150 vph for two moving lanes

Minor Approach Volume: 226 vph

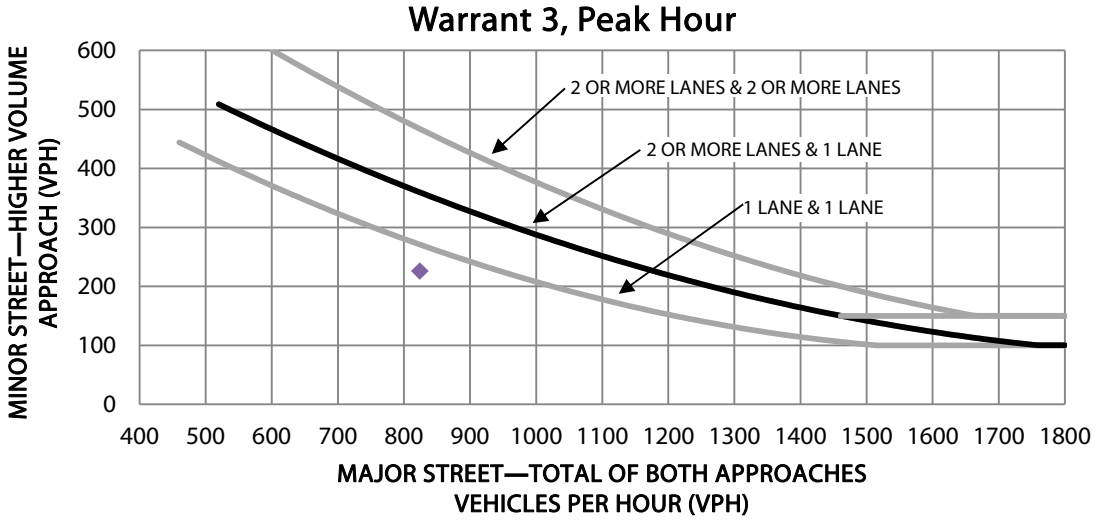
Condition A3 — Met

The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more appraches or 650 vph for intersections with three approaches

Total Entering Volume: 1243 vph

Condition B — Not Met

The plotted point falls above the curve



Warrant 3: Peak-Hour Volumes and Delay

City and County of Honolulu
Cooke St & Halekauwila St

Kakaako Block I

	Major Street	Minor Street
Street Name	Cooke St	Halekauwila St
Direction	N-S	E-W
Number of Lanes	2	1
Approach Speed	25	25

Population less than 10,000? No
Date of Count:
Scenario: PM + Project

Warrant 3 Met?: Met when either Condition A or B is met — **Yes**

Condition A: Met when conditions A1, A2, and A3 are met — Met

Condition A1 — Met

The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one lane approach, or five vehicle-hours for a two-lane approach

Minor Approach Delay: 6.1 vehicle-hours

Condition A2 — Met

The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic of 150 vph for two moving lanes

Minor Approach Volume: 411 vph

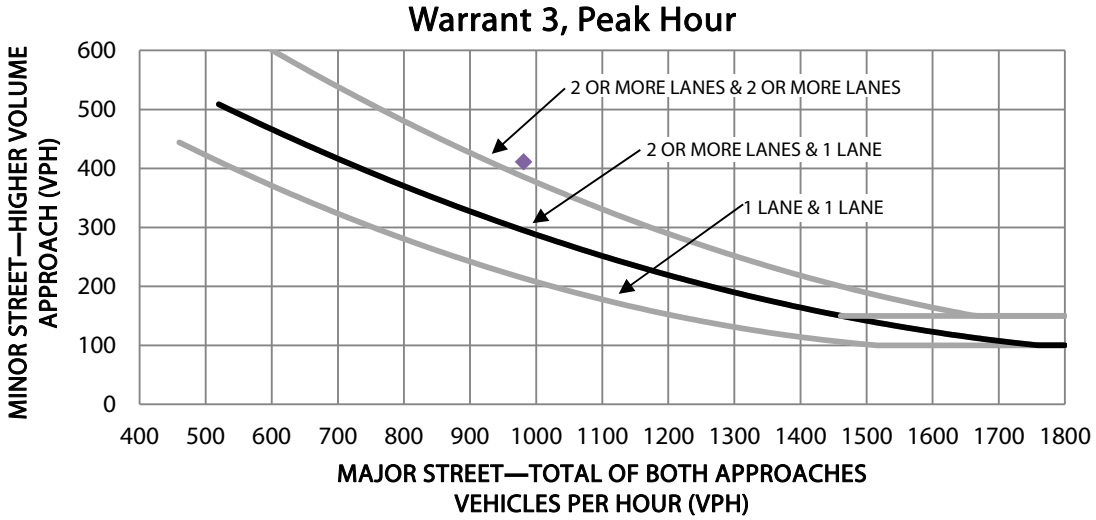
Condition A3 — Met

The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more appraches or 650 vph for intersections with three approaches

Total Entering Volume: 1631 vph

Condition B — Met

The plotted point falls above the curve

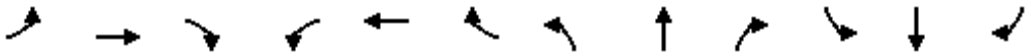


APPENDIX F

CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2026 PEAK PERIOD TRAFFIC
ANALYSIS WITH PROJECT

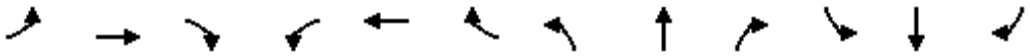
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	260	1672	12	97	1773	215	2	41	44	293	116	219
Future Volume (vph)	260	1672	12	97	1773	215	2	41	44	293	116	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0	5.0	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	0.86		1.00	0.93	1.00	0.95	
Flpb, ped/bikes	1.00	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	0.85		1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (prot)	1770	5078		1770	5085	1357		3531	1473	1610	2925	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (perm)	1770	5078		1770	5085	1357		3531	1473	1610	2925	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	274	1760	13	102	1866	226	2	43	46	308	122	231
RTOR Reduction (vph)	0	1	0	0	0	87	0	0	0	0	142	0
Lane Group Flow (vph)	274	1772	0	102	1866	139	0	45	46	228	291	0
Confl. Peds. (#/hr)			13			94			51			73
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	18.5	57.6		9.3	48.4	48.4		14.4	14.4	22.1	22.1	
Effective Green, g (s)	18.5	57.6		9.3	48.4	48.4		14.4	14.4	22.1	22.1	
Actuated g/C Ratio	0.15	0.47		0.08	0.39	0.39		0.12	0.12	0.18	0.18	
Clearance Time (s)	5.0	5.0		5.0	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	3.0	3.0	3.0	
Lane Grp Cap (vph)	265	2370		133	1994	532		412	171	288	523	
v/s Ratio Prot	c0.15	0.35		0.06	c0.37			0.01		c0.14	0.10	
v/s Ratio Perm						0.10			c0.03			
v/c Ratio	1.03	0.75		0.77	0.94	0.26		0.11	0.27	0.79	0.56	
Uniform Delay, d1	52.5	27.0		56.0	36.0	25.4		48.8	49.7	48.4	46.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	64.4	1.3		22.8	8.9	0.3		0.1	0.9	13.8	1.3	
Delay (s)	116.8	28.3		78.8	44.9	25.7		48.9	50.6	62.2	47.5	
Level of Service	F	C		E	D	C		D	D	E	D	
Approach Delay (s)		40.1			44.5			49.7			52.6	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	43.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	123.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	92.2%	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												
Traffic Volume (vph)	235	2025	2	52	1464	284	6	108	160	347	69	290
Future Volume (vph)	235	2025	2	52	1464	284	6	108	160	347	69	290
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	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	0.81		1.00	0.87	1.00	0.96	
Flpb, ped/bikes	1.00	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	0.85		1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (prot)	1770	5084		1770	5085	1276		3530	1376	1610	2926	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	
Satd. Flow (perm)	1770	5084		1770	5085	1276		3530	1376	1610	2926	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	247	2132	2	55	1541	299	6	114	168	365	73	305
RTOR Reduction (vph)	0	0	0	0	0	143	0	0	0	0	197	0
Lane Group Flow (vph)	247	2134	0	55	1541	156	0	120	168	259	287	0
Confl. Peds. (#/hr)			41			107			94			31
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	23.1	69.6		6.0	52.5	52.5		27.1	27.1	27.7	27.7	
Effective Green, g (s)	23.1	69.6		6.0	52.5	52.5		27.1	27.1	27.7	27.7	
Actuated g/C Ratio	0.15	0.46		0.04	0.35	0.35		0.18	0.18	0.18	0.18	
Clearance Time (s)	5.0	5.0		5.0	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	3.0	3.0	3.0	
Lane Grp Cap (vph)	271	2352		70	1775	445		636	247	296	538	
v/s Ratio Prot	c0.14	c0.42		0.03	0.30			0.03		c0.16	0.10	
v/s Ratio Perm						0.12			c0.12			
v/c Ratio	0.91	0.91		0.79	0.87	0.35		0.19	0.68	0.88	0.53	
Uniform Delay, d1	62.6	37.4		71.6	45.7	36.3		52.3	57.6	59.7	55.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	32.3	5.6		42.6	4.8	0.5		0.1	7.5	23.7	1.0	
Delay (s)	95.0	43.0		114.2	50.5	36.8		52.5	65.1	83.4	56.5	
Level of Service	F	D		F	D	D		D	E	F	E	
Approach Delay (s)		48.4			50.2			59.8			65.9	
Approach LOS		D			D			E			E	

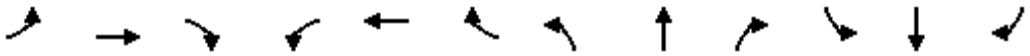
Intersection Summary			
HCM 2000 Control Delay	52.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	150.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	101.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	1979	5	23	1966	8	4	0	2	24	3	9
Future Volume (vph)	8	1979	5	23	1966	8	4	0	2	24	3	9
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	0.91		1.00	0.91			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.95			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.97	
Satd. Flow (prot)	1770	5084		1770	5082			1722			1740	
Flt Permitted	0.95	1.00		0.95	1.00			0.78			0.80	
Satd. Flow (perm)	1770	5084		1770	5082			1380			1432	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	2151	5	25	2137	9	4	0	2	26	3	10
RTOR Reduction (vph)	0	0	0	0	0	0	0	6	0	0	10	0
Lane Group Flow (vph)	9	2156	0	25	2146	0	0	0	0	0	29	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	1.1	75.3		3.9	78.1			4.5			4.5	
Effective Green, g (s)	1.1	75.3		3.9	78.1			4.5			4.5	
Actuated g/C Ratio	0.01	0.76		0.04	0.79			0.05			0.05	
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)	19	3878		69	4021			62			65	
v/s Ratio Prot	0.01	c0.42		c0.01	c0.42							
v/s Ratio Perm								0.00			c0.02	
v/c Ratio	0.47	0.56		0.36	0.53			0.00			0.45	
Uniform Delay, d1	48.5	4.8		46.2	3.7			45.0			45.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	17.5	0.2		3.2	0.1			0.0			4.9	
Delay (s)	66.0	5.0		49.4	3.9			45.0			50.9	
Level of Service	E	A		D	A			D			D	
Approach Delay (s)		5.2			4.4			45.0			50.9	
Approach LOS		A			A			D			D	

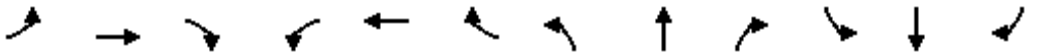
Intersection Summary			
HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	98.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



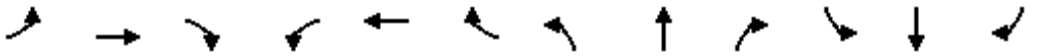
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	2283	6	10	1787	31	6	10	2	30	1	11
Future Volume (vph)	16	2283	6	10	1787	31	6	10	2	30	1	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Frt	1.00	1.00		1.00	1.00			0.98			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1770	5082		1770	5061			1799			1712	
Flt Permitted	0.95	1.00		0.95	1.00			0.93			0.80	
Satd. Flow (perm)	1770	5082		1770	5061			1692			1414	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	16	2354	6	10	1842	32	6	10	2	31	1	11
RTOR Reduction (vph)	0	0	0	0	1	0	0	2	0	0	9	0
Lane Group Flow (vph)	16	2360	0	10	1873	0	0	16	0	0	34	0
Confl. Peds. (#/hr)	35		17	17		35			15	15		
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	2.1	91.4		1.5	90.8			16.0			16.0	
Effective Green, g (s)	2.1	91.4		1.5	90.8			16.0			16.0	
Actuated g/C Ratio	0.02	0.74		0.01	0.73			0.13			0.13	
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)	30	3748		21	3708			218			182	
v/s Ratio Prot	c0.01	c0.46		0.01	0.37							
v/s Ratio Perm								0.01			c0.02	
v/c Ratio	0.53	0.63		0.48	0.51			0.07			0.19	
Uniform Delay, d1	60.4	8.0		60.8	7.0			47.4			48.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	17.0	0.3		16.0	0.1			0.1			0.5	
Delay (s)	77.4	8.3		76.9	7.1			47.6			48.7	
Level of Service	E	A		E	A			D			D	
Approach Delay (s)		8.8			7.5			47.6			48.7	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	123.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



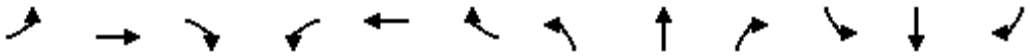
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	1989	29	13	1883	83	12	19	7	60	21	68
Future Volume (vph)	80	1989	29	13	1883	83	12	19	7	60	21	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	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			1.00	1.00		1.00	1.00
Frt	1.00	1.00		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		0.96	1.00
Satd. Flow (prot)	1770	5071		1770	5048			1822	1557		1790	1552
Flt Permitted	0.95	1.00		0.95	1.00			0.88	1.00		0.76	1.00
Satd. Flow (perm)	1770	5071		1770	5048			1639	1557		1412	1552
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	84	2094	31	14	1982	87	13	20	7	63	22	72
RTOR Reduction (vph)	0	1	0	0	3	0	0	0	6	0	0	62
Lane Group Flow (vph)	84	2124	0	14	2066	0	0	33	1	0	85	10
Confl. Peds. (#/hr)			9			11	5		3	3		5
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	11.4	84.6		2.3	75.5			16.0	16.0		16.0	16.0
Effective Green, g (s)	11.4	84.6		2.3	75.5			16.0	16.0		16.0	16.0
Actuated g/C Ratio	0.10	0.72		0.02	0.64			0.14	0.14		0.14	0.14
Clearance Time (s)	5.0	5.0		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		3.0	3.0
Lane Grp Cap (vph)	171	3638		34	3232			222	211		191	210
v/s Ratio Prot	c0.05	c0.42		0.01	c0.41							
v/s Ratio Perm								0.02	0.00		c0.06	0.01
v/c Ratio	0.49	0.58		0.41	0.64			0.15	0.00		0.45	0.05
Uniform Delay, d1	50.5	8.1		57.1	12.9			44.9	44.1		46.9	44.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.2	0.2		7.9	0.4			0.3	0.0		1.7	0.1
Delay (s)	52.7	8.3		65.0	13.3			45.3	44.1		48.5	44.4
Level of Service	D	A		E	B			D	D		D	D
Approach Delay (s)		10.0			13.7			45.0			46.6	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	117.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



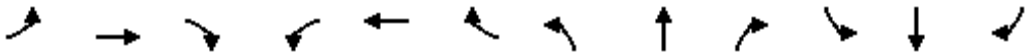
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	2276	10	3	1718	85	21	35	15	65	23	149
Future Volume (vph)	77	2276	10	3	1718	85	21	35	15	65	23	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	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	0.97		1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		0.99	1.00
Frt	1.00	1.00		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		0.96	1.00
Satd. Flow (prot)	1770	5080		1770	5040			1807	1543		1779	1483
Flt Permitted	0.95	1.00		0.95	1.00			0.88	1.00		0.74	1.00
Satd. Flow (perm)	1770	5080		1770	5040			1613	1543		1373	1483
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	81	2396	11	3	1808	89	22	37	16	68	24	157
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	13	0	0	107
Lane Group Flow (vph)	81	2407	0	3	1894	0	0	59	3	0	92	50
Confl. Peds. (#/hr)			23			17	28		11	11		28
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	9.4	88.1		0.6	79.3			19.9	19.9		19.9	19.9
Effective Green, g (s)	9.4	88.1		0.6	79.3			19.9	19.9		19.9	19.9
Actuated g/C Ratio	0.08	0.71		0.00	0.64			0.16	0.16		0.16	0.16
Clearance Time (s)	5.0	5.0		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		3.0	3.0
Lane Grp Cap (vph)	134	3620		8	3233			259	248		221	238
v/s Ratio Prot	c0.05	c0.47		0.00	0.38							
v/s Ratio Perm								0.04	0.00		c0.07	0.03
v/c Ratio	0.60	0.66		0.38	0.59			0.23	0.01		0.42	0.21
Uniform Delay, d1	55.3	9.7		61.3	12.7			45.2	43.6		46.6	45.0
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	7.5	0.5		27.1	0.3			0.5	0.0		1.3	0.4
Delay (s)	62.8	10.2		88.4	13.0			45.6	43.6		47.9	45.5
Level of Service	E	B		F	B			D	D		D	D
Approach Delay (s)		11.9			13.1			45.2			46.4	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	123.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



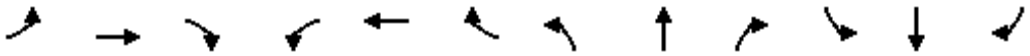
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	38	40	70	80	62	65	364	42	56	579	51
Future Volume (vph)	18	38	40	70	80	62	65	364	42	56	579	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (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	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.97		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		0.96	1.00		0.97	1.00		0.96	1.00	
Frt	1.00	0.92		1.00	0.93		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1757	1674		1705	1724		1715	3454		1706	3470	
Flt Permitted	0.66	1.00		0.70	1.00		0.40	1.00		0.51	1.00	
Satd. Flow (perm)	1226	1674		1263	1724		727	3454		907	3470	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	19	40	42	73	83	65	68	379	44	58	603	53
RTOR Reduction (vph)	0	34	0	0	38	0	0	11	0	0	8	0
Lane Group Flow (vph)	19	48	0	73	110	0	68	412	0	58	648	0
Confl. Peds. (#/hr)	14		67	67		14	75		63	63		75
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	6.4	6.4		6.4	6.4		16.2	16.2		16.2	16.2	
Effective Green, g (s)	6.4	6.4		6.4	6.4		16.2	16.2		16.2	16.2	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.50	0.50		0.50	0.50	
Clearance Time (s)	5.0	5.0		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		3.0	3.0	
Lane Grp Cap (vph)	240	328		247	338		361	1716		450	1724	
v/s Ratio Prot		0.03			c0.06			0.12			c0.19	
v/s Ratio Perm	0.02			0.06			0.09			0.06		
v/c Ratio	0.08	0.15		0.30	0.33		0.19	0.24		0.13	0.38	
Uniform Delay, d1	10.7	10.8		11.2	11.2		4.6	4.7		4.4	5.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.2		0.7	0.6		0.3	0.1		0.1	0.1	
Delay (s)	10.8	11.0		11.8	11.8		4.8	4.8		4.5	5.2	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		11.0			11.8			4.8			5.2	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	32.6	Sum of lost time (s)	10.0
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												
Traffic Volume (vph)	34	91	59	203	72	213	61	426	71	111	502	73
Future Volume (vph)	34	91	59	203	72	213	61	426	71	111	502	73
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	1.00		1.00	1.00			0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.90			0.97		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		0.89	1.00			1.00		0.91	1.00	
Frt	1.00	0.94		1.00	0.89			0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1770	1753		1573	1491			3354		1617	3472	
Flt Permitted	0.52	1.00		0.65	1.00			0.83		0.38	1.00	
Satd. Flow (perm)	967	1753		1083	1491			2787		644	3472	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	99	64	221	78	232	66	463	77	121	546	79
RTOR Reduction (vph)	0	26	0	0	56	0	0	14	0	0	14	0
Lane Group Flow (vph)	37	137	0	221	254	0	0	592	0	121	611	0
Confl. Peds. (#/hr)				122		200			194	194		
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	25.5	25.5		25.5	25.5			25.3		25.3	25.3	
Effective Green, g (s)	25.5	25.5		25.5	25.5			25.3		25.3	25.3	
Actuated g/C Ratio	0.42	0.42		0.42	0.42			0.42		0.42	0.42	
Clearance Time (s)	5.0	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	3.0	
Lane Grp Cap (vph)	405	735		454	625			1159		267	1444	
v/s Ratio Prot		0.08			0.17						0.18	
v/s Ratio Perm	0.04			c0.20				c0.21		0.19		
v/c Ratio	0.09	0.19		0.49	0.41			0.51		0.45	0.42	
Uniform Delay, d1	10.7	11.1		12.9	12.3			13.2		12.8	12.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.8	0.4			0.4		1.2	0.2	
Delay (s)	10.8	11.2		13.7	12.8			13.5		14.0	12.8	
Level of Service	B	B		B	B			B		B	B	
Approach Delay (s)		11.1			13.2			13.5			13.0	
Approach LOS		B			B			B			B	

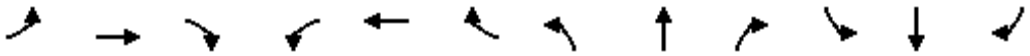
Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	60.8	Sum of lost time (s)	10.0
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	13	13	7	14	104	22	167	5	36	148	55
Future Volume (Veh/h)	38	13	13	7	14	104	22	167	5	36	148	55
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	14	14	8	15	113	24	182	5	39	161	60
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								450				
pX, platoon unblocked												
vC, conflicting volume	528	504	110	412	532	94	221			187		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	528	504	110	412	532	94	221			187		
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 %	89	97	98	98	97	88	98			97		
cM capacity (veh/h)	358	447	922	487	432	945	1345			1385		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	69	136	115	96	120	140
Volume Left	41	8	24	0	39	0
Volume Right	14	113	0	5	0	60
cSH	429	796	1345	1700	1385	1700
Volume to Capacity	0.16	0.17	0.02	0.06	0.03	0.08
Queue Length 95th (ft)	14	15	1	0	2	0
Control Delay (s)	15.0	10.4	1.7	0.0	2.7	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	15.0	10.4	0.9		1.2	
Approach LOS	B	B				

Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	32.6%	ICU Level of Service		A
Analysis Period (min)	15			

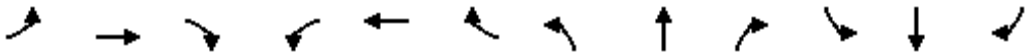


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	41	25	10	26	103	31	138	36	97	241	70
Future Volume (Veh/h)	76	41	25	10	26	103	31	138	36	97	241	70
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	80	43	26	11	27	108	33	145	38	102	254	74
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								419				
pX, platoon unblocked												
vC, conflicting volume	755	744	164	608	762	92	328			183		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	755	744	164	608	762	92	328			183		
tC, single (s)	*6.5	*5.5	*5.9	*6.5	*5.5	*5.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	*2.5	*2.0	*2.3	*2.5	*2.0	*2.3	2.2			2.2		
p0 queue free %	80	93	98	98	96	92	97			93		
cM capacity (veh/h)	391	636	1260	506	621	1387	1228			1389		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	149	146	106	110	229	201
Volume Left	80	11	33	0	102	0
Volume Right	26	108	0	38	0	74
cSH	508	1021	1228	1700	1389	1700
Volume to Capacity	0.29	0.14	0.03	0.07	0.07	0.12
Queue Length 95th (ft)	30	12	2	0	6	0
Control Delay (s)	15.0	9.1	2.7	0.0	3.8	0.0
Lane LOS	B	A	A		A	
Approach Delay (s)	15.0	9.1	1.3		2.0	
Approach LOS	B	A				

Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	47.1%	ICU Level of Service		A
Analysis Period (min)	15			

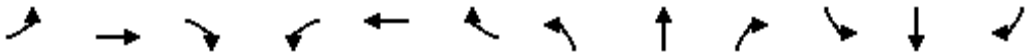
* User Entered Value



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	89	83	15	54	152	130	30	232	39	46	183	149
Future Volume (vph)	89	83	15	54	152	130	30	232	39	46	183	149
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	96	89	16	58	163	140	32	249	42	49	197	160

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	201	361	157	167	148	259
Volume Left (vph)	96	58	32	0	49	0
Volume Right (vph)	16	140	0	42	0	160
Hadj (s)	0.08	-0.17	0.14	-0.14	0.20	-0.40
Departure Headway (s)	7.0	6.3	7.4	7.1	7.3	6.7
Degree Utilization, x	0.39	0.63	0.32	0.33	0.30	0.48
Capacity (veh/h)	459	541	447	471	465	499
Control Delay (s)	14.3	19.5	12.6	12.3	12.2	14.5
Approach Delay (s)	14.3	19.5	12.4		13.6	
Approach LOS	B	C	B		B	

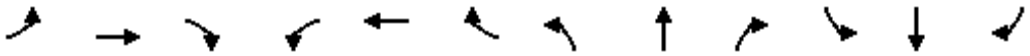
Intersection Summary				
Delay	15.1			
Level of Service	C			
Intersection Capacity Utilization	56.0%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	170	172	42	79	115	73	24	236	75	116	306	146
Future Volume (vph)	170	172	42	79	115	73	24	236	75	116	306	146
Peak Hour Factor	0.97	0.92	0.97	0.92	0.92	0.92	0.97	0.97	0.92	0.92	0.97	0.97
Hourly flow rate (vph)	175	187	43	86	125	79	25	243	82	126	315	151

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	405	290	147	204	284	309
Volume Left (vph)	175	86	25	0	126	0
Volume Right (vph)	43	79	0	82	0	151
Hadj (s)	0.06	-0.07	0.12	-0.25	0.26	-0.31
Departure Headway (s)	7.8	8.1	8.9	8.5	8.6	8.0
Degree Utilization, x	0.88	0.66	0.36	0.48	0.68	0.69
Capacity (veh/h)	451	414	373	389	399	434
Control Delay (s)	45.4	25.3	15.7	17.9	26.5	25.5
Approach Delay (s)	45.4	25.3	17.0		26.0	
Approach LOS	E	D	C		D	

Intersection Summary				
Delay	28.7			
Level of Service	D			
Intersection Capacity Utilization	70.7%	ICU Level of Service	C	
Analysis Period (min)	15			



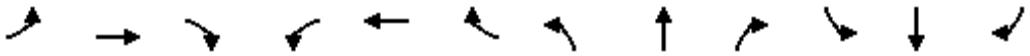
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	66	83	44	56	118	52	41	362	49	34	280	58
Future Volume (vph)	66	83	44	56	118	52	41	362	49	34	280	58
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	69	87	46	59	124	55	43	381	52	36	295	61

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	202	238	234	243	184	209
Volume Left (vph)	69	59	43	0	36	0
Volume Right (vph)	46	55	0	52	0	61
Hadj (s)	-0.03	-0.06	0.13	-0.12	0.13	-0.17
Departure Headway (s)	6.8	6.6	6.9	6.6	7.0	6.7
Degree Utilization, x	0.38	0.44	0.45	0.45	0.36	0.39
Capacity (veh/h)	485	500	493	519	485	508
Control Delay (s)	13.9	14.7	14.1	13.7	12.7	12.7
Approach Delay (s)	13.9	14.7	13.9		12.7	
Approach LOS	B	B	B		B	

Intersection Summary				
Delay	13.7			
Level of Service	B			
Intersection Capacity Utilization	51.0%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
11: Cooke St & Halekauwila St

03/11/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	106	230	75	73	101	65	28	389	71	55	359	49
Future Volume (vph)	106	230	75	73	101	65	28	389	71	55	359	49
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	110	240	78	76	105	68	29	405	74	57	374	51

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	428	249	232	277	244	238
Volume Left (vph)	110	76	29	0	57	0
Volume Right (vph)	78	68	0	74	0	51
Hadj (s)	-0.02	-0.07	0.10	-0.15	0.15	-0.12
Departure Headway (s)	7.8	8.5	8.7	8.4	8.8	8.5
Degree Utilization, x	0.93	0.59	0.56	0.65	0.59	0.56
Capacity (veh/h)	428	403	396	409	389	402
Control Delay (s)	53.4	22.8	20.9	24.3	22.6	20.6
Approach Delay (s)	53.4	22.8	22.7		21.6	
Approach LOS	F	C	C		C	

Intersection Summary				
Delay	30.3			
Level of Service	D			
Intersection Capacity Utilization	65.9%	ICU Level of Service	C	
Analysis Period (min)	15			

APPENDIX G

CAPACITY ANALYSIS CALCULATIONS
BASELINE PEDESTRIAN LEVELS OF SERVICE

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	87.0	97.0	56.0	67.0
Crosswalk Width (ft)	12.0	11.0	11.0	12.0
Total Number of Lanes Crossed	8	7	5	5
Number of Right-Turn Islands	1	0	0	0
Type of Control	Actuated	Actuated	Actuated	Actuated
Corresponding Signal Phase	4	8	2	6
Effective Walk Time (s)	11.0	11.0	11.0	11.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	37	25	7	47
Ped. Right-Left Flow Rate (p/h)	36	26	6	47
Ped. R. Sidewalk Flow Rate (p/h)	73	51	13	94
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	231	44	12	227
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	436.7	342.0	914.3	253.4
Right Corner Quality of Service	A	A	A	A
Ped. Circulation Area (sq.ft)	89.3	185.7	701.2	54.0
Crosswalk Circulation Code	A	A	A	B
Pedestrian Delay (s/p)	64.4	64.4	64.4	64.4
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	3.08	3.15	2.38	2.50
Pedestrian Crosswalk LOS	C	C	B	B

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	87.0	97.0	56.0	68.0
Crosswalk Width (ft)	12.0	11.0	11.0	12.0
Total Number of Lanes Crossed	8	7	5	6
Number of Right-Turn Islands	1	1	0	0
Type of Control	Actuated	Actuated	Actuated	Actuated
Corresponding Signal Phase	4	8	2	6
Effective Walk Time (s)	11.0	11.0	11.0	11.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	16	47	21	54
Ped. Right-Left Flow Rate (p/h)	15	47	20	53
Ped. R. Sidewalk Flow Rate (p/h)	31	94	41	107
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	291	163	2	286
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	677.5	217.4	381.2	273.1
Right Corner Quality of Service	A	A	A	A
Ped. Circulation Area (sq.ft)	152.6	73.3	212.4	29.2
Crosswalk Circulation Code	A	A	A	C
Pedestrian Delay (s/p)	69.4	69.4	69.4	69.4
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	3.09	2.99	2.40	2.66
Pedestrian Crosswalk LOS	C	C	B	B

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	96.1	96.1	24.1	23.9
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	7	7	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	4	8	2	6
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	75.0	75.0	75.0	75.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	3.17	3.17	1.76	1.76
Pedestrian Crosswalk LOS	C	C	A	A

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	84.1	72.0	43.0	40.0
Crosswalk Width (ft)	12.0	11.0	10.0	10.0
Total Number of Lanes Crossed	7	7	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	Actuated
Corresponding Signal Phase	4	8	2	6
Effective Walk Time (s)	0.0	0.0	0.0	11.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	13	13	17
Ped. Right-Left Flow Rate (p/h)	0	14	12	17
Ped. R. Sidewalk Flow Rate (p/h)	0	27	25	34
Veh. Perm. L. Flow in Walk (v/h)	0	20	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	2	6	30
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	2864.0	795.7	914.3	1050.4
Right Corner Quality of Service	A	A	A	A
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	191.1
Crosswalk Circulation Code	-	F	F	A
Pedestrian Delay (s/p)	80.0	80.0	80.0	69.4
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	3.16	3.19	1.76	1.79
Pedestrian Crosswalk LOS	C	C	A	A

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	85.3	86.0	56.0	54.0
Crosswalk Width (ft)	11.0	11.0	10.0	10.5
Total Number of Lanes Crossed	7	8	3	4
Number of Right-Turn Islands	0	0	0	0
Type of Control	Actuated	Actuated	Actuated	Actuated
Corresponding Signal Phase	4	8	2	6
Effective Walk Time (s)	11.0	11.0	11.0	11.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	3	2	4	5
Ped. Right-Left Flow Rate (p/h)	2	1	5	6
Ped. R. Sidewalk Flow Rate (p/h)	5	3	9	11
Veh. Perm. L. Flow in Walk (v/h)	13	47	0	0
Veh. Perm. R. Flow in Walk (v/h)	70	8	32	68
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	3811.4	4259.8	3444.6	2673.2
Right Corner Quality of Service	A	A	A	A
Ped. Circulation Area (sq.ft)	1720.5	3041.8	869.9	657.2
Crosswalk Circulation Code	A	A	A	A
Pedestrian Delay (s/p)	64.4	64.4	64.4	64.4
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	3.18	3.28	2.00	2.22
Pedestrian Crosswalk LOS	C	C	A	B

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	85.3	86.0	56.0	54.0
Crosswalk Width (ft)	11.0	11.0	10.0	10.5
Total Number of Lanes Crossed	7	8	3	4
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	Actuated
Corresponding Signal Phase	4	8	2	6
Effective Walk Time (s)	0.0	0.0	0.0	11.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	14	6	12	9
Ped. Right-Left Flow Rate (p/h)	14	5	11	8
Ped. R. Sidewalk Flow Rate (p/h)	28	11	23	17
Veh. Perm. L. Flow in Walk (v/h)	23	63	0	0
Veh. Perm. R. Flow in Walk (v/h)	161	17	11	56
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	889.9	1836.4	1249.1	1142.0
Right Corner Quality of Service	A	A	A	A
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	409.2
Crosswalk Circulation Code	F	F	F	A
Pedestrian Delay (s/p)	80.0	80.0	80.0	69.4
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	3.25	3.35	2.01	2.25
Pedestrian Crosswalk LOS	C	C	B	B

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	49.6	70.0	77.0	79.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	3	4	4	5
Number of Right-Turn Islands	0	1	0	0
Type of Control	None	Actuated	Actuated	Actuated
Corresponding Signal Phase	6	2	4	8
Effective Walk Time (s)	0.0	11.0	11.0	11.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	31	33	7
Ped. Right-Left Flow Rate (p/h)	0	32	34	7
Ped. R. Sidewalk Flow Rate (p/h)	0	63	67	14
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	87	68	80
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	1066.7	508.6	355.8	2592.7
Right Corner Quality of Service	A	A	A	A
Ped. Circulation Area (sq.ft)	0.0	249.5	246.8	1176.9
Crosswalk Circulation Code	-	A	A	A
Pedestrian Delay (s/p)	45.0	34.7	34.7	34.7
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	2.04	2.35	2.36	2.47
Pedestrian Crosswalk LOS	B	B	B	B

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	40.3	70.0	77.0	79.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	3	4	5	5
Number of Right-Turn Islands	0	1	0	0
Type of Control	None	Actuated	Actuated	Actuated
Corresponding Signal Phase	6	2	4	8
Effective Walk Time (s)	0.0	11.0	11.0	11.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	97	61	100
Ped. Right-Left Flow Rate (p/h)	0	97	61	100
Ped. R. Sidewalk Flow Rate (p/h)	0	194	122	200
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	118	79	228
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	30	30	30
Right Corner Area per Ped (sq.ft)	575.9	109.5	150.8	171.4
Right Corner Quality of Service	A	A	A	A
Ped. Circulation Area (sq.ft)	0.0	76.2	132.8	65.6
Crosswalk Circulation Code	-	A	A	A
Pedestrian Delay (s/p)	45.0	34.7	34.7	34.7
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	2.05	2.38	2.52	2.53
Pedestrian Crosswalk LOS	B	B	B	B

Approach	
Approach Direction	NB
Median Present?	No
Approach Delay(s)	15.8
Level of Service	C

Crosswalk	
Length (ft)	56
Lanes Crossed	4
Veh Vol Crossed	253
Ped Vol Crossed	0
Yield Rate(%)	0
Ped Platooning	No
Critical Headway (s)	17.00
Prob of Delayed X-ing	0.70
Prob of Blocked Lane	0.26
Delay for adq Gap	22.61
Avg Ped Delay (s)	15.76

Approach	
Approach Direction	SB
Median Present?	No
Approach Delay(s)	15.8
Level of Service	C

Crosswalk	
Length (ft)	56
Lanes Crossed	4
Veh Vol Crossed	253
Ped Vol Crossed	0
Yield Rate(%)	0
Ped Platooning	No
Critical Headway (s)	17.00
Prob of Delayed X-ing	0.70
Prob of Blocked Lane	0.26
Delay for adq Gap	22.61
Avg Ped Delay (s)	15.76

Approach	
Approach Direction	NB
Median Present?	No
Approach Delay(s)	21.3
Level of Service	D

Crosswalk	
Length (ft)	56
Lanes Crossed	4
Veh Vol Crossed	307
Ped Vol Crossed	0
Yield Rate(%)	0
Ped Platooning	No
Critical Headway (s)	17.00
Prob of Delayed X-ing	0.77
Prob of Blocked Lane	0.30
Delay for adq Gap	27.77
Avg Ped Delay (s)	21.25

Approach	
Approach Direction	SB
Median Present?	No
Approach Delay(s)	25.6
Level of Service	D

Crosswalk	
Length (ft)	61
Lanes Crossed	4
Veh Vol Crossed	307
Ped Vol Crossed	0
Yield Rate(%)	0
Ped Platooning	No
Critical Headway (s)	18.25
Prob of Delayed X-ing	0.79
Prob of Blocked Lane	0.32
Delay for adq Gap	32.47
Avg Ped Delay (s)	25.62

APPENDIX H

CAPACITY ANALYSIS CALCULATIONS
PROJECTED PEDESTRIAN LEVELS OF SERVICE

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	87.0	97.0	56.0	67.0
Crosswalk Width (ft)	12.0	11.0	11.0	12.0
Total Number of Lanes Crossed	8	7	5	6
Number of Right-Turn Islands	1	0	0	0
Type of Control	Actuated	Actuated	Actuated	Actuated
Corresponding Signal Phase	4	8	2	6
Effective Walk Time (s)	11.0	11.0	11.0	11.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	37	25	7	47
Ped. Right-Left Flow Rate (p/h)	36	26	6	47
Ped. R. Sidewalk Flow Rate (p/h)	73	51	13	94
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	231	44	12	227
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	436.7	342.0	914.3	253.4
Right Corner Quality of Service	A	A	A	A
Ped. Circulation Area (sq.ft)	89.3	185.7	701.2	54.0
Crosswalk Circulation Code	A	A	A	B
Pedestrian Delay (s/p)	64.4	64.4	64.4	64.4
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	3.10	3.22	2.39	2.67
Pedestrian Crosswalk LOS	C	C	B	B

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	87.0	97.0	56.0	68.0
Crosswalk Width (ft)	12.0	11.0	11.0	12.0
Total Number of Lanes Crossed	8	7	5	5
Number of Right-Turn Islands	1	1	0	0
Type of Control	Actuated	Actuated	Actuated	Actuated
Corresponding Signal Phase	4	8	2	6
Effective Walk Time (s)	11.0	11.0	11.0	11.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	16	47	21	54
Ped. Right-Left Flow Rate (p/h)	15	47	20	53
Ped. R. Sidewalk Flow Rate (p/h)	31	94	41	107
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	291	163	2	286
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	677.5	217.4	381.2	273.1
Right Corner Quality of Service	A	A	A	A
Ped. Circulation Area (sq.ft)	152.6	73.3	212.4	29.2
Crosswalk Circulation Code	A	A	A	C
Pedestrian Delay (s/p)	69.4	69.4	69.4	69.4
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	3.11	3.01	2.41	2.60
Pedestrian Crosswalk LOS	C	C	B	B

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	96.1	96.1	24.1	23.9
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	7	7	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	4	8	2	6
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	75.0	75.0	75.0	75.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	3.23	3.23	1.76	1.77
Pedestrian Crosswalk LOS	C	C	A	A

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	84.1	72.0	43.0	40.0
Crosswalk Width (ft)	12.0	11.0	10.0	10.0
Total Number of Lanes Crossed	7	7	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	Actuated
Corresponding Signal Phase	4	8	2	6
Effective Walk Time (s)	0.0	0.0	0.0	11.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	13	13	17
Ped. Right-Left Flow Rate (p/h)	0	14	12	17
Ped. R. Sidewalk Flow Rate (p/h)	0	27	25	34
Veh. Perm. L. Flow in Walk (v/h)	0	20	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	2	6	30
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	2864.0	795.7	914.3	1050.4
Right Corner Quality of Service	A	A	A	A
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	191.1
Crosswalk Circulation Code	-	F	F	A
Pedestrian Delay (s/p)	80.0	80.0	80.0	69.4
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	3.22	3.25	1.76	1.79
Pedestrian Crosswalk LOS	C	C	A	A

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	85.3	86.0	56.0	54.0
Crosswalk Width (ft)	11.0	11.0	10.0	10.5
Total Number of Lanes Crossed	7	8	3	4
Number of Right-Turn Islands	0	0	0	0
Type of Control	Actuated	Actuated	Actuated	Actuated
Corresponding Signal Phase	4	8	2	6
Effective Walk Time (s)	11.0	11.0	11.0	11.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	3	2	4	5
Ped. Right-Left Flow Rate (p/h)	2	1	5	6
Ped. R. Sidewalk Flow Rate (p/h)	5	3	9	11
Veh. Perm. L. Flow in Walk (v/h)	13	47	0	0
Veh. Perm. R. Flow in Walk (v/h)	70	8	32	68
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	3811.4	4259.8	3444.6	2673.2
Right Corner Quality of Service	A	A	A	A
Ped. Circulation Area (sq.ft)	1720.5	3041.8	869.9	657.2
Crosswalk Circulation Code	A	A	A	A
Pedestrian Delay (s/p)	64.4	64.4	64.4	64.4
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	3.23	3.33	2.00	2.24
Pedestrian Crosswalk LOS	C	C	A	B

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	85.3	86.0	56.0	54.0
Crosswalk Width (ft)	11.0	11.0	10.0	10.5
Total Number of Lanes Crossed	7	8	3	4
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	Actuated
Corresponding Signal Phase	4	8	2	6
Effective Walk Time (s)	0.0	0.0	0.0	11.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	14	6	12	9
Ped. Right-Left Flow Rate (p/h)	14	5	11	8
Ped. R. Sidewalk Flow Rate (p/h)	28	11	23	17
Veh. Perm. L. Flow in Walk (v/h)	23	63	0	0
Veh. Perm. R. Flow in Walk (v/h)	161	17	11	56
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	889.9	1836.4	1249.1	1142.0
Right Corner Quality of Service	A	A	A	A
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	409.2
Crosswalk Circulation Code	F	F	F	A
Pedestrian Delay (s/p)	80.0	80.0	80.0	69.4
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	3.28	3.38	2.01	2.27
Pedestrian Crosswalk LOS	C	C	B	B

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	75.0	70.0	77.0	79.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	3	3	5	5
Number of Right-Turn Islands	1	1	0	0
Type of Control	Actuated	Actuated	Actuated	Actuated
Corresponding Signal Phase	6	2	4	8
Effective Walk Time (s)	9.0	9.0	9.0	9.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	38	31	33	7
Ped. Right-Left Flow Rate (p/h)	37	32	34	7
Ped. R. Sidewalk Flow Rate (p/h)	75	63	67	14
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	74	87	68	80
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	30	30	30
Right Corner Area per Ped (sq.ft)	321.2	508.0	355.0	687.9
Right Corner Quality of Service	A	A	A	A
Ped. Circulation Area (sq.ft)	173.7	198.3	198.0	941.2
Crosswalk Circulation Code	A	A	A	A
Pedestrian Delay (s/p)	36.5	36.5	36.5	36.5
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	2.15	2.17	2.54	2.53
Pedestrian Crosswalk LOS	B	B	B	B

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	36.0	70.0	77.0	79.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	3	3	4	5
Number of Right-Turn Islands	0	1	0	0
Type of Control	None	Actuated	Actuated	Actuated
Corresponding Signal Phase	6	2	4	8
Effective Walk Time (s)	0.0	11.0	9.0	11.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	97	61	100
Ped. Right-Left Flow Rate (p/h)	0	97	61	100
Ped. R. Sidewalk Flow Rate (p/h)	0	194	122	200
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	118	79	228
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	574.8	109.5	150.5	171.4
Right Corner Quality of Service	A	A	A	A
Ped. Circulation Area (sq.ft)	0.0	76.2	106.1	65.6
Crosswalk Circulation Code	-	A	A	A
Pedestrian Delay (s/p)	45.0	34.7	36.5	34.7
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	2.09	2.22	2.48	2.59
Pedestrian Crosswalk LOS	B	B	B	B

Approach	
Approach Direction	NB
Median Present?	No
Approach Delay(s)	22.2
Level of Service	D

Crosswalk	
Length (ft)	56
Lanes Crossed	4
Veh Vol Crossed	315
Ped Vol Crossed	0
Yield Rate(%)	0
Ped Platooning	No
Critical Headway (s)	17.00
Prob of Delayed X-ing	0.77
Prob of Blocked Lane	0.31
Delay for adq Gap	28.62
Avg Ped Delay (s)	22.15

Approach	
Approach Direction	SB
Median Present?	No
Approach Delay(s)	22.2
Level of Service	D

Crosswalk	
Length (ft)	56
Lanes Crossed	4
Veh Vol Crossed	315
Ped Vol Crossed	0
Yield Rate(%)	0
Ped Platooning	No
Critical Headway (s)	17.00
Prob of Delayed X-ing	0.77
Prob of Blocked Lane	0.31
Delay for adq Gap	28.62
Avg Ped Delay (s)	22.15

Approach	
Approach Direction	NB
Median Present?	No
Approach Delay(s)	31.6
Level of Service	E

Crosswalk	
Length (ft)	57
Lanes Crossed	4
Veh Vol Crossed	379
Ped Vol Crossed	0
Yield Rate(%)	0
Ped Platooning	No
Critical Headway (s)	17.25
Prob of Delayed X-ing	0.84
Prob of Blocked Lane	0.36
Delay for adq Gap	37.79
Avg Ped Delay (s)	31.64

Approach	
Approach Direction	SB
Median Present?	No
Approach Delay(s)	33.0
Level of Service	E

Crosswalk	
Length (ft)	58
Lanes Crossed	4
Veh Vol Crossed	379
Ped Vol Crossed	0
Yield Rate(%)	0
Ped Platooning	No
Critical Headway (s)	17.50
Prob of Delayed X-ing	0.84
Prob of Blocked Lane	0.37
Delay for adq Gap	39.16
Avg Ped Delay (s)	32.95

APPENDIX I

CAPACITY ANALYSIS CALCULATIONS
TRANSIT LEVELS OF SERVICE

Multimodal Transit LOS Calculation

		Ala Moana Blvd WB	Ala Moana Blvd EB	Ward Ave NB	Ward Ave SB
	From	Ward Ave	Punchbowl St	Ala Moana Blvd	Kapiolani Blvd
	To	Punchbowl St	Ward Ave	Kapiolani Blvd	Ala Moana Blvd
Inputs		**1**	**2**		
	TRANSIT OPERATIONS INFORMATION				
	Number of local buses on street segment per hour (bus/h)	5	9	2	2
	Number of express buses stopping in segment per hour (bus/h)	1	2	0	0
t_{ex}	Average excess wait time (min)	3.0	5.1	3.6	3.3
L_f	Average passenger load factor (p/seat)	0.4	0.5	0.4	0.3
S	Average transit travel speed (mi/h)	11.3	12.0	7.9	11.5
l_{pt}	Average passenger trip length (mi)	4.5	7.0	2.0	1.7
	Is the segment in the CBD of a metro area of 5 million or more?	No	No	No	No
	TRANSIT AMENITY DATA				
p_{sh}	Percent stops in segment with a shelter	30%	100%	0%	0%
p_{be}	Percent stops in segment with a bench	100%	100%	100%	100%
	PEDESTRIAN ENVIRONMENT DATA				
W_A	Sidewalk width (ft) (Enter 0 if no sidewalk)	8.0	8.0	8.0	8.0
W_{buf}	Buffer width from sidewalk to street (ft)	0.0	0.0	0.0	0.0
	Does a continuous barrier exist between the street and sidewalk?	Yes	Yes	No	No
	Is the street divided?	Yes	Yes	Yes	Yes
	Are parking spaces striped?	No	No	No	No
p_{pk}	Proportion of on-street parking occupied	50%	50%	50%	50%
W_{bl}	Bicycle lane width (ft)	0.0	0.0	6.0	6.0
W_{os}	Shoulder/parking lane width (ft)	0.0	0.0	0.0	8.0
W_{ol}	Outside travel lane (closest to sidewalk) width (ft)	10.0	10.0	10.0	10.0
v_m	Outside lane demand flow rate at midsegment (veh/h)	600	600	400	400
S_R	Average vehicle running speed, including intersection delay (mi/h)	25.0	25.0	25.0	25.0

Calculations					
f	Transit frequency (bus/h)	6	11	2	2
f_h	Headway factor	3.15	3.51	1.95	1.95
f_{pl}	Passenger load weighting factor	1.00	1.00	1.00	1.00
T_{at}	Perceived amenity time rate (min/mi)	0.1	0.2	0.1	0.1
T_{ex}	Excess wait time rate due to late arrivals (min/mi)	0.7	0.7	1.8	1.9
T_{ptt}	Perceived travel time rate (min/mi)	6.5	6.2	11.1	9.0
T_{btt}	Base travel time rate (min/mi)	4.0	4.0	4.0	4.0
f_{tt}	Perceived travel time factor	0.83	0.84	0.68	0.73
$s_{w\text{-}r}$	Transit wait-ride score	2.60	2.95	1.34	1.43
f_s	Motorized vehicle speed adjustment factor	0.25	0.25	0.25	0.25
f_v	Motorized vehicle volume adjustment factor	1.37	1.37	0.91	0.91
W_{aA}	Adjusted available sidewalk width (ft)	8.0	8.0	8.0	8.0
f_{sw}	Sidewalk width coefficient	3.60	3.60	3.60	3.60
f_b	Buffer area coefficient	5.37	5.37	1.00	1.00
W_t	Total width of outside lane, bike lane, and parking lane/shoulder (ft)	10.0	10.0	16.0	16.0
W_v	Effective total width as a function of traffic volume (ft)	10.0	10.0	16.0	16.0
W_1	Effective width of combined bike lane and shoulder (ft)	10.0	10.0	10.0	10.0
f_w	Cross-section adjustment factor	-5.19	-5.19	-5.30	-5.30
I_p	Pedestrian environment score	2.47	2.47	1.91	1.91
	Pedestrian LOS	B	B	A	A
I_t	Transit LOS score	2.47	1.95	4.28	4.14

Output					
	Transit LOS	***B***	***A***	***E***	***D***