

APPENDIX C

TRAFFIC IMPACT REPORT

From: Jennylyn Tapat <JTapat@wilsonokamoto.com>
Sent: Monday, December 14, 2020 1:38 PM
To: Lee Cranmer
Subject: FW: Project: WARD VILLAGE BLOCK F - TRAFFIC - File Transfer - Block F TIR

This email originated from an external server. Use caution.

Good afternoon Lee,

Please see below email from TRB indicating their acceptance of the Block F TIR.

Thank you,
Jennylyn Tapat
Traffic Engineer



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From: Watanabe, Lance K. [mailto:lkwatanabe@honolulu.gov]
Sent: Monday, December 14, 2020 9:24 AM
To: Jennylyn Tapat <JTapat@wilsonokamoto.com>
Subject: RE: Project: WARD VILLAGE BLOCK F - TRAFFIC - File Transfer - Block F TIR

Jenny – TRB has accepted the Block F TIR dated December 2020.

Thanks,
Lance

*Lance Watanabe, P.E.
Traffic Review Branch, DPP
Phone: 768-8079
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Traffic Impact Report

Block F

TRAFFIC IMPACT REPORT

*FOR
BLOCK F*



Prepared for:
Victoria Ward Limited

Prepared by:
Wilson Okamoto Corporation

December 2020

Prepared for:

Victoria Ward Limited
1240 Ala Moana Blvd., Suite 200
Honolulu, HI 96813

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December 2020

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I. INTRODUCTION

A. Purpose of Study

The purpose of this study is to identify and assess the potential traffic impacts resulting from the Block F development of the Ward Village Master Plan in Kakaako on the island of Oahu. A previous assessment including the Block F development was included in the “Transportation Master Plan and Assessment for the Ward Villages Master Plan” (hereafter referred to as the “Ward Villages Master Plan”) dated October 2018. This report is a supplemental study to specifically address the Block F development and incorporate the most recent development plans which include residential, commercial, and restaurant uses.

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. Superimposing 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

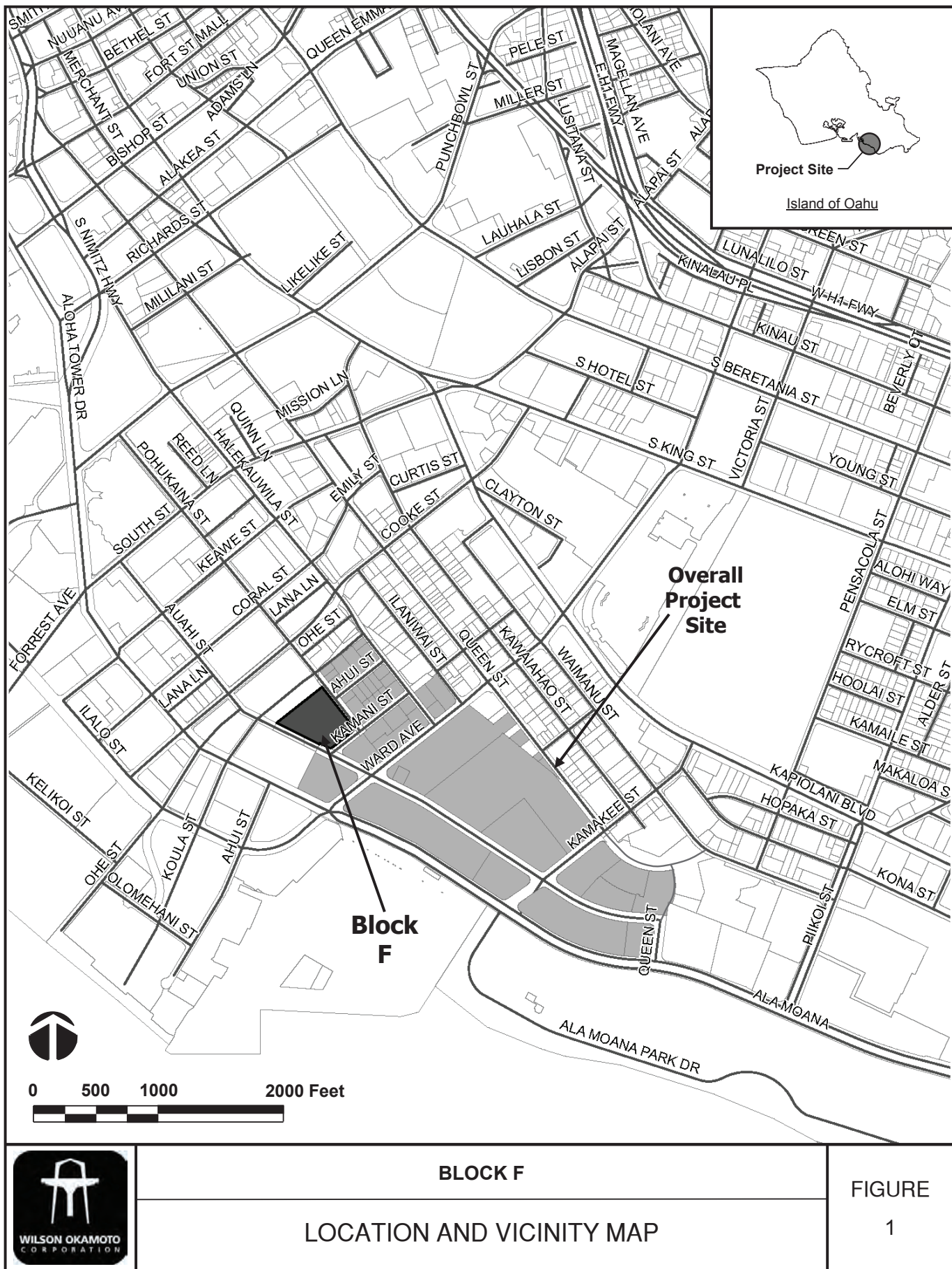
A. Location

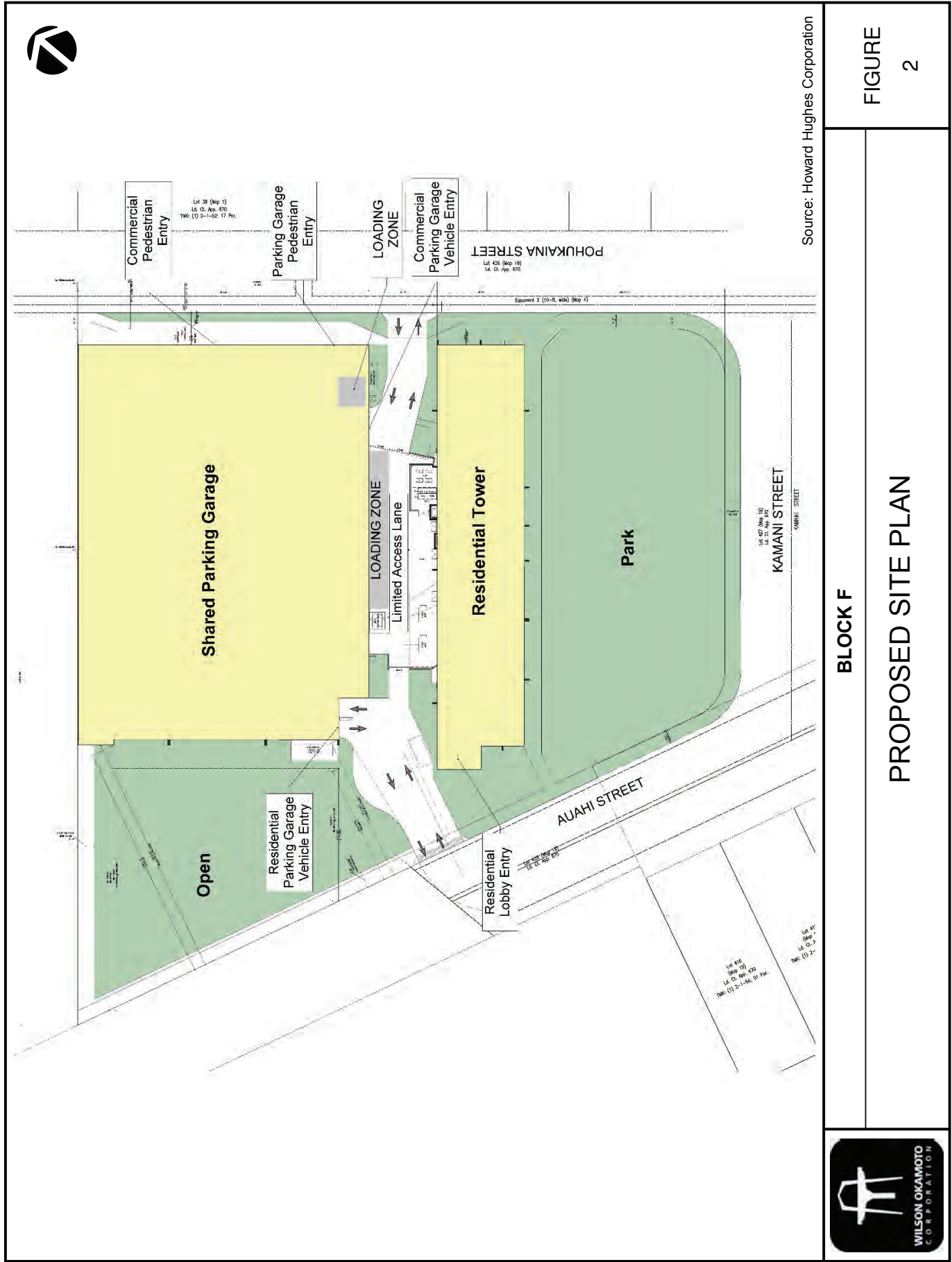
The project site for the proposed Block F development is located adjacent to Ward Avenue in Kakaako on the island of Oahu (see Figure 1). The project site is bounded by Kamani Street to the east, Pohukaina Street to the north, Auahi Street to the south, and commercial and light industrial uses to the west. Access to the project site is expected to be provided via driveways off Pohukaina Street and Auahi Street.

B. Project Characteristics

The overall Ward Village Master Plan entails the future redevelopment of Ward Center, Ward Village Shops, and other surrounding commercial and office buildings implemented in five (5) phases over the next 10-15 years. At the time of this report, Phase 1 of the overall master plan has been completed which includes Blocks C East (Waiea), K (Anaha), M (Ae'o), and O (Ke Kilohana). Phase 2 which includes Blocks N-East ('A'ali'i), I (Ko'ula), and C-West (Victoria Place) is currently under design and/or construction with completion of the entire phase expected by Year 2023.

The Block F development is the second development included in Phase 3 of the overall Ward Village Master Plan and is expected to be built at the same time as the Block H development. Both Blocks H and F are anticipated to be completed by Year 2024. At the time of the field investigations, the project site for Block F included 50,647 square feet (sf) of commercial uses and 35,590 sf of general light industry uses. The proposed project entails redevelopment of the existing site to include 748 units for residential uses, 5,625 sf of retail uses, 2,700 sf of restaurant uses, and 36,000 sf of general light industry uses. Access to the project site is expected to be provided via internally connected two-way driveways off Pohukaina Street and Auahi Street. The driveway off Pohukaina Street is expected to serve the development's commercial and light industrial uses providing access to an at-grade parking area and a ramp that leads to a shared parking garage. The driveway off Pohukaina Street is also expected to serve a controlled-access loading area near the center of the project site. The two-way driveway off Auahi Street is expected to serve the development's residential uses. It should be noted that Auahi Street is expected to be realigned east of Ward Avenue to intersect Pohukaina Street further north. West of Ward Avenue, the segment of Auahi Street between Ward Avenue and Kamani Street is expected to be closed to vehicular traffic with the remaining portion of Auahi Street serving only as an access for Block F. Figure 2 shows the proposed project site plan.





III. EXISTING TRAFFIC CONDITIONS

A. Area Roadway System

East-west traffic flow through the Kakaako area is served by a number of existing major roadways which include Ala Moana Boulevard, Queen Street, and Kapiolani Boulevard that provide continuous east-west mobility through the project vicinity. These major roadways are supported by a network of connector roadways including Auahi Street, Pohukaina Street, and Halekauwila Street that provide alternate east-west routes through the surrounding areas. North-south traffic through the Kakaako area is served by a number of existing major roadways including Ward Avenue and Piikoi Street that support either one-way or two-way travel through the project vicinity. These major roadways are supported by a network of connector roadways including Cooke Street and Kamakee Street that provide alternate north-south routes through the surrounding areas. Figure 3 shows the existing lane use at key locations within the study area.

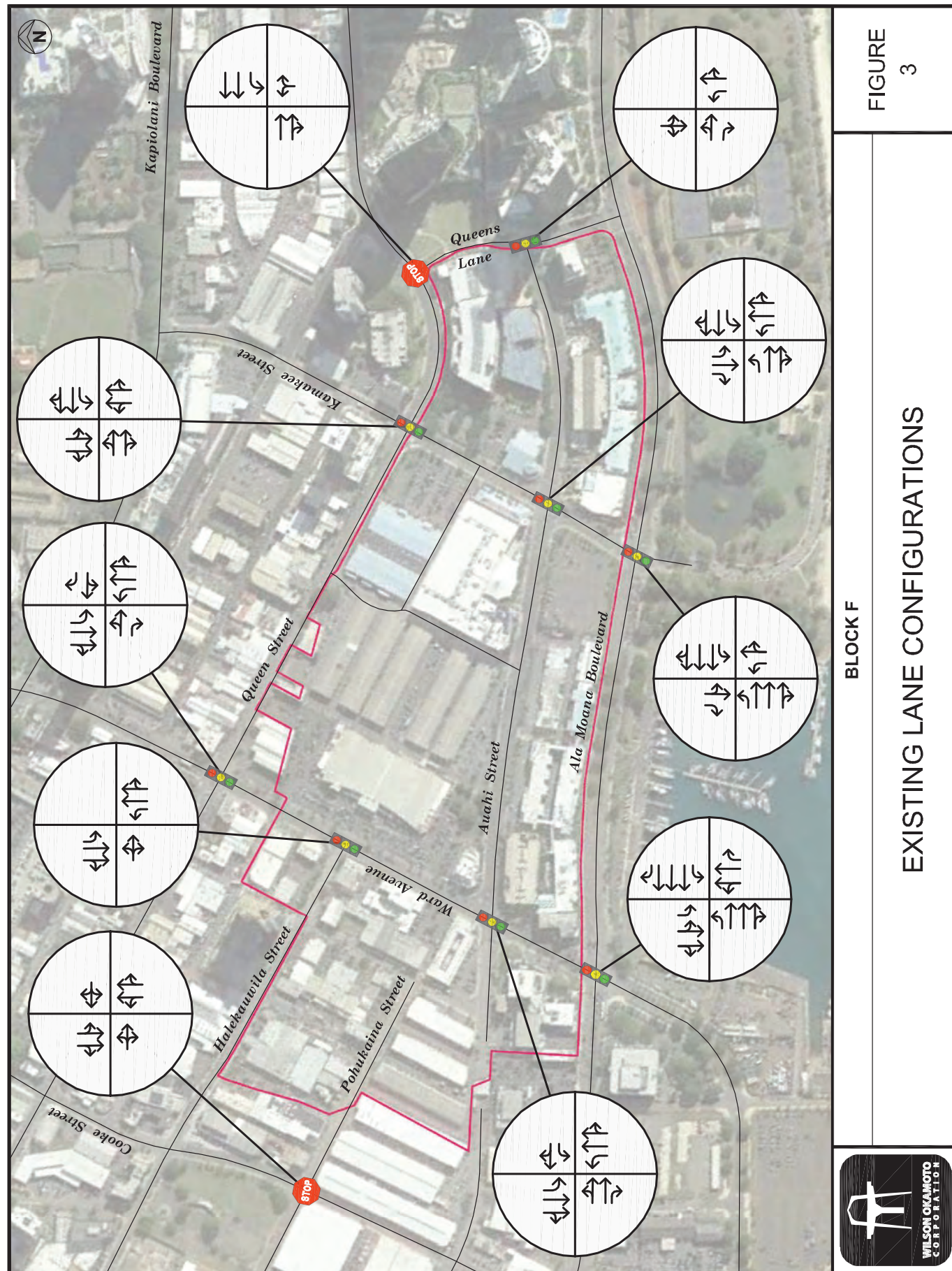
B. Traffic Volumes and Conditions

1. General

a. Field Investigation

The existing traffic count data utilized for this study consisted of turning movement count surveys at 22 locations during the weekday morning peak hours of 6:00 AM and 9:00 AM and afternoon peak hours of 3:00 PM and 6:00 PM. The surveys were conducted during March and April 2018 at the intersections along the following roadways:

- Along Kapiolani Boulevard at the intersections with Cooke Street, Ward Avenue, Kamakee Street, Queen Street, and Piikoi Street
- Along Auahi Street at the intersections with Cooke Street, Ward Avenue, Kamakee Street, and Queen Street and Queens Lane
- Along Halekauwila Street at the intersections with Cooke Street, Ward Avenue, and Kamakee Street
- Along Queen Street at the intersections with Cooke Street, Ward Avenue, Kamakee Street, and Queens Lane
- Along Ala Moana Boulevard at the intersections with Cooke Street, Ward Avenue, Kamakee Street, and Piikoi Street



- Pohukaina Street and Cooke Street
- Waimanu Street and Piikoi Street

It should be noted that at the time of the field investigations, Blocks C East and K have been completed and occupied and as such, the trips associated with these blocks are assumed to be captured within the surveyed existing volumes. In addition, the project sites for Blocks N East, I, C West, N West, B East, B West, and A had been cleared of their existing uses at the time of the field investigation. Appendix A includes the existing traffic count data.

b. Capacity Analysis Methodology

The highway capacity analysis performed in this study is based upon procedures presented in the “Highway Capacity Manual”, Transportation Research Board, 2000, and the “Synchro” software, developed by Trafficware. It should be noted that the HCM 2010 methodology is available with the Synchro software; however, as previously discussed in the Ward Villages Master Plan, analysis conducted using that methodology 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 consistency with the overall traffic study. 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

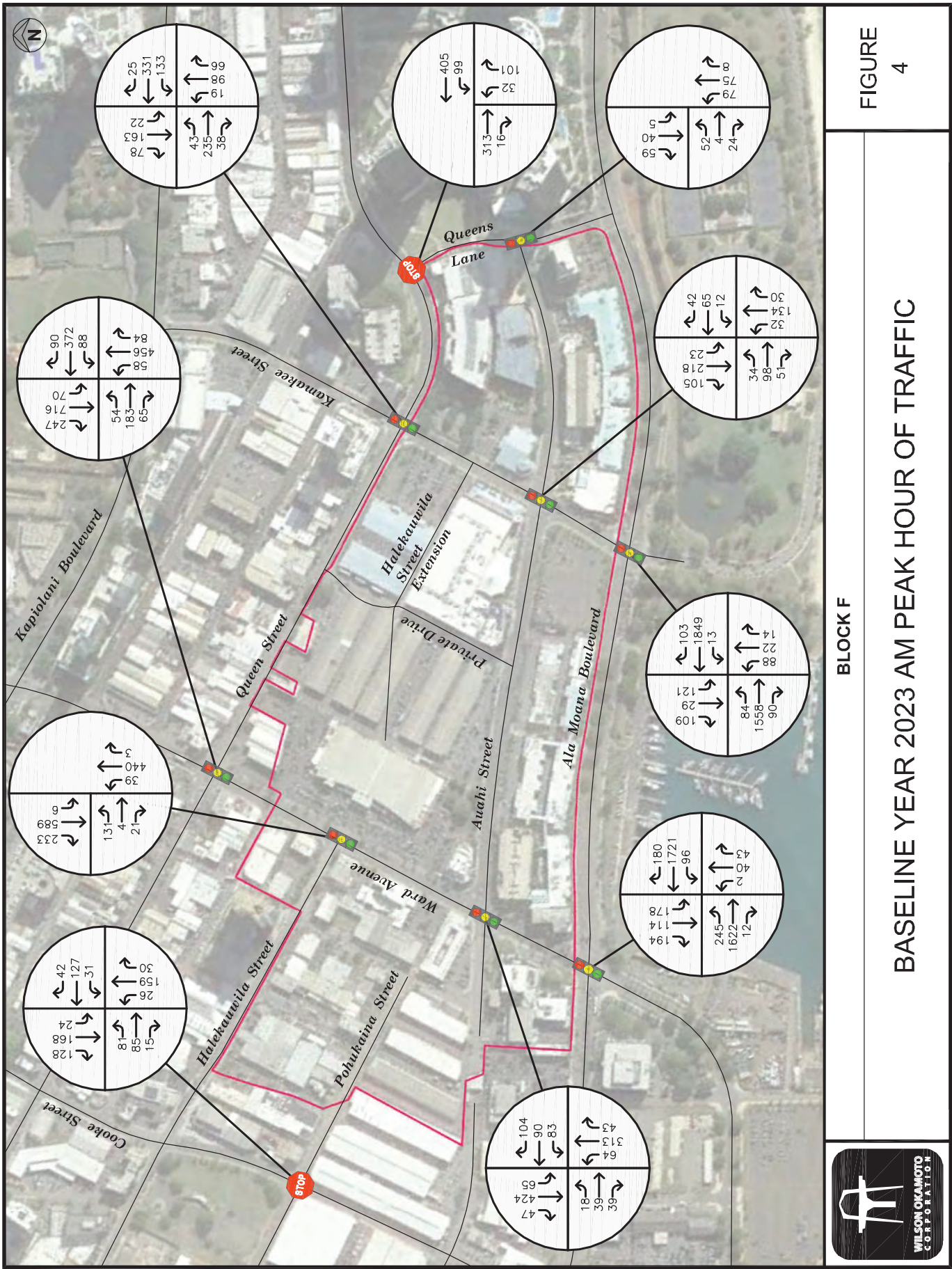
a. General

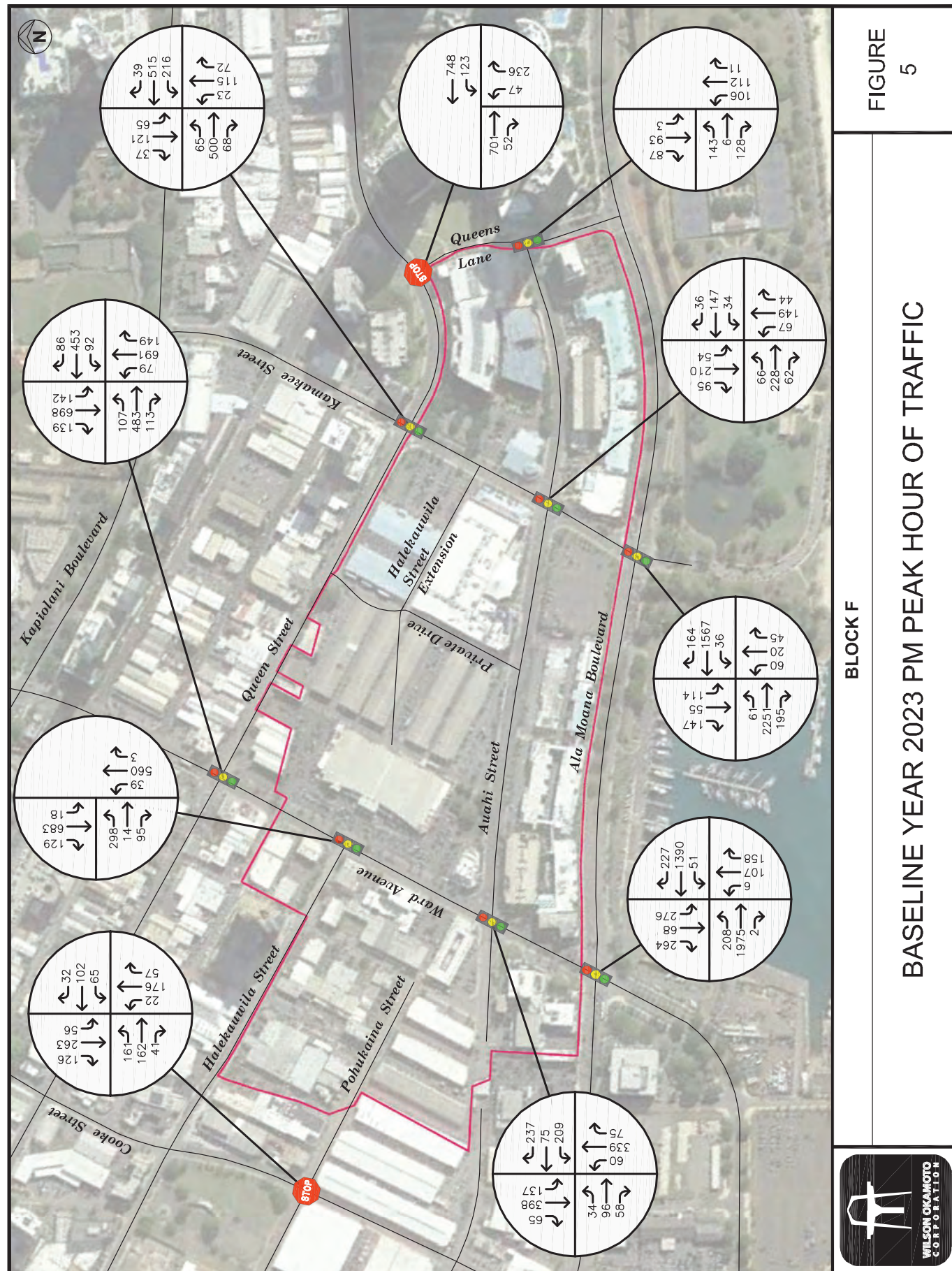
Figures 4 and 5 show the baseline Year 2023 AM and PM peak hour traffic volumes at key locations within the study area which include the development of other projects in the vicinity, as well as Phases 1 and 2 of the Ward Village Master Plan. Those phases are expected to include residential and commercial/retail uses for Blocks C East, K, M, O, N East, I, and C West. The baseline traffic conditions are based on the projected Year 2023 conditions included in the "Traffic Impact Report for Block C-West" dated August 2019. It should be noted that in conjunction with the development of Block N East during Phase 2, improvements at the intersection of Ward Avenue and Queen Street are expected to provide an exclusive left-turn lane and a shared through and right-turn lane along both approaches of Queen Street.

The AM peak hour of traffic generally occurs between 7:15 AM and 8:15 AM while the PM peak hour of traffic generally occurs between 4:30 PM and 5:30 PM. Although the peak hours of traffic generally occur around the same time periods at each of the 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 for the study intersections are included in Appendix C.

b. Ward Avenue and Queen Street

At the intersection with Queen Street, Ward Avenue carries 598 vehicles northbound and 1,033 vehicles southbound during the AM peak hour of traffic. During the PM peak period, the overall





traffic volume is higher with 919 vehicles traveling northbound and 979 vehicles traveling southbound. The northbound and southbound approaches of the intersection operate at LOS “C” during the AM and PM peak periods.

The Queen Street approaches of the intersection carry 302 vehicles eastbound and 550 vehicles westbound during the AM peak hour of traffic. During the PM peak period, traffic volumes are higher with 703 vehicles traveling eastbound and 631 vehicles traveling westbound. The eastbound approach of Queen Street operates at LOS “B” and LOS “D” during the AM and PM peak periods, respectively, while the westbound approach operates at LOS “C” and LOS “D” during the AM and PM peak periods, respectively.

c. Queen Street and Kamakee Street

At the intersection with Kamakee Street, Queen Street carries 316 vehicles eastbound and 489 vehicles westbound during the AM peak hour of traffic. During the PM peak period, traffic volumes are higher with 633 vehicles traveling eastbound and 799 vehicles traveling westbound. The eastbound approach 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.

The Kamakee Street approaches carry 183 vehicles northbound and 263 vehicles southbound during the AM peak hour of traffic. During the PM peak period, the overall traffic volume is similar with 210 vehicles traveling northbound and 223 vehicles traveling southbound. Both approaches of Kamakee Street operate at LOS “B” during the AM peak period and LOS “C” during the PM peak period.

d. Queen Street and Queens Lane

At the intersection with Queens Lane, Queen Street carries 327 vehicles eastbound and 504 vehicles westbound during the AM peak

period. During the PM peak period, traffic volumes are higher with 753 vehicles traveling eastbound and 871 vehicles traveling westbound. The westbound left-turn traffic movement operates at LOS “A” during both peak periods.

Queens Lane carries 133 vehicles northbound during the AM peak period and 283 vehicles during the PM peak period. The Queens Lane approach operates at LOS “B” during both peak periods.

e. Ward Avenue and Halekauwila Street

At the intersection with Halekauwila Street, Ward Avenue carries 482 vehicles northbound and 828 vehicles southbound during the AM peak hour of traffic. During the PM peak period, traffic volumes are higher with 602 vehicles traveling northbound and 830 vehicles traveling southbound. Both approaches of Ward Avenue operate at LOS “A” during the AM peak period and LOS “B” during the PM peak period.

The Halekauwila Street approach of the intersection carries 156 vehicles eastbound during the AM peak period and 407 vehicles during the PM peak period. The eastbound approach of Halekauwila Street operates at LOS “B” during both peak periods.

f. Cooke Street and Pohukaina Street

At the intersection with Pohukaina Street, Cooke Street carries 215 vehicles northbound and 320 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are higher with 255 vehicles traveling northbound and 445 vehicles traveling southbound. The northbound approach of Cooke Street operates at LOS “A” and LOS “B” during the AM and PM peak periods, respectively, while the southbound approach operates at LOS “B” during both peak periods.

Pohukaina Street carries 181 vehicles eastbound and 200 vehicles westbound during the AM peak period. During the PM peak

period, the traffic volume is higher with 364 vehicles traveling eastbound and 199 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.

g. Ward Avenue and Auahi Street

At the intersection with Auahi Street, Ward Avenue carries 420 vehicles northbound and 536 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are higher with 474 vehicles traveling northbound and 600 vehicles traveling southbound. During the AM peak period both approaches of Ward Avenue operate at LOS “A” and LOS “B” during the AM and PM peak periods, respectively.

The Auahi Street approaches of the intersection carry 96 vehicles eastbound and 277 vehicles westbound during the AM peak period. During the PM peak period, traffic volumes are higher with 188 vehicles traveling eastbound and 521 vehicles traveling westbound. The Auahi Street approaches operate at LOS “B” during both peak periods.

h. Kamakee Street and Auahi Street

At the intersection with Auahi Street, Kamakee Street carries 196 vehicles northbound and 346 vehicles southbound during the AM peak period. During the PM peak period, the traffic volumes are higher with 260 vehicles traveling northbound and 359 vehicles traveling southbound. Both approaches of Kamakee Street operate at LOS “A” during the AM peak period and LOS “B” during the PM peak period.

Auahi Street carries 183 vehicles eastbound and 119 vehicles westbound during the AM peak period. During the PM peak period, traffic volumes are higher with 356 vehicles traveling eastbound and 217 vehicles traveling westbound. The eastbound approach operates at

LOS “B” during both peak periods while the westbound approach operates at LOS “C” and LOS “B” during the AM and PM peak periods, respectively.

i. Auahi Street, Queens Lane, and Queen Street

At the intersection with Queens Lane and Queen Street, Auahi Street carries 80 vehicles eastbound during the AM peak period and 277 vehicles during the PM peak period. The eastbound approach of Auahi Street operates at LOS “B” during both peak periods.

The Queens Lane approach carries 104 vehicles southbound during the AM peak period and 183 vehicles during the PM peak period. The Queens Lane approach operates at LOS “A” and LOS “B” during the AM and PM peak periods, respectively. The northbound approach is comprised of Queen Street which carries 162 vehicles during the AM peak period and 229 vehicles during the PM peak period. The Queen Street approach operates at LOS “B” during both peak periods.

j. Ala Moana Boulevard and Ward Avenue

At the intersection with Ward Avenue, Ala Moana Boulevard carries 1,879 vehicles eastbound and 1,997 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is similar with 2,185 vehicles traveling eastbound and 1,668 vehicles traveling westbound. The eastbound approach operates at LOS “D” during both peak periods, while the westbound approach at LOS “E” and LOS “D” during the AM and PM peak periods, respectively.

The Ward Avenue approaches of the intersection carry 85 vehicles northbound and 486 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes are higher with 271 vehicles traveling northbound and 608 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.

k. Ala Moana Boulevard, Kamakee Street, and Ala Moana Park Drive

At the intersection with Kamakee Street, Ala Moana Boulevard carries 1,732 vehicles eastbound and 1,965 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 2,507 vehicles traveling eastbound and 1,767 vehicles traveling westbound. The eastbound approach operates at LOS “B” and LOS “C” during the AM and PM peak periods, respectively, while the westbound approach operates at LOS “C” and LOS “B” during the AM and PM peak periods, respectively.

The Kamakee Street approach of the intersection carries 259 vehicles southbound during the AM peak period and 316 vehicles during the PM peak period. The Kamakee Street approach operates at LOS “D” during both peak periods. The northbound approach is comprised of Ala Moana Park Drive which carries 124 vehicles during the AM peak period and 125 vehicles during the PM peak period. The Ala Moana Park Drive operates at LOS “D” 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. 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 site is currently served by established, convenient transit routes that may reduce the number of vehicular trips added to the surrounding major roadways. In addition, the City and County of Honolulu is currently developing a fixed guideway transit system that will extend from Kapolei to the central Honolulu area, thereby providing an alternate mode of travel through the Kakaako area. However, the planned system is not expected to be completed prior to the completion of the Block F development and as such, trip reductions associated with the fixed guideway transit system were not incorporated into projected conditions. The trip generation characteristics for the proposed project were adjusted to account for the influence of the internal capture of trips and multi-modal trips, as well as to account for the removal and replacement of the existing uses. Tables 1 and 2 summarize the adjusted existing and proposed trip generation characteristics for the Block F development. Appendix D includes a detailed trip generation worksheet for the Block F development.

Table 1: Adjusted Existing Peak Hour Trip Generation

SHOPPING CENTER INDEPENDENT VARIABLE: 1,000 sf of development = 50.647		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	19
	EXIT	12
	TOTAL	31
PM PEAK	ENTER	44
	EXIT	46
	TOTAL	90
GENERAL LIGHT INDUSTRIAL INDEPENDENT VARIABLE: 1,000 sf of development = 35.59		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	18
	EXIT	3
	TOTAL	21
PM PEAK	ENTER	2
	EXIT	14
	TOTAL	16

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

TOTALS		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	37
	EXIT	15
	TOTAL	52
PM PEAK	ENTER	46
	EXIT	60
	TOTAL	106

Table 2: Adjusted Proposed Peak Hour Trip Generation

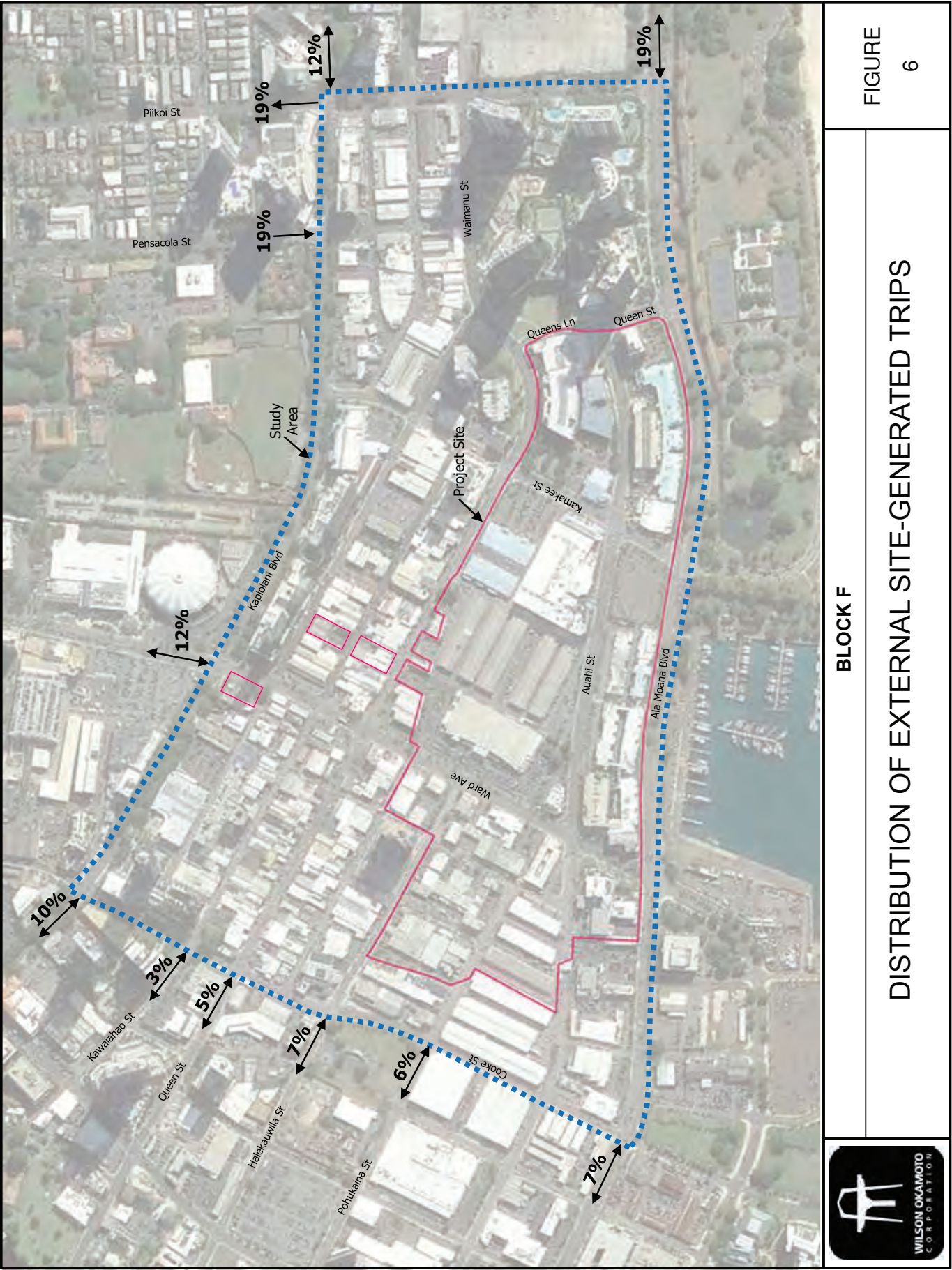
HIGH-RISE APARTMENT INDEPENDENT VARIABLE: Dwelling Units = 748		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	44
	EXIT	137
	TOTAL	181
PM PEAK	ENTER	138
	EXIT	91
	TOTAL	229
SHOPPING CENTER INDEPENDENT VARIABLE: 1,000 sf of development = 5.625		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	3
	EXIT	6
	TOTAL	9
PM PEAK	ENTER	14
	EXIT	8
	TOTAL	22
HIGH-TURNOVER (SIT-DOWN) RESTAURANT INDEPENDENT VARIABLE: 1,000 sf of development = 2.7		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	13
	EXIT	33
	TOTAL	46
PM PEAK	ENTER	21
	EXIT	7
	TOTAL	28

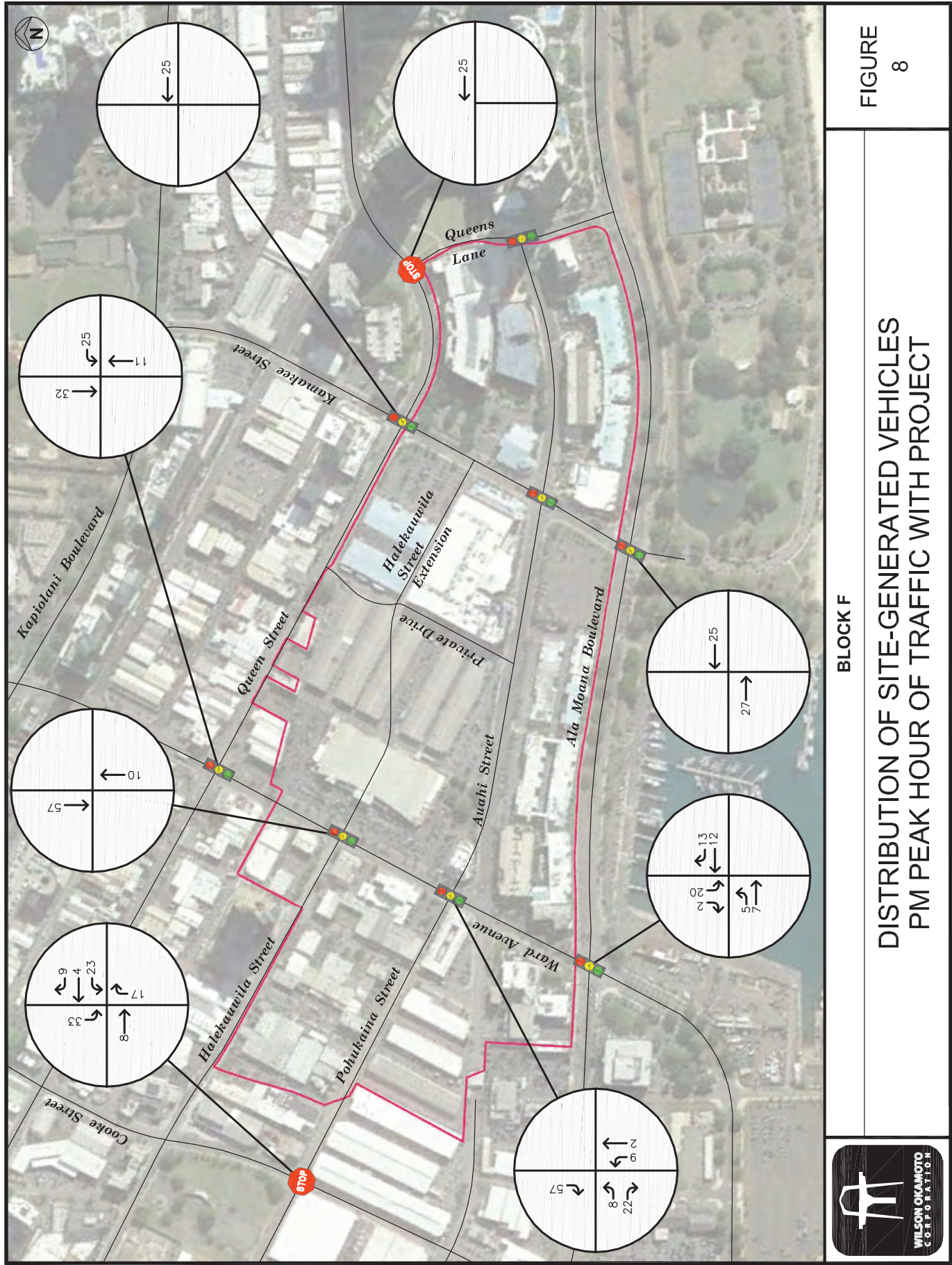
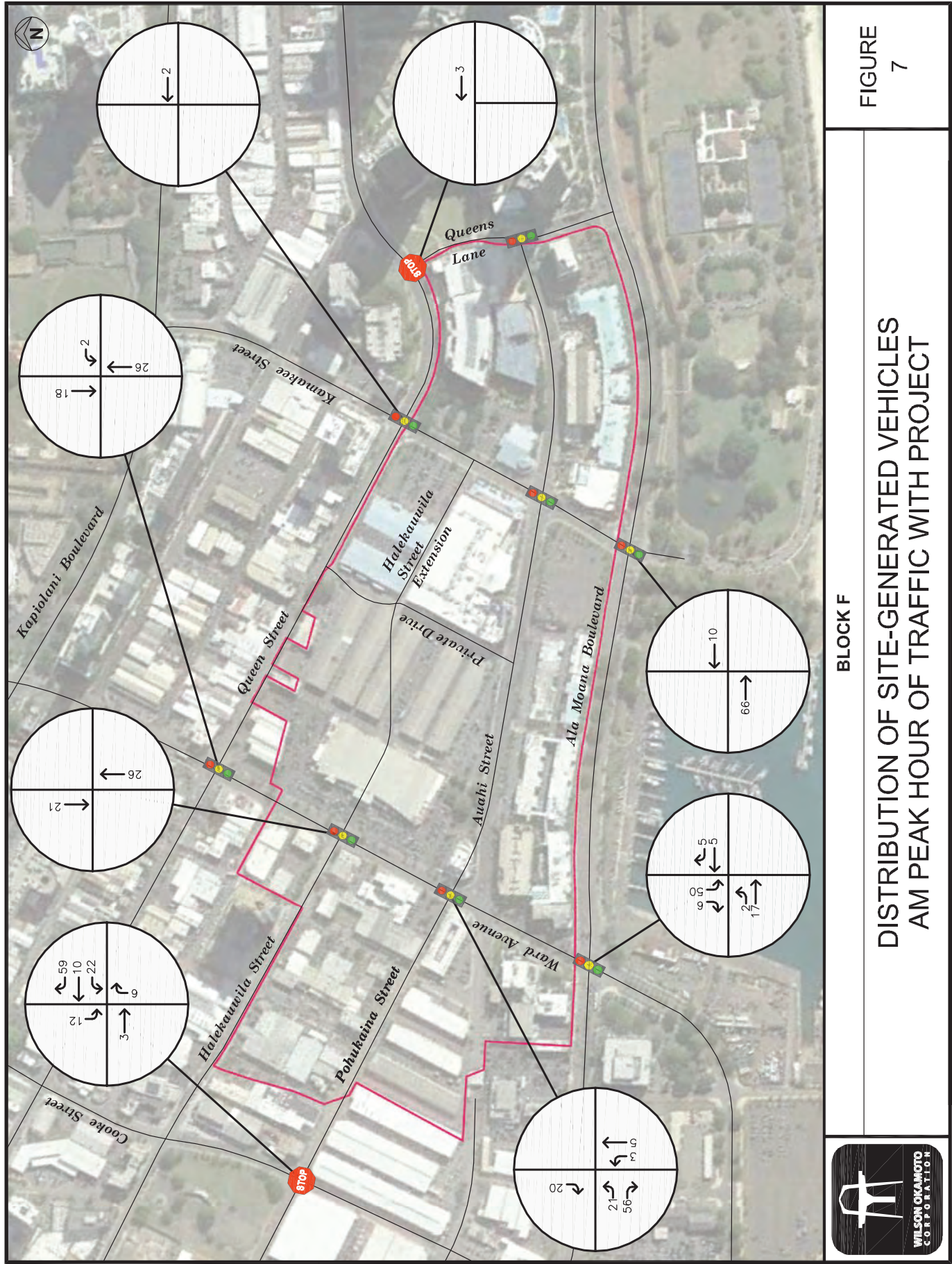
Table 2: Adjusted Proposed Peak Hour Trip Generation (Cont'd)

GENERAL LIGHT INDUSTRIAL		
INDEPENDENT VARIABLE: 1,000 sf of development = 36.0		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	25
	EXIT	12
	TOTAL	37
PM PEAK	ENTER	5
	EXIT	23
	TOTAL	28
TOTALS		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	85
	EXIT	188
	TOTAL	273
PM PEAK	ENTER	178
	EXIT	129
	TOTAL	307
NET DIFFERENCE FROM EXISTING		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	48
	EXIT	173
	TOTAL	221
PM PEAK	ENTER	132
	EXIT	69
	TOTAL	201

2. Trip Distribution and Through Traffic Forecasting Methodology

The travel forecast utilized for this study is based on the OMPO regional forecasting model which contains estimated land usage for the island of Oahu by the Year 2035 including the development of other projects such as the adjacent Kamehameha Schools/Bishop Estate (KSBE) lands to the west. The travel forecast utilized for the OMPO model is based on Socio-Economic Data (SED) which represents the population distribution within a multitude of traffic analysis zones. The model utilizes this data to forecast individual vehicle trips between destinations within the model. The use of the OMPO model more accurately reflects the anticipated impacts of development on the island more than the use of historical travel patterns or traffic count data. Figures 6 to 8 show the trip distribution percentages and the distribution of





site-generated traffic during the AM and PM peak periods based on the OMPO model. Parking for the commercial and restaurant uses is expected to be accommodated on-site via a two-way driveway off Pohukaina Street while access to parking for the residential uses are expected to be provided via a two-way driveway off Auahi Street. The trips associated with the proposed project were distributed at the study intersections based on their assumed origin/destination, allowed turning movements, and the relative convenience of the available routes. In addition, population estimates for the island of Oahu indicate that growth is expected to be relatively linear to the Year 2035. As such, a corresponding growth factor was interpolated for the Year 2024.

B. Other Considerations

1. Block H Development

As previously discussed, there is another planned development associated with the overall Ward Village in the vicinity of Block F. The Block H development located near the northeast corner of the Ward Avenue and Auahi Street intersection is expected to replace existing uses to include 600 residential units, 30,000 sf of retail uses, and 15,000 sf of restaurant uses. During the AM peak period, the proposed project is expected to generate 183 trips and 242 trips during the PM peak period. A separate traffic study is being prepared for this development. In conjunction with the Block H development, roadway improvements are planned to complete the extension of Halekauwila Street east of Ward Avenue thereby providing an alternate east-west access to Kamakee Street in the project vicinity. With the planned roadway extension, modifications at the intersection of Ward Avenue and Halekauwila Street are also expected to provide an exclusive left-turn lane and a shared through and right turn lane on the eastbound approach of that intersection. Access to the Block H development is expected to be provided via driveways off Auahi Street and the Halekauwila Street Extension with the Halekauwila Street Extension driveway intended to serve the commercial uses while the driveway off Auahi Street is expected to serve residential uses. The

Block H development is expected to be completed in Year 2024 and as such were incorporated into the projected conditions.

2. Auahi Street Realignment

In conjunction with the development of the overall Ward Village Master Plan, a number of roadway improvements are also planned in the project vicinity including the improvements associated with Auahi Street. These improvements entail the realignment of Auahi Street east of Ward Avenue to intersect Pohukaina Street and conversion of that roadway from a four-lane roadway to a two-lane roadway to accommodate enhanced pedestrian and bicycle facilities. The realignment of Auahi Street is expected to provide a more direct and continuous east-west route through the Kakaako area and provide further mobility throughout the area. In the vicinity of the project, consideration was given to the provision of turning lanes at the intersection of Ward Ave, Auahi Street, and Pohukaina Street to minimize potential conflict between vehicular and crossing pedestrian traffic at that intersection. However, to accommodate a designated right-turn lane, the removal of the designated bike lanes along Pohukaina Street would be required. In addition, due to the set right-of-way and property line restrictions, the addition of designated right-turn lanes would create an off-set of 10 feet for through traffic crossing Ward Avenue. With the 10 feet offset, the through lane on either side of the intersection would face the designated left-turn lane on the opposite side of the intersection head on. Due to the drastic maneuver required for the through lanes, the designated right-turn lane was determined to be unfeasible.

It should be noted that with the realignment of Auahi Street, connection to Ward Avenue from the remaining west segment of Auahi Street will be eliminated. The realignment of Auahi Street and other associated improvements along this roadway is expected to be completed by Year 2024

and as such this improvement was incorporated into the Year 2024 project scenarios.

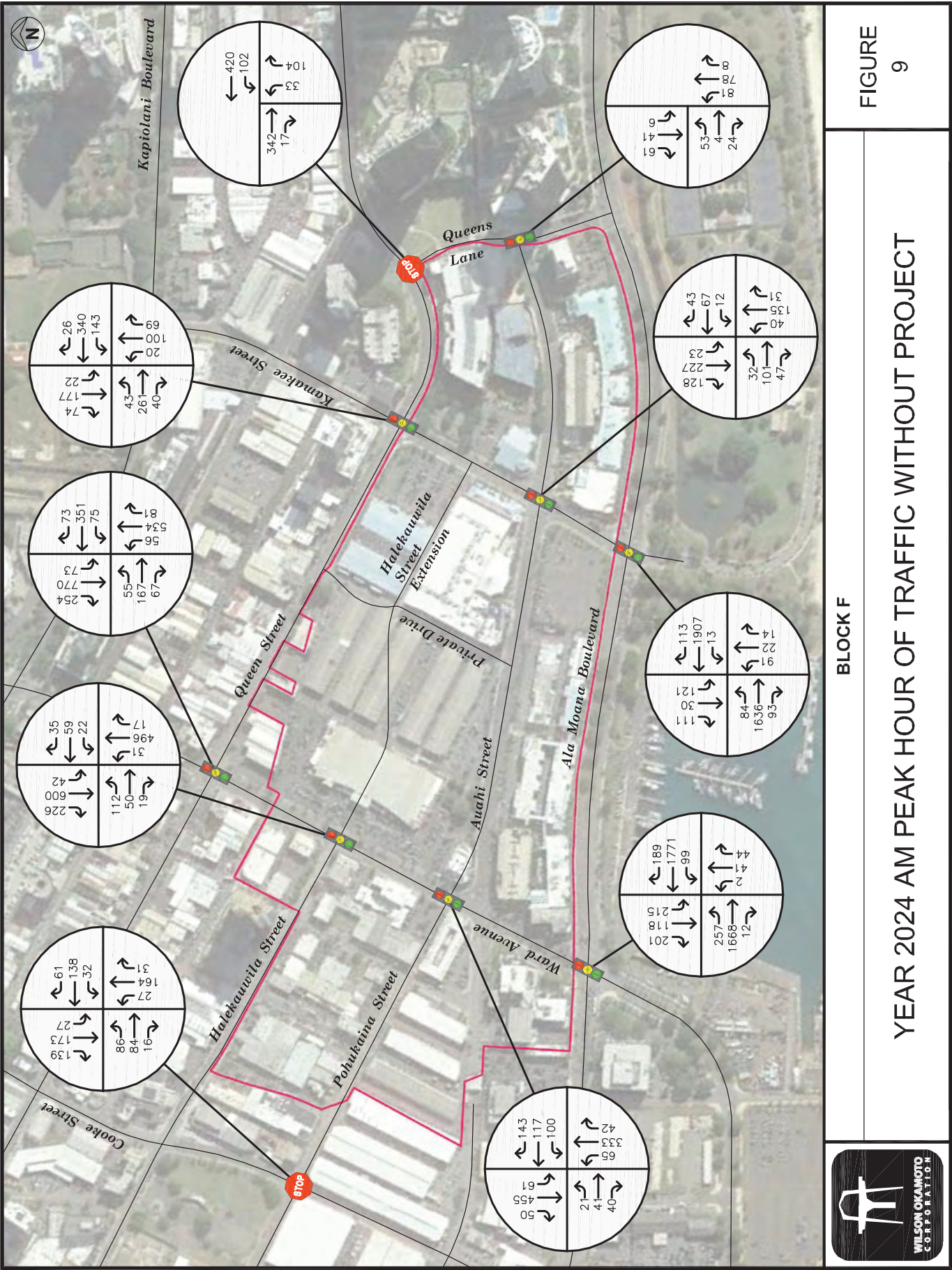
C. Total Traffic Volumes Without Project

The projected Year 2024 AM and PM peak period traffic volumes and operating conditions without the Block F development are shown in Figures 9 and 10 and summarized in Table 3. The analysis incorporates the trips associated with the development of other projects in the area including Blocks C East, K, O, N East, I, C West, and H of the Ward Villages Master Plan and the anticipated ambient growth in traffic in the vicinity. In addition, the analysis incorporates the planned roadway improvements associated with the overall Ward Village Master Plan including the extension of Halekauwila Street east of Ward Avenue to connect with the existing Halekauwila Street extension west of Kamakee Street as well as the improvements associated with the realignment of Auahi Street. The baseline levels of service are provided for comparison purposes. LOS calculations are included in Appendix E.

Table 3: Baseline and Projected Year 2024 (Without Project) LOS Traffic Operating Conditions

Intersection	Approach/ Critical Movement	AM		PM	
		Base- line*	Year 2024 w/out Proj	Base- line*	Year 2024 w/out Proj
Ward Ave/ Queen St**	Eastbound	B	C	D	D
	Westbound	C	C	D	D
	Northbound	C	B	C	C
	Southbound	C	C	C	C
Queen St/ Kamakee St	Eastbound	B	B	C	C
	Westbound	B	B	B	B
	Northbound	B	B	C	C
	Southbound	B	B	C	C
Queen St/ Queen Lane	Westbound (LT)***	A	A	A	B
	Northbound	B	B	B	B

*Year 2023 conditions which incorporate the completion of Blocks C East, K, M, O, N East, I, and C West.
**Intersection improvements implemented.
***LT = Left-Turn



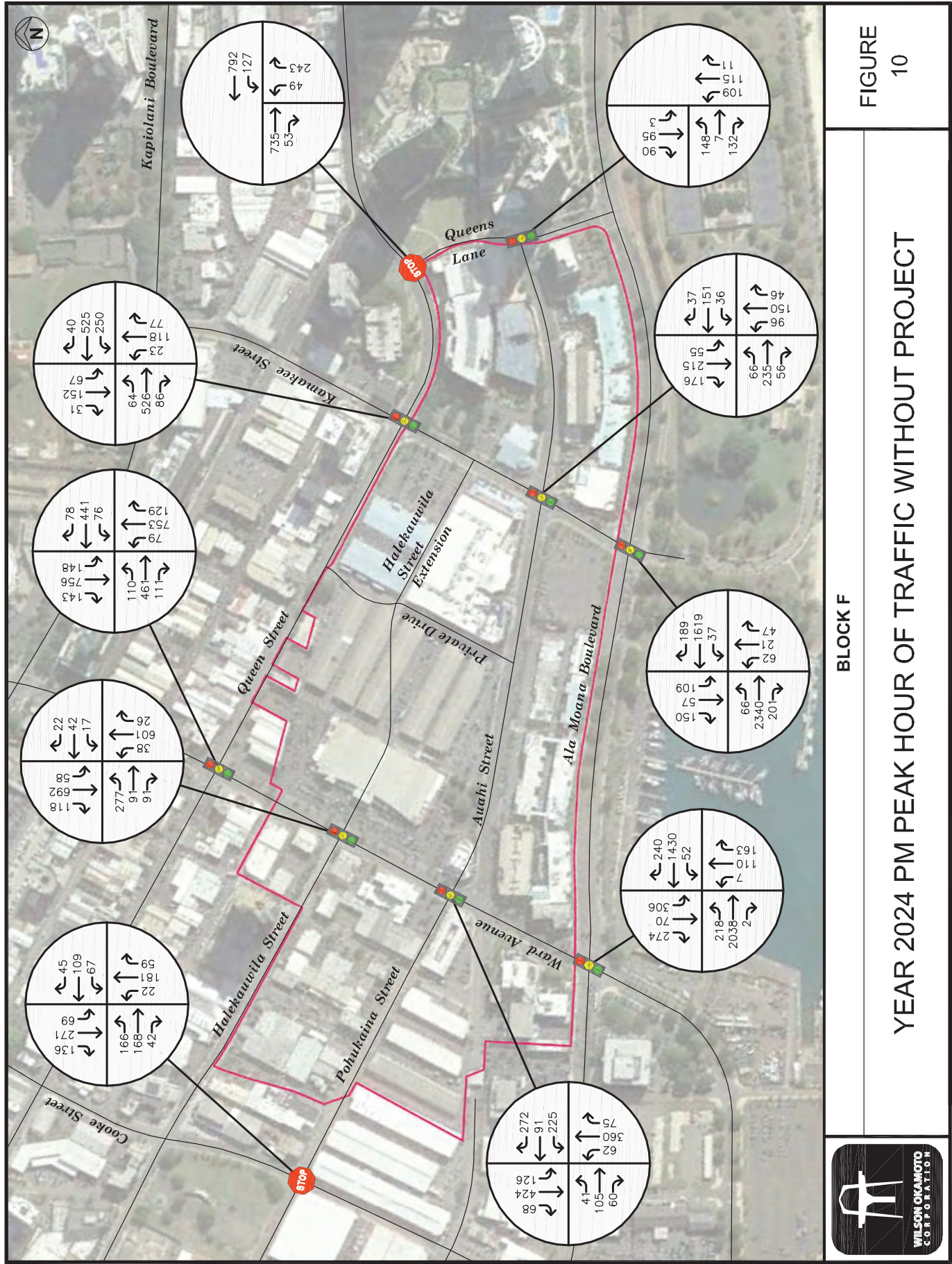


Table 3: Baseline and Projected Year 2024 (Without Project) LOS
Traffic Operating Conditions (Cont'd)

Intersection	Approach/ Critical Movement	AM		PM	
		Base- line*	Year 2024 w/out Proj	Base- line*	Year 2024 w/out Proj
Ward Ave/ Halekauwila St**	Eastbound	B	B	B	B
	Westbound	-	B	-	B
	Northbound	A	A	B	B
	Southbound	A	A	B	B
Cooke St/ Pohukaina St	Eastbound	B	B	C	D
	Westbound	B	B	B	C
	Northbound	A	A	B	B
	Southbound	B	B	B	C
Ward Ave/ Auahi St	Eastbound	B	A	B	B
	Westbound	B	A	B	B
	Northbound	A	A	B	B
	Southbound	A	A	B	B
Kamakee St/ Auahi St	Eastbound	B	B	B	B
	Westbound	C	C	B	B
	Northbound	A	A	B	B
	Southbound	A	B	B	B
Auahi St/ Queens Ln/ Queen St	Eastbound	B	B	B	B
	Northbound	B	B	B	B
	Southbound	A	A	B	B
Ala Moana Blvd/ Ward Ave	Eastbound	D	E	D	E
	Westbound	E	E	D	E
	Northbound	D	D	D	D
	Southbound	D	D	E	E
Ala Moana Blvd/ Kamakee St	Eastbound	B	B	C	C
	Westbound	C	C	B	B
	Northbound	D	D	D	D
	Southbound	D	D	D	D

*Year 2023 conditions which incorporate the completion of Blocks C East, K, M, O, N East, I, and C West.
**Intersection improvements implemented.
***LT = Left-Turn

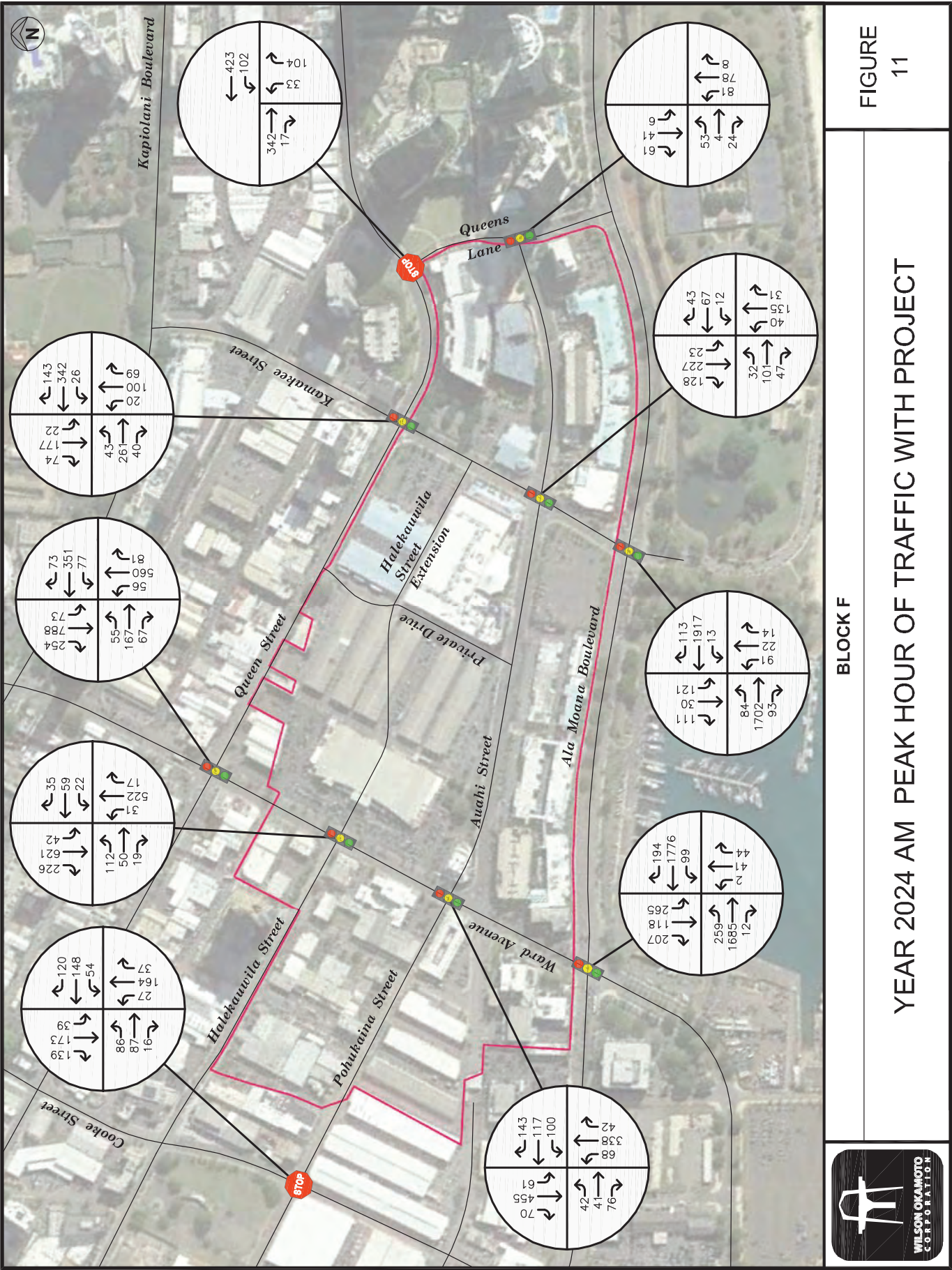
Traffic operations under Year 2024 without project conditions are generally expected to remain similar to baseline conditions. Along Ward Avenue, traffic operations at the intersection with Queen Street are expected to continue operating at LOS “C” during the AM peak period and LOS “D” or better during the PM peak period, whereas those at the intersection with Halekauwila Street are expected to continue operating at LOS “B” or better during both peak periods. Along Pohukaina Street, traffic operations at the intersection with Cooke Street are expected to continue operating similar to baseline conditions during the AM peak period, but are expected to deteriorate from LOS “C” or better to LOS “D” or better during the PM peak period. Traffic volumes at that intersection are expected to increase as the planned realignment of Auahi Street to connect to Pohukaina Street provides a continuous east-west route through the Kakaako area. Along Ala Moana Boulevard, traffic operations at the intersections with Kamakee Street are expected to continue operating at LOS “D” or better during both peak periods while those at the intersection with Ward Avenue are expected to continue operating at LOS “E” or better during both peak periods. The low levels of service at this intersection is primarily due to the high volume of east-west through traffic at this intersection. Traffic operations at the remaining study intersections are also expected to continue operating similar to baseline conditions.

D. Total Traffic Volumes With Project

Figures 11 and 12 show the Year 2024 cumulative AM and PM peak hour traffic conditions resulting from the completion of the Block F development. The cumulative volumes consist of site-generated traffic superimposed over Year 2024 projected traffic demands. The traffic impacts resulting from the proposed project are addressed in the following section.

V. TRAFFIC IMPACT ANALYSIS

The Year 2024 cumulative AM and PM peak hour traffic conditions with the completion of the Block F development are shown on Figures 11 and 12 and summarized in Table 4. The projected Year 2024 (Without Project) operating conditions are provided for comparison purposes. LOS calculations are included in Appendix G.



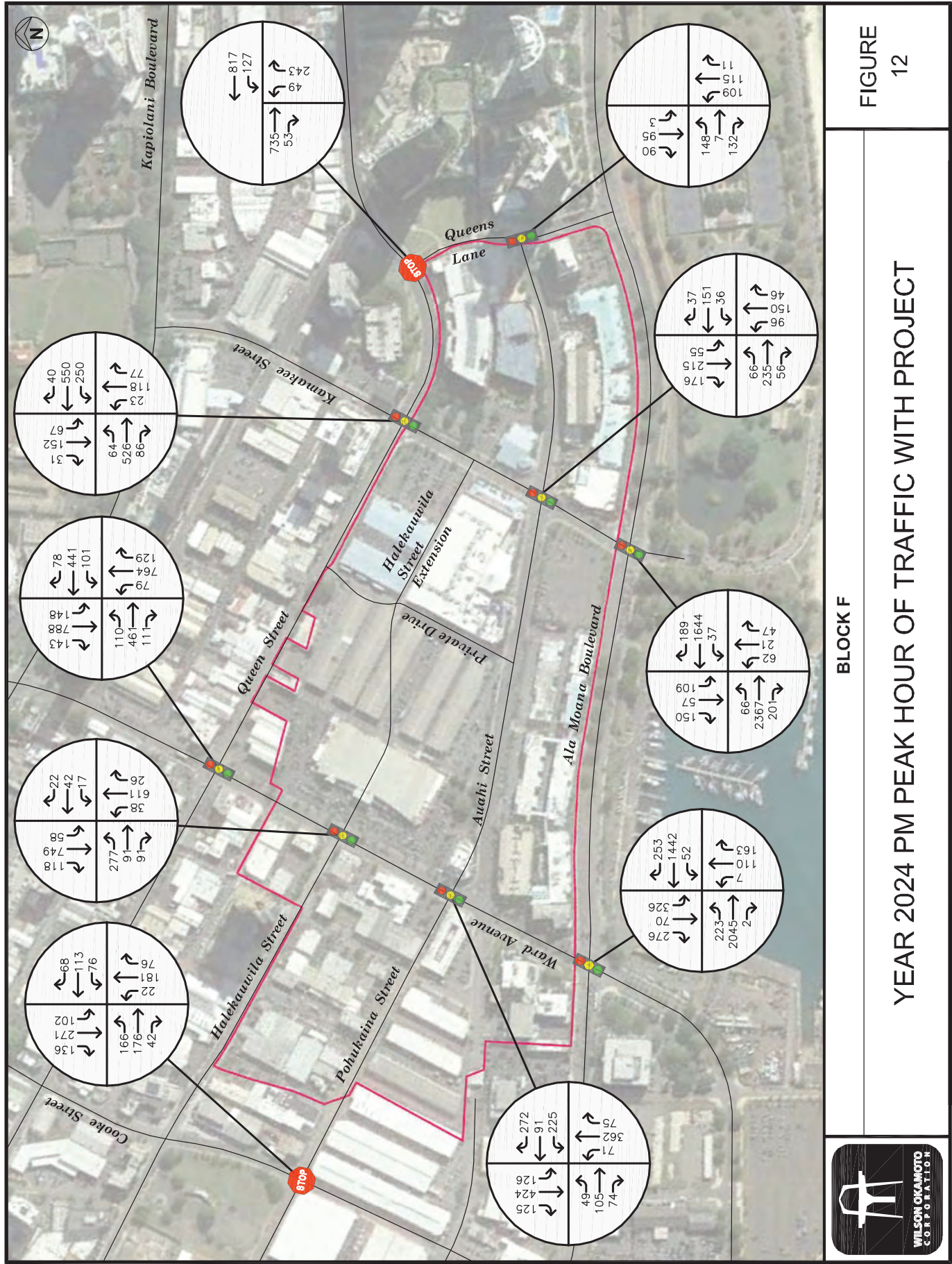


Table 4: Projected Year 2024 (Without and With Project)
LOS Traffic Operating Conditions

Intersection	Approach/ Critical Movement	AM		PM	
		Year 2024		Year 2024	
		w/out Proj	w/ Proj	w/out Proj	w/ Proj
Ward Ave/ Queen St	Eastbound	C	C	D	D
	Westbound	C	C	D	D
	Northbound	B	C	C	D
	Southbound	C	C	C	C
Queen St/ Kamakee St	Eastbound	B	B	C	C
	Westbound	B	B	B	B
	Northbound	B	B	C	C
	Southbound	B	B	C	C
Queen St/ Queens Ln	Westbound (LT)**	A	A	B	B
	Northbound	B	B	B	C
Ward Ave/ Halekauwila St*	Eastbound	B	B	B	B
	Westbound	B	B	B	B
	Northbound	A	A	B	B
	Southbound	A	A	B	B
Cooke St/ Pohukaina St	Eastbound	B	B	D	D
	Westbound	B	C	C	C
	Northbound	A	B	B	B
	Southbound	B	B	C	C
Ward Ave/ Pohukaina St/ Auahi St*	Eastbound	A	A	B	B
	Westbound	A	A	B	B
	Northbound	A	A	B	B
	Southbound	A	A	B	B
Kamakee St/ Auahi St	Eastbound	B	B	B	B
	Westbound	C	C	B	B
	Northbound	A	A	B	B
	Southbound	B	B	B	B
Queens Ln/ Queen St/ Auahi St	Eastbound	B	B	B	B
	Northbound	B	B	B	B
	Southbound	A	A	B	B

*Intersection improvements implemented

**LT = Left-Turn

**Table 4: Projected Year 2024 (Without and With Project)
LOS Traffic Operating Conditions (Cont'd)**

Intersection	Approach/ Critical Movement	AM		PM	
		Year 2024		Year 2024	
		w/out Proj	w/ Proj	w/out Proj	w/ Proj
Ala Moana Blvd/ Ward Ave	Eastbound	E	E	E	E
	Westbound	E	E	E	E
	Northbound	D	D	D	D
	Southbound	D	D	E	E
Ala Moana Blvd/ Kamakee St	Eastbound	B	B	C	C
	Westbound	C	C	B	B
	Northbound	D	D	D	D
	Southbound	D	D	D	D

*Intersection improvements implemented

**LT = Left-Turn

Traffic operations under Year 2024 with project conditions are generally expected to remain similar to without project conditions. Along Queen Street, the approaches at the intersection with Ward Avenue are expected to continue operating at LOS “C” during the AM peak period and LOS “D” or better during the PM peak period, while those at Kamakee Street are expected to continue operating at LOS “B” during the AM peak period and LOS “C” or better during the PM peak period. At Queen Lane, the approaches at that intersection are expected to continue operating at LOS “B” or better during the AM peak period, but the northbound approach is expected to operate at a slightly lower LOS “C” during the PM peak period. Along Auahi Street, traffic operations at the intersections of Ward Avenue and Pohukania Street are expected to continue operating at LOS “B” or better during both peak periods while those at Kamakee Street are expected to continue operating at LOS “C” or better during the AM peak period and LOS “B” during the PM peak period. The remaining study intersections are also anticipated to continue operating similar to without project conditions.

As previously mentioned, consideration was given to modifying the design of the intersection of Ward Avenue, Auahi Street, and Pohukaina Street to minimize potential conflicts between crossing pedestrians and turning vehicle traffic. However, a design assessment indicated that the improvements to the layout of the intersection were not

feasible. As such, additional assessment was conducted to determine what the resulting queues would be without the provision of designated turning lanes. Along Auahi Street, average queues of ~238 feet are expected on the westbound approach while average queues of ~56 feet are expected on the eastbound approach along Pohukaina Street. It should be noted that the narrower roadway width without the provision of additional turning lanes provides a shorter crossing distance for pedestrians and lessens potential conflicts for bicyclists traversing through the intersection. In addition, it maintains the planned bike lanes along that roadway. As such, traffic operations for vehicular traffic is expected to be impacted but as a tradeoff, it will provide better conditions for pedestrians and bicyclists.

VI. MULTIMODAL FACILITIES

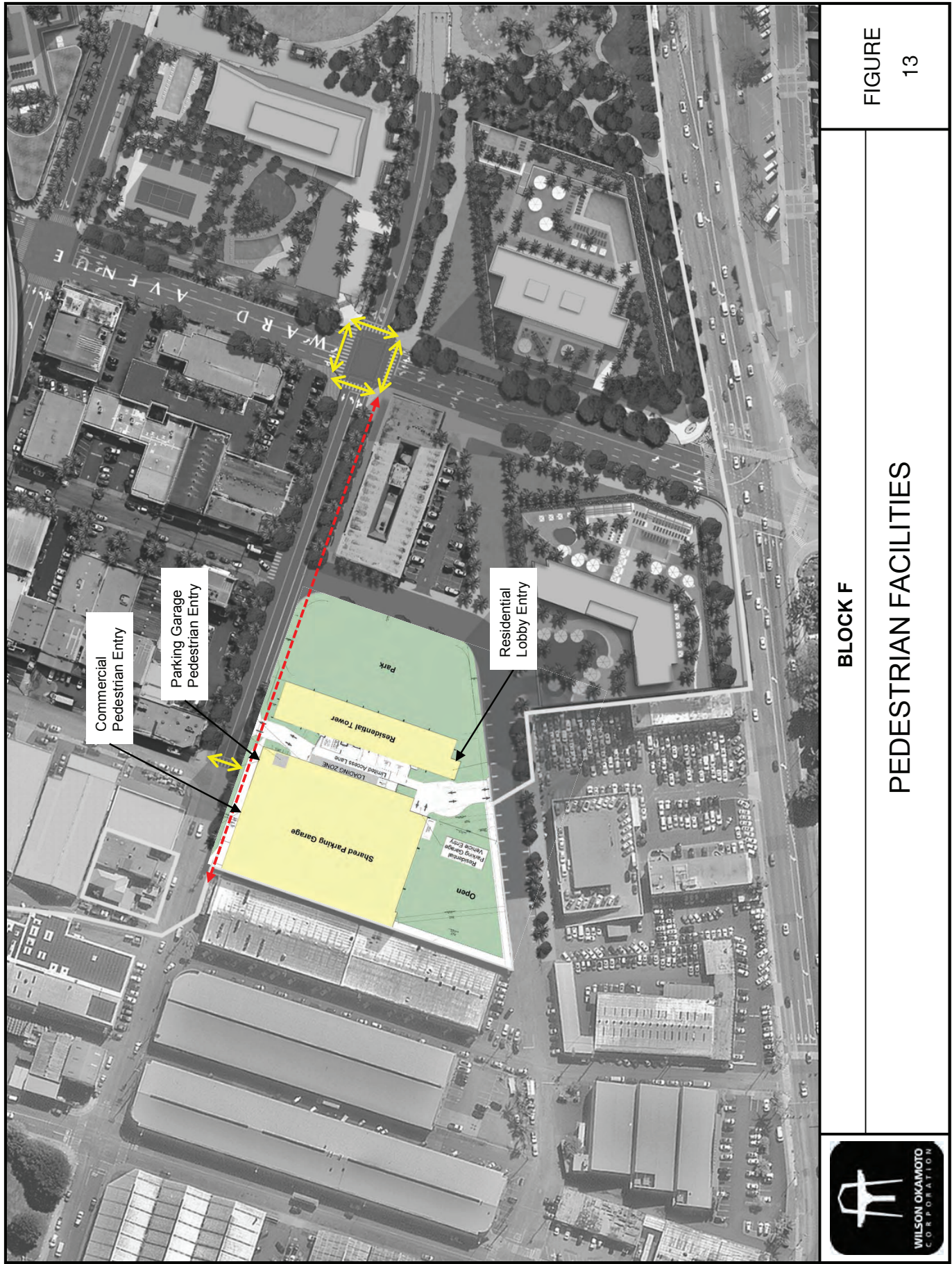
A. Pedestrian Facilities

1. Existing Conditions

The existing pedestrian facilities in the vicinity of the project are generally comprised of sidewalks, crosswalks, curb ramps, and street lighting. Along the project frontage on Kamani Street and Pohukaina Street, curb ramps and improved sidewalks are provided along both sides of the roadway; however those pedestrian facilities terminate west of Ahui Street requiring pedestrians to utilize a portion of the travel way until Cooke Street. East of the project site, improved sidewalks are provided along Auahi Street and Ward Avenue with pedestrian crossings facilitated by protected pedestrian phases at signalized crossings located at the intersections of Ward Avenue with Auahi Street and Halekauwila Street. These facilities facilitate connections to destinations within the Ward Village, as well as to the surrounding uses in the project vicinity.

2. Projected Conditions

The proposed project is expected to maintain and improve the existing pedestrian facilities in the project vicinity. Landscaped areas planned along the project frontage on Kamani Street and Auahi Street are expected to increase the attractiveness of the project vicinity which is primarily characterized by light industrial uses. Pedestrian access to the project site will be provided via connections located along Pohukaina Street (see Figure 13).



In addition to those associated with Block F, the overall Ward Village Master Plan is also expected to include additional improvements to further enhance pedestrian connectivity in the vicinity of the project. As previously discussed, the realignment of Auahi Street to connect to Pohukaina Street will create a continuous east-west roadway with improved pedestrian facilities that are expected to facilitate access between the Block F development and the uses east of Ward Avenue. West of Ward Avenue, the segment of Auahi Street between Ward Avenue and Kamani Street is expected to be converted into green space with the remaining west segment portion of Auahi Street serving only as an access for Block F.

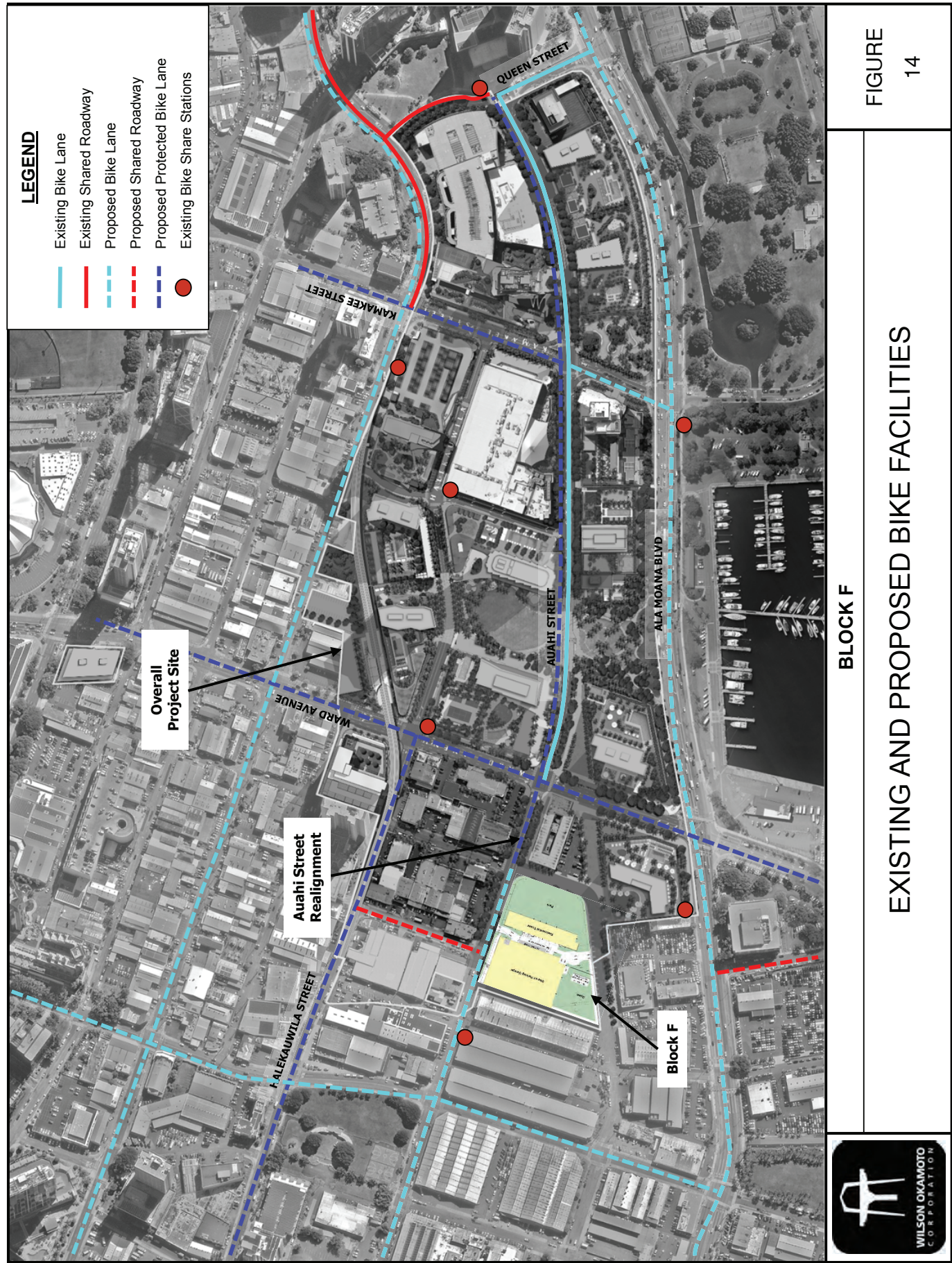
B. Bicycle Facilities

1. Existing Conditions

Bicycle facilities generally consist of shared-use paths, bike lanes, and shared roadways with pavement markings called sharrows. Currently, bicycle facilities in the vicinity of the project are limited to those along Auahi Street. Between Kamani Street and Ward Avenue, Auahi Street is a shared roadway but transitions east of Ward Avenue to include bike lanes along both sides of the roadway until Queens Lane (see Figure 14). A number of BIKI bikeshare facilities are also located in the vicinity of the project. The nearest bikeshare station is located at the southwest corner of the intersection of Pohukaina Street and Koula Street with additional stations located within the Ohana Marketplace parking lot east of the intersection of Ward Avenue and Halekauwila Street and near the northwest corner of the Ward Avenue and Ala Moana Boulevard intersection.

2. Bicycle Level of Traffic Stress

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, 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:

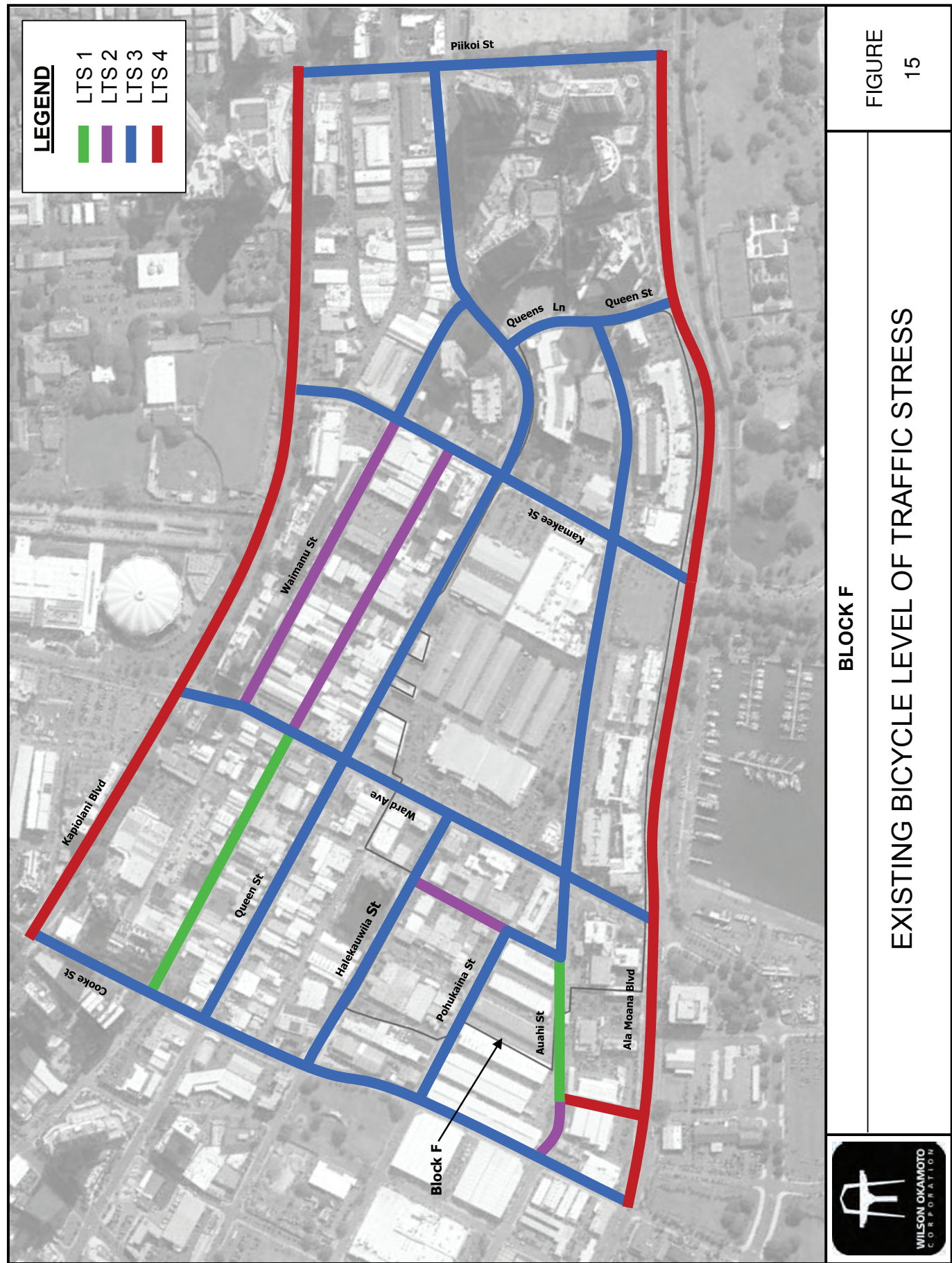
- LTS 1: Characterized by strong separation from all except low speed, low volume traffic. Simple crossings. Suitable for children.
- LTS 2: Except in low speed/low volume traffic situations, cyclists have their own place to ride that keeps them from having to interact with traffic except at formal crossings. 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 LTS 2. The LTS of the roadways in the vicinity of the proposed Block F development are depicted in Figure 15. As shown in Figure 13, Auahi Street and Pohukaina Street are rated LTS 3 since bicyclists along these roadways share the travel way with other motorists.

3. Projected Conditions

The proposed project is expected to provide on-site bicycle facilities for residents, guests, and employees to encourage the use of alternate modes of transport. In addition, the Howard Hughes Corporation continues to work with the City and County of Honolulu Department of Transportation Services (DTS) to facilitate the implementation of bicycle improvements planned by the City and County in the vicinity of Ward Village. According to the Oahu Bike Plan (Updated 2019) published by the City and County of Honolulu DTS, these improvements include the following:

- Provision of bike lanes along Ward Avenue between Ala Moana Boulevard and Queen Street



- Conversion of the existing bike lanes along Auahi Street to protected bike lanes
- Provision of protected bike lanes along Halekauwila Street between Ala Moana Boulevard and Ward Avenue
- Provision of bike lanes along Pohukaina Street between Punchbowl Street and Ward Avenue

The addition of these facilities are expected to enhance bicycle connectivity and improve the bicycle level of traffic stress along the roadways in the project vicinity.

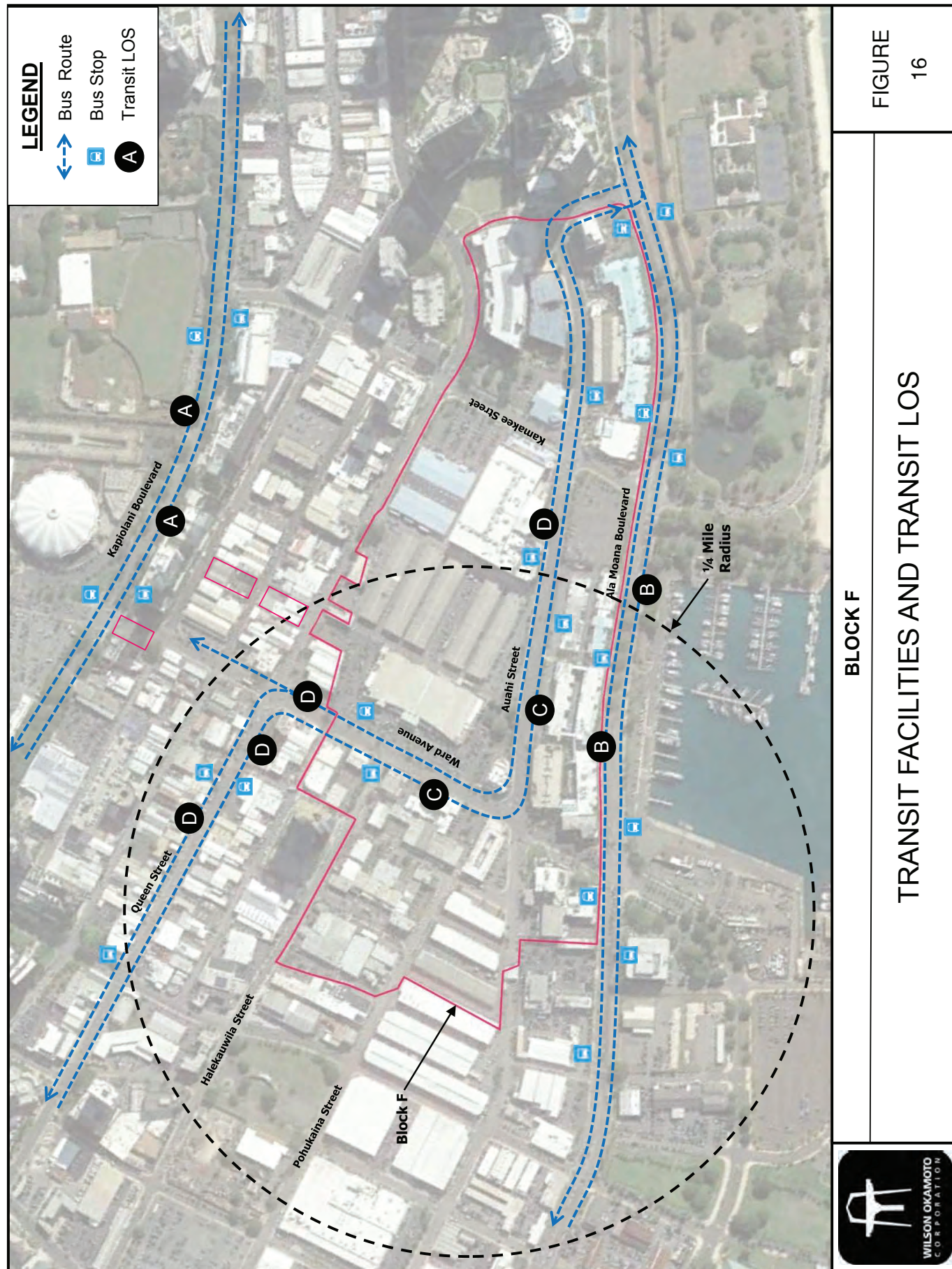
C. Transit Facilities

1. Existing Conditions

Public transportation services located in the vicinity of the project are provided by the “The Bus” which is operated by the Oahu Transit Service (OTS) for the City and County of Honolulu. These services currently consist of fixed route bus services, as well as a “HandiVan” service which provides door-to-door services for those who have difficulty accessing the fixed route services. The fixed route bus services in the project vicinity consist of regional routes along Ala Moana Boulevard and supplemented by local routes along Auahi Street and Queen Street. There are approximately 9 transit stops that are served by 8 distinct bus routes within a quarter mile radius of the proposed project (see Figure 16). In addition, the project vicinity is also served by a number of trolley companies including Lealea (H.I.S.), Waikiki Trolley, JALPAK, and Oli Oli (JTB). Trolley stops are located along the perimeter of Ward Village with many found along Auahi Street and Kamakee Street.

2. Transit Capacity and Quality of Service Manual (TCQSM) and Transit Level of Service

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, 3rd Edition (TCQSM)



published in 2013 which provides research-based guidance on public transit 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.

Figure 16 summarizes the existing transit LOS for the transit facilities within a quarter-mile radius of the project site. Transit LOS calculations are included in Appendix G. In general, there is good transit quality of service in the project vicinity. The project vicinity is served by a number of transit facilities that provide connections to local and regional bus routes with headways of one hour or less. Access to the nearby bus stops are facilitated by pedestrian facilities along Ward Avenue, Auahi Street, and Ala Moana Boulevard.

3. Projected Conditions

In general, the existing transit facilities are expected to be maintained under with project conditions, with the exception of those along Auahi Street. In conjunction with planned improvements along Auahi Street, the existing bus stops along that roadway will be relocated to facilitate access to other planned developments within the Ward Village with additional bus stops provided to further enhance convenient access to transit. A relocated bus stop

is expected to be provided near the future Block H development that may be accessed from the Block F development via pedestrian facilities along Pohukania Street and Ward Avenue. Although some of the bus stops locations are expected to be modified with the Auahi Street improvements, service to the stops are not expected to change significantly and as such, the level of service for transit in the vicinity of the project is anticipated to remain similar to existing conditions.

In addition, the City and County of Honolulu is currently developing a fixed guideway transit system that is to provide services from Kapolei to the central Honolulu area, therefore providing an additional mode of transportation through the Kakaako area. In the vicinity of the Ward Villages development, the guideway alignment is expected to run along Halekauwila Street, cross over to Queen Street and then follow that roadway to Waimanu Street. The planned transit system is expected to be completed by Year 2025, a year after the completion of the Block F development. A transit station is expected to be provided near the intersection of Queen Street and Ward Avenue northeast of the Block F development.

VII. RECOMMENDATIONS

Based on the analysis of the traffic data, the following are the recommendations of this study to be incorporated in the project design.

1. Maintain sufficient sight distance for motorists to safely enter and exit the project driveways, as well as at the internal intersections within the project site, 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.
3. Provide adequate turn-around area for service, delivery, and refuse collection vehicles to maneuver on the project site to avoid vehicle-reversing maneuvers onto public roadways.
4. Provide sufficient turning radii for all anticipated vehicle types at all project driveways to avoid or minimize vehicle encroachments to oncoming traffic lanes.

5. The Auahi Street corridor is expected to accommodate increased pedestrian and bicycle activity. The developer shall continue to work with the City and County of Honolulu during the design phase of the project and shall develop alternative schemes to accommodate the potential increase in pedestrian and bicycle use along the corridor. Should the need arise, such schemes shall be approved by the City and County of Honolulu and implemented by the developer.
6. If the existing City base yard along Auahi Street is relocated prior to the completion of Block F, a supplemental traffic assessment should be prepared to assess the changes to circulation in the project vicinity. If the relocation occurs after the completion of Block F, then such assessment should be incorporated with a future iteration of the Ward Village Transportation Master Plan.
7. Remove existing parking along Pohukaina Street fronting the project site to provide adequate sight distance for vehicles entering and exiting the project site and to support the planned bicycle facilities along that roadway.
8. If access at the entrance to the parking garage is 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. The layout and dimensions shall be determined during the design phase.
9. Provide adequate passing areas along the proposed drop off/pick up area near the residential lobby off Auahi Street and monitor queueing to facilitate traffic flow through the area. The layout and dimensions shall be determined during the design phase.
10. Provide adequate signage to indicate the designation of the vehicular access points for the residential, commercial, and industrial uses.
11. Consider relocating the proposed loading zone within the at-grade commercial parking area to minimize conflicts with vehicles accessing the parking area and prevent queueing from that access onto the adjacent public roadway.
12. Consider the layout of the at-grade parking area to ensure the configuration accommodates all anticipated vehicle types and minimize potential queueing onto the adjacent public roadways.
13. Consider implementing a one-way traffic flow within the loading zone near the center of the project site to facilitate traffic flow through the area.
14. Ensure that all new pedestrian facilities in the vicinity of the project are made accessible in conformance with the American With Disabilities Act (ADA) including the associated crossings at the project intersections.

- 15. Continue to coordinate with the City and County of Honolulu Department of Transportation Services to facilitate the implementation of the planned bicycle facilities along the roadways adjacent to the project site.
- 16. Update the study should development phasing, land use intensity, or land use mix change.
- 17. Continue to develop and/or enhance bicycle and pedestrian facilities, as well as public transportation services in the project vicinity as described in the “Transportation Master Plan and Assessment for the Ward Villages Master Plan,” dated October 2018.

VIII. CONCLUSION

The project site for the Ward Village Master Plan currently encompasses Ward Entertainment Center, Ward Village Shops, and other surrounding commercial and office buildings. The overall master plan is expected to be implemented in five (5) phases over the next 10-15 years and entail the redevelopment of most of the existing commercial, office, and industrial spaces. Block F is the second development included in Phase 3 of the master plan which is expected to include residential, commercial, restaurant, and light industrial uses. With the implementation of the aforementioned recommendations, traffic operations with the Block F development are generally expected to remain similar to without project conditions. In addition, as previously discussed, there are roadway improvements planned in conjunction with the development of Ward Villages Master Plan including the extension of Halekauwila Street east of Ward Avenue and the realignment of Auahi Street to intersect Pohukaina Street. These improvements are expected to provide alternate east-west routes and increase mobility through the area. The Howard Hughes Corporation will also continue to work with the City and County of Honolulu to incorporate bicycle and enhanced pedestrian facilities into the development plans for the Ward Villages project to encourage alternative modes of travel and further minimize the impact of the proposed project to the surrounding roadways. However, since the Ward Village Master Plan is expected to be developed in phases over a period of 10+ years, it is recommended that Traffic Impact Analysis Reports (TIARs) continue to be prepared for each phase of the project to verify future conditions and ensure necessary mitigation measures are implemented.

APPENDIX A
TRAFFIC COUNT DATA

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: AH, GH
Counters: D4-3889, D4-5674
Weather: CLEAR

File Name : WAR QUE AM
Site Code : 00000001
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted																							
Ward Avenue Southbound						Queen Street Westbound						Ward Avenue Northbound						Queen 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	4	131	18	0	153	1	14	1	6	22	5	21	3	1	30	5	9	10	6	30	235		
06:15 AM	7	141	21	3	172	1	9	5	6	21	4	37	2	1	44	6	10	9	4	29	266		
06:30 AM	3	132	28	0	163	7	25	2	6	40	10	39	6	1	56	8	19	15	6	48	307		
06:45 AM	8	157	31	3	199	8	25	4	1	38	10	65	2	2	79	8	22	9	5	44	360		
Total	22	561	98	6	687	17	73	12	19	121	29	162	13	5	209	27	60	43	21	151	1168		
07:00 AM	7	138	47	5	197	7	37	9	11	64	7	81	11	0	99	19	17	7	12	55	415		
07:15 AM	9	142	66	2	219	10	52	3	11	76	17	94	5	1	117	10	24	13	7	54	466		
07:30 AM	4	171	56	4	235	17	63	0	13	93	11	97	4	8	120	9	24	15	11	59	507		
07:45 AM	11	166	50	1	228	13	80	8	11	112	16	97	11	2	126	17	29	18	6	70	536		
Total	31	617	219	12	879	47	232	20	46	345	51	369	31	11	462	55	94	53	36	238	1924		
08:00 AM	7	166	73	5	251	12	70	8	8	98	11	86	7	2	106	14	30	11	8	63	518		
08:15 AM	11	150	50	5	216	7	63	12	8	90	9	108	14	3	134	10	42	14	5	71	511		
08:30 AM	7	138	34	1	180	9	36	9	2	56	21	97	7	4	129	18	33	22	4	77	442		
08:45 AM	11	170	58	2	241	7	34	5	10	56	9	103	8	5	125	26	32	19	9	86	508		
Total	36	624	215	13	888	35	203	34	28	300	50	394	36	14	494	68	137	66	26	297	1979		
Grand Total	89	1802	532	31	2454	99	508	66	93	766	130	925	80	30	1165	150	291	162	83	686	5071		
Approch %	3.6	73.4	21.7	1.3		12.9	66.3	8.6	12.1		11.2	79.4	6.9	2.6		21.9	42.4	23.6	12.1				
Total %	1.8	35.5	10.5	0.6	48.4	2	10	1.3	1.8	15.1	2.6	18.2	1.6	0.6	23	3	5.7	3.2	1.6	13.5			

Groups Printed- Unshifted																							
Ward Avenue Southbound						Queen Street Westbound						Ward Avenue Northbound						Queen Street Eastbound					
Start Time	Left	Thru	Right	App. Total		Left	Thru	Right	App. Total		Left	Thru	Right	App. Total		Left	Thru	Right	App. 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	4	171	56	231		17	63	0	80		11	97	4	112		9	24	15	48				
07:45 AM	11	166	50	227		13	80	8	101		16	97	11	124		17	29	18	64				
08:00 AM	7	166	73	246		12	70	8	90		11	86	7	104		14	30	11	55				
08:15 AM	11	150	50	211		7	63	12	82		9	108	14	131		10	42	14	66				
Total Volume	33	653	229	915		49	276	28	353		47	388	36	471		50	125	58	233				
% App. Total	3.6	71.4	25			13.9	78.2	7.9			10	82.4	7.6			21.5	53.6	24.9					
PHF	.750	.955	.784	.930		.721	.863	.583	.874		.734	.898	.643	.899		.735	.744	.806	.883				

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: AH, GH
Counters: D4-3889, D4-5674
Weather: CLEAR

File Name : WAR QUE PM
Site Code : 00000001
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted																						
Ward Avenue Southbound						Queen Street Westbound						Ward Avenue Northbound						Queen 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		
03:00 PM	11	143	31	3	188	9	66	21	14	110	25	154	12	3	194	26	33	22	7	88		
03:15 PM	15	149	37	3	204	14	57	18	14	103	24	154	10	3	191	27	45	11	5	88		
03:30 PM	9	141	37	8	195	8	55	19	10	92	28	174	14	4	220	20	62	14	9	105		
03:45 PM	12	140	17	3	172	14	65	11	8	98	22	138	17	9	186	21	36	14	11	82		
Total	47	573	122	17	759	45	243	69	46	403	99	620	53	19	791	94	176	61	32	363		
04:00 PM	12	135	40	5	192	20	59	13	14	106	14	144	14	10	182	25	57	12	17	111		
04:15 PM	10	128	23	6	167	8	75	13	5	101	11	153	16	0	180	14	70	21	16	121		
04:30 PM	10	152	31	3	196	11	60	17	12	100	17	153	18	3	191	32	67	17	11	127		
04:45 PM	20	128	24	9	181	14	37	10	11	72	19	150	24	4	197	33	95	30	5	163		
Total	52	543	118	23	736	53	231	53	42	379	61	600	72	17	750	104	289	80	49	522		
05:00 PM	19	141	29	3	192	15	74	13	9	111	17	159	18	5	199	29	72	15	17	133		
05:15 PM	16	151	26	5	198	12	69	12	20	113	15	167	28	7	217	26	103	21	12	162		
05:30 PM	18	179	39	4	240	7	76	7	11	101	16	154	22	5	197	17	86	32	7	142		
05:45 PM	10	149	35	6	200	14	58	10	15	97	21	138	14	4	177	27	79	30	16	152		
Total	63	620	129	18	830	48	277	42	55	422	69	618	82	21	790	99	340	98	52	589		
Grand Total	162	1736	369	58	2325	146	751	164	143	1204	229	1838	207	57	2331	297	805	239	133	1474		
Approch %	7	74.7	15.9	2.5		12.1	62.4	13.6	11.9	16.4	9.8	78.9	8.9	2.4		20.1	54.6	16.2	9			
Total %	2.2	23.7	5	0.8	31.7	2	10.2	2.2	1.9	16.4	3.1	25.1	2.8	0.8	31.8	4	11	3.3	1.8	20.1		

		Ward Avenue Southbound					Queen Street Westbound					Ward Avenue Northbound					Queen 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 05:00 PM																					
05:00 PM		19	141	29	189	15	74	13	102	17	159	18	194	29	72	15	116	601			
05:15 PM		16	151	26	193	12	69	12	93	15	167	28	210	26	103	21	150	646			
05:30 PM		18	179	39	236	7	76	7	90	16	154	22	192	17	86	32	135	653			
05:45 PM		10	149	35	194	14	58	10	82	21	138	14	173	27	79	30	136	585			
Total Volume		63	620	129	812	48	277	42	367	69	618	82	769	99	340	98	537	2485			
% App. Total		7.8	76.4	15.9		13.1	75.5	11.4		9	80.4	10.7		18.4	63.3	18.2					
PHF		.829	.866	.827	.860	.800	.911	.808	.900	.821	.925	.732	.915	.853	.825	.766	.895	.951			

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: LF, FS
Counters: D4-5673, D4-5677
Weather: CLEAR

File Name : WAR HAL AM
Site Code : 00000002
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted													
Ward Avenue Southbound							Ward Avenue Northbound						
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	Thru	Left	Thru	Right	App. Total	Int. Total
06:00 AM	1	103	47	151	15	20	3	5	10	1	7	24	218
06:15 AM	0	102	44	146	5	35	0	8	6	1	10	27	221
06:30 AM	0	95	47	142	2	48	0	12	9	1	6	32	252
06:45 AM	1	113	49	163	2	57	1	20	21	0	6	40	310
Total	2	413	187	602	24	160	4	45	46	3	29	88	1001
07:00 AM	3	94	46	143	6	78	0	17	22	0	10	17	293
07:15 AM	1	115	40	156	4	93	0	12	24	2	2	14	307
07:30 AM	3	135	56	194	3	89	2	13	22	1	2	15	341
07:45 AM	1	128	56	185	1	94	0	10	28	1	5	13	337
Total	8	472	198	678	14	354	2	52	96	4	19	59	1278
08:00 AM	2	129	42	173	4	86	1	12	20	1	5	14	316
08:15 AM	0	119	38	157	9	105	0	16	30	1	5	15	338
08:30 AM	4	105	37	146	7	107	2	10	15	2	11	8	308
08:45 AM	4	124	36	164	1	86	0	8	33	2	7	9	310
Total	10	477	153	640	21	384	3	46	98	6	28	46	1272
Grand Total	20	1362	538	1920	59	898	9	143	240	13	76	193	3551
Apprch %	1	70.9	28		5.3	81	0.8	12.9	46	2.5	14.6	37	
Total %	0.6	38.4	15.2	54.1	1.7	25.3	0.3	4	6.8	0.4	2.1	5.4	14.7

Ward Avenue Southbound							Ward Avenue Northbound						
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	Thru	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 06:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	3	135	56	194	3	89	2	94	22	1	2	25	313
07:45 AM	1	128	56	185	1	94	0	95	28	1	5	34	314
08:00 AM	2	129	42	173	4	86	1	91	20	1	5	26	290
08:15 AM	0	119	38	157	9	105	0	114	30	1	5	36	307
Total Volume	6	511	192	709	17	374	3	394	100	4	17	121	1224
% App. Total	0.8	72.1	27.1		4.3	94.9	0.8		82.6	3.3	14		
PHF	.500	.946	.857	.914	.472	.890	.375	.864	.833	1.00	.850	.840	.975

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: LF, FS
Counters: D4-5673, D4-5677
Weather: CLEAR

File Name : WAR HAL PM
Site Code : 00000002
Start Date : 3/7/2018
Page No : 1

Groups Printed- Unshifted													
Ward Avenue Southbound							Ward Avenue Northbound						
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	Thru	Left	Thru	Right	App. Total	Int. Total
03:00 PM	2	128	23	153	6	147	2	18	44	2	13	16	401
03:15 PM	2	130	29	161	6	130	2	43	39	1	11	45	438
03:30 PM	5	110	38	153	8	147	2	19	43	2	17	47	438
03:45 PM	2	126	27	155	6	109	1	18	43	2	10	14	358
Total	11	494	117	622	26	533	7	98	169	7	51	122	1635
04:00 PM	3	119	35	157	8	109	0	25	46	4	9	10	368
04:15 PM	1	121	28	150	6	102	2	33	41	4	16	17	371
04:30 PM	5	146	20	171	5	110	2	22	59	1	21	18	409
04:45 PM	3	137	29	169	8	116	0	23	63	1	20	12	412
Total	12	523	112	647	27	437	4	103	209	10	66	57	1560
05:00 PM	3	139	28	170	7	123	2	31	46	5	18	23	425
05:15 PM	5	159	16	180	6	115	1	13	81	2	20	18	436
05:30 PM	6	161	31	198	7	118	0	17	55	5	22	6	428
05:45 PM	2	152	42	196	5	86	1	17	43	4	12	16	380
Total	16	611	117	744	25	442	4	78	225	16	72	63	1669
Grand Total	39	1628	346	2013	78	1412	15	279	603	33	189	242	4864
Apprch %	1.9	80.9	17.2		4.4	79.1	0.8	15.6	56.5	3.1	17.7	22.7	
Total %	0.8	33.5	7.1	41.4	1.6	29	0.3	5.7	12.4	0.7	3.9	5	21.9

Ward Avenue Southbound							Ward Avenue Northbound						
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	Thru	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	3	137	29	169	8	116	0	124	63	1	20	84	377
05:00 PM	3	139	28	170	7	123	2	132	46	5	18	69	371
05:15 PM	5	159	16	180	6	115	1	122	81	2	20	103	405
05:30 PM	6	161	31	198	7	118	0	125	55	5	22	82	405
Total Volume	17	596	104	717	28	472	3	503	245	13	80	338	1558
% App. Total	2.4	83.1	14.5		5.6	93.8	0.6		72.5	3.8	23.7		
PHF	.708	.925	.839	.905	.875	.959	.375	.953	.756	.650	.909	.820	.962

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			

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

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400

Honolulu, HI 96826

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			

Groups Printed- Unshifted																					
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: DY, YS
Counters: D4-3890, D4-5671
Weather: CLEAR

File Name : ALA WAR AM1
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	Int. Total			
06:00 AM	36	17	15	0	68	13	157	11	5	186	0	3	3	0	6	502			
06:15 AM	21	22	9	3	55	6	188	11	5	210	0	2	4	5	11	553			
06:30 AM	28	23	12	2	65	15	256	22	6	299	0	3	4	5	12	706			
06:45 AM	36	30	28	1	95	15	301	29	2	347	0	4	3	1	8	880			
Total	121	92	64	6	283	49	902	73	18	1042	0	12	14	11	37	2641			
07:00 AM	44	30	28	6	108	15	343	26	4	388	0	6	12	7	25	932			
07:15 AM	29	25	35	3	92	29	427	37	2	495	0	14	10	4	28	1057			
07:30 AM	50	33	42	5	130	33	386	46	7	472	0	8	7	6	21	1047			
07:45 AM	39	34	40	2	115	35	415	42	1	493	2	7	14	1	24	1055			
Total	162	122	145	16	445	112	1571	151	14	1848	2	35	43	18	98	4091			
08:00 AM	34	14	34	4	86	27	358	37	3	425	0	8	9	2	19	967			
08:15 AM	39	42	10	3	94	24	365	47	8	444	1	15	9	2	27	993			
08:30 AM	30	43	34	2	109	35	293	47	3	378	0	11	6	4	21	921			
08:45 AM	30	27	32	2	91	27	291	33	4	355	0	14	15	0	29	869			
Total	133	126	110	11	380	113	1307	164	18	1602	1	48	39	8	96	3750			
Grand Total	416	340	319	33	1108	274	3780	388	50	4492	3	95	96	37	231	10482			
Approch %	37.5	30.7	28.8	3		6.1	84.1	8.6	1.1		1.3	41.1	41.6	16					
Total %	4	3.2	3	0.3	10.6	2.6	36.1	3.7	0.5	42.9	0	0.9	0.9	0.4	2.2	44.4			

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
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	29	427	37	493	0	14	10	24	59	376	6	441
07:30 AM	50	33	42	125	33	386	46	465	0	8	7	15	54	365	1	420
07:45 AM	39	34	40	113	35	415	42	492	2	7	14	23	54	367	1	422
08:00 AM	34	14	34	82	27	358	37	422	0	8	9	17	50	379	3	432
Total Volume	152	106	151	409	124	1586	162	1872	2	37	40	79	217	1487	11	1715
% App. Total	37.2	25.9	36.9		6.6	84.7	8.7		2.5	46.8	50.6		12.7	86.7	0.6	
PHF	.760	.779	.899	.818	.886	.929	.880	.949	.250	.661	.714	.823	.919	.981	.458	.972

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	Int. Total			
03:00 PM	29	16	73	6	124	17	304	43	3	367	0	17	11	5	33	414			
03:15 PM	46	10	88	13	157	12	384	35	6	437	0	21	10	8	39	465			
03:30 PM	49	13	94	6	162	15	330	48	3	396	2	22	23	1	48	511			
03:45 PM	45	20	56	4	125	8	250	102	6	366	1	18	19	5	43	480			
Total	169	59	311	29	568	52	1268	228	18	1566	3	78	63	19	163	1870			
04:00 PM	49	10	39	5	103	5	290	49	8	352	1	18	23	10	52	520			
04:15 PM	47	15	44	4	110	12	346	32	7	397	1	19	28	5	53	530			
04:30 PM	71	19	55	6	151	13	287	81	11	392	3	32	38	3	76	482			
04:45 PM	48	14	54	16	132	12	311	50	6	379	1	19	34	12	66	544			
Total	215	58	192	31	496	42	1234	212	32	1520	6	88	123	30	247	2076			
05:00 PM	68	11	63	8	150	16	279	44	15	354	4	27	51	7	89	421			
05:15 PM	68	20	53	8	149	13	355	51	7	426	1	34	36	10	81	490			
05:30 PM	63	18	56	3	140	6	309	54	6	375	0	19	26	12	57	534			
05:45 PM	69	11	59	5	144	10	301	37	12	360	0	16	24	10	50	464			
Total	268	60	231	24	583	45	1244	186	40	1515	5	96	137	39	277	1909			
Grand Total	652	177	734	84	1647	139	3746	626	90	4601	14	262	323	88	687	5855			
Approch %	39.6	10.7	44.6	5.1		3	81.4	13.6	2		2	38.1	47	12.8		9.8			
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	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
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
05:00 PM	68	11	63	142	16	279	44	339	4	27	51	82	53	366	0	419
05:15 PM	68	20	53	141	13	355	51	419	1	34	36	71	35	451	0	486
05:30 PM	63	18	56	137	6	309	54	369	0	19	26	45	43	486	2	531
Total Volume	247	63	226	536	47	1254	199	1500	6	99	147	252	167	1801	2	1970
% 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: FS, GH
Counters: D4-5672, D4-5674
Weather: CLEAR

File Name : KAM AUA AM
Site Code : 00000001
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted																						
Kamakee Street Southbound						Auahi Street Westbound						Kamakee 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	2	14	9	3	28	0	4	3	6	13	2	9	3	2	16	0	6	1	0	7	64	
06:15 AM	2	13	13	5	33	1	9	2	2	14	7	7	1	1	16	2	5	3	2	12	75	
06:30 AM	3	17	10	11	41	0	8	9	8	25	2	12	0	4	18	1	5	2	3	11	95	
06:45 AM	0	18	12	7	37	0	7	7	5	19	7	17	4	6	34	8	8	2	3	21	111	
Total	7	62	44	26	139	1	28	21	21	71	18	45	8	13	84	11	24	8	8	51	345	
07:00 AM	2	27	21	7	57	3	15	9	5	32	7	8	2	3	20	4	12	3	4	23	132	
07:15 AM	3	28	20	4	55	4	13	8	2	27	5	13	6	5	29	4	12	2	7	25	136	
07:30 AM	2	25	20	5	52	4	21	9	5	39	7	13	3	5	28	1	8	4	3	16	135	
07:45 AM	2	23	19	6	50	6	14	6	2	28	3	32	9	1	45	0	12	9	2	23	146	
Total	9	103	80	22	214	17	63	32	14	126	22	66	20	14	122	9	44	18	16	87	549	
08:00 AM	5	39	20	7	71	4	15	9	2	30	6	23	5	3	37	3	21	5	1	30	168	
08:15 AM	4	37	23	8	72	0	14	9	3	26	10	18	11	7	46	3	19	1	5	28	172	
08:30 AM	5	30	22	8	65	4	19	9	8	40	2	10	9	4	25	7	22	7	9	45	175	
08:45 AM	7	31	21	13	72	3	12	12	12	39	3	21	3	3	30	3	29	3	4	39	180	
Total	21	137	86	36	280	11	60	39	25	135	21	72	28	17	138	16	91	16	19	142	695	
Grand Total	37	302	210	84	633	29	151	92	60	332	61	183	56	44	344	36	159	42	43	280	1589	
Approch %	5.8	47.7	33.2	13.3		8.7	45.5	27.7	18.1		17.7	53.2	16.3	12.8		12.9	56.8	15	15.4			
Total %	2.3	19	13.2	5.3	39.8	1.8	9.5	5.8	3.8	20.9	3.8	11.5	3.5	2.8	21.6	2.3	10	2.6	2.7	17.6		

Kamakee Street Southbound												Auahi Street Westbound				Kamakee 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 08:00 AM																							
08:00 AM	5	39	20	64	4	15	9	28	6	23	5	34	3	21	5	29	155						
08:15 AM	4	37	23	64	0	14	9	23	10	18	11	39	3	19	1	23	149						
08:30 AM	5	30	22	57	4	19	9	32	2	10	9	21	7	22	7	36	146						
08:45 AM	7	31	21	59	3	12	12	27	3	21	3	27	3	29	3	35	148						
Total Volume	21	137	86	244	11	60	39	110	21	72	28	121	16	91	16	123	598						
% App. Total	8.6	56.1	35.2		10	54.5	35.5		17.4	59.5	23.1		13	74	13								
PHF	.750	.878	.935	.953	.688	.789	.813	.859	.525	.783	.636	.776	.571	.784	.571	.854	.965						

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: FS, GH
Counters: D4-5672, D4-5674
Weather: CLEAR

File Name : KAM AUA PM
Site Code : 00000001
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted																							
Kamakee Street Southbound						Auahi Street Westbound						Kamakee 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	7	49	24	31	111	13	27	17	24	81	7	17	11	25	60	6	56	5	20	87	339		
03:15 PM	11	38	20	39	108	8	30	18	29	85	9	18	11	23	61	12	37	13	25	87	341		
03:30 PM	10	30	23	24	87	10	27	15	23	75	5	17	6	23	51	13	53	6	6	78	291		
03:45 PM	7	19	16	29	71	6	26	12	17	61	5	14	8	13	40	14	56	7	9	86	258		
Total	35	136	83	123	377	37	110	62	93	302	26	66	36	84	212	45	202	31	60	338	1229		
04:00 PM	10	29	19	38	96	5	23	5	20	53	4	21	8	11	44	15	44	4	14	77	270		
04:15 PM	8	36	20	31	95	8	39	10	24	81	7	17	7	24	55	7	56	6	17	86	317		
04:30 PM	19	42	14	60	135	9	31	5	48	93	9	15	12	15	51	15	48	11	14	88	367		
04:45 PM	11	38	16	22	87	6	35	8	5	54	13	21	8	23	65	14	54	7	15	90	296		
Total	48	145	69	151	413	28	128	28	97	281	33	74	35	73	215	51	202	28	60	341	1250		
05:00 PM	12	29	16	27	84	9	31	10	37	87	10	15	14	36	75	15	54	9	19	97	343		
05:15 PM	18	30	16	46	110	7	24	8	26	65	7	15	12	18	52	14	58	8	18	98	325		
05:30 PM	16	29	14	32	91	6	21	10	18	55	8	15	14	23	60	8	70	9	24	111	317		
05:45 PM	16	39	18	43	116	9	24	10	24	67	5	16	11	28	60	12	69	3	18	102	345		
Total	62	127	64	148	401	31	100	38	105	274	30	61	51	105	247	49	251	29	79	408	1330		
Grand Total	145	408	216	422	1191	96	338	128	295	857	89	201	122	262	674	145	655	88	199	1087	3809		
Approch %	12.2	34.3	18.1	35.4		11.2	39.4	14.9	34.4		13.2	29.8	18.1	38.9		13.3	60.3	8.1	18.3				
Total %	3.8	10.7	5.7	11.1	31.3	2.5	8.9	3.4	7.7	22.5	2.3	5.3	3.2	6.9	17.7	3.8	17.2	2.3	5.2	28.5			

Groups Printed- Unshifted																							
Kamakee Street Southbound						Auahi Street Westbound						Kamakee 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	8	36	20	64		8	39	10	57		7	17	7	31		7	56	6	69		221		
04:30 PM	19	42	14	75		9	31	5	45		9	15	12	36		15	48	11	74		230		
04:45 PM	11	38	16	65		6	35	8	49		13	21	8	42		14	54	7	75		231		
05:00 PM	12	29	16	57		9	31	10	50		10	15	14	39		15	54	9	78		224		
Total Volume	50	145	66	261		32	136	33	201		39	68	41	148		51	212	33	296		906		
% App. Total	19.2	55.6	25.3			15.9	67.7	16.4			26.4	45.9	27.7			17.2	71.6	11.1					
PHF	.658	.863	.825	.870		.889	.872	.825	.882		.750	.810	.732	.881		.850	.946	.750	.949		.981		

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: LF
Counters: D4-5673
Weather: CLEAR

File Name : KAM MID AM
Site Code : 00000002
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted													
Kamakee Street							Kamakee Street						
Southbound							Northbound						
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Thru	Peds	App. Total	Left	Right	Peds	App. Total
06:00 AM	27	2	0	29	0	10	10	0	10	1	0	1	2
06:15 AM	19	6	1	26	3	8	8	3	14	0	2	2	4
06:30 AM	24	3	3	30	3	24	24	2	29	0	2	3	5
06:45 AM	27	7	2	36	4	28	28	1	33	0	3	6	9
Total	97	18	6	121	10	70	70	6	86	1	7	12	20
07:00 AM	46	7	4	57	5	19	19	1	25	1	4	2	7
07:15 AM	49	3	3	55	5	22	22	1	28	2	2	0	4
07:30 AM	44	6	3	53	0	24	24	4	28	3	2	4	9
07:45 AM	43	7	0	50	1	35	35	0	36	2	3	3	8
Total	182	23	10	215	11	100	100	6	117	8	11	9	28
08:00 AM	62	2	2	66	4	30	30	0	34	4	2	0	6
08:15 AM	56	7	2	65	0	30	30	0	30	2	2	0	4
08:30 AM	54	6	0	60	2	24	24	2	28	3	2	2	8
08:45 AM	54	5	1	60	0	35	35	1	36	2	6	3	11
Total	226	20	5	251	6	119	119	3	128	11	13	5	29
Grand Total	505	61	21	587	27	289	289	15	331	20	31	26	77
Apprch %	86	10.4	3.6		8.2	87.3	4.5			26	40.3	33.8	
Total %	50.8	6.1	2.1	59	2.7	29	1.5		33.3	2	3.1	2.6	7.7

Kamakee Street							Kamakee Street						
Southbound							Northbound						
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Thru	Peds	App. Total	Left	Right	Peds	App. Total
08:00 AM	62	2	2	64	4	30	30	6	34	4	2	2	6
08:15 AM	56	7	6	63	0	30	30	0	30	2	2	0	4
08:30 AM	54	6	6	60	2	24	24	2	26	3	3	3	9
08:45 AM	54	5	5	59	0	35	35	0	35	2	6	6	8
Total Volume	226	20	20	246	6	119	125	11	125	11	13	24	395
% App. Total	91.9	8.1			4.8	95.2				45.8	54.2		
PHF	.911	.714		.961	.375	.850	.893		.893	.688	.542		.950

Counted By: LF
Counters: D4-5673
Weather: CLEAR

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

File Name : KAM MID PM
Site Code : 00000002
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted													
Kamakee Street							Kamakee Street						
Southbound							Northbound						
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Thru	Peds	App. Total	Left	Right	Peds	App. Total
03:00 PM	81	14	2	97	3	34	34	6	43	12	2	7	21
03:15 PM	72	8	7	87	2	47	1	50	50	8	6	12	26
03:30 PM	56	18	4	78	2	42	0	44	44	3	7	6	16
03:45 PM	43	13	3	59	4	34	0	38	38	7	2	2	108
Total	252	53	16	321	11	157	7	175	175	30	17	27	74
04:00 PM	58	14	9	81	4	40	0	44	44	9	5	8	22
04:15 PM	60	9	6	75	1	31	1	33	33	11	3	4	18
04:30 PM	72	11	5	88	4	29	1	34	34	9	7	4	20
04:45 PM	60	22	7	89	7	38	2	47	47	8	10	8	26
Total	250	56	27	333	16	138	4	158	158	37	25	24	86
05:00 PM	60	12	7	79	2	35	7	44	44	8	1	4	13
05:15 PM	67	15	2	84	5	36	2	43	43	6	4	6	16
05:30 PM	60	21	2	83	5	29	3	37	37	8	3	6	17
05:45 PM	74	18	10	102	10	29	0	39	39	6	10	7	23
Total	261	66	21	348	22	129	12	163	163	28	18	23	69
Grand Total	763	175	64	1002	49	424	23	496	496	95	60	74	229
Apprch %	76.1	17.5	6.4		9.9	85.5	4.6			41.5	26.2	32.3	
Total %	44.2	10.1	3.7	58	2.8	24.6	1.3		28.7	5.5	3.5	4.3	13.3

Kamakee Street							Kamakee Street						
Southbound							Northbound						
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Thru	Peds	App. Total	Left	Right	Peds	App. Total
04:30 PM	72	11	11	83	4	29	29	7	33	9	7	7	16
04:45 PM	60	22	6	82	7	38	38	2	45	8	10	18	145
05:00 PM	60	12	6	72	2	35	35	1	37	8	1	9	118
05:15 PM	67	15	15	82	5	36	36	4	41	6	4	10	133
Total Volume	259	60	60	319	18	138	138	22	156	31	22	53	528
% App. Total	81.2	18.8			11.5	88.5				58.5	41.5		
PHF	.899	.682		.961	.643	.908	.867		.867	.861	.550		.910

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400

Honolulu, HI 96826

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

File Name : QUE KAM AM
Site Code : 00000003
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted																					
Kamakee Street Southbound						Queen Street Westbound					Kamakee Street Northbound					Queen 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	5	17	2	0	24	6	2	0	0	8	3	6	0	2	11	2	13	2	1	18	61
06:15 AM	7	15	7	0	29	11	8	1	1	21	1	5	0	0	6	5	11	2	4	22	78
06:30 AM	5	20	6	1	32	4	18	0	2	24	3	7	8	1	19	1	12	4	4	21	96
06:45 AM	2	22	15	0	39	8	16	4	2	30	5	15	5	2	27	2	19	3	5	29	125
Total	19	74	30	1	124	29	44	5	5	83	12	33	13	5	63	10	55	11	14	90	360
07:00 AM	4	32	9	1	46	21	46	1	1	69	1	13	6	1	21	3	14	4	3	24	160
07:15 AM	4	31	14	0	49	17	58	6	0	81	1	20	4	1	26	3	20	6	3	32	188
07:30 AM	4	24	23	2	53	12	84	5	1	102	4	14	1	2	21	3	36	6	9	54	230
07:45 AM	6	23	17	1	47	27	79	3	2	111	4	25	6	1	36	3	19	4	4	30	224
Total	18	110	63	4	195	77	267	15	4	363	10	72	17	5	104	12	89	20	19	140	802
08:00 AM	4	33	10	5	52	31	66	11	1	109	0	9	11	2	22	1	46	5	3	55	238
08:15 AM	6	28	12	4	50	26	44	4	1	75	10	17	8	5	40	3	42	10	3	58	223
08:30 AM	7	25	14	6	52	23	33	5	0	61	6	7	10	12	35	1	37	10	0	48	196
08:45 AM	14	28	8	9	59	21	30	4	1	56	3	5	7	5	20	7	37	7	2	53	188
Total	31	114	44	24	213	101	173	24	3	301	19	38	36	24	117	12	162	32	8	214	845
Grand Total	68	298	137	29	532	207	484	44	12	747	41	143	66	34	284	34	306	63	41	444	2007
Approch %	12.8	56	25.8	5.5		27.7	64.8	5.9	1.6		14.4	50.4	23.2	12		7.7	68.9	14.2	9.2		
Total %	3.4	14.8	6.8	1.4	26.5	10.3	24.1	2.2	0.6	37.2	2	7.1	3.3	1.7	14.2	1.7	15.2	3.1	2	22.1	

Start Time	Kamakee Street Southbound				Queen Street Westbound				Kamakee Street Northbound				Queen Street Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. 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	4	24	23	51	12	84	5	101	4	14	1	19	3	36	6	45
07:45 AM	6	23	17	46	27	79	3	109	4	25	6	35	3	19	4	26
08:00 AM	4	33	10	47	31	66	11	108	0	9	11	20	1	46	5	52
08:15 AM	6	28	12	46	26	44	4	74	10	17	8	35	3	42	10	55
Total Volume	20	108	62	190	96	273	23	392	18	65	26	109	10	143	25	178
% App. Total	10.5	56.8	32.6		24.5	69.6	5.9		16.5	59.6	23.9		5.6	80.3	14	
PHF	.833	.818	.674	.931	.774	.813	.523	.899	.450	.650	.591	.779	.833	.777	.625	.809

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

Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400

Honolulu, HI 96826

File Name : QUE KAM PM
Site Code : 00000003
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted																				
Kamakee Street Southbound						Queen Street Westbound					Kamakee Street Northbound					Queen Street Eastbound				
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total				
03:00 PM	15	34	14	9	72	42	41	3	0	86	7	16	26	18	67	75				
03:15 PM	13	31	15	10	69	36	36	6	1	79	6	28	9	16	59	96				
03:30 PM	11	29	8	11	59	36	53	8	2	99	5	16	12	10	43	82				
03:45 PM	9	18	7	2	36	28	59	5	1	93	1	36	17	4	58	87				
Total	48	112	44	32	236	142	189	22	4	357	19	96	64	48	227	340				
04:00 PM	8	27	7	6	48	30	59	10	0	99	2	17	16	5	40	122				
04:15 PM	12	21	6	5	44	38	74	11	2	125	4	20	16	7	47	85				
04:30 PM	14	30	3	4	51	36	41	10	1	88	3	25	10	15	53	140				
04:45 PM	12	23	5	4	44	40	82	10	1	133	4	23	12	9	48	123				
Total	46	101	21	19	187	144	256	41	4	445	13	85	54	36	188	470				
05:00 PM	17	29	8	6	60	37	75	9	2	123	5	20	15	20	60	128				
05:15 PM	14	19	6	2	41	41	71	14	3	129	8	27	11	13	59	138				
05:30 PM	17	36	9	3	65	26	68	3	2	99	4	21	7	4	36	133				
05:45 PM	12	41	5	6	64	30	62	3	1	96	2	33	5	5	45	128				
Total	60	125	28	17	230	134	276	29	8	447	19	101	38	42	200	527				
Grand Total	154	338	93	68	653	420	721	92	16	1249	51	282	156	126	615	1337				
Approch %	23.6	51.8	14.2	10.4		33.6	57.7	7.4	1.3		8.3	45.9	25.4	20.5						
Total %	4	8.8	2.4	1.8	16.9	10.9	18.7	2.4	0.4	32.4	1.3	7.3	4	3.3	16	34.7				

		Kamakee Street Southbound				Queen Street Westbound				Kamakee Street Northbound				Queen Street Eastbound			
Start Time		Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. 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		12	23	5	40	40	82	10	132	4	23	12	39	6	98	12	116
05:00 PM		17	29	8	54	37	75	9	121	5	20	15	40	10	88	8	106
05:15 PM		14	19	6	39	41	71	14	126	8	27	11	46	12	93	21	126
05:30 PM		17	36	9	62	26	68	3	97	4	21	7	32	9	94	15	118
Total Volume		60	107	28	195	144	296	36	476	21	91	45	157	37	373	56	466
% App. Total		30.8	54.9	14.4		30.3	62.2	7.6		13.4	58	28.7		7.9	80	12	
PHF		.882	.743	.778	.786	.878	.902	.643	.902	.656	.843	.750	.853	.771	.952	.667	.960

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: DY
Counters: D4-5671
Weather: CLEAR

File Name : QUE QUE AM
Site Code : 00000004
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted													
Start Time	Queen Street Westbound				Queens Lane Northbound				Queen Street Eastbound				
	Left	Thru	App. Total	Left	Right	Peds	App. Total	Thru	Right	Thru	Right	App. Total	Int. Total
06:00 AM	1	22	23	0	5	5	10	19	2	21		21	54
06:15 AM	10	26	36	2	4	2	8	12	4	16		16	60
06:30 AM	9	28	37	4	7	1	12	7	16	3		19	68
06:45 AM	11	38	49	7	11	7	25	19	3	22		22	96
Total	31	114	145	13	27	15	55	66	12	78		78	278
07:00 AM	9	63	72	4	12	2	18	29	1	30		30	120
07:15 AM	16	79	95	10	16	3	29	35	4	39		39	163
07:30 AM	20	83	103	3	16	6	25	40	3	43		43	171
07:45 AM	30	80	110	12	25	2	39	27	5	32		32	181
Total	75	305	380	29	69	13	111	131	13	144		144	635
08:00 AM	24	91	115	7	22	1	30	56	2	58		58	203
08:15 AM	18	73	91	6	22	3	31	50	3	53		53	175
08:30 AM	20	70	90	5	25	2	32	47	5	52		52	174
08:45 AM	20	62	82	11	25	6	42	46	3	49		49	173
Total	82	296	378	29	94	12	135	199	13	212		212	725
Grand Total	188	715	903	71	190	40	301	396	38	434		434	1638
Apprch %	20.8	79.2		23.6	63.1	13.3		91.2	8.8				
Total %	11.5	43.7	55.1	4.3	11.6	2.4	18.4	24.2	2.3	26.5			

Start Time	Queen Street Westbound				Queens Lane Northbound				Queen Street Eastbound				
	Left	Thru	App. Total	Left	Right	Peds	App. Total	Thru	Right	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	30	80	110	12	25		37	27	5	32		32	179
08:00 AM	24	91	115	7	22		29	56	2	58		58	202
08:15 AM	18	73	91	6	22		28	50	3	53		53	172
08:30 AM	20	70	90	5	25		30	47	5	52		52	172
Total Volume	92	314	406	30	94		124	180	15	195		195	725
% App. Total	22.7	77.3		24.2	75.8			92.3	7.7				
PHF	.767	.863	.883	.625	.940		.838	.804	.750	.841			.897

Counted By: DY
Counters: D4-5671
Weather: CLEAR

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

File Name : QUE QUE PM
Site Code : 00000004
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted													
Start Time	Queen Street Westbound				Queens Lane Northbound				Queen Street Eastbound				
	Left	Thru	App. Total	Left	Right	Peds	App. Total	Thru	Right	Thru	Right	App. Total	Int. Total
03:00 PM	28	108	136	8	41	6	55	94	11	105		105	296
03:15 PM	24	106	130	6	42	11	59	103	14	117		117	306
03:30 PM	28	126	154	9	50	8	67	88	8	96		96	317
03:45 PM	21	106	127	3	39	3	45	90	7	97		97	269
Total	101	446	547	26	172	28	226	375	40	415		415	1188
04:00 PM	24	99	123	12	37	3	52	120	12	132		132	307
04:15 PM	33	113	146	22	70	6	98	98	7	105		105	349
04:30 PM	40	111	151	5	44	6	55	123	11	134		134	340
04:45 PM	23	130	153	11	62	7	80	132	15	147		147	380
Total	120	453	573	50	213	22	285	473	45	518		518	1376
05:00 PM	25	115	140	15	54	8	77	143	12	155		155	372
05:15 PM	26	100	126	13	59	6	78	139	10	149		149	353
05:30 PM	27	93	120	12	48	7	67	115	16	131		131	318
05:45 PM	33	100	133	16	53	11	80	108	18	126		126	339
Total	111	408	519	56	214	32	302	505	56	561		561	1382
Grand Total	332	1307	1639	132	599	82	813	1353	141	1494		1494	3946
Apprch %	20.3	79.7		16.2	73.7	10.1		90.6	9.4				
Total %	8.4	33.1	41.5	3.3	15.2	2.1	20.6	34.3	3.6	37.9			

Start Time	Queen Street Westbound				Queens Lane Northbound				Queen Street Eastbound				
	Left	Thru	App. Total	Left	Right	Peds	App. Total	Thru	Right	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	40	111	151	5	44		49	123	11	134		134	334
04:45 PM	23	130	153	11	62		73	132	15	147		147	373
05:00 PM	25	115	140	15	54		69	143	12	155		155	364
05:15 PM	26	100	126	13	59		72	139	10	149		149	347
Total Volume	114	456	570	44	219		263	537	48	585		585	1418
% App. Total	20	80		16.7	83.3			91.8	8.2				
PHF	.713	.877	.931	.733	.883		.901	.939	.800	.944			.950

Wilson Okamoto Corporation

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

Counted By: WL
Counters: D4-3890
Weather: CLEAR

File Name : AUA QUE QUE AM
Site Code : 00000005
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted																							
Queens Lane Southbound										Auahi Street Westbound				Queen 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	3	2	3	9					2	2	3	4	0	3	10	2	0	5	5	12	33	
06:15 AM	0	5	7	2	14					5	5	4	1	0	4	10	1	0	3	9	13	42	
06:30 AM	1	7	6	4	18					9	9	6	8	2	6	22	3	0	1	13	17	66	
06:45 AM	3	1	5	1	10					7	7	10	10	0	5	25	6	0	2	11	19	61	
Total	5	16	20	10	51					23	23	24	23	2	18	67	12	0	11	38	61	202	
07:00 AM	0	5	6	3	14					8	8		12	2	2	25	4	1	5	14	24	71	
07:15 AM	1	10	9	1	21					2	2	8	11	1	2	22	6	1	3	13	23	68	
07:30 AM	1	11	9	7	28					9	9	21	14	0	5	40	6	0	6	19	31	108	
07:45 AM	2	12	16	1	31					3	3	17	24	0	3	44	9	1	2	12	24	102	
Total	4	38	40	12	94					22	22	55	61	3	12	131	25	3	16	58	102	349	
08:00 AM	2	7	14	5	28					6	6	18	13	0	1	32	12	1	8	17	38	104	
08:15 AM	1	9	10	5	25					2	2	19	18	2	2	41	14	0	6	24	44	112	
08:30 AM	0	9	15	12	36					10	10	19	15	5	8	47	13	2	6	18	39	132	
08:45 AM	3	9	5	6	23					6	6	14	14	1	8	37	12	0	12	26	50	116	
Total	6	34	44	28	112					24	24	70	60	8	19	157	51	3	32	85	171	464	
Grand Total	15	88	104	50	257					69	69	149	144	13	49	355	88	6	59	181	334	1015	
Apprch %	5.8	34.2	40.5	19.5						100		42	40.6	3.7	13.8		26.3	1.8	17.7	54.2			
Total %	1.5	8.7	10.2	4.9	25.3					6.8	6.8	14.7	14.2	1.3	4.8	35	8.7	0.6	5.8	17.8	32.9		

	Start Time	Queens Lane Southbound				Westbound				Queen Street Northbound				Aushi Street Eastbound			
		Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. 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	2	12	16	30	0	17	24	0	41	9	1	2	12			83
	08:00 AM	2	7	14	23	0	18	13	0	31	12	1	8	21			75
	08:15 AM	1	9	10	20	0	19	18	2	39	14	0	6	20			79
	08:30 AM	0	9	15	24	0	19	15	5	39	13	2	6	21			84
	Total Volume	5	37	55	97	0	73	70	7	150	48	4	22	74			321
	% App. Total	5.2	38.1	56.7			48.7	46.7	4.7		64.9	5.4	29.7				
	PHF	.625	.771	.859	.808	.000	.961	.729	.350	.915	.857	.500	.688	.881			.955

Counted By: WL
Counters: D4-3890
Weather: CLEAR

Wilson Okamoto Corporation

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

File Name : AUA QUE QUE PM
Site Code : 00000005
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted																							
Queens Lane Southbound						Auahi Street Westbound						Queen Street Northbound						Auahi Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total					
03:00 PM	3	21	17	22	63	7	7	32	21	2	22	77	24	9	12	21	66	213					
03:15 PM	4	16	17	11	48	1	1	30	20	4	16	70	22	4	12	21	59	178					
03:30 PM	1	16	21	11	49	6	6	20	16	2	8	46	38	4	20	16	78	179					
03:45 PM	1	8	18	19	46	23	23	26	18	1	7	52	14	2	26	15	57	178					
Total	9	61	73	63	206	37	37	108	75	9	53	245	98	19	70	73	260	748					
04:00 PM	1	22	10	20	53	7	7	17	17	1	4	39	31	3	16	16	66	165					
04:15 PM	0	22	16	25	63	21	21	28	37	4	17	86	36	3	23	44	106	276					
04:30 PM	1	21	25	20	67	23	23	36	14	2	9	61	27	5	20	38	90	241					
04:45 PM	2	14	18	14	48	21	21	37	30	5	18	90	27	4	22	32	85	244					
Total	4	79	69	79	231	72	72	118	98	12	48	276	121	15	81	130	347	926					
05:00 PM	2	17	21	22	62	16	16	26	27	2	13	68	35	1	25	33	94	240					
05:15 PM	1	23	14	16	54	23	23	20	36	3	6	65	27	1	37	28	93	235					
05:30 PM	0	26	19	12	57	16	16	26	18	5	18	67	34	4	28	29	95	235					
05:45 PM	0	20	27	30	77	22	22	26	23	0	11	60	37	0	29	30	96	255					
Total	3	86	81	80	250	77	77	98	104	10	48	260	133	6	119	120	378	965					
Grand Total	16	226	223	222	687	186	186	324	277	31	149	781	352	40	270	323	985	2639					
Apprch %	2.3	32.9	32.5	32.3		100		41.5	35.5	4	19.1		35.7	4.1	27.4	32.8							
Total %	0.6	8.6	8.5	8.4	26	7	7	12.3	10.5	1.2	5.6	29.6	13.3	1.5	10.2	12.2	37.3						

	Queens Lane Southbound						Westbound			Queen Street Northbound			Auahi Street Eastbound		
Start Time	Left	Thru	Right	App. Total	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 05:00 PM															
05:00 PM	2	17	21	40	0		26	27	2	55	35	1	25	61	156
05:15 PM	1	23	14	38	0		20	36	3	59	27	1	37	65	162
05:30 PM	0	26	19	45	0		26	18	5	49	34	4	28	66	160
05:45 PM	0	20	27	47	0		26	23	0	49	37	0	29	66	162
Total Volume	3	86	81	170	0		98	104	10	212	133	6	119	258	640
% App. Total	1.8	50.6	47.6				46.2	49.1	4.7		51.6	2.3	46.1		
PHF	.375	.827	.750	.904	.000		.942	.722	.500	.898	.899	.375	.804	.977	.988

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

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

File Name : AUA MID AM
Site Code : 00000006
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted																	
Parking Garage Southbound					Auahi Street Westbound				Parking Garage Exit Northbound					Auahi Street Eastbound			
Start Time	Left	Right	Peds	App. Total	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Int. Total
06:00 AM	0	0	8	8	4	0	4	0	0	0	2	2	3	6	0	9	23
06:15 AM	0	2	0	2	7	0	7	0	1	0	5	6	1	4	2	7	22
06:30 AM	0	1	9	10	9	0	9	0	0	0	2	2	0	6	2	8	29
06:45 AM	0	0	5	5	12	4	16	0	0	0	1	1	1	7	1	9	31
Total	0	3	22	25	32	4	36	0	1	0	10	11	5	23	5	33	105
07:00 AM	0	2	5	7	14	1	15	0	0	0	4	4	3	11	0	14	40
07:15 AM	0	5	9	14	16	0	16	1	0	0	2	3	3	11	4	18	51
07:30 AM	1	3	7	11	24	4	28	3	0	0	3	6	0	10	3	13	58
07:45 AM	1	2	5	8	27	4	31	3	0	0	2	5	4	11	4	19	63
Total	2	12	26	40	81	9	90	7	0	0	11	18	10	43	11	64	212
08:00 AM	0	2	11	13	22	6	28	0	0	3	6	9	7	18	4	29	79
08:15 AM	0	4	9	13	21	10	31	1	1	4	7	13	10	18	6	34	91
08:30 AM	0	4	7	11	26	5	31	2	0	4	10	16	7	20	5	32	90
08:45 AM	2	3	13	18	15	5	20	4	1	3	3	11	2	21	2	25	74
Total	2	13	40	55	84	26	110	7	2	14	26	49	26	77	17	120	334
Grand Total	4	28	88	120	197	39	236	14	3	14	47	78	41	143	33	217	651
Apprch %	3.3	23.3	73.3		83.5	16.5		17.9	3.8	17.9	60.3		18.9	65.9	15.2		
Total %	0.6	4.3	13.5	18.4	30.3	6	36.3	2.2	0.5	2.2	7.2	12	6.3	22	5.1	33.3	

		Parking Garage Southbound				Auahi Street Westbound				Parking Garage Exit Northbound				Auahi Street Eastbound			
Start Time		Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	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 08:00 AM																	
08:00 AM		0	2		22	6	28	0	0	3	3	7	18	25	58		
08:15 AM		0	4		21	10	31	1	1	4	6	10	18	28	69		
08:30 AM		0	4		26	5	31	2	0	4	6	7	20	27	68		
08:45 AM		2	3		15	5	20	4	1	3	8	2	21	23	56		
Total Volume		2	13	15	84	26	110	7	2	14	23	26	77	103	251		
% App. Total		13.3	86.7		76.4	23.6		30.4	8.7	60.9		25.2	74.8				
PHF		.250	.813	.750	.808	.650	.887	.438	.500	.875	.719	.650	.917	.920	.909		

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

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

File Name : AUA MID PM
Site Code : 00000006
Start Date : 3/13/2018
Page No : 1

Groups Printed- Unshifted																	
Parking Garage Southbound					Auahi Street Westbound				Parking Garage Exit Northbound					Auahi Street Eastbound			
Start Time	Left	Right	Peds	App. Total	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Int. Total
03:00 PM	0	6	28	34	29	13	42	15	0	10	11	36	18	33	35	86	198
03:15 PM	2	11	31	44	41	9	50	16	0	13	30	59	13	23	28	64	217
03:30 PM	1	7	29	37	41	4	45	9	3	17	16	45	18	35	25	78	205
03:45 PM	0	8	24	32	29	8	37	16	1	12	12	41	16	32	33	81	191
Total	3	32	112	147	140	34	174	56	4	52	69	181	65	123	121	309	811
04:00 PM	1	7	32	40	21	7	28	14	4	20	12	50	9	24	38	71	189
04:15 PM	1	8	34	43	38	12	50	11	1	20	14	46	15	43	42	100	239
04:30 PM	1	5	39	45	48	16	64	15	1	10	14	40	22	39	50	111	260
04:45 PM	2	9	40	51	46	10	56	12	1	10	11	34	7	36	28	71	212
Total	5	29	145	179	153	45	198	52	7	60	51	170	53	142	158	353	900
05:00 PM	1	11	13	25	34	10	44	13	0	13	10	36	10	40	36	86	191
05:15 PM	5	7	31	43	28	6	34	12	1	11	2	26	4	46	27	77	180
05:30 PM	2	4	40	46	30	10	40	13	3	10	19	45	16	47	37	100	231
05:45 PM	4	10	45	59	44	14	58	8	2	17	16	43	14	42	31	87	247
Total	12	32	129	173	136	40	176	46	6	51	47	150	44	175	131	350	849
Grand Total	20	93	386	499	429	119	548	154	17	163	167	501	162	440	410	1012	2560
Approch %	4	18.6	77.4		78.3	21.7		30.7	3.4	32.5	33.3		16	43.5	40.5		
Total %	0.8	3.6	15.1	19.5	16.8	4.6	21.4	6	0.7	6.4	6.5	19.6	6.3	17.2	16	39.5	

Parking Garage Southbound				Auahi Street Westbound				Parking Garage Exit Northbound				Auahi Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	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	1	8	9	38	12	50	11	1	20	32	15	43	58	149	
04:30 PM	1	5	6	48	16	64	15	1	10	26	22	39	61	157	
04:45 PM	2	9	11	46	10	56	12	1	10	23	7	36	43	133	
05:00 PM	1	11	12	34	10	44	13	0	13	26	10	40	50	132	
Total Volume	5	33	38	166	48	214	51	3	53	107	54	158	212	571	
% App. Total	13.2	86.8		77.6	22.4		47.7	2.8	49.5		25.5	74.5			
PHF	.625	.750	.792	.865	.750	.836	.850	.750	.663	.836	.614	.919	.869	.909	

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: FS, GH
Counters: D4-5677, D4-5673
Weather: CLEAR

File Name : ALA KAM AM
Site Code : 00000001
Start Date : 3/14/2018
Page No : 1

Groups Printed- Unshifted														
Kamakee Street Southbound					Ala Moana Boulevard Westbound					Ala Moana Park Drive Northbound				
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Int. Total
06:00 AM	1	3	6	4	14	1	176	3	11	191	4	1	6	220
06:15 AM	5	9	7	4	25	0	148	6	4	158	5	20	1	214
06:30 AM	2	3	13	3	21	1	276	9	8	294	4	1	4	291
06:45 AM	8	6	13	4	31	2	301	7	10	320	8	0	2	397
Total	16	21	39	15	91	4	901	25	33	963	21	22	7	1122
07:00 AM	5	1	22	9	37	3	371	8	14	396	9	6	2	391
07:15 AM	8	7	23	5	43	2	432	14	15	446	22	2	3	416
07:30 AM	5	4	19	7	35	5	417	4	20	446	26	6	2	397
07:45 AM	2	8	21	12	43	2	431	16	13	462	19	4	5	360
Total	20	20	85	33	158	12	1651	42	62	1767	76	18	12	1564
08:00 AM	7	8	32	3	50	3	426	11	7	447	15	8	3	404
08:15 AM	3	7	26	4	40	3	318	3	7	331	13	5	6	356
08:30 AM	6	12	18	6	42	6	335	6	9	356	19	6	2	368
08:45 AM	3	8	31	7	49	2	274	4	9	289	19	2	6	315
Total	19	35	107	20	181	14	1353	24	32	1423	66	21	17	1443
Grand Total	55	76	231	68	430	30	3905	91	127	4153	163	61	36	4129
Approch %	12.8	17.7	53.7	15.8		0.7	94	2.2	3.1	46	52.8	19.7	11.7	6.1
Total %	0.6	0.8	2.6	0.8	4.8	0.3	43.3	1	1.4		1.8	0.7	0.4	2.8

Groups Printed- Unshifted														
Kamakee Street Southbound					Ala Moana Boulevard Westbound					Ala Moana Park Drive Northbound				
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	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	8	7	23		38	2	432	14		448	22	2	3	27
07:30 AM	5	4	19		28	5	417	4		426	26	6	2	34
07:45 AM	2	8	21		31	2	431	16		449	19	4	5	28
08:00 AM	7	8	32		47	3	426	11		440	15	8	3	26
Total Volume	22	27	95		144	12	1706	45		1763	82	20	13	115
% App. Total	15.3	18.8	66			0.7	96.8	2.6		71.3	17.4	11.3		4.3
PHF	.688	.844	.742		.766	.600	.987	.703		.982	.788	.625	.650	.846
											.850	.935	.808	.948

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: FS, GH
Counters: D4-5677, D4-5673
Weather: CLEAR

File Name : ALA KAM PM
Site Code : 00000001
Start Date : 3/14/2018
Page No : 1

Groups Printed- Unshifted														
Kamakee Street Southbound					Ala Moana Boulevard Westbound					Ala Moana Park Drive Northbound				
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Int. Total
03:00 PM	17	12	26	12	67	7	318	14	30	369	12	5	5	31
03:15 PM	11	5	45	3	64	15	330	10	8	363	20	1	11	13
03:30 PM	10	13	35	14	72	6	317	13	22	358	21	9	4	12
03:45 PM	12	10	30	14	66	7	317	17	13	354	21	7	9	11
Total	50	40	136	43	269	35	1282	54	73	1444	74	22	29	45
04:00 PM	5	9	32	9	55	9	344	11	14	378	12	0	11	11
04:15 PM	9	16	30	13	68	7	388	14	14	423	10	5	9	4
04:30 PM	6	13	41	10	70	8	347	24	26	405	18	9	7	11
04:45 PM	17	13	28	3	61	9	333	19	11	372	16	5	15	7
Total	37	51	131	35	254	33	1412	68	65	1578	56	19	42	33
05:00 PM	14	8	43	8	73	7	279	11	13	310	26	11	7	10
05:15 PM	9	11	35	11	66	5	330	18	18	371	11	8	7	9
05:30 PM	8	10	33	9	60	2	322	14	19	345	20	10	10	15
05:45 PM	8	8	43	2	61	5	290	21	29	345	28	8	9	7
Total	39	37	154	30	260	19	1221	64	79	1383	85	37	33	41
06:00 PM	126	128	421	108	783	87	3915	186	217	4405	215	78	104	119
Approch %	16.1	16.3	53.8	13.8		2	88.9	4.2	4.9		41.7	15.1	20.2	23.1
Total %	1	1	3.4	0.9	6.4	0.7	31.8	1.5	1.8	35.7	1.7	0.6	0.8	1

Groups Printed- Unshifted														
Kamakee Street Southbound					Ala Moana Boulevard Westbound					Ala Moana Park Drive Northbound				
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	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	5	9	32		46	9	344	11		364	12	0	11	23
04:15 PM	9	16	30		55	7	388	14		409	10	5	9	24
04:30 PM	6	13	41		60	8	347	24		379	18	9	7	34
04:45 PM	17	13	28		58	9	333	19		361	16	5	15	36
Total Volume	37	51	131		219	33	1412	68		1513	56	19	42	117
% App. Total	16.9	23.3	59.8			2.2	93.3	4.5		47.9	16.2	35.9		2.1
PHF	.544	.797	.799		.913	.917	.910	.708		.925	.778	.528	.700	.813

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: LF, WL
Counters: D4-5674, D4-5672
Weather: CLEAR

File Name : ALA QUE AM
Site Code : 00000002
Start Date : 3/14/2018
Page No : 1

Groups Printed- Unshifted													
Queen Street Southbound							Ala Moana Boulevard Westbound						
Start Time	Left	Right	Peds	App. Total	Thru	Right	Thru	Right	App. Total	Left	Thru	Peds	Int. Total
06:00 AM	3	4	3	10	182	9	181	9	191	2	211	4	418
06:15 AM	4	2	8	14	169	12	181	12	181	1	195	9	400
06:30 AM	9	3	4	16	249	12	261	12	261	2	260	10	549
06:45 AM	4	1	5	10	294	16	310	16	310	0	355	11	686
Total	20	10	20	50	894	49	943	49	943	5	1021	34	2053
07:00 AM	4	7	5	16	356	21	377	21	377	4	368	13	778
07:15 AM	7	4	5	16	435	14	449	14	449	2	400	5	872
07:30 AM	8	4	5	17	409	23	432	23	432	4	361	12	826
07:45 AM	4	5	6	15	440	31	471	31	471	6	320	10	822
Total	23	20	21	64	1640	89	1729	89	1729	16	1449	40	3298
08:00 AM	8	12	7	27	402	29	431	29	431	6	373	12	849
08:15 AM	8	8	9	25	307	30	337	30	337	3	325	2	692
08:30 AM	8	6	13	27	330	29	359	29	359	4	326	9	725
08:45 AM	12	6	8	26	264	24	288	24	288	8	270	11	603
Total	36	32	37	105	1303	112	1415	112	1415	21	1294	34	2869
Grand Total	79	62	78	219	3837	250	4087	250	4087	42	3764	108	8220
Apprch %	36.1	28.3	35.6		93.9	6.1		6.1		1.1	96.2	2.8	
Total %	1	0.8	0.9	2.7	46.7	3	49.7	3	49.7	0.5	45.8	1.3	47.6

Groups Printed- Unshifted													
Queen Street Southbound							Ala Moana Boulevard Westbound						
Start Time	Left	Right	Peds	App. Total	Thru	Right	Thru	Right	App. Total	Left	Thru	Peds	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	7	4		11	435	14	449	14	449	2	400		862
07:30 AM	8	4		12	409	23	432	23	432	4	361		809
07:45 AM	4	5		9	440	31	471	31	471	6	320		806
08:00 AM	8	12		20	402	29	431	29	431	6	373		830
Total Volume	27	25		52	1686	97	1783	97	1783	18	1454		3307
% App. Total	51.9	48.1			94.6	5.4		5.4		1.2	98.8		
PHF	.844	.521		.650	.958	.782	.946	.782	.946	.750	.909		.959

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: LF, WL
Counters: D4-5674, D4-5672
Weather: CLEAR

File Name : ALA QUE PM
Site Code : 00000002
Start Date : 3/14/2018
Page No : 1

Groups Printed- Unshifted													
Queen Street Southbound							Ala Moana Boulevard Westbound						
Start Time	Left	Right	Peds	App. Total	Thru	Right	Thru	Right	App. Total	Left	Thru	Peds	Int. Total
03:00 PM	31	9	6	46	357	53	412	53	412	11	435	8	912
03:15 PM	17	6	8	31	298	26	337	13	337	11	499	11	889
03:30 PM	25	12	40	77	322	37	4	4	363	10	492	16	958
03:45 PM	26	10	12	48	346	38	0	0	384	9	498	4	943
Total	99	37	66	202	1323	154	19	19	1496	41	1924	39	3702
04:00 PM	28	12	25	65	302	39	0	0	341	10	505	5	926
04:15 PM	25	14	16	55	422	44	11	11	477	2	512	30	1076
04:30 PM	19	14	5	38	324	47	0	0	371	14	529	7	959
04:45 PM	26	15	15	56	323	40	13	13	376	13	542	13	1000
Total	98	55	61	214	1371	170	24	24	1565	39	2088	55	3961
05:00 PM	40	15	16	71	291	49	5	5	345	7	537	15	975
05:15 PM	34	14	11	59	286	35	6	6	327	11	500	23	920
05:30 PM	29	23	4	56	303	46	5	5	354	9	532	25	976
05:45 PM	33	17	25	75	306	46	16	16	368	11	519	15	988
Total	136	69	56	261	1186	176	32	32	1394	38	2088	78	3859
Grand Total	333	161	183	677	3880	500	75	75	4455	118	6100	172	11522
Apprch %	49.2	23.8	27		87.1	11.2	1.7	1.7		1.8	95.5	2.7	
Total %	2.9	1.4	1.6	5.9	33.7	4.3	0.7	0.7	38.7	1	52.9	1.5	55.5

Groups Printed- Unshifted													
Queen Street Southbound							Ala Moana Boulevard Westbound						
Start Time	Left	Right	Peds	App. Total	Thru	Right	Thru	Right	App. Total	Left	Thru	Peds	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	25	14		39	422	44	466	44	466	2	512		1019
04:30 PM	19	14		33	324	47	371	47	371	14	529		947
04:45 PM	26	15		41	323	40	363	40	363	13	542		959
05:00 PM	40	15		55	291	49	340	49	340	7	537		939
Total Volume	110	58		168	1360	180	1540	180	1540	36	2120		3864
% App. Total	65.5	34.5			88.3	11.7		11.7		1.7	98.3		
PHF	.688	.967		.764	.806	.918	.826	.918	.826	.643	.971		.948

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: HM, EV
Counters: D4-5671, D4-5675
Weather: CLEAR

File Name : ALA PII AM
Site Code : 00000003
Start Date : 3/14/2018
Page No : 1

Groups Printed- Unshifted											
Pilikoi Street Southbound				Ala Moana Boulevard Westbound				Ala Moana Boulevard Eastbound			
Start Time	Left	Right	Peds	Thru	Right	Peds	Thru	Left	Thru	App. Total	Int. Total
06:00 AM	11	12	2	84	33	0	117	38	179	217	359
06:15 AM	8	19	4	31	61	10	237	31	161	192	460
06:30 AM	22	29	4	55	74	13	353	55	201	256	664
06:45 AM	31	28	11	70	70	13	376	84	264	348	794
Total	72	88	21	181	238	36	1083	208	805	1013	2277
07:00 AM	36	22	4	62	103	17	477	90	299	389	928
07:15 AM	32	34	6	72	99	4	516	85	308	393	981
07:30 AM	42	37	9	88	421	90	524	96	271	367	979
07:45 AM	29	51	5	85	71	9	503	69	269	338	926
Total	139	144	24	307	363	43	2020	340	1147	1487	3814
08:00 AM	29	39	7	75	83	9	474	104	281	385	934
08:15 AM	39	22	9	70	86	9	444	78	244	322	836
08:30 AM	37	36	6	79	292	14	385	91	242	333	797
08:45 AM	23	45	12	80	104	7	371	73	193	266	717
Total	128	142	34	304	1283	39	1674	346	960	1306	3284
Grand Total	339	374	79	792	3706	118	4777	894	2912	3806	9375
Apprch %	42.8	47.2	10	77.6	19.9	2.5	51	23.5	76.5	31.1	40.6
Total %	3.6	4	0.8	8.4	39.5	10.2	1.3	9.5	31.1	40.6	

Pilikoi Street Southbound				Ala Moana Boulevard Westbound				Ala Moana Boulevard Eastbound			
Start Time	Left	Right	Peds	Thru	Right	Peds	Thru	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:30 AM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 07:15 AM											
07:15 AM	32	34		413	99		512	85	308	393	971
07:30 AM	42	37		421	90		511	96	271	367	957
07:45 AM	29	51		423	71		494	69	269	338	912
08:00 AM	29	39		382	83		465	104	281	385	918
Total Volume	132	161		1639	343		1982	354	1129	1483	3758
% App. Total	45.1	54.9		82.7	17.3		76.1	23.9	76.1		
PHF	.786	.789		.969	.866		.968	.851	.916	.943	.968

Counted By: HM, EV
Counters: D4-5671, D4-5675
Weather: CLEAR

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

File Name : ALA PII PM
Site Code : 00000003
Start Date : 3/14/2018
Page No : 1

Groups Printed- Unshifted											
Pilikoi Street Southbound				Ala Moana Boulevard Westbound				Ala Moana Boulevard Eastbound			
Start Time	Left	Right	Peds	Thru	Right	Peds	Thru	Left	Thru	App. Total	Int. Total
03:00 PM	47	66	23	307	83	12	402	64	376	440	978
03:15 PM	40	36	21	308	87	29	424	93	431	524	1045
03:30 PM	48	40	23	267	78	13	358	104	425	529	998
03:45 PM	39	38	36	336	91	29	456	65	455	520	1089
Total	174	180	103	1218	339	83	1640	326	1687	2013	4110
04:00 PM	46	45	14	295	85	13	393	94	449	543	1041
04:15 PM	49	62	30	383	109	22	514	84	469	553	1208
04:30 PM	50	51	33	327	103	14	444	68	475	543	1121
04:45 PM	62	63	13	138	92	21	394	106	474	580	1112
Total	207	221	90	518	389	70	1745	352	1867	2219	4482
05:00 PM	55	51	17	123	86	15	388	83	491	574	1085
05:15 PM	37	53	33	123	97	11	406	95	466	561	1090
05:30 PM	67	55	29	151	93	22	357	120	432	552	1060
05:45 PM	50	67	22	139	90	19	446	102	444	546	1131
Total	209	226	101	536	366	67	1597	400	1833	2233	4366
Grand Total	590	627	294	3668	1094	220	4982	1078	5387	6465	12958
Apprch %	39	41.5	19.5	73.6	22	4.4	38.4	16.7	83.3	41.6	
Total %	4.6	4.8	2.3	28.3	8.4	1.7		8.3	41.6	49.9	

Pilikoi Street Southbound				Ala Moana Boulevard Westbound				Ala Moana Boulevard Eastbound			
Start Time	Left	Right	Peds	Thru	Right	Peds	Thru	Left	Thru	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	49	62		383	109		492	84	469	553	1156
04:30 PM	50	51		327	103		430	68	475	543	1074
04:45 PM	62	63		281	92		373	106	474	580	1078
05:00 PM	55	51		287	86		373	83	491	574	1053
Total Volume	216	227		1278	390		1668	341	1909	2250	4361
% App. Total	48.8	51.2		76.6	23.4		84.8	15.2	84.8		
PHF	.871	.901		.834	.894		.848	.804	.972	.970	.943

Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: BE, DY
Counters: D4-3889, D4-3890
Weather: CLEAR

File Name : PII WAI AM
Site Code : 00000004
Start Date : 3/14/2018
Page No : 1

Groups Printed- Unshifted																
Piikoi Street Southbound				Ala Moana Center Ramp				Piikoi Street Northbound				Waimanu Street Eastbound				
Start Time	Thru	Right	App. Total	Thru	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total
06:00 AM	5	2	7	0	3	0	3	82	3	6	91	21	7	21	2	51
06:15 AM	14	2	16	3	1	5	9	85	5	6	96	34	9	20	3	66
06:30 AM	24	9	33	2	4	5	11	118	11	11	140	29	16	34	4	83
06:45 AM	20	6	26	1	5	9	15	124	13	7	144	58	17	49	5	129
Total	63	19	82	6	13	19	38	409	32	30	471	142	49	124	14	329
07:00 AM	17	13	30	2	6	10	18	190	21	5	216	74	28	47	6	155
07:15 AM	27	8	35	7	5	5	17	163	9	8	180	94	35	46	5	180
07:30 AM	32	24	56	7	4	9	20	175	24	9	208	70	43	55	6	174
07:45 AM	43	14	57	13	9	6	28	143	19	11	173	87	37	38	7	169
Total	119	59	178	29	24	30	83	671	73	33	777	325	143	186	24	678
08:00 AM	43	18	61	8	8	7	23	146	16	8	170	85	47	46	7	185
08:15 AM	20	10	30	10	15	15	40	151	19	12	182	89	47	54	5	195
08:30 AM	36	11	47	10	15	13	38	144	20	15	179	73	56	67	13	209
08:45 AM	32	11	43	9	17	15	41	170	9	9	188	83	56	56	3	198
Total	131	50	181	37	55	50	142	611	64	44	719	330	206	223	28	787
Grand Total	313	128	441	72	92	99	263	1691	169	107	1967	797	398	533	66	1794
Approach %	71	29		27.4	35	37.6		86	8.6	5.4		44.4	22.2	29.7	3.7	
Total %	7	2.9	9.9	1.6	2.1	2.2	5.9	37.9	3.8	2.4	44.1	17.8	8.9	11.9	1.5	40.2

	Start Time	Piikoi Street Southbound				Ala Moana Center Ramp Westbound				Piikoi Street Northbound				Waimanu Street Eastbound				
		Thru	Right	App.	Total	Thru	Right	App.	Total	Thru	Right	App.	Total	Left	Thru	Right	App.	Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 08:00 AM																		
	08:00 AM	43	18		61	8	8		16	146	16		162	85	47	46		178
	08:15 AM	20	10		30	10	15		25	151	19		170	89	47	54		190
	08:30 AM	36	11		47	10	15		25	144	20		164	73	56	67		196
	08:45 AM	32	11		43	9	17		26	170	9		179	83	56	56		195
	Total Volume	131	50		181	37	55		92	611	64		675	330	206	223		759
	% App. PHF	72.4	27.6			40.2	59.8			90.5	9.5			43.5	27.1	29.4		
		.762	.694		.742	.925	.809		.885	.899	.800		.943	.927	.920	.932		.968
																		.963

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

Counted By: BE, DY
Counters: D4-3889, D4-3890
Weather: CLEAR

File Name : PII WAI PM
Site Code : 00000004
Start Date : 3/14/2018
Page No : 1

Groups Printed- Unshifted																		
Piikoi Street Southbound				Ala Moana Center Ramp Westbound				Piikoi Street Northbound				Waimanu Street Eastbound						
Start Time	Thru	Right	App. Total	Thru	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total	
03:00 PM	61	8	69	53	71	37	161	174	21	31	226	120	65	58	9	252	708	
03:15 PM	60	23	83	41	54	28	123	184	15	23	222	110	60	72	7	249	677	
03:30 PM	67	18	85	30	44	17	91	142	19	23	184	81	62	66	16	225	585	
03:45 PM	50	18	68	37	53	27	117	148	20	46	214	114	81	55	10	260	659	
Total	238	67	305	161	222	109	492	648	75	123	846	425	268	251	42	986	2629	
04:00 PM	44	21	65	35	42	16	93	154	16	39	209	90	69	69	24	252	619	
04:15 PM	61	38	99	40	65	23	128	169	20	31	220	110	67	63	19	259	706	
04:30 PM	70	23	93	40	59	25	124	150	16	66	232	91	85	70	21	267	716	
04:45 PM	85	29	114	50	76	26	152	157	19	50	226	122	77	97	22	318	810	
Total	260	111	371	165	242	90	497	630	71	186	887	413	298	299	86	1096	2851	
05:00 PM	73	13	86	33	49	23	105	147	8	52	207	120	90	78	23	311	709	
05:15 PM	80	23	103	51	60	29	140	160	13	51	224	127	87	66	24	304	771	
05:30 PM	75	19	94	49	46	27	122	184	15	44	243	107	94	88	27	316	775	
05:45 PM	77	32	109	57	61	21	139	149	24	48	221	95	86	78	26	285	754	
Total	305	87	392	190	216	100	506	640	60	195	895	449	357	310	100	1216	3009	
Grand Total	803	265	1068	516	680	299	1495	1918	206	504	2628	1287	923	860	228	3298	8489	
Approach %	75.2	24.8		34.5	45.5	20	39	73	7.8	19.2	28	39	28	26.1	6.9			
Total %	9.5	3.1	12.6	6.1	8	3.5	17.6	22.6	2.4	5.9	31	15.2	10.9	10.1	2.7	38.9		

Start Time	Piikoi Street Southbound			Ala Moana Center Ramp Westbound			Piikoi Street Northbound			Waimanu Street Eastbound				
	Thru	Right	App. Total	Thru	Right	App. Total	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	85	29	114	50	76	126	157	19	176	122	77	97	296	712
05:00 PM	73	13	86	33	49	82	147	8	155	120	90	78	288	611
05:15 PM	80	23	103	51	60	111	160	13	173	127	87	66	280	667
05:30 PM	75	19	94	49	46	95	184	15	199	107	94	88	289	677
Total Volume	313	84	397	183	231	414	648	55	703	476	348	329	1153	2667
% App. Total	78.8	21.2		44.2	55.8		92.2	7.8		41.3	30.2	28.5		
PHF	921	724	871	897	760	821	880	724	883	937	926	848	974	936

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: HM, EV
Counters: D4-5671, D4-5675
Weather: CLEAR

File Name : KAP COO AM
Site Code : 00000001
Start Date : 3/15/2018
Page No : 1

Groups Printed- Unshifted											
Cooke Street Southbound						Kapiolani Boulevard Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
06:00 AM	0	2	0	4	6	28	48	15	5	96	
06:15 AM	0	3	0	2	5	51	68	29	6	154	
06:30 AM	0	3	2	4	9	69	79	37	7	192	
06:45 AM	0	6	10	6	22	93	151	46	17	307	
Total	0	14	12	16	42	241	346	127	35	749	
07:00 AM	1	3	5	8	17	104	168	55	5	332	
07:15 AM	3	6	4	19	32	109	226	58	14	407	
07:30 AM	4	13	4	10	31	113	228	69	11	421	
07:45 AM	0	11	15	11	37	112	211	72	14	409	
Total	8	33	28	48	117	438	833	254	44	1569	
08:00 AM	4	9	11	14	38	118	177	48	14	357	
08:15 AM	1	8	6	15	30	96	169	46	12	323	
08:30 AM	1	6	6	4	17	88	109	39	16	252	
08:45 AM	1	8	6	3	18	58	110	26	5	199	
Total	7	31	29	36	103	360	565	159	47	1131	
Grand Total	15	78	69	100	262	1039	1744	540	126	3449	
Apprch %	5.7	29.8	26.3	38.2		30.1	50.6	15.7	3.7		
Total %	0.2	1.2	1.1	1.6	4.1	16.4	27.5	8.5	2	54.4	

Groups Printed- Unshifted																	
Cooke Street Southbound						Kapiolani Boulevard Westbound											
Start Time	Left	Thru	Right	App. Total		Left	Thru	Right	App. 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	3	6	4	13		109	226	58	393								
07:30 AM	4	13	4	21		113	228	69	410								
07:45 AM	0	11	15	26		112	211	72	395								
08:00 AM	4	9	11	24		118	177	48	343								
Total Volume	11	39	34	84		452	842	247	1541								
% App. Total	13.1	46.4	40.5			29.3	54.6	16									
PHF	.688	.750	.567	.808		.958	.923	.858	.940								
						Cooke Street Northbound						Kapiolani Boulevard Eastbound					
Start Time	Left	Thru	Right	App. Total		Left	Thru	Right	App. Total								
07:15 AM	15	53	10	78		0	137	12	149								
07:30 AM	9	45	12	66		0	144	25	169								
07:45 AM	15	41	6	62		0	145	15	160								
08:00 AM	14	50	22	86		0	129	19	148								
Total Volume	53	189	50	292		0	555	71	626								
% App. Total	18.2	64.7	17.1			0	88.7	11.3									
PHF	.883	.892	.568	.849		.000	.957	.710	.926								

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: WL, LF
Counters: D4-5677, D4-5672
Weather: CLEAR

File Name : KAP KAM AM
Site Code : 00000003
Start Date : 3/15/2018
Page No : 1

Groups Printed- Unshifted													
Kapiolani Boulevard Westbound							Kamakee Street Northbound						
Start Time	Left	Thru	Peds	App. Total	Left	Thru	Left	Right	Peds	App. Total	Thru	Right	Int. Total
06:00 AM	22	99	3	124	4	5	2	5	2	11	63	12	217
06:15 AM	27	152	2	181	18	6	9	6	9	33	45	13	282
06:30 AM	20	268	1	289	13	10	14	14	14	37	101	12	452
06:45 AM	32	291	5	328	30	17	6	17	6	53	92	25	510
Total	101	810	11	922	65	38	31	38	31	134	301	62	1461
07:00 AM	35	387	1	423	27	7	13	7	13	47	131	15	629
07:15 AM	45	403	4	452	27	10	7	10	7	44	144	27	710
07:30 AM	51	414	2	467	31	15	14	15	14	60	193	17	786
07:45 AM	50	361	8	419	41	16	9	16	9	66	151	6	710
Total	181	1565	15	1761	126	48	43	48	43	217	619	65	2835
08:00 AM	39	362	4	405	24	24	13	24	13	61	180	15	716
08:15 AM	39	278	6	323	19	12	21	12	21	52	160	11	569
08:30 AM	26	222	3	251	23	22	10	22	10	55	172	16	521
08:45 AM	18	174	8	200	10	27	9	27	9	46	167	24	452
Total	122	1036	21	1179	76	85	53	85	53	214	679	66	2258
Grand Total	404	3411	47	3862	267	171	127	171	127	565	1599	193	6554
Apprch %	10.5	88.3	1.2		47.3	30.3	22.5	30.3	22.5		75.2	9.1	15.7
Total %	6.2	52	0.7	58.9	4.1	2.6	1.9	2.6	1.9	8.6	24.4	2.9	32.5

Kapiolani Boulevard Westbound							Kamakee Street Northbound						
Start Time	Left	Thru	Peds	App. Total	Left	Thru	Left	Right	Peds	App. Total	Thru	Right	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	45	403		448	27	10	10	10		37	144	27	656
07:30 AM	51	414		465	31	15	15	15		46	193	17	721
07:45 AM	50	361		411	41	16	16	16		57	151	6	625
08:00 AM	39	362		401	24	24	24	24		48	180	15	644
Total Volume	185	1540		1725	123	65	65	65		188	668	65	733
% App. Total	10.7	89.3			65.4	34.6		34.6			91.1	8.9	
PHF	.907	.930		.927	.750	.677		.677		.825	.865	.602	.917

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: WL, LF
Counters: D4-5677, D4-5672
Weather: CLEAR

File Name : KAP KAM PM
Site Code : 00000003
Start Date : 3/15/2018
Page No : 1

Groups Printed- Unshifted													
Kapiolani Boulevard Westbound							Kamakee Street Northbound						
Start Time	Left	Thru	Peds	App. Total	Left	Thru	Left	Right	Peds	App. Total	Thru	Right	Int. Total
03:00 PM	28	201	3	232	29	37	17	37	17	83	249	28	606
03:15 PM	18	195	9	222	27	43	12	43	12	82	322	13	661
03:30 PM	0	211	4	215	40	43	15	43	15	98	338	23	697
03:45 PM	1	255	8	264	18	48	22	48	22	88	377	19	788
Total	47	862	24	933	114	171	66	171	66	351	1286	83	2752
04:00 PM	3	222	4	229	43	32	20	32	20	95	338	14	689
04:15 PM	1	226	6	233	21	40	20	40	20	81	394	19	749
04:30 PM	0	215	8	223	39	54	15	54	15	108	412	33	803
04:45 PM	6	206	4	216	31	53	33	53	33	117	502	26	880
Total	10	869	22	901	134	179	88	179	88	401	1646	92	3121
05:00 PM	1	220	9	230	49	55	16	55	16	120	442	29	846
05:15 PM	0	225	5	230	26	53	25	53	25	104	444	36	832
05:30 PM	32	177	9	218	30	45	22	45	22	97	347	26	708
05:45 PM	31	175	2	208	23	33	25	33	25	81	359	15	679
Total	64	797	25	886	128	186	88	186	88	402	1592	106	3065
Grand Total	121	2528	71	2720	376	536	242	536	242	1154	4524	281	8938
Apprch %	4.4	92.9	2.6		32.6	46.4	21	46.4	21		89.3	5.5	
Total %	1.4	28.3	0.8	30.4	4.2	6	2.7	6	2.7	12.9	50.6	3.1	56.7

Kapiolani Boulevard Westbound							Kamakee Street Northbound						
Start Time	Left	Thru	Peds	App. Total	Left	Thru	Left	Right	Peds	App. Total	Thru	Right	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	0	215		215	39	54	54	54		93	412	33	753
04:45 PM	6	206		212	31	53	53	53		84	502	26	824
05:00 PM	1	220		221	49	55	55	55		104	442	29	796
05:15 PM	0	225		225	26	53	53	53		79	444	36	784
Total Volume	7	866		873	145	215	215	215		360	1800	124	3157
% App. Total	0.8	99.2			40.3	59.7		59.7			93.6	6.4	
PHF	.292	.962		.970	.740	.977		.977		.865	.896	.861	.958

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counted By: FS, GH
Counters: D4-5673, D4-5671
Weather: CLEAR

File Name : QUE COO AM
Site Code : 00000001
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted											
Cooke Street Southbound						Queen Street Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
06:00 AM	0	19	6	3	28	2	21	4	15	42	
06:15 AM	4	21	13	5	43	7	42	5	9	63	
06:30 AM	3	33	17	3	56	5	43	5	8	61	
06:45 AM	1	45	33	3	82	8	62	4	13	87	
Total	8	118	69	14	209	22	168	18	45	253	
07:00 AM	4	36	27	5	72	15	80	9	10	114	
07:15 AM	5	51	41	7	104	13	100	20	12	145	
07:30 AM	1	40	47	12	100	19	116	9	13	157	
07:45 AM	3	47	40	7	97	16	119	10	15	160	
Total	13	174	155	31	373	63	415	48	50	576	
08:00 AM	5	41	44	4	94	16	99	10	14	139	
08:15 AM	4	54	29	1	88	16	80	10	7	113	
08:30 AM	4	45	29	4	82	12	85	8	12	117	
08:45 AM	8	45	26	5	84	9	63	12	21	105	
Total	21	185	128	14	348	53	327	40	54	474	
Grand Total	42	477	352	59	930	138	910	106	149	1303	
Apprch %	4.5	51.3	37.8	6.3		10.6	69.8	8.1	11.4		
Total %	1.1	12.6	9.3	1.6	24.6	3.6	24.1	2.8	3.9	34.4	

Cooke Street Southbound						Queen Street Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. 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	5	51	41		97	13	100	20		133	
07:30 AM	1	40	47		88	19	116	9		144	
07:45 AM	3	47	40		90	16	119	10		145	
08:00 AM	5	41	44		90	16	99	10		125	
Total Volume	14	179	172		365	64	434	49		547	
% App. Total	3.8	49	47.1			11.7	79.3	9			
PHF	.700	.877	.915		.941	.842	.912	.613		.943	

Cooke Street Northbound						Queen Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:15 AM	10	44	11		65	10	30	14		54	349
07:30 AM	10	57	10		73	10	44	17		71	376
07:45 AM	6	49	10		65	6	54	13		73	373
08:00 AM	12	58	12		82	6	45	16		67	364
Total Volume	34	208	43		285	32	173	60		265	1462
% App. Total	11.9	73	15.1			12.1	65.3	22.6			
PHF	.708	.897	.896		.869	.800	.801	.882		.908	.972

Counted By: FS
Counters: D4-5673
Weather: CLEAR

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

File Name : QUE COO PM
Site Code : 00000001
Start Date : 4/3/2018
Page No : 1

Groups Printed- Unshifted											
Cooke Street Southbound						Queen Street Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
03:00 PM	9	55	17	0	81	24	85	12	5	126	
03:15 PM	7	60	16	4	87	13	78	16	8	115	
03:30 PM	4	54	28	4	90	14	81	11	17	123	
03:45 PM	6	54	27	4	91	15	80	9	3	107	
Total	26	223	88	12	349	66	324	48	33	471	
04:00 PM	7	48	28	3	86	18	71	17	6	112	
04:15 PM	2	67	23	3	95	14	67	6	3	90	
04:30 PM	3	51	32	7	93	20	81	17	9	127	
04:45 PM	4	73	24	6	107	14	88	20	10	132	
Total	16	239	107	19	381	66	307	60	28	461	
05:00 PM	5	73	17	9	104	8	78	20	7	113	
05:15 PM	5	63	31	4	103	7	64	13	6	90	
05:30 PM	8	35	16	18	77	20	65	12	16	113	
05:45 PM	3	46	12	6	67	16	83	13	13	125	
Total	21	217	76	37	351	51	290	58	42	441	
Grand Total	63	679	271	68	1081	183	921	166	103	1373	
Apprch %	5.8	62.8	25.1	6.3		13.3	67.1	12.1	7.5		
Total %	1.2	13	5.2	1.3	20.7	3.5	17.6	3.2	2	26.3	

		Cooke Street Southbound					Queen Street Westbound					Cooke Street Northbound					Queen 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		3	51	32	86	20	81	17	118	7	76	11	94	24	110	16	150	448			
04:45 PM		4	73	24	101	14	88	20	122	9	86	11	106	35	100	13	148	477			
05:00 PM		5	73	17	95	8	78	20	106	11	81	14	106	16	113	11	140	447			
05:15 PM		5	63	31	99	7	64	13	84	6	79	10	95	32	132	13	177	455			
Total Volume		17	260	104	381	49	311	70	430	33	322	46	401	107	455	53	615	1827			
% App. Total		4.5	68.2	27.3		11.4	72.3	16.3		8.2	80.3	11.5		17.4	74	8.6					
PHF		.850	.890	.813	.943	.613	.884	.875	.881	.750	.936	.821	.946	.764	.862	.828	.869	.958			

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					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
06:00 AM	8	19	4	2	33	2	2	2	4	10	
06:15 AM	7	29	4	3	43	1	8	3	6	18	
06:30 AM	7	30	6	2	45	7	7	9	4	27	
06:45 AM	11	38	12	3	64	3	14	6	6	29	
Total	33	116	26	10	185	13	31	20	20	84	
07:00 AM	7	45	15	2	69	9	16	3	5	33	
07:15 AM	14	48	13	5	80	4	17	6	4	31	
07:30 AM	4	50	21	3	78	5	14	13	6	38	
07:45 AM	10	56	14	4	84	9	21	8	3	41	
Total	35	199	63	14	311	27	68	30	18	143	
08:00 AM	4	54	13	3	74	9	12	7	2	30	
08:15 AM	5	64	15	2	86	6	16	9	2	33	
08:30 AM	7	55	12	5	79	2	17	8	7	34	
08:45 AM	7	49	13	4	73	8	6	7	2	23	
Total	23	222	53	14	312	25	51	31	13	120	
Grand Total	91	537	142	38	808	65	150	81	51	347	
Approch %	11.3	66.5	17.6	4.7		18.7	43.2	23.3	14.7		
Total %	4.1	24	6.3	1.7	36	2.9	6.7	3.6	2.3	15.5	

Groups Printed- Unshifted											
Cooke Street Southbound						Halekauwila Street Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:45 AM	10	56	14		80	9	21	8		38	
08:00 AM	4	54	13		71	9	12	7		28	
08:15 AM	5	64	15		84	6	16	9		31	
08:30 AM	7	55	12		74	2	17	8		27	
Total Volume	26	229	54		309	26	66	32		124	
% App. Total	8.4	74.1	17.5			21	53.2	25.8		7.5	
PHF	.650	.895	.900		.920	.722	.786	.889		.816	
07:45 AM	6	47	10		63	13	22	6		41	
08:00 AM	3	44	9		56	14	14	3		31	
08:15 AM	5	49	9		63	14	14	3		31	
08:30 AM	9	40	3		52	18	16	15		49	
Total Volume	19	150	31		180	44	48	103		254	
% App. Total	6.1	48.3	12.2		72.2	39.1	39.7	21.2		39.1	
PHF	.705	.705	.550		.784	.847	.705	.550		.796	

Wilson Okamoto Corporation

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

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

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					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
03:00 PM	17	65	11	3	96	15	26	14	7	62	
03:15 PM	12	68	9	12	101	6	24	10	23	63	
03:30 PM	9	62	14	1	86	16	27	16	12	71	
03:45 PM	11	69	9	4	93	11	15	11	3	40	
Total	49	264	43	20	376	48	92	51	45	236	
04:00 PM	5	66	11	7	89	13	17	10	4	44	
04:15 PM	3	86	8	4	101	11	21	5	2	39	
04:30 PM	6	67	14	0	87	11	14	11	5	41	
04:45 PM	14	76	10	3	103	12	18	18	4	52	
Total	28	295	43	14	380	47	70	44	15	176	
05:00 PM	10	75	9	5	99	13	17	15	5	50	
05:15 PM	11	67	13	1	92	15	19	12	5	51	
05:30 PM	11	50	11	5	77	15	18	16	5	54	
05:45 PM	8	51	11	5	75	6	18	10	4	38	
Total	40	243	44	16	343	49	72	53	19	193	
Grand Total	117	802	130	50	1099	144	234	148	79	605	
Approch %	10.6	73	11.8	4.5		23.8	38.7	24.5	13.1		
Total %	3.4	23.1	3.7	1.4	31.6	4.1	6.7	4.3	2.3	17.4	

Groups Printed- Unshifted											
Cooke Street Southbound						Halekauwila Street Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
04:30 PM	6	67	14		87	11	14	11		36	
04:45 PM	14	76	10		100	12	18	18		48	
05:00 PM	10	75	9		94	13	17	15		45	
05:15 PM	11	67	13		91	15	19	12		46	
Total Volume	41	285	46		372	51	68	56		175	
% App. Total	11	76.6	12.4			29.1	38.9	32		5.2	
PHF	.732	.938	.821		.930	.850	.895	.778		.911	
04:30 PM	22	48	6		76	22	248	42		332	
04:45 PM	18	56	9		83	18	32	17		55	
05:00 PM	22	59	10		92	22	59	10		92	
05:15 PM	17	37	11		65	17	48	6		71	
Total	82	141	47		267	82	141	47		312	
Grand Total	217	399	126		742	217	399	126		742	
Approch %	26.4	48.5	15.3		27.3	26.4	48.5	15.3		27.3	
Total %	6.2	11.5	3.6		23.7	6.2	11.5	3.6		23.7	

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		
Approch %	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	Left	Thru	Right	App. 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								
08:00 AM	8	22	13	43	0	3	8	11	7	34	1	42	15	1	4	20								
08:15 AM	6	31	9	46	2	1	12	15	6	28	0	34	6	7	3	16								
08:30 AM	7	32	14	53	3	5	14	22	2	42	3	47	8	2	5	15								
Total Volume	22	115	54	191	6	14	41	61	22	134	5	161	37	10	13	60								
% 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								

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		
Approch %	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: 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
Approch %	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	Left	Thru	Right	App. 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											
07:45 AM	6	10	17	33	4	416	12	432	5	4	3	12	23	458	7	488											
08:00 AM	11	4	10	25	3	455	21	479	0	6	1	7	17	453	7	477											
08:15 AM	12	7	13	32	4	325	17	346	5	6	2	13	9	450	9	468											
Total Volume	42	21	61	124	13	1644	60	1717	12	19	7	38	64	1787	29	1880											
% 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	

Groups Printed- Unshifted																							
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: SH
Counters: D4-5675
Weather: CLEAR

File Name : KAM HAL AM
Site Code : 00000001
Start Date : 8/14/2018
Page No : 1

Groups Printed- Unshifted											
Kamakee St Southbound						Kamakee St Northbound					
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds
07:30 AM	55	11	2	68	4	28	1	33	3	4	10
07:45 AM	50	15	5	70	12	35	2	49	5	17	15
Total	105	26	7	138	16	63	3	82	8	21	25
08:00 AM	52	16	3	71	7	35	4	46	6	7	6
08:15 AM	49	9	7	65	4	36	3	43	9	17	5
Grand Total	206	51	17	274	27	134	10	171	23	45	36
Apprch %	75.2	18.6	6.2		15.8	78.4	5.8		22.1	43.3	34.6
Total %	37.5	9.3	3.1	49.9	4.9	24.4	1.8	31.1	4.2	8.2	6.6

Kamakee St Southbound						Kamakee St Northbound					
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 07:30 AM											
07:30 AM	55	11	11	66	4	28	8	32	3	4	7
07:45 AM	50	15	15	65	12	35	35	47	5	17	22
08:00 AM	52	16	16	68	7	35	35	42	6	7	13
08:15 AM	49	9	9	58	4	36	36	40	9	17	26
Total Volume	206	51	51	257	27	134	134	161	23	45	68
% App. Total	80.2	19.8	19.8		16.8	83.2	83.2		33.8	66.2	
PHF	.936	.797	.797	.945	.563	.931		.856	.639	.662	.654

Counted by: CA
Counters:D4-5675
Weather:CLEAR

Wilson Okamoto Corporation

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

File Name : KAM HAL PM
Site Code : 00000001
Start Date : 8/14/2018
Page No : 1

Groups Printed- Unshifted											
Kamakee St Southbound						Kamakee St Northbound					
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds
04:30 PM	89	19	20	128	18	50	8	76	17	12	45
04:45 PM	75	18	5	98	6	52	4	62	10	16	80
Total	164	37	25	226	24	102	12	138	27	28	125
05:00 PM	87	20	20	127	16	49	7	72	15	13	60
05:15 PM	81	17	11	109	11	55	22	88	19	17	45
Grand Total	332	74	56	462	51	206	41	298	61	58	230
Apprch %	71.9	16	12.1		17.1	69.1	13.8		17.5	16.6	65.9
Total %	29.9	6.7	5	41.7	4.6	18.6	3.7	26.9	5.5	5.2	20.7

Kamakee St Southbound						Kamakee St Northbound					
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 04:30 PM											
04:30 PM	89	19	19	108	18	50	50	68	17	12	29
04:45 PM	75	18	18	93	6	52	52	58	10	16	26
05:00 PM	87	20	20	107	16	49	49	65	15	13	28
05:15 PM	81	17	17	98	11	55	55	66	19	17	36
Total Volume	332	74	74	406	51	206	206	257	61	58	119
% App. Total	81.8	18.2	18.2		19.8	80.2	80.2		51.3	48.7	
PHF	.933	.925	.925	.940	.708	.936		.945	.803	.853	.826

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.

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.

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

APPENDIX C

CAPACITY ANALYSIS CALCULATIONS

BASELINE PEAK PERIOD TRAFFIC ANALYSIS

HCM Signalized Intersection Capacity Analysis

15: Ward Ave & Queen St

06/07/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	183	65	88	372	90	58	456	84	70	716	247
Future Volume (vph)	54	183	65	88	372	90	58	456	84	70	716	247
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	0.99		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.98	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.97		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1761	1769		1731	1800		1770	3420		1770	3354	
Flt Permitted	0.23	1.00		0.52	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	434	1769		948	1800		1770	3420		1770	3354	
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)	57	193	68	93	392	95	61	480	88	74	754	260
RTOR Reduction (vph)	0	14	0	0	10	0	0	16	0	0	38	0
Lane Group Flow (vph)	57	247	0	93	477	0	61	552	0	74	976	0
Confl. Peds. (#/hr)	15		42	42		15			40			30
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	25.3	25.3		25.3	25.3		4.3	27.7		6.1	29.5	
Effective Green, g (s)	25.3	25.3		25.3	25.3		4.3	27.7		6.1	29.5	
Actuated g/C Ratio	0.34	0.34		0.34	0.34		0.06	0.37		0.08	0.40	
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)	148	603		323	614		102	1278		145	1335	
v/s Ratio Prot		0.14			c0.27		0.03	0.16		c0.04	c0.29	
v/s Ratio Perm	0.13			0.10								
v/c Ratio	0.39	0.41		0.29	0.78		0.60	0.43		0.51	0.73	
Uniform Delay, d1	18.5	18.7		17.8	21.9		34.1	17.3		32.6	18.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.5		0.5	6.1		9.1	0.2		3.0	2.1	
Delay (s)	20.2	19.1		18.3	28.0		43.2	17.6		35.6	21.0	
Level of Service	C	B		B	C		D	B		D	C	
Approach Delay (s)		19.3			26.5			20.0			22.0	
Approach LOS		B			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			22.2		HCM 2000 Level of Service					C		
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			74.1		Sum of lost time (s)				15.0			
Intersection Capacity Utilization			77.1%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
15: Ward Ave & Queen St

06/07/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	483	113	92	453	86	79	691	149	142	700	139
Future Volume (vph)	107	483	113	92	453	86	79	691	149	142	700	139
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	0.99		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	0.97		1.00	0.98		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1761	1799		1761	1810		1770	3380		1770	3399	
Flt Permitted	0.20	1.00		0.14	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	364	1799		255	1810		1770	3380		1770	3399	
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)	113	508	119	97	477	91	83	727	157	149	737	146
RTOR Reduction (vph)	0	10	0	0	8	0	0	21	0	0	18	0
Lane Group Flow (vph)	113	617	0	97	560	0	83	863	0	149	865	0
Confl. Peds. (#/hr)	18		21	21		18			55			52
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	33.6	33.6		33.6	33.6		5.3	28.9		8.1	31.7	
Effective Green, g (s)	33.6	33.6		33.6	33.6		5.3	28.9		8.1	31.7	
Actuated g/C Ratio	0.39	0.39		0.39	0.39		0.06	0.34		0.09	0.37	
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)	142	706		100	710		109	1141		167	1258	
v/s Ratio Prot		0.34			0.31		0.05	c0.26		c0.08	c0.25	
v/s Ratio Perm	0.31			c0.38								
v/c Ratio	0.80	0.87		0.97	0.79		0.76	0.76		0.89	0.69	
Uniform Delay, d1	23.0	24.0		25.5	22.9		39.5	25.2		38.3	22.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	25.7	11.6		79.3	5.8		26.4	2.9		40.2	1.6	
Delay (s)	48.7	35.7		104.8	28.7		65.9	28.1		78.5	24.4	
Level of Service	D	D		F	C		E	C		E	C	
Approach Delay (s)		37.7			39.8			31.4			32.2	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay		34.6			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		85.6			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		86.9%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
16: Kamakee St & Queen St

06/07/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	235	38	133	331	25	19	98	66	22	163	78
Future Volume (vph)	43	235	38	133	331	25	19	98	66	22	163	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes		0.99		1.00	1.00			0.99			0.98	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.98		1.00	0.99			0.95			0.96	
Flt Protected		0.99		0.95	1.00			0.99			1.00	
Satd. Flow (prot)		3425		1770	3497			3300			3307	
Flt Permitted		0.85		0.95	1.00			0.91			0.92	
Satd. Flow (perm)		2948		1770	3497			3013			3061	
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)	45	245	40	139	345	26	20	102	69	23	170	81
RTOR Reduction (vph)	0	10	0	0	6	0	0	47	0	0	37	0
Lane Group Flow (vph)	0	320	0	139	365	0	0	144	0	0	237	0
Confl. Peds. (#/hr)	12		64			12	73		5	5		73
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Actuated Green, G (s)		14.0		8.2	27.2			17.1			17.1	
Effective Green, g (s)		14.0		8.2	27.2			17.1			17.1	
Actuated g/C Ratio		0.26		0.15	0.50			0.31			0.31	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		760		267	1751			948			963	
v/s Ratio Prot				c0.08	0.10							
v/s Ratio Perm		c0.11						0.05			c0.08	
v/c Ratio		0.42		0.52	0.21			0.15			0.25	
Uniform Delay, d1		16.8		21.2	7.6			13.4			13.8	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.4		1.8	0.1			0.1			0.1	
Delay (s)		17.2		23.1	7.6			13.5			13.9	
Level of Service		B		C	A			B			B	
Approach Delay (s)		17.2			11.8			13.5			13.9	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay		13.9			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.37										
Actuated Cycle Length (s)		54.3			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		69.5%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
16: Kamakee St & Queen St

06/07/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	500	68	216	515	39	23	115	72	65	121	37
Future Volume (vph)	65	500	68	216	515	39	23	115	72	65	121	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes		0.98		1.00	1.00			0.99			0.95	
Flpb, ped/bikes		1.00		1.00	1.00			0.98			1.00	
Frt		0.98		1.00	0.99			0.95			0.97	
Flt Protected		0.99		0.95	1.00			0.99			0.99	
Satd. Flow (prot)		3401		1770	3494			3241			3227	
Flt Permitted		0.83		0.95	1.00			0.90			0.79	
Satd. Flow (perm)		2839		1770	3494			2934			2601	
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)	68	521	71	225	536	41	24	120	75	68	126	39
RTOR Reduction (vph)	0	9	0	0	6	0	0	54	0	0	13	0
Lane Group Flow (vph)	0	651	0	225	571	0	0	165	0	0	220	0
Confl. Peds. (#/hr)	15		117			15	127		8	8		127
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Actuated Green, G (s)		25.0		15.1	45.1			14.8			14.8	
Effective Green, g (s)		25.0		15.1	45.1			14.8			14.8	
Actuated g/C Ratio		0.36		0.22	0.65			0.21			0.21	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		1015		382	2254			621			550	
v/s Ratio Prot				c0.13	0.16							
v/s Ratio Perm		c0.23						0.06			c0.08	
v/c Ratio		0.64		0.59	0.25			0.27			0.40	
Uniform Delay, d1		18.7		24.6	5.3			23.0			23.7	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		1.4		2.3	0.1			0.2			0.5	
Delay (s)		20.1		26.9	5.3			23.2			24.2	
Level of Service		C		C	A			C			C	
Approach Delay (s)		20.1			11.4			23.2			24.2	
Approach LOS		C			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.3		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			69.9		Sum of lost time (s)					15.0		
Intersection Capacity Utilization			72.1%		ICU Level of Service					C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
17: Queens Ln & Queen St

06/07/2019

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	313	16	99	405	32	101
Future Volume (Veh/h)	313	16	99	405	32	101
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	348	18	110	450	36	112
Pedestrians					8	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type	TWLT			None		
Median storage (veh)	2					
Upstream signal (ft)	564			680		
pX, platoon unblocked						
vC, conflicting volume			374		810	191
vC1, stage 1 conf vol					365	
vC2, stage 2 conf vol					445	
vCu, unblocked vol			374		810	191
tC, single (s)			4.1		*5.8	*5.9
tC, 2 stage (s)					4.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			91		94	87
cM capacity (veh/h)			1173		557	859
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	232	134	110	225	225	148
Volume Left	0	0	110	0	0	36
Volume Right	0	18	0	0	0	112
cSH	1700	1700	1173	1700	1700	759
Volume to Capacity	0.14	0.08	0.09	0.13	0.13	0.20
Queue Length 95th (ft)	0	0	8	0	0	18
Control Delay (s)	0.0	0.0	8.4	0.0	0.0	10.9
Lane LOS			A			B
Approach Delay (s)	0.0		1.6			10.9
Approach LOS						B
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			33.6%		ICU Level of Service	A
Analysis Period (min)			15			
* User Entered Value						

HCM Unsignalized Intersection Capacity Analysis
17: Queens Ln & Queen St

06/07/2019

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↱		↱	↑↑	↱↲	
Traffic Volume (veh/h)	701	52	123	748	47	236
Future Volume (Veh/h)	701	52	123	748	47	236
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	738	55	129	787	49	248
Pedestrians					27	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type	TW	LT		None		
Median storage veh)	2					
Upstream signal (ft)	564			687		
pX, platoon unblocked			0.92		0.92	0.92
vC, conflicting volume			820		1444	424
vC1, stage 1 conf vol					792	
vC2, stage 2 conf vol					652	
vCu, unblocked vol			621		1302	189
tC, single (s)			4.1		*5.8	*5.9
tC, 2 stage (s)					4.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			85		87	68
cM capacity (veh/h)			856		392	777
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	492	301	129	394	394	297
Volume Left	0	0	129	0	0	49
Volume Right	0	55	0	0	0	248
cSH	1700	1700	856	1700	1700	668
Volume to Capacity	0.29	0.18	0.15	0.23	0.23	0.44
Queue Length 95th (ft)	0	0	13	0	0	57
Control Delay (s)	0.0	0.0	10.0	0.0	0.0	14.6
Lane LOS			A			B
Approach Delay (s)	0.0		1.4			14.6
Approach LOS						B
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			55.2%		ICU Level of Service	B
Analysis Period (min)			15			
* User Entered Value						

HCM Signalized Intersection Capacity Analysis
24: Ward Ave & Halekauwila St

06/07/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	4	21	0	0	0	39	440	3	6	589	233
Future Volume (vph)	131	4	21	0	0	0	39	440	3	6	589	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0					5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00					1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.99					1.00	1.00		1.00	0.96	
Flpb, ped/bikes		1.00					0.97	1.00		1.00	1.00	
Frt		0.98					1.00	1.00		1.00	0.96	
Flt Protected		0.96					0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1741					1714	3536		1770	3263	
Flt Permitted		0.96					0.28	1.00		0.49	1.00	
Satd. Flow (perm)		1741					508	3536		910	3263	
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)	135	4	22	0	0	0	40	454	3	6	607	240
RTOR Reduction (vph)	0	7	0	0	0	0	0	1	0	0	51	0
Lane Group Flow (vph)	0	154	0	0	0	0	40	456	0	6	796	0
Confl. Peds. (#/hr)			78				85					85
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		17.4					25.9	25.9		25.9	25.9	
Effective Green, g (s)		17.4					25.9	25.9		25.9	25.9	
Actuated g/C Ratio		0.33					0.49	0.49		0.49	0.49	
Clearance Time (s)		5.0					5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0					3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		568					246	1718		442	1585	
v/s Ratio Prot								0.13			c0.24	
v/s Ratio Perm		0.09					0.08			0.01		
v/c Ratio		0.27					0.16	0.27		0.01	0.50	
Uniform Delay, d1		13.3					7.6	8.1		7.1	9.3	
Progression Factor		1.00					1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3					0.3	0.1		0.0	0.3	
Delay (s)		13.5					8.0	8.2		7.1	9.6	
Level of Service		B					A	A		A	A	
Approach Delay (s)		13.5			0.0			8.2			9.5	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.5		HCM 2000 Level of Service					A		
HCM 2000 Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			53.3		Sum of lost time (s)					10.0		
Intersection Capacity Utilization			61.5%		ICU Level of Service					B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
24: Ward Ave & Halekauwila St/Driveway

06/07/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	298	14	95	0	0	0	39	560	3	18	683	129
Future Volume (vph)	298	14	95	0	0	0	39	560	3	18	683	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0					5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00					1.00	0.95		1.00	0.95	
Flpb, ped/bikes		0.97					1.00	1.00		1.00	0.88	
Flpb, ped/bikes		1.00					0.98	1.00		1.00	1.00	
Frt		0.97					1.00	1.00		1.00	0.98	
Flt Protected		0.96					0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1694					1730	3536		1770	3024	
Flt Permitted		0.96					0.25	1.00		0.39	1.00	
Satd. Flow (perm)		1694					449	3536		731	3024	
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)	310	15	99	0	0	0	41	583	3	19	711	134
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	0	0	19	0
Lane Group Flow (vph)	0	424	0	0	0	0	41	585	0	19	826	0
Confl. Peds. (#/hr)			155					59				1300
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		24.6					24.2	24.2		24.2	24.2	
Effective Green, g (s)		24.6					24.2	24.2		24.2	24.2	
Actuated g/C Ratio		0.42					0.41	0.41		0.41	0.41	
Clearance Time (s)		5.0					5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0					3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		708					184	1455		300	1244	
v/s Ratio Prot								0.17			c0.27	
v/s Ratio Perm		0.25					0.09			0.03		
v/c Ratio		0.60					0.22	0.40		0.06	0.66	
Uniform Delay, d1		13.3					11.2	12.2		10.5	14.0	
Progression Factor		1.00					1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.4					0.6	0.2		0.1	1.3	
Delay (s)		14.6					11.8	12.4		10.5	15.4	
Level of Service		B					B	B		B	B	
Approach Delay (s)		14.6			0.0			12.3			15.3	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		14.2										
HCM 2000 Volume to Capacity ratio		0.63										
Actuated Cycle Length (s)		58.8								10.0		
Intersection Capacity Utilization		65.5%									C	
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
25: Cooke St & Pohukaina St

07/07/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	80	84	15	31	127	42	26	159	30	24	168	128
Future Volume (vph)	80	84	15	31	127	42	26	159	30	24	168	128
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)	86	90	16	33	137	45	28	171	32	26	181	138
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	192	215	114	118	117	229						
Volume Left (vph)	86	33	28	0	26	0						
Volume Right (vph)	16	45	0	32	0	138						
Hadj (s)	0.07	-0.06	0.16	-0.16	0.15	-0.39						
Departure Headway (s)	5.9	5.7	6.4	6.1	6.2	5.7						
Degree Utilization, x	0.31	0.34	0.20	0.20	0.20	0.36						
Capacity (veh/h)	563	582	522	547	541	595						
Control Delay (s)	11.5	11.6	9.8	9.4	9.6	10.7						
Approach Delay (s)	11.5	11.6	9.6		10.3							
Approach LOS	B	B	A		B							
Intersection Summary												
Delay			10.7									
Level of Service			B									
Intersection Capacity Utilization			51.3%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

25: Cooke St & Pohukaina Street/Pohukaina St

07/07/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	161	163	41	65	103	32	22	176	57	56	263	126
Future Volume (vph)	161	163	41	65	103	32	22	176	57	56	263	126
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	166	168	42	67	106	33	23	181	59	58	271	130
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	376	206	114	150	194	266						
Volume Left (vph)	166	67	23	0	58	0						
Volume Right (vph)	42	33	0	59	0	130						
Hadj (s)	0.06	0.00	0.14	-0.24	0.18	-0.31						
Departure Headway (s)	6.5	6.9	7.6	7.2	7.3	6.8						
Degree Utilization, x	0.68	0.40	0.24	0.30	0.39	0.50						
Capacity (veh/h)	522	465	428	458	470	498						
Control Delay (s)	22.3	14.4	11.7	12.0	13.7	15.1						
Approach Delay (s)	22.3	14.4	11.9		14.5							
Approach LOS	C	B	B		B							
Intersection Summary												
Delay			16.2									
Level of Service			C									
Intersection Capacity Utilization			65.5%		ICU Level of Service				C			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

34: Ward Ave & Auahi St

06/07/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	39	39	83	90	104	64	313	43	65	424	47
Future Volume (vph)	18	39	39	83	90	104	64	313	43	65	424	47
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		0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		0.99	1.00	
Frt		1.00	0.85	1.00	0.92		1.00	0.98		1.00	0.99	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3478	1559	1764	1696		1762	3465		1757	3476	
Flt Permitted		0.86	1.00	0.72	1.00		0.47	1.00		0.53	1.00	
Satd. Flow (perm)		3044	1559	1329	1696		877	3465		982	3476	
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	41	41	86	94	108	67	326	45	68	442	49
RTOR Reduction (vph)	0	0	28	0	56	0	0	12	0	0	9	0
Lane Group Flow (vph)	0	60	13	86	146	0	67	359	0	68	482	0
Confl. Peds. (#/hr)	14		7	7		14	10		23	23		10
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		14.9	14.9	14.9	14.9		22.7	22.7		22.7	22.7	
Effective Green, g (s)		14.9	14.9	14.9	14.9		22.7	22.7		22.7	22.7	
Actuated g/C Ratio		0.31	0.31	0.31	0.31		0.48	0.48		0.48	0.48	
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)		952	488	416	530		418	1652		468	1657	
v/s Ratio Prot					c0.09			0.10			c0.14	
v/s Ratio Perm		0.02	0.01	0.06			0.08			0.07		
v/c Ratio		0.06	0.03	0.21	0.28		0.16	0.22		0.15	0.29	
Uniform Delay, d1		11.5	11.3	12.0	12.3		7.1	7.3		7.0	7.6	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.0	0.2	0.3		0.2	0.1		0.1	0.1	
Delay (s)		11.5	11.3	12.3	12.6		7.2	7.3		7.1	7.7	
Level of Service		B	B	B	B		A	A		A	A	
Approach Delay (s)		11.4			12.5			7.3			7.6	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			8.8		HCM 2000 Level of Service				A			
HCM 2000 Volume to Capacity ratio			0.28									
Actuated Cycle Length (s)			47.6		Sum of lost time (s)				10.0			
Intersection Capacity Utilization			53.3%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
34: Ward Ave & Auahi St

06/07/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	96	58	209	75	237	60	339	75	137	398	65
Future Volume (vph)	34	96	58	209	75	237	60	339	75	137	398	65
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		0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98	1.00	0.92		1.00	0.98		1.00	0.99	
Flpb, ped/bikes		0.98	1.00	0.99	1.00		0.99	1.00		0.96	1.00	
Frt		1.00	0.85	1.00	0.89		1.00	0.97		1.00	0.98	
Flt Protected		0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3441	1545	1752	1514		1749	3385		1692	3444	
Flt Permitted		0.84	1.00	0.66	1.00		0.44	1.00		0.48	1.00	
Satd. Flow (perm)		2922	1545	1221	1514		818	3385		860	3444	
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)	37	105	64	230	82	260	66	373	82	151	437	71
RTOR Reduction (vph)	0	0	37	0	104	0	0	23	0	0	16	0
Lane Group Flow (vph)	0	142	27	230	238	0	66	432	0	151	492	0
Confl. Peds. (#/hr)	170		21	21		170	23		134	134		23
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		24.6	24.6	24.6	24.6		23.4	23.4		23.4	23.4	
Effective Green, g (s)		24.6	24.6	24.6	24.6		23.4	23.4		23.4	23.4	
Actuated g/C Ratio		0.42	0.42	0.42	0.42		0.40	0.40		0.40	0.40	
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)		1239	655	517	642		330	1365		346	1389	
v/s Ratio Prot					0.16			0.13			0.14	
v/s Ratio Perm		0.05	0.02	c0.19			0.08			c0.18		
v/c Ratio		0.11	0.04	0.44	0.37		0.20	0.32		0.44	0.35	
Uniform Delay, d1		10.1	9.8	11.9	11.4		11.2	11.8		12.5	12.0	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0	0.0	0.6	0.4		0.3	0.1		0.9	0.2	
Delay (s)		10.1	9.8	12.5	11.8		11.5	12.0		13.4	12.2	
Level of Service		B	A	B	B		B	B		B	B	
Approach Delay (s)		10.0			12.1			11.9			12.5	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			11.9			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			58.0			Sum of lost time (s)				10.0		
Intersection Capacity Utilization			71.9%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
35: Kamakee St & Auahi St

06/07/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	98	51	12	65	42	32	134	30	23	218	105
Future Volume (vph)	34	98	51	12	65	42	32	134	30	23	218	105
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	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.97	1.00		0.99	1.00	1.00
Frt	1.00	0.95		1.00	0.94		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3302		1770	3294		1723	3427		1750	1863	1509
Flt Permitted	0.95	1.00		0.95	1.00		0.62	1.00		0.64	1.00	1.00
Satd. Flow (perm)	1770	3302		1770	3294		1119	3427		1186	1863	1509
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)	35	102	53	12	68	44	33	140	31	24	227	109
RTOR Reduction (vph)	0	38	0	0	33	0	0	18	0	0	0	64
Lane Group Flow (vph)	35	117	0	13	79	0	33	153	0	24	227	45
Confl. Peds. (#/hr)			51			36	63		25	25		63
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		4
Actuated Green, G (s)	1.9	14.6		0.6	13.3		21.1	21.1		21.1	21.1	21.1
Effective Green, g (s)	1.9	14.6		0.6	13.3		21.1	21.1		21.1	21.1	21.1
Actuated g/C Ratio	0.04	0.28		0.01	0.26		0.41	0.41		0.41	0.41	0.41
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)	65	939		20	854		460	1409		487	766	620
v/s Ratio Prot	c0.02	c0.04		0.01	0.02			0.04			c0.12	
v/s Ratio Perm							0.03			0.02		0.03
v/c Ratio	0.54	0.12		0.65	0.09		0.07	0.11		0.05	0.30	0.07
Uniform Delay, d1	24.3	13.6		25.2	14.4		9.2	9.3		9.1	10.1	9.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.3	0.1		56.6	0.0		0.1	0.0		0.0	0.2	0.0
Delay (s)	32.6	13.7		81.8	14.5		9.2	9.3		9.1	10.3	9.2
Level of Service	C	B		F	B		A	A		A	B	A
Approach Delay (s)		17.2			21.5			9.3			9.9	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			13.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			51.3			Sum of lost time (s)				15.0		
Intersection Capacity Utilization			58.1%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
35: Kamakee St & Auahi St

06/07/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	228	62	34	147	36	67	149	44	54	210	95
Future Volume (vph)	66	228	62	34	147	36	67	149	44	54	210	95
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	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.97		1.00	0.97		1.00	0.98		1.00	1.00	0.86
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.92	1.00		0.92	1.00	1.00
Frt	1.00	0.97		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3309		1770	3337		1631	3333		1636	1863	1363
Flt Permitted	0.95	1.00		0.95	1.00		0.57	1.00		0.63	1.00	1.00
Satd. Flow (perm)	1770	3309		1770	3337		986	3333		1081	1863	1363
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	67	233	63	35	150	37	68	152	45	55	214	97
RTOR Reduction (vph)	0	28	0	0	22	0	0	31	0	0	0	69
Lane Group Flow (vph)	67	268	0	35	165	0	68	166	0	55	214	28
Confl. Peds. (#/hr)			153			218	120		114	114		143
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		4
Actuated Green, G (s)	6.2	30.3		3.9	28.0		20.4	20.4		20.4	20.4	20.4
Effective Green, g (s)	6.2	30.3		3.9	28.0		20.4	20.4		20.4	20.4	20.4
Actuated g/C Ratio	0.09	0.44		0.06	0.40		0.29	0.29		0.29	0.29	0.29
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)	157	1440		99	1342		289	976		316	546	399
v/s Ratio Prot	c0.04	c0.08		0.02	0.05			0.05			c0.11	
v/s Ratio Perm							0.07			0.05		0.02
v/c Ratio	0.43	0.19		0.35	0.12		0.24	0.17		0.17	0.39	0.07
Uniform Delay, d1	30.0	12.1		31.6	13.1		18.7	18.3		18.3	19.6	17.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.9	0.1		2.2	0.0		0.4	0.1		0.3	0.5	0.1
Delay (s)	31.9	12.1		33.8	13.1		19.1	18.4		18.6	20.1	17.8
Level of Service	C	B		C	B		B	B		B	C	B
Approach Delay (s)		15.8			16.4			18.6			19.3	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay		17.6			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.30										
Actuated Cycle Length (s)		69.6			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		71.7%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
36: Queens Lane/Queens Ln & Auahi St

06/07/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	4	24	0	0	0	79	75	8	5	40	59
Future Volume (vph)	52	4	24	0	0	0	79	75	8	5	40	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0				5.0	5.0				5.0
Lane Util. Factor		1.00	1.00				1.00	1.00				1.00
Frpb, ped/bikes		1.00	0.98				1.00	1.00				0.97
Flpb, ped/bikes		0.97	1.00				1.00	1.00				1.00
Frt		1.00	0.85				1.00	0.99				0.92
Flt Protected		0.96	1.00				0.95	1.00				1.00
Satd. Flow (prot)		1726	1546				1770	1829				1654
Flt Permitted		0.96	1.00				0.95	1.00				0.99
Satd. Flow (perm)		1726	1546				1770	1829				1643
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)	55	4	25	0	0	0	83	79	8	5	42	62
RTOR Reduction (vph)	0	0	21	0	0	0	0	3	0	0	37	0
Lane Group Flow (vph)	0	59	4	0	0	0	83	84	0	0	72	0
Confl. Peds. (#/hr)	23		14	14		23			21	21		60
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2			6	
Permitted Phases	4		4							6		
Actuated Green, G (s)		8.5	8.5				6.3	31.9			20.6	
Effective Green, g (s)		8.5	8.5				6.3	31.9			20.6	
Actuated g/C Ratio		0.17	0.17				0.12	0.63			0.41	
Clearance Time (s)		5.0	5.0				5.0	5.0			5.0	
Vehicle Extension (s)		3.0	3.0				3.0	3.0			3.0	
Lane Grp Cap (vph)		291	260				221	1157			671	
v/s Ratio Prot							c0.05	0.05				
v/s Ratio Perm		0.03	0.00								c0.04	
v/c Ratio		0.20	0.02				0.38	0.07			0.11	
Uniform Delay, d1		18.0	17.5				20.2	3.6			9.2	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		0.3	0.0				1.1	0.0			0.1	
Delay (s)		18.4	17.5				21.3	3.6			9.3	
Level of Service		B	B				C	A			A	
Approach Delay (s)		18.1			0.0			12.2			9.3	
Approach LOS		B			A			B			A	
Intersection Summary												
HCM 2000 Control Delay		12.7						HCM 2000 Level of Service			B	
HCM 2000 Volume to Capacity ratio		0.18										
Actuated Cycle Length (s)		50.4						Sum of lost time (s)			15.0	
Intersection Capacity Utilization		34.7%						ICU Level of Service			A	
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
36: Queens Lane/Queens Ln & Auahi St

06/07/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	6	128	0	0	0	106	112	11	3	93	87
Future Volume (vph)	143	6	128	0	0	0	106	112	11	3	93	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0				5.0	5.0			5.0	
Lane Util. Factor		1.00	1.00				1.00	1.00			1.00	
Frpb, ped/bikes		1.00	0.95				1.00	0.99			0.94	
Flpb, ped/bikes		0.88	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	0.99			0.94	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1570	1496				1770	1816			1640	
Flt Permitted		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1570	1496				1770	1816			1636	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	144	6	129	0	0	0	107	113	11	3	94	88
RTOR Reduction (vph)	0	0	97	0	0	0	0	4	0	0	35	0
Lane Group Flow (vph)	0	150	32	0	0	0	107	120	0	0	150	0
Confl. Peds. (#/hr)	80		48	48		80			77	77		120
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2			6	
Permitted Phases	4		4							6		
Actuated Green, G (s)		13.5	13.5				7.1	31.2			19.1	
Effective Green, g (s)		13.5	13.5				7.1	31.2			19.1	
Actuated g/C Ratio		0.25	0.25				0.13	0.57			0.35	
Clearance Time (s)		5.0	5.0				5.0	5.0			5.0	
Vehicle Extension (s)		3.0	3.0				3.0	3.0			3.0	
Lane Grp Cap (vph)		387	369				229	1035			571	
v/s Ratio Prot							c0.06	0.07				
v/s Ratio Perm		0.10	0.02								c0.09	
v/c Ratio		0.39	0.09				0.47	0.12			0.26	
Uniform Delay, d1		17.2	15.9				22.0	5.4			12.8	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		0.6	0.1				1.5	0.1			0.2	
Delay (s)		17.8	16.0				23.6	5.5			13.0	
Level of Service		B	B				C	A			B	
Approach Delay (s)		16.9			0.0			13.8			13.0	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		14.9					HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio		0.34										
Actuated Cycle Length (s)		54.7					Sum of lost time (s)				15.0	
Intersection Capacity Utilization		56.8%					ICU Level of Service				B	
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
41: Ala Moana Blvd & Ward Ave

06/07/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	245	1622	12	96	1721	181	2	40	43	178	114	194
Future Volume (vph)	245	1622	12	96	1721	181	2	40	43	178	114	194
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	0.97		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	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	1.00	
Satd. Flow (prot)	1770	5078		1770	5085	1530		3531	1544	1610	3025	
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	1530		3531	1544	1610	3025	
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)	258	1707	13	101	1812	191	2	42	45	187	120	204
RTOR Reduction (vph)	0	1	0	0	0	81	0	0	0	0	167	0
Lane Group Flow (vph)	258	1719	0	101	1812	110	0	44	45	168	176	0
Confl. Peds. (#/hr)			13			14			11			13
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)	18.8	58.4		9.4	49.0	49.0		25.8	25.8	25.2	25.2	
Effective Green, g (s)	18.8	58.4		9.4	49.0	49.0		25.8	25.8	25.2	25.2	
Actuated g/C Ratio	0.14	0.42		0.07	0.35	0.35		0.19	0.19	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)	239	2136		119	1795	540		656	286	292	549	
v/s Ratio Prot	c0.15	0.34		0.06	c0.36			0.01		c0.10	0.06	
v/s Ratio Perm						0.07			c0.03			
v/c Ratio	1.08	0.80		0.85	1.01	0.20		0.07	0.16	0.58	0.32	
Uniform Delay, d1	60.0	35.2		64.0	44.9	31.3		46.6	47.4	51.9	49.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	81.0	2.3		39.8	23.6	0.2		0.0	0.3	2.7	0.3	
Delay (s)	141.0	37.5		103.8	68.5	31.5		46.6	47.6	54.6	49.7	
Level of Service	F	D		F	E	C		D	D	D	D	
Approach Delay (s)		51.0			66.8			47.1			51.3	
Approach LOS		D			E			D			D	
Intersection Summary												
HCM 2000 Control Delay		58.1					HCM 2000 Level of Service				E	
HCM 2000 Volume to Capacity ratio		0.74										
Actuated Cycle Length (s)		138.8					Sum of lost time (s)				20.0	
Intersection Capacity Utilization		77.7%					ICU Level of Service				D	
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
41: Ala Moana Blvd & Ward Ave

06/07/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	208	1975	2	51	1390	227	6	107	158	276	68	264
Future Volume (vph)	208	1975	2	51	1390	227	6	107	158	276	68	264
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	0.93		1.00	0.94	1.00	0.97	
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	1466		3530	1493	1610	2943	
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	1466		3530	1493	1610	2943	
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)	219	2079	2	54	1463	239	6	113	166	291	72	278
RTOR Reduction (vph)	0	0	0	0	0	122	0	0	0	0	230	0
Lane Group Flow (vph)	219	2081	0	54	1463	117	0	119	166	224	187	0
Confl. Peds. (#/hr)			41			35			34			19
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)	22.3	69.1		6.0	52.8	52.8		35.0	35.0	27.4	27.4	
Effective Green, g (s)	22.3	69.1		6.0	52.8	52.8		35.0	35.0	27.4	27.4	
Actuated g/C Ratio	0.14	0.44		0.04	0.34	0.34		0.22	0.22	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)	250	2230		67	1704	491		784	331	280	511	
v/s Ratio Prot	c0.12	c0.41		0.03	0.29			0.03		c0.14	0.06	
v/s Ratio Perm					0.08				c0.11			
v/c Ratio	0.88	0.93		0.81	0.86	0.24		0.15	0.50	0.80	0.37	
Uniform Delay, d1	66.2	42.0		75.2	48.9	37.8		49.3	53.6	62.4	57.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	27.1	7.9		48.7	4.5	0.3		0.1	1.2	15.0	0.4	
Delay (s)	93.4	49.9		123.9	53.4	38.1		49.4	54.8	77.4	57.8	
Level of Service	F	D		F	D	D		D	D	E	E	
Approach Delay (s)		54.1			53.5			52.5			64.7	
Approach LOS		D			D			D			E	
Intersection Summary												
HCM 2000 Control Delay		55.1			HCM 2000 Level of Service			E				
HCM 2000 Volume to Capacity ratio		0.81										
Actuated Cycle Length (s)		157.5			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		93.3%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
43: Ala Moana Park Dr/Kamakee St & Ala Moana Blvd

06/07/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	1558	90	13	1849	103	88	22	14	121	29	109
Future Volume (vph)	84	1558	90	13	1849	103	88	22	14	121	29	109
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	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.95	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.94			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	5028		1770	5029		1770	1707			1702	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.55	1.00			0.74	1.00
Satd. Flow (perm)	1770	5028		1770	5029		1026	1707			1314	1583
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)	87	1606	93	13	1906	106	91	23	14	125	30	112
RTOR Reduction (vph)	0	4	0	0	4	0	0	11	0	0	0	88
Lane Group Flow (vph)	87	1695	0	13	2008	0	91	26	0	0	155	24
Confl. Peds. (#/hr)			18			27			55	55		
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	11.9	84.5		1.8	74.4		27.7	27.7			27.7	27.7
Effective Green, g (s)	11.9	84.5		1.8	74.4		27.7	27.7			27.7	27.7
Actuated g/C Ratio	0.09	0.66		0.01	0.58		0.21	0.21			0.21	0.21
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)	163	3293		24	2900		220	366			282	339
v/s Ratio Prot	c0.05	0.34		0.01	c0.40			0.02				
v/s Ratio Perm							0.09				c0.12	0.02
v/c Ratio	0.53	0.51		0.54	0.69		0.41	0.07			0.55	0.07
Uniform Delay, d1	55.9	11.6		63.2	19.2		43.7	40.4			45.1	40.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.3	0.1		22.7	0.7		1.3	0.1			2.2	0.1
Delay (s)	59.2	11.7		85.9	20.0		44.9	40.5			47.3	40.5
Level of Service	E	B		F	B		D	D			D	D
Approach Delay (s)		14.0			20.4			43.6			44.4	
Approach LOS		B			C			D			D	
Intersection Summary												
HCM 2000 Control Delay		19.9			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.64										
Actuated Cycle Length (s)		129.0			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		81.3%			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)	61	2251	195	36	1567	164	60	20	45	114	55	147
Future Volume (vph)	61	2251	195	36	1567	164	60	20	45	114	55	147
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	0.99		1.00	0.99		1.00	0.93			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.95	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1770	4984		1770	4972		1770	1557			1704	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.50	1.00			0.76	1.00
Satd. Flow (perm)	1770	4984		1770	4972		937	1557			1332	1583
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)	63	2321	201	37	1615	169	62	21	46	118	57	152
RTOR Reduction (vph)	0	6	0	0	7	0	0	36	0	0	0	90
Lane Group Flow (vph)	63	2516	0	37	1777	0	62	31	0	0	175	62
Confl. Peds. (#/hr)			33			35			65	65		
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	8.4	94.7		6.5	92.8		33.8	33.8			33.8	33.8
Effective Green, g (s)	8.4	94.7		6.5	92.8		33.8	33.8			33.8	33.8
Actuated g/C Ratio	0.06	0.63		0.04	0.62		0.23	0.23			0.23	0.23
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)	99	3146		76	3076		211	350			300	356
v/s Ratio Prot	c0.04	c0.50		0.02	0.36			0.02				
v/s Ratio Perm							0.07				c0.13	0.04
v/c Ratio	0.64	0.80		0.49	0.58		0.29	0.09			0.58	0.17
Uniform Delay, d1	69.3	20.6		70.1	17.0		48.2	45.9			51.8	46.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	12.6	1.5		4.8	0.3		0.8	0.1			2.9	0.2
Delay (s)	81.9	22.1		75.0	17.2		49.0	46.0			54.7	47.1
Level of Service	F	C		E	B		D	D			D	D
Approach Delay (s)		23.5			18.4			47.5			51.2	
Approach LOS		C			B			D			D	
Intersection Summary												
HCM 2000 Control Delay		24.1			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.75										
Actuated Cycle Length (s)		150.0			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		84.5%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

APPENDIX D

TRIP GENERATION CALCULATIONS

Trip Generation				9th Edition																	
Number of Units	Units	Land Use Number	Land Use No./Type	Weekday Trip Rate per Unit	AM PEAK				PM PEAK				Out				In				
					Trip Rate per Unit	Number of Trips	In %	In Rate	Out %	Out Rate	Trips	Trip Rate per Unit	Number of Trips	In %	In Rate	Out %	Out Rate	Trips			
Block F - Phase 3																					
Existing																					
50,647	ksf	820	Shopping Center	37.75	1912	0.94	48	62	0.58	30	38	0.36	18	3.81	193	48	1.83	93	52	1.98	100
35.59	ksf	110	General/Light Industrial	6.97	248	0.92	33	88	0.81	29	12	0.11	4	0.97	35	12	0.12	4	88	0.85	31
			Existing Subtotal	2160			81	59		22				228		97			131		
			Internal Capture	-1171			-29			-7				-122		-51			-71		
			Existing Total	989			52	37		15				106		46			60		
Proposed																					
748	units	222	High-Rise Apartment	4.45	3329	0.31	232	24	0.07	56	76	0.24	176	0.36	269	61	0.22	164	39	0.14	105
5,625	ksf	820	Shopping Center	37.75	212	0.94	5	62	0.58	3	38	0.36	2	3.81	21	48	1.83	10	52	1.98	11
36	ksf	110	General Light Industrial	6.97	251	0.92	33	88	0.81	29	12	0.11	4	0.97	35	12	0.12	4	88	0.85	31
2.7	ksf	932	High-Turnover (Sit-Down) Restaurant (formerly #8)	112.18	303	9.94	27	55	5.47	15	45	4.47	12	9.77	26	62	6.06	16	38	3.71	10
Block F - Residential Alt Mode Trip Reduction				-508			-51			-12			-39		-40		-26		-14		
			P1-5	-603			-61			-14			-47		-48		-31		-17		
Block F East Residential				2821			181			44			137		229		138		91		
			P1-5	2726			171			42			129		221		133		88		
Non Res SubTotal (no reductions)				766			65			47			18		82		30		52		
Block F - Trip Reduction				-415			-24			-18			-6		-44		-16		-28		
			P1-5	-442			-27			-20			-7		-48		-17		-31		
Block F - Retail Trip Reduction				93			27			-6			33		0		10		-14		
			P1-5	161			34			-6			14		0		14		-14		
Block F Non Residential (to Block G East Parking)				-130			40			4			36		-28		-6		-22		
			P1-5	-62			47			4			43		-24		-2		-22		

HCM Signalized Intersection Capacity Analysis
15: Ward Ave & Queen St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	167	67	75	351	73	56	534	81	73	770	254
Future Volume (vph)	55	167	67	75	351	73	56	534	81	73	770	254
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	0.96		1.00	1.00		1.00	0.97		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		0.92	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.97		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1761	1719		1634	1807		1770	3382		1770	3361	
Flt Permitted	0.26	1.00		0.53	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	476	1719		910	1807		1770	3382		1770	3361	
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)	58	176	71	79	369	77	59	562	85	77	811	267
RTOR Reduction (vph)	0	17	0	0	9	0	0	13	0	0	36	0
Lane Group Flow (vph)	58	230	0	79	437	0	59	634	0	77	1042	0
Confl. Peds. (#/hr)	15		146	146		15			144			30
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	23.2	23.2		23.2	23.2		3.6	28.6		6.2	31.2	
Effective Green, g (s)	23.2	23.2		23.2	23.2		3.6	28.6		6.2	31.2	
Actuated g/C Ratio	0.32	0.32		0.32	0.32		0.05	0.39		0.08	0.43	
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)	151	546		289	574		87	1325		150	1436	
v/s Ratio Prot		0.13			c0.24		0.03	0.19		c0.04	c0.31	
v/s Ratio Perm	0.12			0.09								
v/c Ratio	0.38	0.42		0.27	0.76		0.68	0.48		0.51	0.73	
Uniform Delay, d1	19.3	19.6		18.6	22.4		34.1	16.6		32.0	17.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	0.5		0.5	5.9		19.0	0.3		2.9	1.9	
Delay (s)	21.0	20.1		19.1	28.3		53.1	16.9		34.9	19.2	
Level of Service	C	C		B	C		D	B		C	B	
Approach Delay (s)		20.3			26.9			19.9			20.2	
Approach LOS		C			C			B			C	
Intersection Summary												
HCM 2000 Control Delay		21.5			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.75										
Actuated Cycle Length (s)		73.0			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		77.5%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
15: Ward Ave & Queen St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	461	111	76	441	78	79	753	129	148	756	143
Future Volume (vph)	110	461	111	76	441	78	79	753	129	148	756	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	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	0.98		1.00	0.94		1.00	0.99	
Flpb, ped/bikes	0.96	1.00		0.97	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1700	1759		1709	1784		1770	3243		1770	3404	
Flt Permitted	0.19	1.00		0.13	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	341	1759		235	1784		1770	3243		1770	3404	
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)	116	485	117	80	464	82	83	793	136	156	796	151
RTOR Reduction (vph)	0	10	0	0	8	0	0	16	0	0	16	0
Lane Group Flow (vph)	116	592	0	80	538	0	83	913	0	156	931	0
Confl. Peds. (#/hr)	136		142	142		136			294			52
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	31.6	31.6		31.6	31.6		5.3	29.9		9.1	33.7	
Effective Green, g (s)	31.6	31.6		31.6	31.6		5.3	29.9		9.1	33.7	
Actuated g/C Ratio	0.37	0.37		0.37	0.37		0.06	0.35		0.11	0.39	
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)	125	649		86	658		109	1132		188	1340	
v/s Ratio Prot		0.34			0.30		0.05	c0.28		c0.09	c0.27	
v/s Ratio Perm	0.34			c0.34								
v/c Ratio	0.93	0.91		0.93	0.82		0.76	0.81		0.83	0.69	
Uniform Delay, d1	25.9	25.7		25.9	24.4		39.5	25.2		37.5	21.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	58.0	17.2		73.9	7.8		26.4	4.3		25.0	1.6	
Delay (s)	83.9	42.8		99.8	32.2		65.9	29.5		62.5	23.2	
Level of Service	F	D		F	C		E	C		E	C	
Approach Delay (s)		49.5			40.9			32.5			28.8	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay		36.4			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio		0.86										
Actuated Cycle Length (s)		85.6			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		87.6%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
16: Kamakee St & Queen St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	261	40	143	340	26	20	100	69	22	177	74
Future Volume (vph)	43	261	40	143	340	26	20	100	69	22	177	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes		0.99		1.00	1.00			0.99			0.98	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.98		1.00	0.99			0.95			0.96	
Flt Protected		0.99		0.95	1.00			0.99			1.00	
Satd. Flow (prot)		3430		1770	3496			3297			3324	
Flt Permitted		0.86		0.95	1.00			0.91			0.92	
Satd. Flow (perm)		2968		1770	3496			3002			3078	
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)	45	272	42	149	354	27	21	104	72	23	184	77
RTOR Reduction (vph)	0	10	0	0	6	0	0	50	0	0	31	0
Lane Group Flow (vph)	0	349	0	149	375	0	0	147	0	0	253	0
Confl. Peds. (#/hr)	12		64			12	73		5	5		73
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Actuated Green, G (s)		14.6		8.6	28.2			17.3			17.3	
Effective Green, g (s)		14.6		8.6	28.2			17.3			17.3	
Actuated g/C Ratio		0.26		0.15	0.51			0.31			0.31	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		780		274	1776			935			959	
v/s Ratio Prot				c0.08	0.11							
v/s Ratio Perm		c0.12						0.05			c0.08	
v/c Ratio		0.45		0.54	0.21			0.16			0.26	
Uniform Delay, d1		17.1		21.6	7.5			13.8			14.3	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.4		2.2	0.1			0.1			0.1	
Delay (s)		17.5		23.8	7.6			13.9			14.5	
Level of Service		B		C	A			B			B	
Approach Delay (s)		17.5			12.2			13.9			14.5	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay		14.3										
HCM 2000 Volume to Capacity ratio		0.39										
Actuated Cycle Length (s)		55.5						15.0				
Intersection Capacity Utilization		69.8%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
16: Kamakee St & Queen St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	526	86	250	525	40	23	118	77	67	152	31
Future Volume (vph)	64	526	86	250	525	40	23	118	77	67	152	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes		0.98		1.00	1.00			0.99			0.96	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.98		1.00	0.99			0.95			0.98	
Flt Protected		1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)		3375		1770	3493			3234			3288	
Flt Permitted		0.83		0.95	1.00			0.90			0.80	
Satd. Flow (perm)		2830		1770	3493			2920			2662	
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)	67	548	90	260	547	42	24	123	80	70	158	32
RTOR Reduction (vph)	0	11	0	0	6	0	0	60	0	0	9	0
Lane Group Flow (vph)	0	694	0	260	583	0	0	167	0	0	251	0
Confl. Peds. (#/hr)	15		117			15	127		8	8		127
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Actuated Green, G (s)		27.8		17.5	50.3			15.5			15.5	
Effective Green, g (s)		27.8		17.5	50.3			15.5			15.5	
Actuated g/C Ratio		0.37		0.23	0.66			0.20			0.20	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		1037		408	2317			597			544	
v/s Ratio Prot				c0.15	0.17							
v/s Ratio Perm		c0.25						0.06			c0.09	
v/c Ratio		0.67		0.64	0.25			0.28			0.46	
Uniform Delay, d1		20.1		26.3	5.1			25.4			26.5	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		1.7		3.3	0.1			0.3			0.6	
Delay (s)		21.8		29.5	5.2			25.7			27.1	
Level of Service		C		C	A			C			C	
Approach Delay (s)		21.8			12.7			25.7			27.1	
Approach LOS		C			B			C			C	
Intersection Summary												
HCM 2000 Control Delay		19.1										
HCM 2000 Volume to Capacity ratio		0.61										
Actuated Cycle Length (s)		75.8						15.0				
Intersection Capacity Utilization		74.0%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
17: Queens Ln & Queen St

06/16/2020

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↱		↱	↑↑	↱↱	
Traffic Volume (veh/h)	342	17	102	420	33	104
Future Volume (Veh/h)	342	17	102	420	33	104
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	380	19	113	467	37	116
Pedestrians					8	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	564			680		
pX, platoon unblocked						
vC, conflicting volume			407		857	208
vC1, stage 1 conf vol					398	
vC2, stage 2 conf vol					460	
vCu, unblocked vol			407		857	208
tC, single (s)			4.1		*5.8	*5.9
tC, 2 stage (s)					4.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			90		93	86
cM capacity (veh/h)			1141		540	842
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	253	146	113	234	234	153
Volume Left	0	0	113	0	0	37
Volume Right	0	19	0	0	0	116
cSH	1700	1700	1141	1700	1700	742
Volume to Capacity	0.15	0.09	0.10	0.14	0.14	0.21
Queue Length 95th (ft)	0	0	8	0	0	19
Control Delay (s)	0.0	0.0	8.5	0.0	0.0	11.1
Lane LOS			A			B
Approach Delay (s)	0.0		1.7			11.1
Approach LOS						B
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			34.7%		ICU Level of Service	A
Analysis Period (min)			15			
* User Entered Value						

HCM Unsignalized Intersection Capacity Analysis
17: Queens Ln & Queen St

06/16/2020

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↘		↙	↑↑	↖↗	
Traffic Volume (veh/h)	735	53	127	792	49	243
Future Volume (Veh/h)	735	53	127	792	49	243
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	774	56	134	834	52	256
Pedestrians					27	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type	TW	LT		None		
Median storage veh)	2					
Upstream signal (ft)	564			687		
pX, platoon unblocked			0.90		0.90	0.90
vC, conflicting volume			857		1514	442
vC1, stage 1 conf vol					829	
vC2, stage 2 conf vol					685	
vCu, unblocked vol			623		1352	163
tC, single (s)			4.1		*5.8	*5.9
tC, 2 stage (s)					4.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			84		86	68
cM capacity (veh/h)			841		377	788
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	516	314	134	417	417	308
Volume Left	0	0	134	0	0	52
Volume Right	0	56	0	0	0	256
cSH	1700	1700	841	1700	1700	666
Volume to Capacity	0.30	0.18	0.16	0.25	0.25	0.46
Queue Length 95th (ft)	0	0	14	0	0	61
Control Delay (s)	0.0	0.0	10.1	0.0	0.0	15.0
Lane LOS			B			B
Approach Delay (s)	0.0		1.4			15.0
Approach LOS						B
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			56.9%		ICU Level of Service	B
Analysis Period (min)			15			
* User Entered Value						

HCM Signalized Intersection Capacity Analysis
24: Ward Ave & Halekauwila St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	50	19	22	59	35	31	496	17	42	600	226
Future Volume (vph)	112	50	19	22	59	35	31	496	17	42	600	226
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	0.98			0.98		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00			1.00		0.97	1.00		1.00	1.00	
Frt	1.00	0.96			0.96		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1757			1741		1717	3513		1770	3279	
Flt Permitted	0.80	1.00			0.94		0.29	1.00		0.46	1.00	
Satd. Flow (perm)	1492	1757			1656		523	3513		849	3279	
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)	115	52	20	23	61	36	32	511	18	43	619	233
RTOR Reduction (vph)	0	14	0	0	19	0	0	3	0	0	46	0
Lane Group Flow (vph)	115	58	0	0	101	0	32	526	0	43	806	0
Confl. Peds. (#/hr)			78			47	85		47			85
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)	14.8	14.8			14.8		25.1	25.1		25.1	25.1	
Effective Green, g (s)	14.8	14.8			14.8		25.1	25.1		25.1	25.1	
Actuated g/C Ratio	0.30	0.30			0.30		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	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	442	521			491		263	1767		427	1649	
v/s Ratio Prot		0.03						0.15			c0.25	
v/s Ratio Perm	c0.08				0.06		0.06			0.05		
v/c Ratio	0.26	0.11			0.21		0.12	0.30		0.10	0.49	
Uniform Delay, d1	13.4	12.8			13.1		6.6	7.2		6.5	8.2	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.1			0.2		0.2	0.1		0.1	0.2	
Delay (s)	13.7	12.9			13.4		6.8	7.3		6.6	8.4	
Level of Service	B	B			B		A	A		A	A	
Approach Delay (s)		13.4			13.4			7.3			8.3	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		8.9			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.40										
Actuated Cycle Length (s)		49.9			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		62.2%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
24: Ward Ave & Halekauwila St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	277	91	91	17	42	22	38	601	26	58	692	118
Future Volume (vph)	277	91	91	17	42	22	38	601	26	58	692	118
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	0.93			0.96		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	0.88	1.00			0.98		0.94	1.00		0.93	1.00	
Frt	1.00	0.93			0.96		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1559	1606			1672		1662	3493		1653	3335	
Flt Permitted	0.70	1.00			0.93		0.24	1.00		0.35	1.00	
Satd. Flow (perm)	1152	1606			1578		419	3493		601	3335	
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)	289	95	95	18	44	23	40	626	27	60	721	123
RTOR Reduction (vph)	0	22	0	0	13	0	0	4	0	0	16	0
Lane Group Flow (vph)	289	168	0	0	72	0	40	649	0	60	828	0
Confl. Peds. (#/hr)	121		185	185		121	160		121	121		160
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)	25.6	25.6			25.6		23.5	23.5		23.5	23.5	
Effective Green, g (s)	25.6	25.6			25.6		23.5	23.5		23.5	23.5	
Actuated g/C Ratio	0.43	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	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	499	695			683		166	1388		238	1326	
v/s Ratio Prot		0.10						0.19			c0.25	
v/s Ratio Perm	c0.25				0.05		0.10			0.10		
v/c Ratio	0.58	0.24			0.11		0.24	0.47		0.25	0.62	
Uniform Delay, d1	12.7	10.6			9.9		11.9	13.2		11.9	14.3	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	0.2			0.1		0.8	0.3		0.6	0.9	
Delay (s)	14.3	10.8			10.0		12.6	13.4		12.5	15.2	
Level of Service	B	B			B		B	B		B	B	
Approach Delay (s)		12.9			10.0			13.4			15.0	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay		13.8			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.60										
Actuated Cycle Length (s)		59.1			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												

HCM Unsignalized Intersection Capacity Analysis

25: Cooke St & Pohukaina St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	86	84	16	32	138	61	27	164	31	27	173	139
Future Volume (vph)	86	84	16	32	138	61	27	164	31	27	173	139
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)	92	90	17	34	148	66	29	176	33	29	186	149
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	199	248	117	121	122	242						
Volume Left (vph)	92	34	29	0	29	0						
Volume Right (vph)	17	66	0	33	0	149						
Hadj (s)	0.08	-0.10	0.16	-0.16	0.15	-0.40						
Departure Headway (s)	6.1	5.8	6.6	6.3	6.4	5.9						
Degree Utilization, x	0.33	0.40	0.22	0.21	0.22	0.39						
Capacity (veh/h)	543	575	504	527	525	577						
Control Delay (s)	12.1	12.6	10.2	9.8	10.0	11.4						
Approach Delay (s)	12.1	12.6	10.0		11.0							
Approach LOS	B	B	A		B							
Intersection Summary												
Delay			11.3									
Level of Service			B									
Intersection Capacity Utilization			55.0%		ICU Level of Service		B					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

25: Cooke St & Pohukaina St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	166	168	42	67	109	45	22	181	59	69	271	136
Future Volume (vph)	166	168	42	67	109	45	22	181	59	69	271	136
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	171	173	43	69	112	46	23	187	61	71	279	140
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	387	227	117	155	211	280						
Volume Left (vph)	171	69	23	0	71	0						
Volume Right (vph)	43	46	0	61	0	140						
Hadj (s)	0.06	-0.03	0.13	-0.24	0.20	-0.32						
Departure Headway (s)	6.7	7.1	7.9	7.5	7.5	7.0						
Degree Utilization, x	0.72	0.45	0.25	0.32	0.44	0.54						
Capacity (veh/h)	506	455	413	431	455	484						
Control Delay (s)	25.5	15.8	12.3	12.8	15.1	16.7						
Approach Delay (s)	25.5	15.8	12.6		16.0							
Approach LOS	D	C	B		C							
Intersection Summary												
Delay			18.0									
Level of Service			C									
Intersection Capacity Utilization			68.6%		ICU Level of Service		C					
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

34: Ward Ave & Pohukaina St/Auahi St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	41	40	100	117	143	65	333	42	61	455	50
Future Volume (vph)	21	41	40	100	117	143	65	333	42	61	455	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		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		0.96	1.00		0.98	1.00	
Frt	1.00	0.93		1.00	0.92		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)	1759	1681		1707	1690		1706	3460		1731	3455	
Flt Permitted	0.59	1.00		0.70	1.00		0.46	1.00		0.52	1.00	
Satd. Flow (perm)	1097	1681		1261	1690		821	3460		949	3455	
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)	22	43	42	104	122	149	68	347	44	64	474	52
RTOR Reduction (vph)	0	29	0	0	60	0	0	12	0	0	10	0
Lane Group Flow (vph)	22	56	0	104	211	0	68	379	0	64	516	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)	9.6	9.6		9.6	9.6		12.3	12.3		12.3	12.3	
Effective Green, g (s)	9.6	9.6		9.6	9.6		12.3	12.3		12.3	12.3	
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.39	0.39		0.39	0.39	
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)	330	505		379	508		316	1334		365	1332	
v/s Ratio Prot		0.03			c0.12			0.11			c0.15	
v/s Ratio Perm	0.02			0.08			0.08			0.07		
v/c Ratio	0.07	0.11		0.27	0.42		0.22	0.28		0.18	0.39	
Uniform Delay, d1	8.0	8.1		8.5	8.9		6.6	6.8		6.5	7.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.4	0.6		0.3	0.1		0.2	0.2	
Delay (s)	8.0	8.2		8.9	9.5		6.9	6.9		6.7	7.3	
Level of Service	A	A		A	A		A	A		A	A	
Approach Delay (s)		8.1			9.3			6.9			7.2	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		7.7			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.40										
Actuated Cycle Length (s)		31.9			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		48.2%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

34: Ward Ave & Pohukaina St/Auahi St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	105	60	225	91	272	62	360	75	126	424	68
Future Volume (vph)	41	105	60	225	91	272	62	360	75	126	424	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	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.97		1.00	0.90		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	0.94	1.00		0.94	1.00		0.97	1.00		0.94	1.00	
Frt	1.00	0.95		1.00	0.89		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1658	1707		1669	1493		1713	3369		1658	3408	
Flt Permitted	0.43	1.00		0.64	1.00		0.42	1.00		0.46	1.00	
Satd. Flow (perm)	751	1707		1130	1493		754	3369		808	3408	
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)	45	115	66	247	100	299	68	396	82	138	466	75
RTOR Reduction (vph)	0	24	0	0	56	0	0	20	0	0	15	0
Lane Group Flow (vph)	45	157	0	247	343	0	68	458	0	138	526	0
Confl. Peds. (#/hr)	200		122	122		200	66		194	194		96
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)	25.7	25.7		25.7	25.7		24.1	24.1		24.1	24.1	
Effective Green, g (s)	25.7	25.7		25.7	25.7		24.1	24.1		24.1	24.1	
Actuated g/C Ratio	0.43	0.43		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		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)	322	733		485	641		303	1357		325	1373	
v/s Ratio Prot		0.09			c0.23			0.14			0.15	
v/s Ratio Perm	0.06			0.22			0.09			c0.17		
v/c Ratio	0.14	0.21		0.51	0.53		0.22	0.34		0.42	0.38	
Uniform Delay, d1	10.3	10.7		12.4	12.6		11.7	12.3		12.9	12.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1		0.8	0.9		0.4	0.1		0.9	0.2	
Delay (s)	10.5	10.9		13.3	13.5		12.1	12.5		13.8	12.8	
Level of Service	B	B		B	B		B	B		B	B	
Approach Delay (s)		10.8			13.4			12.4			13.0	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay		12.7			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.48										
Actuated Cycle Length (s)		59.8			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												

HCM Signalized Intersection Capacity Analysis
35: Kamakee St & Auahi St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	101	47	12	67	43	40	135	31	23	227	128
Future Volume (vph)	32	101	47	12	67	43	40	135	31	23	227	128
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	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	0.95	1.00	1.00	0.96	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1746		1770	1863	1509	1692	1863	1514	1735	1863	1457
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.61	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	1770	1746		1770	1863	1509	1090	1863	1514	1218	1863	1457
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)	33	105	49	12	70	45	42	141	32	24	236	133
RTOR Reduction (vph)	0	24	0	0	0	33	0	0	19	0	0	78
Lane Group Flow (vph)	33	130	0	13	70	12	42	141	13	24	236	55
Confl. Peds. (#/hr)			51			36	63		25	25		63
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		4
Actuated Green, G (s)	1.7	15.1		0.5	13.9	13.9	21.5	21.5	21.5	21.5	21.5	21.5
Effective Green, g (s)	1.7	15.1		0.5	13.9	13.9	21.5	21.5	21.5	21.5	21.5	21.5
Actuated g/C Ratio	0.03	0.29		0.01	0.27	0.27	0.41	0.41	0.41	0.41	0.41	0.41
Clearance Time (s)	5.0	5.0		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	3.0	3.0
Lane Grp Cap (vph)	57	506		16	497	402	449	768	624	502	768	601
v/s Ratio Prot	c0.02	c0.07		0.01	0.04			0.08			c0.13	
v/s Ratio Perm						0.01	0.04		0.01	0.02		0.04
v/c Ratio	0.58	0.26		0.81	0.14	0.03	0.09	0.18	0.02	0.05	0.31	0.09
Uniform Delay, d1	24.8	14.2		25.8	14.6	14.1	9.3	9.7	9.1	9.2	10.3	9.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.5	0.3		132.2	0.1	0.0	0.1	0.1	0.0	0.0	0.2	0.1
Delay (s)	38.3	14.5		157.9	14.7	14.1	9.4	9.8	9.1	9.2	10.5	9.4
Level of Service	D	B		F	B	B	A	A	A	A	B	A
Approach Delay (s)		18.7			29.0			9.6			10.1	
Approach LOS		B			C			A			B	
Intersection Summary												
HCM 2000 Control Delay		14.3			HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio		0.31										
Actuated Cycle Length (s)		52.1			Sum of lost time (s)				15.0			
Intersection Capacity Utilization		59.8%			ICU Level of Service				B			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
35: Kamakee St & Auahi St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	235	56	36	151	37	96	150	46	55	215	176
Future Volume (vph)	66	235	56	36	151	37	96	150	46	55	215	176
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	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	0.76	1.00	1.00	0.82	1.00	1.00	0.77
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.87	1.00	1.00	0.86	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1753		1770	1863	1201	1540	1863	1292	1530	1863	1212
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.56	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	1770	1753		1770	1863	1201	914	1863	1292	1063	1863	1212
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	67	240	57	37	154	38	98	153	47	56	219	180
RTOR Reduction (vph)	0	10	0	0	0	23	0	0	33	0	0	127
Lane Group Flow (vph)	67	287	0	37	154	15	98	153	14	56	219	53
Confl. Peds. (#/hr)			153			218	120		114	114		143
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		4
Actuated Green, G (s)	6.2	31.7		3.1	28.6	28.6	20.6	20.6	20.6	20.6	20.6	20.6
Effective Green, g (s)	6.2	31.7		3.1	28.6	28.6	20.6	20.6	20.6	20.6	20.6	20.6
Actuated g/C Ratio	0.09	0.45		0.04	0.41	0.41	0.29	0.29	0.29	0.29	0.29	0.29
Clearance Time (s)	5.0	5.0		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	3.0	3.0
Lane Grp Cap (vph)	155	789		77	756	487	267	545	378	311	545	354
v/s Ratio Prot	c0.04	c0.16		0.02	0.08			0.08			c0.12	
v/s Ratio Perm						0.01	0.11		0.01	0.05		0.04
v/c Ratio	0.43	0.36		0.48	0.20	0.03	0.37	0.28	0.04	0.18	0.40	0.15
Uniform Delay, d1	30.4	12.7		32.9	13.5	12.6	19.7	19.2	17.8	18.6	20.0	18.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.3		4.7	0.1	0.0	0.9	0.3	0.0	0.3	0.5	0.2
Delay (s)	32.4	13.0		37.5	13.7	12.6	20.6	19.5	17.8	18.9	20.4	18.6
Level of Service	C	B		D	B	B	C	B	B	B	C	B
Approach Delay (s)		16.6			17.3			19.6			19.5	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay		18.4			HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio		0.40										
Actuated Cycle Length (s)		70.4			Sum of lost time (s)				15.0			
Intersection Capacity Utilization		73.1%			ICU Level of Service				D			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

36: Queens Lane/Queens Ln & Auahi St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	4	24	0	0	0	81	78	8	6	41	61
Future Volume (vph)	53	4	24	0	0	0	81	78	8	6	41	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	
Lane Util. Factor		1.00	1.00				1.00	1.00			1.00	
Frpb, ped/bikes		1.00	0.98				1.00	1.00			0.94	
Flpb, ped/bikes		0.97	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	0.99			0.92	
Flt Protected		0.96	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1726	1546				1770	1830			1614	
Flt Permitted		0.96	1.00				0.95	1.00			0.99	
Satd. Flow (perm)		1726	1546				1770	1830			1601	
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)	56	4	25	0	0	0	85	82	8	6	43	64
RTOR Reduction (vph)	0	0	21	0	0	0	0	3	0	0	38	0
Lane Group Flow (vph)	0	60	4	0	0	0	85	87	0	0	75	0
Confl. Peds. (#/hr)	23		14	14		23			21	21		60
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2			6	
Permitted Phases	4		4							6		
Actuated Green, G (s)		8.5	8.5				6.3	31.8			20.5	
Effective Green, g (s)		8.5	8.5				6.3	31.8			20.5	
Actuated g/C Ratio		0.17	0.17				0.13	0.63			0.41	
Clearance Time (s)		5.0	5.0				5.0	5.0			5.0	
Vehicle Extension (s)		3.0	3.0				3.0	3.0			3.0	
Lane Grp Cap (vph)		291	261				221	1156			652	
v/s Ratio Prot							c0.05	0.05				
v/s Ratio Perm		0.03	0.00								c0.05	
v/c Ratio		0.21	0.02				0.38	0.08			0.12	
Uniform Delay, d1		18.0	17.4				20.2	3.6			9.3	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		0.4	0.0				1.1	0.0			0.1	
Delay (s)		18.3	17.4				21.3	3.6			9.3	
Level of Service		B	B				C	A			A	
Approach Delay (s)		18.1			0.0			12.2			9.3	
Approach LOS		B			A			B			A	
Intersection Summary												
HCM 2000 Control Delay		12.7										
HCM 2000 Volume to Capacity ratio		0.18										
Actuated Cycle Length (s)		50.3						15.0				
Intersection Capacity Utilization		34.9%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

36: Queens Lane/Queens Ln & Auahi St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	7	132	0	0	0	109	115	11	3	95	90
Future Volume (vph)	148	7	132	0	0	0	109	115	11	3	95	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0				5.0	5.0			5.0	
Lane Util. Factor		1.00	1.00				1.00	1.00			1.00	
Frpb, ped/bikes		1.00	0.95				1.00	0.99			0.90	
Flpb, ped/bikes		0.88	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	0.99			0.94	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1572	1497				1770	1817			1573	
Flt Permitted		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1572	1497				1770	1817			1569	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	149	7	133	0	0	0	110	116	11	3	96	91
RTOR Reduction (vph)	0	0	100	0	0	0	0	4	0	0	36	0
Lane Group Flow (vph)	0	156	33	0	0	0	110	123	0	0	154	0
Confl. Peds. (#/hr)	80		48	48		80			77	77		120
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2			6	
Permitted Phases	4		4							6		
Actuated Green, G (s)		13.6	13.6				7.2	31.0			18.8	
Effective Green, g (s)		13.6	13.6				7.2	31.0			18.8	
Actuated g/C Ratio		0.25	0.25				0.13	0.57			0.34	
Clearance Time (s)		5.0	5.0				5.0	5.0			5.0	
Vehicle Extension (s)		3.0	3.0				3.0	3.0			3.0	
Lane Grp Cap (vph)		391	372				233	1031			540	
v/s Ratio Prot							c0.06	0.07				
v/s Ratio Perm		0.10	0.02								c0.10	
v/c Ratio		0.40	0.09				0.47	0.12			0.29	
Uniform Delay, d1		17.1	15.7				21.9	5.5			13.0	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		0.7	0.1				1.5	0.1			0.3	
Delay (s)		17.8	15.8				23.5	5.5			13.3	
Level of Service		B	B				C	A			B	
Approach Delay (s)		16.9			0.0			13.8			13.3	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		14.9										
HCM 2000 Volume to Capacity ratio		0.36										
Actuated Cycle Length (s)		54.6						15.0				
Intersection Capacity Utilization		57.1%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
41: Ala Moana Blvd & Ward Ave

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	257	1668	12	99	1771	189	2	41	44	215	118	201
Future Volume (vph)	257	1668	12	99	1771	189	2	41	44	215	118	201
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	0.84		1.00	0.93	1.00	0.94	
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	1.00	
Satd. Flow (prot)	1770	5078		1770	5085	1330		3531	1470	1610	2886	
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	1330		3531	1470	1610	2886	
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)	271	1756	13	104	1864	199	2	43	46	226	124	212
RTOR Reduction (vph)	0	1	0	0	0	82	0	0	0	0	167	0
Lane Group Flow (vph)	271	1768	0	104	1864	117	0	45	46	194	201	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)	18.7	58.3		9.4	49.0	49.0		25.8	25.8	25.5	25.5	
Effective Green, g (s)	18.7	58.3		9.4	49.0	49.0		25.8	25.8	25.5	25.5	
Actuated g/C Ratio	0.13	0.42		0.07	0.35	0.35		0.19	0.19	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)	238	2129		119	1792	468		655	272	295	529	
v/s Ratio Prot	c0.15	0.35		0.06	c0.37			0.01		c0.12	0.07	
v/s Ratio Perm					0.09				c0.03			
v/c Ratio	1.14	0.83		0.87	1.04	0.25		0.07	0.17	0.66	0.38	
Uniform Delay, d1	60.1	36.0		64.2	45.0	32.0		46.7	47.6	52.7	49.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	100.8	2.9		45.9	32.5	0.3		0.0	0.3	5.2	0.5	
Delay (s)	161.0	38.9		110.1	77.5	32.2		46.7	47.9	57.9	50.3	
Level of Service	F	D		F	E	C		D	D	E	D	
Approach Delay (s)		55.1			74.9			47.3			52.9	
Approach LOS		E			E			D			D	
Intersection Summary												
HCM 2000 Control Delay		63.5			HCM 2000 Level of Service			E				
HCM 2000 Volume to Capacity ratio		0.78										
Actuated Cycle Length (s)		139.0			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		94.0%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
41: Ala Moana Blvd & Ward Ave

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	218	2038	2	52	1430	240	7	110	163	306	70	274
Future Volume (vph)	218	2038	2	52	1430	240	7	110	163	306	70	274
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	0.86	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	1262		3529	1367	1610	2916	
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	1262		3529	1367	1610	2916	
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)	229	2145	2	55	1505	253	7	116	172	322	74	288
RTOR Reduction (vph)	0	0	0	0	0	126	0	0	0	0	212	0
Lane Group Flow (vph)	229	2147	0	55	1505	127	0	123	172	238	234	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)	22.9	69.1		6.0	52.2	52.2		35.0	35.0	27.8	27.8	
Effective Green, g (s)	22.9	69.1		6.0	52.2	52.2		35.0	35.0	27.8	27.8	
Actuated g/C Ratio	0.15	0.44		0.04	0.33	0.33		0.22	0.22	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)	256	2224		67	1681	417		782	303	283	513	
v/s Ratio Prot	c0.13	c0.42		0.03	0.30			0.03		c0.15	0.08	
v/s Ratio Perm					0.10				c0.13			
v/c Ratio	0.89	0.97		0.82	0.90	0.30		0.16	0.57	0.84	0.46	
Uniform Delay, d1	66.3	43.2		75.4	50.3	39.3		49.6	54.7	62.9	58.3	
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	12.0		52.9	6.6	0.4		0.1	2.4	19.6	0.6	
Delay (s)	96.4	55.2		128.3	56.9	39.8		49.7	57.1	82.6	58.9	
Level of Service	F	E		F	E	D		D	E	F	E	
Approach Delay (s)		59.2			56.6			54.0			67.1	
Approach LOS		E			E			D			E	
Intersection Summary												
HCM 2000 Control Delay		59.0			HCM 2000 Level of Service			E				
HCM 2000 Volume to Capacity ratio		0.85										
Actuated Cycle Length (s)		157.9			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		101.7%			ICU Level of Service			G				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
43: Ala Moana Park Dr/Kamakee St & Ala Moana Blvd

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	1636	93	13	1907	113	91	22	14	121	30	111
Future Volume (vph)	84	1636	93	13	1907	113	91	22	14	121	30	111
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	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.95	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.94			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	5028		1770	5025		1770	1706			1701	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.54	1.00			0.74	1.00
Satd. Flow (perm)	1770	5028		1770	5025		1009	1706			1315	1583
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)	87	1687	96	13	1966	116	94	23	14	125	31	114
RTOR Reduction (vph)	0	4	0	0	4	0	0	11	0	0	0	90
Lane Group Flow (vph)	87	1779	0	13	2078	0	94	26	0	0	156	24
Confl. Peds. (#/hr)			18			27			55	55		
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	12.0	87.7		1.8	77.5		27.8	27.8			27.8	27.8
Effective Green, g (s)	12.0	87.7		1.8	77.5		27.8	27.8			27.8	27.8
Actuated g/C Ratio	0.09	0.66		0.01	0.59		0.21	0.21			0.21	0.21
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)	160	3332		24	2943		212	358			276	332
v/s Ratio Prot	c0.05	0.35		0.01	c0.41			0.02				
v/s Ratio Perm							0.09				c0.12	0.02
v/c Ratio	0.54	0.53		0.54	0.71		0.44	0.07			0.57	0.07
Uniform Delay, d1	57.5	11.6		64.8	19.4		45.5	41.9			46.8	41.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.7	0.2		22.7	0.8		1.5	0.1			2.6	0.1
Delay (s)	61.3	11.8		87.5	20.1		47.0	42.0			49.5	42.0
Level of Service	E	B		F	C		D	D			D	D
Approach Delay (s)		14.1			20.6			45.6			46.3	
Approach LOS		B			C			D			D	
Intersection Summary												
HCM 2000 Control Delay		20.1			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.66										
Actuated Cycle Length (s)		132.3			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		82.8%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
43: Ala Moana Park Dr/Kamakee St & Ala Moana Blvd

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	2340	201	37	1619	189	62	21	47	109	57	150
Future Volume (vph)	66	2340	201	37	1619	189	62	21	47	109	57	150
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	0.99		1.00	0.99		1.00	0.93			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.95	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1770	4984		1770	4960		1770	1556			1707	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.50	1.00			0.76	1.00
Satd. Flow (perm)	1770	4984		1770	4960		941	1556			1340	1583
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)	68	2412	207	38	1669	195	64	22	48	112	59	155
RTOR Reduction (vph)	0	6	0	0	8	0	0	37	0	0	0	88
Lane Group Flow (vph)	68	2613	0	38	1856	0	64	33	0	0	171	67
Confl. Peds. (#/hr)			33			35			65	65		
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	8.7	97.1		6.6	95.0		33.6	33.6			33.6	33.6
Effective Green, g (s)	8.7	97.1		6.6	95.0		33.6	33.6			33.6	33.6
Actuated g/C Ratio	0.06	0.64		0.04	0.62		0.22	0.22			0.22	0.22
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)	101	3177		76	3093		207	343			295	349
v/s Ratio Prot	c0.04	c0.52		0.02	0.37			0.02				
v/s Ratio Perm							0.07				c0.13	0.04
v/c Ratio	0.67	0.82		0.50	0.60		0.31	0.10			0.58	0.19
Uniform Delay, d1	70.4	21.0		71.2	17.2		49.6	47.2			53.0	48.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	16.3	1.8		5.1	0.3		0.9	0.1			2.8	0.3
Delay (s)	86.7	22.9		76.3	17.5		50.5	47.4			55.8	48.6
Level of Service	F	C		E	B		D	D			E	D
Approach Delay (s)		24.5			18.7			48.9			52.4	
Approach LOS		C			B			D			D	
Intersection Summary												
HCM 2000 Control Delay		24.8			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		152.3			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		88.7%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

APPENDIX F

CAPACITY ANALYSIS CALCULATIONS

PROJECTED YEAR 2024 PEAK PERIOD TRAFFIC

ANALYSIS WITH PROJECT

HCM Signalized Intersection Capacity Analysis

15: Ward Ave & Queen St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	167	67	77	351	73	56	560	81	73	788	254
Future Volume (vph)	55	167	67	77	351	73	56	560	81	73	788	254
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	
Frbp, ped/bikes	1.00	0.96		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		0.92	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.97		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1761	1718		1633	1807		1770	3388		1770	3363	
Flt Permitted	0.25	1.00		0.53	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	470	1718		906	1807		1770	3388		1770	3363	
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)	58	176	71	81	369	77	59	589	85	77	829	267
RTOR Reduction (vph)	0	17	0	0	9	0	0	13	0	0	35	0
Lane Group Flow (vph)	58	230	0	81	437	0	59	661	0	77	1061	0
Confl. Peds. (#/hr)	15		146	146		15			144			30
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	23.3	23.3		23.3	23.3		3.6	29.2		6.2	31.8	
Effective Green, g (s)	23.3	23.3		23.3	23.3		3.6	29.2		6.2	31.8	
Actuated g/C Ratio	0.32	0.32		0.32	0.32		0.05	0.40		0.08	0.43	
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)	148	543		286	571		86	1342		148	1451	
v/s Ratio Prot		0.13			c0.24		0.03	0.20		c0.04	c0.32	
v/s Ratio Perm	0.12			0.09								
v/c Ratio	0.39	0.42		0.28	0.77		0.69	0.49		0.52	0.73	
Uniform Delay, d1	19.7	19.9		18.9	22.7		34.5	16.7		32.3	17.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.5		0.5	6.1		20.3	0.3		3.3	1.9	
Delay (s)	21.4	20.4		19.5	28.8		54.8	17.0		35.6	19.3	
Level of Service	C	C		B	C		D	B		D	B	
Approach Delay (s)		20.6			27.4			20.0			20.4	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			21.7		HCM 2000 Level of Service					C		
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			73.7		Sum of lost time (s)					15.0		
Intersection Capacity Utilization			78.1%		ICU Level of Service					D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
15: Ward Ave & Queen St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	461	111	101	441	78	79	764	129	148	788	143
Future Volume (vph)	110	461	111	101	441	78	79	764	129	148	788	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	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	0.98		1.00	0.93		1.00	0.99	
Flpb, ped/bikes	0.96	1.00		0.96	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1698	1757		1707	1783		1770	3237		1770	3406	
Flt Permitted	0.21	1.00		0.16	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	381	1757		282	1783		1770	3237		1770	3406	
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)	116	485	117	106	464	82	83	804	136	156	829	151
RTOR Reduction (vph)	0	10	0	0	7	0	0	15	0	0	16	0
Lane Group Flow (vph)	116	592	0	106	539	0	83	925	0	156	964	0
Confl. Peds. (#/hr)	136		142	142		136			294			52
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	35.0	35.0		35.0	35.0		5.5	30.6		9.0	34.1	
Effective Green, g (s)	35.0	35.0		35.0	35.0		5.5	30.6		9.0	34.1	
Actuated g/C Ratio	0.39	0.39		0.39	0.39		0.06	0.34		0.10	0.38	
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)	148	686		110	696		108	1105		177	1296	
v/s Ratio Prot		0.34			0.30		0.05	c0.29		c0.09	c0.28	
v/s Ratio Perm	0.30			c0.38								
v/c Ratio	0.78	0.86		0.96	0.77		0.77	0.84		0.88	0.74	
Uniform Delay, d1	24.0	25.1		26.7	23.8		41.4	27.2		39.8	24.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	23.2	10.9		73.7	5.4		27.3	5.7		36.3	2.4	
Delay (s)	47.2	36.0		100.4	29.2		68.8	32.9		76.1	26.3	
Level of Service	D	D		F	C		E	C		E	C	
Approach Delay (s)		37.8			40.8			35.8			33.2	
Approach LOS		D			D			D			C	
Intersection Summary												
HCM 2000 Control Delay		36.3			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio		0.90										
Actuated Cycle Length (s)		89.6			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		89.3%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
16: Kamakee St & Queen St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	261	40	143	342	26	20	100	69	22	177	74
Future Volume (vph)	43	261	40	143	342	26	20	100	69	22	177	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes		0.99		1.00	1.00			0.99			0.98	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.98		1.00	0.99			0.95			0.96	
Flt Protected		0.99		0.95	1.00			0.99			1.00	
Satd. Flow (prot)		3430		1770	3497			3297			3324	
Flt Permitted		0.86		0.95	1.00			0.91			0.92	
Satd. Flow (perm)		2967		1770	3497			3002			3078	
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)	45	272	42	149	356	27	21	104	72	23	184	77
RTOR Reduction (vph)	0	10	0	0	6	0	0	50	0	0	31	0
Lane Group Flow (vph)	0	349	0	149	377	0	0	147	0	0	253	0
Confl. Peds. (#/hr)	12		64			12	73		5	5		73
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Actuated Green, G (s)		14.6		8.6	28.2			17.3			17.3	
Effective Green, g (s)		14.6		8.6	28.2			17.3			17.3	
Actuated g/C Ratio		0.26		0.15	0.51			0.31			0.31	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		780		274	1776			935			959	
v/s Ratio Prot				c0.08	0.11							
v/s Ratio Perm		c0.12						0.05			c0.08	
v/c Ratio		0.45		0.54	0.21			0.16			0.26	
Uniform Delay, d1		17.1		21.6	7.5			13.8			14.3	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.4		2.2	0.1			0.1			0.1	
Delay (s)		17.5		23.8	7.6			13.9			14.5	
Level of Service		B		C	A			B			B	
Approach Delay (s)		17.5			12.1			13.9			14.5	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay		14.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.39										
Actuated Cycle Length (s)		55.5			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		69.8%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
16: Kamakee St & Queen St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	526	86	250	550	40	23	118	77	67	152	31
Future Volume (vph)	64	526	86	250	550	40	23	118	77	67	152	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes		0.98		1.00	1.00			0.99			0.96	
Flpb, ped/bikes		1.00		1.00	1.00			0.98			1.00	
Frt		0.98		1.00	0.99			0.95			0.98	
Flt Protected		1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)		3375		1770	3495			3234			3287	
Flt Permitted		0.83		0.95	1.00			0.90			0.80	
Satd. Flow (perm)		2814		1770	3495			2920			2662	
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)	67	548	90	260	573	42	24	123	80	70	158	32
RTOR Reduction (vph)	0	11	0	0	6	0	0	60	0	0	9	0
Lane Group Flow (vph)	0	694	0	260	609	0	0	167	0	0	251	0
Confl. Peds. (#/hr)	15		117			15	127		8	8		127
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Actuated Green, G (s)		27.9		17.5	50.4			15.5			15.5	
Effective Green, g (s)		27.9		17.5	50.4			15.5			15.5	
Actuated g/C Ratio		0.37		0.23	0.66			0.20			0.20	
Clearance Time (s)		5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		1034		408	2320			596			543	
v/s Ratio Prot				c0.15	0.17							
v/s Ratio Perm		c0.25						0.06			c0.09	
v/c Ratio		0.67		0.64	0.26			0.28			0.46	
Uniform Delay, d1		20.2		26.3	5.2			25.5			26.5	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		1.7		3.3	0.1			0.3			0.6	
Delay (s)		21.9		29.6	5.2			25.8			27.2	
Level of Service		C		C	A			C			C	
Approach Delay (s)		21.9			12.5			25.8			27.2	
Approach LOS		C			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			19.0		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			75.9		Sum of lost time (s)					15.0		
Intersection Capacity Utilization			74.7%		ICU Level of Service					D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
17: Queens Ln & Queen St

06/16/2020

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	342	17	102	423	33	104
Future Volume (Veh/h)	342	17	102	423	33	104
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	380	19	113	470	37	116
Pedestrians					8	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type	TWLT			None		
Median storage veh	2					
Upstream signal (ft)	564			680		
pX, platoon unblocked						
vC, conflicting volume			407		858	208
vC1, stage 1 conf vol					398	
vC2, stage 2 conf vol					461	
vCu, unblocked vol			407		858	208
tC, single (s)			4.1		*5.8	*5.9
tC, 2 stage (s)					4.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			90		93	86
cM capacity (veh/h)			1141		540	842
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	253	146	113	235	235	153
Volume Left	0	0	113	0	0	37
Volume Right	0	19	0	0	0	116
cSH	1700	1700	1141	1700	1700	742
Volume to Capacity	0.15	0.09	0.10	0.14	0.14	0.21
Queue Length 95th (ft)	0	0	8	0	0	19
Control Delay (s)	0.0	0.0	8.5	0.0	0.0	11.1
Lane LOS			A			B
Approach Delay (s)	0.0		1.6			11.1
Approach LOS						B
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization			34.7%		ICU Level of Service	A
Analysis Period (min)			15			
* User Entered Value						

HCM Unsignalized Intersection Capacity Analysis
17: Queens Ln & Queen St

06/16/2020

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↱		↱	↑↑	↱↲	
Traffic Volume (veh/h)	735	53	127	817	49	243
Future Volume (Veh/h)	735	53	127	817	49	243
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	774	56	134	860	52	256
Pedestrians					27	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type	TW	LT		None		
Median storage veh)	2					
Upstream signal (ft)	564			687		
pX, platoon unblocked			0.90		0.90	0.90
vC, conflicting volume			857		1527	442
vC1, stage 1 conf vol					829	
vC2, stage 2 conf vol					698	
vCu, unblocked vol			623		1366	163
tC, single (s)			4.1		*5.8	*5.9
tC, 2 stage (s)					4.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			84		86	68
cM capacity (veh/h)			841		374	788
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	516	314	134	430	430	308
Volume Left	0	0	134	0	0	52
Volume Right	0	56	0	0	0	256
cSH	1700	1700	841	1700	1700	664
Volume to Capacity	0.30	0.18	0.16	0.25	0.25	0.46
Queue Length 95th (ft)	0	0	14	0	0	62
Control Delay (s)	0.0	0.0	10.1	0.0	0.0	15.0
Lane LOS			B			C
Approach Delay (s)	0.0		1.4			15.0
Approach LOS						C
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			56.9%		ICU Level of Service	B
Analysis Period (min)			15			
* User Entered Value						

HCM Signalized Intersection Capacity Analysis
24: Ward Ave & Halekauwila St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↱	↑			↕		↱	↑↑		↱	↑↑	
Traffic Volume (vph)	112	50	19	22	59	35	31	522	17	42	621	226
Future Volume (vph)	112	50	19	22	59	35	31	522	17	42	621	226
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	0.98			0.98		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00			1.00		0.97	1.00		1.00	1.00	
Frt	1.00	0.96			0.96		1.00	1.00		1.00	0.96	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1757			1741		1718	3515		1770	3284	
Flt Permitted	0.80	1.00			0.94		0.28	1.00		0.44	1.00	
Satd. Flow (perm)	1488	1757			1656		508	3515		827	3284	
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)	115	52	20	23	61	36	32	538	18	43	640	233
RTOR Reduction (vph)	0	14	0	0	19	0	0	3	0	0	43	0
Lane Group Flow (vph)	115	58	0	0	101	0	32	553	0	43	830	0
Confl. Peds. (#/hr)			78			47	85		47			85
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)	14.8	14.8			14.8		25.6	25.6		25.6	25.6	
Effective Green, g (s)	14.8	14.8			14.8		25.6	25.6		25.6	25.6	
Actuated g/C Ratio	0.29	0.29			0.29		0.51	0.51		0.51	0.51	
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)	436	515			486		258	1785		420	1668	
v/s Ratio Prot		0.03						0.16			c0.25	
v/s Ratio Perm	c0.08				0.06		0.06			0.05		
v/c Ratio	0.26	0.11			0.21		0.12	0.31		0.10	0.50	
Uniform Delay, d1	13.6	13.0			13.4		6.5	7.2		6.4	8.2	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.1			0.2		0.2	0.1		0.1	0.2	
Delay (s)	14.0	13.1			13.6		6.7	7.3		6.5	8.4	
Level of Service	B	B			B		A	A		A	A	
Approach Delay (s)		13.6			13.6			7.3			8.3	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		8.9			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.41										
Actuated Cycle Length (s)		50.4			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		62.7%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
24: Ward Ave & Halekauwila St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	277	91	91	17	42	22	38	611	26	58	749	118
Future Volume (vph)	277	91	91	17	42	22	38	611	26	58	749	118
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	
Flpb, ped/bikes	1.00	0.93			0.96		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	0.88	1.00			0.98		0.94	1.00		0.93	1.00	
Frt	1.00	0.93			0.96		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1552	1603			1669		1671	3494		1652	3345	
Flt Permitted	0.70	1.00			0.93		0.22	1.00		0.34	1.00	
Satd. Flow (perm)	1147	1603			1575		379	3494		593	3345	
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)	289	95	95	18	44	23	40	636	27	60	780	123
RTOR Reduction (vph)	0	18	0	0	13	0	0	4	0	0	14	0
Lane Group Flow (vph)	289	172	0	0	72	0	40	659	0	60	889	0
Confl. Peds. (#/hr)	121		185	185		121	160		121	121		160
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)	26.0	26.0			26.0		24.9	24.9		24.9	24.9	
Effective Green, g (s)	26.0	26.0			26.0		24.9	24.9		24.9	24.9	
Actuated g/C Ratio	0.43	0.43			0.43		0.41	0.41		0.41	0.41	
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)	489	684			672		154	1428		242	1367	
v/s Ratio Prot		0.11						0.19			c0.27	
v/s Ratio Perm	c0.25				0.05		0.11			0.10		
v/c Ratio	0.59	0.25			0.11		0.26	0.46		0.25	0.65	
Uniform Delay, d1	13.4	11.2			10.5		11.9	13.1		11.8	14.5	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	0.2			0.1		0.9	0.2		0.5	1.1	
Delay (s)	15.3	11.4			10.5		12.8	13.4		12.4	15.6	
Level of Service	B	B			B		B	B		B	B	
Approach Delay (s)		13.7			10.5			13.3			15.4	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay		14.2			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.62										
Actuated Cycle Length (s)		60.9			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		63.3%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
25: Cooke St & Pohukaina St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	86	87	16	54	148	120	27	164	37	39	173	139
Future Volume (vph)	86	87	16	54	148	120	27	164	37	39	173	139
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)	92	94	17	58	159	129	29	176	40	42	186	149
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	203	346	117	128	135	242						
Volume Left (vph)	92	58	29	0	42	0						
Volume Right (vph)	17	129	0	40	0	149						
Hadj (s)	0.07	-0.16	0.16	-0.18	0.19	-0.40						
Departure Headway (s)	6.5	5.9	7.1	6.8	6.9	6.3						
Degree Utilization, x	0.37	0.57	0.23	0.24	0.26	0.43						
Capacity (veh/h)	506	574	456	485	487	535						
Control Delay (s)	13.2	16.6	11.1	10.7	11.2	12.7						
Approach Delay (s)	13.2	16.6	10.9		12.2							
Approach LOS	B	C	B		B							
Intersection Summary												
Delay		13.4										
Level of Service		B										
Intersection Capacity Utilization		52.8%		ICU Level of Service				A				
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis
25: Cooke St & Pohukaina St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	166	176	42	76	113	68	22	181	76	102	271	136
Future Volume (vph)	166	176	42	76	113	68	22	181	76	102	271	136
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	171	181	43	78	116	70	23	187	78	105	279	140
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	395	264	117	172	245	280						
Volume Left (vph)	171	78	23	0	105	0						
Volume Right (vph)	43	70	0	78	0	140						
Hadj (s)	0.06	-0.07	0.13	-0.28	0.25	-0.32						
Departure Headway (s)	7.1	7.5	8.3	7.9	8.0	7.4						
Degree Utilization, x	0.78	0.55	0.27	0.37	0.54	0.57						
Capacity (veh/h)	485	445	393	411	434	462						
Control Delay (s)	31.4	19.1	13.1	14.3	18.7	18.6						
Approach Delay (s)	31.4	19.1	13.8		18.7							
Approach LOS	D	C	B		C							
Intersection Summary												
Delay			21.2									
Level of Service			C									
Intersection Capacity Utilization			70.5%		ICU Level of Service		C					
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
34: Ward Ave & Pohukaina St/Auahi St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	41	76	100	117	143	68	338	42	61	455	70
Future Volume (vph)	42	41	76	100	117	143	68	338	42	61	455	70
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		0.97	1.00		0.97	1.00		0.98	1.00	
Frt	1.00	0.90		1.00	0.92		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1759	1626		1710	1690		1708	3461		1731	3425	
Flt Permitted	0.59	1.00		0.68	1.00		0.45	1.00		0.52	1.00	
Satd. Flow (perm)	1097	1626		1222	1690		805	3461		945	3425	
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)	44	43	79	104	122	149	71	352	44	64	474	73
RTOR Reduction (vph)	0	55	0	0	60	0	0	12	0	0	15	0
Lane Group Flow (vph)	44	67	0	104	211	0	71	384	0	64	532	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)	9.7	9.7		9.7	9.7		12.1	12.1		12.1	12.1	
Effective Green, g (s)	9.7	9.7		9.7	9.7		12.1	12.1		12.1	12.1	
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.38	0.38		0.38	0.38	
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)	334	495		372	515		306	1316		359	1303	
v/s Ratio Prot		0.04			c0.12			0.11			c0.16	
v/s Ratio Perm	0.04			0.09			0.09			0.07		
v/c Ratio	0.13	0.14		0.28	0.41		0.23	0.29		0.18	0.41	
Uniform Delay, d1	8.0	8.0		8.4	8.8		6.7	6.9		6.5	7.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1		0.4	0.5		0.4	0.1		0.2	0.2	
Delay (s)	8.2	8.1		8.8	9.3		7.1	7.0		6.8	7.4	
Level of Service	A	A		A	A		A	A		A	A	
Approach Delay (s)		8.1			9.2			7.0			7.4	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		7.8		HCM 2000 Level of Service					A			
HCM 2000 Volume to Capacity ratio		0.41										
Actuated Cycle Length (s)		31.8		Sum of lost time (s)					10.0			
Intersection Capacity Utilization		54.9%		ICU Level of Service					A			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
34: Ward Ave & Pohukaina St/Auahi St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	105	74	225	91	272	71	362	75	126	424	125
Future Volume (vph)	49	105	74	225	91	272	71	362	75	126	424	125
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	0.90		1.00	0.98		1.00	0.97	
Flpb, ped/bikes	0.94	1.00		0.94	1.00		0.97	1.00		0.94	1.00	
Frt	1.00	0.94		1.00	0.89		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1657	1687		1670	1492		1718	3369		1657	3324	
Flt Permitted	0.43	1.00		0.63	1.00		0.38	1.00		0.46	1.00	
Satd. Flow (perm)	749	1687		1116	1492		682	3369		804	3324	
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)	54	115	81	247	100	299	78	398	82	138	466	137
RTOR Reduction (vph)	0	30	0	0	56	0	0	20	0	0	32	0
Lane Group Flow (vph)	54	166	0	247	343	0	78	460	0	138	571	0
Confl. Peds. (#/hr)	200		122	122		200	66		194	194		96
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)	25.9	25.9		25.9	25.9		24.4	24.4		24.4	24.4	
Effective Green, g (s)	25.9	25.9		25.9	25.9		24.4	24.4		24.4	24.4	
Actuated g/C Ratio	0.43	0.43		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		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)	321	724		479	640		275	1363		325	1345	
v/s Ratio Prot		0.10			c0.23			0.14			c0.17	
v/s Ratio Perm	0.07			0.22			0.11			0.17		
v/c Ratio	0.17	0.23		0.52	0.54		0.28	0.34		0.42	0.42	
Uniform Delay, d1	10.6	10.9		12.6	12.7		12.1	12.4		12.9	12.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2		0.9	0.9		0.6	0.1		0.9	0.2	
Delay (s)	10.8	11.0		13.5	13.6		12.6	12.5		13.8	13.1	
Level of Service	B	B		B	B		B	B		B	B	
Approach Delay (s)		11.0			13.6			12.5			13.2	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay		12.9			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.48										
Actuated Cycle Length (s)		60.3			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												

HCM Signalized Intersection Capacity Analysis
35: Kamakee St & Auahi St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	101	47	12	67	43	40	135	31	23	227	128
Future Volume (vph)	32	101	47	12	67	43	40	135	31	23	227	128
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	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	0.95	1.00	0.96	1.00	0.96	1.00	0.92
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1746		1770	1863	1509	1692	1863	1514	1735	1863	1457
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.61	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	1770	1746		1770	1863	1509	1090	1863	1514	1218	1863	1457
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)	33	105	49	12	70	45	42	141	32	24	236	133
RTOR Reduction (vph)	0	24	0	0	0	33	0	0	19	0	0	78
Lane Group Flow (vph)	33	130	0	13	70	12	42	141	13	24	236	55
Confl. Peds. (#/hr)			51			36	63		25	25		63
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		4
Actuated Green, G (s)	1.7	15.1		0.5	13.9	13.9	21.5	21.5	21.5	21.5	21.5	21.5
Effective Green, g (s)	1.7	15.1		0.5	13.9	13.9	21.5	21.5	21.5	21.5	21.5	21.5
Actuated g/C Ratio	0.03	0.29		0.01	0.27	0.27	0.41	0.41	0.41	0.41	0.41	0.41
Clearance Time (s)	5.0	5.0		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	3.0	3.0
Lane Grp Cap (vph)	57	506		16	497	402	449	768	624	502	768	601
v/s Ratio Prot	c0.02	c0.07		0.01	0.04			0.08			c0.13	
v/s Ratio Perm						0.01	0.04		0.01	0.02		0.04
v/c Ratio	0.58	0.26		0.81	0.14	0.03	0.09	0.18	0.02	0.05	0.31	0.09
Uniform Delay, d1	24.8	14.2		25.8	14.6	14.1	9.3	9.7	9.1	9.2	10.3	9.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.5	0.3		132.2	0.1	0.0	0.1	0.1	0.0	0.0	0.2	0.1
Delay (s)	38.3	14.5		157.9	14.7	14.1	9.4	9.8	9.1	9.2	10.5	9.4
Level of Service	D	B		F	B	B	A	A	A	A	B	A
Approach Delay (s)		18.7			29.0			9.6			10.1	
Approach LOS		B			C			A			B	
Intersection Summary												
HCM 2000 Control Delay		14.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.31										
Actuated Cycle Length (s)		52.1			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		59.8%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
35: Kamakee St & Auahi St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	235	56	36	151	37	96	150	46	55	215	176
Future Volume (vph)	66	235	56	36	151	37	96	150	46	55	215	176
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	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	0.76	1.00	1.00	0.82	1.00	1.00	0.77
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.87	1.00	1.00	0.86	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1753		1770	1863	1201	1540	1863	1292	1530	1863	1212
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.56	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	1770	1753		1770	1863	1201	914	1863	1292	1063	1863	1212
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	67	240	57	37	154	38	98	153	47	56	219	180
RTOR Reduction (vph)	0	10	0	0	0	23	0	0	33	0	0	127
Lane Group Flow (vph)	67	287	0	37	154	15	98	153	14	56	219	53
Confl. Peds. (#/hr)			153			218	120		114	114		143
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		4
Actuated Green, G (s)	6.2	31.7		3.1	28.6	28.6	20.6	20.6	20.6	20.6	20.6	20.6
Effective Green, g (s)	6.2	31.7		3.1	28.6	28.6	20.6	20.6	20.6	20.6	20.6	20.6
Actuated g/C Ratio	0.09	0.45		0.04	0.41	0.41	0.29	0.29	0.29	0.29	0.29	0.29
Clearance Time (s)	5.0	5.0		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	3.0	3.0
Lane Grp Cap (vph)	155	789		77	756	487	267	545	378	311	545	354
v/s Ratio Prot	c0.04	c0.16		0.02	0.08			0.08			c0.12	
v/s Ratio Perm						0.01	0.11		0.01	0.05		0.04
v/c Ratio	0.43	0.36		0.48	0.20	0.03	0.37	0.28	0.04	0.18	0.40	0.15
Uniform Delay, d1	30.4	12.7		32.9	13.5	12.6	19.7	19.2	17.8	18.6	20.0	18.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.3		4.7	0.1	0.0	0.9	0.3	0.0	0.3	0.5	0.2
Delay (s)	32.4	13.0		37.5	13.7	12.6	20.6	19.5	17.8	18.9	20.4	18.6
Level of Service	C	B		D	B	B	C	B	B	B	C	B
Approach Delay (s)		16.6			17.3			19.6			19.5	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay		18.4			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.40										
Actuated Cycle Length (s)		70.4			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		73.1%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
36: Queens Lane/Queens Ln & Auahi St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	4	24	0	0	0	81	78	8	6	41	61
Future Volume (vph)	53	4	24	0	0	0	81	78	8	6	41	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
Lane Util. Factor		1.00	1.00				1.00	1.00				1.00
Frpb, ped/bikes		1.00	0.98				1.00	1.00				0.94
Flpb, ped/bikes		0.97	1.00				1.00	1.00				1.00
Frt		1.00	0.85				1.00	0.99				0.92
Flt Protected		0.96	1.00				0.95	1.00				1.00
Satd. Flow (prot)		1726	1546				1770	1830				1614
Flt Permitted		0.96	1.00				0.95	1.00				0.99
Satd. Flow (perm)		1726	1546				1770	1830				1601
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)	56	4	25	0	0	0	85	82	8	6	43	64
RTOR Reduction (vph)	0	0	21	0	0	0	0	3	0	0	38	0
Lane Group Flow (vph)	0	60	4	0	0	0	85	87	0	0	75	0
Confl. Peds. (#/hr)	23		14	14		23			21	21		60
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2			6	
Permitted Phases	4		4							6		
Actuated Green, G (s)		8.5	8.5				6.3	31.8			20.5	
Effective Green, g (s)		8.5	8.5				6.3	31.8			20.5	
Actuated g/C Ratio		0.17	0.17				0.13	0.63			0.41	
Clearance Time (s)		5.0	5.0				5.0	5.0			5.0	
Vehicle Extension (s)		3.0	3.0				3.0	3.0			3.0	
Lane Grp Cap (vph)		291	261				221	1156			652	
v/s Ratio Prot							c0.05	0.05				
v/s Ratio Perm		0.03	0.00								c0.05	
v/c Ratio		0.21	0.02				0.38	0.08			0.12	
Uniform Delay, d1		18.0	17.4				20.2	3.6			9.3	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		0.4	0.0				1.1	0.0			0.1	
Delay (s)		18.3	17.4				21.3	3.6			9.3	
Level of Service		B	B				C	A			A	
Approach Delay (s)		18.1			0.0			12.2			9.3	
Approach LOS		B			A			B			A	
Intersection Summary												
HCM 2000 Control Delay		12.7					HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio		0.18										
Actuated Cycle Length (s)		50.3					Sum of lost time (s)				15.0	
Intersection Capacity Utilization		34.9%					ICU Level of Service				A	
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

36: Queens Lane/Queens Ln & Auahi St

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	7	132	0	0	0	109	115	11	3	95	90
Future Volume (vph)	148	7	132	0	0	0	109	115	11	3	95	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0				5.0	5.0			5.0	
Lane Util. Factor		1.00	1.00				1.00	1.00			1.00	
Frpb, ped/bikes		1.00	0.95				1.00	0.99			0.90	
Flpb, ped/bikes		0.88	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	0.99			0.94	
Flt Protected		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (prot)		1572	1497				1770	1817			1573	
Flt Permitted		0.95	1.00				0.95	1.00			1.00	
Satd. Flow (perm)		1572	1497				1770	1817			1569	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	149	7	133	0	0	0	110	116	11	3	96	91
RTOR Reduction (vph)	0	0	100	0	0	0	0	4	0	0	36	0
Lane Group Flow (vph)	0	156	33	0	0	0	110	123	0	0	154	0
Confl. Peds. (#/hr)	80		48	48		80			77	77		120
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2			6	
Permitted Phases	4		4							6		
Actuated Green, G (s)		13.6	13.6				7.2	31.0			18.8	
Effective Green, g (s)		13.6	13.6				7.2	31.0			18.8	
Actuated g/C Ratio		0.25	0.25				0.13	0.57			0.34	
Clearance Time (s)		5.0	5.0				5.0	5.0			5.0	
Vehicle Extension (s)		3.0	3.0				3.0	3.0			3.0	
Lane Grp Cap (vph)		391	372				233	1031			540	
v/s Ratio Prot							c0.06	0.07				
v/s Ratio Perm		0.10	0.02								c0.10	
v/c Ratio		0.40	0.09				0.47	0.12			0.29	
Uniform Delay, d1		17.1	15.7				21.9	5.5			13.0	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		0.7	0.1				1.5	0.1			0.3	
Delay (s)		17.8	15.8				23.5	5.5			13.3	
Level of Service		B	B				C	A			B	
Approach Delay (s)		16.9			0.0			13.8			13.3	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		14.9					HCM 2000 Level of Service		B			
HCM 2000 Volume to Capacity ratio		0.36										
Actuated Cycle Length (s)		54.6					Sum of lost time (s)		15.0			
Intersection Capacity Utilization		57.1%					ICU Level of Service		B			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

41: Ala Moana Blvd & Ward Ave

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	259	1685	12	99	1776	194	2	41	44	265	118	207
Future Volume (vph)	259	1685	12	99	1776	194	2	41	44	265	118	207
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	0.84		1.00	0.93	1.00	0.94	
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	1330		3531	1470	1610	2908	
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	1330		3531	1470	1610	2908	
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)	273	1774	13	104	1869	204	2	43	46	279	124	218
RTOR Reduction (vph)	0	1	0	0	0	84	0	0	0	0	144	0
Lane Group Flow (vph)	273	1786	0	104	1869	120	0	45	46	215	262	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)	18.7	58.2		9.3	48.8	48.8		25.8	25.8	25.8	25.8	
Effective Green, g (s)	18.7	58.2		9.3	48.8	48.8		25.8	25.8	25.8	25.8	
Actuated g/C Ratio	0.13	0.42		0.07	0.35	0.35		0.19	0.19	0.19	0.19	
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)	237	2124		118	1783	466		654	272	298	539	
v/s Ratio Prot	c0.15	0.35		0.06	c0.37			0.01		c0.13	0.09	
v/s Ratio Perm						0.09			c0.03			
v/c Ratio	1.15	0.84		0.88	1.05	0.26		0.07	0.17	0.72	0.49	
Uniform Delay, d1	60.2	36.3		64.4	45.1	32.2		46.7	47.6	53.3	50.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	105.6	3.2		48.1	35.2	0.3		0.0	0.3	8.3	0.7	
Delay (s)	165.8	39.5		112.5	80.4	32.5		46.8	47.9	61.6	51.4	
Level of Service	F	D		F	F	C		D	D	E	D	
Approach Delay (s)		56.2			77.4			47.4			54.9	
Approach LOS		E			E			D			D	
Intersection Summary												
HCM 2000 Control Delay		65.2					HCM 2000 Level of Service		E			
HCM 2000 Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		139.1					Sum of lost time (s)		20.0			
Intersection Capacity Utilization		94.4%					ICU Level of Service		F			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
41: Ala Moana Blvd & Ward Ave

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	2045	2	52	1442	253	7	110	163	326	70	276
Future Volume (vph)	223	2045	2	52	1442	253	7	110	163	326	70	276
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	0.86	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	1261		3529	1367	1610	2922	
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	1261		3529	1367	1610	2922	
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)	235	2153	2	55	1518	266	7	116	172	343	74	291
RTOR Reduction (vph)	0	0	0	0	0	133	0	0	0	0	195	0
Lane Group Flow (vph)	235	2155	0	55	1518	133	0	123	172	247	266	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)	22.0	69.0		6.0	53.0	53.0		35.0	35.0	28.2	28.2	
Effective Green, g (s)	22.0	69.0		6.0	53.0	53.0		35.0	35.0	28.2	28.2	
Actuated g/C Ratio	0.14	0.44		0.04	0.34	0.34		0.22	0.22	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)	246	2217		67	1703	422		780	302	286	520	
v/s Ratio Prot	c0.13	c0.42		0.03	0.30			0.03		c0.15	0.09	
v/s Ratio Perm						0.11			c0.13			
v/c Ratio	0.96	0.97		0.82	0.89	0.32		0.16	0.57	0.86	0.51	
Uniform Delay, d1	67.6	43.7		75.6	49.9	39.1		49.7	54.9	63.1	58.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	44.7	13.1		52.9	6.3	0.4		0.1	2.5	22.6	0.9	
Delay (s)	112.3	56.8		128.5	56.2	39.5		49.8	57.3	85.7	59.6	
Level of Service	F	E		F	E	D		D	E	F	E	
Approach Delay (s)		62.3			56.0			54.2			68.7	
Approach LOS		E			E			D			E	
Intersection Summary												
HCM 2000 Control Delay		60.5			HCM 2000 Level of Service			E				
HCM 2000 Volume to Capacity ratio		0.86										
Actuated Cycle Length (s)		158.2			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		102.0%			ICU Level of Service			G				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
43: Ala Moana Park Dr/Kamakee St & Ala Moana Blvd

06/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	1702	93	13	1917	113	91	22	14	121	30	111
Future Volume (vph)	84	1702	93	13	1917	113	91	22	14	121	30	111
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	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.95	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.94			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	5030		1770	5026		1770	1706			1700	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.54	1.00			0.74	1.00
Satd. Flow (perm)	1770	5030		1770	5026		1006	1706			1315	1583
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)	87	1755	96	13	1976	116	94	23	14	125	31	114
RTOR Reduction (vph)	0	3	0	0	4	0	0	11	0	0	0	90
Lane Group Flow (vph)	87	1848	0	13	2088	0	94	26	0	0	156	24
Confl. Peds. (#/hr)			18			27			55	55		
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	12.0	88.4		1.8	78.2		27.8	27.8			27.8	27.8
Effective Green, g (s)	12.0	88.4		1.8	78.2		27.8	27.8			27.8	27.8
Actuated g/C Ratio	0.09	0.66		0.01	0.59		0.21	0.21			0.21	0.21
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)	159	3343		23	2955		210	356			274	330
v/s Ratio Prot	c0.05	c0.37		0.01	c0.42			0.02				
v/s Ratio Perm							0.09				c0.12	0.02
v/c Ratio	0.55	0.55		0.57	0.71		0.45	0.07			0.57	0.07
Uniform Delay, d1	57.9	11.8		65.2	19.3		45.9	42.2			47.2	42.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.8	0.2		28.1	0.8		1.5	0.1			2.7	0.1
Delay (s)	61.7	12.0		93.3	20.1		47.4	42.3			49.9	42.3
Level of Service	E	B		F	C		D	D			D	D
Approach Delay (s)		14.3			20.6			46.0			46.7	
Approach LOS		B			C			D			D	
Intersection Summary												
HCM 2000 Control Delay		20.1			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.66										
Actuated Cycle Length (s)		133.0			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		83.0%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	2367	201	37	1644	189	62	21	47	109	57	150
Future Volume (vph)	66	2367	201	37	1644	189	62	21	47	109	57	150
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	0.99		1.00	0.99		1.00	0.93			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.95	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1770	4985		1770	4962		1770	1556			1707	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.50	1.00			0.76	1.00
Satd. Flow (perm)	1770	4985		1770	4962		939	1556			1340	1583
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)	68	2440	207	38	1695	195	64	22	48	112	59	155
RTOR Reduction (vph)	0	6	0	0	8	0	0	37	0	0	0	87
Lane Group Flow (vph)	68	2641	0	38	1882	0	64	33	0	0	171	68
Confl. Peds. (#/hr)			33			35			65	65		
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	8.7	97.6		6.6	95.5		33.6	33.6			33.6	33.6
Effective Green, g (s)	8.7	97.6		6.6	95.5		33.6	33.6			33.6	33.6
Actuated g/C Ratio	0.06	0.64		0.04	0.62		0.22	0.22			0.22	0.22
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)	100	3184		76	3101		206	342			294	348
v/s Ratio Prot	c0.04	c0.53		0.02	0.38			0.02				
v/s Ratio Perm							0.07				c0.13	0.04
v/c Ratio	0.68	0.83		0.50	0.61		0.31	0.10			0.58	0.19
Uniform Delay, d1	70.7	21.2		71.5	17.3		49.9	47.5			53.3	48.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	17.3	1.9		5.1	0.3		0.9	0.1			2.9	0.3
Delay (s)	88.0	23.1		76.6	17.6		50.8	47.6			56.2	48.8
Level of Service	F	C		E	B		D	D			E	D
Approach Delay (s)		24.7			18.8			49.1			52.7	
Approach LOS		C			B			D			D	
Intersection Summary												
HCM 2000 Control Delay		24.9			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		152.8			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		88.7%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												