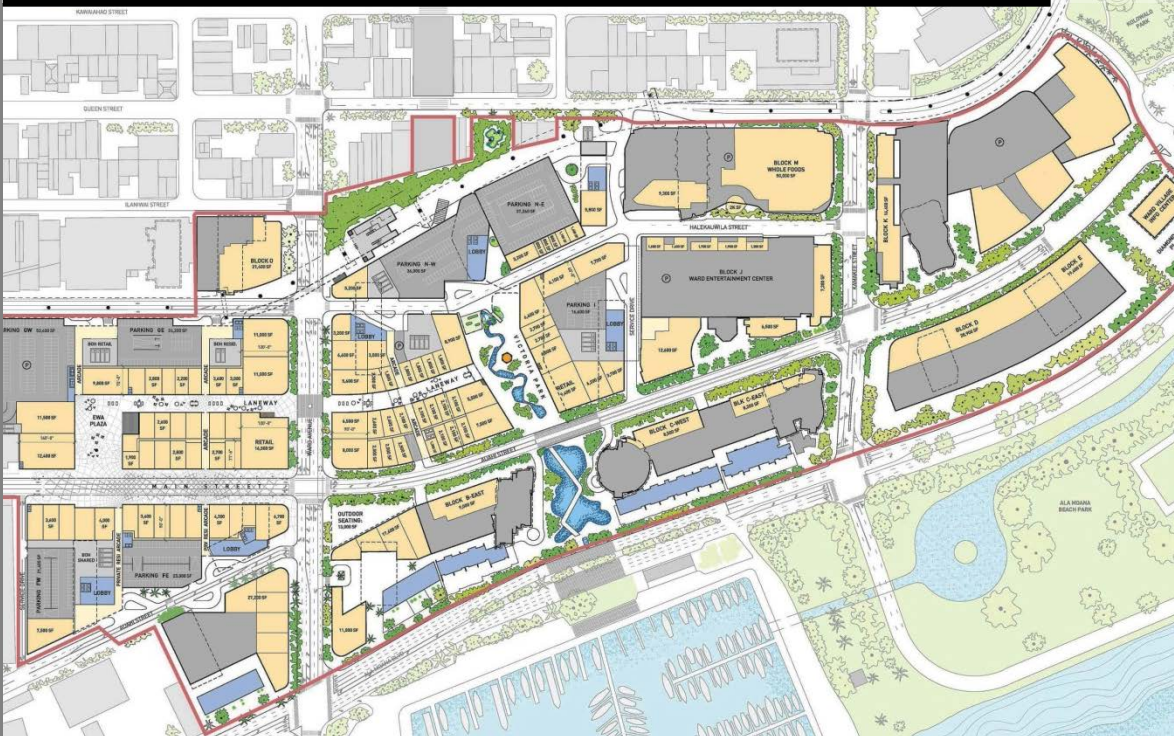


# Transportation Master Plan

## Ward Villages Master Plan



Prepared For  
**The Howard Hughes  
Corporation**

Prepared By  
**Wilson Okamoto  
Corporation**

**May 2016**

***TRANSPORTATION MASTER PLAN***  
***FOR THE***  
***WARD VILLAGES MASTER PLAN***

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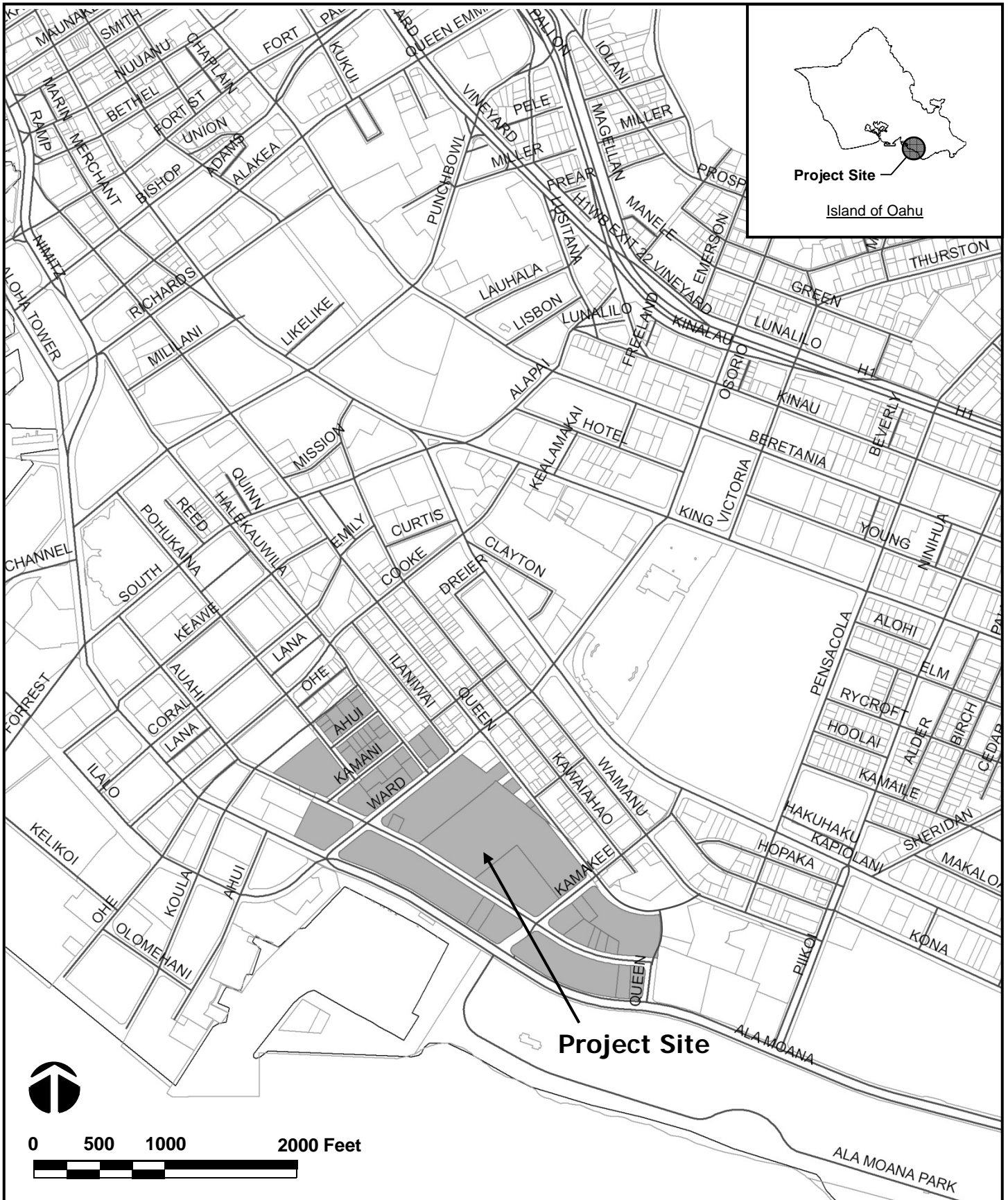
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**I. INTRODUCTION**

The purpose of this study is to assess traffic conditions in the Kaakako area on the island of Oahu with construction of the proposed Ward Villages Master Plan. The project site currently encompasses Ward Warehouse, Ward Centre, Ward Entertainment Center, Ward Village Shops, and other surrounding commercial and office buildings. The project site is bounded by Ala Moana Boulevard to the south, Koula Street to the west, Kapiolani Boulevard to the north, and Queen Lane to the east (see Figure 1). The proposed project entails the replacement of all of the existing uses as detailed in Table 1 except for Ward Entertainment Center and recently completed portions of Ward Village Shops. This report is an update of the “Transportation Plan for the Victoria Ward Master Plan” dated October 2012 to accommodate updates to the project’s development plan.

**Table 1: Victoria Ward Development Plan**

<b>Phase</b>	<b>Block</b>	<b>Proposed Land Uses</b>
Phase 1A (Expected completion by Year 2017)	C East	<ul style="list-style-type: none"> <li>• 176 Multi-family residential units</li> <li>• 8,209 square feet (sq ft) of restaurant space</li> <li>• Vehicular access provided via Auahi St</li> </ul>
	K	<ul style="list-style-type: none"> <li>• 318 Multi-family residential units</li> <li>• 4,095 sq ft of retail space</li> <li>• 13,000 sq feet of restaurant space</li> <li>• Vehicular access provided via Auahi St and Queen St</li> </ul>
Phase 1B (Expected completion by Year 2019)	M	<ul style="list-style-type: none"> <li>• 466 Multi-family residential units</li> <li>• 72,073 sq ft of retail space</li> <li>• 9,326 sq ft of restaurant space</li> <li>• A new parking garage for District Parking</li> <li>• Vehicular access provided via the Halekauwila Street Extension, and Queen St</li> </ul>
	O	<ul style="list-style-type: none"> <li>• 424 Multi-family residential units</li> <li>• 29,643 sq ft of retail space</li> <li>• Vehicular access provided via Ilaniwai St and Halekauwila St</li> </ul>



**WARD VILLAGES MASTER PLAN**  
**LOCATION AND VICINITY MAP**

**FIGURE**  
**1**

**Table 1: Victoria Ward Development Plan (Cont'd)**

<b>Phase</b>	<b>Block</b>	<b>Proposed Land Uses</b>
Phase 2 (Expected completion by Year 2021)	I	<ul style="list-style-type: none"> <li>• 600 Multi-family residential units</li> <li>• 37,500 sq ft of retail space</li> <li>• 37,500 sq ft of restaurant space</li> <li>• Vehicular access provided via the Halekauwila Street Extension</li> </ul>
	C West	<ul style="list-style-type: none"> <li>• 126 Multi-family residential units</li> <li>• 5,000 sq ft of retail space</li> <li>• 5,000 sq ft of restaurant space</li> <li>• Vehicular access provided via Auahi St</li> </ul>
	N East	<ul style="list-style-type: none"> <li>• 750 Multi-family residential units</li> <li>• 15,000 sq ft of retail space</li> <li>• 5,000 sq ft of restaurant space</li> <li>• Vehicular access provided via the Halekauwila Street Extension</li> </ul>
Phase 3 (Expected completion by Year 2023)	A	<ul style="list-style-type: none"> <li>• 227 Multi-family residential units</li> <li>• 15,000 sq ft of retail space</li> <li>• 5,000 sq ft of restaurant space</li> <li>• Vehicular access provided via Auahi St</li> </ul>
	G East	<ul style="list-style-type: none"> <li>• 160 Multi-family residential units</li> <li>• 67,500 sq ft of retail space</li> <li>• 22,500 sq ft of restaurant space</li> <li>• A new parking garage for District Parking</li> <li>• Vehicular access provided via Halekauwila St</li> </ul>
	F West	<ul style="list-style-type: none"> <li>• 350 Multi-family residential units</li> <li>• 15,000 sq ft of retail space</li> <li>• 5,000 sq ft of restaurant space</li> <li>• Vehicular access provided via Auahi St</li> </ul>
	F East	<ul style="list-style-type: none"> <li>• 310 Multi-family residential units</li> <li>• 18,750 sq ft of retail space</li> <li>• 6,250 sq ft of restaurant space</li> <li>• Vehicular access provided via Auahi St</li> </ul>
Phase 4 (Expected completion by Year 2024)	B East	<ul style="list-style-type: none"> <li>• 111 Multi-family residential units</li> <li>• 4,865 sq ft of retail space</li> <li>• 4,865 sq ft of restaurant space</li> <li>• Vehicular access provided via Auahi St</li> </ul>
	B West	<ul style="list-style-type: none"> <li>• 174 Multi-family residential units</li> <li>• 7,657 sq ft of retail space</li> <li>• 2,553 sq ft of restaurant space</li> <li>• Vehicular access provided via Auahi St</li> </ul>

**Table 1: Victoria Ward Development Plan (Cont'd)**

<b>Phase</b>	<b>Block</b>	<b>Proposed Land Uses</b>
Phase 4 (Cont'd)	G West	<ul style="list-style-type: none"> <li>• 163 Multi-family residential units</li> <li>• 67,500 sq ft of retail space</li> <li>• 22,500 sq ft of restaurant space</li> <li>• Vehicular access provided via Halekauwila St and Koula St</li> </ul>
	N-West	<ul style="list-style-type: none"> <li>• 600 Multi-family residential units</li> <li>• 22,500 sq ft of retail space</li> <li>• 7,500 sq ft of restaurant space</li> <li>• Vehicular access provided via the Halekauwila Street Extension</li> </ul>
Phase 5 (Expected completion by Year 2027)	D	<ul style="list-style-type: none"> <li>• 180 Multi-family residential units</li> <li>• 7,500 sq ft of retail space</li> <li>• 2,500 sq ft of restaurant space</li> <li>• Vehicular access provided via Auahi St and Kamakee St</li> </ul>
	E	<ul style="list-style-type: none"> <li>• 185 Multi-family residential units</li> <li>• 6,696 sq ft of retail space</li> <li>• 2,232 sq ft of restaurant space</li> <li>• Vehicular access provided via Auahi St</li> </ul>
	H North	<ul style="list-style-type: none"> <li>• 500 Multi-family residential units</li> <li>• 30,000 sq ft of retail space</li> <li>• 10,000 sq ft of restaurant space</li> <li>• A new parking garage for District Parking</li> <li>• Vehicular access provided via the Halekauwila Street Extension and Auahi St</li> </ul>
	H South	<ul style="list-style-type: none"> <li>• 330 Multi-family residential units</li> <li>• 45,000 sq ft of retail space</li> <li>• 15,000 sq ft of restaurant space</li> <li>• Vehicular access provided via the Halekauwila Street Extension and Auahi St</li> </ul>

The proposed project will also ultimately entail modifications to the surrounding roadway network to extend Halekauwila Street further east to Kamakee Street, realignment of Auahi Street east of Ward Avenue to intersect Pohukaina Street, and connection of the segments of Auahi Street west of Ward Avenue. These roadway modifications are intended



to provide additional, alternate east-west routes through the Kakaako area and provide alternate access opportunities. See Figure 2 for the proposed project site plan.

## **II. AREA ROADWAY SYSTEM**

East-west traffic 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 corridors through the project vicinity. These major roadways are supported by a network of smaller 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 provide either one-way or two-way corridors through the project vicinity. These major roadways are supported by a network of smaller connector roadways including Cooke Street and Kamakee Street that provide alternate north-south routes through the surrounding areas.

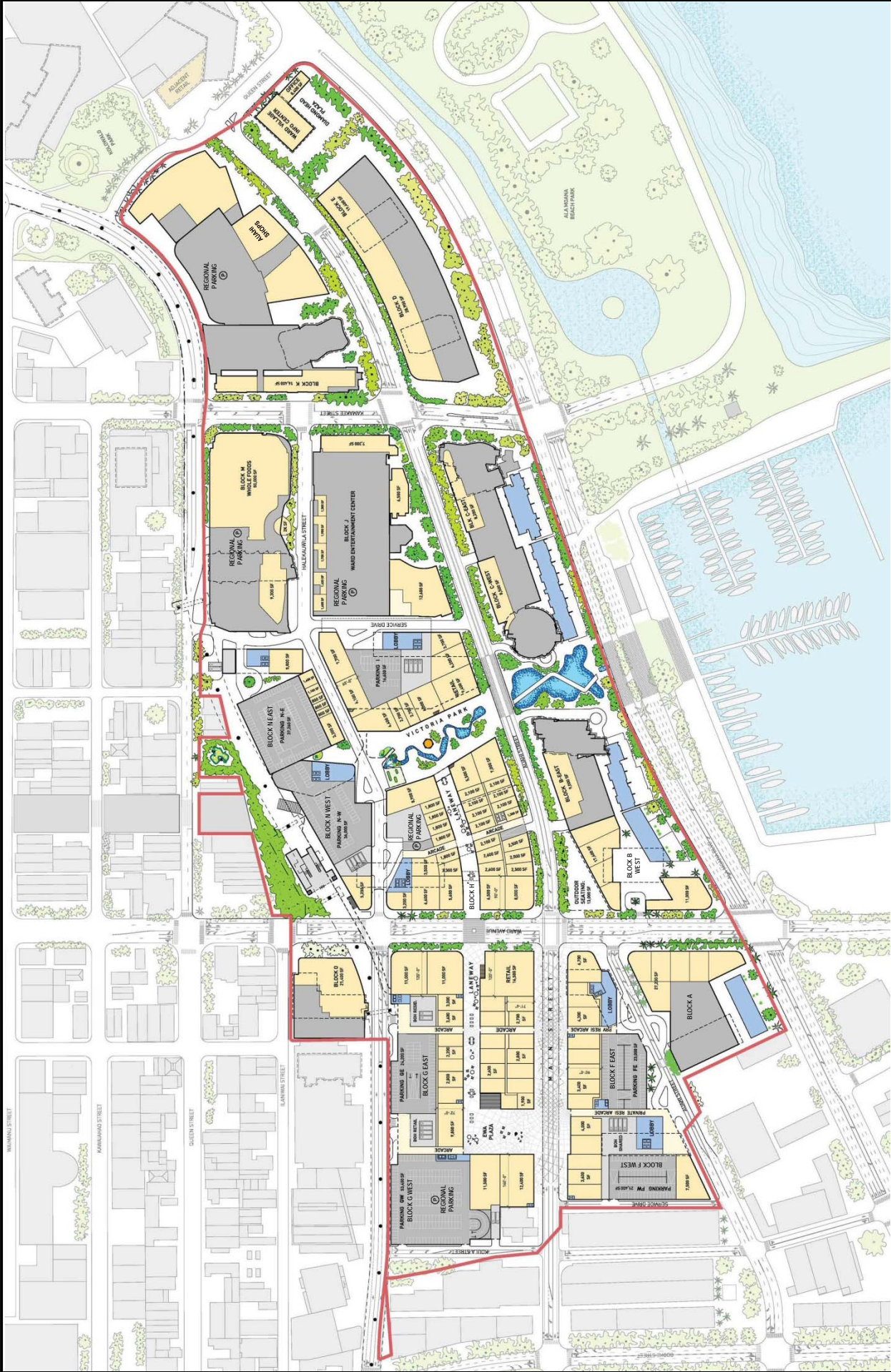
## **III. EXISTING CONDITIONS**

### **A. Existing Traffic Count Data**

The existing traffic count data utilized for this study consisted of turning movement count surveys at approximately 46 locations during the weekday morning peak hours of 6:00 and 9:00 AM and afternoon peak hours of 3:00 PM and 6:00 PM. The surveys were conducted during March and April 2015 at the intersections along the following roadways:

- Kapiolani Boulevard between Cooke Street and Piikoi Street
- Kona Street between Kamakee Street and Piikoi Street
- Waimanu Street between Ward Avenue and Piikoi Street
- Kawaiahao Street between Cooke Street and Kamakee Street
- Queen Street between Cooke Street and Waimanu Street
- Ward Avenue with Ilaniwai Street
- Halekauwila Street between Cooke Street and Ward Avenue
- Pohukaina Street between Cooke Street and Kamani Street
- Auahi Street between South Street and Queens Lane
- Ala Moana Boulevard between Cooke Street and Piikoi Street

These field investigations were supplemented by updated surveys at key intersections conducted in April 2016. A comparison of these volumes with the 2015 traffic data



**WARD VILLAGES MASTER PLAN  
PROPOSED SITE PLAN**

FIGURE  
2

indicates that volumes along the study roadways have remained relatively stable over the past year, and, as such, the 2015 traffic data is assumed to be representative of existing (Year 2016) traffic conditions. Appendix A includes the existing traffic count data.

**B. Capacity Analysis Methodology**

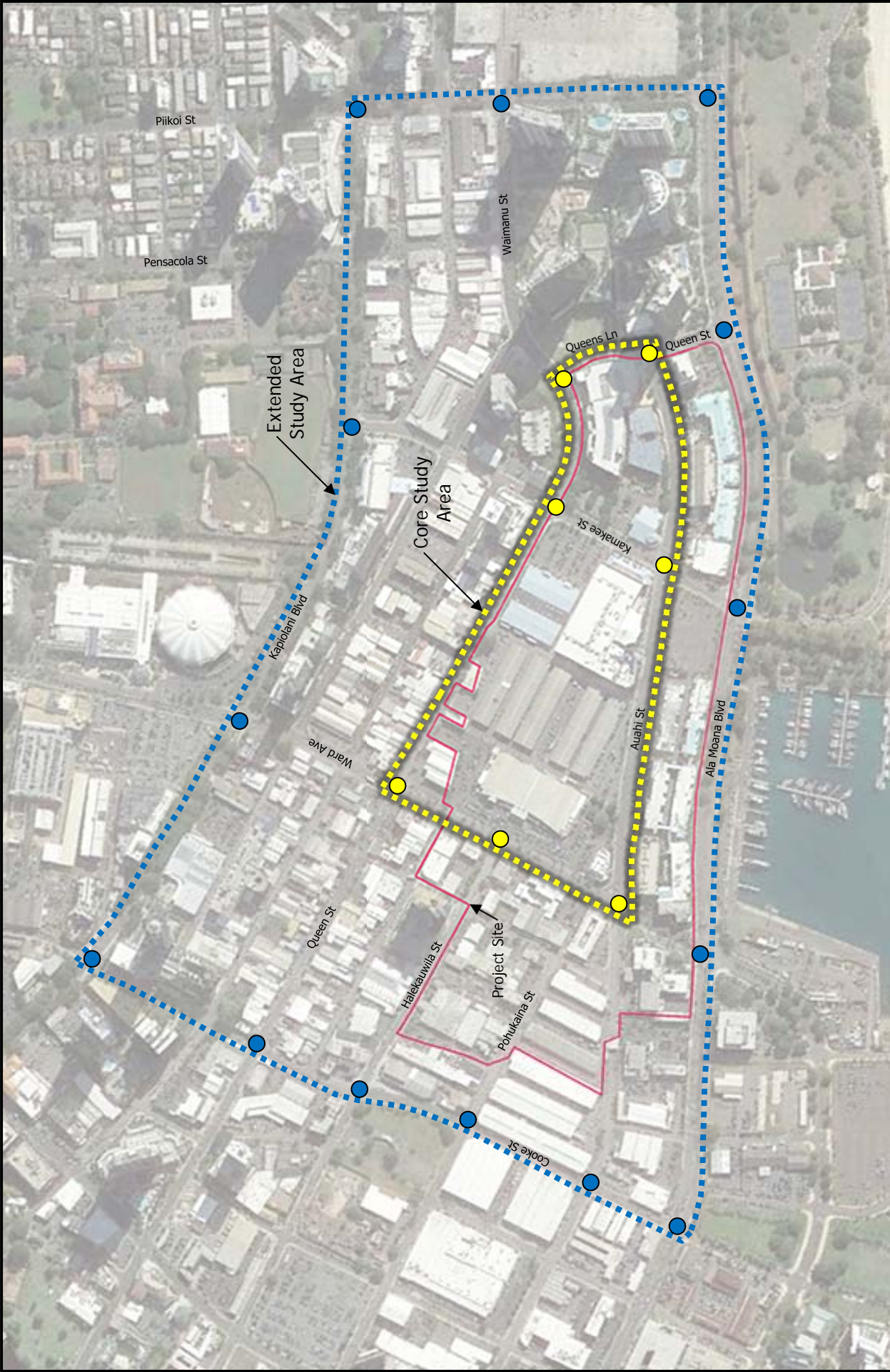
The highway capacity analysis performed in this study is based upon procedures presented in the “Highway Capacity Manual”, Transportation Research Board, 2000, and the “Synchro” software, developed by Trafficware. The analysis is based on the concept of Level of Service (LOS) to identify the traffic 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.

**C. Existing Peak Hour Traffic**

The core study area is comprised of the key locations in the immediate vicinity of the proposed development while the extended study area is comprised of the study locations outside of the core area (see Figure 3). The existing lane use and peak hour traffic operating conditions at key locations within the study area are shown in Figures 4 to 9, and summarized in Tables 2 and 3. The morning peak hour of traffic generally occurs between 7:15 AM and 8:15 AM while the afternoon peak hour of traffic generally occurs between the hours of 4:45 PM and 5:45 PM. Although the peak hours of traffic generally occur around the same time periods at each of the study intersection, the absolute commuter peak hour time periods for each intersection may differ slightly. The analysis is based on these absolute commuter peak hour time



WARD VILLAGES MASTER PLAN

STUDY AREA AND LOCATIONS

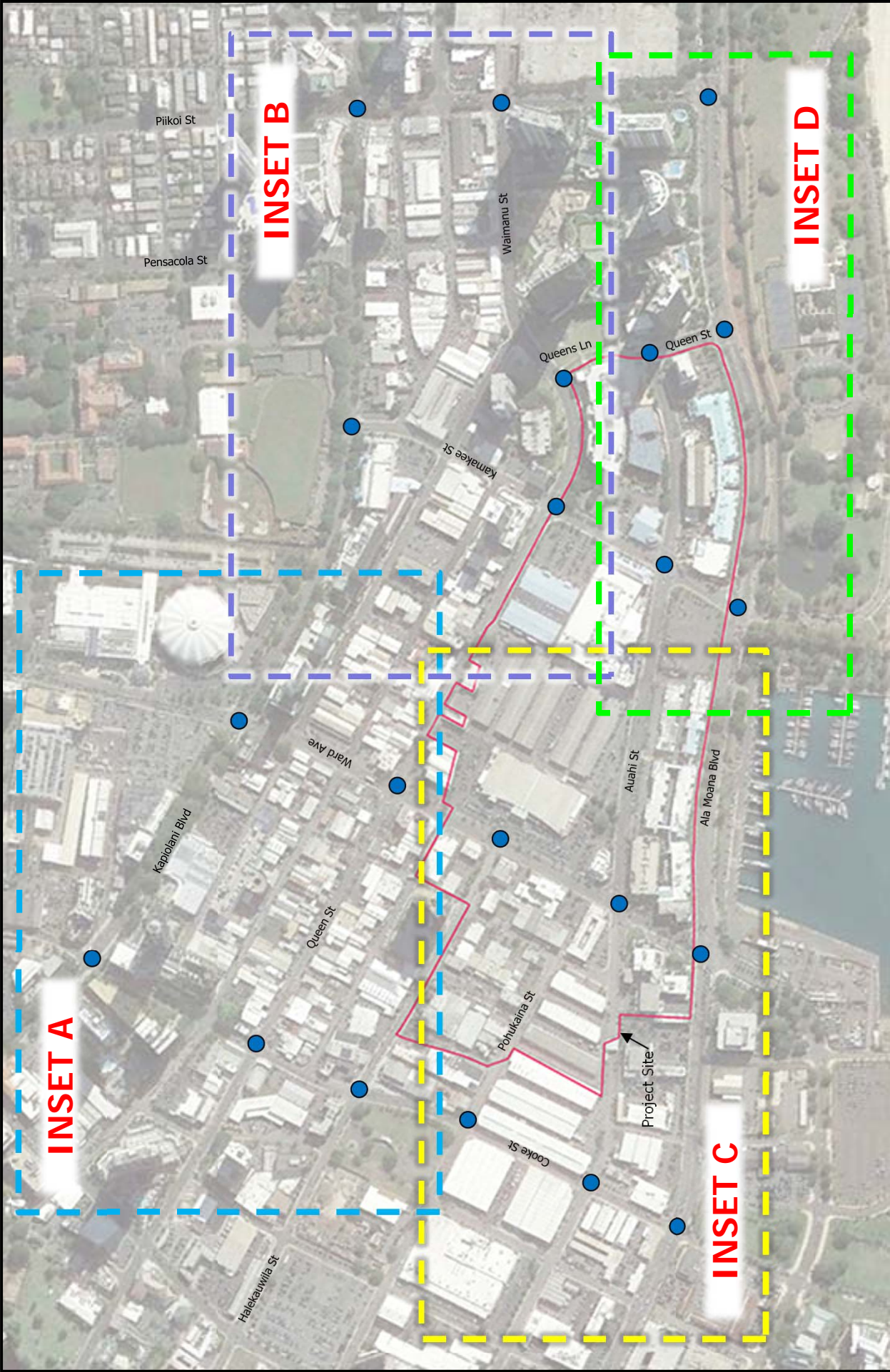


WARD VILLAGES MASTER PLAN

EXISTING LANE CONFIGURATIONS

FIGURE

4



WARD VILLAGES MASTER PLAN  
TYPICAL INSET LOCATION MAP

FIGURE 5



WARD VILLAGES MASTER PLAN

EXISTING PEAK HOURS OF TRAFFIC - INSET A

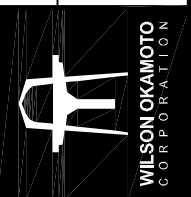
FIGURE

6



WARD VILLAGES MASTER PLAN

EXISTING PEAK HOURS OF TRAFFIC - INSET B









periods to identify the traffic impacts resulting from the proposed project. LOS calculations are included in Appendix C.

**Table 2: Existing LOS Traffic Operating Conditions  
Core Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>AM</b>	<b>PM</b>
Ward Ave/ Queen St	Eastbound	C	C
	Westbound	C	C
	Northbound	B	C
	Southbound	C	C
Queen St/ Kamakee St	Eastbound	B	C
	Westbound	B	B
	Northbound	B	C
	Southbound	B	C
Queen St/ Queens Ln	Westbound	A	A
	Northbound	A	B
Ward Ave/ Halekauwila St	Eastbound	B	B
	Northbound	A	B
	Southbound	A	B
Ward Ave/ Auahi St	Eastbound	B	B
	Westbound	B	B
	Northbound	A	B
	Southbound	A	B
Kamakee St/ Auahi St	Eastbound	C	B
	Westbound	B	B
	Northbound	A	B
	Southbound	A	C
Auahi St/ Queens Ln/ Queen St	Eastbound	B	B
	Northbound	B	B
	Southbound	A	B

**Table 3: Existing LOS Traffic Operating Conditions  
Extended Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>AM</b>	<b>PM</b>
Kapiolani Blvd/ Cooke St	Eastbound	B	C
	Westbound	A	B
	Northbound	C	D
	Southbound	C	C
Kapiolani Blvd/ Ward Ave	Eastbound	D	C
	Westbound	C	C
	Northbound	D	D
	Southbound	E	D
Kapiolani Blvd/ Kamakee St	Eastbound	B	B
	Westbound	B	B
	Northbound	C	C
Kapiolani Blvd/ Piikoi St	Eastbound	A	B
	Westbound	B	B
	Northbound	C	C
Queen St/ Cooke St	Eastbound	A	B
	Westbound	B	A
	Northbound	A	A
	Southbound	A	A
Piikoi St/ Waimanu St	Eastbound	B	B
	Westbound	C	C
	Northbound	B	C
	Southbound	B	C
Cooke St/ Halekauwila St	Eastbound	B	B
	Westbound	B	B
	Northbound	A	B
	Southbound	B	B

**Table 3: Existing LOS Traffic Operating Conditions  
Extended Study Area (Cont'd)**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>AM</b>	<b>PM</b>
Cooke St/ Pohukaina St	Eastbound	B	B
	Westbound	B	B
	Northbound	A	B
	Southbound	A	B
Cooke St/ Auahi St	Eastbound	B	B
	Westbound	B	B
	Northbound	A	A
	Southbound	A	A
Ala Moana Blvd/ Cooke St	Eastbound	A	B
	Westbound	B	B
	Northbound	D	D
	Southbound	D	D
Ala Moana Blvd/ Ward Ave	Eastbound	D	E
	Westbound	D	F
	Northbound	D	D
	Southbound	D	E
Ala Moana Blvd/ Kamakee St/ Queen St	Eastbound	B	C
	Westbound	B	B
	Northbound	C	D
	Southbound	C	D
Ala Moana Blvd/ Queen St	Eastbound	A	B
	Westbound	B	B
	Southbound	C	C
Ala Moana Blvd/ Piikoi St	Eastbound	C	C
	Westbound	C	C
	Southbound	E	E

#### **IV. PROJECTED TRAFFIC CONDITIONS**

##### **A. Trip Generation and Distribution**

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, 9<sup>th</sup> Edition,” 2012. The ITE trip generation rates are developed empirically by correlating the vehicle trip generation data with various land use characteristics such as the number of vehicle trips generated per dwelling unit or 1,000 square feet of development. The trip generation methodology developed by ITE also includes provisions for pass-by trips, internal capture of trips, and multi-modal trips. Pass-by trips are generated when vehicles that would be traveling through the area whether or not the project was developed make an intermediate stop at the project site between their origin and primary destination. 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 trip 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. The planned system is expected to be completed prior to the completion of Phase 3 of the Ward Villages Master Plan and include the development of a transit station within the project site north of Block H. The trip generation characteristics for the proposed project were adjusted to account for the influence of these factors, as well as to account for the trip generation characteristics of the existing uses that will be replaced by the new development. Tables 4 and 5 summarize the adjusted trip generation characteristics of the new development that incorporates the influence of the aforementioned factors. Appendix D includes the detailed trip generation worksheets.

**Table 4: Adjusted Peak Hour Trip Generation  
(Prior to Completion of Fixed Guideway Transit System)**

Phase	Block	AM			PM		
		Total	Enter	Exit	Total	Enter	Exit
1A	C East	110	39	71	91	62	29
	K	178	58	120	131	94	37
	Sub-Total	288	97	191	222	156	66
1B	M	210	60	150	195	133	62
	O	88	-7	95	120	89	31
	Sub-Total	298	53	245	315	222	93
2	I	450	169	281	364	256	108
	C West	42	5	37	-57	-14	-43
	N East	164	40	124	178	119	59
	Sub-Total	656	214	442	485	361	124
TOTALS		1242	364	878	1022	739	283

**Table 5: Adjusted Peak Hour Trip Generation  
(After Completion of Fixed Guideway Transit System)**

Phase	Block	AM			PM		
		Total	Enter	Exit	Total	Enter	Exit
1A	C East	102	36	66	80	55	25
	K	165	54	111	114	82	32
	Sub-Total	267	90	177	194	137	57
1B	M	192	54	138	162	113	49
	O	77	-9	86	101	77	24
	Sub-Total	269	45	224	263	190	73
2	I	418	157	261	319	227	92
	C West	37	3	34	-64	-19	-45
	N East	150	36	114	154	104	50
	Sub-Total	605	196	409	409	312	97
3	A	61	-5	66	72	62	10
	G East	142	46	96	76	72	4
	F West	111	17	94	104	80	24
	F East	110	25	85	54	46	8
	Sub-Total	424	83	341	306	260	46

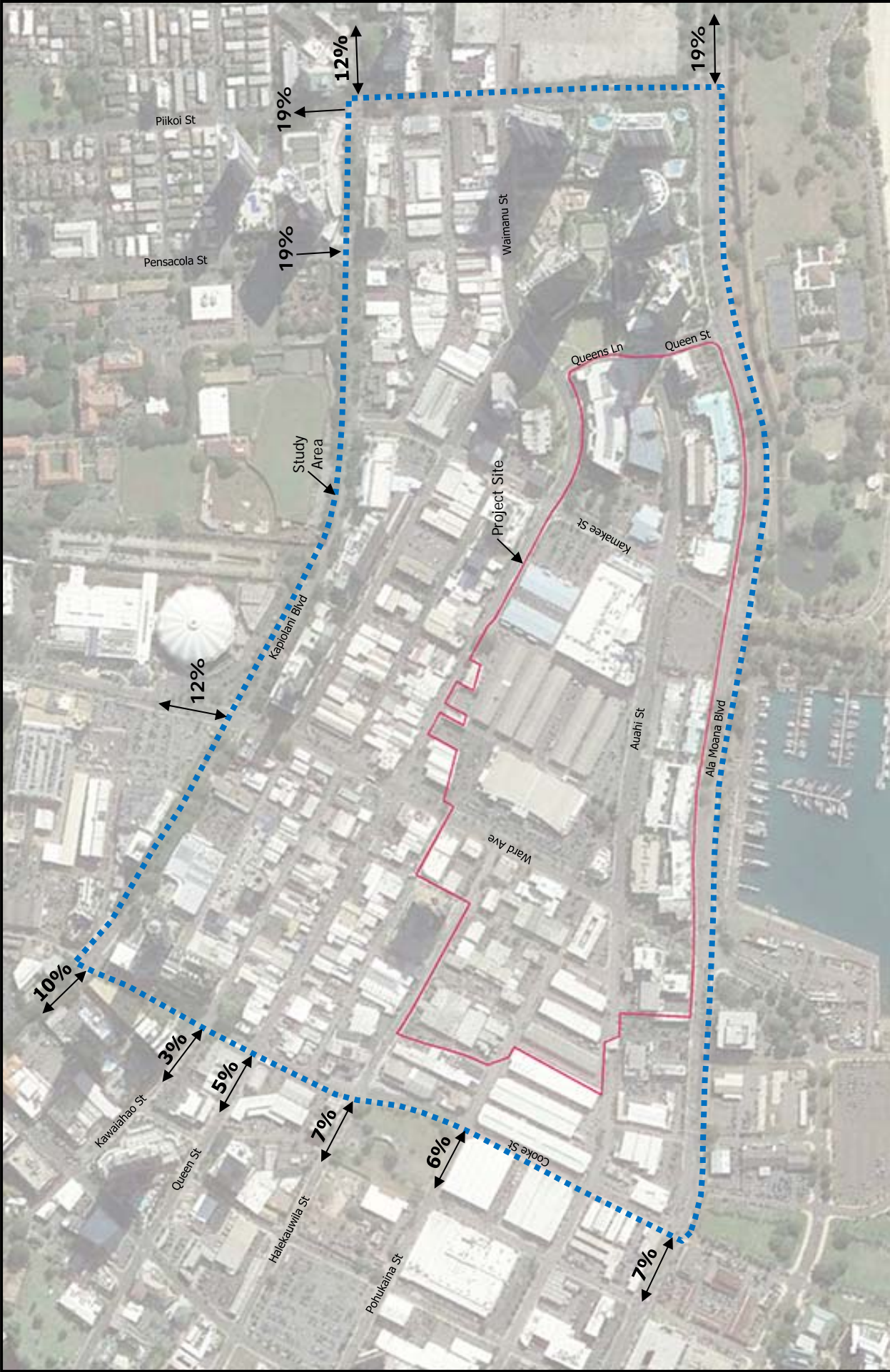
**Table 5: Adjusted Peak Hour Trip Generation (Cont'd)  
(After Completion of Fixed Guideway Transit System)**

Phase	Block	AM			PM		
		Total	Enter	Exit	Total	Enter	Exit
4	B East	30	2	28	-51	-19	-32
	B West	-103	-73	-30	-105	-57	-48
	G West	186	68	118	218	149	69
	N West	199	44	155	167	119	48
	Sub-Total	312	41	271	229	192	37
5	D	-108	-77	-31	-118	-67	-51
	E	-109	-78	-31	-120	-68	-52
	H	379	118	261	340	230	110
	Sub-Total	162	-37	199	102	95	7
TOTALS		2039	418	1621	1503	1186	317

**B. 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 Societal 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. Figure 10 shows the trip distribution percentages for the proposed development based on the OMPO model. In addition, since population estimates for the island of Oahu indicate that population growth is expected to be relatively linear to the Year 2035, a linear growth in traffic was also assumed over that period. As such, growth factors were determined for the Year 2017, Year 2019, Year 2021, Year 2023, Year 2024, and Year 2027.





WARD VILLAGES MASTER PLAN

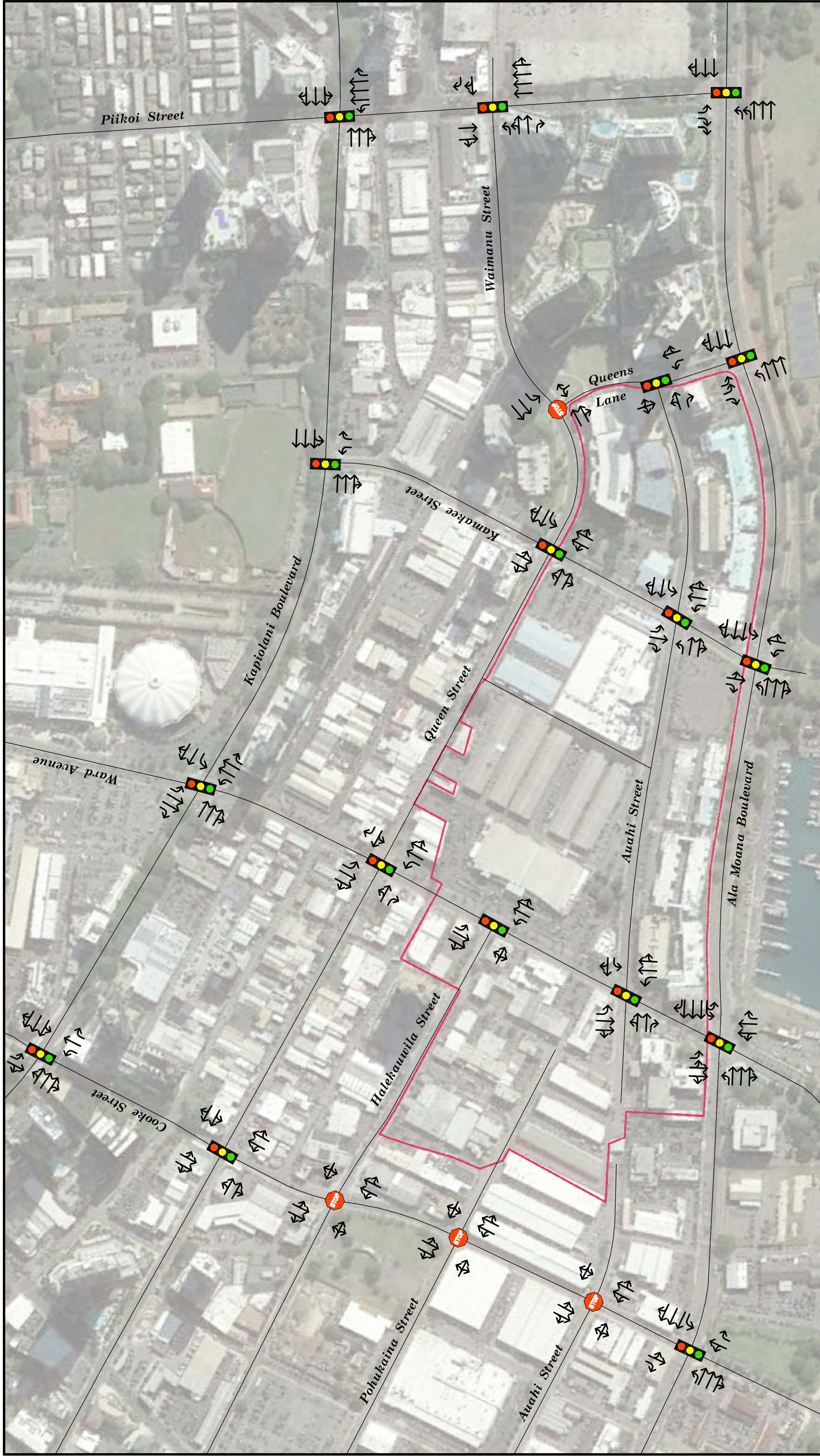
DISTRIBUTION OF EXTERNAL SITE-GENERATED TRIPS

**C. Year 2017 Total Traffic Volumes (Phase 1A)**

The Year 2017 lane use and AM and PM peak hour traffic operating conditions at the study intersections with the development of Phase 1A of the Ward Villages Master Plan are shown in Figures 11 to 15, and summarized in Tables 6 and 7. The analysis incorporates the development of other projects in the area, as well as, the implementation of intersection improvements in the vicinity. Since the baseline traffic data was collected, intersection improvements were implemented at the intersections of Kapiolani Boulevard with Ward Avenue and Piikoi Street with Waimanu Street. In addition, the lane use at the intersection of Ala Moana Boulevard with Kamakee Street is expected to be modified in conjunction with Phase 1A. As such, the improvements have been incorporated to the Year 2017 traffic conditions. LOS calculations are included in Appendix E.

**Table 6: Year 2017 LOS Traffic Operating Conditions  
Core Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2017 AM</b>	<b>Year 2017 PM</b>
Ward Ave/ Queen St	Eastbound	C	D
	Westbound	C	C
	Northbound	B	D
	Southbound	C	D
Queen St/ Kamakee St	Eastbound	B	C
	Westbound	B	B
	Northbound	B	C
	Southbound	B	C
Queen St/ Queens Ln	Westbound	A	A
	Northbound	B	B
Ward Ave/ Halekauwila St	Eastbound	B	B
	Northbound	A	B
	Southbound	A	B
Ward Ave/ Auahi St	Eastbound	B	B
	Westbound	B	B
	Northbound	A	A
	Southbound	A	B



WARD VILLAGES MASTER PLAN

YEAR 2017 LANE CONFIGURATIONS



WARD VILLAGES MASTER PLAN

YEAR 2017 PEAK HOURS OF TRAFFIC - INSET A



WARD VILLAGES MASTER PLAN

YEAR 2017 PEAK HOURS OF TRAFFIC - INSET B



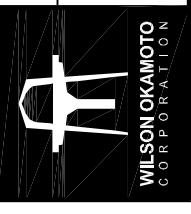


WARD VILLAGES MASTER PLAN

YEAR 2017 PEAK HOURS OF TRAFFIC - INSET C



YEAR 2017 PEAK HOURS OF TRAFFIC - INSET D



**Table 6: Year 2017 LOS Traffic Operating Conditions (Cont'd)  
Core Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2017 AM</b>	<b>Year 2017 PM</b>
Kamakee St/ Auahi St	Eastbound	C	B
	Westbound	B	B
	Northbound	A	C
	Southbound	A	C
Auahi St/ Queens Ln/ Queen St	Eastbound	B	B
	Northbound	B	B
	Southbound	B	B

**Table 7: Year 2017 LOS Traffic Operating Conditions  
Extended Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2017 AM</b>	<b>Year 2017 PM</b>
Kapiolani Blvd/ Cooke St	Eastbound	B	C
	Westbound	A	B
	Northbound	C	D
	Southbound	C	C
Kapiolani Blvd/ Ward Ave*	Eastbound	D	C
	Westbound	C	C
	Northbound	D	D
	Southbound	D	D
Kapiolani Blvd/ Kamakee St	Eastbound	A	B
	Westbound	B	B
	Northbound	C	C
Kapiolani Blvd/ Piikoi St	Eastbound	A	C
	Westbound	B	B
	Northbound	C	C
Queen St/ Cooke St	Eastbound	A	B
	Westbound	B	A
	Northbound	A	B
	Southbound	A	B

\*Intersection modifications implemented by others.



**Table 7: Year 2017 LOS Traffic Operating Conditions (Cont'd)  
Extended Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2017 AM</b>	<b>Year 2017 PM</b>
Piikoi St/ Waimanu St*	Eastbound	B	C
	Westbound	C	C
	Northbound	C	D
	Southbound	C	D
Cooke St/ Halekauwila St	Eastbound	B	C
	Westbound	B	B
	Northbound	A	B
	Southbound	B	B
Cooke St/ Pohukaina St	Eastbound	B	C
	Westbound	B	B
	Northbound	A	B
	Southbound	A	B
Cooke St/ Auahi St	Eastbound	B	B
	Westbound	B	B
	Northbound	A	A
	Southbound	A	A
Ala Moana Blvd/ Cooke St	Eastbound	A	B
	Westbound	B	B
	Northbound	D	D
	Southbound	D	D
Ala Moana Blvd/ Ward Ave	Eastbound	D	E
	Westbound	D	F
	Northbound	D	D
	Southbound	D	D
Ala Moana Blvd/ Kamakee St**	Eastbound	B	C
	Westbound	B	B
	Northbound	C	D
	Southbound	C	D

\*Intersection modifications implemented by others.

\*\*Intersection modifications implemented with Phase 1A.

**Table 7: Year 2017 LOS Traffic Operating Conditions (Cont'd)  
Extended Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2017 AM</b>	<b>Year 2017 PM</b>
Ala Moana Blvd/ Queen St	Eastbound	A	B
	Westbound	B	B
	Southbound	D	D
Ala Moana Blvd/ Piikoi St	Eastbound	C	D
	Westbound	C	C
	Southbound	E	E

Despite the anticipated increases in traffic volumes along the roadways surrounding the project site, traffic operations with the completion of Phase 1A are expected to remain similar to existing conditions within the project core. Traffic operations within the extended study area are expected to deteriorate primarily due to the anticipated regional growth in traffic.

**D. Year 2019 Total Traffic Volumes (Phase 1B)**

The Year 2019 AM and PM peak hour traffic operating conditions at the study intersections with Phases 1A and 1B of the Ward Villages Master Plan are shown in Figures 16 to 19, and summarized in Tables 8 and 9. The analysis incorporates the development of other projects in the area. LOS calculations are included in Appendix F.

**Table 8: Year 2019 LOS Traffic Operating Conditions  
Core Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2019 AM</b>	<b>Year 2019 PM</b>
Ward Ave/ Queen St	Eastbound	C	F
	Westbound	C	E
	Northbound	C	D
	Southbound	C	D
Queen St/ Kamakee St	Eastbound	B	C
	Westbound	B	B
	Northbound	B	C
	Southbound	B	C



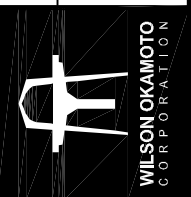
WARD VILLAGES MASTER PLAN

YEAR 2019 PEAK HOURS OF TRAFFIC - INSET A



WARD VILLAGES MASTER PLAN

YEAR 2019 PEAK HOURS OF TRAFFIC - INSET B







**Table 8: Year 2019 LOS Traffic Operating Conditions (Cont'd)  
Core Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2019 AM</b>	<b>Year 2019 PM</b>
Queen St/ Queens Ln	Westbound	A	A
	Northbound	B	B
Ward Ave/ Halekauwila St	Eastbound	B	B
	Northbound	A	B
	Southbound	A	B
Ward Ave/ Auahi St	Eastbound	B	B
	Westbound	B	C
	Northbound	A	A
	Southbound	A	B
Kamakee St/ Auahi St	Eastbound	C	B
	Westbound	B	B
	Northbound	A	C
	Southbound	A	C
Auahi St/ Queens Ln/ Queen St	Eastbound	B	B
	Northbound	B	B
	Southbound	B	B

**Table 9: Year 2019 LOS Traffic Operating Conditions  
Extended Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2019 AM</b>	<b>Year 2019 PM</b>
Kapiolani Blvd/ Cooke St	Eastbound	B	C
	Westbound	A	B
	Northbound	C	D
	Southbound	C	C
Kapiolani Blvd/ Ward Ave	Eastbound	D	C
	Westbound	C	C
	Northbound	D	D
	Southbound	D	D
Kapiolani Blvd/ Kamakee St	Eastbound	A	B
	Westbound	B	B
	Northbound	C	C

**Table 9: Year 2019 LOS Traffic Operating Conditions (Cont'd)  
Extended Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2019 AM</b>	<b>Year 2019 PM</b>
Kapiolani Blvd/ Piikoi St	Eastbound	B	C
	Westbound	B	C
	Northbound	C	C
Queen St/ Cooke St	Eastbound	A	B
	Westbound	B	A
	Northbound	A	B
	Southbound	B	B
Piikoi St/ Waimanu St	Eastbound	B	C
	Westbound	C	C
	Northbound	C	D
	Southbound	C	D
Cooke St/ Halekauwila St	Eastbound	B	C
	Westbound	B	B
	Northbound	B	B
	Southbound	B	B
Cooke St/ Pohukaina St	Eastbound	B	C
	Westbound	B	B
	Northbound	A	B
	Southbound	B	B
Cooke St/ Auahi St	Eastbound	B	B
	Westbound	B	B
	Northbound	A	A
	Southbound	A	A
Ala Moana Blvd/ Cooke St	Eastbound	B	B
	Westbound	B	B
	Northbound	D	D
	Southbound	D	D
Ala Moana Blvd/ Ward Ave	Eastbound	D	E
	Westbound	D	F
	Northbound	D	D
	Southbound	D	E



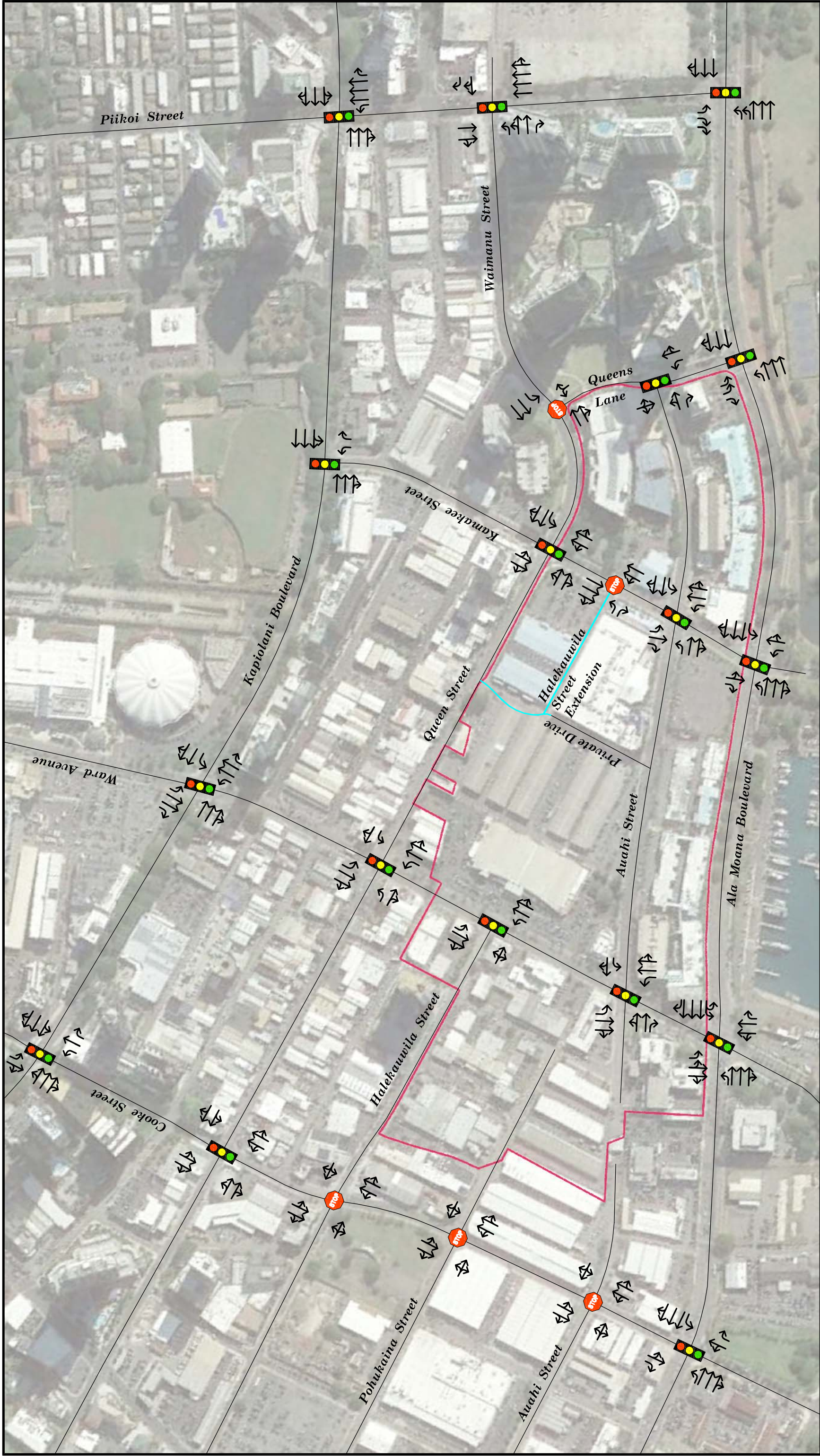
**Table 9: Year 2019 LOS Traffic Operating Conditions (Cont'd)  
Extended Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2019 AM</b>	<b>Year 2019 PM</b>
Ala Moana Blvd/ Kamakee St/	Eastbound	B	C
	Westbound	B	C
	Northbound	D	D
	Southbound	D	D
Ala Moana Blvd/ Queen St	Eastbound	A	B
	Westbound	B	B
	Southbound	D	D
Ala Moana Blvd/ Piikoi St	Eastbound	C	D
	Westbound	C	C
	Southbound	E	E

Traffic operations with the completion of Phase 1B are generally expected to remain similar to Phase 1A conditions. The influence of regional growth in the extended study area is still apparent and, as such, periodic monitoring of traffic operating conditions may be required to verify projected conditions.

**E. Year 2021 Total Traffic Volumes (Phase 2)**

The Year 2021 lane use and AM and PM peak hour traffic operating conditions at the study intersections with Phases 1 and 2 of the Ward Villages Master Plan are shown in Figures 20 to 24, and summarized in Tables 10 and 11. The analysis incorporates the development of other projects in the area, as well as, the implementation of roadway and intersection improvements in the vicinity. These improvements include the construction of a portion of the Halekauwila Street Extension between Kamakee Street and the internal north-south connector road referred to as “Private Drive.” In addition, modifications to the existing lane use on the Queen Street approaches of the intersection with Ward Avenue are expected to be implemented to provide exclusive left-turn bays. LOS calculations are included in Appendix G.



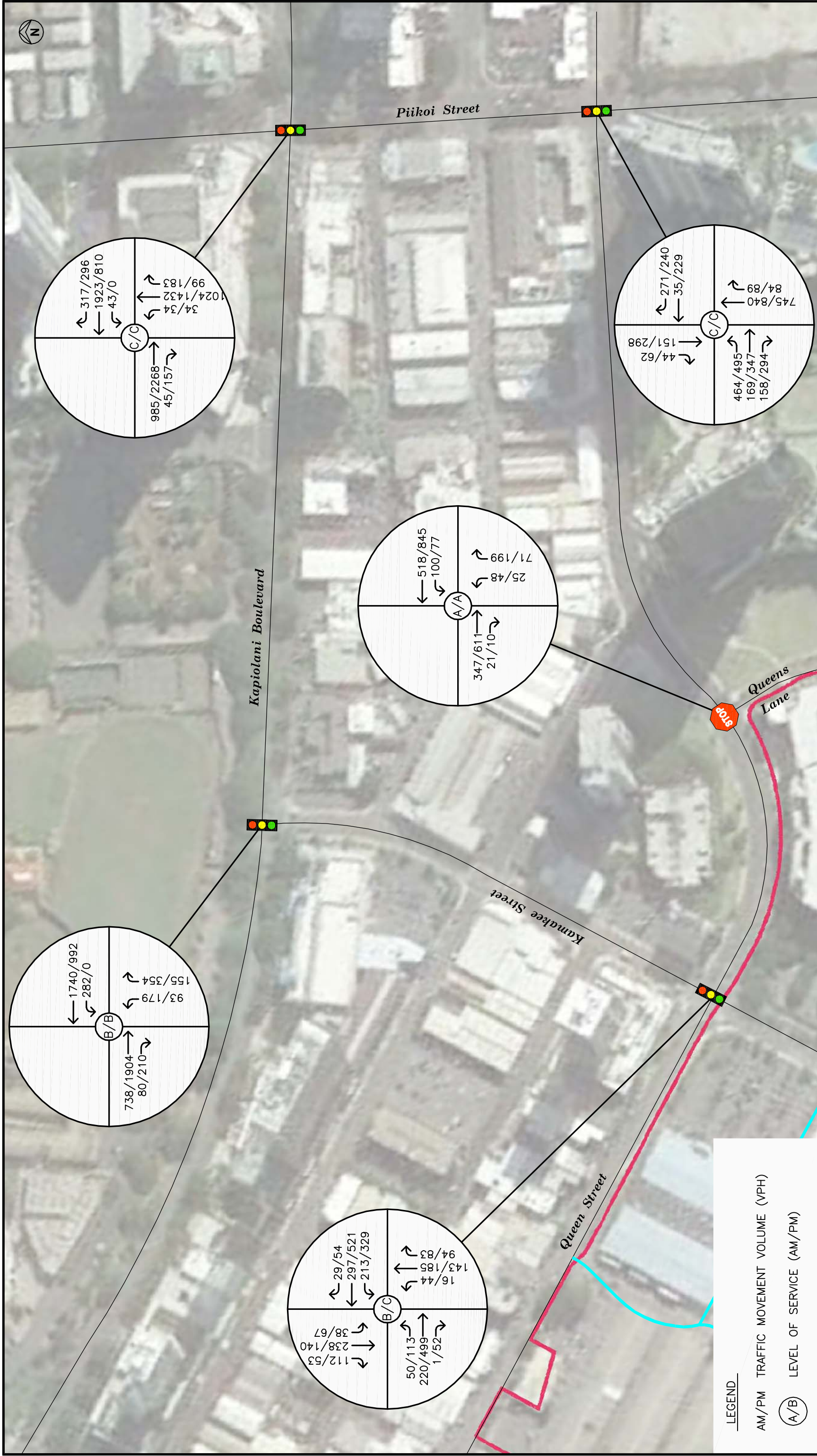
WARD VILLAGES MASTER PLAN

YEAR 2021 LANE CONFIGURATIONS



WARD VILLAGES MASTER PLAN

YEAR 2021 PEAK HOURS OF TRAFFIC - INSET A



WARD VILLAGES MASTER PLAN

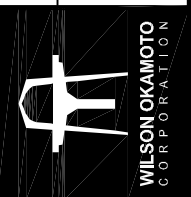
YEAR 2021 PEAK HOURS OF TRAFFIC - INSET B





WARD VILLAGES MASTER PLAN

YEAR 2021 PEAK HOURS OF TRAFFIC - INSET C





**Table 10: Year 2021 LOS Traffic Operating Conditions  
Core Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2021 AM</b>	<b>Year 2021 PM</b>
Ward Ave/ Queen St*	Eastbound	C	D
	Westbound	C	D
	Northbound	C	D
	Southbound	C	D
Queen St/ Kamakee St	Eastbound	B	C
	Westbound	B	B
	Northbound	B	C
	Southbound	B	C
Queen St/ Queens Ln	Westbound	A	A
	Northbound	B	B
Ward Ave/ Halekauwila St	Eastbound	B	B
	Northbound	A	B
	Southbound	A	B
Kamakee St/ Halekauwila St Extension	Eastbound	B	B
	Northbound	A	A
Ward Ave/ Auahi St	Eastbound	B	C
	Westbound	B	C
	Northbound	A	A
	Southbound	A	B
Kamakee St/ Auahi St	Eastbound	B	B
	Westbound	C	B
	Northbound	B	C
	Southbound	B	C
Auahi St/ Queens Ln/ Queen St	Eastbound	B	B
	Northbound	B	B
	Southbound	B	B

\*Intersection modifications implemented.

**Table 11: Year 2021 LOS Traffic Operating Conditions  
Extended Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2021 AM</b>	<b>Year 2021 PM</b>
Kapiolani Blvd/ Cooke St	Eastbound	B	C
	Westbound	A	B
	Northbound	C	D
	Southbound	C	C
Kapiolani Blvd/ Ward Ave	Eastbound	D	D
	Westbound	D	C
	Northbound	D	D
	Southbound	D	D
Kapiolani Blvd/ Kamakee St	Eastbound	A	B
	Westbound	B	B
	Northbound	C	C
Kapiolani Blvd/ Piikoi St	Eastbound	B	C
	Westbound	B	C
	Northbound	D	C
Queen St/ Cooke St	Eastbound	A	B
	Westbound	B	B
	Northbound	B	B
	Southbound	B	B
Piikoi St/ Waimanu St/	Eastbound	B	C
	Westbound	C	C
	Northbound	C	D
	Southbound	C	D
Cooke St/ Halekauwila St	Eastbound	B	C
	Westbound	B	C
	Northbound	B	B
	Southbound	B	B
Cooke St/ Pohukaina St	Eastbound	B	C
	Westbound	B	B
	Northbound	A	B
	Southbound	B	B



**Table 11: Year 2021 LOS Traffic Operating Conditions (Cont'd)  
Extended Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2021 AM</b>	<b>Year 2021 PM</b>
Cooke St/ Auahi St	Eastbound	B	C
	Westbound	B	B
	Northbound	A	A
	Southbound	A	A
Ala Moana Blvd/ Cooke St	Eastbound	B	B
	Westbound	B	B
	Northbound	D	D
	Southbound	D	D
Ala Moana Blvd/ Ward Ave	Eastbound	D	E
	Westbound	D	F
	Northbound	D	D
	Southbound	D	E
Ala Moana Blvd/ Kamakee St/ Queen St	Eastbound	B	C
	Westbound	C	C
	Northbound	D	D
	Southbound	D	D
Ala Moana Blvd/ Queen St	Eastbound	A	B
	Westbound	B	B
	Southbound	D	D
Ala Moana Blvd/ Piikoi St	Eastbound	C	D
	Westbound	C	D
	Southbound	E	E

Traffic operations with the completion of Phase 2 are generally expected to remain similar to Phase 1B conditions. The influence of regional growth in the extended study area is still apparent. As such, the continued emphasis by the development to incorporate enhanced facilities for alternative modes of travel is expected to alleviate projected conditions. However, as previously stated, periodic monitoring of traffic operating conditions may be required to verify projected conditions.

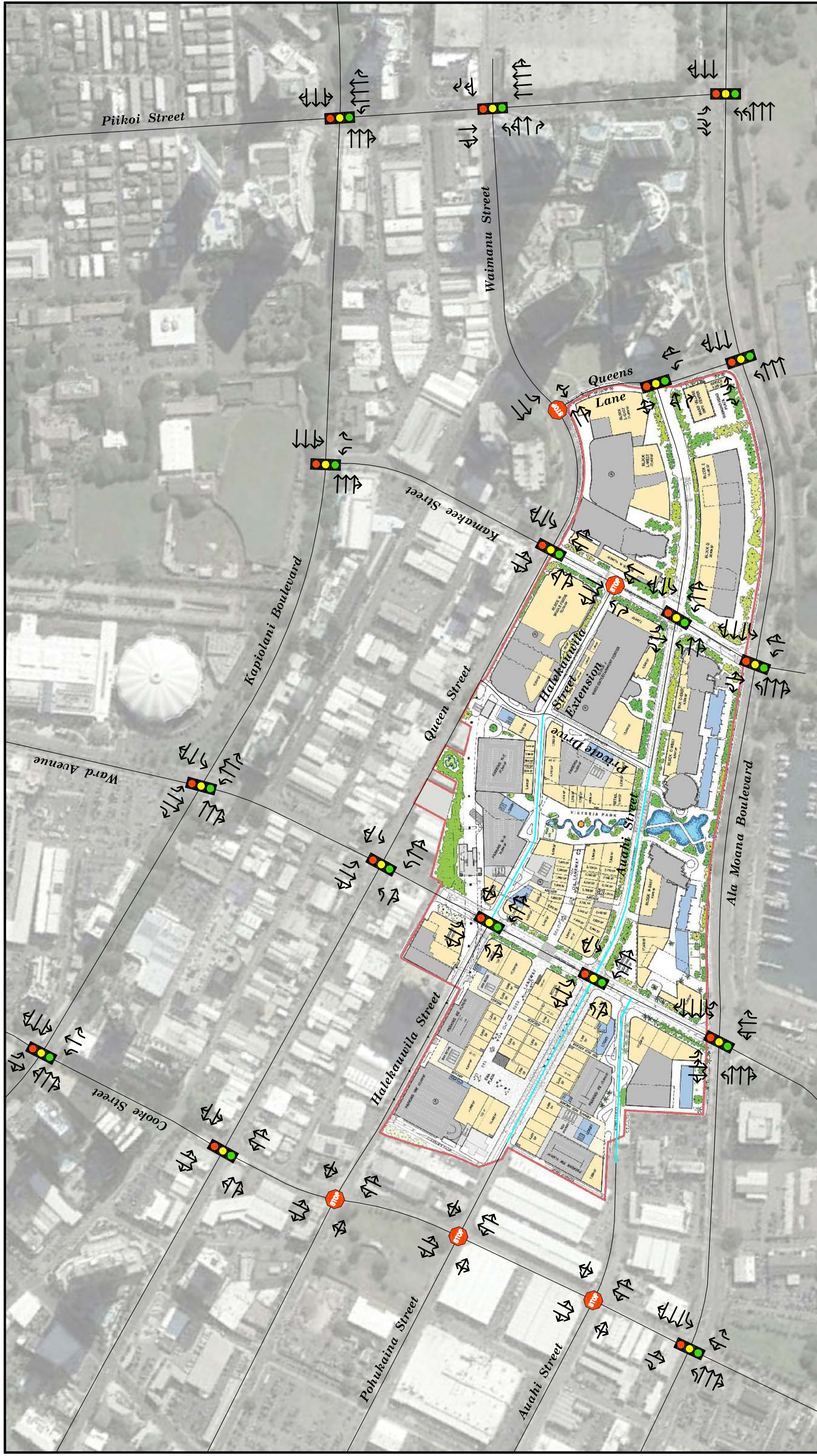
**F. Year 2023 Total Traffic Volumes (Phase 3)**

The Year 2023 lane use and AM and PM peak hour traffic operating conditions at the study intersections with Phases 1 to 3 of the Ward Villages Master Plan are shown in Figures 25 to 29, and summarized in Tables 12 and 13. The analysis incorporates the development of other projects in the area and completion of the fixed guideway transit system, as well as, the implementation of roadway and intersection improvements in the vicinity. These improvements include the completion of the Halekauwila Street Extension between Ward Avenue and Private Drive, realignment of Auahi Street east of Ward Avenue, and extension of Auahi Street west of Ward Avenue. In addition, the lane use on the eastbound Halekauwila Street approach of the intersection of Ward Avenue is assumed to be modified to provide a left-turn bay. LOS calculations are included in Appendix H.

**Table 12: Year 2023 LOS Traffic Operating Conditions  
Core Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2023 AM</b>	<b>Year 2023 PM</b>
Ward Ave/ Queen St	Eastbound	C	D
	Westbound	C	D
	Northbound	C	C
	Southbound	C	C
Queen St/ Kamakee St	Eastbound	B	C
	Westbound	B	B
	Northbound	B	C
	Southbound	B	C
Queen St/ Queens Ln	Westbound	A	A
	Northbound	B	B
Ward Ave/ Halekauwila St*	Eastbound	B	B
	Westbound	B	B
	Northbound	A	B
	Southbound	B	B
Kamakee St/ Halekauwila St Extension	Eastbound	B	B
	Northbound	A	A

\*Intersection modifications implemented.



WARD VILLAGES MASTER PLAN

YEAR 2023 LANE CONFIGURATIONS

FIGURE

25



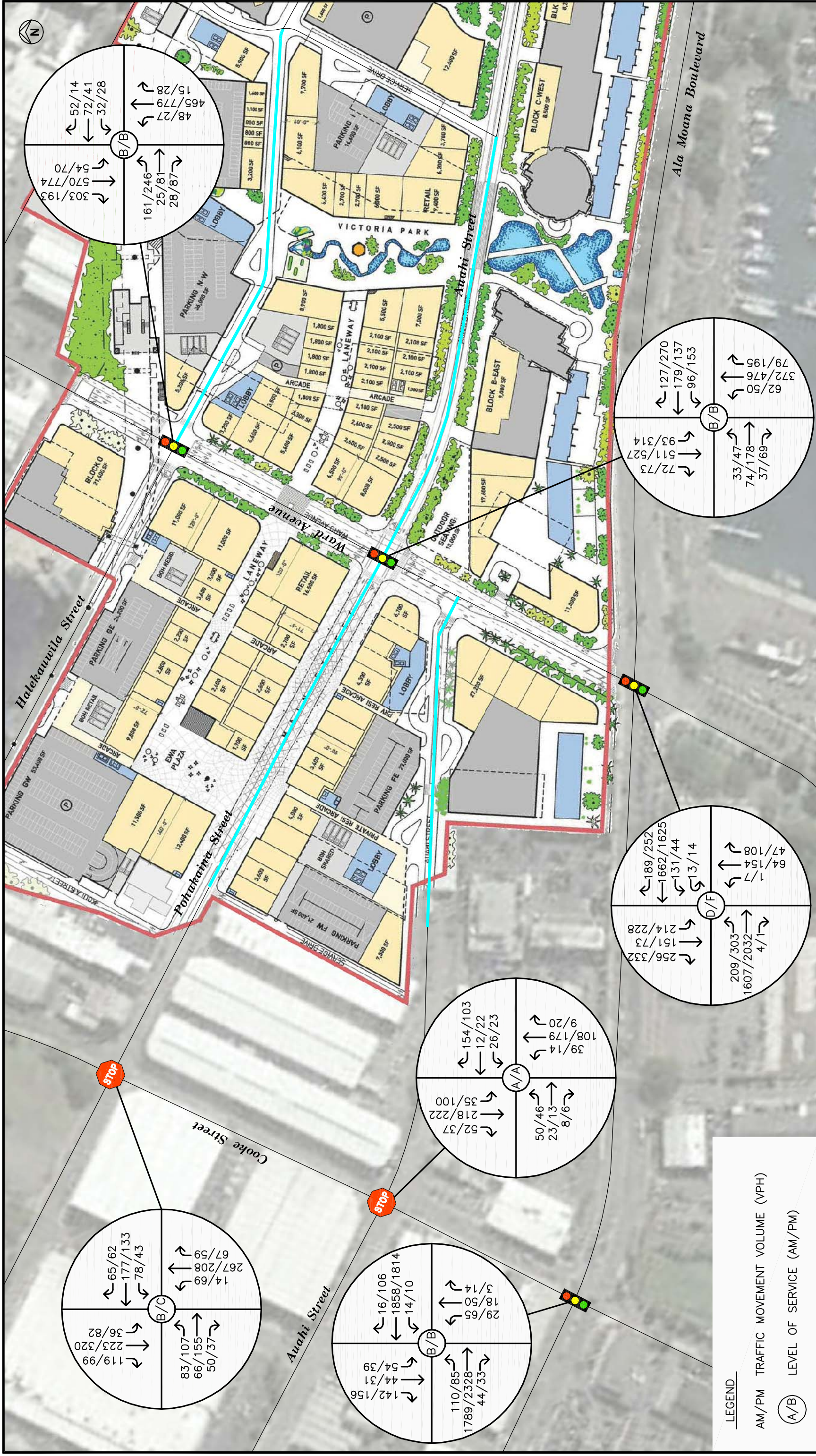
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WARD VILLAGES MASTER PLAN

YEAR 2023 PEAK HOURS OF TRAFFIC - INSET A





**LEGEND**

AM/PM TRAFFIC MOVEMENT VOLUME (VPH)

(A/B) LEVEL OF SERVICE (AM/PM)

WARD VILLAGES MASTER PLAN

YEAR 2023 PEAK HOURS OF TRAFFIC - INSET C



WILSON OKAMOTO CORPORATION



**Table 12: Year 2023 LOS Traffic Operating Conditions (Cont'd)  
Core Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2023 AM</b>	<b>Year 2023 PM</b>
Ward Ave/ Auahi St	Eastbound	B	C
	Westbound	B	C
	Northbound	A	A
	Southbound	A	C
Kamakee St/ Auahi St	Eastbound	B	B
	Westbound	B	B
	Northbound	B	C
	Southbound	B	C
Auahi St/ Queens Ln/ Queen St	Eastbound	B	B
	Northbound	B	B
	Southbound	B	B

**Table 13: Year 2023 LOS Traffic Operating Conditions  
Extended Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2023 AM</b>	<b>Year 2023 PM</b>
Kapiolani Blvd/ Cooke St	Eastbound	B	C
	Westbound	A	B
	Northbound	C	D
	Southbound	C	C
Kapiolani Blvd/ Ward Ave	Eastbound	D	D
	Westbound	D	C
	Northbound	E	D
	Southbound	E	D
Kapiolani Blvd/ Kamakee St	Eastbound	A	B
	Westbound	B	B
	Northbound	C	C
Kapiolani Blvd/ Piikoi St	Eastbound	B	C
	Westbound	B	C
	Northbound	D	C



**Table 13: Year 2023 LOS Traffic Operating Conditions (Cont'd)  
Extended Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2023 AM</b>	<b>Year 2023 PM</b>
Queen St/ Cooke St	Eastbound	A	B
	Westbound	B	A
	Northbound	B	B
	Southbound	B	B
Piikoi St/ Waimanu St/	Eastbound	B	C
	Westbound	C	C
	Northbound	C	D
	Southbound	C	D
Cooke St/ Halekauwila St	Eastbound	C	D
	Westbound	C	C
	Northbound	B	C
	Southbound	B	C
Cooke St/ Pohukaina St	Eastbound	B	C
	Westbound	C	C
	Northbound	B	C
	Southbound	B	C
Cooke St/ Auahi St	Eastbound	C	C
	Westbound	B	B
	Northbound	A	A
	Southbound	A	A
Ala Moana Blvd/ Cooke St	Eastbound	B	B
	Westbound	B	B
	Northbound	D	D
	Southbound	D	D
Ala Moana Blvd/ Ward Ave	Eastbound	D	F
	Westbound	E	F
	Northbound	D	D
	Southbound	D	E

**Table 13: Year 2023 LOS Traffic Operating Conditions (Cont'd)  
Extended Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2023 AM</b>	<b>Year 2023 PM</b>
Ala Moana Blvd/ Kamakee St/	Eastbound	B	C
	Westbound	B	C
	Northbound	D	D
	Southbound	D	D
Ala Moana Blvd/ Queen St	Eastbound	A	B
	Westbound	B	B
	Southbound	D	D
Ala Moana Blvd/ Piikoi St	Eastbound	C	D
	Westbound	C	D
	Southbound	E	E

Traffic operations with the completion of Phase 3 within the project core are expected to remain similar to Phase 2 conditions primarily due to the completion of the Halekauwila Street Extension, realignment of Auahi Street east of Ward Avenue, and extension of Auahi Street west of Ward Avenue. Those roadway improvements are expected to alleviate projected traffic operations due to the provision of alternate east-west routes resulting in changes to traffic circulation, routes, and distribution in the vicinity. Within the extended study area, the influence of regional growth is still apparent, but the completion of the fixed guideway transit system, as well as, continued efforts to enhance facilities for alternative modes of travel are expected to alleviate projected conditions. As previously stated, periodic monitoring of traffic operating conditions may be required to verify projected conditions.

**G. Year 2024 Total Traffic Volumes (Phase 4)**

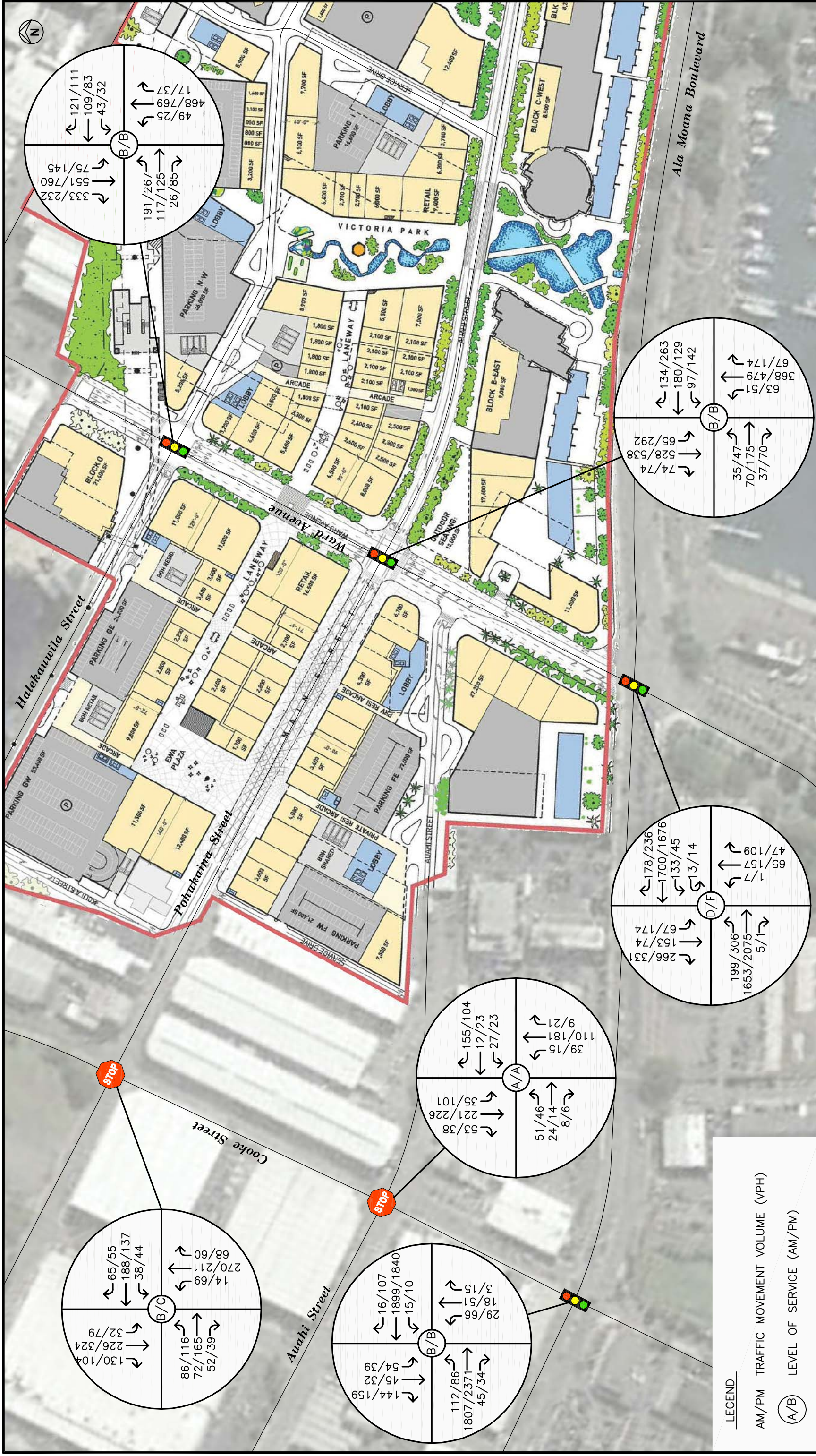
The Year 2024 AM and PM peak hour traffic operating conditions at the study intersections with Phases 1 to 4 of the Ward Villages Master Plan are shown in Figures 30 to 33, and summarized in Tables 14 and 15. The analysis incorporates the development of other projects in the area. LOS calculations are included in Appendix I.



WARD VILLAGES MASTER PLAN

YEAR 2024 PEAK HOURS OF TRAFFIC - INSET A





WARD VILLAGES MASTER PLAN

YEAR 2024 PEAK HOURS OF TRAFFIC - INSET C



**Table 14: Year 2024 LOS Traffic Operating Conditions  
Core Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2024 AM</b>	<b>Year 2024 PM</b>
Ward Ave/ Queen St	Eastbound	C	C
	Westbound	C	D
	Northbound	C	D
	Southbound	C	D
Queen St/ Kamakee St	Eastbound	B	C
	Westbound	B	B
	Northbound	B	C
	Southbound	B	C
Queen St/ Queens Ln	Westbound	A	A
	Northbound	B	B
Ward Ave/ Halekauwila St	Eastbound	B	B
	Westbound	B	B
	Northbound	B	B
	Southbound	B	B
Kamakee St/ Halekauwila St Extension	Eastbound	B	B
	Northbound	A	A
Ward Ave/ Auahi St	Eastbound	B	C
	Westbound	B	C
	Northbound	A	A
	Southbound	B	B
Kamakee St/ Auahi St	Eastbound	B	B
	Westbound	B	B
	Northbound	B	C
	Southbound	B	C
Auahi St/ Queens Ln/ Queen St	Eastbound	B	B
	Northbound	B	B
	Southbound	B	B

**Table 15: Year 2024 LOS Traffic Operating Conditions  
Extended Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2024 AM</b>	<b>Year 2024 PM</b>
Kapiolani Blvd/ Cooke St	Eastbound	B	C
	Westbound	A	B
	Northbound	C	D
	Southbound	C	D
Kapiolani Blvd/ Ward Ave	Eastbound	E	D
	Westbound	D	C
	Northbound	E	D
	Southbound	E	D
Kapiolani Blvd/ Kamakee St	Eastbound	A	B
	Westbound	B	B
	Northbound	C	C
Kapiolani Blvd/ Piikoi St	Eastbound	B	C
	Westbound	B	C
	Northbound	D	C
Queen St/ Cooke St	Eastbound	A	B
	Westbound	B	A
	Northbound	B	B
	Southbound	B	B
Piikoi St/ Waimanu St	Eastbound	B	C
	Westbound	D	C
	Northbound	C	D
	Southbound	C	D
Cooke St/ Halekauwila St	Eastbound	C	E
	Westbound	C	C
	Northbound	C	C
	Southbound	C	C
Cooke St/ Pohukaina St	Eastbound	B	D
	Westbound	C	C
	Northbound	B	C
	Southbound	B	C



**Table 15: Year 2024 LOS Traffic Operating Conditions (Cont'd)  
Extended Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2024 AM</b>	<b>Year 2024 PM</b>
Cooke St/ Auahi St	Eastbound	C	C
	Westbound	B	B
	Northbound	A	A
	Southbound	A	A
Ala Moana Blvd/ Cooke St	Eastbound	B	B
	Westbound	B	B
	Northbound	D	D
	Southbound	D	D
Ala Moana Blvd/ Ward Ave	Eastbound	D	F
	Westbound	E	F
	Northbound	D	D
	Southbound	D	E
Ala Moana Blvd/ Kamakee St/ Queen St	Eastbound	B	C
	Westbound	B	C
	Northbound	D	D
	Southbound	D	D
Ala Moana Blvd/ Queen St	Eastbound	A	B
	Westbound	B	B
	Southbound	D	D
Ala Moana Blvd/ Piikoi St	Eastbound	C	D
	Westbound	C	D
	Southbound	E	E

Traffic operations with the completion of Phase 4 are expected to generally remain similar to Phase 3 conditions. However, the extensive roadway and intersection improvements implemented with Phases 1-3 of the proposed development, as well as, the development of enhanced facilities for alternative modes of travel are expected to support the anticipated additional growth within the project core. As previously stated, the influence of regional growth is still anticipated within the extended study areas. As such, periodic monitoring of traffic operating conditions may be required to verify projected conditions.

**H. Year 2027 Total Traffic Volumes (Phase 5)**

The Year 2027 AM and PM peak hour traffic operating conditions at the study intersections with the completion of the Ward Villages Master Plan are shown in Figures 34 to 37, and summarized in Tables 16 and 17. The analysis incorporates the development of other projects in the area. LOS calculations are included in Appendix J.

**Table 16: Year 2027 LOS Traffic Operating Conditions  
Core Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2027 AM</b>	<b>Year 2027 PM</b>
Ward Ave/ Queen St	Eastbound	C	C
	Westbound	D	D
	Northbound	C	E
	Southbound	C	D
Queen St/ Kamakee St	Eastbound	B	C
	Westbound	B	B
	Northbound	B	D
	Southbound	B	D
Queen St/ Queens Ln	Westbound	A	A
	Northbound	B	B
Ward Ave/ Halekauwila St	Eastbound	B	C
	Westbound	B	C
	Northbound	B	B
	Southbound	B	B
Kamakee St/ Halekauwila St Extension	Eastbound	B	C
	Northbound	A	A
Ward Ave/ Auahi St	Eastbound	B	C
	Westbound	B	C
	Northbound	A	A
	Southbound	B	B
Kamakee St/ Auahi St	Eastbound	B	B
	Westbound	B	B
	Northbound	B	C
	Southbound	B	C

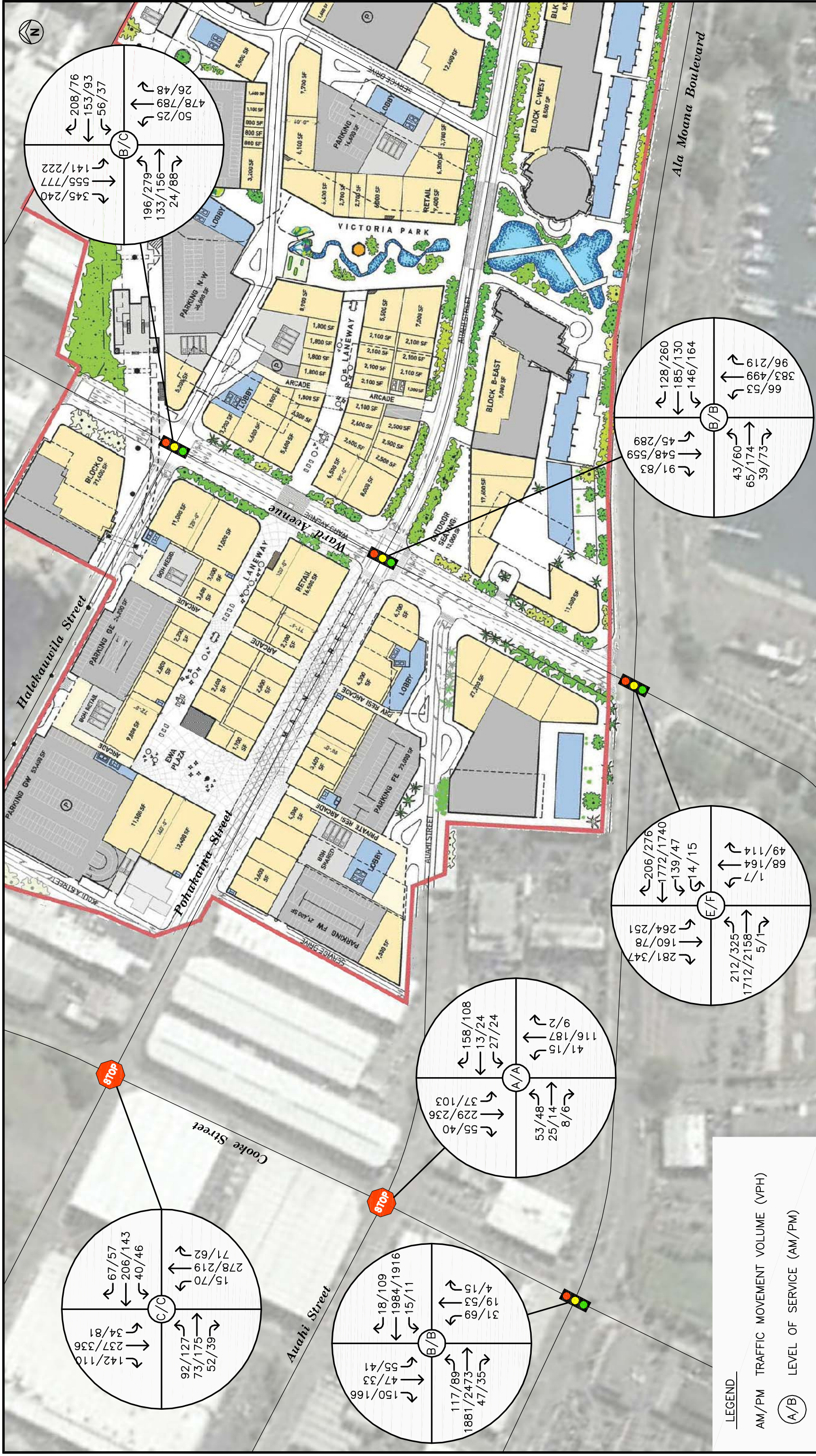


YEAR 2027 PEAK HOURS OF TRAFFIC - INSET A



WARD VILLAGES MASTER PLAN

YEAR 2027 PEAK HOURS OF TRAFFIC - INSET B



**LEGEND**

AM/PM TRAFFIC MOVEMENT VOLUME (VPH)

(A/B) LEVEL OF SERVICE (AM/PM)

WARD VILLAGES MASTER PLAN

YEAR 2027 PEAK HOURS OF TRAFFIC - INSET C



WILSON OKAMOTO CORPORATION



**Table 16: Year 2027 LOS Traffic Operating Conditions (Cont'd)  
Core Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2027 AM</b>	<b>Year 2027 PM</b>
Auahi St/ Queens Ln/ Queen St	Eastbound	B	B
	Northbound	B	B
	Southbound	B	B

**Table 17: Year 2027 LOS Traffic Operating Conditions  
Extended Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2027 AM</b>	<b>Year 2027 PM</b>
Kapiolani Blvd/ Cooke St	Eastbound	B	C
	Westbound	A	C
	Northbound	C	D
	Southbound	C	D
Kapiolani Blvd/ Ward Ave	Eastbound	E	D
	Westbound	E	C
	Northbound	E	D
	Southbound	E	D
Kapiolani Blvd/ Kamakee St	Eastbound	A	B
	Westbound	B	B
	Northbound	C	D
Kapiolani Blvd/ Piikoi St	Eastbound	B	C
	Westbound	C	C
	Northbound	D	C
Queen St/ Cooke St	Eastbound	A	B
	Westbound	B	A
	Northbound	B	B
	Southbound	B	B
Piikoi St/ Waimanu St	Eastbound	B	C
	Westbound	D	C
	Northbound	D	D
	Southbound	C	D

**Table 17: Year 2027 LOS Traffic Operating Conditions (Cont'd)  
Extended Study Area**

<b>Intersection</b>	<b>Approach/ Critical Movement</b>	<b>Year 2027 AM</b>	<b>Year 2027 PM</b>
Cooke St/ Halekauwila St	Eastbound	C	F
	Westbound	D	D
	Northbound	C	C
	Southbound	C	D
Cooke St/ Pohukaina St	Eastbound	C	E
	Westbound	C	C
	Northbound	B	C
	Southbound	B	C
Cooke St/ Auahi St	Eastbound	C	C
	Westbound	B	B
	Northbound	A	A
	Southbound	A	A
Ala Moana Blvd/ Cooke St	Eastbound	B	B
	Westbound	B	B
	Northbound	D	D
	Southbound	D	D
Ala Moana Blvd/ Ward Ave	Eastbound	E	F
	Westbound	E	F
	Northbound	D	D
	Southbound	E	E
Ala Moana Blvd/ Kamakee St/	Eastbound	B	C
	Westbound	B	C
	Northbound	D	D
	Southbound	D	D
Ala Moana Blvd/ Queen St	Eastbound	A	B
	Westbound	B	B
	Southbound	D	D
Ala Moana Blvd/ Piikoi St	Eastbound	C	D
	Westbound	C	D
	Southbound	E	E



Traffic volumes are expected to continue increasing along the adjacent roadways within the project vicinity with the completion of the final phase of the proposed project. However, as previously stated, the extensive roadway and intersection improvements implemented with Phases 1-3, as well as, the development of enhanced facilities for alternative modes of travel are expected to support the anticipated growth within the project core. Traffic operations within the extended study area are expected to continue to be influenced by regional growth. As such, periodic monitoring of traffic operating conditions may be required to verify projected conditions.

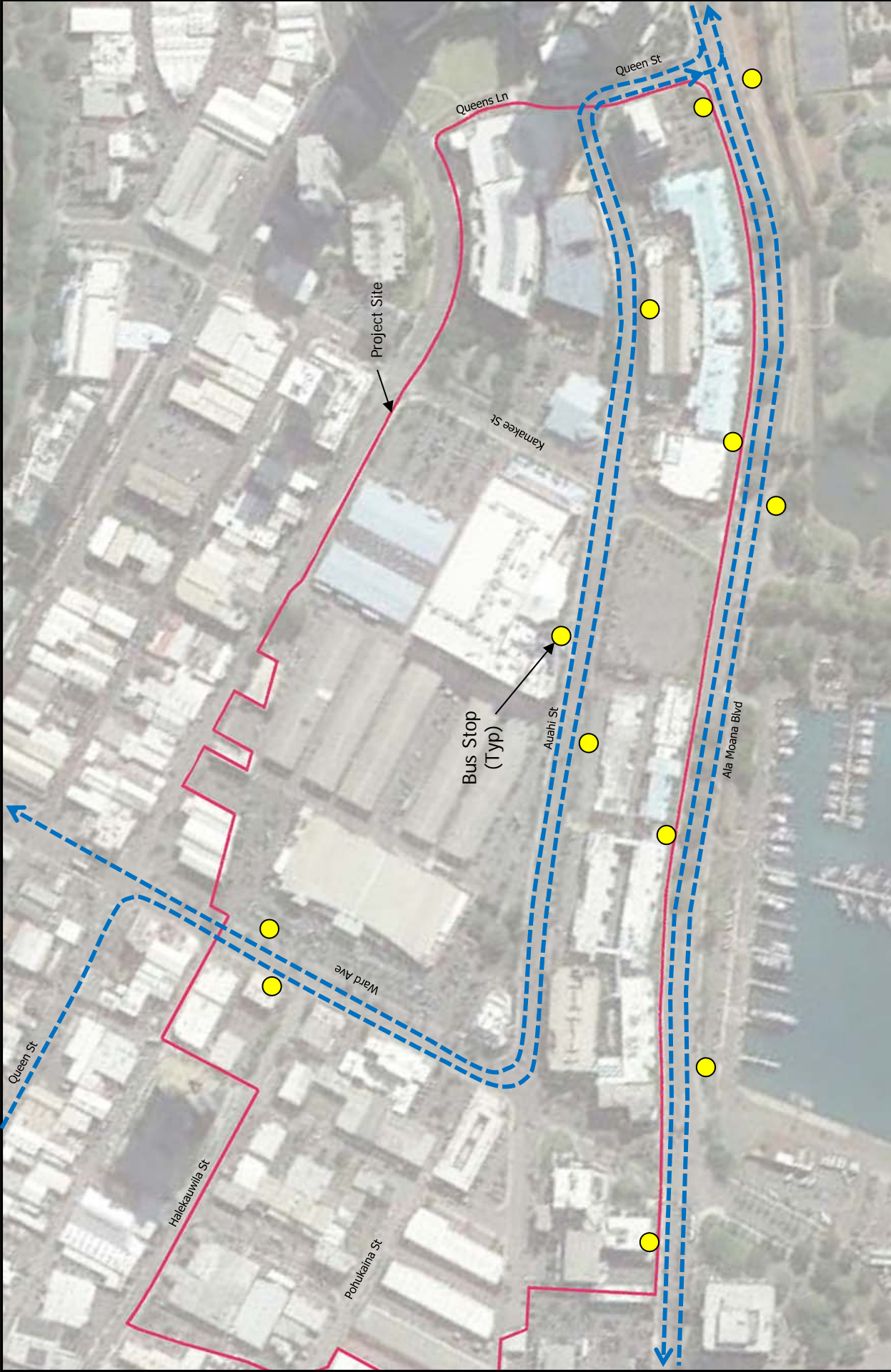
## **V. ALTERNATE MODES OF TRAVEL**

### **A. Public Transportation**

#### **1. Existing Routes and Facilities**

Public transportation services in the vicinity of the project are provided by the City and County of Honolulu. These services currently consist of fixed route bus services, as well as, door-to-door services for people who have difficulty accessing the fixed route services (HandiVan). The fixed route bus services in the project vicinity consist of regional routes along Ala Moana Boulevard supplemented by a local route along Auahi Street which are summarized below (see Figure 38):

- Route 6 – Local route that services Nuuanu, Downtown, Kakaako, Moiliili, and Manoa
- Routes 19 & 20 – Regional route between Aiea and Waikiki with stops in Kakaako
- Route 42 – Regional route between Ewa Beach and Waikiki with stops in Kakaako
- Route 55 – Regional route between Ala Moana and Wahiawa with stops in Kakaako
- Route 56 – Regional route between Ala Moana and Kailua-Kaneohe with stops in Kakaako
- Route 57 – Regional route between Ala Moana and Sea Life Park with stops in Kakaako
- Route 57A – Regional route between Ala Moana and Kailua-Kaneohe with stops in Kakaako
- Route 88A – Regional route between Ala Moana and the North Shore with stops in Kakaako



WARD VILLAGES MASTER PLAN  
 EXISTING BUS ROUTES

FIGURE  
 38

In addition to fixed bus routes, the project vicinity is also served by a number of trolley companies including Oli Oli (JTB), Lealea (H.I.S.), Waikiki Trolley, and JALPAK (see Figure 39). The primary route in the vicinity of the project site utilizes Queen Street and Auahi Street to travel between Ala Moana Boulevard and Ward Avenue.

## **2. Planned Transit Facilities**

As previously mentioned, 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. The proposed Honolulu High-Capacity Transit Corridor Project is intended to increase east-west mobility on Oahu's most heavily congested corridor. As described in the project EIS, the transit project is intended to:

- provide faster, more reliable public transportation service than can be achieved with buses operating in congested mixed-flow traffic
- provide reliable mobility in areas of the corridor with people of limited income, an aging population and rapidly developing areas
- provide additional transit capacity and an alternative to the automobile
- moderate anticipated traffic congestion in conjunction with other improvements included in the Oahu Regional Transportation Plan 2035 (ORTP)

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 (see Figure 40). The planned transit system is expected to be completed prior to the completion of Phase 3 of the Ward Villages Master Plan and is also expected to include the development of a transit station within the project site north of Block H.

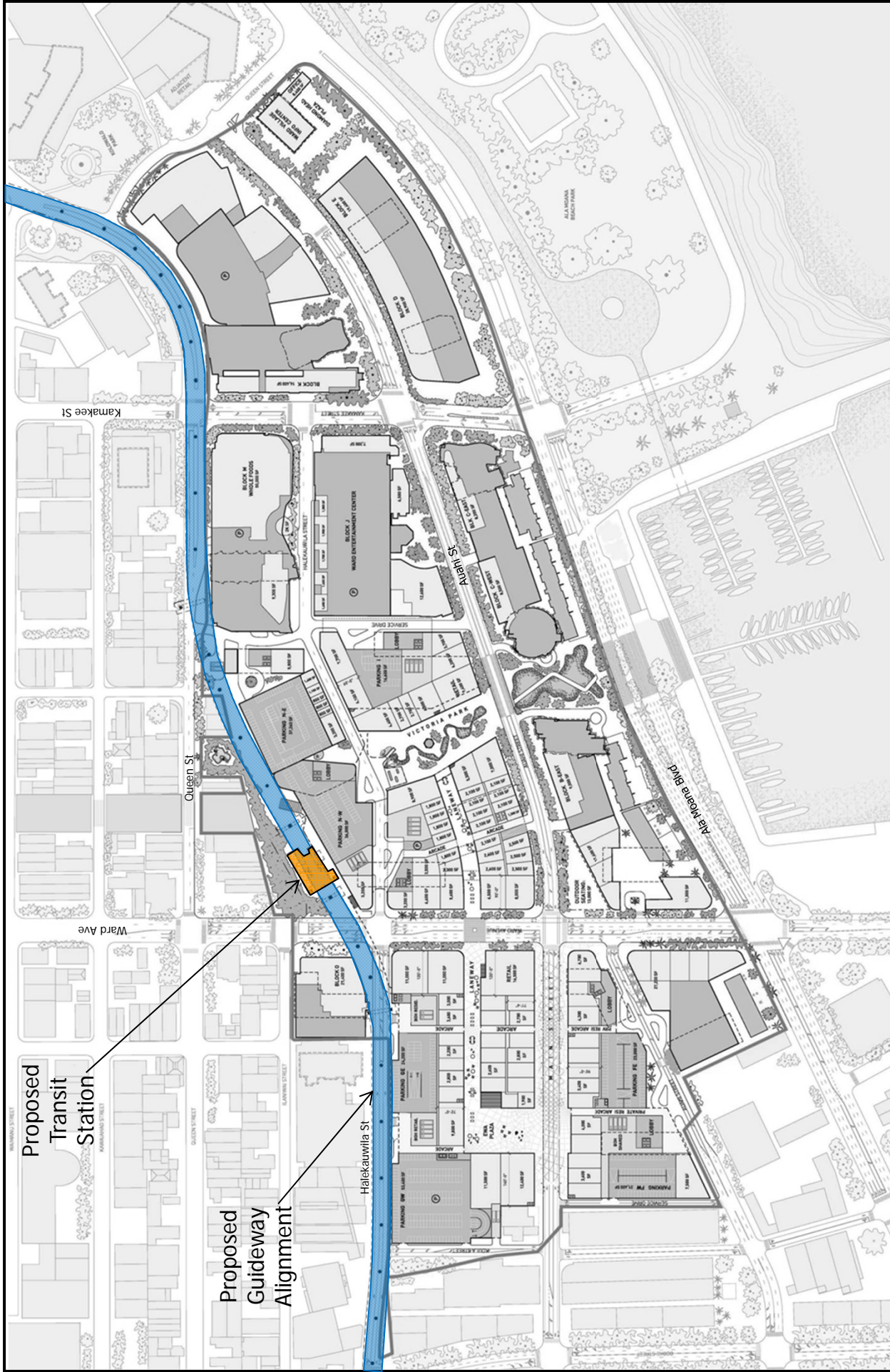
### **B. Bicycle Facilities**

Currently, the only designated bicycle facilities (lanes, paths, or routes) along the roadways adjacent to the project site is an existing bike route along Queen Street east of Kamakee Street. Bicyclist along the other roadways including Ala Moana



WARD VILLAGES MASTER PLAN

EXISTING TROLLEY ROUTES



WARD VILLAGES MASTER PLAN  
FIXED GUIDEWAY TRANSIT ROUTE

Boulevard, Auahi Street, Kamakee Street, Ward Avenue, and Halekauwila Street share the existing travel lanes. The State of Hawaii Department of Transportation has a master plan for bicycle facilities entitled “Bike Plan Hawaii” and the City and County of Honolulu has a similar document entitled the “Oahu Bike Plan.” These plans detail future potential bicycle facilities in the vicinity of the Ward Villages Master Plan (see Figure 41) including the following:

- Bike lanes on Ala Moana Boulevard between Nimitz Highway and Kalakaua Avenue
- Bike lanes on Kamakee Street between Kapiolani Boulevard and Ala Moana Boulevard
- Bike route along Auahi Street from South Street to Queen Street
- Bike route along Ward Avenue
- Bike route along Halekauwila Street
- Extension of the existing bike route along Queen Street further west
- Bike lanes along Cooke Street
- Bike route along Pensacola Street
- Bike route along Piikoi Street

Since the development of the “Oahu Bike Plan,” the City and County of Honolulu has also been working on developing a network of protected bicycle facilities in conjunction with their Complete Streets Initiative. This network includes the following facilities in the vicinity of the Ward Villages development (see Figure 42):

- Cycle track along Ward Avenue instead of the bike route designated in the bike plan
- Cycle track along Halekauwila Street instead of the bike route designated in the bike plan
- Protected bike lanes along Kapiolani Boulevard

The Howard Hughes Corporation (HHC) has been working with the City and County of Honolulu regarding the incorporation of bicycle facilities into the development plans for the Ward Villages project. These facilities include the following:

- Provision of bike lanes along Auahi Street between Ward Avenue and Queen Street (expected prior to the completion of Phase 1B)

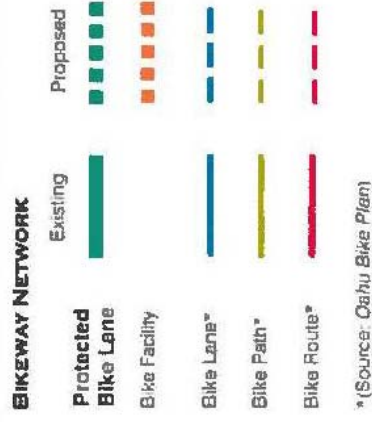
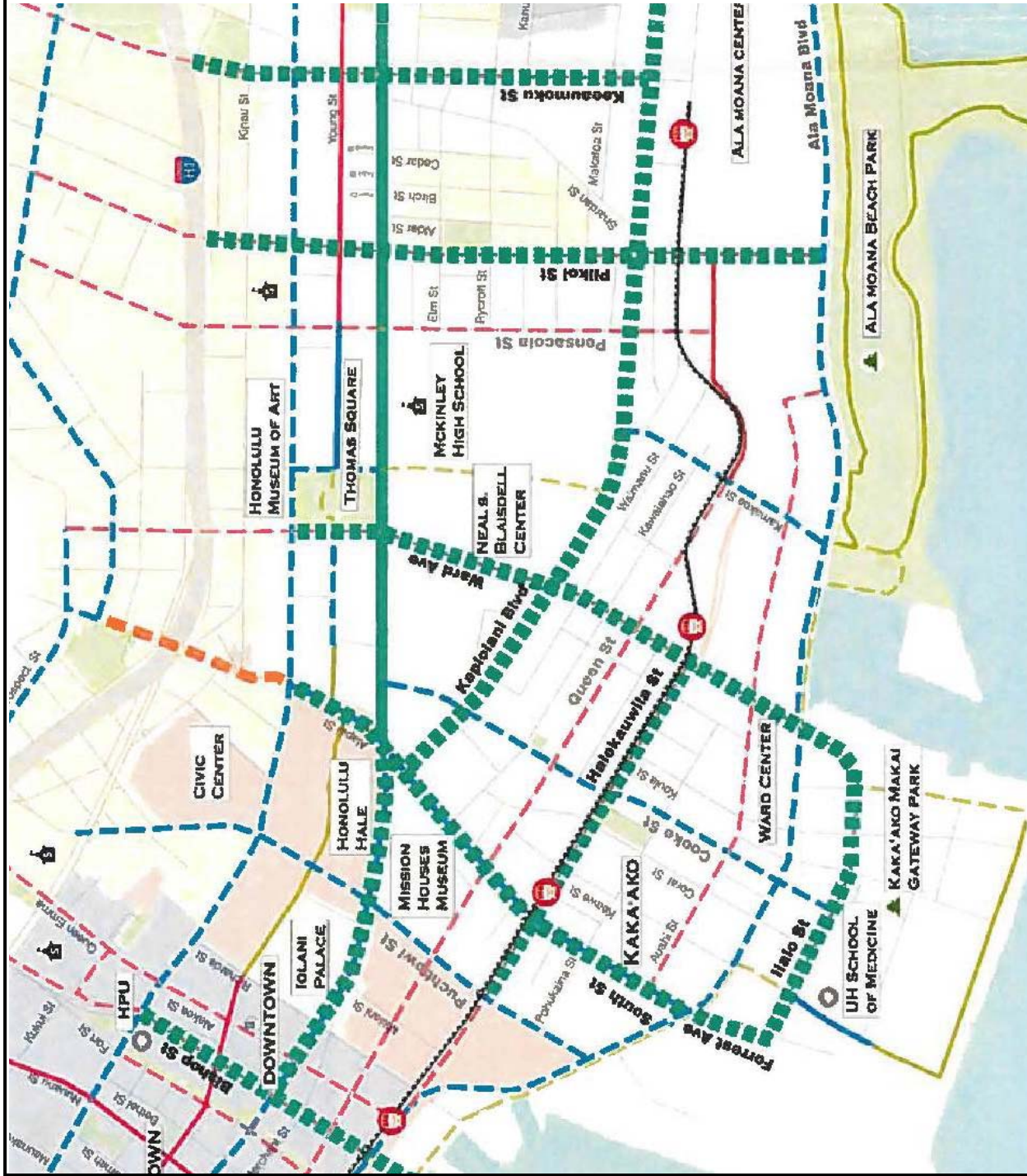


**WARD VILLAGES MASTER PLAN**

**PLANNED BICYCLE FACILITY IMPROVEMENTS – OAHU BIKE PLAN**

**FIGURE 41**





Source: City and County of Honolulu

WARD VILLAGES MASTER PLAN

PLANNED PROTECTED BICYCLE FACILITIES

FIGURE

42



- Modification of the bike lanes along Auahi Street to accommodate the planned realignment of Auahi Street east of Ward Avenue (expected prior to the completion of Phase 3)
- Provision of a cycle track along Ward Avenue between Ala Moana Boulevard and Queen Street to assist with the City and County of Honolulu’s plan to provide a cycle track along Ward Avenue
- Provision of bike racks at various locations throughout the Ward Villages development (see Figure 43)
- Potential provision of Bike Share facilities within the Ward Villages development (see Figure 43)

**C. Pedestrian Facilities**

Currently, there are improved pedestrian facilities such as sidewalks and crosswalks provided along the roadways adjacent to the project site including Ala Moana Boulevard, Auahi Street, Kamakee Street, Ward Avenue, Queen Street, and Halekauwila Street. The master plan for the Ward Villages development is expected to either maintain or enhance these existing facilities. In addition, the development is expected to include the following additional pedestrian facilities (see Figure 44):

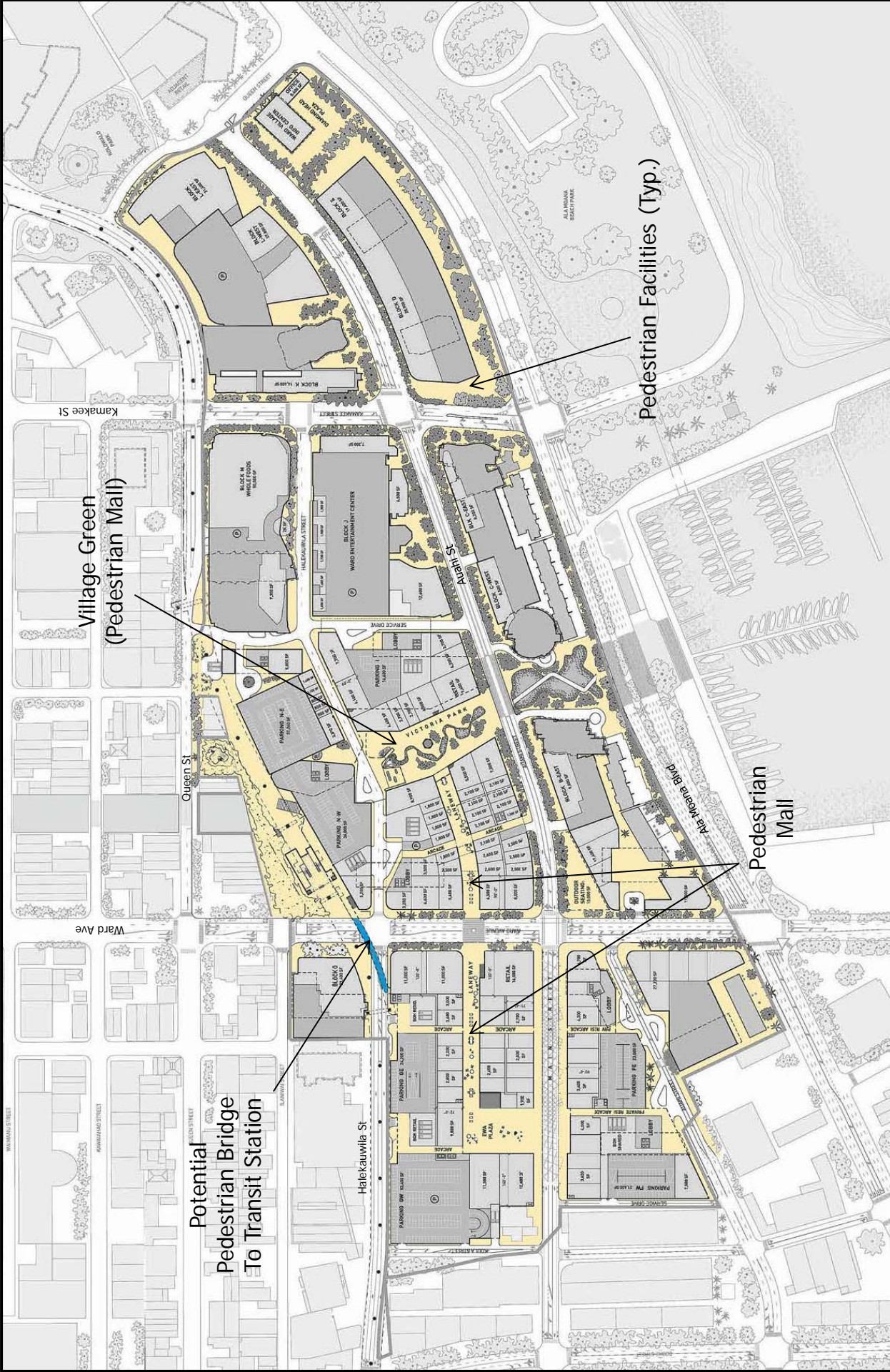
- North-south pedestrian route between Ward Avenue and Kamakee Street connecting the Halekauwila Street Extension to Ala Moana Boulevard.
- Village Green and pedestrian malls providing pedestrian connection through Blocks H and G with connection to the Ewa Plaza.
- Improved pedestrian facilities (i.e. sidewalks, crosswalks, etc.) along the new internal roadways including the Halekauwila Street Extension and Private Drive.
- Internal pedestrian connections (referred to as “arcades”) through the commercial/retail uses to provide additional north-south pedestrian connections to Blocks F, G, and H.
- Provision of pedestrian plazas to be provided in conjunction with Block N, G, B and E.
- Potential pedestrian bridge connection between the proposed transit station and Blocks I, N, and G.

The minimum design criteria for these planned pedestrian facilities are expected to be determined during the planning stages of each phase of the Ward Villages Master Plan based on the projected pedestrian traffic. These projections were developed based on the trip generation characteristics, anticipated modal split, and the relative convenience of the available routes for the proposed development. In general, all sidewalks are anticipated to have a minimum width of 8 feet along the



WARD VILLAGES MASTER PLAN

BIKE FACILITIES



WARD VILLAGES MASTER PLAN  
 PEDESTRIAN FACILITIES

FIGURE 44

major roadways through the project site. Table 18 includes the peak pedestrian hour volumes during the AM and PM peak periods anticipated along the major roadways in the vicinity of the development.

**Table 18: Projected Peak Hour Pedestrian Volumes**

<b>Roadway</b>	<b>Segment</b>	<b>Pedestrian Volume (peds/hr)</b>
Queen Street	West of Kamakee Street	350
	East of Kamakee Street	300
Kamakee Street	Between Queen Street and Auahi Street	400
	South of Auahi Street	300
Auahi Street	East of Kamakee Street	350
	Between Kamakee Street and Ward Avenue	600
	West of Kamakee Street	350
Ward Avenue	Between Ala Moana Boulevard and Queen Street	350
Halekauwila Street	West of Ward Avenue	300
Halekauwila Street Extension	East of Ward Avenue	300
Private Drive	Between Queen Street and Auahi Street	400

**VI. RECOMMENDATIONS**

**A. General**

The following are the general recommendations of this study to be implemented in conjunction with the proposed project:

1. Maintain sufficient sight distances for motorists to safely enter and exit all driveways/roadways.
2. Provide adequate on-site loading and off-loading service areas for all developments.
3. Provide adequate turn-around areas for service, delivery, and refuse collection vehicles to maneuver on-site for all developments to avoid vehicle-reversing maneuvers onto public roadways.
4. Provide sufficient turning radii at all driveways/roadways to avoid or minimize vehicle encroachments to oncoming traffic lanes.

5. With regards to public transportation, coordinate with the City and County of Honolulu Department of Transportation Services and Oahu Transit Services to ensure the smooth continuation of public transportation services within the project vicinity. Consideration should be given to the provision of bus shelters at new or relocated bus stop locations.
6. With regards to bicycle facilities, continue to coordinate with the City and County of Honolulu Department of Transportation Services and the State of Hawaii Department of Transportation to assist with their development of the bicycle facilities proposed by the City and State bike plans.
7. With regards to pedestrian facilities, improved pedestrian facilities such as sidewalks should be provided along all roadways within the project boundaries including Auahi Street, Kamakee Street, Halekauwila Street, and Queen Street. Pedestrian facilities should be made accessible in conformance with the Americans With Disabilities Act (ADA). In addition, consideration should be given to the inclusion of improved pedestrian facilities to increase pedestrian safety within the project boundary such as marked or protected crosswalks at intersections, raised intersections, raised crosswalks, and bulb-outs to reduce pedestrian crossing distances.
8. Prepare a Transportation Management Plan for the development that includes traffic circulation, parking, loading, and traffic demand management (TDM) strategies that address daily traffic, as well as, special events.
9. Prepare Traffic Impact Analysis Reports (TIAR) for each phase of the development to verify projected traffic operating conditions and identify additional mitigative measures to be implemented with each phase. The TIARs should be prepared during the planning stages for each phase.

**B. Year 2021 (Phase 2)**

In addition to the general recommendations, the following are the recommendations of this study for the surrounding roadways and intersections to be implemented in conjunction with Phase 2 of the proposed development:

1. Construct a portion of the Halekauwila Street Extension between Kamakee Street and the north-south connector roadway within the project site referred to as “Private Drive.”
2. Modify the intersection of Ward Avenue with Queen Street to provide exclusive left-turn lanes and shared through and right-turn lane on the eastbound and westbound approaches of the intersection.

**C. Year 2023 (Phase 3)**

In addition to the general and Phase 2 recommendations, the following are the recommendations of this study for the surrounding roadways and intersections to be implemented in conjunction with Phase 3 of the proposed development:

1. Complete the Halekauwila Street Extension between Ward Avenue and Private Drive to create a complete east-west roadway through the project site.
2. Realign Auahi Street east of Ward Avenue to connect to the eastern terminus of Pohukaina Street west of Ward Avenue.
3. Extend Auahi Street west of Ward Avenue to connect to the other existing portions of Auahi Street to create a continuous east-west roadway between Ward Avenue and South Street.
4. Modify the intersection of Ward Avenue with Halekauwila Street to provide an exclusive left-turn lane and a shared through and right-turn lane on the eastbound approach of the intersection.
5. Restrict turning movements at the driveways along Ward Avenue for Block A and Block B West to right-turn-in and right-turn-out due to the close proximity of the intersections with Ala Moana Boulevard and Auahi Street.
6. Restrict turning movements at the driveways along Kamakee Street for Block C East and Block D to right-turn-in and right-turn-out due to the close proximity of the intersections with Ala Moana Boulevard and Auahi Street.
7. Monitor vehicular and pedestrian traffic at the intersection of Kamakee Street and the Halekauwila Street Extension and install a traffic signal system when warranted. A Traffic Signal Warrant Study should be prepared prior to installation.
8. Monitor vehicular and pedestrian traffic at the planned pedestrian crossing of Ward Avenue between Halekauwila Street and Auahi Street and install a traffic signal system when warranted. A Traffic Signal Warrant Study should be prepared prior to installation.

**VII. CONCLUSION**

The implementation of the Ward Villages Master Plan entails the replacement of existing retail, office, and restaurant uses within the Kakaako area with a new multi-use master-planned development. The proposed development will include multi-family residential, retail, and restaurant uses surrounding the existing Ward Entertainment Center

which will remain and function in its current location. With the development of the proposed multi-use project, traffic volumes along the adjacent roadways are expected to increase. However, intersection improvements and modifications to the existing roadway network in the vicinity are planned in conjunction with the proposed project that are anticipated to alleviate future traffic conditions. These modifications include the provision of additional and alternate east-west routes through the Kakaako area through the realignment of Auahi Street west of Ward Avenue to intersect Pohukaina Street to improve east-west connectivity, extension of Halekauwila Street further east to Kamakee Street to further provide mobility throughout the area, and the extension of Auahi Street west of Ward Avenue. The new east-west routes provide access connections that will distribute traffic demands throughout the region. In addition, the project emphasizes the development of enhanced facilities for alternative modes of travel. However, since the proposed project is expected to be developed in phases over a period of 10+ years, it is recommended that Traffic Impact Analysis Reports (TIARs) be prepared for each phase of the project to verify future conditions and ensure necessary mitigation measures are implemented. Finally, a Transportation Management Plan should be developed to identify traffic circulation, parking, loading, and traffic demand management (TDM) strategies, and other measures that may improve operations in the region.

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**APPENDIX A**  
**EXISTING TRAFFIC COUNT DATA**

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# WILSON UKAMOTO CORPORATION

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

Counted By: JC, CY  
Counters: D4-3888, D4-5677  
Weather: Clear

File Name : AuaKam AM  
Site Code : 00000006  
Start Date : 3/3/2015  
Page No : 1

## Groups Printed - Unshifted

Start Time	Kamami Street Thru = Vehicles Entering Bank Of Hawaii Parking Garage Southbound				Auahi Street Left = Turn Into Bank Of Hawaii Driveaway Westbound				Bank Of Hawaii Driveaway Northbound				Auahi Street Eastbound									
	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	1	0	0	6	1	6	2	0	9	0	0	1	0	1	0	0	0	0	0	0	16
06:15 AM	4	0	1	0	5	5	0	15	0	20	0	0	2	0	2	1	0	0	0	0	1	28
06:30 AM	9	0	1	0	10	0	0	14	0	14	0	0	1	0	1	0	0	0	0	0	0	25
06:45 AM	9	0	2	1	12	1	0	22	0	23	0	0	0	0	0	1	0	0	0	0	1	36
Total	27	1	4	1	33	7	6	53	0	66	0	0	4	0	4	2	0	0	0	0	2	105
07:00 AM	12	0	0	1	13	3	1	39	0	43	0	0	0	0	0	0	0	0	0	0	0	56
07:15 AM	24	4	0	1	29	3	0	37	0	40	0	0	1	0	1	0	0	0	0	0	0	70
07:30 AM	13	0	0	0	13	5	1	49	0	55	0	0	0	0	0	0	1	0	0	0	1	69
07:45 AM	12	1	1	3	17	4	5	40	0	49	0	0	3	0	3	1	0	0	0	0	1	70
Total	61	5	1	5	72	15	7	165	0	187	0	0	4	0	4	1	1	0	0	0	2	265
08:00 AM	19	1	1	0	21	4	1	40	0	45	0	0	4	0	4	2	0	0	0	0	2	72
08:15 AM	26	3	1	0	30	9	1	50	0	60	0	0	4	0	4	0	1	0	0	0	1	95
08:30 AM	30	4	2	1	37	12	2	35	0	49	0	0	5	0	5	1	1	0	0	0	2	93
08:45 AM	38	6	2	1	47	10	0	24	0	34	0	0	5	0	5	2	1	0	0	0	3	89
Total	113	14	6	2	135	35	4	149	0	188	0	0	18	0	18	5	3	0	0	0	8	349
Grand Total	201	20	11	8	240	57	17	367	0	441	0	0	26	0	26	8	4	0	0	0	12	719
Approch %	83.8	8.3	4.6	3.3		12.9	3.9	83.2	0		0	0	100	0		66.7	33.3	0	0	0		
Total %	28	2.8	1.5	1.1	33.4	7.9	2.4	51	0	61.3	0	0	3.6	0		1.1	0.6	0	0	0	1.7	

Start Time	Kamami Street Thru = Vehicles Entering Bank Of Hawaii Parking Garage Southbound				Auahi Street Left = Turn Into Bank Of Hawaii Driveaway Westbound				Bank Of Hawaii Driveaway Northbound				Auahi Street Eastbound									
	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	
08:00 AM	19	1	1	1	21	4	1	40	0	45	0	0	4	0	4	2	0	0	0	0	2	72
08:15 AM	26	3	1	0	30	9	1	50	0	60	0	0	4	0	4	0	1	0	0	0	1	95
08:30 AM	30	4	2	1	37	12	2	35	0	49	0	0	5	0	5	1	1	0	0	0	2	92
08:45 AM	38	6	2	1	47	10	0	24	0	34	0	0	5	0	5	2	1	0	0	0	3	88
Total Volume	113	14	6	2	133	35	4	149	0	188	0	0	18	0	18	5	3	0	0	0	8	347
% App. Total	85	10.5	4.5			18.6	2.1	79.3	0		0	0	100	0		62.5	37.5	0	0	0		
PHF	.743	.583	.750		.723	.729	.500	.745		.783	.000	.000	.900		.900	.625	.750	.000	.000		.667	.913

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

# WILSON UKAMOTO CORPORATION

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

Counted By: CY, JC  
Counters: D4-3888, D4-5677  
Weather: Clear

File Name : AuaKam PM  
Site Code : 00000006  
Start Date : 3/3/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Kamani Street Thru = Vehicles Entering Bank Of Hawaii Parking Garage Southbound				Auahi Street Westbound				Bank Of Hawaii Driveway Northbound				Auahi Street Eastbound				Int. Total					
	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	34	2	1	0	37	2	0	30	0	32	0	0	10	0	10	0	2	0	0	0	2	81
03:15 PM	47	2	1	0	50	7	0	56	0	63	0	0	6	0	6	1	2	0	0	0	3	122
03:30 PM	50	2	1	3	56	6	1	41	0	48	0	0	5	0	5	3	1	0	0	0	4	113
03:45 PM	50	1	0	0	51	5	0	37	0	42	0	4	0	0	4	1	0	0	0	0	1	98
Total	181	7	3	3	194	20	1	164	0	185	0	0	25	0	25	5	5	0	0	0	10	414
04:00 PM	42	2	0	1	45	4	0	34	0	38	0	0	12	0	12	4	4	0	0	0	8	103
04:15 PM	47	0	1	0	48	1	1	42	0	44	0	0	7	0	7	0	2	0	0	0	2	101
04:30 PM	52	1	0	0	53	2	1	43	0	46	0	0	7	0	7	4	4	0	0	0	8	114
04:45 PM	53	1	0	0	54	5	0	31	0	36	0	0	7	0	7	3	0	0	0	0	3	100
Total	194	4	1	1	200	12	2	150	0	164	0	0	33	0	33	11	10	0	0	0	21	418
05:00 PM	49	0	0	0	49	5	0	53	1	59	0	0	13	0	13	7	2	0	0	0	9	130
05:15 PM	46	0	0	0	46	3	0	34	0	37	0	0	0	0	0	1	1	0	0	0	2	85
05:30 PM	50	0	0	0	50	4	0	42	0	46	0	0	8	0	8	1	3	0	0	0	4	108
05:45 PM	45	3	0	0	48	8	0	32	0	40	1	0	9	0	9	1	0	1	0	0	2	100
Total	190	3	0	0	193	20	0	161	1	182	1	0	30	0	30	10	6	1	0	0	17	423
Grand Total	565	14	4	4	587	52	3	475	1	531	1	0	88	0	88	26	21	1	0	0	48	1255
Approch %	96.3	2.4	0.7	0.7	46.8	9.8	0.6	89.5	0.2	42.3	0.1	0	98.9	0	7.1	54.2	43.8	2.1	0	0	3.8	
Total %	45	1.1	0.3	0.3	24.2	4.1	0.2	37.8	0.1	21.5	0.1	0	7	0	7.1	2.1	1.7	0.1	0	0	3.8	

Start Time	Kamani Street Thru = Vehicles Entering Bank Of Hawaii Parking Garage Southbound				Auahi Street Westbound				Bank Of Hawaii Driveway Northbound				Auahi Street Eastbound				Int. Total					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total	
04:15 PM	47	0	0	1	48	1	1	42	0	44	0	0	7	0	7	0	2	0	0	0	2	101
04:30 PM	52	1	0	0	53	2	1	43	0	46	0	0	7	0	7	4	4	0	0	0	8	114
04:45 PM	53	1	0	0	54	5	0	31	0	36	0	0	7	0	7	3	0	0	0	0	3	100
05:00 PM	49	0	0	0	49	5	0	37	0	42	0	0	7	0	7	7	2	0	0	0	9	129
Total Volume	201	2	1	1	204	13	2	169	0	184	0	0	34	0	34	14	8	0	0	0	22	444
% App. Total	98.5	1	0.5	0.5	46.8	7.1	1.1	91.8	0	42.3	0	0	100	0	7.1	63.6	36.4	0	0	0	3.8	
PHF	.948	.500	.250	.250	.944	.650	.500	.797	.000	.793	.000	.000	.654	.000	.654	.500	.500	.000	.000	.000	.611	.860

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

# Wilson Okamoto Corporation

1907 S. Beretania Street, Suite 400

Honolulu, HI 96826

Counted By: FS, PA

Counters: D4-5672, D4-5673

Weather: Clear

File Name : PohKam AM

Site Code : 00000005

Start Date : 3/3/2015

Page No : 1

## Groups Printed- Unshifted

Start Time	Kamani Street Left = Left Turn Into Business Driveway Southbound						Business Driveway Westbound						Kamani Street Northbound						Pohukaina Street Thru = To Business Driveway Eastbound						Int. Total		
	Left		Right		Peds		Left		Right		Peds		Left		Right		Peds		Left		Right		Peds			App. Total	
	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right		Thru	Right
06:00 AM	1	0	5	1	0	0	0	0	0	0	0	0	3	1	0	0	0	0	4	3	1	3	0	0	7	18	
06:15 AM	0	1	7	0	0	0	2	2	2	1	0	0	13	2	1	0	0	16	0	0	0	3	0	0	3	29	
06:30 AM	0	0	5	0	0	0	1	1	1	0	0	12	0	0	0	0	12	0	0	5	3	12	0	0	20	38	
06:45 AM	0	3	7	1	0	2	0	3	20	1	1	0	20	1	1	0	22	5	2	5	2	8	1	16	52		
Total	1	4	24	2	0	2	0	6	48	4	2	0	48	4	2	0	54	13	6	13	6	26	1	46	137		
07:00 AM	0	2	9	1	0	1	0	2	3	1	0	2	28	4	1	0	33	4	0	4	0	9	1	14	62		
07:15 AM	0	4	17	2	0	1	0	4	35	5	0	0	35	5	0	0	40	11	1	11	24	0	0	36	104		
07:30 AM	0	2	19	2	0	1	0	0	41	3	1	0	41	3	1	0	45	10	1	10	13	3	3	27	96		
07:45 AM	0	1	18	0	1	1	1	1	46	3	0	0	46	3	0	0	49	7	1	7	13	3	3	24	94		
Total	0	9	63	5	77	7	11	150	150	15	2	0	167	32	3	59	167	32	3	32	3	59	7	101	356		
08:00 AM	0	6	9	3	18	10	12	32	4	0	0	0	32	4	0	0	36	8	0	8	0	17	2	27	93		
08:15 AM	1	3	9	1	14	1	1	38	7	0	0	0	38	7	0	0	45	1	0	1	24	0	0	25	85		
08:30 AM	0	4	8	1	13	3	5	37	5	2	0	0	37	5	2	0	44	6	0	6	0	22	1	29	91		
08:45 AM	0	4	14	2	20	3	6	21	8	0	0	0	21	8	0	0	29	2	1	2	34	1	1	38	93		
Total	1	17	40	7	65	17	24	128	24	2	0	0	154	17	1	97	154	17	1	17	1	97	4	119	362		
Grand Total	2	30	127	14	173	28	41	326	43	6	0	0	375	62	10	182	375	62	10	23.3	3.8	68.4	4.5	266	855		
Approch %	1.2	17.3	73.4	8.1	20.2	68.3	4.8	86.9	11.5	1.6	0	0	86.9	11.5	0.7	0	43.9	7.3	1.2	21.3	1.4	31.1					
Total %	0.2	3.5	14.9	1.6	20.2	3.3	4.8	38.1	5	0.7	0	0	38.1	5	0.7	0	43.9	7.3	1.2	21.3	1.4	31.1					

Start Time	Kamani Street Left = Left Turn Into Business Driveway Southbound						Business Driveway Westbound						Kamani Street Northbound						Pohukaina Street Thru = To Business Driveway Eastbound						Int. Total		
	Left		Right		Peds		Left		Right		Peds		Left		Right		Peds		Left		Right		Peds			App. Total	
	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right		Thru	Right
07:15 AM	0	4	17	21	0	1	1	35	5	0	0	40	11	1	24	36	40	11	1	11	1	24	0	36	98		
07:30 AM	0	2	19	21	0	1	1	41	3	1	0	45	10	1	13	45	45	10	1	10	1	13	0	24	91		
07:45 AM	0	1	18	19	0	1	1	46	3	0	0	49	7	1	13	49	49	7	1	7	1	13	0	21	90		
08:00 AM	0	6	9	15	0	2	2	32	4	0	0	36	8	0	17	36	36	8	0	8	0	17	0	25	78		
Total Volume	0	13	63	76	0	5	5	154	15	1	1	170	36	3	67	170	170	36	3	36	3	67	0	106	357		
% App. Total	0	17.1	82.9	90.5	0	20	20	90.6	8.8	0.6	0	86.7	34	2.8	63.2	86.7	86.7	34	2.8	81.8	7.50	63.2	0	736	.911		
PHF	.000	.542	.829	.905	.000	.250	.625	.837	.750	.250	0	.867	.818	.750	.698	.867	.867	.818	.750	.698	.750	.698	0	.736	.911		

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

# Wilson Okamoto Corporation

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

Counted By: FS, PA

Counters: D4-5673, D4-5672

Weather: Clear

File Name : PohKam PM

Site Code : 00000005

Start Date : 3/3/2015

Page No : 1

## Groups Printed- Unshifted

Start Time	Kamani Street Southbound				Business Driveway Westbound				Kamani Street Northbound				Pohukaina Street Eastbound				Int. Total				
	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	2	4	4	5	15	0	1	0	8	9	16	13	4	0	33	10	1	20	3	34	91
03:15 PM	1	3	8	5	17	0	1	0	9	10	44	17	3	0	64	8	2	31	0	41	132
03:30 PM	0	6	10	4	20	0	1	0	8	9	38	10	1	0	49	14	0	38	2	54	132
03:45 PM	0	4	14	1	19	0	3	1	8	12	28	13	0	0	41	12	1	40	4	57	129
<b>Total</b>	<b>3</b>	<b>17</b>	<b>36</b>	<b>15</b>	<b>71</b>	<b>0</b>	<b>6</b>	<b>1</b>	<b>33</b>	<b>40</b>	<b>126</b>	<b>53</b>	<b>8</b>	<b>0</b>	<b>187</b>	<b>44</b>	<b>4</b>	<b>129</b>	<b>9</b>	<b>186</b>	<b>484</b>
04:00 PM	1	3	12	4	20	0	1	4	3	8	25	13	1	0	39	8	1	36	4	49	116
04:15 PM	0	8	11	1	20	0	0	1	3	4	31	10	1	0	42	10	2	44	1	57	123
04:30 PM	0	5	10	2	17	0	0	2	2	4	31	12	1	0	44	18	3	53	5	79	144
04:45 PM	0	7	13	5	25	0	0	1	2	3	20	11	1	0	32	14	1	52	4	71	131
<b>Total</b>	<b>1</b>	<b>23</b>	<b>46</b>	<b>12</b>	<b>82</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>10</b>	<b>19</b>	<b>107</b>	<b>46</b>	<b>4</b>	<b>0</b>	<b>157</b>	<b>50</b>	<b>7</b>	<b>185</b>	<b>14</b>	<b>256</b>	<b>514</b>
05:00 PM	2	6	8	0	16	0	3	0	8	11	35	21	0	0	56	14	6	50	2	72	155
05:15 PM	0	1	10	6	17	0	0	1	6	7	21	8	0	0	29	9	2	50	3	64	117
05:30 PM	0	9	14	3	26	0	1	3	1	5	18	10	2	0	30	16	1	36	1	54	115
05:45 PM	1	5	8	3	17	0	6	3	7	16	24	7	1	4	36	13	3	51	1	68	137
<b>Total</b>	<b>3</b>	<b>21</b>	<b>40</b>	<b>12</b>	<b>76</b>	<b>0</b>	<b>10</b>	<b>7</b>	<b>22</b>	<b>39</b>	<b>98</b>	<b>46</b>	<b>3</b>	<b>4</b>	<b>151</b>	<b>52</b>	<b>12</b>	<b>187</b>	<b>7</b>	<b>258</b>	<b>524</b>
<b>Grand Total</b>	<b>7</b>	<b>61</b>	<b>122</b>	<b>39</b>	<b>229</b>	<b>0</b>	<b>17</b>	<b>16</b>	<b>65</b>	<b>98</b>	<b>331</b>	<b>145</b>	<b>15</b>	<b>4</b>	<b>495</b>	<b>146</b>	<b>23</b>	<b>501</b>	<b>30</b>	<b>700</b>	<b>1522</b>
Approch %	3.1	26.6	53.3	17		0	17.3	16.3	66.3	6.4	66.9	29.3	3	0.8	32.5	20.9	3.3	71.6	4.3	46	
Total %	0.5	4	8	2.6	15	0	1.1	1.1	4.3	6.4	21.7	9.5	1	0.3	32.5	9.6	1.5	32.9	2	46	

Start Time	Kamani Street Southbound				Business Driveway Westbound				Kamani Street Northbound				Pohukaina Street Eastbound				Int. Total		
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right
04:15 PM	0	8	11	19	38	0	0	1	1	2	31	10	1	42	10	2	44	56	118
04:30 PM	0	5	10	15	30	0	0	2	2	4	31	12	1	44	18	3	53	74	135
04:45 PM	0	7	13	20	37	0	0	1	1	2	20	11	1	32	14	1	52	67	120
05:00 PM	2	6	8	16	32	0	3	0	0	3	35	21	0	56	14	6	50	70	145
Total Volume	2	26	42	70	140	0	3	4	4	7	117	54	3	174	56	12	199	267	518
% App. PHF	2.9	37.1	60	87.5		0	42.9	57.1	500	583	836	643	750	777	778	4.5	74.5	902	893
	.250	.813	.808	.875	.583	.000	.250	.500	.500	.583	.836	.643	.750	.777	.778	.500	.939	.902	.893

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

# Wilson Okamoto Corporation

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

Counted By: DY, GC  
Counters: D4-5676, D4-5675  
Weather: Clear

File Name : WarAua AM  
Site Code : 00000003  
Start Date : 3/3/2015  
Page No : 1

Groups Printed- Unshifted

Start Time	Ward Avenue Southbound				Auahi Street Westbound				Ward Avenue Northbound				Auahi Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
06:00 AM	10	70	7	1	88	8	5	2	6	21	2	29	10	1	42	2	1	2	3	8	159
06:15 AM	7	77	6	3	93	9	7	8	6	30	7	38	10	0	55	1	2	4	3	10	188
06:30 AM	5	75	8	2	90	8	4	3	6	21	1	42	11	0	54	2	3	5	3	13	178
06:45 AM	13	73	7	2	95	17	10	7	3	37	6	48	12	0	66	1	6	4	4	15	213
<b>Total</b>	<b>35</b>	<b>295</b>	<b>28</b>	<b>8</b>	<b>366</b>	<b>42</b>	<b>26</b>	<b>20</b>	<b>21</b>	<b>109</b>	<b>16</b>	<b>157</b>	<b>43</b>	<b>1</b>	<b>217</b>	<b>6</b>	<b>12</b>	<b>15</b>	<b>13</b>	<b>46</b>	<b>738</b>
07:00 AM	11	84	15	3	113	9	14	12	9	44	13	50	14	0	77	2	4	5	5	16	250
07:15 AM	15	105	9	7	136	16	23	8	16	63	7	56	10	0	73	3	12	7	6	28	300
07:30 AM	16	90	13	7	126	16	18	21	18	73	25	69	15	0	109	1	8	6	3	18	326
07:45 AM	12	77	10	9	108	20	30	11	17	78	15	73	20	0	108	0	7	7	8	22	316
<b>Total</b>	<b>54</b>	<b>356</b>	<b>47</b>	<b>26</b>	<b>483</b>	<b>61</b>	<b>85</b>	<b>52</b>	<b>60</b>	<b>258</b>	<b>60</b>	<b>248</b>	<b>59</b>	<b>0</b>	<b>367</b>	<b>6</b>	<b>31</b>	<b>25</b>	<b>22</b>	<b>84</b>	<b>1192</b>
08:00 AM	18	96	10	8	132	17	17	24	11	69	12	78	12	0	102	3	11	3	6	23	326
08:15 AM	15	116	10	9	150	26	33	18	17	94	21	73	21	0	115	10	11	7	5	33	392
08:30 AM	25	103	21	8	157	22	22	31	20	95	13	79	22	0	114	6	18	8	10	42	408
08:45 AM	27	86	24	12	149	19	11	29	8	67	10	66	18	0	94	5	24	15	13	57	367
<b>Total</b>	<b>85</b>	<b>401</b>	<b>65</b>	<b>37</b>	<b>588</b>	<b>84</b>	<b>83</b>	<b>102</b>	<b>56</b>	<b>325</b>	<b>56</b>	<b>296</b>	<b>73</b>	<b>0</b>	<b>425</b>	<b>24</b>	<b>64</b>	<b>33</b>	<b>34</b>	<b>155</b>	<b>1493</b>
<b>Grand Total</b>	<b>174</b>	<b>1052</b>	<b>140</b>	<b>71</b>	<b>1437</b>	<b>187</b>	<b>194</b>	<b>174</b>	<b>137</b>	<b>692</b>	<b>132</b>	<b>701</b>	<b>175</b>	<b>1</b>	<b>1009</b>	<b>36</b>	<b>107</b>	<b>73</b>	<b>69</b>	<b>285</b>	<b>3423</b>
Approach %	12.1	73.2	9.7	4.9		27	28	25.1	19.8		13.1	69.5	17.3	0.1		12.6	37.5	25.6	24.2		
Total %	5.1	30.7	4.1	2.1	42	5.5	5.7	5.1	4	20.2	3.9	20.5	5.1	0	29.5	1.1	3.1	2.1	2	8.3	

Start Time	Ward Avenue Southbound				Auahi Street Westbound				Ward Avenue Northbound				Auahi Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
08:00 AM	18	96	10		124	17	17	24		58	12	78	12		102	3	11	3		17	301
08:15 AM	15	116	10		141	26	33	18		77	21	73	21		115	10	11	7		28	361
08:30 AM	25	103	21		149	22	22	31		75	13	79	22		114	6	18	8		32	370
08:45 AM	27	86	24		137	19	11	29		59	10	66	18		94	5	24	15		44	334
Total Volume	85	401	65		551	84	83	102		289	56	296	73		425	24	64	33		121	1366
% App. PHF	15.4	72.8	11.8		.924	31.2	30.9	37.9		.873	13.2	69.6	17.2		.924	19.8	52.9	27.3		.688	.923
	.787	.864	.677			.808	.629	.823			.667	.937	.830			.600	.667	.550			

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

# Wilson Okamoto Corporation

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

Counted By: GC, DY  
Counters: D4-5675, D4-5676  
Weather: Clear

File Name : WarAua PM  
Site Code : 0000003  
Start Date : 3/3/2015  
Page No : 1

## Groups Printed - Unshifted

Start Time	Ward Avenue Southbound				Auahi Street Westbound				Ward Avenue Northbound				Auahi Street Eastbound				Int. Total				
	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	37	74	20	10	141	39	16	56	21	132	6	77	20	9	112	8	20	14	9	51	436
03:15 PM	44	107	33	13	197	26	43	52	21	142	12	86	28	4	130	8	20	14	6	48	517
03:30 PM	40	88	13	13	154	36	26	52	20	134	9	82	31	9	131	15	22	16	9	62	481
03:45 PM	39	92	16	12	159	31	23	60	36	150	10	76	36	6	128	10	34	14	7	65	502
<b>Total</b>	160	361	82	48	651	132	108	220	98	558	37	321	115	28	501	41	96	58	31	226	1936
04:00 PM	42	100	13	14	169	35	24	39	23	121	5	83	33	9	130	13	27	14	11	65	485
04:15 PM	54	102	9	10	175	42	18	51	27	138	16	89	34	12	151	9	38	18	14	79	543
04:30 PM	60	85	12	16	173	34	12	58	21	125	19	89	40	8	156	10	32	21	7	70	524
04:45 PM	68	84	8	20	180	39	18	49	16	122	10	87	34	3	134	9	42	14	4	69	505
<b>Total</b>	224	371	42	60	697	150	72	197	87	506	50	348	141	32	571	41	139	67	36	283	2057
05:00 PM	59	103	10	17	189	31	34	62	18	145	17	78	39	8	142	8	39	16	12	75	551
05:15 PM	79	99	17	14	209	27	18	50	24	119	8	95	46	10	159	9	37	18	11	75	562
05:30 PM	70	100	18	14	202	42	19	51	25	137	13	97	47	10	167	7	33	21	10	71	577
05:45 PM	71	101	21	9	202	29	14	55	19	117	7	93	46	11	157	5	47	7	10	69	545
<b>Total</b>	279	403	66	54	802	129	85	218	86	518	45	363	178	39	625	29	156	62	43	290	2235
<b>Grand Total</b>	663	1135	190	162	2150	411	265	635	271	1582	132	1032	434	99	1697	111	391	187	110	799	6228
Approach %	30.8	52.8	8.8	7.5		26	16.8	40.1	17.1		7.8	60.8	25.6	5.8		13.9	48.9	23.4	13.8		
Total %	10.6	18.2	3.1	2.6	34.5	6.6	4.3	10.2	4.4	25.4	2.1	16.6	7	1.6	27.2	1.8	6.3	3	1.8	12.8	

Start Time	Ward Avenue Southbound				Auahi Street Westbound				Ward Avenue Northbound				Auahi Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
05:00 PM	59	103	10	10	172	31	34	62	39	127	17	78	39	39	134	8	39	16	16	63	496
05:15 PM	79	99	17	17	195	27	18	50	46	95	8	95	46	46	149	9	37	18	18	64	503
05:30 PM	70	100	18	18	188	42	19	51	51	112	13	97	47	47	157	7	33	21	21	61	518
05:45 PM	71	101	21	21	193	29	14	55	46	98	7	93	46	46	146	5	47	7	7	59	496
<b>Total Volume</b>	279	403	66	66	748	129	85	218	178	432	45	363	178	178	586	29	156	62	62	247	2013
% App. Total	37.3	53.9	8.8	8.8		29.9	19.7	50.5	30.4		7.7	61.9	30.4	30.4		11.7	63.2	25.1	25.1		
PHF	.883	.978	.786	.786	.959	.768	.625	.879	.947	.850	.662	.936	.947	.947	.933	.806	.830	.738	.738	.965	.972

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

# Wilson Okamoto Corporation

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

Counted By: CM  
Counters: TU-2050  
Weather: Clear

File Name : KamAua AM  
Site Code : 00000004  
Start Date : 4/12/2016  
Page No : 1

## Groups Printed- Unshifted

Start Time	Kamakee Street Southbound				Auahi Street Westbound				Kamakee Street Northbound				Auahi Street Eastbound								
	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	14	4	35	1	6	1	4	12	3	5	5	8	21	4	9	3	7	23	91
06:15 AM	3	24	15	9	51	2	3	1	16	22	6	17	5	7	35	2	12	3	21	38	146
06:30 AM	5	22	22	16	65	1	6	2	12	21	10	19	5	13	47	4	8	9	10	31	164
06:45 AM	7	34	21	14	76	2	6	5	2	15	6	18	13	7	44	8	11	1	13	33	168
Total	16	96	72	43	227	6	21	9	34	70	25	59	28	35	147	18	40	16	51	125	569
07:00 AM	6	30	20	3	59	0	12	4	6	22	7	11	6	4	28	4	19	3	7	33	142
07:15 AM	5	24	33	3	65	1	24	4	5	34	7	21	1	4	33	2	15	1	7	25	157
07:30 AM	5	46	40	11	102	1	21	4	5	31	7	22	4	5	38	5	12	0	5	22	193
07:45 AM	11	43	36	5	95	2	18	3	2	25	5	27	4	4	40	6	28	3	5	42	202
Total	27	143	129	22	321	4	75	15	18	112	26	81	15	17	139	17	74	7	24	122	694
08:00 AM	11	31	37	7	86	0	24	5	7	36	22	24	7	3	56	5	32	2	3	42	220
08:15 AM	13	35	40	11	99	3	16	5	6	30	4	33	4	3	44	6	35	2	4	47	220
08:30 AM	6	33	34	13	86	4	17	3	1	25	9	19	6	2	36	6	25	2	2	35	182
08:45 AM	7	25	40	6	78	1	13	8	2	24	8	14	8	9	39	9	32	2	10	53	194
Total	37	124	151	37	349	8	70	21	16	115	43	90	25	17	175	26	124	8	19	177	816
Grand Total	80	363	352	102	897	18	166	45	68	297	94	230	68	69	461	61	238	31	94	424	2079
Approach %	8.9	40.5	39.2	11.4		6.1	55.9	15.2	22.9		20.4	49.9	14.8	15		14.4	56.1	7.3	22.2		
Total %	3.8	17.5	16.9	4.9	43.1	0.9	8	2.2	3.3	14.3	4.5	11.1	3.3	3.3	22.2	2.9	11.4	1.5	4.5	20.4	

Start Time	Kamakee Street Southbound				Auahi Street Westbound				Kamakee Street Northbound				Auahi Street Eastbound								
	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
07:30 AM	5	46	40	4	91	1	21	4	4	26	7	22	4	4	33	5	12	0	0	17	167
07:45 AM	11	43	36	3	90	2	18	3	3	23	5	27	4	4	36	6	28	3	3	37	186
08:00 AM	11	31	37	3	79	0	24	5	5	29	22	24	7	7	53	5	32	2	2	39	200
08:15 AM	13	35	40	4	88	3	16	5	5	24	4	33	4	4	41	6	35	2	2	43	196
Total Volume	40	155	153	17	348	6	79	17	17	102	38	106	19	19	163	22	107	7	7	136	749
% App. Total	11.5	44.5	44	4.9		5.9	77.5	16.7	11.7		23.3	65	11.7	11.7		16.2	78.7	5.1	5.1		
PHF	.769	.842	.956	.850	.956	.500	.823	.850	.850	.879	.432	.803	.679	.679	.769	.917	.764	.583	.583	.791	.936

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

# Wilson Okamoto Corporation

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

Counted By: JH, PA  
Counters: TU-2050, TU-1957  
Weather: Clear

File Name : KamAua PM  
Site Code : 00000004  
Start Date : 4/12/2016  
Page No : 1

## Groups Printed- Unshifted

Start Time	Kamakee Street Southbound				Auahi Street Westbound				Kamakee Street Northbound				Auahi Street Eastbound								
	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	12	41	32	45	130	1	24	19	6	50	11	24	6	21	62	36	56	4	24	120
03:15 PM	7	41	29	34	111	3	30	6	13	52	10	18	6	10	44	28	56	2	9	95	302
03:30 PM	11	56	36	40	143	2	46	14	18	80	13	21	7	17	58	32	48	4	11	95	376
03:45 PM	5	60	38	24	127	3	28	8	23	62	10	34	10	12	66	20	62	6	19	107	362
Total	35	198	135	143	511	9	128	47	60	244	44	97	29	60	230	116	222	16	63	417	1402
04:00 PM	16	55	28	25	124	8	33	9	25	75	12	27	5	3	47	26	39	3	3	71	317
04:15 PM	6	38	32	44	120	1	38	9	26	74	10	22	10	2	44	27	53	11	3	94	332
04:30 PM	13	34	39	32	118	5	26	11	13	55	8	31	11	9	59	37	39	5	4	85	317
04:45 PM	5	45	27	36	113	3	17	6	21	47	9	20	10	4	43	34	74	6	12	126	329
Total	40	172	126	137	475	17	114	35	85	251	39	100	36	18	193	124	205	25	22	376	1295
05:00 PM	12	58	37	37	144	3	14	7	21	45	11	19	10	7	47	28	58	4	5	95	331
05:15 PM	21	49	27	25	122	3	19	10	9	41	19	32	11	4	66	12	67	8	6	93	322
05:30 PM	16	47	35	40	138	1	33	5	33	72	11	16	13	0	40	28	63	10	11	112	362
05:45 PM	19	48	31	22	120	8	21	6	25	60	13	21	8	3	45	27	59	2	9	97	322
Total	68	202	130	124	524	15	87	28	88	218	54	88	42	14	198	95	247	24	31	397	1337
Grand Total	143	572	391	404	1510	41	329	110	233	713	137	285	107	92	621	335	674	65	116	1190	4034
Approch %	9.5	37.9	25.9	26.8		5.8	46.1	15.4	32.7		22.1	45.9	17.2	14.8		28.2	56.6	5.5	9.7		
Total %	3.5	14.2	9.7	10	37.4	1	8.2	2.7	5.8	17.7	3.4	7.1	2.7	2.3	15.4	8.3	16.7	1.6	2.9	29.5	

Start Time	Kamakee Street Southbound				Auahi Street Westbound				Kamakee Street Northbound				Auahi Street Eastbound								
	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
	03:30 PM	11	56	36	36	103	2	46	14	14	62	13	21	7	41	32	48	4	4	84	290
03:45 PM	5	60	38	38	103	3	28	8	8	39	10	34	10	54	20	62	6	6	88	284	
04:00 PM	16	55	28	28	99	8	33	9	9	50	12	27	5	44	26	39	3	3	68	261	
04:15 PM	6	38	32	32	76	1	38	9	9	48	10	22	10	42	27	53	11	11	91	257	
Total Volume	38	209	134	134	381	14	145	40	40	199	45	104	32	181	105	202	24	24	331	1092	
% App. Total	10	54.9	35.2	35.2		7	72.9	20.1	20.1		24.9	57.5	17.7		31.7	61	7.3	7.3			
PHF	.594	.871	.882	.882	.925	.438	.788	.714	.714	.802	.865	.765	.800	.838	.820	.815	.545	.545		.909	.941

Peak Hour Analysis From 03:00 PM to 05:30 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 03:30 PM



# Wilson Okamoto Corporation

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

Counted By: RJ, JJ  
Counters: TU-0651, TU-0652  
Weather: Clear

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

## Groups Printed - Unshifted

Start Time	Kamakee Street Southbound				Auahi Street Westbound				Kamakee Street Northbound				Auahi Street Eastbound								
	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	20	8	3	33	1	3	1	4	9	3	6	3	6	18	2	6	3	12	23	83
06:15 AM	1	29	10	4	44	0	5	2	3	10	3	7	1	6	17	1	6	3	5	15	86
06:30 AM	0	25	16	5	46	1	3	9	2	15	2	12	0	1	15	4	9	5	13	31	107
06:45 AM	2	26	18	8	54	0	4	2	6	12	11	10	2	4	27	9	8	5	8	30	123
Total	5	100	52	20	177	2	15	14	15	46	19	35	6	17	77	16	29	16	38	99	399
07:00 AM	3	29	29	7	68	0	9	4	6	19	8	21	3	1	33	7	11	4	8	30	150
07:15 AM	0	42	29	5	76	1	14	5	9	29	2	21	2	4	29	3	16	6	5	30	164
07:30 AM	5	34	33	5	77	2	20	3	5	30	11	24	9	9	53	6	14	4	8	32	192
07:45 AM	4	40	31	4	79	3	16	3	7	29	8	18	8	8	42	4	11	4	7	26	176
Total	12	145	122	21	300	6	59	15	27	107	29	84	22	22	157	20	52	18	28	118	682
08:00 AM	4	42	35	7	88	3	18	6	7	34	9	20	6	5	40	4	14	13	5	36	198
08:15 AM	6	45	40	13	104	1	21	3	10	35	13	24	7	10	54	5	24	4	9	42	235
08:30 AM	5	29	37	7	78	2	20	2	5	29	6	12	4	11	33	13	26	6	13	58	198
08:45 AM	8	35	28	19	90	3	18	12	11	44	8	26	7	8	49	16	21	3	16	56	239
Total	23	151	140	46	360	9	77	23	33	142	36	82	24	34	176	38	85	26	43	192	870
Grand Total	40	396	314	87	837	17	151	52	75	295	84	201	52	73	410	74	166	60	109	409	1951
Approach %	4.8	47.3	37.5	10.4	42.9	5.8	51.2	17.6	25.4	15.1	20.5	49	12.7	17.8	18.1	40.6	14.7	26.7	21	21	
Total %	2.1	20.3	16.1	4.5		0.9	7.7	2.7	3.8		4.3	10.3	2.7	3.7		3.8	8.5	3.1	5.6		

Start Time	Kamakee Street Southbound				Auahi Street Westbound				Kamakee Street Northbound				Auahi Street Eastbound								
	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
08:00 AM	4	42	35	7	81	3	18	6	6	27	9	20	6	6	35	4	14	13	13	31	174
08:15 AM	6	45	40	13	91	1	21	3	3	25	13	24	7	7	44	5	24	4	4	33	193
08:30 AM	5	29	37	7	71	2	20	2	2	24	6	12	4	4	22	13	26	6	6	45	162
08:45 AM	8	35	28	19	71	3	18	12	11	33	8	26	7	7	41	16	21	3	3	40	185
Total Volume	23	151	140	46	314	9	77	23	23	109	36	82	24	24	142	38	85	26	26	149	714
% App. Total	7.3	48.1	44.6		8.63	8.3	70.6	21.1		25.4	25.4	57.7	16.9		25.5	57	17.4			8.28	
PHF	.719	.839	.875		.863	.750	.917	.479		.826	.692	.788	.857		.807	.594	.817	.500			.925

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

# Wilson Okamoto Corporation

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

Counted By: RJ, JJ  
Counters: TU-0651, TUI-0652  
Weather: Clear

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

## Groups Printed- Unshifted

Start Time	Kamakee Street Southbound				Auahi Street Westbound				Kamakee Street Northbound				Auahi Street Eastbound								
	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	13	52	43	47	155	3	27	8	40	78	16	20	10	25	71	20	48	16	29	113	417
03:15 PM	7	47	44	52	150	5	43	9	36	93	13	30	8	32	83	34	51	4	26	115	441
03:30 PM	16	55	33	30	134	7	28	13	11	59	18	34	9	35	96	21	43	12	28	104	393
03:45 PM	12	53	35	30	130	1	28	8	25	62	16	38	12	36	102	14	52	6	21	93	387
<b>Total</b>	<b>48</b>	<b>207</b>	<b>155</b>	<b>159</b>	<b>569</b>	<b>16</b>	<b>126</b>	<b>38</b>	<b>112</b>	<b>292</b>	<b>63</b>	<b>122</b>	<b>39</b>	<b>128</b>	<b>352</b>	<b>89</b>	<b>194</b>	<b>38</b>	<b>104</b>	<b>425</b>	<b>1638</b>
04:00 PM	19	41	32	64	156	1	37	9	27	74	14	25	6	34	79	31	42	5	22	100	409
04:15 PM	10	27	32	40	109	2	20	12	45	79	15	25	8	48	96	39	47	14	23	123	407
04:30 PM	7	49	36	45	137	3	30	13	29	75	18	30	15	40	103	22	59	13	18	112	427
04:45 PM	7	34	39	60	140	3	31	12	24	70	20	20	9	45	94	27	60	14	20	121	425
<b>Total</b>	<b>43</b>	<b>151</b>	<b>139</b>	<b>209</b>	<b>542</b>	<b>9</b>	<b>118</b>	<b>46</b>	<b>125</b>	<b>298</b>	<b>67</b>	<b>100</b>	<b>38</b>	<b>167</b>	<b>372</b>	<b>119</b>	<b>208</b>	<b>46</b>	<b>83</b>	<b>456</b>	<b>1668</b>
05:00 PM	18	54	36	39	147	0	42	17	34	93	11	24	14	27	76	22	77	17	28	144	460
05:15 PM	14	52	41	41	148	1	35	18	50	104	19	18	7	42	86	24	67	8	26	125	463
05:30 PM	17	42	35	38	132	2	35	15	18	70	17	27	11	46	101	23	70	15	31	139	442
05:45 PM	22	60	37	47	166	1	35	12	20	68	16	31	10	31	88	19	81	14	16	130	452
<b>Total</b>	<b>71</b>	<b>208</b>	<b>149</b>	<b>165</b>	<b>593</b>	<b>4</b>	<b>147</b>	<b>62</b>	<b>122</b>	<b>335</b>	<b>63</b>	<b>100</b>	<b>42</b>	<b>146</b>	<b>351</b>	<b>88</b>	<b>295</b>	<b>54</b>	<b>101</b>	<b>538</b>	<b>1817</b>
<b>Grand Total</b>	<b>162</b>	<b>566</b>	<b>443</b>	<b>533</b>	<b>1704</b>	<b>29</b>	<b>391</b>	<b>146</b>	<b>359</b>	<b>925</b>	<b>193</b>	<b>322</b>	<b>119</b>	<b>441</b>	<b>1075</b>	<b>296</b>	<b>697</b>	<b>138</b>	<b>288</b>	<b>1419</b>	<b>5123</b>
Apprch %	9.5	33.2	26	31.3		3.1	42.3	15.8	38.8		18	30	11.1	41		20.9	49.1	9.7	20.3		
Total %	3.2	11	8.6	10.4	33.3	0.6	7.6	2.8	7	18.1	3.8	6.3	2.3	8.6	21	5.8	13.6	2.7	5.6		27.7

Start Time	Kamakee Street Southbound				Auahi Street Westbound				Kamakee Street Northbound				Auahi Street Eastbound								
	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
05:00 PM	18	54	36	36	108	0	42	17	17	59	11	24	14	14	49	22	77	17	17	116	332
05:15 PM	14	52	41	41	107	1	35	18	18	54	19	18	7	7	44	24	67	8	8	99	304
05:30 PM	17	42	35	35	94	2	35	15	15	52	17	27	11	11	55	23	70	15	15	108	309
05:45 PM	22	60	37	37	119	1	35	12	12	48	16	31	10	10	57	19	81	14	14	114	338
Total Volume	71	208	149	149	428	4	147	62	62	213	63	100	42	42	205	88	295	54	54	437	1283
% App. Total	16.6	48.6	34.8	34.8		1.9	69	29.1	29.1		30.7	48.8	20.5	20.5		20.1	67.5	12.4	12.4		
PHF	.807	.867	.909	.909	.899	.500	.875	.861	.861	.903	.829	.806	.750	.750	.899	.917	.910	.794	.794		.942

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

# Wilson Okamoto Corporation

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

Counted By: KW, AC  
Counters: TU-650, TU-0649  
Weather: Clear

File Name : AuaQue AM  
Site Code : 00000001  
Start Date : 3/3/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Queen's Lane Southbound				Honua Building Westbound				Queen Street Northbound				AuaHi Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
06:00 AM	1	6	2	0	9	0	0	0	7	7	9	7	0	5	21	1	1	0	3	5	42
06:15 AM	4	1	3	0	8	0	0	0	5	7	6	7	1	0	14	1	2	3	8	14	41
06:30 AM	3	4	4	3	14	0	0	0	3	5	13	5	0	0	18	2	0	1	9	12	47
06:45 AM	1	5	4	4	14	0	0	0	7	4	5	4	1	3	13	4	1	5	7	17	51
Total	9	16	13	7	45	0	0	0	22	23	33	23	2	8	66	8	4	9	27	48	181
07:00 AM	4	3	5	1	13	0	0	0	2	8	11	8	1	3	23	1	0	5	5	11	49
07:15 AM	3	8	7	3	21	0	0	0	5	14	18	14	3	2	37	6	1	9	14	30	93
07:30 AM	3	4	6	1	14	0	0	0	5	19	19	12	0	3	34	8	2	6	9	25	78
07:45 AM	1	9	7	2	19	0	0	0	3	22	18	22	4	6	50	6	3	5	16	30	102
Total	11	24	25	7	67	0	0	0	15	56	66	56	8	14	144	21	6	25	44	96	322
08:00 AM	2	7	11	4	24	0	0	0	5	17	14	17	2	14	47	11	1	8	22	42	118
08:15 AM	7	7	9	4	27	0	0	0	2	26	26	16	2	5	49	12	2	16	12	42	120
08:30 AM	5	6	3	2	16	0	0	0	4	18	18	18	2	5	43	4	4	13	12	33	96
08:45 AM	6	10	18	2	36	0	0	0	5	21	20	21	0	10	51	14	0	7	13	34	126
Total	20	30	41	12	103	0	0	0	16	72	78	72	6	34	190	41	7	44	59	151	460
Grand Total	40	70	79	26	215	0	0	0	53	151	177	151	16	56	400	70	17	78	130	295	963
Approch %	18.6	32.6	36.7	12.1		0	0	0	100	44.2	44.2	37.8	4	14		23.7	5.8	26.4	44.1		
Total %	4.2	7.3	8.2	2.7	22.3	0	0	0	5.5	18.4	18.4	15.7	1.7	5.8	41.5	7.3	1.8	8.1	13.5	30.6	

Start Time	Queen's Lane Southbound				Honua Building Westbound				Queen Street Northbound				AuaHi Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
08:00 AM	2	7	11	11	20	0	0	0	0	17	14	17	2	2	33	11	1	8	8	20	73
08:15 AM	7	7	9	9	23	0	0	0	0	26	26	16	2	2	44	12	2	16	16	30	97
08:30 AM	5	6	3	3	14	0	0	0	0	18	18	18	2	2	38	4	4	13	13	21	73
08:45 AM	6	10	18	18	34	0	0	0	0	21	20	21	0	0	41	14	0	7	7	21	96
Total Volume	20	30	41	41	91	0	0	0	0	78	78	72	6	6	156	41	7	44	44	92	339
% App. Total	22	33	45.1	45.1		0	0	0	0	50	50	46.2	3.8	3.8		44.6	7.6	47.8	47.8		
PHF	.714	.750	.569	.569	.669	.000	.000	.000	.000	.750	.750	.857	.750	.750	.886	.732	.438	.688	.688	.767	.874

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

# Wilson Okamoto Corporation

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

Counted By:  
Counters:  
Weather:

File Name : AuaQue PM  
Site Code : 00000001  
Start Date : 3/3/2015  
Page No : 1

## Groups Printed - Unshifted

Start Time	Queen's Lane Southbound				Honua Driveway Westbound				Queen Street Northbound				Auaahi Street Eastbound				Int. Total				
	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	3	11	7	18	39	0	0	0	9	9	18	14	4	8	44	19	4	31	6	60	152
03:15 PM	6	13	10	26	55	0	0	0	11	11	29	22	4	22	77	24	3	30	29	86	229
03:30 PM	10	17	7	17	51	0	0	0	8	8	28	28	0	3	59	24	2	30	9	65	183
03:45 PM	6	13	19	14	52	0	0	0	9	9	33	14	4	10	61	27	3	28	24	82	204
Total	25	54	43	75	197	0	0	0	37	37	108	78	12	43	241	94	12	119	68	293	768
04:00 PM	4	23	11	8	46	0	0	0	8	8	27	19	3	17	66	26	0	22	4	52	172
04:15 PM	7	14	8	7	36	0	0	0	10	10	35	16	1	16	68	27	1	25	21	74	188
04:30 PM	4	13	13	18	48	0	0	0	8	8	38	23	3	15	79	29	2	26	18	75	210
04:45 PM	11	9	10	12	42	0	0	0	18	18	31	23	3	14	71	24	0	35	11	70	201
Total	26	59	42	45	172	0	0	0	44	44	131	81	10	62	284	106	3	108	54	271	771
05:00 PM	8	21	8	18	55	0	0	0	11	11	40	26	3	13	82	17	3	36	29	85	233
05:15 PM	4	16	14	9	43	0	0	0	7	7	45	23	3	31	102	28	1	44	35	108	260
05:30 PM	2	15	7	19	43	0	0	0	12	12	46	21	2	16	85	27	1	44	24	96	236
05:45 PM	3	18	16	14	51	0	0	0	17	17	27	26	2	17	72	15	4	43	14	76	216
Total	17	70	45	60	192	0	0	0	47	47	158	96	10	77	341	87	9	167	102	365	945
Grand Total	68	183	130	180	561	0	0	0	128	128	397	255	32	182	866	287	24	394	224	929	2484
Approach %	12.1	32.6	23.2	32.1		0	0	0	100		45.8	29.4	3.7	21		30.9	2.6	42.4	24.1		
Total %	2.7	7.4	5.2	7.2	22.6	0	0	0	5.2	5.2	16	10.3	1.3	7.3	34.9	11.6	1	15.9	9	37.4	

Start Time	Queen's Lane Southbound				Honua Driveway Westbound				Queen Street Northbound				Auaahi Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
05:00 PM	8	21	8	18	55	0	0	0	11	11	40	26	3	13	82	17	3	36	29	85	233
05:15 PM	4	16	14	9	43	0	0	0	7	7	45	23	3	31	102	28	1	44	35	108	260
05:30 PM	2	15	7	19	43	0	0	0	12	12	46	21	2	16	85	27	1	44	24	96	236
05:45 PM	3	18	16	14	51	0	0	0	17	17	27	26	2	17	72	15	4	43	14	76	216
Total Volume	17	70	45	60	192	0	0	0	47	47	158	96	10	77	341	87	9	167	102	365	945
% App. Total	8.9	36.5	23.4	31.2		0	0	0	100		46.3	28.2	2.9	22.6		23.8	2.5	45.8	27.9		
PHF	.531	.833	.703	.789	.873	.000	.000	.000	.691	.691	.859	.923	.833	.621	.836	.777	.563	.949	.729	.845	.909

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

# Wilson Okamoto Corporation

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

Counted By: GC, KW  
Counters: D4-5674, D4-5671  
Weather: Clear

File Name : SouAua AM  
Site Code : 00000001  
Start Date : 3/4/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	South Street Southbound				Auahi Street Westbound				South Street Northbound				Eastbound				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total	
06:00 AM	0	8	0	2	10	3	0	4	1	8	0	31	4	1	36	0	54
06:15 AM	5	7	0	0	12	5	0	4	2	11	0	32	4	0	36	0	59
06:30 AM	8	5	0	2	15	7	0	8	1	16	0	47	3	0	50	0	81
06:45 AM	6	7	0	1	14	5	0	7	1	13	0	51	5	0	56	0	83
Total	19	27	0	5	51	20	0	23	5	48	0	161	16	1	178	0	277
07:00 AM	4	18	0	5	27	5	0	9	8	22	0	71	2	0	73	0	122
07:15 AM	12	17	0	6	35	4	0	14	2	20	0	78	3	0	81	0	136
07:30 AM	6	16	0	3	25	7	0	6	2	15	0	91	2	0	93	0	133
07:45 AM	8	21	0	6	35	7	0	9	1	17	0	74	6	0	80	0	132
Total	30	72	0	20	122	23	0	38	13	74	0	314	13	0	327	0	523
08:00 AM	10	16	0	4	30	6	0	15	0	21	0	68	5	0	73	0	124
08:15 AM	10	20	0	2	32	4	0	17	1	22	0	76	3	0	79	0	133
08:30 AM	6	17	0	11	34	3	0	8	6	17	0	61	8	0	69	0	120
08:45 AM	8	9	0	7	24	4	0	6	3	13	0	70	8	0	78	0	115
Total	34	62	0	24	120	17	0	46	10	73	0	275	24	0	299	0	492
Grand Total	83	161	0	49	293	60	0	107	28	195	0	750	53	1	804	0	1292
Approch %	28.3	54.9	0	16.7		30.8	0	54.9	14.4		0	93.3	6.6	0.1		0	
Total %	6.4	12.5	0	3.8	22.7	4.6	0	8.3	2.2	15.1	0	58	4.1	0.1	62.2	0	

Start Time	South Street Southbound				Auahi Street Westbound				South Street Northbound				Eastbound				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total	
07:30 AM	6	16	0	0	22	7	0	6	6	13	0	91	2	0	93	0	128
07:45 AM	8	21	0	0	29	7	0	9	9	16	0	74	6	0	80	0	125
08:00 AM	10	16	0	0	26	6	0	15	1	21	0	68	5	0	73	0	120
08:15 AM	10	20	0	0	30	4	0	17	0	21	0	76	3	0	79	0	130
Total Volume	34	73	0	0	107	24	0	47	17	71	0	309	16	0	325	0	503
% App. Total	31.8	68.2	0	0		33.8	0	66.2			0	95.1	4.9			0	
PHF	.850	.869	.000	.000	.892	.857	.000	.691	.845	.874	.000	.849	.667	.874	.000	.967	

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

# Wilson Okamoto Corporation

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

Counted By: GC, KW  
Counters: D4-5671, D4-5674  
Weather: Clear

File Name : SouAua PM  
Site Code : 00000001  
Start Date : 3/4/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	South Street Southbound				Auahi Street Westbound				South Street Northbound				Eastbound			
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	5	28	0	7	40	10	0	9	2	21	0	48	3	0	51	112
03:15 PM	8	23	0	5	36	7	0	11	1	19	0	56	1	0	57	112
03:30 PM	12	32	0	4	48	2	0	15	2	19	0	61	5	0	66	133
03:45 PM	4	24	0	5	33	6	0	14	2	22	0	60	4	0	64	119
Total	29	107	0	21	157	25	0	49	7	81	0	225	13	0	238	476
04:00 PM	9	33	0	8	50	12	0	9	3	24	0	62	4	0	66	140
04:15 PM	6	30	0	5	41	3	0	17	0	20	0	66	3	0	69	130
04:30 PM	7	59	0	3	69	9	0	13	0	22	0	80	9	0	89	180
04:45 PM	10	35	0	7	52	8	0	16	1	25	0	83	13	0	96	173
Total	32	157	0	23	212	32	0	55	4	91	0	291	29	0	320	623
05:00 PM	8	55	0	6	69	7	0	10	3	20	0	85	5	0	90	179
05:15 PM	12	53	0	5	70	8	0	19	4	31	0	84	11	0	95	196
05:30 PM	9	24	0	11	44	5	0	8	11	24	0	67	4	0	71	139
05:45 PM	4	21	0	5	30	2	0	11	5	18	0	84	10	0	94	142
Total	33	153	0	27	213	22	0	48	23	93	0	320	30	0	350	656
Grand Total	94	417	0	71	582	79	0	152	34	265	0	836	72	0	908	1755
Approch %	16.2	71.6	0	12.2		29.8	0	57.4	12.8		0	92.1	7.9	0		
Total %	5.4	23.8	0	4	33.2	4.5	0	8.7	1.9	15.1	0	47.6	4.1	0	51.7	0

Start Time	South Street Southbound				Auahi Street Westbound				South Street Northbound				Eastbound			
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
04:30 PM	7	59	0	0	66	9	0	0	13	22	0	80	9	0	89	177
04:45 PM	10	35	0	0	45	8	0	0	16	24	0	83	13	0	96	165
05:00 PM	8	55	0	0	63	7	0	0	10	17	0	85	5	0	90	170
05:15 PM	12	53	0	0	65	8	0	0	19	27	0	84	11	0	95	187
Total Volume	37	202	0	0	239	32	0	0	58	90	0	332	38	0	370	699
% App. Total	15.5	84.5	0	0		35.6	0	0	64.4		0	89.7	10.3	0		
PHF	.771	.856	.000	.000	.905	.889	.000	.000	.763	.833	.000	.976	.731	.000	.964	.934

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

# Wilson Okamoto Corporation

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

Counted By: CY, DY  
Counters: TU-0653, TU-0654  
Weather: Clear

File Name : KeaAua AM  
Site Code : 00000003  
Start Date : 3/4/2015  
Page No : 1

Groups Printed- Unshifted

Start Time	Keawe Street Southbound				Auahi Street Westbound				Keawe Street Northbound				Auahi Street Eastbound								
	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	3	4	3	12	1	4	1	2	8	1	6	2	2	11	2	3	1	2	8	39
06:15 AM	1	5	2	2	10	1	4	3	5	13	3	3	0	1	7	2	1	3	3	9	39
06:30 AM	2	6	3	4	15	0	5	1	3	9	6	6	3	4	19	2	4	0	11	17	60
06:45 AM	3	3	1	11	18	2	6	3	10	21	5	8	4	0	17	2	8	3	12	25	81
<b>Total</b>	<b>8</b>	<b>17</b>	<b>10</b>	<b>20</b>	<b>55</b>	<b>4</b>	<b>19</b>	<b>8</b>	<b>20</b>	<b>51</b>	<b>15</b>	<b>23</b>	<b>9</b>	<b>7</b>	<b>54</b>	<b>8</b>	<b>16</b>	<b>7</b>	<b>28</b>	<b>59</b>	<b>219</b>
07:00 AM	3	9	3	4	19	1	3	0	4	8	6	9	3	0	18	1	2	2	2	7	52
07:15 AM	0	5	3	1	9	0	9	1	4	14	5	5	2	2	14	2	7	3	5	17	54
07:30 AM	0	11	2	2	15	1	6	4	1	12	4	12	3	1	20	0	5	3	2	10	57
07:45 AM	2	7	9	6	24	2	3	3	2	10	3	12	5	0	20	2	5	4	1	12	66
<b>Total</b>	<b>5</b>	<b>32</b>	<b>17</b>	<b>13</b>	<b>67</b>	<b>4</b>	<b>21</b>	<b>8</b>	<b>11</b>	<b>44</b>	<b>18</b>	<b>38</b>	<b>13</b>	<b>3</b>	<b>72</b>	<b>5</b>	<b>19</b>	<b>12</b>	<b>10</b>	<b>46</b>	<b>229</b>
08:00 AM	5	9	5	3	22	0	6	4	3	13	3	15	5	3	26	5	4	1	2	12	73
08:15 AM	5	9	4	3	21	1	6	3	7	17	4	10	0	0	14	3	3	2	2	10	62
08:30 AM	8	13	3	3	27	0	2	5	7	14	4	8	8	0	20	2	7	1	3	13	74
08:45 AM	3	5	3	2	13	1	8	5	7	21	1	10	3	3	17	6	5	1	7	19	70
<b>Total</b>	<b>21</b>	<b>36</b>	<b>15</b>	<b>11</b>	<b>83</b>	<b>2</b>	<b>22</b>	<b>17</b>	<b>24</b>	<b>65</b>	<b>12</b>	<b>43</b>	<b>16</b>	<b>6</b>	<b>77</b>	<b>16</b>	<b>19</b>	<b>5</b>	<b>14</b>	<b>54</b>	<b>279</b>
<b>Grand Total</b>	<b>34</b>	<b>85</b>	<b>42</b>	<b>44</b>	<b>205</b>	<b>10</b>	<b>62</b>	<b>33</b>	<b>55</b>	<b>160</b>	<b>45</b>	<b>104</b>	<b>38</b>	<b>16</b>	<b>203</b>	<b>29</b>	<b>54</b>	<b>24</b>	<b>52</b>	<b>159</b>	<b>727</b>
Apprch %	16.6	41.5	20.5	21.5		6.2	38.8	20.6	34.4		22.2	51.2	18.7	7.9		18.2	34	15.1	32.7		
Total %	4.7	11.7	5.8	6.1	28.2	1.4	8.5	4.5	7.6	22	6.2	14.3	5.2	2.2	27.9	4	7.4	3.3	7.2	21.9	

Start Time	Keawe Street Southbound				Auahi Street Westbound				Keawe Street Northbound				Auahi Street Eastbound								
	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
07:45 AM	2	7	9		18	2	3	3		8	3	12	5		20	2	5	4		11	57
08:00 AM	5	9	5		19	0	6	4		10	3	15	5		23	5	4	1		10	62
08:15 AM	5	9	4		18	1	6	3		10	4	10	0		14	3	3	2		8	50
08:30 AM	8	13	3		24	0	2	5		7	4	8	8		20	2	7	1		10	61
<b>Total Volume</b>	<b>20</b>	<b>38</b>	<b>21</b>		<b>79</b>	<b>3</b>	<b>17</b>	<b>15</b>		<b>35</b>	<b>14</b>	<b>45</b>	<b>18</b>		<b>77</b>	<b>12</b>	<b>19</b>	<b>8</b>		<b>39</b>	<b>230</b>
% App. Total	25.3	48.1	26.6			8.6	48.6	42.9			18.2	58.4	23.4			30.8	48.7	20.5			
PHF	.625	.731	.583		.823	.375	.708	.750		.875	.875	.750	.563		.837	.600	.679	.500		.866	.927

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

# Wilson Okamoto Corporation

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

Counted By: CY, DY

Counters: TU-0654, TU-0653

Weather: Clear

File Name : KeaAua PM  
Site Code : 00000003  
Start Date : 3/4/2015  
Page No : 1

Start Time	Keawe Street Southbound						Auahi Street Westbound						Keawe Street Northbound						Auahi Street Eastbound						
	Left	Thru	Right	Peds	App. Total	Int. Total	Left	Thru	Right	Peds	App. Total	Int. Total	Left	Thru	Right	Peds	App. Total	Int. Total	Left	Thru	Right	Peds	App. Total	Int. Total	
																									Left
03:00 PM	3	20	6	5	34	0	9	4	7	20	1	2	6	3	12	2	4	1	8	15	81				
03:15 PM	4	6	3	0	13	0	9	2	4	15	2	8	4	1	15	5	4	3	0	12	55				
03:30 PM	7	17	7	2	33	0	9	6	7	22	2	6	3	2	13	2	8	5	0	15	83				
03:45 PM	3	16	4	6	29	3	12	6	13	34	3	11	9	2	25	4	6	2	2	14	102				
Total	17	59	20	13	109	3	39	18	31	91	8	27	22	8	65	13	22	11	10	56	321				
04:00 PM	5	21	5	2	33	1	13	6	1	21	0	13	7	0	20	2	10	0	1	13	87				
04:15 PM	6	31	6	4	47	0	4	7	4	15	5	10	6	0	21	1	4	4	1	10	93				
04:30 PM	5	20	6	2	33	1	12	6	5	24	6	13	6	2	27	7	10	3	1	21	105				
04:45 PM	0	13	11	3	27	1	13	5	2	21	4	9	2	2	24	4	14	4	4	26	98				
Total	16	85	28	11	140	3	42	24	12	81	15	45	28	4	92	14	38	11	7	70	383				
05:00 PM	9	21	4	0	34	1	12	2	10	25	2	9	3	6	20	2	11	1	0	14	93				
05:15 PM	3	16	7	4	30	6	11	6	4	27	4	8	6	0	18	3	17	2	3	25	100				
05:30 PM	3	13	3	9	28	0	9	2	8	19	1	10	8	7	26	4	9	1	7	21	94				
05:45 PM	6	9	5	3	23	2	9	5	5	21	2	9	11	9	31	2	14	3	5	24	99				
Total	21	59	19	16	115	9	41	15	27	92	9	36	28	22	95	11	51	7	15	84	386				
Grand Total	54	203	67	40	364	15	122	57	70	264	32	108	78	34	252	38	111	29	32	210	1090				
Approach %	14.8	55.8	18.4	11		5.7	46.2	21.6	26.5		12.7	42.9	31	13.5		18.1	52.9	13.8	15.2						
Total %	5	18.6	6.1	3.7	33.4	1.4	11.2	5.2	6.4	24.2	2.9	9.9	7.2	3.1	23.1	3.5	10.2	2.7	2.9	19.3					

Start Time	Keawe Street Southbound						Auahi Street Westbound						Keawe Street Northbound						Auahi Street Eastbound						
	Left	Thru	Right	Peds	App. Total	Int. Total	Left	Thru	Right	Peds	App. Total	Int. Total	Left	Thru	Right	Peds	App. Total	Int. Total	Left	Thru	Right	Peds	App. Total	Int. Total	
																									Left
04:00 PM	5	21	5	5	31	1	13	6	6	20	0	13	7	7	20	2	10	0	0	12	83				
04:15 PM	6	31	6	6	43	0	4	7	7	11	5	10	6	6	21	1	4	4	4	9	84				
04:30 PM	5	20	6	6	31	1	12	6	6	19	6	13	6	6	25	7	10	3	3	20	95				
04:45 PM	0	13	11	11	24	1	13	5	5	19	4	9	9	9	22	4	14	4	4	22	87				
Total Volume	16	85	28	28	129	3	42	24	24	69	15	45	28	88		14	38	11	63	349					
% App. Total	12.4	65.9	21.7			4.3	60.9	34.8			17	51.1	31.8			22.2	60.3	17.5		63	349				
PHF	.667	.685	.636		.750	.750	.808	.857		.863	.625	.865	.778		.880	.500	.679	.688		.716	.918				

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



# Wilson Okamoto Corporation

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

Counted By: JC, AC  
Counters: TU-0649, TU-0650  
Weather: Clear

File Name : CorAua AM  
Site Code : 00000004  
Start Date : 3/4/2015  
Page No : 1

## Groups Printed - Unshifted

Start Time	Coral Street Southbound				Auahi Street Westbound				Coral Street Northbound				Auahi Street Eastbound								
	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	3	1	1	7	1	4	0	4	9	1	3	3	1	8	1	2	0	3	6	30
06:15 AM	1	3	0	3	7	1	5	1	0	7	1	0	1	2	4	1	3	1	0	5	23
06:30 AM	2	1	0	8	11	4	7	1	4	16	0	5	2	7	14	2	1	0	3	6	47
06:45 AM	2	6	2	5	15	5	5	3	3	16	2	8	1	4	15	2	4	2	3	11	57
Total	7	13	3	17	40	11	21	5	11	48	4	16	7	14	41	6	10	3	9	28	157
07:00 AM	0	6	2	0	8	5	6	2	1	14	2	2	3	0	7	1	7	2	1	11	40
07:15 AM	0	7	1	1	9	0	8	2	2	12	4	4	0	1	9	0	8	1	2	11	41
07:30 AM	2	8	2	6	18	2	5	1	4	12	1	6	1	5	13	2	8	2	2	14	57
07:45 AM	2	10	0	4	16	1	6	0	3	10	5	4	3	4	16	2	9	0	4	15	57
Total	4	31	5	11	51	8	25	5	10	48	12	16	7	10	45	5	32	5	9	51	195
08:00 AM	5	11	7	2	25	3	4	1	7	15	4	4	3	1	12	5	9	6	3	23	75
08:15 AM	8	19	1	4	32	2	8	5	3	18	3	5	0	3	11	6	14	2	2	24	85
08:30 AM	1	11	2	3	17	1	5	1	0	7	3	7	6	2	18	2	9	1	0	12	54
08:45 AM	2	10	3	5	20	4	9	3	1	17	2	5	3	3	13	2	11	3	0	16	66
Total	16	51	13	14	94	10	26	10	11	57	12	21	12	9	54	15	43	12	5	75	280
Grand Total	27	95	21	42	185	29	72	20	32	153	28	53	26	33	140	26	85	20	23	154	632
Approch %	14.6	51.4	11.4	22.7		19	47.1	13.1	20.9		20	37.9	18.6	23.6		16.9	55.2	13	14.9		
Total %	4.3	15	3.3	6.6	29.3	4.6	11.4	3.2	5.1	24.2	4.4	8.4	4.1	5.2	22.2	4.1	13.4	3.2	3.6	24.4	

Start Time	Coral Street Southbound				Auahi Street Westbound				Coral Street Northbound				Auahi Street Eastbound								
	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
08:00 AM	5	11	7	7	23	3	4	1	1	8	4	4	3	3	11	5	9	6	6	20	62
08:15 AM	8	19	1	1	28	2	8	5	5	15	3	5	0	0	8	6	14	2	2	22	73
08:30 AM	1	11	2	2	14	1	5	1	1	7	3	7	6	6	16	2	9	1	1	12	49
08:45 AM	2	10	3	3	15	4	9	3	3	16	2	5	3	3	10	2	11	3	3	16	57
Total Volume	16	51	13	13	80	10	26	10	10	46	12	21	12	12	45	15	43	12	12	70	241
% App. Total	20	63.8	16.2			21.7	56.5	21.7			26.7	46.7	26.7			21.4	61.4	17.1			
PHF	.500	.671	.464		.714	.625	.722	.500		.719	.750	.750	.500		.703	.625	.768	.500		.795	.825

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

# Wilson Okamoto Corporation

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

Counted By: AC, JC  
Counters: TU-0649, TU-0650  
Weather: Clear

File Name : CorAua PM  
Site Code : 00000000  
Start Date : 3/4/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Coral Street Southbound				Auahi Street Westbound				Coral Street Northbound				Auahi Street Eastbound				Int. Total				
	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	5	8	5	7	25	0	8	3	5	16	3	8	1	3	15	6	7	5	5	23	79
03:15 PM	5	16	2	3	26	4	3	3	2	12	4	2	5	3	14	3	14	2	0	19	71
03:30 PM	2	14	4	0	20	5	7	5	3	20	5	11	3	0	19	2	14	3	2	21	80
03:45 PM	2	16	5	12	35	3	11	3	1	18	1	10	3	4	18	1	10	7	0	18	89
Total	14	54	16	22	106	12	29	14	11	66	13	31	12	10	66	12	45	17	7	81	319
04:00 PM	4	4	1	8	17	3	10	3	4	20	5	7	3	6	21	2	4	1	1	8	66
04:15 PM	1	19	1	6	27	4	4	5	0	13	2	5	0	2	9	1	12	0	3	16	65
04:30 PM	3	18	3	6	30	2	15	11	1	29	3	5	0	4	12	2	17	3	0	22	93
04:45 PM	8	19	2	6	35	1	10	6	0	17	4	8	4	5	21	1	13	2	0	16	89
Total	16	60	7	26	109	10	39	25	5	79	14	25	7	17	63	6	46	6	4	62	313
05:00 PM	1	18	6	4	29	4	10	4	6	24	6	16	1	1	24	1	14	2	0	17	94
05:15 PM	3	9	3	2	17	1	9	1	1	12	6	7	3	1	17	0	5	3	1	9	55
05:30 PM	2	11	2	0	15	0	5	3	2	10	1	7	3	0	11	1	6	2	0	9	45
05:45 PM	1	20	6	1	28	4	9	7	1	21	8	14	1	1	24	1	14	6	1	22	95
Total	7	58	17	7	89	9	33	15	10	67	21	44	8	3	76	3	39	13	2	57	289
Grand Total	37	172	40	55	304	31	101	54	26	212	48	100	27	30	205	21	130	36	13	200	921
Approch %	12.2	56.6	13.2	18.1		14.6	47.6	25.5	12.3		23.4	48.8	13.2	14.6		10.5	65	18	6.5		
Total %	4	18.7	4.3	6	33	3.4	11	5.9	2.8	23	5.2	10.9	2.9	3.3	22.3	2.3	14.1	3.9	1.4	21.7	

Start Time	Coral Street Southbound				Auahi Street Westbound				Coral Street Northbound				Auahi Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
04:15 PM	1	19	1	1	21	4	4	5	0	13	2	5	0	7	1	12	0	0	13	54	
04:30 PM	3	18	3	3	24	2	15	11	0	28	3	5	0	8	2	17	3	3	22	82	
04:45 PM	8	19	2	2	29	1	10	6	4	17	4	8	4	16	1	13	2	2	16	78	
05:00 PM	1	18	6	6	25	4	10	4	4	18	6	16	1	23	1	14	2	2	17	83	
Total Volume	13	74	12	12	99	11	39	26	5	76	15	34	5	54	5	56	7	7	68	297	
% App. Total	13.1	74.7	12.1			14.5	51.3	34.2	9.3		27.8	63	9.3		58.7	7.4	82.4	10.3			
PHF	.406	.974	.500		.853	.688	.650	.591	.313	.679	.625	.531	.313	.587	.773	.625	.824	.583		.773	.895

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

# Wilson Okamoto Corporation

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

Counted By: JJ, RJ  
Counters: TU-0653, TU-0654  
Weather: Clear

File Name : CooAua AM  
Site Code : 00000002  
Start Date : 3/4/2015  
Page No : 1

Groups Printed- Unshifted

Start Time	Cooke Street Southbound					Auahi Street Westbound					Cooke Street Northbound					Auahi Street Eastbound				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total
06:00 AM	2	18	3	1	24	1	2	9	2	14	4	8	1	2	15	2	2	3	2	9
06:15 AM	5	7	6	1	19	0	0	3	1	4	8	11	0	1	20	3	1	1	1	6
06:30 AM	3	17	8	1	29	1	2	3	0	6	10	12	2	4	28	2	2	1	1	6
06:45 AM	3	12	10	2	27	2	1	7	0	10	10	21	1	1	33	3	3	2	2	10
<b>Total</b>	13	54	27	5	99	4	5	22	3	34	32	52	4	8	96	10	8	7	6	31
07:00 AM	5	20	9	3	37	1	5	6	3	15	8	16	2	2	28	6	4	0	3	13
07:15 AM	4	20	5	2	31	1	4	13	1	19	7	31	3	1	42	4	3	1	1	9
07:30 AM	6	29	5	2	42	1	0	9	5	15	8	28	1	2	39	7	4	2	2	15
07:45 AM	10	26	3	1	40	3	1	7	1	12	6	24	1	0	31	11	3	0	4	18
<b>Total</b>	25	95	22	8	150	6	10	35	10	61	29	99	7	5	140	28	14	3	10	55
08:00 AM	9	29	6	4	48	2	4	13	5	24	5	24	2	1	32	12	5	1	2	20
08:15 AM	11	23	10	1	45	2	2	14	6	24	12	27	2	0	41	13	7	3	3	26
08:30 AM	8	39	5	1	53	2	2	14	0	18	5	30	3	3	41	11	5	1	1	18
08:45 AM	6	30	8	2	46	6	3	13	1	23	13	24	1	0	38	9	4	2	2	17
<b>Total</b>	34	121	29	8	192	12	11	54	12	89	35	105	8	4	152	45	21	7	8	81
<b>Grand Total</b>	72	270	78	21	441	22	26	111	25	184	96	256	19	17	388	83	43	17	24	167
Apprch %	16.3	61.2	17.7	4.8		12	14.1	60.3	13.6		24.7	66	4.9	4.4		49.7	25.7	10.2	14.4	
Total %	6.1	22.9	6.6	1.8	37.4	1.9	2.2	9.4	2.1	15.6	8.1	21.7	1.6	1.4	32.9	7	3.6	1.4	2	14.2

Start Time	Cooke Street Southbound					Auahi Street Westbound					Cooke Street Northbound					Auahi Street Eastbound				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total
08:00 AM	9	29	6	6	44	2	4	13	13	19	5	24	2	2	31	12	5	1	1	18
08:15 AM	11	23	10	5	44	2	2	14	14	18	12	27	2	2	41	13	7	3	3	23
08:30 AM	8	39	5	8	52	2	2	14	14	18	5	30	3	3	38	11	5	1	1	17
08:45 AM	6	30	8	8	44	6	3	13	13	22	13	24	1	1	38	9	4	2	2	15
<b>Total Volume</b>	34	121	29	29	184	12	11	54	54	77	35	105	8	8	148	45	21	7	7	73
% App. Total	18.5	65.8	15.8	15.8		15.6	14.3	70.1	70.1		23.6	70.9	5.4	5.4		61.6	28.8	9.6	9.6	
PHF	.773	.776	.725	.725	.885	.500	.688	.964	.964	.875	.673	.875	.667	.667	.902	.865	.750	.583	.583	.793

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

# Wilson Okamoto Corporation

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

Counted By: JJ, RJ  
Counters: TU-0653, TU-0654  
Weather: Clear

File Name : CooAua PM  
Site Code : 00000002  
Start Date : 3/4/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Cooke Street Southbound				Auahi Street Westbound				Cooke Street Northbound				Auahi Street Eastbound				Int. Total			
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds
03:00 PM	8	29	3	4	44	1	3	11	0	15	5	22	3	0	30	10	2	1	3	16
03:15 PM	5	36	3	0	44	3	1	19	6	29	6	31	0	2	39	17	5	2	5	29
03:30 PM	11	54	8	4	77	5	5	16	6	32	4	27	2	0	33	13	4	2	5	24
03:45 PM	14	47	9	3	73	5	4	16	5	30	5	24	5	2	36	12	2	1	2	17
Total	38	166	23	11	238	14	13	62	17	106	20	104	10	4	138	52	13	6	15	86
04:00 PM	7	50	4	5	66	6	8	25	5	44	4	27	1	0	32	8	2	1	2	13
04:15 PM	8	51	10	3	72	1	3	17	6	27	0	32	4	1	37	8	4	1	1	14
04:30 PM	10	45	18	0	73	1	9	15	2	27	1	22	4	2	29	15	3	2	3	23
04:45 PM	9	40	8	7	64	0	2	21	5	28	7	26	2	5	40	17	4	4	7	32
Total	34	186	40	15	275	8	22	78	18	126	12	107	11	8	138	48	13	8	13	82
05:00 PM	5	49	8	1	63	4	4	26	6	40	6	20	1	0	27	10	2	4	1	17
05:15 PM	3	41	7	1	52	0	3	22	2	27	1	18	0	1	20	6	2	3	1	12
05:30 PM	5	43	7	0	55	1	1	19	7	28	0	24	1	3	28	6	4	1	5	16
05:45 PM	7	34	12	4	57	1	2	11	2	16	6	20	1	0	27	13	2	1	4	20
Total	20	167	34	6	227	6	10	78	17	111	13	82	3	4	102	35	10	9	11	65
Grand Total	92	519	97	32	740	28	45	218	52	343	45	293	24	16	378	135	36	23	39	233
Apprch %	12.4	70.1	13.1	4.3		8.2	13.1	63.6	15.2		11.9	77.5	6.3	4.2		57.9	15.5	9.9	16.7	
Total %	5.4	30.6	5.7	1.9	43.7	1.7	2.7	12.9	3.1	20.2	2.7	17.3	1.4	0.9	22.3	8	2.1	1.4	2.3	13.8

Start Time	Cooke Street Southbound				Auahi Street Westbound				Cooke Street Northbound				Auahi Street Eastbound				Int. Total			
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds
03:30 PM	11	54	8	8	73	5	5	16	2	26	4	27	2	0	33	13	4	2	19	
03:45 PM	14	47	9	9	70	5	4	16	5	25	5	24	5	1	34	12	2	1	15	
04:00 PM	7	50	4	4	61	6	8	25	1	39	4	27	1	1	32	8	2	1	11	
04:15 PM	8	51	10	10	69	1	3	17	4	21	0	32	4	4	36	8	4	1	13	
Total Volume	40	202	31	31	273	17	20	74	11	111	13	110	12	12	135	41	12	5	58	
% App. Total	14.7	74	11.4	11.4		15.3	18	66.7	8.9		9.6	81.5	8.9	8.9		70.7	20.7	8.6		
PHF	.714	.935	.775	.775	.935	.708	.625	.740	.712	.712	.650	.859	.600	.600	.938	.788	.750	.625	.763	.955

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Entire Intersection Begins at 03:30 PM

# Wilson Okamoto Corporation

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

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

File Name : OheAua AM  
Site Code : 00000007  
Start Date : 3/4/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Southbound			Auahi Street Westbound			Ohe Street Northbound			Auahi Street Eastbound			Int. Total				
	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
06:00 AM	0	0	0	2	0	2	0	0	0	0	0	3	0	0	0	3	5
06:15 AM	0	0	0	2	0	2	0	0	0	0	0	4	0	1	0	5	7
06:30 AM	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	4	0	2	0	6	6
Total	0	0	0	6	0	6	0	0	0	0	0	11	0	3	0	14	20
07:00 AM	0	1	0	0	0	1	0	0	0	0	1	2	0	0	0	2	4
07:15 AM	0	0	0	1	0	1	0	0	0	0	0	6	0	0	1	7	8
07:30 AM	0	0	0	2	0	2	0	0	1	1	1	9	0	0	2	11	14
07:45 AM	0	0	0	6	1	7	0	0	0	0	0	14	0	0	0	14	21
Total	0	1	0	9	1	11	1	0	0	1	2	31	0	0	3	34	47
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	6	0	1	0	7	7
08:15 AM	0	1	0	4	0	5	0	0	0	0	0	4	0	2	0	6	11
08:30 AM	0	1	0	2	0	3	0	0	0	0	0	5	0	1	0	6	9
08:45 AM	0	1	0	2	0	3	0	0	0	0	0	0	0	2	0	2	5
Total	0	3	0	8	0	11	0	0	0	0	0	15	0	6	0	21	32
Grand Total	0	4	0	23	1	28	1	0	0	1	2	57	0	9	3	69	99
Approch %		14.3	0	82.1	3.6		50	0	0	50		82.6	0	13	4.3		
Total %		4	0	23.2	1	28.3	1	0	0	1	2	57.6	0	9.1	3	69.7	

Start Time	Southbound			Auahi Street Westbound			Ohe Street Northbound			Auahi Street Eastbound			Int. Total				
	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
07:30 AM	0	0	0	0	2	2	0	0	0	0	0	9	0	0	0	9	11
07:45 AM	0	0	0	0	6	6	0	0	0	0	0	14	0	0	0	14	20
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	6	0	1	7	7	7
08:15 AM	0	0	1	0	4	5	0	0	0	0	0	4	0	2	6	6	11
Total Volume	0	1	1	0	12	13	0	0	0	0	0	33	0	3	36	36	49
% App. Total		7.7	7.7	0	92.3		91.7	0	0	0	0	91.7	0	8.3			
PHF	.000	.250	.250	.000	.500	.542	.000	.000	.000	.000	.000	.589	.000	.375	.643	.643	.613

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

# Wilson Okamoto Corporation

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

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

File Name : OheAua PM  
Site Code : 00000006  
Start Date : 3/4/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Ohe Street Southbound				Auahi Street Westbound				Ohe Street Northbound				Auahi Street Eastbound				Int. Total				
	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	0	0	0	1	1	0	0	4	0	4	1	0	0	2	3	4	0	0	1	5	13
03:15 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	3	0	0	0	3	4
03:30 PM	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	2	0	3	0	5	7
03:45 PM	0	0	1	0	1	0	0	2	0	2	0	0	0	0	0	5	0	1	1	7	10
Total	0	0	1	1	2	0	0	9	0	9	1	0	0	2	3	14	0	4	2	20	34
04:00 PM	0	0	0	0	0	0	0	3	0	3	1	0	0	0	1	2	0	2	1	5	10
04:15 PM	0	0	0	3	3	0	0	14	0	14	4	0	0	0	4	3	0	0	1	4	25
04:30 PM	0	0	0	4	4	0	0	3	0	3	1	0	0	2	3	3	0	0	0	3	13
04:45 PM	0	0	0	1	1	1	0	4	0	5	2	0	1	1	4	1	0	1	2	4	14
Total	0	0	0	8	8	2	0	24	0	26	8	0	1	3	12	9	0	3	4	16	62
05:00 PM	1	0	1	5	7	1	0	3	0	4	0	0	0	0	0	4	0	0	0	4	15
05:15 PM	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	0	1	2	4
05:30 PM	0	0	0	1	1	0	0	5	0	5	1	0	0	0	1	1	0	0	0	1	8
05:45 PM	1	0	0	0	1	0	0	3	0	3	0	0	0	0	3	4	0	1	0	5	9
Total	2	0	1	6	9	1	0	13	0	14	1	0	0	0	1	10	0	1	1	12	36
Grand Total	2	0	2	15	19	3	0	46	0	49	10	0	1	5	16	33	0	8	7	48	132
Approach %	10.5	0	10.5	78.9	61	62.5	0	93.9	0	62.5	7.6	0	6.2	31.2	68.8	25	0	16.7	14.6	36.4	
Total %	1.5	0	1.5	11.4	14.4	2.3	0	34.8	0	37.1	7.6	0	0.8	3.8	12.1	25	0	6.1	5.3		

Start Time	Ohe Street Southbound				Auahi Street Westbound				Ohe Street Northbound				Auahi Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
04:15 PM	0	0	0	0	0	0	0	0	14	14	4	0	0	0	4	3	0	0	0	3	21
04:30 PM	0	0	0	0	0	0	0	3	3	3	1	0	0	0	1	3	0	0	0	3	7
04:45 PM	0	0	0	0	0	1	0	4	5	5	2	0	1	1	3	1	0	1	1	2	10
05:00 PM	1	0	1	1	2	1	0	3	4	4	0	0	0	0	0	4	0	0	0	4	10
Total Volume	1	0	1	1	2	2	0	24	26	26	7	0	1	1	8	11	0	1	1	12	48
% App. Total	50	0	50	92.3	7.7	87.5	0	92.3	12.5	91.7	0	0	12.5	8.3	91.7	0	0	8.3	0		
PHF	.250	.000	.250	.429	.464	.438	.000	.429	.500	.464	.438	.000	.250	.250	.500	.688	.000	.250	.250	.750	.571

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

# Wilson Okamoto Corporation

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

Counted By: PA  
Counters: D4-3889  
Weather: Clear

File Name : KouAua AM  
Site Code : 00000006  
Start Date : 3/4/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Koula Street Southbound				Auahi Street Westbound				Koula Street Northbound				Auahi Street Eastbound									
	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	2	11	1	15	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	1	17
06:15 AM	1	0	5	0	6	2	1	0	1	4	1	0	0	0	1	0	2	0	0	0	2	13
06:30 AM	1	1	6	0	8	2	1	0	0	3	0	0	2	0	2	0	2	1	0	0	3	16
06:45 AM	1	4	6	0	11	4	4	0	0	8	2	0	3	1	6	0	5	1	0	0	6	31
Total	4	7	28	1	40	8	6	0	1	15	4	0	5	1	10	0	10	2	0	0	12	77
07:00 AM	1	1	6	0	8	2	2	0	0	4	2	0	1	1	4	0	1	3	0	0	4	20
07:15 AM	3	3	13	0	19	0	3	0	0	3	5	0	2	2	9	0	3	2	1	6	37	
07:30 AM	0	1	7	0	8	1	1	0	0	2	4	0	2	0	6	0	1	2	0	3	19	
07:45 AM	2	3	9	0	14	3	2	0	0	5	4	0	3	2	9	0	2	2	0	4	32	
Total	6	8	35	0	49	6	8	0	0	14	15	0	8	5	28	0	7	9	1	17	108	
08:00 AM	1	2	12	0	15	6	6	0	0	12	3	0	0	0	3	0	4	3	0	0	7	37
08:15 AM	5	7	11	0	23	0	5	0	0	5	5	0	2	0	7	0	8	2	0	10	45	
08:30 AM	4	3	10	0	17	3	5	0	0	8	3	0	1	2	6	0	3	1	0	4	35	
08:45 AM	1	3	14	0	18	5	3	0	0	8	1	0	4	0	5	0	2	5	0	7	38	
Total	11	15	47	0	73	14	19	0	0	33	12	0	7	2	21	0	17	11	0	28	155	
Grand Total	21	30	110	1	162	28	33	0	1	62	31	0	20	8	59	0	34	22	1	57	340	
Apprch %	13	18.5	67.9	0.6	47.6	45.2	53.2	0	1.6	18.2	52.5	0	33.9	13.6	17.4	0	59.6	38.6	1.8	16.8		
Total %	6.2	8.8	32.4	0.3	47.6	8.2	9.7	0	0.3	18.2	9.1	0	5.9	2.4	17.4	0	10	6.5	0.3	16.8		

Start Time	Koula Street Southbound				Auahi Street Westbound				Koula Street Northbound				Auahi Street Eastbound								
	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
08:00 AM	1	2	12	15	12	3	0	0	0	3	0	0	0	0	3	0	4	3	0	7	37
08:15 AM	5	7	11	23	17	0	5	0	2	7	5	0	2	2	7	0	8	2	2	10	45
08:30 AM	4	3	10	17	13	3	5	0	1	8	3	0	1	4	4	0	3	1	1	4	33
08:45 AM	1	3	14	18	14	5	3	0	0	8	1	0	4	0	5	0	2	5	0	7	38
Total Volume	11	15	47	73	33	14	19	0	0	33	12	0	7	2	21	0	17	11	0	28	155
% App. Total	15.1	20.5	64.4	79.3	68.8	63.2	0	36.8	0	67.9	60.0	0	60.7	39.3	67.9	0.000	60.7	39.3	0.550	70.0	.850
PHF	.550	.536	.839	.793	.688	.600	.000	.438	.000	.679	.000	.531	.550	.700	.679	.000	.531	.550	.700	.700	.850

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

# Wilson Okamoto Corporation

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

Counted By: PA  
Counters: D4-3889  
Weather: Clear

File Name : KouAua PM  
Site Code : 00000007  
Start Date : 3/4/2015  
Page No : 1

Start Time	Groups Printed - Unshifted												Int. Total																		
	Koula Street Southbound				Auahi Street Westbound				Koula Street Northbound					Auahi Street Eastbound																	
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds		Left	Thru	Right	Peds														
03:00 PM	1	1	7	1	4	4	0	0	6	0	5	0	0	3	6	3	0	0	0	0	11	8	11	0	0	0	0	0	12	12	41
03:15 PM	1	4	10	0	5	4	0	0	5	0	3	1	0	4	0	1	0	0	0	0	9	9	8	1	0	0	0	0	5	38	38
03:30 PM	5	1	16	0	3	6	0	0	2	1	4	1	0	0	7	0	0	0	1	0	8	8	19	4	0	0	0	0	8	47	47
03:45 PM	0	0	7	0	2	9	0	1	10	0	5	4	0	0	5	1	0	0	5	1	12	12	47	6	0	0	0	0	11	49	49
Total	7	6	40	1	14	23	0	1	23	1	17	6	0	0	13	5	0	0	18	5	38	38	175	17	0	0	0	0	36	175	175
04:00 PM	3	3	11	0	4	12	0	0	14	0	4	4	0	0	2	0	0	0	2	0	16	16	22	4	0	0	0	0	7	62	62
04:15 PM	4	2	22	0	5	4	0	2	7	0	1	4	0	0	2	5	0	0	5	0	11	11	12	4	0	0	0	0	7	58	58
04:30 PM	1	5	14	0	3	4	0	0	7	0	1	2	0	0	4	10	0	0	10	1	7	7	10	1	0	0	0	0	15	52	52
04:45 PM	6	6	14	0	2	4	0	0	11	0	1	1	0	0	6	6	0	0	6	0	6	6	13	1	0	0	0	0	15	60	60
Total	14	16	61	0	14	24	0	2	39	0	7	11	0	0	20	23	0	0	23	1	40	40	57	11	0	0	0	0	44	232	232
05:00 PM	1	3	16	0	5	11	0	0	6	0	0	2	0	0	2	8	0	0	8	0	16	16	8	2	0	0	0	0	10	54	54
05:15 PM	3	4	8	0	0	6	0	0	10	0	2	2	0	0	2	5	0	0	5	0	6	6	14	2	0	0	0	0	7	42	42
05:30 PM	5	1	12	0	0	3	0	0	8	0	1	7	0	0	2	6	0	0	6	0	3	3	16	0	0	0	0	0	8	45	45
05:45 PM	1	5	11	0	2	3	0	0	3	0	1	5	0	0	4	5	0	0	5	0	5	5	9	0	0	0	0	0	9	40	40
Total	10	13	47	0	7	23	0	0	27	0	4	16	0	0	10	24	0	0	24	0	30	30	47	16	0	0	0	0	34	181	181
Grand Total	31	35	148	1	35	70	0	3	89	1	28	33	0	0	43	65	0	0	65	6	108	108	151	33	0	0	0	0	114	588	588
Approch %	14.4	16.3	68.8	0.5	32.4	64.8	0	2.8	58.9	0.7	18.5	21.9	0	0	37.7	57	0	0	57	5.3	18.4	18.4	25.7	5.6	0	0	0	0	19.4		
Total %	5.3	6	25.2	0.2	6	11.9	0	0.5	15.1	0.2	4.8	5.6	0	0	7.3	11.1	0	0	11.1	1											

Start Time	Koula Street Southbound								Auahi Street Westbound				Koula Street Northbound				Auahi Street Eastbound														
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds											
	04:00 PM	3	3	11	17	4	12	0	0	14	0	4	4	0	0	2	0	0	0	2	0	16	16	18	4	0	0	0	0	7	58
04:15 PM	4	2	22	28	5	4	0	0	7	0	1	4	0	0	2	5	0	0	5	0	9	9	8	1	0	0	0	0	7	52	52
04:30 PM	1	5	14	20	3	4	0	0	7	0	1	2	0	0	4	10	0	0	10	1	8	8	12	1	0	0	0	0	14	49	49
04:45 PM	6	6	14	26	2	4	0	0	11	0	1	1	0	0	6	6	0	0	6	0	12	12	46	7	0	0	0	0	15	59	59
Total Volume	14	16	61	91	14	24	0	0	39	0	7	11	0	0	20	23	0	0	23	0	46	46	175	17	0	0	0	0	43	218	218
% App. Total	15.4	17.6	67	81.3	36.8	63.2	0	0	84.8	0	15.2	15.2	0	0	46.5	53.5	0	0	53.5	0	63.9	63.9	175	17	0	0	0	0	717	924	924
PHF	.583	.667	.693	.813	.700	.500	.000	.000	.696	.000	.438	.438	.000	.000	.556	.575	.000	.000	.575	.000	.639	.639	.924	.924	.000	.000	.000	.000	.717	.924	.924

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



# Wilson Okamoto Corporation

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

Counted By: KW, GC  
Counters: D4-3888, D4-3890  
Weather: Clear

File Name : CooAla AM  
Site Code : 00000001  
Start Date : 3/5/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Cooke Street Southbound				Ala Moana Boulevard Westbound				Cooke Street Northbound				Ala Moana Boulevard Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
06:00 AM	1	2	8	2	13	2	174	1	3	180	4	3	1	4	12	5	267	7	0	279	484
06:15 AM	1	3	7	5	16	0	224	5	2	231	0	2	0	3	5	9	319	8	2	338	590
06:30 AM	5	2	14	6	27	2	275	5	0	282	3	0	1	8	12	10	337	7	3	357	678
06:45 AM	3	5	11	6	25	0	324	5	1	330	6	5	1	6	18	22	390	11	5	428	801
Total	10	12	40	19	81	4	997	16	6	1023	13	10	3	21	47	46	1313	33	10	1402	2553
07:00 AM	4	3	11	0	18	3	363	5	4	375	4	3	0	8	15	25	402	8	3	438	846
07:15 AM	4	2	25	0	31	4	410	10	2	426	4	3	1	6	14	26	445	12	4	487	958
07:30 AM	2	6	16	5	29	1	394	5	3	403	5	3	0	9	17	21	423	6	3	453	902
07:45 AM	7	6	19	3	35	5	444	6	2	457	7	4	0	12	23	15	377	11	6	409	924
Total	17	17	71	8	113	13	1611	26	11	1661	20	13	1	35	69	87	1647	37	16	1787	3630
08:00 AM	6	6	20	7	39	3	406	6	6	421	10	6	2	11	29	32	413	11	1	457	946
08:15 AM	6	8	23	5	42	3	409	6	6	424	3	6	0	4	13	15	340	11	4	370	849
08:30 AM	3	9	16	7	35	7	335	8	3	353	9	3	1	7	20	22	304	10	7	343	751
08:45 AM	4	10	15	5	34	4	281	15	2	302	6	5	7	3	21	14	306	12	2	334	691
Total	19	33	74	24	150	17	1431	35	17	1500	28	20	10	25	83	83	1363	44	14	1504	3237
Grand Total	46	62	185	51	344	34	4039	77	34	4184	61	43	14	81	199	216	4323	114	40	4693	9420
Apprch %	13.4	18	53.8	14.8		0.8	96.5	1.8	0.8		30.7	21.6	7	40.7		4.6	92.1	2.4	0.9		
Total %	0.5	0.7	2	0.5	3.7	0.4	42.9	0.8	0.4	44.4	0.6	0.5	0.1	0.9	2.1	2.3	45.9	1.2	0.4	49.8	

Start Time	Cooke Street Southbound				Ala Moana Boulevard Westbound				Cooke Street Northbound				Ala Moana Boulevard Eastbound				Int. Total			
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds
07:15 AM	4	2	25	2	31	4	410	10	3	424	4	3	1	8	26	445	12	6	483	946
07:30 AM	2	6	16	19	32	1	394	5	0	400	5	3	0	8	21	423	6	6	450	882
07:45 AM	7	6	19	20	32	5	444	6	0	455	7	4	0	11	15	377	11	11	403	901
08:00 AM	6	6	20	20	32	3	406	6	2	415	10	6	2	18	32	413	11	11	456	921
Total Volume	19	20	80	80	119	13	1654	27	3	1694	26	16	3	45	94	1658	40	1792	3650	
% App. PHF	.679	.833	.800	.800	.930	.650	.931	.675	1.6	.931	.650	.667	.375	.625	.734	.931	.833	.928	.965	

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

# Wilson Okamoto Corporation

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

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

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

## Groups Printed- Unshifted

Start Time	Koula Street Southbound				Ala Moana Boulevard Westbound				Koula Street Northbound				Ala Moana Boulevard Eastbound				Int. Total				
	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	13	3	23	2	41	1	341	6	1	349	15	7	6	12	40	7	437	7	1	452	882
03:15 PM	5	4	18	5	32	3	362	18	2	385	14	10	9	14	47	13	439	6	2	460	924
03:30 PM	8	6	32	11	57	2	395	13	5	415	22	11	5	12	50	13	532	10	5	560	1082
03:45 PM	9	8	39	8	64	5	425	14	3	447	12	7	4	11	34	12	547	4	5	568	1113
Total	35	21	112	26	194	11	1523	51	11	1596	63	35	24	49	171	45	1955	27	13	2040	4001
04:00 PM	9	10	25	11	55	2	391	15	0	408	14	15	1	11	41	19	499	10	2	530	1034
04:15 PM	9	4	43	11	67	0	416	10	10	436	11	12	3	5	31	18	476	6	3	503	1037
04:30 PM	11	11	33	17	72	2	353	11	3	369	9	15	3	14	41	14	521	8	12	555	1037
04:45 PM	11	7	29	6	53	2	378	8	7	395	16	14	2	5	37	5	478	2	8	493	978
Total	40	32	130	45	247	6	1538	44	20	1608	50	56	9	35	150	56	1974	26	25	2081	4086
05:00 PM	8	12	27	8	55	4	342	9	6	361	7	11	5	12	35	6	507	8	10	531	982
05:15 PM	14	10	32	11	67	2	349	13	3	367	3	10	4	14	31	9	517	13	11	550	1015
05:30 PM	11	6	21	7	45	1	395	6	10	412	8	14	3	14	39	10	506	4	19	539	1035
05:45 PM	13	2	26	7	48	2	325	7	4	338	11	9	2	16	38	10	519	0	12	541	965
Total	46	30	106	33	215	9	1411	35	23	1478	29	44	14	56	143	35	2049	25	52	2161	3997
Grand Total	121	83	348	104	656	26	4472	130	54	4682	142	135	47	140	464	136	5978	78	90	6282	12084
Approch %	18.4	12.7	53	15.9		0.6	95.5	2.8	1.2		30.6	29.1	10.1	30.2		2.2	95.2	1.2	1.4		
Total %	1	0.7	2.9	0.9	5.4	0.2	37	1.1	0.4	38.7	1.2	1.1	0.4	1.2	3.8	1.1	49.5	0.6	0.7	52	

Start Time	Koula Street Southbound				Ala Moana Boulevard Westbound				Koula Street Northbound				Ala Moana Boulevard Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
03:30 PM	8	6	32	32	46	2	395	13	13	410	22	11	5	38	13	532	10	10	555	1049	
03:45 PM	9	8	39	39	56	5	425	14	14	444	12	7	4	23	12	547	4	4	563	1086	
04:00 PM	9	10	25	25	44	2	391	15	15	408	14	15	1	30	19	499	10	10	528	1010	
04:15 PM	9	4	43	43	56	0	416	10	10	426	11	12	3	26	18	476	6	6	500	1008	
Total Volume	35	28	139	139	202	9	1627	52	52	1688	59	45	13	117	62	2054	30	30	2146	4153	
% App. Total	17.3	13.9	68.8	68.8		0.5	96.4	3.1	3.1		50.4	38.5	11.1	3.8	2.9	95.7	1.4	1.4			
PHF	.972	.700	.808	.808	.902	.450	.957	.867	.867	.950	.670	.750	.650	.770	.816	.939	.750	.750		.953	.956

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 03:30 PM

# Wilson Okamoto Corporation

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

Counted By: AC, FS  
Counters: TU-0649, TU-0650  
Weather: Clear

File Name : OheAla AM  
Site Code : 00000004  
Start Date : 3/5/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Ohe Street Southbound						Ala Moana Boulevard Westbound						Ohe Street Northbound						Ala Moana Boulevard Eastbound					
	Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total	
06:00 AM	0	0	1	1	2		0	178	0	0	178		0	1	2	1	4	4	0	260	1	1	262	446
06:15 AM	0	0	0	4	4		0	234	1	0	235		0	0	3	4	7	7	0	310	9	5	324	570
06:30 AM	0	0	0	4	4		0	285	0	0	285		0	0	0	6	6	6	0	320	7	4	331	626
06:45 AM	0	0	0	3	3		0	330	0	0	330		0	0	0	6	6	6	0	368	8	5	381	720
Total	0	0	1	12	13		0	1027	1	0	1028		0	1	5	17	23	23	0	1258	25	15	1298	2362
07:00 AM	0	0	0	3	3		0	371	0	0	371		0	0	1	9	10	10	0	380	6	3	389	773
07:15 AM	0	0	0	5	5		0	423	0	0	423		0	0	0	6	6	6	0	413	13	5	431	865
07:30 AM	0	0	0	3	3		0	404	0	0	404		0	0	2	15	17	17	0	404	6	2	412	836
07:45 AM	0	0	0	1	1		0	456	0	0	456		0	1	1	15	16	16	0	356	11	6	373	846
Total	0	0	0	12	12		0	1654	0	0	1654		0	0	4	45	49	49	0	1553	36	16	1605	3320
08:00 AM	0	0	1	4	5		0	410	1	0	411		0	0	1	11	12	12	0	385	11	1	397	825
08:15 AM	0	0	2	1	3		0	415	0	0	415		0	0	0	5	5	5	0	305	12	4	321	744
08:30 AM	0	0	1	3	4		0	351	0	0	351		0	0	0	5	5	5	0	274	11	7	292	652
08:45 AM	0	0	2	4	6		0	290	0	0	290		0	0	0	4	4	4	0	285	13	4	302	602
Total	0	0	6	12	18		0	1466	1	0	1467		0	0	1	25	26	26	0	1249	47	16	1312	2823
Grand Total	0	0	7	36	43		0	4147	2	0	4149		0	1	10	87	98	98	0	4060	108	47	4215	8505
Apprch %	0	0	16.3	83.7	0.5		0	100	0	0	100		0	1	10.2	88.8	1.2	1.2	0	96.3	2.6	1.1	99.6	100
Total %	0	0	0.1	0.4	0.5		0	48.8	0	0	48.8		0	0	0.1	1	1.2	1.2	0	47.7	1.3	0.6	49.6	100

Start Time	Ohe Street Southbound						Ala Moana Boulevard Westbound						Ohe Street Northbound						Ala Moana Boulevard Eastbound					
	Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total	
07:15 AM	0	0	0	0	0		0	423	0	0	423		0	0	0	0	0	0	0	413	13	6	426	849
07:30 AM	0	0	0	0	0		0	404	0	0	404		0	0	2	2	2	2	0	404	6	6	410	816
07:45 AM	0	0	0	0	0		0	456	0	0	456		0	0	1	1	1	1	0	356	11	11	367	824
08:00 AM	0	0	0	1	1		0	410	1	1	411		0	0	1	1	1	1	0	385	11	11	396	809
Total Volume	0	0	1	1	1		0	1693	1	1	1694		0	0	4	4	4	4	0	1558	41	41	1599	3298
% App. Total	0	0	0	100	0.250		0	99.9	0.1	0	100		0	0	100	0.500	0.500	0.500	0	97.4	2.6	0.6	99.6	100
PHF	.000	.000	.000	.250	.250		.000	.928	.250	.929	.929		.000	.000	.000	.500	.500	.500	.000	.943	.788	.938	.938	.971

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

# Wilson Okamoto Corporation

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

Counted By: AC, FS  
Counters: TU-0649, TU-0650  
Weather: Clear

File Name : OheAla PM  
Site Code : 00000004  
Start Date : 3/5/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Ohe Street Southbound				Ala Moana Boulevard Westbound				Ohe Street Northbound				Ala Moana Boulevard Eastbound				Int. Total				
	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	0	0	0	3	3	0	350	0	0	350	0	0	4	8	12	0	452	7	0	459	824
03:15 PM	0	0	3	4	7	0	388	0	0	388	0	0	0	13	13	0	426	7	2	435	843
03:30 PM	0	0	1	11	12	0	397	0	0	397	0	0	0	11	11	0	523	11	2	536	956
03:45 PM	0	0	3	5	8	0	441	0	0	441	0	0	0	6	6	0	528	2	3	533	988
Total	0	0	7	23	30	0	1576	0	0	1576	0	0	4	38	42	0	1929	27	7	1963	3611
04:00 PM	0	0	0	5	5	0	392	0	0	392	0	0	0	6	6	0	491	8	1	500	903
04:15 PM	0	0	3	16	19	0	430	2	0	432	0	0	0	2	2	0	460	5	3	468	921
04:30 PM	0	0	2	7	9	0	357	1	0	358	0	0	0	13	13	0	522	6	11	539	919
04:45 PM	0	0	2	2	4	0	391	1	0	392	0	0	0	6	6	0	467	3	9	479	881
Total	0	0	7	30	37	0	1570	4	0	1574	0	0	0	27	27	0	1940	22	24	1986	3624
05:00 PM	0	0	2	6	8	0	366	0	0	366	0	0	0	12	12	0	510	7	10	527	913
05:15 PM	1	1	2	9	13	0	373	0	0	373	0	1	4	14	19	0	531	8	7	546	951
05:30 PM	0	0	1	5	6	0	367	1	0	368	0	0	2	15	17	0	510	2	15	527	918
05:45 PM	0	0	0	14	14	0	361	0	0	361	0	0	0	7	7	0	537	0	11	548	930
Total	1	1	5	34	41	0	1467	1	0	1468	0	1	6	48	55	0	2088	17	43	2148	3712
Grand Total	1	1	19	87	108	0	4613	5	0	4618	0	1	10	113	124	0	5957	66	74	6097	10947
Apprch %	0.9	0.9	17.6	80.6		0	99.9	0.1	0		0	0.8	8.1	91.1		0	97.7	1.1	1.2		
Total %	0	0	0.2	0.8	1	0	42.1	0	0	42.2	0	0	0.1	1	1.1	0	54.4	0.6	0.7	55.7	

Start Time	Ohe Street Southbound				Ala Moana Boulevard Westbound				Ohe Street Northbound				Ala Moana Boulevard Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
03:30 PM	0	0	0	1	1	0	397	0	0	397	0	0	0	0	0	0	523	11	0	534	932
03:45 PM	0	0	3	3	3	0	441	0	0	441	0	0	0	0	0	0	528	2	0	530	974
04:00 PM	0	0	0	0	0	0	392	0	0	392	0	0	0	0	0	0	491	8	8	499	891
04:15 PM	0	0	0	3	3	0	430	2	0	432	0	0	0	0	0	0	460	5	5	465	900
Total Volume	0	0	7	7	7	0	1660	2	0	1662	0	0	0	0	0	0	2002	26	26	2028	3697
% App. Total	0	0	0	100		0	99.9	0.1	0		0	0	0	0	0	0	98.7	1.3	0		
PHF	.000	.000	.583	.583	.583	.000	.941	.250	.000	.942	.000	.000	.000	.000	.000	.000	.948	.591	.000	.949	.949

Peak Hour for Entire Intersection Begins at 03:30 PM  
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1

# Wilson Okamoto Corporation

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

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

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

## Groups Printed- Unshifted

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

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

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

# Wilson Okamoto Corporation

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

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

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

## Groups Printed- Unshifted

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

Start Time	Koula Street Southbound						Ala Moana Boulevard Westbound						Koula Street Northbound						Ala Moana Boulevard Eastbound					
	Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total	
03:30 PM	3	0	2		5		3	390	7		400		1	1	0		2		1	528	1		530	
03:45 PM	5	0	2		7		3	430	6		439		1	0	0		1		2	525	1		528	
04:00 PM	6	0	4		10		1	372	11		384		4	5	1		10		6	486	4		496	
04:15 PM	6	1	3		10		3	479	6		488		0	4	1		5		7	461	0		468	
Total Volume	20	1	11		32		10	1671	30		1711		6	10	2		18		16	2000	6		2022	
% App. PHF	62.5	3.1	34.4			0.6	97.7	1.8			33.3	55.6	11.1		0.8	98.9	0.3		0.5	53.8	0.2		54.5	
	.833	.250	.688		.800		.833	.872	.682		.877		.375	.500	.500		.450	.947	.375		.954			

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Entire Intersection Begins at 03:30 PM

# Wilson Okamoto Corporation

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

Counted By: PA, JC  
Counters: D4-5672, D4-5677  
Weather: Clear

File Name : AhuiAla AM  
Site Code : 00000000  
Start Date : 3/5/2015  
Page No : 1

Groups Printed- Unshifted

Start Time	Southbound			Ala Moana Boulevard Westbound			Ahuhi Street Northbound			Ala Moana Boulevard Eastbound			App. Total	Int. Total			
	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left			Thru	Right	Peds
06:00 AM	0	0	180	0	0	180	0	0	0	6	6	0	241	10	0	251	437
06:15 AM	0	0	231	0	0	231	0	0	1	6	7	0	302	9	0	311	549
06:30 AM	0	0	290	0	0	290	0	0	0	9	9	0	317	9	0	326	625
06:45 AM	0	0	328	0	0	328	0	0	0	13	13	0	361	12	0	373	714
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1029</b>	<b>0</b>	<b>0</b>	<b>1029</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>34</b>	<b>35</b>	<b>0</b>	<b>1221</b>	<b>40</b>	<b>0</b>	<b>1261</b>	<b>2325</b>
07:00 AM	0	0	389	0	0	389	0	0	1	11	12	0	373	7	0	380	781
07:15 AM	0	0	418	0	0	418	0	0	4	6	10	1	407	7	0	415	843
07:30 AM	0	0	397	0	0	397	0	0	1	9	10	0	400	8	0	408	815
07:45 AM	0	0	487	0	0	487	0	0	1	6	7	0	353	7	0	360	854
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1691</b>	<b>0</b>	<b>0</b>	<b>1691</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>32</b>	<b>39</b>	<b>1</b>	<b>1533</b>	<b>29</b>	<b>0</b>	<b>1563</b>	<b>3293</b>
08:00 AM	0	0	418	0	0	418	0	0	0	6	6	0	384	8	0	392	816
08:15 AM	0	0	411	0	0	411	0	0	1	2	3	0	297	9	0	306	720
08:30 AM	0	1	351	0	0	352	0	0	1	9	10	0	268	7	0	275	637
08:45 AM	0	1	291	0	0	292	0	0	0	4	4	0	279	8	0	287	583
<b>Total</b>	<b>0</b>	<b>2</b>	<b>1471</b>	<b>0</b>	<b>0</b>	<b>1473</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>21</b>	<b>23</b>	<b>0</b>	<b>1228</b>	<b>32</b>	<b>0</b>	<b>1260</b>	<b>2756</b>
<b>Grand Total</b>	<b>0</b>	<b>2</b>	<b>4191</b>	<b>0</b>	<b>0</b>	<b>4193</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>87</b>	<b>97</b>	<b>1</b>	<b>3982</b>	<b>101</b>	<b>0</b>	<b>4084</b>	<b>8374</b>
Apprch %	0	0	100	0	0	50.1	0	0	10.3	89.7	1.2	0	97.5	2.5	0	48.8	
Total %	0	0	50	0	0	50.1	0	0	0.1	1	1.2	0	47.6	1.2	0	48.8	

Start Time	Southbound			Ala Moana Boulevard Westbound			Ahuhi Street Northbound			Ala Moana Boulevard Eastbound			App. Total	Int. Total			
	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left			Thru	Right	Peds
07:15 AM	0	0	418	0	0	418	0	0	0	4	4	1	407	7	0	415	837
07:30 AM	0	0	397	0	0	397	0	0	1	1	1	0	400	8	0	408	806
07:45 AM	0	0	487	0	0	487	0	0	1	1	1	0	353	7	0	360	848
08:00 AM	0	0	418	0	0	418	0	0	0	0	0	0	384	8	0	392	810
Total Volume	0	0	1720	0	0	1720	0	0	6	6	6	1	1544	30	0	1575	3301
% App. Total	.000	.000	.883	.000	.000	.883	.000	.000	.375	.375	.375	.250	.948	.938	.000	.949	.973
PHF																	

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

# Wilson Okamoto Corporation

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

Counted By: PA, JC  
Counters: D4-5672, D4-5677  
Weather: Clear

File Name : AhuiAla PM  
Site Code : 00000004  
Start Date : 3/5/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Southbound			Ala Moana Boulevard Westbound						Ahui Street Northbound						Ala Moana Boulevard Eastbound										
	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	Int. Total
03:00 PM	0	0	364	0	0	364	0	0	1	6	7	0	0	4	0	451	0	451	4	0	455	0	0	4	0	826
03:15 PM	0	1	373	0	0	374	0	0	4	7	11	0	0	5	0	419	0	419	5	0	424	0	0	0	0	809
03:30 PM	0	0	411	0	0	411	0	0	2	13	15	0	0	10	0	534	0	534	10	0	544	0	0	0	0	970
03:45 PM	0	0	438	0	0	438	0	0	6	8	14	0	0	4	0	531	0	531	4	0	535	0	0	0	0	987
Total	0	1	1586	0	0	1587	0	0	13	34	47	0	0	23	0	1935	0	1935	23	0	1958	0	0	0	0	3592
04:00 PM	0	0	378	0	0	378	0	0	0	5	5	0	0	3	0	487	0	487	3	0	490	0	0	0	0	873
04:15 PM	0	1	489	0	0	490	0	0	4	5	9	0	0	3	0	470	0	470	3	0	473	0	0	0	0	972
04:30 PM	0	0	374	0	0	374	0	0	2	14	16	0	0	3	0	520	0	520	3	0	523	0	0	0	0	913
04:45 PM	0	0	341	0	0	341	0	0	4	5	9	0	0	2	0	487	0	487	2	0	489	0	0	0	0	839
Total	0	1	1582	0	0	1583	0	0	10	29	39	0	0	11	0	1964	0	1964	11	0	1975	0	0	0	0	3597
05:00 PM	0	0	378	0	0	378	0	0	1	8	9	0	0	0	0	533	0	533	0	0	533	0	0	0	0	920
05:15 PM	0	0	381	0	0	381	0	0	3	19	22	0	0	2	0	538	0	538	2	0	540	0	0	0	0	943
05:30 PM	0	0	370	0	0	370	0	0	2	10	12	0	0	2	0	505	0	505	2	0	507	0	0	0	0	889
05:45 PM	0	0	382	0	0	382	0	0	1	2	3	0	0	2	0	530	0	530	2	0	532	0	0	0	0	917
Total	0	0	1511	0	0	1511	0	0	7	39	46	0	0	6	0	2106	0	2106	6	0	2112	0	0	0	0	3669
Grand Total	0	2	4679	0	0	4681	0	0	30	102	132	0	0	40	0	6005	0	6005	40	0	6045	0	0	0	0	10858
Approch %	0	0	100	0	0	100	0	0	22.7	77.3	1.2	0	0	99.3	0.7	99.3	0	99.3	0.7	0	6045	0	0	0	0	10858
Total %	0	0	43.1	0	0	43.1	0	0	0.3	0.9	1.2	0	0	55.3	0.4	55.3	0	55.3	0.4	0	55.7	0	0	0	0	55.7

Start Time	Southbound			Ala Moana Boulevard Westbound						Ahui Street Northbound						Ala Moana Boulevard Eastbound										
	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	Int. Total
03:30 PM	0	0	411	0	0	411	0	0	0	2	2	0	0	2	0	534	0	534	10	0	544	0	0	0	0	957
03:45 PM	0	0	438	0	0	438	0	0	0	6	6	0	0	4	0	531	0	531	4	0	535	0	0	0	0	979
04:00 PM	0	0	378	0	0	378	0	0	0	0	0	0	0	3	0	487	0	487	3	0	490	0	0	0	0	868
04:15 PM	0	0	489	0	0	490	0	0	4	4	4	0	0	3	0	470	0	470	3	0	473	0	0	0	0	967
Total Volume	0	0	1716	0	0	1717	0	0	12	12	12	0	0	20	0	2022	0	2022	20	0	2042	0	0	0	0	3771
% App. Total	.000	0.1	99.9	0	0	100	0	0	100	.500	.500	.000	.000	.500	.500	.947	.000	.947	.500	.500	.938	.000	0	0	0	.963
PHF			.250	.877	.000	.876	.000	.000	.000	.500	.500	.000	.000	.500	.500	.947	.000	.947	.500	.500	.938	.000	0	0	0	.963

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 03:30 PM



# Wilson Okamoto Corporation

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

Counted By: GC, DY  
Counters: D4-5675, D4-5676  
Weather: Clear

File Name : AlaWar AM  
Site Code : 00000001  
Start Date : 4/13/2016  
Page No : 1

## Groups Printed- Unshifted

Start Time	Ward Avenue Southbound				Ala Moana Boulevard Westbound				Ward Avenue Northbound				Ala Moana Boulevard Eastbound								
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	38	9	42	3	92	5	157	7	3	172	3	2	4	3	12	32	266	0	0	298	574
06:15 AM	38	25	39	5	107	10	221	10	2	243	1	3	6	4	14	33	271	1	6	311	675
06:30 AM	24	17	37	9	87	17	255	22	5	299	1	3	2	8	14	43	313	2	2	360	760
06:45 AM	26	25	30	4	85	11	322	9	4	346	0	4	6	1	11	60	330	0	8	398	840
Total	126	76	148	21	371	43	955	48	14	1060	5	12	18	16	51	168	1180	3	16	1367	2849
07:00 AM	25	25	42	7	99	23	352	34	5	414	0	6	4	2	12	37	352	0	8	397	922
07:15 AM	36	30	37	3	106	26	382	41	10	459	0	9	7	6	22	53	346	1	4	404	991
07:30 AM	37	29	50	3	119	21	389	35	4	449	0	11	8	2	21	40	345	1	3	389	978
07:45 AM	29	24	71	2	126	30	336	45	7	418	1	4	8	5	18	63	327	0	6	396	958
Total	127	108	200	15	450	100	1459	155	26	1740	1	30	27	15	73	193	1370	2	21	1586	3849
08:00 AM	33	33	49	3	118	41	364	37	10	452	1	3	11	1	16	53	349	1	4	407	993
08:15 AM	36	32	63	2	133	35	397	55	2	489	0	4	13	2	19	53	338	1	3	395	1036
08:30 AM	38	36	54	6	134	17	260	41	12	330	0	8	8	1	17	59	271	0	6	336	817
08:45 AM	35	22	46	3	106	25	263	41	2	331	1	7	12	2	22	56	306	0	2	364	823
Total	142	123	212	14	491	118	1284	174	26	1602	2	22	44	6	74	221	1264	2	15	1502	3669
Grand Total	395	307	560	50	1312	261	3698	377	66	4402	8	64	89	37	198	582	3814	7	52	4455	10367
Approch %	30.1	23.4	42.7	3.8	12.7	5.9	84	8.6	1.5	42.5	0.1	32.3	44.9	18.7	13.1	85.6	0.2	1.2	43		
Total %	3.8	3	5.4	0.5	12.7	2.5	35.7	3.6	0.6	42.5	0.1	0.6	0.9	0.4	1.9	5.6	36.8	0.1	0.5		

Start Time	Ward Avenue Southbound				Ala Moana Boulevard Westbound				Ward Avenue Northbound				Ala Moana Boulevard Eastbound								
	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
07:30 AM	37	29	50	5	116	21	389	35	35	445	0	11	8	8	19	40	345	1	386	966	
07:45 AM	29	24	71	7	124	30	336	45	41	411	1	4	8	8	13	63	327	0	390	938	
08:00 AM	33	33	49	6	115	41	364	37	55	442	1	3	11	11	15	53	349	1	403	975	
08:15 AM	36	32	63	6	131	35	397	55	55	487	0	4	13	13	17	53	338	1	392	1027	
Total Volume	135	118	233	23	486	127	1486	172	1785	64	2	22	40	64	209	1359	3	1571	3906		
% App. Total	27.8	24.3	47.9	4.7	12.7	7.1	83.2	9.6	7.82	42.5	3.1	34.4	62.5	18.7	13.3	86.5	0.2	1.2	43		
PHF	.912	.894	.820	.820	.927	.774	.936	.782	.916	.842	.500	.500	.769	.842	.829	.973	.750		.975		

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

# Wilson Okamoto Corporation

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

Counted By: GC, DY  
Counters: D4-5675, D4-5676  
Weather: Clear

File Name : AlaWar AM - U-Turns  
Site Code : 00000001  
Start Date : 4/13/2016  
Page No : 1

## Groups Printed- Unshifted

Start Time	Southbound		Ala Moana Boulevard				Left = U-Turns Westbound		Northbound		Eastbound	
	App. Total		Left	Thru	Right	Peds	App. Total	App. Total	App. Total	App. Total	Int. Total	
06:00 AM	0		2	0	0	0	2	0	0	0	2	
06:15 AM	0		1	0	0	0	1	0	0	0	1	
06:30 AM	0		1	0	0	0	1	0	0	0	1	
06:45 AM	0		2	0	0	0	2	0	0	0	2	
Total	0		6	0	0	0	6	0	0	0	6	
07:00 AM	0		1	0	0	0	1	0	0	0	1	
07:15 AM	0		0	0	0	0	0	0	0	0	0	
07:30 AM	0		2	0	0	0	2	0	0	0	2	
07:45 AM	0		1	0	0	0	1	0	0	0	1	
Total	0		4	0	0	0	4	0	0	0	4	
08:00 AM	0		1	0	0	0	1	0	0	0	1	
08:15 AM	0		3	0	0	0	3	0	0	0	3	
08:30 AM	0		0	0	0	0	0	0	0	0	0	
08:45 AM	0		0	0	0	0	0	0	0	0	0	
Total	0		4	0	0	0	4	0	0	0	4	
Grand Total	0		14	0	0	0	14	0	0	0	14	
Apprch %	100		100	0	0	0	100	0	0	0	100	
Total %	0		100	0	0	0	100	0	0	0	100	

Start Time	Southbound		Westbound		Northbound		Eastbound	
	App. Total		App. Total		App. Total		App. Total	Int. Total
06:00 AM	0		0	0	0	0	0	0
06:15 AM	0		0	0	0	0	0	0
06:30 AM	0		0	0	0	0	0	0
06:45 AM	0		0	0	0	0	0	0
Total Volume	0		0	0	0	0	0	0
% App. Total	.000		.000	.000	.000	.000	.000	.000
PHF								

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Entire Intersection Begins at 06:00 AM

# Wilson Okamoto Corporation

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

Counted By: GC, DY  
Counters: D4-5675, D4-5676  
Weather: Clear

File Name : AlaWar PM  
Site Code : 00000001  
Start Date : 4/13/2016  
Page No : 1

## Groups Printed- Unshifted

Start Time	Ward Avenue Southbound						Ala Moana Boulevard Westbound						Ward Avenue Northbound						Ala Moana Boulevard Eastbound					
	Left		Right		Peds		Left		Right		Peds		Left		Right		Peds		Left		Right		Peds	
	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total
03:00 PM	37	142	11	6	88	6	10	312	34	14	370	2	20	10	6	41	408	3	2	454	1004			
03:15 PM	39	126	11	1	75	1	21	355	54	5	435	1	18	9	5	72	457	1	3	533	1127			
03:30 PM	53	168	15	2	98	2	8	361	45	8	422	4	24	14	5	48	405	1	6	460	1097			
03:45 PM	37	132	14	1	80	1	7	393	57	9	466	1	21	7	7	63	470	2	3	538	1186			
Total	166	568	51	10	341	10	46	1421	190	36	1693	8	83	54	23	224	1740	7	14	1985	4414			
04:00 PM	51	137	8	2	76	2	8	313	41	9	371	1	25	24	4	63	448	0	11	522	1084			
04:15 PM	68	162	12	2	80	2	10	375	47	9	441	1	33	34	3	56	458	2	13	529	1203			
04:30 PM	43	127	11	1	72	1	12	341	39	11	403	1	41	33	11	66	475	1	4	546	1162			
04:45 PM	51	142	11	4	76	4	13	291	53	10	367	3	21	34	9	68	413	3	2	486	1062			
Total	213	568	42	9	304	9	43	1320	180	39	1582	6	120	125	27	253	1794	6	30	2083	4511			
05:00 PM	47	116	8	6	55	6	11	298	41	15	365	0	34	38	7	52	477	1	4	534	1094			
05:15 PM	71	151	13	9	58	9	13	315	36	9	373	2	25	28	7	62	469	0	4	541	1127			
05:30 PM	56	153	12	5	80	5	9	265	53	14	341	1	24	26	4	55	414	1	2	497	1046			
05:45 PM	36	112	5	0	71	0	8	310	40	4	362	1	18	25	8	75	517	1	2	595	1121			
Total	210	532	38	20	264	20	41	1188	170	42	1441	4	101	117	26	275	1877	3	12	2167	4388			
Grand Total	589	1668	131	39	909	39	130	3929	540	117	4716	18	304	296	76	752	5411	16	56	6235	13313			
Approch %	35.3	12.5	7.9	2.3	54.5	2.3	2.8	83.3	11.5	2.5	35.4	0.1	43.8	42.7	11	12.1	86.8	0.3	0.9	46.8				
Total %	4.4	1.2	1	0.3	6.8	0.3	1	29.5	4.1	0.9	35.4	0.1	2.3	2.2	0.6	5.6	40.6	0.1	0.4	46.8				

Start Time	Ward Avenue Southbound						Ala Moana Boulevard Westbound						Ward Avenue Northbound						Ala Moana Boulevard Eastbound					
	Left		Right		Peds		Left		Right		Peds		Left		Right		Peds		Left		Right		Peds	
	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total
03:45 PM	37	131	14	80	8	7	393	57	457	1	21	21	63	470	2	535	1166							
04:00 PM	51	135	8	76	135	8	313	41	362	1	25	24	63	448	0	511	1058							
04:15 PM	68	160	12	80	160	10	375	47	432	1	33	34	56	458	2	516	1176							
04:30 PM	43	126	11	72	126	12	341	39	392	1	41	33	66	475	1	542	1135							
Total Volume	199	552	45	308	552	37	1422	184	1643	4	120	112	248	1851	5	2104	4535							
% App. Total	36.1	12.5	8.2	55.8	12.5	2.3	86.5	11.2	35.4	1.7	50.8	47.5	11.8	88	0.2	970	964							
PHF	.732	.863	.804	.963	.863	.771	.905	.807	.899	1.00	.732	.824	.939	.974	.625	.970	.964							

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 03:45 PM

# Wilson Okamoto Corporation

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

Counted By: GC, DY  
Counters: D4-5675, D4-5676  
Weather: Clear

File Name : AlaWar PM - U-Turns  
Site Code : 00000001  
Start Date : 4/13/2016  
Page No : 1

## Groups Printed- Unshifted

Start Time	Ala Moana Boulevard				Left = U-Turns Westbound				Northbound		Eastbound			
	Southbound		Thru		Right		Peds		App. Total		App. Total		Int. Total	
	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	App. Total	App. Total	App. Total	App. Total	Int. Total		
03:00 PM	0	1	0	0	0	0	0	0	1	0	0	0	1	
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
03:30 PM	0	1	0	0	0	0	0	0	1	0	0	0	1	
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	2	0	0	0	0	0	0	2	0	0	0	2	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
05:45 PM	0	2	0	0	0	0	0	0	2	0	0	0	2	
Total	0	2	0	0	0	0	0	0	2	0	0	0	2	
Grand Total	0	4	0	0	0	0	0	0	4	0	0	0	4	
Approch %	100	0	0	0	0	0	0	0	0	0	0	0	0	
Total %	0	100	0	0	0	0	0	0	100	0	0	0	0	

Start Time	Ala Moana Boulevard				Left = U-Turns Westbound				Northbound		Eastbound			
	Southbound		Thru		Right		Peds		App. Total		App. Total		Int. Total	
	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	App. Total	App. Total	App. Total	App. Total	Int. Total		
03:00 PM	0	1	0	0	0	0	0	0	1	0	0	0	1	
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
03:30 PM	0	1	0	0	0	0	0	0	1	0	0	0	1	
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	0	2	0	0	0	0	0	0	2	0	0	0	2	
% App. Total	.000	.500	.000	.000	.000	.500	.000	.000	.500	.000	.000	.000	.500	
PHF														

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

# Wilson Okamoto Corporation

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

Counted By: JJ, RJ  
Counters: D4-5675, D4-5676  
Weather: Clear

File Name : WarAla AM  
Site Code : 00000005  
Start Date : 3/5/2015  
Page No : 1

Start Time	Ward Avenue Southbound				Ala Moana Boulevard Westbound				Ward Avenue Northbound				Ala Moana Boulevard Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
06:00 AM	28	21	19	2	70	10	164	8	3	185	0	5	2	3	10	25	215	0	0	240	505
06:15 AM	22	33	38	4	97	10	190	16	1	217	2	3	5	4	14	38	269	2	1	310	638
06:30 AM	33	27	28	3	91	17	259	19	3	298	1	6	10	9	26	32	287	0	4	323	738
06:45 AM	23	22	27	3	75	11	303	21	1	336	0	5	7	8	20	58	302	1	3	364	795
<b>Total</b>	106	103	112	12	333	48	916	64	8	1036	3	19	24	24	70	153	1073	3	8	1237	2676
07:00 AM	24	25	50	0	99	23	341	21	2	387	0	6	14	9	29	56	315	0	10	381	896
07:15 AM	28	33	38	3	102	26	375	33	3	437	0	8	10	4	22	41	367	0	8	416	977
07:30 AM	33	26	46	6	111	27	347	37	1	412	1	8	8	8	25	50	357	2	10	419	967
07:45 AM	23	31	59	4	117	32	440	43	10	525	0	12	12	3	27	44	308	2	8	362	1031
<b>Total</b>	108	115	193	13	429	108	1503	134	16	1761	1	34	44	24	103	191	1347	4	36	1578	3871
08:00 AM	29	46	45	3	123	33	375	27	5	440	0	10	12	4	26	48	332	0	4	384	973
08:15 AM	22	42	61	4	129	40	355	40	4	439	1	9	10	3	23	39	259	1	7	306	897
08:30 AM	30	33	44	4	111	29	302	30	7	368	1	13	13	10	37	47	221	0	6	274	790
08:45 AM	19	43	56	10	128	37	231	24	13	305	2	9	13	5	29	66	213	1	9	289	751
<b>Total</b>	100	164	206	21	491	139	1263	121	29	1552	4	41	48	22	115	200	1025	2	26	1253	3411
<b>Grand Total</b>	314	382	511	46	1253	295	3682	319	53	4349	8	94	116	70	288	544	3445	9	70	4068	9958
Approch %	25.1	30.5	40.8	3.7	12.6	6.8	84.7	7.3	1.2	43.7	2.8	32.6	40.3	24.3	13.4	84.7	0.2	1.7	1.7	40.9	
Total %	3.2	3.8	5.1	0.5		3	37	3.2	0.5		0.1	0.9	1.2	0.7	2.9	5.5	34.6	0.1	0.7		

Start Time	Ward Avenue Southbound				Ala Moana Boulevard Westbound				Ward Avenue Northbound				Ala Moana Boulevard Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
07:15 AM	28	33	38		99	26	375	33		434	0	8	10		18	41	367	0		408	959
07:30 AM	33	26	46		105	27	347	37		411	1	8	8		17	50	357	2		409	942
07:45 AM	23	31	59		113	32	440	43		515	0	12	12		24	44	308	2		354	1006
08:00 AM	29	46	45		120	33	375	27		435	0	10	12		22	48	332	0		380	957
<b>Total Volume</b>	113	136	188		437	118	1537	140		1795	1	38	42		81	183	1364	4		1551	3864
% App. Total	25.9	31.1	43		910	6.6	85.6	7.8		871	1.2	46.9	51.9		8.44	11.8	87.9	0.3		948	960
PHF	.856	.739	.797			.894	.873	.814			.250	.792	.875			.915	.929	.500			

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

# Wilson Okamoto Corporation

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

Counted By: JJ, RJ  
Counters: D4-5675, D4-5676  
Weather: Clear

File Name : WarAla AM - U-Turns  
Site Code : 00000005  
Start Date : 3/5/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Southbound				Ala Moana Boulevard				Left = U-Turns Westbound				Northbound		Eastbound	
	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	App. Total	Northbound	App. Total	Eastbound	App. Total	Int. Total	
																App. Total
06:00 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	
06:15 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	
06:30 AM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	2	
06:45 AM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	2	
Total	0	6	0	0	0	6	0	0	0	0	0	0	0	0	6	
07:00 AM	0	5	0	0	0	5	0	0	0	0	0	0	0	0	5	
07:15 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	
07:30 AM	0	4	0	0	0	4	0	0	0	0	0	0	0	0	4	
07:45 AM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	2	
Total	0	12	0	0	0	12	0	0	0	0	0	0	0	0	12	
08:00 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	
08:15 AM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	2	
08:30 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	
08:45 AM	0	3	0	0	0	3	0	0	0	0	0	0	0	0	3	
Total	0	7	0	0	0	7	0	0	0	0	0	0	0	0	7	
Grand Total	0	25	0	0	0	25	0	0	0	0	0	0	0	0	25	
Apprch %	0	100	0	0	0	100	0	0	0	0	0	0	0	0	100	
Total %	0	100	0	0	0	100	0	0	0	0	0	0	0	0	100	

Start Time	Southbound				Ala Moana Boulevard				Left = U-Turns Westbound				Northbound		Eastbound	
	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Northbound	App. Total	Eastbound	App. Total	Int. Total		
															App. Total	Int. Total
06:45 AM	0	2	0	0	0	2	0	0	0	0	0	0	0	0		
07:00 AM	0	5	0	0	0	5	0	0	0	0	0	0	0	0		
07:15 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0		
07:30 AM	0	4	0	0	0	4	0	0	0	0	0	0	0	0		
Total Volume	0	12	0	0	0	12	0	0	0	0	0	0	0	0		
% App. Total	.000	100	.000	.000	.000	.600	.000	.000	.000	.000	.000	.000	.000	.600		
PHF																

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 06:45 AM

# Wilson Okamoto Corporation

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

Counted By: JJ, RJ  
 Counters: D4-5675, D4-5676  
 Weather: Clear

File Name : WarAla PM  
 Site Code : 00000005  
 Start Date : 3/5/2015  
 Page No : 1

Start Time	Ward Avenue Southbound				Ala Moana Boulevard Westbound				Ward Avenue Northbound				Ala Moana Boulevard Eastbound								
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total					
03:00 PM	33	16	68	2	119	11	302	38	8	359	1	18	14	4	37	48	398	0	3	449	964
03:15 PM	42	15	73	4	134	8	294	32	16	350	2	17	15	7	41	62	362	0	6	430	955
03:30 PM	35	16	79	7	137	9	330	40	17	396	1	33	12	12	58	65	463	0	8	536	1127
03:45 PM	55	16	71	5	147	13	358	51	16	438	2	19	16	11	48	77	467	1	9	554	1187
<b>Total</b>	165	63	291	18	537	41	1284	161	57	1543	6	87	57	34	184	252	1690	1	26	1969	4233
04:00 PM	44	18	78	9	149	9	292	34	17	352	0	32	33	12	77	55	400	0	4	459	1037
04:15 PM	58	16	63	9	146	9	427	44	15	495	3	35	36	10	84	59	473	0	3	535	1260
04:30 PM	57	12	76	14	159	12	264	42	23	341	3	31	27	12	73	67	435	0	24	526	1099
04:45 PM	61	12	69	2	144	15	274	42	13	344	1	29	40	11	81	50	448	0	7	505	1074
<b>Total</b>	220	58	286	34	598	45	1257	162	68	1532	7	127	136	45	315	231	1756	0	38	2025	4470
05:00 PM	53	22	55	8	138	6	310	51	11	378	6	32	36	6	80	53	494	3	7	557	1153
05:15 PM	60	20	58	9	147	14	316	39	17	386	2	28	33	13	76	63	465	1	2	531	1140
05:30 PM	60	21	77	10	168	17	295	23	16	351	2	29	44	13	88	49	469	4	8	530	1137
05:45 PM	71	14	57	11	153	10	321	29	13	373	1	21	31	8	61	61	471	1	5	538	1125
<b>Total</b>	244	77	247	38	606	47	1242	142	57	1488	11	110	144	40	305	226	1899	9	22	2156	4555
<b>Grand Total</b>	629	198	824	90	1741	133	3783	465	182	4563	24	324	337	119	804	709	5345	10	86	6150	13258
Approach %	36.1	11.4	47.3	5.2		2.9	82.9	10.2	4		3	40.3	41.9	14.8		11.5	86.9	0.2	1.4		
Total %	4.7	1.5	6.2	0.7	13.1	1	28.5	3.5	1.4	34.4	0.2	2.4	2.5	0.9	6.1	5.3	40.3	0.1	0.6		46.4

Start Time	Ward Avenue Southbound				Ala Moana Boulevard Westbound				Ward Avenue Northbound				Ala Moana Boulevard Eastbound								
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total					
03:30 PM	35	16	79		130	9	330	40		379	1	33	12		46	65	463	0		528	1083
03:45 PM	55	16	71		142	13	358	51		422	2	19	16		37	77	467	1		545	1146
04:00 PM	44	18	78		140	9	292	34		335	0	32	33		65	55	400	0		455	995
04:15 PM	58	16	63		137	9	427	44		480	3	35	36		74	59	473	0		532	1223
Total Volume	192	66	291		549	40	1407	169		1616	6	119	97		222	256	1803	1		2060	4447
% App. Total	35	12	53		967	2.5	87.1	10.5		842	2.7	53.6	43.7		750	12.4	87.5	0		945	909
PHF	.828	.917	.921			.769	.824	.828		.842	.500	.850	.674		.750	.831	.953	.250		.945	.909

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Entire Intersection Begins at 03:30 PM

# Wilson Okamoto Corporation

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

Counted By: JJ, RJ  
Counters: D4-5675, D4-5676  
Weather: Clear

File Name : WarAla PM - U-Turns  
Site Code : 00000005  
Start Date : 3/5/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Southbound			Ala Moana Boulevard				Northbound			Eastbound		
	App. Total	Left	Thru	Left = U-Turns Westbound	Right	Peds	App. Total	App. Total	App. Total	App. Total	App. Total	Int. Total	
03:00 PM	0	1	0	0	0	0	1	0	0	0	0	1	
03:15 PM	0	1	0	0	0	0	1	0	0	0	0	1	
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	2	0	0	0	0	2	0	0	0	0	2	
04:00 PM	0	1	0	0	0	0	1	0	0	0	0	1	
04:15 PM	0	3	0	0	0	0	3	0	0	0	0	3	
04:30 PM	0	3	0	0	0	0	3	0	0	0	0	3	
04:45 PM	0	6	0	0	0	0	6	0	0	0	0	6	
Total	0	13	0	0	0	0	13	0	0	0	0	13	
05:00 PM	0	1	0	0	0	0	1	0	0	0	0	1	
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	1	0	0	0	0	1	0	0	0	0	1	
Grand Total	0	16	0	0	0	0	16	0	0	0	0	16	
Apprch %		100	0	0	0	0							
Total %		0	0	0	0	0	100	0	0	0	0	0	

Start Time	Southbound			Ala Moana Boulevard				Northbound			Eastbound		
	App. Total	Left	Thru	Left = U-Turns Westbound	Right	Peds	App. Total	App. Total	App. Total	App. Total	App. Total	Int. Total	
04:00 PM	0	1	0	0	0	0	1	0	0	0	0	1	
04:15 PM	0	3	0	0	0	0	3	0	0	0	0	3	
04:30 PM	0	3	0	0	0	0	3	0	0	0	0	3	
04:45 PM	0	6	0	0	0	0	6	0	0	0	0	6	
Total Volume	0	13	0	0	0	0	13	0	0	0	0	13	
% App. Total		100	0	0	0	0							
PHF	.000	.542	.000	.000	.000	.000	.542	.000	.000	.000	.000	.542	

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



# Wilson Okamoto Corporation

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

Counted By: PA  
Counters: D4-5677  
Weather: Clear

File Name : Kewalo Basin Driveways West and East AM  
Site Code : 00000004  
Start Date : 3/10/2015  
Page No : 1

Start Time	Groups Printed- Unshifted																				
	Southbound						Westbound						Ala Moana Boulevard Right = RT Into Kewalo Basin Driveway (West)								
	App. Total	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	0	0	0	0	0	0	2	0	0	2	0	0	3	0	0	0	0	0	0	3	5
06:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3	3
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5	5	5
06:45 AM	0	0	1	0	1	0	1	0	0	1	0	0	6	0	0	0	0	0	6	6	7
Total	0	0	3	0	3	0	3	0	0	3	0	0	17	0	0	0	0	0	17	17	20
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8	8	8
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1
07:30 AM	0	0	1	0	1	0	1	0	0	1	0	0	9	0	0	0	0	0	9	9	10
07:45 AM	0	0	1	0	1	0	1	0	0	1	0	0	9	0	0	0	0	0	9	9	10
Total	0	0	2	0	2	0	2	0	0	2	0	0	27	0	0	0	0	0	27	27	29
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5	5	5
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	16	16	16
08:30 AM	0	0	2	0	2	0	2	0	0	2	0	0	4	0	0	0	0	0	4	4	6
08:45 AM	0	0	2	0	2	0	2	0	0	2	0	0	11	0	0	0	0	0	11	11	11
Total	0	0	2	0	2	0	2	0	0	2	0	0	36	0	0	0	0	0	36	36	38
Grand Total	0	0	7	0	7	0	7	0	0	7	0	0	80	0	0	0	0	0	80	80	87
Apprch %	0	0	100	0	0	0	100	0	0	0	0	0	100	0	0	0	0	0	100	0	0
Total %	0	0	8	0	8	0	8	0	0	8	0	0	92	0	0	0	0	0	92	92	92

Start Time	Kewalo Basin Driveway (East)												Ala Moana Boulevard Right = RT Into Kewalo Basin Driveway (West)													
	Southbound						Westbound						Kewalo Basin Driveway (East)						Ala Moana Boulevard							
	App. Total	Thru	Right	Peds	App. Total	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
07:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	9	10
07:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	9	10	
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	16	
Total Volume	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	0	39	41	
% App. Total	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.500	.000	.000	.609	.609	.641	
PHF																										

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

# Wilson Okamoto Corporation

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

Counted By: PA  
Counters: D4-5677  
Weather: Clear

File Name : Kewalo Basin Driveways West and East PM  
Site Code : 00000004  
Start Date : 3/10/2015  
Page No : 1

Start Time	Groups Printed- Unshifted															
	Southbound					Kewalo Basin Driveway (East)					Ala Moana Boulevard					
	App. Total	Westbound	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Eastbound	Peds	App. Total	Right	Int. Total
03:00 PM	0	0	0	0	0	3	0	3	0	0	0	0	0	18	0	21
03:15 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	8	0	10
03:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	17	0	19
03:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	18	0	19
Total	0	0	0	0	0	8	0	8	0	0	0	0	0	61	0	69
04:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	13	0	14
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8
04:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	22	0	23
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8
Total	0	0	0	0	0	2	0	2	0	0	0	0	0	51	0	53
05:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	8	0	9
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	11
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	11
05:45 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	10	0	12
Total	0	0	0	0	0	3	0	3	0	0	0	0	0	40	0	43
Grand Total	0	0	0	0	0	13	0	13	0	0	0	0	0	152	0	165
Approch %	0	0	0	0	0	100	0	0	0	0	0	0	0	100	0	0
Total %	0	0	0	0	0	7.9	0	7.9	0	0	0	0	0	92.1	0	92.1

Start Time	Ala Moana Boulevard															
	Kewalo Basin Driveway (East)					Kewalo Basin Driveway (West)										
	App. Total	Westbound	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	Eastbound	Peds	App. Total	Right	Int. Total	
03:00 PM	0	0	0	0	0	3	0	3	0	0	0	0	0	18	0	21
03:15 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	8	0	10
03:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	17	0	19
03:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	18	0	19
Total	0	0	0	0	0	8	0	8	0	0	0	0	0	61	0	69
04:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	13	0	14
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8
04:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	22	0	23
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8
Total	0	0	0	0	0	2	0	2	0	0	0	0	0	51	0	53
05:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	8	0	9
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	11
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	11
05:45 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	10	0	12
Total	0	0	0	0	0	3	0	3	0	0	0	0	0	40	0	43
Grand Total	0	0	0	0	0	13	0	13	0	0	0	0	0	152	0	165
Approch %	0	0	0	0	0	100	0	0	0	0	0	0	0	100	0	0
Total %	0	0	0	0	0	7.9	0	7.9	0	0	0	0	0	92.1	0	92.1

Start Time	Kewalo Basin Driveway (East)					Ala Moana Boulevard										
	App. Total	Westbound	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	Eastbound	Peds	App. Total	Right	Int. Total	
03:00 PM	0	0	0	0	0	3	0	3	0	0	0	0	0	18	0	21
03:15 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	8	0	10
03:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	17	0	19
03:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	18	0	19
Total	0	0	0	0	0	8	0	8	0	0	0	0	0	61	0	69
% App. Total	.000	.000	.000	.000	.000	.667	.000	.667	.000	.000	.000	.000	.000	.847	.000	.821
PHF																

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

# Wilson Okamoto Corporation

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

Counted By: DY, JC  
Counters: TU-0654, TU-0653  
Weather: Clear

File Name : Kewalo Basin Entrance AM  
Site Code : 00000000  
Start Date : 3/10/2015  
Page No : 1

Start Time	Groups Printed- Unshifted																									
	Southbound			Ala Moana Boulevard Westbound			Kewalo Basin Entrance Northbound			Ala Moana Boulevard Eastbound																
	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	Int. Total
06:00 AM	0	0	173	0	0	173	2	0	3	2	7	0	200	10	0	210	0	200	10	0	210	0	200	10	0	390
06:15 AM	0	0	227	0	0	227	2	0	1	1	4	0	270	9	0	279	0	270	9	0	279	0	270	9	0	510
06:30 AM	0	0	282	0	0	282	3	0	3	3	9	0	290	12	0	302	0	290	12	0	302	0	290	12	0	593
06:45 AM	0	0	336	0	0	336	2	0	3	7	12	0	403	10	3	416	0	403	10	3	416	0	403	10	3	764
Total	0	0	1018	0	0	1018	9	0	10	13	32	0	1163	41	3	1207	0	1163	41	3	1207	0	1163	41	3	2257
07:00 AM	0	0	405	0	0	405	10	0	4	6	20	0	390	5	1	396	0	390	5	1	396	0	390	5	1	821
07:15 AM	0	0	457	0	0	457	5	0	5	10	20	0	378	2	0	380	0	378	2	0	380	0	378	2	0	857
07:30 AM	0	0	436	0	0	436	5	0	5	7	17	0	391	4	0	395	0	391	4	0	395	0	391	4	0	848
07:45 AM	0	0	387	0	0	387	5	1	6	12	24	0	375	8	0	383	0	375	8	0	383	0	375	8	0	794
Total	0	0	1685	0	0	1685	25	1	20	35	81	0	1534	19	1	1554	0	1534	19	1	1554	0	1534	19	1	3320
08:00 AM	0	0	447	0	0	447	4	0	4	6	14	0	371	4	0	375	0	371	4	0	375	0	371	4	0	836
08:15 AM	0	0	411	0	0	411	7	0	4	12	23	0	349	4	0	353	0	349	4	0	353	0	349	4	0	787
08:30 AM	0	0	389	0	0	389	4	0	7	6	17	0	350	4	1	355	0	350	4	1	355	0	350	4	1	762
08:45 AM	0	0	304	0	0	304	6	0	4	5	15	0	326	12	1	339	0	326	12	1	339	0	326	12	1	658
Total	0	0	1551	0	0	1552	21	0	19	29	69	0	1396	24	2	1422	0	1396	24	2	1422	0	1396	24	2	3043
Grand Total	0	1	4254	0	0	4255	55	1	49	77	182	0	4093	84	6	4183	0	4093	84	6	4183	0	4093	84	6	8620
Approach % Total	0	0	100	0	0	49.4	30.2	0.5	26.9	42.3	2.1	0	97.8	2	0.1	48.5	0	97.8	2	0.1	48.5	0	97.8	2	0.1	
			49.4	0	0	49.4	0.6	0	0.6	0.9	2.1	0	47.5	1	0.1	48.5	0	47.5	1	0.1	48.5	0	47.5	1	0.1	

Start Time	Ala Moana Boulevard Westbound												Kewalo Basin Entrance Northbound			Ala Moana Boulevard Eastbound										
	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	Int. Total
	07:15 AM	0	0	457	0	0	457	5	0	5	5	10	0	378	2	0	380	0	378	2	0	380	0	378	2	0
07:30 AM	0	0	436	0	0	436	5	0	5	5	10	0	391	4	4	395	0	391	4	4	395	0	391	4	4	841
07:45 AM	0	0	387	0	0	387	5	1	6	6	12	0	375	4	8	383	0	375	4	8	383	0	375	4	8	782
08:00 AM	0	0	447	0	0	447	4	0	4	4	8	0	371	4	4	375	0	371	4	4	375	0	371	4	4	830
Total Volume	0	0	1727	0	0	1727	19	1	20	20	40	0	1515	18	18	1533	0	1515	18	18	1533	0	1515	18	18	3300
% App. Total PHF	.000	.000	.945	.000	.000	.945	.950	2.5	.50	.833	.833	.000	.969	.563	.970	.970	.000	.969	.563	.970	.970	.000	.969	.563	.970	.974

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

# Wilson Okamoto Corporation

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

Counted By: DY, CY  
Counters: TU-0653, TU-0654  
Weather: Clear

File Name : Kewalo Basin Entrance PM  
Site Code : 00000002  
Start Date : 3/10/2015  
Page No : 1

Start Time	Southbound			Ala Moana Boulevard Westbound			Kewalo Basin Driveway Northbound			Ala Moana Boulevard Eastbound																
	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	Int. Total
03:00 PM	0	0	368	0	0	368	8	0	8	8	24	0	400	7	0	407	0	400	7	0	407	0	400	7	0	799
03:15 PM	0	0	316	0	0	316	9	0	15	9	33	0	387	6	2	395	0	387	6	2	395	0	387	6	2	744
03:30 PM	0	0	427	0	0	427	20	0	13	4	37	0	477	7	1	485	0	477	7	1	485	0	477	7	1	949
03:45 PM	0	0	398	0	0	398	10	0	11	3	24	0	460	6	1	467	0	460	6	1	467	0	460	6	1	889
Total	0	0	1509	0	0	1509	47	0	47	24	118	0	1724	26	4	1754	0	1724	26	4	1754	0	1724	26	4	3381
04:00 PM	0	0	359	0	0	359	20	0	10	5	35	0	518	12	1	531	0	518	12	1	531	0	518	12	1	925
04:15 PM	0	0	402	0	0	402	7	0	20	6	33	0	551	5	2	558	0	551	5	2	558	0	551	5	2	993
04:30 PM	0	0	342	0	0	342	1	0	6	1	8	0	511	7	0	518	0	511	7	0	518	0	511	7	0	868
04:45 PM	0	0	348	0	0	348	5	0	9	4	18	0	546	5	0	551	0	546	5	0	551	0	546	5	0	917
Total	0	0	1451	0	0	1451	33	0	45	16	94	0	2126	29	3	2158	0	2126	29	3	2158	0	2126	29	3	3703
05:00 PM	0	0	304	0	0	304	5	0	8	18	31	0	536	8	0	544	0	536	8	0	544	0	536	8	0	879
05:15 PM	0	0	368	0	0	368	5	0	15	15	35	0	515	7	0	522	0	515	7	0	522	0	515	7	0	925
05:30 PM	0	0	340	0	0	340	5	0	10	22	37	0	555	6	0	561	0	555	6	0	561	0	555	6	0	938
05:45 PM	0	0	310	0	0	310	7	0	10	17	34	0	514	6	0	520	0	514	6	0	520	0	514	6	0	864
Total	0	0	1322	0	0	1322	22	0	43	72	137	0	2120	27	0	2147	0	2120	27	0	2147	0	2120	27	0	3606
Grand Total	0	0	4282	0	0	4282	102	0	135	112	349	0	5970	82	7	6059	0	5970	82	7	6059	0	5970	82	7	10690
Approch %	0	0	100	0	0	100	29.2	0	38.7	32.1	3.3	0	98.5	1.4	0.1	56.7	0	98.5	1.4	0.1	56.7	0	98.5	1.4	0.1	
Total %	0	0	40.1	0	0	40.1	1	0	1.3	1	3.3	0	55.8	0.8	0.1	56.7	0	55.8	0.8	0.1	56.7	0	55.8	0.8	0.1	

Start Time	Southbound			Ala Moana Boulevard Westbound			Kewalo Basin Driveway Northbound			Ala Moana Boulevard Eastbound																
	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	Int. Total
03:30 PM	0	0	427	0	0	427	20	0	13	13	33	0	477	7	0	484	0	477	7	0	484	0	477	7	0	944
03:45 PM	0	0	398	0	0	398	10	0	11	11	21	0	460	6	0	466	0	460	6	0	466	0	460	6	0	885
04:00 PM	0	0	359	0	0	359	20	0	10	10	30	0	518	12	0	530	0	518	12	0	530	0	518	12	0	919
04:15 PM	0	0	402	0	0	402	7	0	20	20	27	0	551	5	0	556	0	551	5	0	556	0	551	5	0	985
Total Volume	0	0	1586	0	0	1586	57	0	54	54	111	0	2006	30	0	2036	0	2006	30	0	2036	0	2006	30	0	3733
% App. Total	.000	.000	.929	.000	.000	.929	.713	.000	.675	.841	.841	.000	.915	.625	.915	.915	.000	.915	.625	.915	.915	.000	.915	.625	.915	.947

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Entire Intersection Begins at 03:30 PM

# Wilson Okamoto Corporation

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

Counted By: KC, CC  
Counters: TU-0650, TU-0651  
Weather: Clear

File Name : AlaKam AM  
Site Code : 00000002  
Start Date : 4/13/2016  
Page No : 1

## Groups Printed- Unshifted

Start Time	Kamakee Street Southbound				Ala Moana Boulevard Westbound				Kamakee Street Northbound				Ala Moana Boulevard Eastbound								
	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	4	12	32	52	1	167	4	40	212	0	0	1	14	15	13	256	25	0	294	573
06:15 AM	3	11	15	38	67	0	215	6	55	276	3	2	0	32	37	22	267	18	0	307	687
06:30 AM	10	3	16	34	63	0	293	8	41	342	4	3	2	16	25	17	298	16	0	331	761
06:45 AM	3	6	29	16	54	4	310	12	19	345	8	6	0	5	19	17	331	15	0	363	781
Total	20	24	72	120	236	5	985	30	155	1175	15	11	3	67	96	69	1152	74	0	1295	2802
07:00 AM	5	1	25	12	43	2	373	7	13	395	10	2	1	4	17	16	356	21	0	393	848
07:15 AM	3	6	20	7	36	3	429	7	14	453	18	4	3	3	28	17	345	15	0	377	894
07:30 AM	3	7	40	4	54	1	386	11	11	409	12	5	2	5	24	15	364	20	0	399	886
07:45 AM	2	10	31	6	49	9	430	13	12	464	9	8	1	6	24	18	330	20	0	368	905
Total	13	24	116	29	182	15	1618	38	50	1721	49	19	7	18	93	66	1395	76	0	1537	3533
08:00 AM	1	5	29	4	39	2	399	31	15	447	8	9	1	7	25	17	358	21	0	396	907
08:15 AM	2	8	30	3	43	2	369	12	10	393	14	8	4	7	33	19	347	31	0	397	866
08:30 AM	1	6	29	8	44	2	266	15	9	292	20	10	5	7	42	19	269	23	0	311	689
08:45 AM	3	5	21	8	37	0	293	11	7	311	16	3	4	4	27	17	306	25	0	348	723
Total	7	24	109	23	163	6	1327	69	41	1443	58	30	14	25	127	72	1280	100	0	1452	3185
Grand Total	40	72	297	172	581	26	3930	137	246	4339	122	60	24	110	316	207	3827	250	0	4284	9520
Approch %	6.9	12.4	51.1	29.6		0.6	90.6	3.2	5.7		38.6	19	7.6	34.8		4.8	89.3	5.8	0		
Total %	0.4	0.8	3.1	1.8	6.1	0.3	41.3	1.4	2.6	45.6	1.3	0.6	0.3	1.2	3.3	2.2	40.2	2.6	0	45	

Start Time	Kamakee Street Southbound				Ala Moana Boulevard Westbound				Kamakee Street Northbound				Ala Moana Boulevard Eastbound								
	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
07:15 AM	3	6	20	29	58	3	429	7	7	439	18	4	3	25	17	345	15	0	377	870	
07:30 AM	3	7	40	50	100	1	386	11	11	398	12	5	2	19	15	364	20	0	399	866	
07:45 AM	2	10	31	43	86	9	430	13	13	452	9	8	1	18	18	330	20	0	368	881	
08:00 AM	1	5	29	35	70	2	399	31	31	432	8	9	1	18	17	358	21	0	396	881	
Total Volume	9	28	120	157	314	15	1644	62	62	1721	47	26	7	80	67	1397	76	0	1540	3498	
% App. Total	5.7	17.8	76.4	76.4		0.9	95.5	3.6	3.6		58.8	32.5	8.8		4.4	90.7	4.9	0			
PHF	.750	.700	.750	.785		.417	.956	.500	.500	.952	.653	.722	.583	.800	.931	.959	.905			.965	.993

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

# Wilson Okamoto Corporation

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

Counted By:CC, KC  
Counters:TU-0650, TU-0651  
Weather:Clear

File Name : AlaKam PM  
Site Code : 00000002  
Start Date : 4/13/2016  
Page No : 1

## Groups Printed- Unshifted

Start Time	Kamakee Street Southbound						Ala Moana Boulevard Westbound						Ala Moana Park Drive Northbound						Ala Moana Boulevard Eastbound						
	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	4	6	36	21	67		4	321	15	29	369		16	5	7	15	43		19	340	20	0	379	
03:15 PM	3	11	32	31	77		5	372	21	18	416		10	2	4	13	29		6	440	19	0	465		987
03:30 PM	12	7	43	42	104		4	355	18	61	438		13	5	2	46	66		21	418	37	0	476		1084
03:45 PM	11	18	40	15	84		2	375	17	12	406		26	13	3	5	47		25	408	29	0	462		999
Total	30	42	151	109	332		15	1423	71	120	1629		65	25	16	79	185		71	1606	105	0	1782		3928
04:00 PM	11	23	32	9	75		4	318	21	25	368		13	14	6	11	44		15	524	35	0	574		1061
04:15 PM	8	9	34	11	62		3	376	21	13	413		12	11	3	7	33		15	487	36	0	538		1046
04:30 PM	11	7	27	7	52		9	337	16	11	373		21	18	4	12	55		17	399	28	0	444		924
04:45 PM	14	14	26	11	65		5	314	20	16	355		28	6	4	17	55		14	439	25	0	478		953
Total	44	53	119	38	254		21	1345	78	65	1509		74	49	17	47	187		61	1849	124	0	2034		3984
05:00 PM	17	12	35	12	76		5	287	15	12	319		18	10	11	14	53		17	446	34	0	497		945
05:15 PM	15	16	37	14	82		5	311	38	9	363		16	9	8	10	43		19	444	40	0	503		991
05:30 PM	12	9	37	8	66		3	284	20	24	331		7	11	10	23	51		17	406	27	0	450		898
05:45 PM	9	7	33	13	62		4	298	20	14	336		17	8	6	8	39		14	472	28	0	514		951
Total	53	44	142	47	286		17	1180	93	59	1349		58	38	35	55	186		67	1768	129	0	1964		3785
Grand Total	127	139	412	194	872		53	3948	242	244	4487		197	112	68	181	558		199	5223	358	0	5780		11697
Apprch %	14.6	15.9	47.2	22.2			1.2	88	5.4	5.4		35.3	20.1	12.2	32.4			3.4	90.4	6.2	0				
Total %	1.1	1.2	3.5	1.7	7.5		0.5	33.8	2.1	2.1	38.4		1.7	1	0.6	1.5	4.8		1.7	44.7	3.1	0	49.4		

Start Time	Kamakee Street Southbound						Ala Moana Boulevard Westbound						Ala Moana Park Drive Northbound						Ala Moana Boulevard Eastbound						
	Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		
	03:30 PM	12	7	43		62		4	355	18		377		13	5	2		20		21	418	37		476	
03:45 PM	11	18	40		69		2	375	17		394		26	13	3		42		25	408	29		462		967
04:00 PM	11	23	32		66		4	318	21		343		13	14	6		33		15	524	35		574		1016
04:15 PM	8	9	34		51		3	376	21		400		12	11	3		26		15	487	36		538		1015
Total Volume	42	57	149		248		13	1424	77		1514		64	43	14		121		76	1837	137		2050		3933
% App. Total	16.9	23	60.1				0.9	94.1	5.1				52.9	35.5	11.6		.720		3.7	89.6	6.7		.893		.968
PHF	.875	.620	.866		.899		.813	.947	.917		.946		.615	.768	.583		.720		.760	.876	.926		.893		.968

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Entire Intersection Begins at 03:30 PM

# Wilson Okamoto Corporation

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

Counted By: GC, KW  
 Counters: D4-5675, D4-5676  
 Weather: Clear

File Name : AlaKam AM  
 Site Code : 00000001  
 Start Date : 3/10/2015  
 Page No : 1

Start Time	Kamakee Street Southbound				Ala Moana Boulevard Westbound				Ala Moana Boulevard Eastbound				Ala Moana Park Drive Northbound				Ala Moana Boulevard Eastbound									
	Left	Thru	Right	Peds	App. Total	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	3	9	1	15	2	160	4	8	174	4	0	1	4	9	7	175	24	0	206	7	175	24	0	206	404
06:15 AM	4	8	4	20	36	1	215	3	23	242	3	1	2	3	9	6	241	25	0	272	6	241	25	0	272	559
06:30 AM	3	8	11	12	34	3	267	5	20	295	3	4	1	7	15	42	231	23	0	296	42	231	23	0	296	640
06:45 AM	3	6	12	14	35	1	309	5	21	336	9	4	2	2	17	9	371	15	0	395	9	371	15	0	395	783
Total	12	25	36	47	120	7	951	17	72	1047	19	9	6	16	50	64	1018	87	0	1169	64	1018	87	0	1169	2386
07:00 AM	4	6	12	4	26	2	377	4	12	395	13	4	0	4	21	16	361	19	0	396	16	361	19	0	396	838
07:15 AM	1	6	17	3	27	3	423	12	13	451	15	5	5	9	34	11	363	13	0	387	11	363	13	0	387	899
07:30 AM	7	12	19	3	41	5	411	13	12	441	5	8	2	10	25	17	369	15	0	401	17	369	15	0	401	908
07:45 AM	2	8	15	10	35	2	382	13	17	414	11	8	5	17	41	14	346	16	0	376	14	346	16	0	376	866
Total	14	32	63	20	129	12	1593	42	54	1701	44	25	12	40	121	58	1439	63	0	1560	58	1439	63	0	1560	3511
08:00 AM	3	8	29	4	44	3	420	11	12	446	11	6	1	7	25	11	345	26	0	382	11	345	26	0	382	897
08:15 AM	4	7	15	4	30	3	367	13	11	394	19	5	3	6	33	19	321	17	0	357	19	321	17	0	357	814
08:30 AM	10	4	17	0	31	5	333	5	16	359	22	4	1	10	37	13	329	14	0	356	13	329	14	0	356	783
08:45 AM	5	16	15	2	38	4	281	10	7	302	13	6	5	9	33	14	300	19	0	333	14	300	19	0	333	706
Total	22	35	76	10	143	15	1401	39	46	1501	65	21	10	32	128	57	1295	76	0	1428	57	1295	76	0	1428	3200
Grand Total	48	92	175	77	392	34	3945	98	172	4249	128	55	28	88	299	179	3752	226	0	4157	179	3752	226	0	4157	9097
Approch %	12.2	23.5	44.6	19.6	4.3	0.8	92.8	2.3	4	42.8	18.4	9.4	29.4	3.3	4.3	90.3	5.4	0	45.7	4.3	90.3	5.4	0	45.7		
Total %	0.5	1	1.9	0.8		0.4	43.4	1.1	1.9	46.7	1.4	0.6	0.3	1	3.3	2	41.2	2.5	0		2	41.2	2.5	0		

Start Time	Kamakee Street Southbound				Ala Moana Boulevard Westbound				Ala Moana Boulevard Eastbound				Ala Moana Park Drive Northbound				Ala Moana Boulevard Eastbound									
	Left	Thru	Right	Peds	App. Total	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
07:15 AM	1	6	17	17	24	3	423	12	12	438	15	5	5	5	25	11	363	13	0	387	11	363	13	0	387	874
07:30 AM	7	12	19	19	38	5	411	13	13	429	5	8	2	2	15	17	369	15	0	401	17	369	15	0	401	883
07:45 AM	2	8	15	15	25	2	382	13	13	397	11	8	5	5	24	14	346	16	0	376	14	346	16	0	376	822
08:00 AM	3	8	29	29	40	3	420	11	11	434	11	6	1	1	18	11	345	26	0	382	11	345	26	0	382	874
Total Volume	13	34	80	80	127	13	1636	49	49	1698	42	27	13	13	82	53	1423	70	0	1546	53	1423	70	0	1546	3453
% App. Total	10.2	26.8	63	63	79.4	0.8	96.3	2.9	2.9	96.9	51.2	32.9	15.9	15.9	82.0	3.4	92	4.5	0	96.4	3.4	92	4.5	0	96.4	978
PHF	.464	.708	.690	.690		.650	.967	.942	.942	.969	.700	.844	.650	.650	.820	.779	.964	.673			.779	.964	.673			

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

# Wilson Okamoto Corporation

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

Counted By: GC, KW  
Counters: D4-5675, D4-5676  
Weather: Clear

File Name : AlaKam PM  
Site Code : 00000001  
Start Date : 3/10/2015  
Page No : 1

Start Time	Kamakee Street Southbound				Ala Moana Boulevard Westbound				Ala Moana Boulevard Northbound				Ala Moana Boulevard Eastbound				Int. Total				
	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	7	6	6	7	26	4	340	12	19	375	18	6	4	13	41	9	379	18	0	406	848
03:15 PM	12	23	30	6	71	3	269	16	28	316	16	13	7	5	41	16	364	22	0	402	830
03:30 PM	13	8	30	27	78	2	365	19	37	423	29	14	6	13	62	16	453	17	0	486	1049
03:45 PM	8	19	21	15	63	6	367	28	28	429	9	6	7	7	29	22	413	32	0	467	988
<b>Total</b>	<b>40</b>	<b>56</b>	<b>87</b>	<b>55</b>	<b>238</b>	<b>15</b>	<b>1341</b>	<b>75</b>	<b>112</b>	<b>1543</b>	<b>72</b>	<b>39</b>	<b>24</b>	<b>38</b>	<b>173</b>	<b>63</b>	<b>1609</b>	<b>89</b>	<b>0</b>	<b>1761</b>	<b>3715</b>
04:00 PM	10	21	28	7	66	1	307	16	30	354	13	9	7	10	39	23	465	34	0	522	981
04:15 PM	15	11	15	1	42	8	364	22	27	421	17	7	7	10	41	12	506	48	0	566	1070
04:30 PM	13	11	17	10	51	1	316	11	23	351	22	7	3	5	37	22	457	37	0	516	955
04:45 PM	19	21	36	3	79	4	313	24	20	361	12	13	5	5	35	13	494	50	0	557	1032
<b>Total</b>	<b>57</b>	<b>64</b>	<b>96</b>	<b>21</b>	<b>238</b>	<b>14</b>	<b>1300</b>	<b>73</b>	<b>100</b>	<b>1487</b>	<b>64</b>	<b>36</b>	<b>22</b>	<b>30</b>	<b>152</b>	<b>70</b>	<b>1922</b>	<b>169</b>	<b>0</b>	<b>2161</b>	<b>4038</b>
05:00 PM	11	18	19	3	51	8	270	26	26	330	11	10	11	22	54	14	478	49	0	541	976
05:15 PM	16	18	39	6	79	6	317	18	20	361	14	12	9	17	52	16	467	44	0	527	1019
05:30 PM	13	27	32	29	101	5	277	29	38	349	33	19	3	22	77	21	495	47	0	563	1090
05:45 PM	16	20	22	12	70	6	260	16	16	298	25	11	9	21	66	24	448	51	0	523	957
<b>Total</b>	<b>56</b>	<b>83</b>	<b>112</b>	<b>50</b>	<b>301</b>	<b>25</b>	<b>1124</b>	<b>89</b>	<b>100</b>	<b>1338</b>	<b>83</b>	<b>52</b>	<b>32</b>	<b>82</b>	<b>249</b>	<b>75</b>	<b>1888</b>	<b>191</b>	<b>0</b>	<b>2154</b>	<b>4042</b>
<b>Grand Total</b>	<b>153</b>	<b>203</b>	<b>295</b>	<b>126</b>	<b>777</b>	<b>54</b>	<b>3765</b>	<b>237</b>	<b>312</b>	<b>4368</b>	<b>219</b>	<b>127</b>	<b>78</b>	<b>150</b>	<b>574</b>	<b>208</b>	<b>5419</b>	<b>449</b>	<b>0</b>	<b>6076</b>	<b>11795</b>
Apprch %	19.7	26.1	38	16.2	19.7	1.2	86.2	5.4	7.1	38.2	38.2	22.1	13.6	26.1	3.4	89.2	7.4	0	0	60.76	117.95
Total %	1.3	1.7	2.5	1.1	6.6	0.5	31.9	2	2.6	37	1.9	1.1	0.7	1.3	4.9	1.8	45.9	3.8	0	51.5	100

Start Time	Kamakee Street Southbound				Ala Moana Boulevard Westbound				Ala Moana Boulevard Northbound				Ala Moana Boulevard Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
04:45 PM	19	21	36	36	76	4	313	24	24	341	12	13	5	5	30	13	494	50	0	557	1004
05:00 PM	11	18	19	19	48	8	270	26	26	304	11	10	11	11	32	14	478	49	0	541	925
05:15 PM	16	18	39	39	73	6	317	18	18	341	14	12	9	9	35	16	467	44	0	527	976
05:30 PM	13	27	32	32	72	5	277	29	29	311	33	19	3	3	55	21	495	47	0	563	1001
Total Volume	59	84	126	126	269	23	1177	97	97	1297	70	54	28	28	152	64	1934	190	0	2188	3906
% App. Total	21.9	31.2	46.8	46.8	88.5	1.8	90.7	7.5	7.5	95.1	46.1	35.5	18.4	18.4	69.1	2.9	88.4	8.7	0	97.2	97.3
PHF	.776	.778	.808	.808	.885	.719	.928	.836	.836	.951	.530	.711	.636	.636	.691	.762	.977	.950	0	.972	.973

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



# Wilson Okamoto Corporation

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

Counted By: RJ, JJ  
Counters: D4-5671, D4-5674  
Weather: Clear

File Name : QueAla AM  
Site Code : 00000003  
Start Date : 3/10/2015  
Page No : 1

Start Time	Queen Street Southbound						Ala Moana Boulevard Westbound						Ala Moana Boulevard Eastbound					
	Left		Right		Peds		Left		Right		Peds		Left		Right		Peds	
	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total
06:00 AM	3	7	0	177	0	0	168	9	0	0	0	3	176	0	3	182	366	
06:15 AM	3	7	0	236	0	0	224	12	0	0	0	1	263	0	7	271	514	
06:30 AM	3	12	0	284	0	0	272	12	0	0	0	0	237	0	4	241	537	
06:45 AM	6	12	0	331	0	0	315	16	0	0	0	1	355	0	7	363	706	
Total	15	38	0	1028	0	0	979	49	0	0	0	5	1031	0	21	1057	2123	
07:00 AM	10	15	0	395	0	0	374	21	0	0	0	3	359	0	7	369	779	
07:15 AM	7	16	0	477	0	0	442	35	0	0	0	3	372	0	9	384	877	
07:30 AM	8	20	0	461	0	0	432	29	0	0	0	4	378	0	14	396	877	
07:45 AM	10	19	0	429	0	0	395	34	0	0	0	5	347	0	14	366	814	
Total	35	70	0	1762	0	0	1643	119	0	0	0	15	1456	0	44	1515	3347	
08:00 AM	18	32	0	460	0	0	425	35	0	0	0	3	349	0	10	362	854	
08:15 AM	10	34	0	405	0	0	375	30	0	0	0	2	334	0	14	350	789	
08:30 AM	12	27	0	363	0	0	331	32	0	0	0	5	329	0	9	343	733	
08:45 AM	19	30	0	344	0	0	312	32	0	0	0	6	318	0	2	326	700	
Total	59	123	0	1572	0	0	1443	129	0	0	0	16	1330	0	35	1381	3076	
Grand Total	109	231	0	4362	0	0	4065	297	0	0	0	36	3817	0	100	3953	8546	
Approch %	47.2	31.6	0	93.2	0	0	93.2	6.8	0	0	0	0.9	96.6	0	2.5	96.6		
Total %	1.3	2.7	0	47.6	0	0	47.6	3.5	0	0	0	0.4	44.7	0	1.2	46.3		

Start Time	Queen Street Southbound						Ala Moana Boulevard Westbound						Ala Moana Boulevard Eastbound					
	Left		Right		Peds		Left		Right		Peds		Left		Right		Peds	
	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total
07:15 AM	7	10	0	477	0	0	442	35	0	0	0	3	372	0	0	375	862	
07:30 AM	8	11	0	461	0	0	432	29	0	0	0	4	378	0	0	382	854	
07:45 AM	10	17	0	429	0	0	395	34	0	0	0	5	347	0	0	352	798	
08:00 AM	18	24	0	460	0	0	425	35	0	0	0	3	349	0	0	352	836	
Total Volume	43	62	0	1827	0	0	1694	133	0	0	0	15	1446	0	0	1461	3350	
% App. Total	69.4	7.3	0	92.7	0	0	92.7	7.3	0	0	0	1	99	0	0	99		
PHF	.597	.646	0	.958	0	0	.958	.950	0	0	0	.750	.956	.000	0	.956	.972	

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

# Wilson Okamoto Corporation

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

Counted By: RJ, JJ  
Counters: D4-5671, D4-5674  
Weather: Clear

File Name : QueAla PM  
Site Code : 00000003  
Start Date : 3/10/2015  
Page No : 1

Start Time	Queen Street Southbound						Ala Moana Boulevard Westbound						Ala Moana Boulevard Eastbound								
	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
	Northbound						Northbound						Northbound								
03:00 PM	47	0	20	17	84	0	308	39	0	347	0	378	0	8	393	7	378	0	8	393	824
03:15 PM	31	0	9	14	54	0	294	38	0	332	0	384	0	23	411	4	384	0	23	411	797
03:30 PM	37	0	11	20	68	0	377	47	0	424	0	462	0	10	485	13	462	0	10	485	977
03:45 PM	46	0	19	4	69	0	366	40	0	406	0	418	0	9	438	11	418	0	9	438	913
Total	161	0	59	55	275	0	1345	164	0	1509	0	1642	0	50	1727	35	1642	0	50	1727	3511
04:00 PM	32	0	6	14	52	0	379	46	0	425	0	497	0	18	523	8	497	0	18	523	1000
04:15 PM	40	0	8	9	57	0	339	48	0	387	0	495	0	14	515	6	495	0	14	515	959
04:30 PM	41	0	6	13	60	0	313	47	0	360	0	466	0	13	483	4	466	0	13	483	903
04:45 PM	29	0	13	12	54	0	360	49	0	409	0	524	0	17	549	8	524	0	17	549	1012
Total	142	0	33	48	223	0	1391	190	0	1581	0	1982	0	62	2070	26	1982	0	62	2070	3874
05:00 PM	45	0	8	6	59	0	275	40	0	315	0	465	0	17	491	9	465	0	17	491	865
05:15 PM	67	0	12	13	92	0	334	56	0	390	0	497	0	21	526	8	497	0	21	526	1008
05:30 PM	43	0	16	21	80	0	316	71	0	387	0	522	0	12	537	3	522	0	12	537	1004
05:45 PM	42	0	4	33	79	0	261	39	0	300	0	459	0	52	521	10	459	0	52	521	900
Total	197	0	40	73	310	0	1186	206	0	1392	0	1943	0	102	2075	30	1943	0	102	2075	3777
Grand Total	500	0	132	176	808	0	3922	560	0	4482	0	5567	0	214	5872	91	5567	0	214	5872	11162
Approch %	61.9	0	16.3	21.8	7.2	0	87.5	12.5	0	40.2	0	94.8	0	3.6	52.6	1.5	94.8	0	3.6	52.6	
Total %	4.5	0	1.2	1.6	0	0	35.1	5	0	0	0	49.9	0	1.9	0	0.8	49.9	0	1.9	0	

Start Time	Queen Street Southbound						Ala Moana Boulevard Westbound						Ala Moana Boulevard Eastbound								
	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
	Northbound						Northbound						Northbound								
04:45 PM	29	0	0	13	42	0	360	49	0	409	0	524	0	8	532	8	524	0	8	532	983
05:00 PM	45	0	0	8	53	0	275	40	0	315	0	465	0	21	526	9	465	0	21	526	842
05:15 PM	67	0	0	12	79	0	334	56	0	390	0	497	0	12	537	8	497	0	12	537	974
05:30 PM	43	0	0	16	59	0	316	71	0	387	0	522	0	52	521	3	522	0	52	521	971
Total Volume	184	0	0	49	233	0	1285	216	0	1501	0	2008	0	208	2036	28	2008	0	208	2036	3770
% App. Total	79	0	0	21	73	0	85.6	14.4	0	91.7	0	98.6	0	0	95.7	1.4	98.6	0	0	95.7	
PHF	.687	.000	.000	.766	.737	.000	.892	.761	.000	.917	.000	.958	.000	.000	.957	.778	.958	.000	.000	.957	.959

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

# Wilson Okamoto Corporation

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

Counted By: AC, DM, FS  
Counters: D4-3888, D4-3889, D4-3890  
Weather: Clear

File Name : PiiAla AM  
Site Code : 00000006  
Start Date : 3/10/2015  
Page No : 1

Start Time	Groups Printed- Unshifted																										
	Piiikoi Street Southbound					Ala Moana Boulevard Westbound					Northbound					Ala Moana Boulevard Eastbound											
	Left	Thru	Right	Peds	App. Total	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	12	0	8	2	22	0	174	57	9	240	0	45	132	0	177	439											
06:15 AM	14	0	21	2	37	0	207	65	24	296	0	54	222	0	276	609											
06:30 AM	29	0	12	3	44	0	274	69	34	377	0	53	182	0	235	656											
06:45 AM	24	0	25	2	51	0	304	72	15	391	0	80	273	0	353	795											
Total	79	0	66	9	154	0	959	263	82	1304	0	232	809	0	1041	2499											
07:00 AM	20	0	31	2	53	0	361	65	22	448	0	98	279	0	377	878											
07:15 AM	27	0	21	1	49	0	451	92	6	549	0	83	289	0	372	970											
07:30 AM	46	0	37	2	85	0	431	72	16	519	0	90	300	0	390	994											
07:45 AM	33	0	37	2	72	0	389	78	6	473	0	110	255	0	365	910											
Total	126	0	126	7	259	0	1632	307	50	1989	0	381	1123	0	1504	3752											
08:00 AM	26	0	32	4	62	0	423	83	11	517	0	80	264	0	344	923											
08:15 AM	24	0	34	0	58	0	368	62	8	438	0	84	254	0	338	834											
08:30 AM	27	0	29	6	62	0	329	56	14	399	0	108	253	0	361	822											
08:45 AM	28	0	29	0	57	0	315	59	10	384	0	87	269	0	356	797											
Total	105	0	124	10	239	0	1435	260	43	1738	0	359	1040	0	1399	3376											
Grand Total	310	0	316	26	652	0	4026	830	175	5031	0	972	2972	0	3944	9627											
Approch %	47.5	0	48.5	4	6.8	0	80	16.5	3.5	52.3	0	24.6	75.4	0	41												
Total %	3.2	0	3.3	0.3	6.8	0	41.8	8.6	1.8	52.3	0	10.1	30.9	0	41												

Start Time	Piiikoi Street Southbound										Ala Moana Boulevard Westbound					Northbound					Ala Moana Boulevard Eastbound						
	Left	Thru	Right	Peds	App. Total	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	
	07:15 AM	27	0	0	21	48	0	451	92	72	543	0	83	289	0	372	963										
07:30 AM	46	0	0	37	83	0	431	72	90	503	0	90	300	0	390	976											
07:45 AM	33	0	0	37	70	0	389	78	83	467	0	110	255	0	365	902											
08:00 AM	26	0	0	32	58	0	423	83	80	506	0	80	264	0	344	908											
Total Volume	132	0	0	127	259	0	1694	325	2019	2019	0	363	1108	0	1471	3749											
% App. Total	51	0	0	49	780	0	83.9	16.1	883	930	0	24.7	75.3	0	943	960											
PHF	.717	.000	.000	.858	.780	.000	.939	.883	.930	.930	.000	.825	.923	.000	.943	.960											

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

# Wilson Okamoto Corporation

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

Counted By: JC, AC, DM  
Counters: D4-3889, D4-3890, D4-3888  
Weather: Clear

File Name : PiiAla PM  
Site Code : 00000006  
Start Date : 3/10/2015  
Page No : 1

Start Time	Groups Printed- Unshifted																					
	Piiikoi Street Southbound					Ala Moana Boulevard Westbound					Northbound					Ala Moana Boulevard Eastbound						
	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	55	0	59	32	146	0	278	59	13	350	88	332	0	0	420	916						
03:15 PM	55	0	60	26	141	0	283	75	7	365	80	346	0	0	426	932						
03:30 PM	57	0	58	30	145	0	361	74	18	453	67	416	0	0	483	1081						
03:45 PM	53	0	50	29	132	0	355	80	2	437	82	403	0	0	485	1054						
Total	220	0	227	117	564	0	1277	288	40	1605	317	1497	0	0	1814	3983						
04:00 PM	43	0	50	16	109	0	369	85	9	463	72	445	0	0	517	1089						
04:15 PM	58	0	55	17	130	0	330	99	2	431	96	447	0	0	543	1104						
04:30 PM	47	0	33	26	106	0	325	38	5	368	80	414	0	0	494	968						
04:45 PM	49	0	43	17	109	0	360	71	12	443	63	509	0	0	572	1124						
Total	197	0	181	76	454	0	1384	293	28	1705	311	1815	0	0	2126	4285						
05:00 PM	65	0	40	23	128	0	272	67	10	349	90	423	0	0	513	990						
05:15 PM	81	0	67	39	187	0	325	64	51	440	83	477	0	0	560	1187						
05:30 PM	50	0	44	37	131	0	350	102	29	481	82	487	0	0	569	1181						
05:45 PM	65	0	52	40	157	0	251	88	38	377	84	436	0	0	520	1054						
Total	261	0	203	139	603	0	1198	321	128	1647	339	1823	0	0	2162	4412						
Grand Total	678	0	611	332	1621	0	3859	902	196	4957	967	5135	0	0	6102	12680						
Apprch %	41.8	0	37.7	20.5	12.8	0	77.8	18.2	4	39.1	15.8	84.2	0	0	48.1							
Total %	5.3	0	4.8	2.6	1.5	0	30.4	7.1	1.5	7.6	40.5	0	0	0								
Start Time	Piiikoi Street Southbound					Ala Moana Boulevard Westbound					Northbound					Ala Moana Boulevard Eastbound						
	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	
04:45 PM	49	0	43	0	92	0	360	71	0	431	63	509	0	0	572	1095						
05:00 PM	65	0	40	0	105	0	272	67	0	339	90	423	0	0	513	957						
05:15 PM	81	0	67	0	148	0	325	64	0	389	83	477	0	0	560	1097						
05:30 PM	50	0	44	0	94	0	350	102	0	452	82	487	0	0	569	1115						
Total Volume	245	0	194	0	439	0	1307	304	0	1611	318	1896	0	0	2214	4264						
% App. Total	55.8	0	44.2	0	74.2	0	81.1	18.9	0	39.1	14.4	85.6	0	0	48.1							
PHF	0.756	0.000	0.724	0.000	0.742	0.000	0.908	0.745	0.000	0.891	0.883	0.931	0.000	0.000	0.968							

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

# Wilson Okamoto Corporation

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

Counted By: DY, JC  
Counters: D4-5677, D4-3889  
Weather: Clear

File Name : KamQue AM  
Site Code : 00000005  
Start Date : 3/11/2015  
Page No : 1

### Groups Printed- Unshifted

Start Time	Kamakee Street Southbound				Queen Street Westbound				Kamakee Street Northbound				Queen Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
06:00 AM	4	20	7	1	32	15	15	2	5	37	2	8	1	0	11	3	17	1	7	28	108
06:15 AM	1	18	9	6	34	6	22	3	3	34	1	7	4	2	14	2	8	1	7	18	100
06:30 AM	6	37	17	6	66	8	25	3	0	36	1	4	3	0	8	4	13	3	9	29	139
06:45 AM	5	17	17	7	46	17	38	3	3	61	3	9	6	1	19	6	16	1	8	31	157
<b>Total</b>	<b>16</b>	<b>92</b>	<b>50</b>	<b>20</b>	<b>178</b>	<b>46</b>	<b>100</b>	<b>11</b>	<b>11</b>	<b>168</b>	<b>7</b>	<b>28</b>	<b>14</b>	<b>3</b>	<b>52</b>	<b>15</b>	<b>54</b>	<b>6</b>	<b>31</b>	<b>106</b>	<b>504</b>
07:00 AM	5	26	15	12	58	13	37	3	2	55	2	7	9	1	19	3	17	3	4	27	159
07:15 AM	6	43	13	5	67	31	63	7	6	107	2	7	7	1	17	4	19	5	6	34	225
07:30 AM	2	38	33	6	79	37	50	4	4	95	5	18	8	1	32	9	22	2	21	54	260
07:45 AM	5	40	32	8	85	42	76	8	3	129	3	15	10	1	29	5	25	1	8	39	282
<b>Total</b>	<b>18</b>	<b>147</b>	<b>93</b>	<b>31</b>	<b>289</b>	<b>123</b>	<b>226</b>	<b>22</b>	<b>15</b>	<b>386</b>	<b>12</b>	<b>47</b>	<b>34</b>	<b>4</b>	<b>97</b>	<b>21</b>	<b>83</b>	<b>11</b>	<b>39</b>	<b>154</b>	<b>926</b>
08:00 AM	6	48	19	5	78	43	60	9	3	115	3	27	6	0	36	8	34	1	12	55	284
08:15 AM	5	45	15	4	69	38	59	4	4	105	1	19	12	7	39	6	32	3	19	60	273
08:30 AM	6	35	15	3	59	32	58	9	5	104	2	23	2	1	28	4	33	4	15	56	247
08:45 AM	12	36	22	10	80	28	56	4	9	97	3	17	8	5	33	11	35	3	10	59	269
<b>Total</b>	<b>29</b>	<b>164</b>	<b>71</b>	<b>22</b>	<b>286</b>	<b>141</b>	<b>233</b>	<b>26</b>	<b>21</b>	<b>421</b>	<b>9</b>	<b>86</b>	<b>28</b>	<b>13</b>	<b>136</b>	<b>29</b>	<b>134</b>	<b>11</b>	<b>56</b>	<b>230</b>	<b>1073</b>
<b>Grand Total</b>	<b>63</b>	<b>403</b>	<b>214</b>	<b>73</b>	<b>753</b>	<b>310</b>	<b>559</b>	<b>59</b>	<b>47</b>	<b>975</b>	<b>28</b>	<b>161</b>	<b>76</b>	<b>20</b>	<b>285</b>	<b>65</b>	<b>271</b>	<b>28</b>	<b>126</b>	<b>490</b>	<b>2503</b>
Approach %	8.4	53.5	28.4	9.7	31.8	57.3	6.1	4.8	7	39	9.8	56.5	26.7	0.8	11.4	13.3	55.3	5.7	25.7	19.6	
Total %	2.5	16.1	8.5	2.9	30.1	12.4	22.3	2.4	1.9	39	1.1	6.4	3	0.8	11.4	2.6	10.8	1.1	5		

Start Time	Kamakee Street Southbound				Queen Street Westbound				Kamakee Street Northbound				Queen Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
07:30 AM	2	38	33		73	37	50	4		91	5	18	8		31	9	22	2		33	228
07:45 AM	5	40	32		77	42	76	8		126	3	15	10		28	5	25	1		31	262
08:00 AM	6	48	19		73	43	60	9		112	3	27	6		36	8	34	1		43	264
08:15 AM	5	45	15		65	38	59	4		101	1	19	12		32	6	32	3		41	239
Total Volume	18	171	99		288	160	245	25		430	12	79	36		127	28	113	7		148	993
% App. Total	6.2	59.4	34.4		37.2	57	5.8			9.4	62.2	28.3			18.9	76.4	4.7			148	993
PHF	.750	.891	.750		.935	.930	.806	.694		.853	.600	.731	.750		.882	.778	.831	.583		.860	.940

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

# Wilson Okamoto Corporation

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

Counted By: DY, JC  
Counters: D4-3889, D4-5677  
Weather: Clear

File Name : KamQue PM  
Site Code : 00000005  
Start Date : 3/11/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Kamakee Street Southbound				Queen Street Westbound				Kamakee Street Northbound				Queen Street Eastbound								
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total					
03:00 PM	12	46	18	9	85	44	62	17	13	136	4	23	17	7	51	17	44	9	29	99	371
03:15 PM	5	33	16	7	61	51	66	14	14	145	4	19	15	9	47	19	52	7	24	102	355
03:30 PM	16	27	17	10	70	48	100	14	13	175	5	38	13	5	61	22	70	4	24	120	426
03:45 PM	8	28	15	10	61	47	76	9	10	142	8	37	10	6	61	25	57	6	25	113	377
Total	41	134	66	36	277	190	304	54	50	598	21	117	55	27	220	83	223	26	102	434	1529
04:00 PM	9	31	17	7	64	48	64	15	14	141	4	21	16	15	56	21	57	6	25	109	370
04:15 PM	8	23	12	8	51	62	77	12	14	165	7	26	21	9	63	25	84	10	28	147	426
04:30 PM	9	27	15	20	71	51	81	9	11	152	9	32	14	9	64	26	92	13	36	167	454
04:45 PM	10	32	14	15	71	66	70	8	18	162	2	30	17	3	52	27	93	17	13	150	435
Total	36	113	58	50	257	227	292	44	57	620	22	109	68	36	235	99	326	46	102	573	1685
05:00 PM	17	30	11	17	75	59	79	11	20	169	5	33	11	5	54	16	83	7	39	145	443
05:15 PM	17	35	9	19	80	57	69	22	17	165	4	27	17	16	64	28	100	10	20	158	467
05:30 PM	16	42	17	9	84	40	59	22	9	125	6	27	13	12	58	34	83	9	44	170	437
05:45 PM	16	42	18	7	83	58	59	19	17	153	5	41	14	13	73	22	68	12	35	137	446
Total	66	149	55	52	322	214	261	74	63	612	20	128	55	46	249	100	334	38	138	610	1793
Grand Total	143	396	179	138	856	631	857	172	170	1830	63	354	178	109	704	282	883	110	342	1617	5007
Approch %	16.7	46.3	20.9	16.1	34.5	46.8	46.8	9.4	9.3	36.5	8.9	50.3	25.3	15.5	14.1	17.4	54.6	6.8	21.2	32.3	
Total %	2.9	7.9	3.6	2.8	17.1	12.6	17.1	3.4	3.4	36.5	1.3	7.1	3.6	2.2	14.1	5.6	17.6	2.2	6.8		

Start Time	Kamakee Street Southbound				Queen Street Westbound				Kamakee Street Northbound				Queen Street Eastbound								
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total					
04:30 PM	9	27	15	15	51	51	81	9	9	141	9	32	14	14	55	26	92	13	13	131	378
04:45 PM	10	32	14	14	56	66	70	8	8	144	2	30	17	17	49	27	93	17	17	137	386
05:00 PM	17	30	11	11	58	59	79	11	11	149	5	33	11	11	49	16	83	7	7	106	362
05:15 PM	17	35	9	9	61	57	69	22	22	148	4	27	17	17	48	28	100	10	10	138	395
Total Volume	53	124	49	49	226	233	299	50	50	582	20	122	59	59	201	97	368	47	47	512	1521
% App. Total	23.5	54.9	21.7	21.7	.926	.883	.923	8.6	8.6	.977	.556	.924	.868	.924	.914	.866	.920	.691	.691	.928	.963
PHF	.779	.886	.817	.817																	

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

# Wilson Okamoto Corporation

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

Counted By: AC, DM  
Counters: TU-0650, TU-0652  
Weather: Clear

File Name : QueQue AM  
Site Code : 00000004  
Start Date : 3/11/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Southbound			Queen Street Westbound			Queen's Lane Northbound			Queen Street Eastbound			Int. Total				
	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
06:00 AM	0	7	29	0	0	36	3	0	0	2	5	0	14	0	0	14	55
06:15 AM	0	6	26	0	0	32	5	0	5	0	10	0	7	0	0	7	49
06:30 AM	0	3	31	0	0	34	5	0	5	2	12	0	13	1	0	14	60
06:45 AM	0	10	53	0	0	63	5	0	7	0	12	0	16	1	0	17	92
Total	0	26	139	0	0	165	18	0	17	4	39	0	50	2	0	52	256
07:00 AM	0	17	49	0	0	66	4	0	10	0	14	0	23	0	0	23	103
07:15 AM	0	13	91	0	0	104	11	0	14	4	29	0	29	0	0	29	162
07:30 AM	0	23	85	0	0	108	5	0	12	2	19	0	26	0	0	26	153
07:45 AM	0	20	119	0	0	139	8	0	13	2	23	0	42	2	2	46	208
Total	0	73	344	0	0	417	28	0	49	8	85	0	120	2	2	124	626
08:00 AM	0	29	103	0	0	132	6	0	17	1	24	0	41	1	0	42	198
08:15 AM	0	22	98	0	0	120	7	0	12	5	24	0	47	0	0	47	191
08:30 AM	0	22	97	0	0	119	2	0	25	6	33	0	41	0	0	41	193
08:45 AM	0	11	89	0	0	100	2	0	3	7	12	0	31	0	0	31	143
Total	0	84	387	0	0	471	17	0	57	19	93	0	160	1	0	161	725
Grand Total	0	183	870	0	0	1053	63	0	123	31	217	0	330	5	2	337	1607
Approch %	0	17.4	82.6	0	0	65.5	29	0	56.7	14.3	13.5	0	97.9	1.5	0.6	21	
Total %	0	11.4	54.1	0	0	3.9	3.9	0	7.7	1.9	0.1	0	20.5	0.3	0.1	0.1	

Start Time	Southbound			Queen Street Westbound			Queen's Lane Northbound			Queen Street Eastbound			Int. Total				
	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
07:45 AM	0	20	119	0	0	139	8	0	13	0	21	0	42	2	0	44	204
08:00 AM	0	29	103	0	0	132	6	0	17	1	23	0	41	1	0	42	197
08:15 AM	0	22	98	0	0	120	7	0	12	5	19	0	47	0	0	47	186
08:30 AM	0	22	97	0	0	119	2	0	25	6	27	0	41	0	0	41	187
08:45 AM	0	11	89	0	0	100	2	0	3	7	12	0	31	0	0	31	143
Total	0	84	387	0	0	471	17	0	57	19	93	0	160	1	0	161	725
Grand Total	0	183	870	0	0	1053	63	0	123	31	217	0	330	5	2	337	1607
Approch %	0	17.4	82.6	0	0	65.5	29	0	56.7	14.3	13.5	0	97.9	1.5	0.6	21	
Total %	0	11.4	54.1	0	0	3.9	3.9	0	7.7	1.9	0.1	0	20.5	0.3	0.1	0.1	

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

Start Time	Southbound	Queen Street Westbound	Queen's Lane Northbound	Queen Street Eastbound	Int. Total
07:45 AM	0	119	13	42	204
08:00 AM	0	103	17	41	197
08:15 AM	0	98	12	47	186
08:30 AM	0	97	25	41	187
08:45 AM	0	89	3	31	143
Total	0	417	67	171	725
% App. Total	0	81.8	74.4	98.3	949
PHF	.000	.876	.670	.910	.949

# Wilson Okamoto Corporation

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

Counted By: AC, DM  
Counters: D4-3889, D4-3890  
Weather: Clear

File Name : QueQue PM  
Site Code : 00000004  
Start Date : 3/11/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Southbound				Queen Street Westbound				Queen's Lane Northbound				Queen Street Eastbound							
	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	Int. Total
03:00 PM	0	18	118	0	136	5	0	53	1	59	0	82	1	0	83	0	82	0	0	278
03:15 PM	0	14	114	0	128	8	0	45	6	59	0	85	0	0	85	0	85	0	0	272
03:30 PM	0	20	140	0	160	20	0	41	5	66	0	95	1	0	96	0	95	1	0	322
03:45 PM	0	17	134	0	151	7	0	51	8	66	0	86	0	0	86	0	86	0	0	303
Total	0	69	506	0	575	40	0	190	20	250	0	348	2	0	350	0	348	2	0	1175
04:00 PM	0	14	118	0	132	14	0	46	6	66	0	74	1	0	75	0	74	1	0	273
04:15 PM	0	16	130	0	146	18	0	57	17	92	0	107	0	0	107	0	107	0	0	345
04:30 PM	0	10	136	0	146	13	0	45	4	62	0	110	3	0	113	0	110	3	0	321
04:45 PM	0	18	123	0	141	8	0	45	8	61	0	128	0	0	128	0	128	0	0	330
Total	0	58	507	0	565	53	0	193	35	281	0	419	4	0	423	0	419	4	0	1269
05:00 PM	0	20	129	0	149	13	0	60	2	75	0	116	0	0	116	0	116	0	0	340
05:15 PM	0	23	137	0	160	11	0	65	5	81	0	144	0	0	144	0	144	0	0	385
05:30 PM	0	13	96	0	109	13	0	35	7	55	0	107	0	0	107	0	107	0	0	271
05:45 PM	0	17	108	0	125	14	0	32	3	49	0	99	0	0	99	0	99	0	0	273
Total	0	73	470	0	543	51	0	192	17	260	0	466	0	0	466	0	466	0	0	1269
Grand Total	0	200	1483	0	1683	144	0	575	72	791	0	1233	6	0	1239	0	1233	6	0	3713
Approch %	0	11.9	88.1	0	0	18.2	0	72.7	9.1	0	0	99.5	0.5	0	0	0	99.5	0.5	0	0
Total %	0	5.4	39.9	0	45.3	3.9	0	15.5	1.9	21.3	0	33.2	0.2	0	33.4	0	33.2	0.2	0	0

Start Time	Southbound				Queen Street Westbound				Queen's Lane Northbound				Queen Street Eastbound							
	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	Int. Total
04:30 PM	0	0	10	136	146	13	0	0	45	58	0	110	3	0	113	0	110	3	0	317
04:45 PM	0	0	18	123	141	8	0	0	45	53	0	128	0	0	128	0	128	0	0	322
05:00 PM	0	0	20	129	149	13	0	0	60	73	0	116	0	0	116	0	116	0	0	338
05:15 PM	0	0	23	137	160	11	0	0	65	76	0	144	0	0	144	0	144	0	0	380
Total Volume	0	0	71	525	596	45	0	0	215	260	0	498	3	0	501	0	498	3	0	1357
% App. Total	.000	11.9	88.1	0	.931	17.3	0	0	82.7	.855	0	99.4	0.6	0	.870	.000	99.4	0.6	0	.893
PHF	.000	.772	.958	.000	.931	.865	.000	.827	.250	.855	.000	.865	.250	.870	.870	.000	.865	.250	.893	.893

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



# Wilson Okamoto Corporation

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

Counted By: PA, FS  
 Counters: D4-3888, D4-3890  
 Weather: Clear

File Name : QueWai AM  
 Site Code : 00000001  
 Start Date : 3/11/2015  
 Page No : 1

Groups Printed- Unshifted

Start Time	Waimanu Street Southbound				Queen Street Westbound				Queen Street Eastbound				Northbound								
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	3	0	6	1	10	0	30	9	0	39	2	14	0	12	28	0	14	0	0	19	77
06:15 AM	8	0	1	2	11	0	30	7	0	37	1	12	0	6	19	0	12	0	6	25	67
06:30 AM	19	0	5	2	26	0	29	9	0	38	1	14	0	10	30	0	14	0	10	30	89
06:45 AM	18	0	4	0	22	0	59	18	0	77	1	24	0	5	30	0	24	0	5	30	129
Total	48	0	16	5	69	0	148	43	0	191	5	64	0	33	102	0	64	0	33	102	362
07:00 AM	19	0	8	11	38	0	58	15	0	73	2	36	0	11	49	0	36	0	11	49	160
07:15 AM	17	0	3	2	22	0	102	20	0	122	2	41	0	7	50	0	41	0	7	50	194
07:30 AM	16	0	5	3	24	0	102	13	0	115	2	38	0	11	51	0	38	0	11	51	190
07:45 AM	16	0	4	1	21	0	133	22	0	155	4	44	0	3	51	0	44	0	3	51	227
Total	68	0	20	17	105	0	395	70	0	465	10	159	0	32	201	0	159	0	32	201	771
08:00 AM	13	0	4	1	18	0	128	19	0	147	4	50	0	7	61	0	50	0	7	61	226
08:15 AM	18	0	7	1	26	0	113	18	0	131	2	47	0	7	56	0	47	0	7	56	213
08:30 AM	14	0	5	2	21	0	114	24	0	138	4	50	0	6	60	0	50	0	6	60	219
08:45 AM	11	0	4	0	15	0	96	18	0	114	5	55	0	8	68	0	55	0	8	68	197
Total	56	0	20	4	80	0	451	79	0	530	15	202	0	28	245	0	202	0	28	245	855
Grand Total	172	0	56	26	254	0	994	192	0	1186	30	425	0	93	548	0	425	0	93	548	1988
Approch %	67.7	0	22	10.2		0	83.8	16.2	0		5.5	77.6	0	17		0	77.6	0	17		
Total %	8.7	0	2.8	1.3	12.8	0	50	9.7	0	59.7	1.5	21.4	0	4.7	27.6	0	21.4	0	4.7	27.6	

Start Time	Waimanu Street Southbound				Queen Street Westbound				Queen Street Eastbound				Northbound								
	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
07:45 AM	16	0	0	4	20	0	133	22	0	155	4	44	0	0	48	0	44	0	0	48	223
08:00 AM	13	0	0	4	17	0	128	19	0	147	4	50	0	0	54	0	50	0	0	54	218
08:15 AM	18	0	0	7	25	0	113	18	0	131	2	47	0	0	49	0	47	0	0	49	205
08:30 AM	14	0	0	5	19	0	114	24	0	138	4	50	0	0	54	0	50	0	0	54	211
Total Volume	61	0	0	20	81	0	488	83	0	571	14	191	0	0	205	0	191	0	0	205	857
% App. Total	75.3	0	0	24.7		0	85.5	14.5	0		6.8	93.2	0	0		0	93.2	0	0		
PHF	.847	.000	.714		.810	.000	.917	.865		.921	.875	.955	.000		.949	.000	.955	.000		.949	.961

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

# Wilson Okamoto Corporation

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

Counted By: PA,, FS  
 Counters: D4-3890, D4-3888  
 Weather: Clear

File Name : QueWai PM  
 Site Code : 00000001  
 Start Date : 3/11/2015  
 Page No : 1

### Groups Printed- Unshifted

Start Time	Waimanu Street Southbound			Queen Street Westbound			Northbound			Queen Street Eastbound			App. Total	Peds	Int. Total		
	Left	Thru	Right	Thru	Right	Peds	App. Total	Left	Thru	Right	Left	Thru				Right	
03:00 PM	15	0	5	0	24	4	127	24	0	151	0	9	126	0	11	146	321
03:15 PM	6	0	6	0	18	6	122	27	0	149	0	14	120	0	8	142	309
03:30 PM	12	0	9	0	29	8	164	35	0	199	0	8	115	0	5	128	356
03:45 PM	10	0	6	0	19	3	135	19	0	154	0	8	119	0	8	135	308
Total	43	0	26	0	90	21	548	105	0	653	0	39	480	0	32	551	1294
04:00 PM	9	0	1	0	10	0	132	29	0	161	0	11	110	0	1	122	293
04:15 PM	19	0	5	0	24	0	142	27	0	169	0	8	147	0	9	164	357
04:30 PM	18	0	13	6	37	0	144	27	0	171	0	16	130	0	6	152	360
04:45 PM	16	0	3	3	22	3	135	30	0	165	0	19	133	0	10	162	349
Total	62	0	22	9	93	3	553	113	0	666	0	54	520	0	26	600	1359
05:00 PM	16	0	9	3	28	0	150	36	0	186	0	14	143	0	12	169	383
05:15 PM	19	0	8	7	34	0	144	40	0	184	0	14	169	0	6	189	407
05:30 PM	11	0	5	2	18	0	121	26	0	147	0	10	128	0	9	147	312
05:45 PM	10	0	6	4	20	0	127	37	0	164	0	9	113	0	13	135	319
Total	56	0	28	16	100	0	542	139	0	681	0	47	553	0	40	640	1421
Grand Total	161	0	76	46	283	0	1643	357	0	2000	0	140	1553	0	98	1791	4074
Apprch %	56.9	0	26.9	16.3	6.9	0	82.2	17.9	0	49.1	0	7.8	86.7	0	5.5	44	
Total %	4	0	1.9	1.1	0	0	40.3	8.8	0	0	0	3.4	38.1	0	2.4		

Start Time	Waimanu Street Southbound			Queen Street Westbound			Northbound			Queen Street Eastbound			App. Total	Peds	Int. Total		
	Left	Thru	Right	Thru	Right	Peds	App. Total	Left	Thru	Right	Left	Thru				Right	
04:30 PM	18	0	13	0	31	0	144	27	0	171	0	16	130	0	0	146	348
04:45 PM	16	0	3	0	19	0	135	30	0	165	0	19	133	0	0	152	336
05:00 PM	16	0	9	0	25	0	150	36	0	186	0	14	143	0	0	157	368
05:15 PM	19	0	8	0	27	0	144	40	0	184	0	14	169	0	0	183	394
Total Volume	69	0	33	0	102	0	573	133	0	706	0	63	575	0	0	638	1446
% App. Total	67.6	0	32.4	0	81.2	0	81.2	18.8	0	949	0	9.9	90.1	0	0	872	918
PHF	.908	.000	.635	.823	.949	.000	.955	.831	.000	.829	.851	.000	.872	.000	.000	.872	.918

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

# Wilson Okamoto Corporation

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

Counted By: JJ, RJ  
 Counters: TU-0649, TU-0651  
 Weather: Clear

File Name : PenWai AM  
 Site Code : 00000002  
 Start Date : 3/11/2015  
 Page No : 1

Groups Printed- Unshifted

Start Time	Pensacola Street Southbound				Waimanu Street Westbound				Honua Condominium Northbound				Waimanu Street Eastbound								
	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	44	4	29	1	78	0	7	0	0	7	3	0	8	5	16	0	18	0	3	21	122
06:15 AM	49	4	31	0	84	0	3	0	0	3	2	0	11	3	16	0	15	1	1	17	120
06:30 AM	47	4	34	3	88	0	2	0	0	2	4	0	11	1	16	0	34	2	4	40	146
06:45 AM	38	8	61	1	108	0	8	0	0	8	7	0	14	10	31	0	44	1	3	48	195
<b>Total</b>	178	20	155	5	358	0	20	0	0	20	16	0	44	19	79	0	111	4	11	126	583
07:00 AM	40	3	54	7	104	0	10	0	0	10	11	0	25	7	43	0	49	7	5	61	218
07:15 AM	45	10	90	2	147	0	12	0	0	12	18	0	20	5	43	0	58	1	1	60	262
07:30 AM	58	9	99	5	171	0	5	0	0	5	9	0	24	14	47	0	47	4	6	57	280
07:45 AM	60	9	122	4	195	0	22	0	0	22	10	0	22	8	40	0	51	4	13	68	325
<b>Total</b>	203	31	365	18	617	0	49	0	0	49	48	0	91	34	173	0	205	16	25	246	1085
08:00 AM	72	24	124	6	226	1	19	0	0	20	5	0	18	13	36	0	56	13	5	74	356
08:15 AM	64	18	115	1	198	0	9	0	0	9	5	0	10	21	36	0	68	10	9	87	330
08:30 AM	78	6	111	3	198	2	15	0	0	17	9	0	22	13	44	0	74	6	8	88	347
08:45 AM	65	8	99	3	175	2	12	0	0	14	6	0	14	9	29	0	67	6	2	75	293
<b>Total</b>	279	56	449	13	797	5	55	0	0	60	25	0	64	56	145	0	265	35	24	324	1326
<b>Grand Total</b>	660	107	969	36	1772	5	124	0	0	129	89	0	199	109	397	0	581	55	60	696	2994
Apprch %	37.2	6	54.7	2		3.9	96.1	0	0		22.4	0	50.1	27.5		0	83.5	7.9	8.6		
Total %	22	3.6	32.4	1.2	59.2	0.2	4.1	0	0	4.3	3	0	6.6	3.6	13.3	0	19.4	1.8	2	23.2	

Start Time	Pensacola Street Southbound				Waimanu Street Westbound				Honua Condominium Northbound				Waimanu Street Eastbound								
	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
07:45 AM	60	9	122		191	0	22	0	0	22	10	0	22		32	0	51	4		55	300
08:00 AM	72	24	124		220	1	19	0	0	20	5	0	18		23	0	56	13		69	332
08:15 AM	64	18	115		197	0	9	0	0	9	5	0	10		15	0	68	10		78	299
08:30 AM	78	6	111		195	2	15	0	0	17	9	0	22		31	0	74	6		80	323
Total Volume	274	57	472		803	3	65	0	0	68	29	0	72		101	0	249	33		282	1254
% App. Total	34.1	7.1	58.8			4.4	95.6	0	0		28.7	0	71.3			0	88.3	11.7			
PHF	.878	.594	.952		.913	.375	.739	.000		.773	.725	.000	.818		.789	.000	.841	.635		.881	.944

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

# Wilson Okamoto Corporation

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

Counted By: JJ, RJ  
Counters: TU-0649, TU-0651  
Weather: Clear

File Name : PenWai PM  
Site Code : 00000002  
Start Date : 3/11/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Pensacola Street Southbound				Waimanu Street Westbound				Honua Condominium Northbound				Waimanu Street Eastbound								
	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	101	13	103	4	221	0	40	0	0	40	5	0	11	33	49	0	122	11	14	147	457
03:15 PM	108	10	101	10	229	2	41	0	0	43	5	0	10	23	38	0	113	11	5	129	439
03:30 PM	75	7	113	0	195	2	76	0	0	78	10	0	9	24	43	0	127	9	10	146	462
03:45 PM	86	25	104	9	224	3	40	0	0	43	7	0	10	27	44	0	128	11	9	148	459
Total	370	55	421	23	869	7	197	0	0	204	27	0	40	107	174	0	490	42	38	570	1817
04:00 PM	98	13	113	3	227	0	41	0	0	41	2	0	10	37	49	0	107	6	6	119	436
04:15 PM	79	12	128	3	222	1	40	0	0	41	4	0	9	27	40	0	147	13	9	169	472
04:30 PM	98	15	121	7	241	5	36	0	0	41	10	0	16	24	50	0	125	8	11	144	476
04:45 PM	93	12	115	6	226	0	42	0	0	42	5	0	18	31	54	0	148	8	13	169	491
Total	368	52	477	19	916	6	159	0	0	165	21	0	53	119	193	0	527	35	39	601	1875
05:00 PM	97	15	128	5	245	1	51	0	0	52	7	0	13	41	61	0	137	13	12	162	520
05:15 PM	86	12	137	12	247	3	39	0	0	42	5	0	12	16	33	0	169	10	11	190	512
05:30 PM	88	10	108	7	213	0	34	0	0	34	5	0	8	27	40	0	125	13	14	152	439
05:45 PM	92	13	102	5	212	2	46	0	0	48	4	0	9	41	54	0	126	6	8	140	454
Total	363	50	475	29	917	6	170	0	0	176	21	0	42	125	188	0	557	42	45	644	1925
Grand Total	1101	157	1373	71	2702	19	526	0	0	545	69	0	135	351	555	0	1574	119	122	1815	5617
Apprch %	40.7	5.8	50.8	2.6	48.1	3.5	96.5	0	0	9.7	12.4	0	24.3	63.2	9.9	0	86.7	6.6	6.7	32.3	
Total %	19.6	2.8	24.4	1.3	48.1	0.3	9.4	0	0	9.7	1.2	0	2.4	6.2	9.9	0	28	2.1	2.2	32.3	

Start Time	Pensacola Street Southbound				Waimanu Street Westbound				Honua Condominium Northbound				Waimanu Street Eastbound								
	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
04:30 PM	98	15	121	121	234	5	36	0	0	41	10	0	16	26	0	125	8	8	133	434	
04:45 PM	93	12	115	115	220	0	42	0	0	42	5	0	18	23	23	0	148	8	8	156	441
05:00 PM	97	15	128	128	240	1	51	0	0	52	7	0	13	20	20	0	137	13	13	150	462
05:15 PM	86	12	137	137	235	3	39	0	0	42	5	0	12	17	17	0	169	10	10	179	473
Total Volume	374	54	501	501	929	9	168	0	0	177	27	0	59	86	86	0	579	39	39	618	1810
% App. Total	40.3	5.8	53.9	53.9	48.1	5.1	94.9	0	0	9.7	31.4	0	68.6	9.9	9.9	0	93.7	6.3	6.3	32.3	
PHF	.954	.900	.914	.914	.968	.450	.824	.000	.000	.851	.675	.000	.819	.827	.827	.000	.857	.750	.750	.863	.957

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

# Wilson Okamoto Corporation

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

Counted By: GC, KW  
Counters: T-1841, D4-5673  
Weather: Clear

File Name : PiiWai AM  
Site Code : 00000001  
Start Date : 3/11/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Piiikoi Street Southbound				Ala Moana Ramp Westbound				Piiikoi Street Northbound				Waimanu Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
06:00 AM	0	9	6	0	15	0	3	4	13	20	0	94	16	2	112	35	35	5	5	80	227
06:15 AM	0	18	2	0	20	0	1	1	6	8	0	87	26	4	117	32	30	16	3	81	226
06:30 AM	0	11	2	0	13	0	0	5	8	13	0	111	32	5	148	41	30	27	3	101	275
06:45 AM	0	21	6	0	27	0	2	4	10	16	0	154	8	8	170	57	25	24	10	116	329
<b>Total</b>	0	59	16	0	75	0	6	14	37	57	0	446	82	19	547	165	120	72	21	378	1057
07:00 AM	0	23	8	0	31	0	2	4	12	18	0	153	14	7	174	73	11	34	9	127	350
07:15 AM	0	26	9	0	35	0	3	4	14	21	0	175	15	7	197	95	14	32	9	150	403
07:30 AM	0	36	4	0	40	0	1	3	13	17	0	175	19	16	210	78	26	34	9	147	414
07:45 AM	0	29	15	0	44	0	8	8	6	22	0	179	17	5	201	80	36	35	7	158	425
<b>Total</b>	0	114	36	0	150	0	14	19	45	78	0	682	65	35	782	326	87	135	34	582	1592
08:00 AM	0	36	17	0	53	0	3	15	8	26	0	165	18	14	197	65	32	30	13	140	416
08:15 AM	0	38	5	0	43	0	6	10	21	37	0	162	22	10	194	67	36	45	10	158	432
08:30 AM	0	33	13	0	46	0	4	6	7	17	0	141	15	18	174	81	29	46	7	163	400
08:45 AM	0	35	12	0	47	0	2	8	13	23	0	164	20	18	202	83	32	34	4	153	425
<b>Total</b>	0	142	47	0	189	0	15	39	49	103	0	632	75	60	767	296	129	155	34	614	1673
<b>Grand Total</b>	0	315	99	0	414	0	35	72	131	238	0	1760	222	114	2096	787	336	362	89	1574	4322
<b>Approch % Total %</b>	0	76.1	23.9	0	9.6	0	14.7	30.3	55	5.5	0	84	10.6	5.4	48.5	50	21.3	23	5.7	36.4	
	0	7.3	2.3	0		0	0.8	1.7	3		0	40.7	5.1	2.6		18.2	7.8	8.4	2.1		

Start Time	Piiikoi Street Southbound				Ala Moana Ramp Westbound				Piiikoi Street Northbound				Waimanu Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
07:30 AM	0	36	4	0	40	0	1	3	3	4	0	175	19	194	78	26	34			138	376
07:45 AM	0	29	15	0	44	0	8	8	8	16	0	179	17	196	80	36	35			151	407
08:00 AM	0	36	17	0	53	0	3	15	18	18	0	165	18	183	65	32	30			127	381
08:15 AM	0	38	5	0	43	0	6	10	21	37	0	162	22	194	67	36	45			148	391
<b>Total Volume</b>	0	139	41	0	180	0	18	36	36	54	0	681	76	757	290	130	144			564	1555
<b>% App. Total</b>	0	77.2	22.8	0	9.6	0	33.3	66.7	66.7	7.5	0	90	10	9.6	51.4	23	25.5			9.34	955
<b>PHF</b>	.000	.914	.603	0	.849	.000	.563	.600	.600	.750	.000	.951	.864	.966	.906	.903	.800			.934	.955

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

# Wilson Okamoto Corporation

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

Counted By: GC, KW  
Counters: T-1841, D4-5673  
Weather: Clear

File Name : PiiWai PM  
Site Code : 00000001  
Start Date : 3/11/2015  
Page No : 1

### Groups Printed- Unshifted

Start Time	Piiwai Street Southbound				Ala Moana Ramp Westbound				Piiwai Street Northbound				Waimanu Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds					
	App. Total				App. Total				App. Total				App. Total								
03:00 PM	0	54	18	0	72	0	27	88	23	138	0	155	7	32	194	95	56	79	11	241	645
03:15 PM	0	62	15	0	77	0	26	53	37	116	0	172	16	38	226	92	58	69	10	229	648
03:30 PM	0	56	22	0	78	0	61	111	23	195	0	193	24	34	251	95	53	70	11	229	753
03:45 PM	0	70	9	0	79	0	28	51	29	108	0	182	18	32	232	91	59	53	14	217	636
<b>Total</b>	0	242	64	0	306	0	142	303	112	557	0	702	65	136	903	373	226	271	46	916	2682
04:00 PM	0	67	19	0	86	0	30	52	34	116	0	148	21	41	210	104	68	62	11	245	657
04:15 PM	0	68	14	0	82	0	22	45	28	95	0	165	19	43	227	100	63	58	10	231	635
04:30 PM	0	47	16	0	63	0	24	59	23	106	0	180	18	27	225	100	75	64	17	256	650
04:45 PM	0	75	19	0	94	0	21	48	34	103	0	193	22	32	247	104	72	62	32	270	714
<b>Total</b>	0	257	68	0	325	0	97	204	119	420	0	686	80	143	909	408	278	246	70	1002	2656
05:00 PM	0	61	16	0	77	0	38	77	56	171	0	191	15	52	258	104	81	70	18	273	779
05:15 PM	0	72	18	0	90	0	21	67	39	127	0	202	19	29	250	100	74	72	22	268	735
05:30 PM	0	57	5	0	62	0	29	80	21	130	0	170	21	36	227	101	66	60	15	242	661
05:45 PM	0	85	13	0	98	0	34	56	42	132	0	174	22	50	246	89	61	47	27	224	700
<b>Total</b>	0	275	52	0	327	0	122	280	158	560	0	737	77	167	981	394	282	249	82	1007	2875
<b>Grand Total</b>	0	774	184	0	958	0	361	787	389	1537	0	2125	222	446	2793	1175	786	766	198	2925	8213
<b>Approch % Total %</b>	0	80.8	19.2	0	11.7	0	23.5	51.2	25.3	18.7	0	76.1	7.9	16	34	40.2	26.9	26.2	6.8	35.6	

Start Time	Piiwai Street Southbound				Ala Moana Ramp Westbound				Piiwai Street Northbound				Waimanu Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds					
	App. Total				App. Total				App. Total				App. Total								
04:45 PM	0	75	19	0	94	0	21	48	77	146	0	193	22	54	215	104	72	62	238	616	
05:00 PM	0	61	16	0	77	0	38	77	56	171	0	191	15	52	258	104	81	70	18	273	779
05:15 PM	0	72	18	0	90	0	21	67	39	127	0	202	19	29	250	100	74	72	22	268	735
05:30 PM	0	57	5	0	62	0	29	80	21	130	0	170	21	36	227	101	66	60	15	242	661
05:45 PM	0	85	13	0	98	0	34	56	42	132	0	174	22	50	246	89	61	47	27	224	700
<b>Total</b>	0	275	52	0	327	0	122	280	158	560	0	737	77	167	981	394	282	249	82	1007	2875
<b>Grand Total</b>	0	774	184	0	958	0	361	787	389	1537	0	2125	222	446	2793	1175	786	766	198	2925	8213
<b>Approch % Total %</b>	0	80.8	19.2	0	11.7	0	23.5	51.2	25.3	18.7	0	76.1	7.9	16	34	40.2	26.9	26.2	6.8	35.6	

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

Total Volume	0	265	58	0	323	0	109	272	80	381	0	756	77	833	409	293	264	966	2503
% App. Total	0	82	18	0	85.9	0	28.6	71.4	25.3	25.0	0	90.8	9.2	27.3	42.3	30.3	27.3	94.7	958
PHF	.000	.883	.763	0	.859	.000	.717	.850	.828	.828	.000	.936	.875	.942	.983	.904	.917	.947	.958

# WILSON UKAMOTO CORPORATION

1907 S. Beretania Street, Suite 400

Honolulu, HI 96826

Counted By: PA, JC  
 Counters: D4-3889, D4-5677  
 Weather: Clear

File Name : KamKaw AM  
 Site Code : 00000004  
 Start Date : 3/12/2015  
 Page No : 1

Groups Printed- Unshifted

Start Time	Kamakee Street Southbound				Kawaiahao (Church Parking Lot / Commercial Parking Lot) Westbound				Kamakee Street Northbound				Kawaiahao Street Eastbound								
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	3	21	7	2	33	0	0	0	0	0	2	6	1	0	9	2	1	2	8	13	55
06:15 AM	0	25	4	1	30	1	0	0	0	1	2	4	0	0	6	2	3	3	6	14	51
06:30 AM	0	48	7	1	56	0	0	1	0	1	6	16	0	0	22	4	0	12	14	30	109
06:45 AM	0	45	10	2	57	0	0	0	0	0	1	12	3	0	16	7	0	4	7	18	91
<b>Total</b>	3	139	28	6	176	1	0	1	0	2	11	38	4	0	53	15	4	21	35	75	306
07:00 AM	1	46	11	0	58	0	0	1	0	1	8	17	0	0	25	11	0	14	15	40	124
07:15 AM	0	58	19	2	79	0	0	0	0	0	5	19	0	0	24	6	0	7	14	27	130
07:30 AM	0	56	18	1	75	0	0	2	0	2	5	20	3	0	28	11	0	12	10	33	138
07:45 AM	0	52	11	4	67	1	0	1	0	2	7	24	0	0	31	6	1	10	10	27	127
<b>Total</b>	1	212	59	7	279	1	0	4	0	5	25	80	3	0	108	34	1	43	49	127	519
08:00 AM	1	62	17	0	80	0	1	1	0	2	13	28	0	0	41	7	0	10	8	25	148
08:15 AM	1	59	10	0	70	1	0	1	0	2	9	20	1	0	36	6	0	9	16	31	133
08:30 AM	2	52	13	2	69	2	0	1	0	3	1	33	2	0	36	11	0	10	20	41	149
08:45 AM	3	53	23	2	81	0	1	1	0	2	7	36	1	0	44	8	1	7	12	28	155
<b>Total</b>	7	226	63	4	300	3	2	4	0	9	30	117	4	0	151	32	1	36	56	125	585
<b>Grand Total</b>	11	577	150	17	755	5	2	9	0	16	66	235	11	0	312	81	6	100	140	327	1410
Apprch %	1.5	76.4	19.9	2.3		31.2	12.5	56.2	0	1.1	21.2	75.3	3.5	0	22.1	24.8	1.8	30.6	42.8		
Total %	0.8	40.9	10.6	1.2	53.5	0.4	0.1	0.6	0	1.1	4.7	16.7	0.8	0	22.1	5.7	0.4	7.1	9.9	23.2	

Start Time	Kamakee Street Southbound				Kawaiahao (Church Parking Lot / Commercial Parking Lot) Westbound				Kamakee Street Northbound				Kawaiahao Street Eastbound								
	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
08:00 AM	1	62	17	0	80	0	1	1	0	2	13	28	0	0	41	7	0	10	8	25	148
08:15 AM	1	59	10	0	70	1	0	1	0	2	9	20	1	0	36	6	0	9	16	31	133
08:30 AM	2	52	13	2	69	2	0	1	0	3	1	33	2	0	36	11	0	10	20	41	149
08:45 AM	3	53	23	2	81	0	1	1	0	2	7	36	1	0	44	8	1	7	12	28	155
<b>Total</b>	7	226	63	4	300	3	2	4	0	9	30	117	4	0	151	32	1	36	56	125	585
<b>Grand Total</b>	11	577	150	17	755	5	2	9	0	16	66	235	11	0	312	81	6	100	140	327	1410
Apprch %	1.5	76.4	19.9	2.3		31.2	12.5	56.2	0	1.1	21.2	75.3	3.5	0	22.1	24.8	1.8	30.6	42.8		
Total %	0.8	40.9	10.6	1.2	53.5	0.4	0.1	0.6	0	1.1	4.7	16.7	0.8	0	22.1	5.7	0.4	7.1	9.9	23.2	

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1

Start Time	Kamakee Street Southbound				Kawaiahao (Church Parking Lot / Commercial Parking Lot) Westbound				Kamakee Street Northbound				Kawaiahao Street Eastbound								
	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
08:00 AM	1	62	17	0	80	0	1	1	0	2	13	28	0	0	41	7	0	10	8	25	140
08:15 AM	1	59	10	0	70	1	0	1	0	2	9	20	1	0	36	6	0	9	16	31	117
08:30 AM	2	52	13	2	67	2	0	1	0	3	1	33	2	0	36	11	0	10	20	41	127
08:45 AM	3	53	23	2	79	0	1	1	0	2	7	36	1	0	44	8	1	7	12	28	141
<b>Total Volume</b>	7	226	63	4	296	3	2	4	0	9	30	117	4	0	151	32	1	36	56	125	525
% App. Total	2.4	76.4	21.3			33.3	22.2	44.4			19.9	77.5	2.6			46.4	1.4	52.2			
PHF	.583	.911	.685		.750	.375	.500	1.00			.577	.813	.500			.727	.250	.900		.821	.931

# WILSON UKAMOTO CORPORATION

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

Counted By: PA, JC  
Counters: D4-3889, D4-5677  
Weather: Clear

File Name : KamKaw PM  
Site Code : 00000000  
Start Date : 3/12/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Kamakee Street Southbound				Kamakee Street (Church Parking Lot / Commercial Parking Lot) Westbound				Kamakee Street Northbound				Kawaiahao Street Eastbound				Int. Total				
	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	1	38	4	1	44	1	0	1	0	2	10	52	2	0	64	13	0	12	23	48	158
03:15 PM	2	53	9	2	66	1	0	3	0	4	3	43	1	0	47	6	1	12	26	45	162
03:30 PM	3	35	12	3	53	0	1	2	0	3	7	55	2	0	64	12	0	9	24	45	165
03:45 PM	1	28	9	1	39	3	0	0	0	3	9	72	3	0	84	12	0	12	23	47	173
Total	7	154	34	7	202	5	1	6	0	12	29	222	8	0	259	43	1	45	96	185	658
04:00 PM	1	27	13	2	43	3	0	1	0	4	15	63	5	0	83	8	1	12	19	40	170
04:15 PM	1	29	12	5	47	0	0	1	1	2	10	52	3	0	65	15	1	15	17	48	162
04:30 PM	0	42	20	0	62	1	0	2	0	3	10	62	2	0	74	17	1	22	24	64	203
04:45 PM	3	42	11	0	56	0	0	3	0	3	5	61	3	0	69	19	1	13	35	68	196
Total	5	140	56	7	208	4	0	7	1	12	40	238	13	0	291	59	4	62	95	220	731
05:00 PM	0	35	11	3	49	2	0	2	0	4	12	79	9	0	100	15	0	13	22	50	203
05:15 PM	3	35	15	2	55	0	0	2	0	2	4	65	3	0	72	16	0	20	18	54	183
05:30 PM	4	61	2	1	68	1	0	0	0	1	12	58	1	0	71	17	0	9	30	56	196
05:45 PM	1	50	3	4	58	0	0	0	0	0	14	55	5	0	74	11	0	8	18	37	169
Total	8	181	31	10	230	3	0	4	0	7	42	257	18	0	317	59	0	50	88	197	751
06:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4
Grand Total	20	475	121	24	640	12	1	17	1	31	111	717	39	0	867	161	5	157	283	606	2144
Approch %	3.1	74.2	18.9	3.8		38.7	3.2	54.8	3.2		12.8	82.7	4.5	0		26.6	0.8	25.9	46.7		
Total %	0.9	22.2	5.6	1.1	29.9	0.6	0	0.8	0	1.4	5.2	33.4	1.8	0	40.4	7.5	0.2	7.3	13.2	28.3	

Start Time	Kamakee Street Southbound				Kamakee Street (Church Parking Lot / Commercial Parking Lot) Westbound				Kamakee Street Northbound				Kawaiahao Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
04:30 PM	0	42	20		62	1	0	2		3	10	62	2		74	17	1	22		40	179
04:45 PM	3	42	11		56	0	0	3		3	5	61	3		69	19	1	13		33	161
05:00 PM	0	35	11		46	2	0	2		4	12	79	9		100	15	0	13		28	178
05:15 PM	3	35	15		53	0	0	2		2	4	65	3		72	16	0	20		36	163
Total Volume	6	154	57		217	3	0	9		12	31	267	17		315	67	2	68		137	681
% App. Total	2.8	71	26.3			25	0	75			9.8	84.8	5.4		.788	48.9	1.5	49.6			
PHF	.500	.917	.713		.875	.375	.000	.750		.750	.646	.845	.472		.788	.882	.500	.773		.856	.951

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



# Wilson Okamoto Corporation

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

Counted By: FC, AC

Counters: D4-5675, D4-5676

Weather: Clear

File Name : KamWai AM  
Site Code : 00000003  
Start Date : 3/12/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Kamakee Street Southbound						Waimanu Street Westbound						Kamakee Street Northbound						Waimanu Street Eastbound						
	Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		
06:00 AM	1	24	2	2	29		2	2	1	5	10		0	8	5	1	14		1	3	3	1	8		
06:15 AM	2	20	5	6	33		5	4	6	5	20		1	6	1	2	10		3	4	2	5	14		
06:30 AM	3	38	8	6	55		4	5	5	10	24		7	10	5	3	25		7	2	7	13	29		
06:45 AM	2	44	6	7	59		11	9	6	5	31		3	14	7	3	27		5	7	6	6	24		
<b>Total</b>	<b>8</b>	<b>126</b>	<b>21</b>	<b>21</b>	<b>176</b>		<b>22</b>	<b>20</b>	<b>18</b>	<b>25</b>	<b>85</b>		<b>11</b>	<b>38</b>	<b>18</b>	<b>9</b>	<b>76</b>		<b>16</b>	<b>16</b>	<b>18</b>	<b>25</b>	<b>75</b>		
07:00 AM	7	47	9	8	71		9	10	9	6	34		1	24	5	9	39		5	9	5	21	40		
07:15 AM	4	61	11	10	86		8	8	16	10	42		3	18	5	5	31		5	7	7	11	30		
07:30 AM	3	56	5	7	71		7	8	15	10	40		3	25	6	5	39		7	8	11	16	42		
07:45 AM	2	56	13	15	86		4	6	18	10	38		5	19	8	4	36		14	11	7	14	46		
<b>Total</b>	<b>16</b>	<b>220</b>	<b>38</b>	<b>40</b>	<b>314</b>		<b>28</b>	<b>32</b>	<b>58</b>	<b>36</b>	<b>154</b>		<b>12</b>	<b>86</b>	<b>24</b>	<b>23</b>	<b>145</b>		<b>31</b>	<b>35</b>	<b>30</b>	<b>62</b>	<b>158</b>		
08:00 AM	3	62	20	7	92		10	13	12	8	43		2	29	5	4	40		8	12	12	13	45		
08:15 AM	1	52	10	8	71		10	8	8	9	35		0	24	5	11	40		11	7	11	18	47		
08:30 AM	1	55	13	6	75		13	10	13	10	46		3	32	5	11	51		7	9	13	18	47		
08:45 AM	4	60	13	6	83		6	8	15	10	39		4	36	11	12	63		11	7	10	12	40		
<b>Total</b>	<b>9</b>	<b>229</b>	<b>56</b>	<b>27</b>	<b>321</b>		<b>39</b>	<b>39</b>	<b>48</b>	<b>37</b>	<b>163</b>		<b>9</b>	<b>121</b>	<b>26</b>	<b>38</b>	<b>194</b>		<b>37</b>	<b>35</b>	<b>46</b>	<b>61</b>	<b>179</b>		
<b>Grand Total</b>	<b>33</b>	<b>575</b>	<b>115</b>	<b>88</b>	<b>811</b>		<b>89</b>	<b>91</b>	<b>124</b>	<b>98</b>	<b>402</b>		<b>32</b>	<b>245</b>	<b>68</b>	<b>70</b>	<b>415</b>		<b>84</b>	<b>86</b>	<b>94</b>	<b>148</b>	<b>412</b>		
Approch %	4.1	70.9	14.2	10.9		22.1	22.6	30.8	24.4		7.7	59	16.4	16.9		20.4	20.9	22.8	35.9		20.4	20.9	22.8	35.9	
Total %	1.6	28.2	5.6	4.3	39.8		4.4	4.5	6.1	4.8	19.7		1.6	12	3.3	3.4	20.3		4.1	4.2	4.6	7.3	20.2		

Start Time	Kamakee Street Southbound						Waimanu Street Westbound						Kamakee Street Northbound						Waimanu Street Eastbound						
	Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		
08:00 AM	3	62	20	20	85		10	13	12	12	35		2	29	5	5	36		8	12	12	12	32		
08:15 AM	1	52	10	10	63		10	8	8	8	26		0	24	5	5	29		11	7	11	11	29		
08:30 AM	1	55	13	13	69		13	10	13	13	36		3	32	5	5	40		7	9	13	13	29		
08:45 AM	4	60	13	13	77		6	8	15	15	29		4	36	11	11	51		11	7	10	10	28		
Total Volume	9	229	56	56	294		39	39	48	48	126		9	121	26	26	156		37	35	46	46	118		
% App. Total	3.1	77.9	19	19		31	31	38.1	38.1		5.8	77.6	16.7	16.7		31.4	29.7	39	39		8.41	7.29	8.85	8.85	
PHF	.563	.923	.700	.700	.865		.750	.750	.800	.800	.875		.563	.840	.591	.591	.765		.841	.729	.885	.885	.922		

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

# Wilson Okamoto Corporation

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

Counted By: AC, FC  
Counters: D4-5676, D4-5675  
Weather: Clear

File Name : KamWai PM  
Site Code : 00000003  
Start Date : 3/12/2015  
Page No : 1

## Groups Printed - Unshifted

Start Time	Kamakee Street Southbound				Waimanu Street Westbound				Kamakee Street Northbound				Waimanu Street Eastbound				Int. Total				
	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	5	36	12	2	55	4	14	17	10	45	2	57	10	5	74	7	6	6	27	46	220
03:15 PM	4	47	4	10	65	9	11	15	19	54	5	38	5	6	54	11	7	9	33	60	233
03:30 PM	5	30	7	11	53	6	17	12	18	53	3	62	5	8	78	14	14	9	18	55	239
03:45 PM	6	24	16	4	50	7	16	7	5	35	6	66	6	8	86	15	8	10	18	51	222
<b>Total</b>	<b>20</b>	<b>137</b>	<b>39</b>	<b>27</b>	<b>223</b>	<b>26</b>	<b>58</b>	<b>51</b>	<b>52</b>	<b>187</b>	<b>16</b>	<b>223</b>	<b>26</b>	<b>27</b>	<b>292</b>	<b>47</b>	<b>35</b>	<b>34</b>	<b>96</b>	<b>212</b>	<b>914</b>
04:00 PM	8	26	5	8	47	6	17	26	11	60	5	51	13	3	72	13	12	7	23	55	234
04:15 PM	5	26	12	12	55	10	21	11	12	54	5	57	10	9	81	16	7	6	18	47	237
04:30 PM	5	35	9	11	60	13	11	14	7	45	6	62	7	10	85	23	13	13	26	75	265
04:45 PM	8	37	7	4	56	9	12	19	13	53	7	66	14	13	100	16	12	13	38	79	288
<b>Total</b>	<b>26</b>	<b>124</b>	<b>33</b>	<b>35</b>	<b>218</b>	<b>38</b>	<b>61</b>	<b>70</b>	<b>43</b>	<b>212</b>	<b>23</b>	<b>236</b>	<b>44</b>	<b>35</b>	<b>338</b>	<b>68</b>	<b>44</b>	<b>39</b>	<b>105</b>	<b>256</b>	<b>1024</b>
05:00 PM	7	29	11	12	59	10	15	22	8	55	6	80	5	6	97	20	16	9	30	75	286
05:15 PM	6	34	5	7	52	9	14	17	11	51	5	71	9	11	96	17	10	8	30	65	264
05:30 PM	8	56	21	5	90	7	14	11	6	38	3	59	9	6	77	10	8	6	25	49	254
05:45 PM	12	48	20	8	88	3	17	6	7	33	6	59	9	6	80	11	12	5	15	43	244
<b>Total</b>	<b>33</b>	<b>167</b>	<b>57</b>	<b>32</b>	<b>289</b>	<b>29</b>	<b>60</b>	<b>56</b>	<b>32</b>	<b>177</b>	<b>20</b>	<b>269</b>	<b>32</b>	<b>29</b>	<b>350</b>	<b>58</b>	<b>46</b>	<b>28</b>	<b>100</b>	<b>232</b>	<b>1048</b>
<b>Grand Total</b>	<b>79</b>	<b>428</b>	<b>129</b>	<b>94</b>	<b>730</b>	<b>93</b>	<b>179</b>	<b>177</b>	<b>127</b>	<b>576</b>	<b>59</b>	<b>728</b>	<b>102</b>	<b>91</b>	<b>980</b>	<b>173</b>	<b>125</b>	<b>101</b>	<b>301</b>	<b>700</b>	<b>2986</b>
<b>Approach %</b>	<b>10.8</b>	<b>58.6</b>	<b>17.7</b>	<b>12.9</b>		<b>16.1</b>	<b>31.1</b>	<b>30.7</b>	<b>22</b>		<b>6</b>	<b>74.3</b>	<b>10.4</b>	<b>9.3</b>		<b>24.7</b>	<b>17.9</b>	<b>14.4</b>	<b>43</b>		
<b>Total %</b>	<b>2.6</b>	<b>14.3</b>	<b>4.3</b>	<b>3.1</b>	<b>24.4</b>	<b>3.1</b>	<b>6</b>	<b>5.9</b>	<b>4.3</b>	<b>19.3</b>	<b>2</b>	<b>24.4</b>	<b>3.4</b>	<b>3</b>	<b>32.8</b>	<b>5.8</b>	<b>4.2</b>	<b>3.4</b>	<b>10.1</b>	<b>23.4</b>	

Start Time	Kamakee Street Southbound				Waimanu Street Westbound				Kamakee Street Northbound				Waimanu Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
04:30 PM	5	35	9	11	60	13	11	14	7	45	6	62	7	10	85	23	13	13	26	75	265
04:45 PM	8	37	7	4	56	9	12	19	13	53	7	66	14	13	100	16	12	13	38	79	288
05:00 PM	7	29	11	12	59	10	15	22	8	55	6	80	5	6	97	20	16	9	30	75	286
05:15 PM	6	34	5	7	52	9	14	17	11	51	5	71	9	11	96	17	10	8	30	65	264
<b>Total Volume</b>	<b>26</b>	<b>135</b>	<b>32</b>	<b>34</b>	<b>227</b>	<b>41</b>	<b>52</b>	<b>72</b>	<b>39</b>	<b>204</b>	<b>24</b>	<b>279</b>	<b>35</b>	<b>40</b>	<b>378</b>	<b>76</b>	<b>51</b>	<b>43</b>	<b>124</b>	<b>294</b>	<b>1103</b>
<b>% App. Total</b>	<b>11.5</b>	<b>59.5</b>	<b>14.1</b>	<b>15</b>		<b>20.1</b>	<b>25.5</b>	<b>35.3</b>	<b>19.1</b>		<b>6.3</b>	<b>73.8</b>	<b>9.3</b>	<b>10.6</b>		<b>25.9</b>	<b>17.3</b>	<b>14.6</b>	<b>42.2</b>		
<b>PHF</b>	<b>.813</b>	<b>.912</b>	<b>.727</b>	<b>.708</b>	<b>.946</b>	<b>.788</b>	<b>.867</b>	<b>.818</b>	<b>.750</b>	<b>.927</b>	<b>.857</b>	<b>.872</b>	<b>.625</b>	<b>.769</b>	<b>.945</b>	<b>.826</b>	<b>.797</b>	<b>.827</b>	<b>.816</b>	<b>.930</b>	<b>.957</b>

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

# Wilson Okamoto Corporation

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

Counted By: DY, CY  
Counters: D4-3888, D4-3890  
Weather: Clear

File Name : KamKon AM  
Site Code : 00000005  
Start Date : 3/12/2015  
Page No : 1

### Groups Printed- Unshifted

Start Time	Kamakee Street Southbound				Kona Street Westbound				Kamakee Street Northbound				Eastbound			
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	3	30	0	0	33	1	0	2	0	3	0	9	4	0	13	0
06:15 AM	0	28	0	1	29	3	0	1	2	6	0	13	0	0	13	0
06:30 AM	4	44	0	0	48	4	0	3	4	11	0	13	5	2	20	0
06:45 AM	6	49	0	3	58	3	0	2	1	6	0	18	4	0	22	0
<b>Total</b>	13	151	0	4	168	11	0	8	7	26	0	53	13	2	68	0
07:00 AM	5	55	0	2	62	3	0	1	5	9	0	33	6	1	40	0
07:15 AM	4	70	0	1	75	3	0	1	6	10	0	30	5	0	35	0
07:30 AM	1	58	0	0	59	7	0	2	8	17	0	39	8	0	47	0
07:45 AM	4	71	0	0	75	4	0	4	4	12	0	38	10	1	49	0
<b>Total</b>	14	254	0	3	271	17	0	8	23	48	0	140	29	2	171	0
08:00 AM	2	78	0	1	81	7	0	7	7	21	0	31	15	0	46	0
08:15 AM	2	57	0	0	59	6	0	8	2	16	0	33	10	0	43	0
08:30 AM	6	64	0	0	70	10	0	5	10	25	0	43	6	0	49	0
08:45 AM	4	69	0	0	73	10	0	9	6	25	0	48	10	0	58	0
<b>Total</b>	14	268	0	1	283	33	0	29	25	87	0	155	41	0	196	0
<b>Grand Total</b>	41	673	0	8	722	61	0	45	55	161	0	348	83	4	435	0
<b>Approch % Total %</b>	5.7	93.2	0	1.1		37.9	0	28	34.2		0	80	19.1	0.9		
	3.1	51.1	0	0.6	54.8	4.6	0	3.4	4.2	12.2	0	26.4	6.3	0.3	33	0

Start Time	Kamakee Street Southbound				Kona Street Westbound				Kamakee Street Northbound				Eastbound			
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
08:00 AM	2	78	0	0	80	7	0	7	7	14	0	31	15	0	46	0
08:15 AM	2	57	0	0	59	6	0	8	8	14	0	33	10	0	43	0
08:30 AM	6	64	0	0	70	10	0	5	10	19	0	48	6	0	58	0
08:45 AM	4	69	0	0	73	10	0	9	6	25	0	48	10	0	58	0
<b>Total Volume</b>	14	268	0	0	282	33	0	29	29	62	0	155	41	0	196	0
<b>% App. Total</b>	5	95	0	0		53.2	0	46.8	20.9		0	79.1	20.9	0		
<b>PHF</b>	.583	.859	.000	.000	.881	.825	.000	.806	.806	.816	.000	.807	.683	.845	.000	.900

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

# Wilson Okamoto Corporation

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

Counted By: CY, DY  
Counters: D4-3888, D4-3890  
Weather: Clear

File Name : KamKon PM  
Site Code : 00000005  
Start Date : 3/12/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Kamakee Street Southbound			Kona Street Westbound			Kamakee Street Northbound			Kona Street Eastbound			Int. Total							
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru		Right	Peds	App. Total				
03:00 PM	5	48	0	0	53	8	0	11	13	32	0	78	6	1	85	0	0	0	0	170
03:15 PM	5	43	0	1	49	10	0	5	16	31	0	56	10	1	67	0	0	0	0	147
03:30 PM	1	35	0	2	38	11	0	23	9	43	0	79	9	2	90	0	0	0	0	171
03:45 PM	4	30	0	1	35	14	0	24	12	50	0	75	3	0	78	0	0	0	0	163
<b>Total</b>	15	156	0	4	175	43	0	63	50	156	0	288	28	4	320	0	0	0	0	651
04:00 PM	1	20	0	1	22	15	0	18	11	44	0	90	10	2	102	0	0	0	0	168
04:15 PM	2	31	0	2	35	10	0	17	7	34	0	69	10	1	80	0	0	0	0	149
04:30 PM	3	32	0	0	35	21	0	25	2	48	0	71	12	0	83	0	0	0	0	166
04:45 PM	4	35	0	0	39	15	0	15	5	35	0	72	12	0	84	0	0	0	0	158
<b>Total</b>	10	118	0	3	131	61	0	75	25	161	0	302	44	3	349	0	0	0	0	641
05:00 PM	3	38	0	0	41	16	0	22	3	41	0	102	14	1	117	0	0	0	0	199
05:15 PM	1	38	0	0	39	10	0	19	5	34	0	87	15	2	104	0	0	0	0	177
05:30 PM	1	68	0	1	70	16	0	6	9	31	0	71	9	2	82	0	0	0	0	183
05:45 PM	2	69	0	0	71	7	0	17	3	27	0	71	7	3	81	0	0	0	0	179
<b>Total</b>	7	213	0	1	221	49	0	64	20	133	0	331	45	8	384	0	0	0	0	738
<b>Grand Total</b>	32	487	0	8	527	153	0	202	95	450	0	921	117	15	1053	0	0	0	0	2030
<b>Approach % Total %</b>	6.1	92.4	0	1.5	34	7.5	0	44.9	21.1	22.2	0	87.5	11.1	1.4	51.9	0	0	0	0	
	1.6	24	0	0.4	26			10	4.7			45.4	5.8	0.7						

Start Time	Kamakee Street Southbound			Kona Street Westbound			Kamakee Street Northbound			Kona Street Eastbound			Int. Total							
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru		Right	Peds	App. Total				
05:00 PM	3	38	0	0	41	16	0	22	3	41	0	102	14	1	117	0	0	0	0	199
05:15 PM	1	38	0	0	39	10	0	19	5	34	0	87	15	2	104	0	0	0	0	177
05:30 PM	1	68	0	1	70	16	0	6	9	31	0	71	9	2	82	0	0	0	0	183
05:45 PM	2	69	0	0	71	7	0	17	3	27	0	71	7	3	81	0	0	0	0	179
<b>Total Volume</b>	7	213	0	1	221	49	0	64	20	133	0	331	45	8	384	0	0	0	0	738
<b>% App. Total</b>	3.2	96.4	0	0.5	36.8	7.66	0	48.1	15	36.8	0	86.2	11.7	2.1	51.9	0	0	0	0	
<b>PHF</b>	.583	.772	.000	.250	.778	.766	.000	.727	.556	.811	.000	.811	.750	.667	.821	.000	.000	.000	.000	.927

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

# Wilson Okamoto Corporation

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

Counted By: R.J, JJ  
Counters: TU-0654, TU-0653  
Weather: Clear

File Name : KonPen AM  
Site Code : 00000002  
Start Date : 3/12/2015  
Page No : 1

### Groups Printed- Unshifted

Start Time	Pensacola Street Southbound				Kona Street Westbound				Pensacola Street Northbound				Kona Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
06:00 AM	9	69	3	0	81	3	1	0	1	5	0	0	0	0	0	1	0	0	2	3	89
06:15 AM	4	60	3	1	68	1	3	0	2	6	0	0	0	0	0	0	0	0	4	4	78
06:30 AM	9	99	3	0	111	4	2	0	1	7	0	0	0	0	0	0	0	0	2	2	120
06:45 AM	15	98	7	1	121	9	3	0	0	12	0	0	0	1	1	0	0	1	2	3	137
<b>Total</b>	<b>37</b>	<b>326</b>	<b>16</b>	<b>2</b>	<b>381</b>	<b>17</b>	<b>9</b>	<b>0</b>	<b>4</b>	<b>30</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>10</b>	<b>12</b>	<b>424</b>
07:00 AM	14	105	3	0	122	2	2	0	0	4	0	0	0	0	0	0	0	0	2	2	128
07:15 AM	12	125	5	2	144	11	3	0	2	16	0	0	0	0	0	0	1	3	4	8	168
07:30 AM	11	163	7	1	182	11	1	0	0	12	0	0	0	0	0	0	1	1	3	5	199
07:45 AM	14	171	8	0	193	13	3	0	3	19	0	0	1	1	1	0	3	2	11	16	229
<b>Total</b>	<b>51</b>	<b>564</b>	<b>23</b>	<b>3</b>	<b>641</b>	<b>37</b>	<b>9</b>	<b>0</b>	<b>5</b>	<b>51</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>5</b>	<b>6</b>	<b>20</b>	<b>31</b>	<b>724</b>
08:00 AM	14	212	5	3	234	18	2	0	0	20	0	0	0	0	0	0	1	5	5	11	265
08:15 AM	18	195	5	2	220	11	2	0	1	14	0	0	0	0	0	0	3	2	1	6	240
08:30 AM	15	184	3	0	202	18	2	0	3	23	0	0	1	1	1	0	2	3	5	10	236
08:45 AM	18	182	6	4	210	15	6	0	7	28	0	0	0	0	0	0	1	1	5	7	245
<b>Total</b>	<b>65</b>	<b>773</b>	<b>19</b>	<b>9</b>	<b>866</b>	<b>62</b>	<b>12</b>	<b>0</b>	<b>11</b>	<b>85</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>7</b>	<b>11</b>	<b>16</b>	<b>34</b>	<b>986</b>
<b>Grand Total</b>	<b>153</b>	<b>1663</b>	<b>58</b>	<b>14</b>	<b>1888</b>	<b>116</b>	<b>30</b>	<b>0</b>	<b>20</b>	<b>166</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>12</b>	<b>18</b>	<b>46</b>	<b>77</b>	<b>2134</b>
Apprch %	8.1	88.1	3.1	0.7		69.9	18.1	0	12		0	0	100	0.1	0.1	1.3	15.6	23.4	59.7		
Total %	7.2	77.9	2.7	0.7	88.5	5.4	1.4	0	0.9	7.8	0	0	0	0.1	0.1	0	0.6	0.8	2.2	3.6	

Start Time	Pensacola Street Southbound				Kona Street Westbound				Pensacola Street Northbound				Kona Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
08:00 AM	14	212	5		231	18	2	0	0	20	0	0	0	0	0	0	0	1	5	6	257
08:15 AM	18	195	5		218	11	2	0	0	13	0	0	0	0	0	0	3	2	2	5	236
08:30 AM	15	184	3		202	18	2	0	0	20	0	0	0	0	0	0	2	3	3	5	227
08:45 AM	18	182	6		206	15	6	0	0	21	0	0	0	0	0	0	1	1	1	2	229
Total Volume	65	773	19		857	62	12	0	0	74	0	0	0	0	0	0	7	11	18	18	949
% App. Total	7.6	90.2	2.2			83.8	16.2	0	0		0	0	0	0	0	0	38.9	61.1			
PHF	.903	.912	.792		.927	.861	.500	.000	.000	.881	.000	.000	.000	.000	.000	.000	.583	.550		.750	.923

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

# Wilson Okamoto Corporation

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

Counted By: RJ, JJ  
Counters: TU-0653, TU-0654  
Weather: Clear

File Name : KonPen PM  
Site Code : 00000002  
Start Date : 3/12/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Pensacola Street Southbound			Kona Street Westbound			Pensacola Street Northbound			Kona Street Eastbound			Int. Total								
	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right		Peds	App. Total						
03:00 PM	13	182	3	0	198	18	8	0	4	30	0	0	0	0	0	1	3	3	7	235	
03:15 PM	17	166	3	1	187	28	2	0	1	31	0	0	0	0	0	0	0	1	11	12	230
03:30 PM	17	194	9	0	220	23	7	0	11	41	0	0	3	3	0	2	4	5	11	275	
03:45 PM	19	196	12	1	228	16	8	0	3	27	0	0	2	2	0	3	2	6	11	268	
<b>Total</b>	66	738	27	2	833	85	25	0	19	129	0	0	5	5	0	6	10	25	41	1008	
04:00 PM	15	195	6	0	216	26	12	0	5	43	0	0	0	0	0	5	4	4	13	272	
04:15 PM	16	209	3	1	229	14	11	0	1	26	0	0	2	2	0	4	3	6	13	270	
04:30 PM	24	203	11	2	240	29	13	0	4	46	0	0	4	4	0	0	1	5	6	296	
04:45 PM	24	210	6	0	240	19	8	0	1	28	0	0	1	1	0	5	2	6	13	282	
<b>Total</b>	79	817	26	3	925	88	44	0	11	143	0	0	7	7	0	14	10	21	45	1120	
05:00 PM	24	204	5	2	235	27	9	0	1	37	0	0	1	1	0	2	1	9	12	285	
05:15 PM	22	212	2	1	237	20	6	0	1	27	0	0	0	0	0	4	2	7	13	277	
05:30 PM	14	202	9	3	228	22	6	0	1	29	0	0	0	0	0	2	5	6	13	270	
05:45 PM	22	180	6	0	208	18	5	0	5	28	0	0	0	0	0	3	1	9	13	249	
<b>Total</b>	82	798	22	6	908	87	26	0	8	121	0	0	1	1	0	11	9	31	51	1081	
<b>Grand Total</b>	227	2353	75	11	2666	260	95	0	38	393	0	0	13	13	0	31	29	77	137	3209	
Approch %	8.5	88.3	2.8	0.4		66.2	24.2	0	9.7		0	0	100	0.4	0	22.6	21.2	56.2			
Total %	7.1	73.3	2.3	0.3	83.1	8.1	3	0	1.2	12.2	0	0	0.4	0.4	0	1	0.9	2.4	4.3		

Start Time	Pensacola Street Southbound			Kona Street Westbound			Pensacola Street Northbound			Kona Street Eastbound			Int. Total							
	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right		Peds	App. Total					
04:30 PM	24	203	11	238	29	13	0	0	0	42	0	0	0	0	0	0	0	1	1	281
04:45 PM	24	210	6	240	19	8	0	0	0	27	0	0	0	0	0	5	2	7	7	274
05:00 PM	24	204	5	233	27	9	0	0	0	36	0	0	0	0	0	2	1	3	3	272
05:15 PM	22	212	2	236	20	6	0	0	0	26	0	0	0	0	0	4	2	6	6	268
Total Volume	94	829	24	947	95	36	0	0	0	131	0	0	0	0	0	11	6	17	17	1095
% App. Total	9.9	87.5	2.5		72.5	27.5	0	0	0		0	0	0	0	0	64.7	35.3			
PHF	.979	.978	.545	.986	.819	.692	.000	.000	.000	.780	.000	.000	.000	.000	.000	.550	.750	.607	.607	.974

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

# Wilson Okamoto Corporation

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

Counted By: GC, KW  
Counters: D4-5671, D4-5674  
Weather: Clear

File Name : KonPii AM  
Site Code : 00000001  
Start Date : 3/12/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Piiikoi Street Southbound			Kona Street Westbound			Piiikoi Street Northbound			Kona Street Eastbound			Int. Total								
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru		Right	Peds	App. Total					
06:00 AM	0	7	1	1	9	7	4	13	5	29	3	113	21	0	137	0	5	0	0	5	180
06:15 AM	0	9	0	0	9	10	3	7	9	29	4	107	25	0	136	0	5	0	0	5	179
06:30 AM	0	8	2	3	13	10	6	14	7	37	2	126	26	0	154	0	2	0	0	2	206
06:45 AM	0	16	2	3	21	5	10	10	5	30	4	141	44	0	189	0	4	1	1	6	246
<b>Total</b>	0	40	5	7	52	32	23	44	26	125	13	487	116	0	616	0	16	1	1	18	811
07:00 AM	0	10	3	7	20	14	3	18	12	47	1	210	29	0	240	0	3	2	8	13	320
07:15 AM	0	17	6	3	26	18	11	18	5	52	2	260	27	0	289	0	6	2	14	22	389
07:30 AM	0	17	1	8	26	14	9	23	11	57	1	233	37	0	271	0	8	0	6	14	368
07:45 AM	0	15	3	13	31	25	14	31	14	84	3	204	43	0	250	0	13	0	5	18	383
<b>Total</b>	0	59	13	31	103	71	37	90	42	240	7	907	136	0	1050	0	30	4	33	67	1460
08:00 AM	0	12	5	4	21	24	16	33	9	82	2	197	34	0	233	0	12	0	10	22	358
08:15 AM	0	19	3	4	26	24	11	28	12	75	4	216	41	0	261	0	19	1	4	24	386
08:30 AM	0	16	5	12	33	31	13	36	14	94	9	210	34	0	253	0	16	0	8	24	404
08:45 AM	0	16	6	11	33	27	14	24	16	81	6	203	39	0	248	0	18	2	11	31	393
<b>Total</b>	0	63	19	31	113	106	54	121	51	332	21	826	148	0	995	0	65	3	33	101	1541
<b>Grand Total</b>	0	162	37	69	268	209	114	255	119	697	41	2220	400	0	2661	0	111	8	67	186	3812
<b>Apprch % Total %</b>	0	60.4	13.8	25.7	7	30	16.4	36.6	17.1	18.3	1.5	83.4	15	0	69.8	0	59.7	4.3	36	4.9	
	0	4.2	1	1.8		5.5	3	6.7	3.1		1.1	58.2	10.5	0		0	2.9	0.2	1.8		

Start Time	Piiikoi Street Southbound			Kona Street Westbound			Piiikoi Street Northbound			Kona Street Eastbound			Int. Total								
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru		Right	Peds	App. Total					
08:00 AM	0	12	5	5	17	24	16	33	33	73	2	197	34	0	233	0	12	0	12	12	335
08:15 AM	0	19	3	3	22	24	11	28	28	63	4	216	41	0	261	0	19	1	1	20	366
08:30 AM	0	16	5	5	21	31	13	36	36	80	9	210	34	0	253	0	16	0	8	16	370
08:45 AM	0	16	6	6	22	27	14	24	24	65	6	203	39	0	248	0	18	2	2	20	355
<b>Total Volume</b>	0	63	19	19	82	106	54	121	121	281	21	826	148	0	995	0	65	3	3	68	1426
<b>% App. Total</b>	0	76.8	23.2			37.7	19.2	43.1			2.1	83	14.9	0	95.6	0	95.6	4.4			
<b>PHF</b>	.000	.829	.792		.932	.855	.844	.840		.878	.583	.956	.902		.953	.000	.855	.375		.850	.964

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

# Wilson Okamoto Corporation

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

Counted By: GC, KKW  
Counters: D4-5671, D4-5674  
Weather: Clear

File Name : KonPii PM  
Site Code : 00000001  
Start Date : 3/12/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Piiikoi Street Southbound			Kona Street Westbound			Piiikoi Street Northbound			Kona Street Eastbound			Int. Total					
	Left	Thru	Right	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total
03:00 PM	0	35	3	27	61	21	151	3	246	16	0	265	0	5	5	21	31	497
03:15 PM	0	32	6	18	67	28	148	6	268	32	0	306	0	17	1	23	41	561
03:30 PM	0	31	9	29	62	35	180	2	274	33	0	309	0	24	3	18	45	590
03:45 PM	0	39	2	9	48	20	116	5	335	36	0	376	0	11	4	9	24	574
<b>Total</b>	0	137	20	83	238	104	595	16	1123	117	0	1256	0	57	13	71	141	2222
04:00 PM	0	18	7	25	69	24	174	4	257	23	0	284	0	20	2	8	30	522
04:15 PM	0	40	3	25	50	21	141	9	295	30	0	334	0	16	4	15	35	576
04:30 PM	0	23	7	27	55	29	151	9	271	19	0	299	0	22	3	8	33	524
04:45 PM	0	29	3	21	73	38	175	2	286	36	0	324	0	26	3	20	49	595
<b>Total</b>	0	110	20	98	247	112	641	24	1109	108	0	1241	0	84	12	51	147	2217
05:00 PM	0	45	8	33	54	29	162	7	260	25	0	292	0	29	3	23	55	586
05:15 PM	0	29	4	21	43	22	125	2	317	28	0	347	0	27	1	20	48	569
05:30 PM	0	39	2	25	58	19	138	5	307	24	0	336	0	18	4	31	53	580
05:45 PM	0	42	5	17	45	36	140	2	309	25	0	336	0	18	2	12	32	572
<b>Total</b>	0	155	19	96	200	106	565	16	1193	102	0	1311	0	92	10	86	188	2307
<b>Grand Total</b>	0	402	59	277	685	322	1801	56	3425	327	0	3808	0	233	35	208	476	6746
<b>Approch % Total %</b>	0	60.8	8.9	15.4	38	17.9	26.7	1.5	89.9	8.6	0	56.4	0	48.9	7.4	43.7	7.1	
	0	6	0.9	4.1	10.2	4.8	26.7	0.8	50.8	4.8	0	56.4	0	3.5	0.5	3.1	7.1	

Start Time	Piiikoi Street Southbound			Kona Street Westbound			Piiikoi Street Northbound			Kona Street Eastbound			Int. Total				
	Left	Thru	Right	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds
04:45 PM	0	29	3	43	21	73	137	2	286	36	0	324	0	26	3	29	522
05:00 PM	0	45	8	46	33	54	133	7	260	25	0	292	0	29	3	32	510
05:15 PM	0	29	4	39	21	43	103	2	317	28	0	347	0	27	1	28	511
05:30 PM	0	39	2	36	25	58	119	5	307	24	0	336	0	18	4	22	518
<b>Total Volume</b>	0	142	17	164	100	228	492	16	1170	113	0	1299	0	100	11	111	2061
<b>% App. Total</b>	0	89.3	10.7	33.3	20.3	46.3	8.7	1.2	90.1	8.7	0	936	0	90.1	9.9	8.68	.987
<b>PHF</b>	.000	.789	.531	.891	.758	.781	.898	.571	.923	.785	.000	.936	.000	.862	.688	.867	.987

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



# Wilson Okamoto Corporation

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

Counted By: DY, TO  
Counters: D4-5676, D4-5675  
Weather: Clear

File Name : KapCoo AM  
Site Code : 00000003  
Start Date : 4/7/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Cooke Street Southbound				Kapiolani Boulevard Westbound				Cooke Street Northbound				Kapiolani Boulevard Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
06:00 AM	0	1	1	4	6	25	76	13	7	121	0	14	3	10	27	0	60	10	6	76	230
06:15 AM	1	3	2	7	13	51	70	24	13	158	3	23	1	14	41	0	73	10	6	89	301
06:30 AM	0	6	3	14	23	75	111	51	18	255	5	31	6	12	54	0	88	14	15	117	449
06:45 AM	0	11	7	7	25	105	140	41	11	297	7	38	5	8	58	0	93	20	9	122	502
<b>Total</b>	<b>1</b>	<b>21</b>	<b>13</b>	<b>32</b>	<b>67</b>	<b>256</b>	<b>397</b>	<b>129</b>	<b>49</b>	<b>831</b>	<b>15</b>	<b>106</b>	<b>15</b>	<b>44</b>	<b>180</b>	<b>0</b>	<b>314</b>	<b>54</b>	<b>36</b>	<b>404</b>	<b>1482</b>
07:00 AM	0	5	0	4	9	111	175	32	9	327	13	22	1	19	55	0	112	17	14	143	534
07:15 AM	1	8	2	3	14	116	222	42	13	393	13	42	9	11	75	0	116	23	18	157	639
07:30 AM	2	9	1	13	25	122	236	53	12	423	13	45	10	14	82	0	148	24	18	190	720
07:45 AM	3	19	5	9	36	122	230	57	12	421	8	49	12	13	82	0	144	28	19	191	730
<b>Total</b>	<b>6</b>	<b>41</b>	<b>8</b>	<b>29</b>	<b>84</b>	<b>471</b>	<b>863</b>	<b>184</b>	<b>46</b>	<b>1564</b>	<b>47</b>	<b>158</b>	<b>32</b>	<b>57</b>	<b>294</b>	<b>0</b>	<b>520</b>	<b>92</b>	<b>69</b>	<b>681</b>	<b>2623</b>
08:00 AM	2	10	8	2	22	105	219	51	17	392	9	32	9	13	63	0	188	25	6	219	696
08:15 AM	4	12	1	5	22	123	168	50	9	350	21	48	6	7	82	0	128	27	28	183	637
08:30 AM	4	21	3	2	30	100	120	28	11	259	8	35	13	12	68	0	129	36	7	172	529
08:45 AM	3	5	3	10	21	66	106	19	11	202	10	35	23	9	77	0	103	22	8	133	433
<b>Total</b>	<b>13</b>	<b>48</b>	<b>15</b>	<b>19</b>	<b>95</b>	<b>394</b>	<b>613</b>	<b>148</b>	<b>48</b>	<b>1203</b>	<b>48</b>	<b>150</b>	<b>51</b>	<b>41</b>	<b>290</b>	<b>0</b>	<b>548</b>	<b>110</b>	<b>49</b>	<b>707</b>	<b>2295</b>
<b>Grand Total</b>	<b>20</b>	<b>110</b>	<b>36</b>	<b>80</b>	<b>246</b>	<b>1121</b>	<b>1873</b>	<b>461</b>	<b>143</b>	<b>3598</b>	<b>110</b>	<b>414</b>	<b>98</b>	<b>142</b>	<b>764</b>	<b>0</b>	<b>1382</b>	<b>256</b>	<b>154</b>	<b>1792</b>	<b>6400</b>
Approch %	8.1	44.7	14.6	32.5		31.2	52.1	12.8	4		14.4	54.2	12.8	18.6		0	77.1	14.3	8.6		
Total %	0.3	1.7	0.6	1.2	3.8	17.5	29.3	7.2	2.2	56.2	1.7	6.5	1.5	2.2	11.9	0	21.6	4	2.4	28	

Start Time	Cooke Street Southbound				Kapiolani Boulevard Westbound				Cooke Street Northbound				Kapiolani Boulevard Eastbound				Int. Total			
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds
07:15 AM	1	8	2	2	11	116	222	42	9	380	13	42	9	9	64	0	116	23	139	594
07:30 AM	2	9	1	1	12	122	236	53	10	411	13	45	10	10	68	0	148	24	172	663
07:45 AM	3	19	5	5	27	122	230	57	12	409	8	49	12	12	69	0	144	28	172	677
08:00 AM	2	10	8	8	20	105	219	51	9	375	9	32	9	9	50	0	188	25	213	658
Total Volume	8	46	16	16	70	465	907	203	40	1575	43	168	40	40	251	0	596	100	696	2592
% App. Total	11.4	65.7	22.9	22.9		29.5	57.6	12.9	15.9		17.1	66.9	15.9	14.4		0	85.6	14.4		
PHF	.667	.605	.500	.500	.648	.953	.961	.890	.833	.958	.827	.857	.833	.893	.909	.000	.793	.893	.817	.957

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

# Wilson Okamoto Corporation

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

Counted By: DY, EV  
Counters: D4-5676, D4-5675  
Weather: Clear

File Name : KapCoo PM  
Site Code : 00000003  
Start Date : 4/7/2015  
Page No : 1

## Groups Printed: Unshifted

Start Time	Cooke Street Southbound				Kapiolani Boulevard Westbound				Cooke Street Northbound				Kapiolani Boulevard Eastbound				Int. Total				
	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	5	11	3	5	24	41	132	27	16	216	22	56	20	10	108	3	174	22	4	203	551
03:15 PM	0	5	5	4	14	74	171	30	12	287	8	56	17	16	97	1	210	16	9	236	634
03:30 PM	0	9	8	19	36	66	277	27	14	384	13	54	25	19	111	2	228	18	17	265	796
03:45 PM	1	6	14	7	28	74	196	26	15	311	13	64	45	12	134	2	252	19	17	290	763
Total	6	31	30	35	102	255	776	110	57	1198	56	230	107	57	450	8	864	75	47	994	2744
04:00 PM	2	7	7	6	22	76	210	36	26	348	19	62	38	16	135	2	277	14	23	316	821
04:15 PM	4	14	4	9	31	74	190	28	15	307	22	71	27	35	155	1	264	26	10	301	794
04:30 PM	4	13	8	8	33	72	210	38	24	344	20	81	54	24	179	1	324	8	27	360	916
04:45 PM	9	16	8	12	45	79	219	26	11	335	17	63	60	19	159	2	292	25	18	337	876
Total	19	50	27	35	131	301	829	128	76	1334	78	277	179	94	628	6	1157	73	78	1314	3407
05:00 PM	3	14	6	7	30	68	216	28	32	344	27	81	50	31	189	0	338	17	18	373	936
05:15 PM	3	11	11	9	34	75	167	32	11	285	23	71	42	36	172	1	301	25	6	333	824
05:30 PM	3	7	5	4	19	32	184	21	23	260	14	72	22	25	133	1	315	17	9	342	754
05:45 PM	3	2	5	6	16	51	121	18	6	196	12	59	26	15	112	1	242	20	9	272	596
Total	12	34	27	26	99	226	688	99	72	1085	76	283	140	107	606	3	1196	79	42	1320	3110
Grand Total	37	115	84	96	332	782	2293	337	205	3617	210	790	426	258	1684	17	3217	227	167	3628	9261
Approch %	11.1	34.6	25.3	28.9	3.6	21.6	63.4	9.3	5.7	12.5	46.9	25.3	15.3	18.2	0.5	88.7	6.3	4.6	1.8	39.2	
Total %	0.4	1.2	0.9	1	3.6	8.4	24.8	3.6	2.2	39.1	2.3	8.5	4.6	2.8	18.2	0.2	34.7	2.5	1.8		

Start Time	Cooke Street Southbound				Kapiolani Boulevard Westbound				Cooke Street Northbound				Kapiolani Boulevard Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
04:30 PM	4	13	8	8	25	72	210	38	54	320	20	81	54	54	155	1	324	8	8	333	833
04:45 PM	9	16	8	8	33	79	219	26	60	324	17	63	60	60	140	2	292	25	25	319	816
05:00 PM	3	14	6	6	23	68	216	28	50	312	27	81	50	50	158	0	338	17	17	355	848
05:15 PM	3	11	11	11	25	75	167	32	42	274	23	71	42	42	136	1	301	25	25	327	762
Total Volume	19	54	33	33	106	294	812	124	206	1230	87	296	206	206	589	4	1255	75	75	1334	3259
% App. Total	17.9	50.9	31.1	31.1	8.03	23.9	66	10.1	35	35.3	14.8	50.3	35	35	9.32	0.3	94.1	5.6	5.6	93.9	96.1
PHF	.528	.844	.750	.750	.803	.930	.927	.816	.816	.949	.806	.914	.858	.858	.932	.500	.928	.750	.750	.939	.961

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

# Wilson Okamoto Corporation

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

Counted By: GC, KW  
Counters: TU-0654, TU-0652  
Weather: Clear

File Name : KapWar AM  
Site Code : 00000002  
Start Date : 4/7/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Ward Avenue Southbound						Kapiolani Boulevard Westbound						Ward Avenue Northbound						Kapiolani Boulevard Eastbound						
	Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		
	06:00 AM	15	103	11	5	134		23	88	6	5	122		17	32	8	14	71		0	46	14	10	70	
06:15 AM	26	141	25	15	207		21	100	16	15	152		24	53	13	16	106		0	56	17	7	80		545
06:30 AM	32	148	18	16	214		45	198	19	15	277		25	63	5	12	105		0	74	8	13	95		691
06:45 AM	28	140	27	18	213		66	224	13	13	316		27	67	13	13	120		0	84	18	7	109		758
<b>Total</b>	101	532	81	54	768		155	610	54	48	867		93	215	39	55	402		0	260	57	37	354		2391
07:00 AM	18	137	14	17	186		61	277	16	15	369		26	88	23	25	162		0	92	17	7	116		833
07:15 AM	30	146	25	12	213		69	322	16	23	430		37	112	6	18	173		0	100	21	17	138		954
07:30 AM	25	150	21	19	215		80	364	12	18	474		33	92	14	19	158		0	128	26	14	168		1015
07:45 AM	30	192	35	24	281		73	351	24	38	486		27	101	14	20	162		0	138	21	18	177		1106
<b>Total</b>	103	625	95	72	895		283	1314	68	94	1759		123	393	57	82	655		0	458	85	56	599		3908
08:00 AM	36	166	29	16	247		90	318	29	31	468		27	89	12	14	142		0	146	29	9	184		1041
08:15 AM	40	170	27	11	248		63	270	20	14	367		36	92	18	16	162		0	133	34	10	177		954
08:30 AM	45	165	17	11	238		65	194	15	15	289		35	85	23	19	162		0	122	27	7	156		845
08:45 AM	45	184	13	11	253		70	153	22	8	259		25	84	21	9	139		0	99	22	2	123		768
<b>Total</b>	166	685	86	49	986		288	935	86	68	1377		123	350	74	58	605		0	500	112	28	640		3608
<b>Grand Total</b>	370	1842	262	175	2649		726	2859	208	210	4003		339	958	170	195	1662		0	1218	254	121	1593		9907
Approch %	14	69.5	9.9	6.6			18.1	71.4	5.2	5.2		20.4	57.6	10.2	11.7				0	76.5	15.9	7.6			
Total %	3.7	18.6	2.6	1.8	26.7		7.3	28.9	2.1	2.1	40.4		3.4	9.7	1.7	2	16.8		0	12.3	2.6	1.2	16.1		

Start Time	Ward Avenue Southbound						Kapiolani Boulevard Westbound						Ward Avenue Northbound						Kapiolani Boulevard Eastbound						
	Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		
	07:30 AM	25	150	21		196		80	364	12		456		33	92	14		139		0	128	26		154	
07:45 AM	30	192	35		257		73	351	24		448		27	101	14		142		0	138	21		159		1006
08:00 AM	36	166	29		231		90	318	29		437		27	89	12		128		0	146	29		175		971
08:15 AM	40	170	27		237		63	270	20		353		36	92	18		146		0	133	34		167		903
Total Volume	131	678	112		921		306	1303	85		1694		123	374	58		555		0	545	110		655		3825
% App. Total	14.2	73.6	12.2				18.1	76.9	5				22.2	67.4	10.5				0	83.2	16.8				
PHF	.819	.883	.800		.896		.850	.895	.733		.929		.854	.926	.806		.950		.000	.933	.809		.936		.951

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

# Wilson Okamoto Corporation

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

Counted By: GC, KW  
Counters: TU-0652, TU-0654  
Weather: Clear

File Name : KapWar PM  
Site Code : 00000002  
Start Date : 4/7/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Ward Avenue Southbound				Kapiolani Boulevard Westbound				Ward Avenue Northbound				Kapiolani Boulevard Eastbound				Int. Total				
	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	54	155	14	7	230	51	153	30	13	247	36	146	30	8	220	0	166	37	5	208	905
03:15 PM	39	154	15	20	228	31	225	34	19	309	38	166	38	11	253	0	200	33	7	240	1030
03:30 PM	66	149	31	21	267	0	305	36	30	371	35	160	42	29	266	0	210	47	4	261	1165
03:45 PM	56	189	21	14	280	0	237	29	11	277	39	182	51	18	290	0	247	47	8	302	1149
<b>Total</b>	215	647	81	62	1005	82	920	129	73	1204	148	654	161	66	1029	0	823	164	24	1011	4249
04:00 PM	60	128	15	14	217	0	267	35	14	316	45	143	57	20	265	0	280	41	5	326	1124
04:15 PM	60	155	24	26	265	0	234	32	20	286	37	153	62	23	275	0	253	44	15	312	1138
04:30 PM	53	160	22	18	253	0	254	25	28	307	47	131	65	32	275	0	338	46	14	398	1233
04:45 PM	60	214	20	15	309	0	272	31	24	327	34	160	64	25	283	0	329	37	12	378	1297
<b>Total</b>	233	657	81	73	1044	0	1027	123	86	1236	163	587	248	100	1098	0	1200	168	46	1414	4792
05:00 PM	62	171	14	17	264	0	258	31	27	316	40	159	66	29	294	0	361	30	16	407	1281
05:15 PM	61	191	27	15	294	0	224	30	26	280	30	174	64	29	297	0	307	38	17	362	1233
05:30 PM	73	157	35	13	278	47	157	24	28	256	48	124	52	33	257	0	299	43	4	346	1137
05:45 PM	62	181	25	15	283	62	145	27	25	259	17	153	48	27	245	0	240	33	10	283	1070
<b>Total</b>	258	700	101	60	1119	109	784	112	106	1111	135	610	230	118	1093	0	1207	144	47	1398	4721
<b>Grand Total</b>	706	2004	263	195	3168	191	2731	364	265	3551	446	1851	639	284	3220	0	3230	476	117	3823	13762
Approach %	22.3	63.3	8.3	6.2		5.4	76.9	10.3	7.5		13.9	57.5	19.8	8.8		0	84.5	12.5	3.1		
Total %	5.1	14.6	1.9	1.4	23	1.4	19.8	2.6	1.9	25.8	3.2	13.5	4.6	2.1	23.4	0	23.5	3.5	0.9	27.8	

Start Time	Ward Avenue Southbound				Kapiolani Boulevard Westbound				Ward Avenue Northbound				Kapiolani Boulevard Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
04:30 PM	53	160	22		235	0	254	25		279	47	131	65		243	0	338	46		384	1141
04:45 PM	60	214	20		294	0	272	31		303	34	160	64		258	0	329	37		366	1221
05:00 PM	62	171	14		247	0	258	31		289	40	159	66		265	0	361	30		391	1192
05:15 PM	61	191	27		279	0	224	30		254	30	174	64		268	0	307	38		345	1146
Total Volume	236	736	83		1055	0	1008	117		1125	151	624	259		1034	0	1335	151		1486	4700
% App. Total	22.4	69.8	7.9			0	89.6	10.4			14.6	60.3	25			0	89.8	10.2			
PHF	.952	.860	.769		.897	.000	.926	.944		.928	.803	.897	.981		.965	.000	.925	.821		.950	.962

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

# Wilson Okamoto Corporation

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

Counted By: AC, PA  
Counters: D4-3890, D4-5674  
Weather: Clear

File Name : KapKam AM  
Site Code : 00000001  
Start Date : 4/7/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Southbound			Kapiolani Boulevard Westbound			Kamae Street Northbound			Kapiolani Boulevard Eastbound			App. Total	Peds	Int. Total		
	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left				Thru	Right
06:00 AM	0	20	111	0	3	134	5	0	6	7	18	0	57	14	6	77	229
06:15 AM	0	30	137	0	4	171	5	0	12	8	25	0	80	13	4	97	293
06:30 AM	0	38	236	0	2	276	8	0	7	6	21	0	94	14	16	124	421
06:45 AM	0	29	301	0	0	330	10	0	17	5	32	0	118	5	10	133	495
Total	0	117	785	0	9	911	28	0	42	26	96	0	349	46	36	431	1438
07:00 AM	0	54	328	0	3	385	16	2	15	9	42	0	127	7	21	155	582
07:15 AM	0	46	390	0	3	439	22	0	17	11	50	0	120	16	38	174	663
07:30 AM	0	51	422	0	2	475	8	0	22	6	36	0	156	6	52	214	725
07:45 AM	0	50	449	0	6	505	22	0	17	13	52	0	168	16	67	251	808
Total	0	201	1589	0	14	1804	68	2	71	39	180	0	571	45	178	794	2778
08:00 AM	0	57	419	0	5	481	18	0	16	13	47	0	173	15	61	249	777
08:15 AM	0	52	333	0	10	395	19	0	29	11	59	0	176	16	50	242	696
08:30 AM	0	45	256	0	4	305	18	0	25	13	56	0	174	11	14	199	560
08:45 AM	0	52	223	0	7	282	20	0	28	12	60	0	138	21	9	168	510
Total	0	206	1231	0	26	1463	75	0	98	49	222	0	661	63	134	858	2543
Grand Total	0	524	3605	0	49	4178	171	2	211	114	498	0	1581	154	348	2083	6759
Approch %	0	12.5	86.3	0	1.2	61.8	34.3	0.4	42.4	22.9	7.4	0	75.9	7.4	16.7	30.8	
Total %	0	7.8	53.3	0	0.7	61.8	2.5	0	3.1	1.7	7.4	0	23.4	2.3	5.1		

Start Time	Southbound			Kapiolani Boulevard Westbound			Kamae Street Northbound			Kapiolani Boulevard Eastbound			App. Total	Peds	Int. Total	
	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left				Thru
07:30 AM	0	51	422	0	0	473	8	0	0	22	30	0	156	6	162	665
07:45 AM	0	50	449	0	0	499	22	0	17	17	39	0	168	16	184	722
08:00 AM	0	57	419	0	0	476	18	0	16	16	34	0	173	15	188	698
08:15 AM	0	52	333	0	0	385	19	0	29	29	48	0	176	16	192	625
Total Volume	0	210	1623	0	84	1833	67	0	84	84	151	0	673	53	726	2710
% App. Total	0	11.5	88.5	0	0	61.8	44.4	0	55.6	7.24	7.86	0	92.7	7.3	30.8	938
PHF	.000	.921	.904	.000	.000	.918	.761	.000	.724	.828	.945	.000	.956	.828	.945	.938

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

# Wilson Okamoto Corporation

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

Counted By: AC, PA  
Counters: D4-3890, D4-5674  
Weather: Clear

File Name : KapKam PM  
Site Code : 00000001  
Start Date : 4/7/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Southbound			Kapiolani Boulevard Westbound			Kamakee Street Northbound			Kapiolani Boulevard Eastbound			App. Total	Peds	Int. Total		
	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left				Thru	Right
03:00 PM	0	44	221	0	8	273	15	0	41	23	79	0	213	31	51	295	647
03:15 PM	0	17	266	0	5	288	23	0	63	18	104	0	257	32	27	316	708
03:30 PM	0	0	300	0	3	303	38	0	67	18	123	0	233	35	22	290	716
03:45 PM	0	0	233	0	6	239	34	0	62	23	119	0	312	42	41	395	753
Total	0	61	1020	0	22	1103	110	0	233	82	425	0	1015	140	141	1296	2824
04:00 PM	0	0	270	0	4	274	29	0	65	23	117	0	383	31	15	429	820
04:15 PM	0	0	231	0	4	235	34	0	70	18	122	0	347	29	36	412	769
04:30 PM	0	0	236	0	7	243	39	0	67	33	139	0	438	36	30	504	886
04:45 PM	0	0	265	0	11	276	37	0	79	31	147	0	426	44	38	508	931
Total	0	0	1002	0	26	1028	139	0	281	105	525	0	1594	140	119	1853	3406
05:00 PM	0	0	251	0	8	259	34	0	94	25	153	0	468	41	31	540	952
05:15 PM	0	0	232	0	2	234	39	0	67	21	127	0	407	52	35	494	855
05:30 PM	0	37	195	0	2	234	29	0	70	23	122	0	350	44	42	436	792
05:45 PM	0	42	196	0	3	241	38	0	55	21	114	0	339	26	42	407	762
Total	0	79	874	0	15	968	140	0	286	90	516	0	1564	163	150	1877	3361
Grand Total	0	140	2896	0	63	3099	389	0	800	277	1466	0	4173	443	410	5026	9591
Approch %	0	4.5	93.4	0	2	32.3	26.5	0	54.6	18.9	15.3	0	83	8.8	8.2	52.4	
Total %	0	1.5	30.2	0	0.7	32.3	4.1	0	8.3	2.9	15.3	0	43.5	4.6	4.3	52.4	

Start Time	Southbound			Kapiolani Boulevard Westbound			Kamakee Street Northbound			Kapiolani Boulevard Eastbound			App. Total	Peds	Int. Total	
	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left				Thru
04:30 PM	0	0	0	236	0	236	39	0	0	67	106	0	438	36	474	816
04:45 PM	0	0	0	265	0	265	37	0	79	79	116	0	426	44	470	851
05:00 PM	0	0	0	251	0	251	34	0	94	94	128	0	468	41	509	888
05:15 PM	0	0	0	232	0	232	39	0	67	67	106	0	407	52	459	797
Total Volume	0	0	0	984	0	984	149	0	307	307	456	0	1739	173	1912	3352
% App. Total	.000	.000	.000	.928	.000	.928	.955	.000	.816	.816	.891	.000	.929	.832	.939	.944

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

# Wilson Okamoto Corporation

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

Counted By: RJ, JJ  
Counters: TU-0649, TU-0651  
Weather: Clear

File Name : KapPen AM  
Site Code : 00000004  
Start Date : 4/7/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Pensacola Street Southbound				Kapiolani Boulevard Westbound				Pensacola Street Northbound				Kapiolani Boulevard Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
06:00 AM	22	71	24	5	122	7	102	0	0	109	0	0	0	5	5	0	53	8	3	64	300
06:15 AM	33	82	14	3	132	2	158	0	0	160	0	0	13	13	13	0	76	11	7	94	399
06:30 AM	28	101	8	8	145	8	272	0	0	280	0	0	8	8	8	0	84	18	9	111	544
06:45 AM	34	88	5	12	139	11	336	0	0	347	0	0	4	4	4	0	100	29	5	134	624
Total	117	342	51	28	538	28	868	0	0	896	0	0	30	30	30	0	313	66	24	403	1867
07:00 AM	34	90	13	11	148	12	372	0	0	384	0	0	10	10	10	0	119	23	7	149	691
07:15 AM	43	122	7	16	188	20	419	0	0	439	0	0	7	7	7	0	113	24	10	147	781
07:30 AM	72	155	18	10	255	22	461	0	0	483	0	0	10	10	10	0	154	23	3	180	928
07:45 AM	54	165	56	9	284	22	470	0	0	492	0	0	13	13	13	0	155	35	3	193	982
Total	203	532	94	46	875	76	1722	0	0	1798	0	0	40	40	40	0	541	105	23	669	3382
08:00 AM	65	181	67	11	324	21	414	0	0	435	0	0	6	6	6	0	167	31	15	213	978
08:15 AM	58	169	23	15	265	25	362	0	0	387	0	0	12	12	12	0	168	34	12	214	878
08:30 AM	67	176	39	10	292	19	241	0	0	260	0	0	12	12	12	0	155	43	5	203	767
08:45 AM	73	205	6	11	295	22	230	0	0	252	0	0	24	24	24	0	132	21	16	169	740
Total	263	731	135	47	1176	87	1247	0	0	1334	0	0	54	54	54	0	622	129	48	799	3363
Grand Total	583	1605	280	121	2589	191	3837	0	0	4028	0	0	124	124	124	0	1476	300	95	1871	8612
Approach %	22.5	62	10.8	4.7	30.1	4.7	95.3	0	0	46.8	0	0	1.4	1.4	1.4	0	78.9	16	5.1	21.7	
Total %	6.8	18.6	3.3	1.4	30.1	2.2	44.6	0	0	46.8	0	0	1.4	1.4	1.4	0	17.1	3.5	1.1	21.7	

Start Time	Pensacola Street Southbound				Kapiolani Boulevard Westbound				Pensacola Street Northbound				Kapiolani Boulevard Eastbound				Int. Total			
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds
07:30 AM	72	155	18	18	245	22	461	0	0	483	0	0	0	0	0	0	154	23	177	905
07:45 AM	54	165	56	56	275	22	470	0	0	492	0	0	0	0	0	0	155	35	190	957
08:00 AM	65	181	67	67	313	21	414	0	0	435	0	0	0	0	0	0	167	31	198	946
08:15 AM	58	169	23	23	250	25	362	0	0	387	0	0	0	0	0	0	168	34	202	839
Total Volume	249	670	164	164	1083	90	1707	0	0	1797	0	0	0	0	0	0	644	123	767	3647
% App. Total	23	61.9	15.1	15.1	30.1	5	95	0	0	46.8	0	0	0	0	0	0	84	16	21.7	
PHF	.865	.925	.612	.612	.865	.900	.908	.000	.000	.913	.000	.000	.000	.000	.000	.000	.958	.879	.949	.953

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

# Wilson Okamoto Corporation

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

File Name : KapPen PM  
Site Code : 00000004  
Start Date : 4/7/2015  
Page No : 1

Counted By: R.J, JJ  
Counters: TU-0649, TU-0651  
Weather: Clear

Groups Printed- Unshifted

Start Time	Pensacola Street Southbound				Kapiolani Boulevard Westbound				Pensacola Street Northbound				Kapiolani Boulevard Eastbound				Int. Total				
	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	63	128	59	16	266	10	206	0	0	216	0	0	0	22	22	0	237	33	9	279	783
03:15 PM	65	177	85	7	334	6	196	0	0	202	0	0	0	18	18	0	260	30	8	298	852
03:30 PM	76	176	117	16	385	0	184	0	0	184	0	0	0	31	31	0	309	36	8	353	953
03:45 PM	83	184	39	13	319	0	190	0	0	190	0	0	21	21	21	0	313	35	9	357	887
Total	287	665	300	52	1304	16	776	0	0	792	0	0	0	92	92	0	1119	134	34	1287	3475
04:00 PM	84	193	78	14	369	0	193	0	0	193	0	0	0	27	27	0	384	38	6	428	1017
04:15 PM	70	183	26	21	300	0	207	0	0	207	0	0	0	27	27	0	369	52	16	437	971
04:30 PM	85	187	42	19	333	0	196	0	0	196	0	0	0	37	37	0	459	26	26	511	1077
04:45 PM	82	192	40	18	332	0	225	0	0	225	0	0	0	26	26	0	459	47	9	515	1088
Total	321	755	186	72	1334	0	821	0	0	821	0	0	0	117	117	0	1671	163	57	1891	4163
05:00 PM	89	192	48	16	345	0	203	0	0	203	0	0	0	29	29	0	503	50	15	568	1145
05:15 PM	82	196	18	9	305	0	216	0	0	216	0	0	0	29	29	0	444	46	10	500	1050
05:30 PM	64	184	43	18	309	14	187	0	0	201	0	0	0	26	26	0	390	38	21	449	985
05:45 PM	63	190	34	17	304	22	204	0	0	226	0	0	0	23	23	0	384	43	14	441	994
Total	298	762	143	60	1263	36	810	0	0	846	0	0	0	107	107	0	1721	177	60	1958	4174
Grand Total	906	2182	629	184	3901	52	2407	0	0	2459	0	0	0	316	316	0	4511	474	151	5136	11812
Approach %	23.2	55.9	16.1	4.7		2.1	97.9	0	0		0	0	0	100		0	87.8	9.2	2.9		
Total %	7.7	18.5	5.3	1.6	33	0.4	20.4	0	0	20.8	0	0	0	2.7	2.7	0	38.2	4	1.3	43.5	

Start Time	Pensacola Street Southbound				Kapiolani Boulevard Westbound				Pensacola Street Northbound				Kapiolani Boulevard Eastbound				Int. Total			
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds
04:30 PM	85	187	42	314	0	196	0	0	0	196	0	0	0	0	0	0	459	26	485	995
04:45 PM	82	192	40	314	0	225	0	0	0	225	0	0	0	0	0	0	459	47	506	1045
05:00 PM	89	192	48	329	0	203	0	0	0	203	0	0	0	0	0	0	503	50	553	1085
05:15 PM	82	196	18	296	0	216	0	0	0	216	0	0	0	0	0	0	444	46	490	1002
Total Volume	338	767	148	1253	0	840	0	0	0	840	0	0	0	0	0	0	1865	169	2034	4127
% App. Total	27	61.2	11.8		0	100	0	0	0		0	0	0	8.3		0	91.7	8.3		
PHF	.949	.978	.771	.952	.933	.933	.000	.933	.000	.933	.000	.000	.000	.000	.000	.000	.927	.845	.920	.951

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



# Wilson Okamoto Corporation

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

Counted By: FS, DM  
Counters: TU-0653, TU-0650  
Weather: Clear

File Name : KapPii AM  
Site Code : 00000005  
Start Date : 4/7/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Southbound				Kapiolani Boulevard Westbound				Piikoi Street Northbound				Kapiolani Boulevard Eastbound				Int. Total			
	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds
06:00 AM	0	5	102	10	122	3	105	7	8	123	0	75	3	7	85	0	75	3	7	330
06:15 AM	0	1	159	23	187	3	98	7	9	117	0	100	6	6	112	0	100	6	6	416
06:30 AM	0	4	273	30	312	3	130	11	8	152	0	109	3	9	121	0	109	3	9	585
06:45 AM	0	11	338	52	405	6	141	5	13	165	0	126	6	9	141	0	126	6	9	711
Total	0	21	872	115	1026	15	474	30	38	557	0	410	18	31	459	0	410	18	31	2042
07:00 AM	0	8	378	54	449	9	187	22	9	227	0	144	5	15	164	0	144	5	15	840
07:15 AM	0	2	423	56	487	9	189	17	13	228	0	149	8	15	172	0	149	8	15	887
07:30 AM	0	11	468	68	550	15	229	8	12	264	0	214	10	18	242	0	214	10	18	1056
07:45 AM	0	10	478	88	581	11	180	21	17	229	0	197	11	10	218	0	197	11	10	1028
Total	0	31	1747	266	2067	44	785	68	51	948	0	704	34	58	796	0	704	34	58	3811
08:00 AM	0	11	423	71	507	8	207	16	10	241	0	216	13	14	243	0	216	13	14	991
08:15 AM	0	8	371	67	454	11	178	22	19	230	0	215	8	11	234	0	215	8	11	918
08:30 AM	0	15	248	48	314	16	205	25	18	264	0	210	10	19	239	0	210	10	19	817
08:45 AM	0	9	239	46	296	11	165	23	17	216	0	197	9	13	219	0	197	9	13	731
Total	0	43	1281	232	1571	46	755	86	64	951	0	838	40	57	935	0	838	40	57	3457
Grand Total	0	95	3900	613	4664	105	2014	184	153	2456	0	1952	92	146	2190	0	1952	92	146	9310
Approch %	0	2	83.6	13.1	1.2	4.3	82	7.5	6.2	26.4	0	89.1	4.2	6.7	23.5	0	89.1	4.2	6.7	
Total %	0	1	41.9	6.6	50.1	1.1	21.6	2	1.6	26.4	0	21	1	1.6	23.5	0	21	1	1.6	

Start Time	Southbound				Kapiolani Boulevard Westbound				Piikoi Street Northbound				Kapiolani Boulevard Eastbound				Int. Total			
	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds
07:30 AM	0	11	468	68	547	15	229	8	8	252	0	214	10	10	224	0	214	10	10	1023
07:45 AM	0	10	478	88	576	11	180	21	21	212	0	197	11	11	208	0	197	11	11	996
08:00 AM	0	11	423	71	505	8	207	16	16	231	0	216	13	13	229	0	216	13	13	965
08:15 AM	0	8	371	67	446	11	178	22	22	211	0	215	8	8	223	0	215	8	8	880
Total Volume	0	40	1740	294	2074	45	794	67	74	906	0	842	42	42	884	0	842	42	42	3864
% App. Total	.000	1.9	83.9	14.2	9.0	.750	86.7	7.4	7.4	89.9	.000	95.2	4.8	4.8	96.5	.000	95.2	4.8	4.8	.944
PHF					.900	.910	.835	.761	.761	.899	.000	.975	.808	.808	.965	.000	.975	.808	.808	.944

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

# Wilson Okamoto Corporation

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

Counted By: FS, DM  
Counters: TU-0653, TU-0650  
Weather: Clear

File Name : KapPii PM  
Site Code : 00000005  
Start Date : 4/7/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Piikoi Street Southbound			Kapiolani Boulevard Westbound			Piikoi Street Northbound			Kapiolani Boulevard Eastbound			Int. Total							
	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right		Peds	App. Total					
03:00 PM	0	0	0	13	10	197	70	9	286	19	223	38	28	308	0	280	16	16	312	919
03:15 PM	0	0	0	28	8	181	70	5	264	19	232	36	34	321	0	311	13	15	339	952
03:30 PM	0	0	0	25	0	162	58	11	231	22	287	55	26	390	0	355	28	18	401	1047
03:45 PM	0	0	0	19	0	151	61	9	221	40	248	44	33	365	0	376	24	19	419	1024
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>85</b>	<b>18</b>	<b>691</b>	<b>259</b>	<b>34</b>	<b>1002</b>	<b>100</b>	<b>990</b>	<b>173</b>	<b>121</b>	<b>1384</b>	<b>0</b>	<b>1322</b>	<b>81</b>	<b>68</b>	<b>1471</b>	<b>3942</b>
04:00 PM	0	0	0	18	0	169	79	4	252	25	242	45	19	331	0	411	52	20	483	1084
04:15 PM	0	0	0	21	0	180	52	3	235	23	256	37	18	334	0	424	18	13	455	1045
04:30 PM	0	0	0	27	0	165	75	5	245	34	263	36	30	363	0	509	33	24	566	1201
04:45 PM	0	0	0	15	0	211	84	2	297	16	241	41	42	340	0	506	36	22	564	1216
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>81</b>	<b>0</b>	<b>725</b>	<b>290</b>	<b>14</b>	<b>1029</b>	<b>98</b>	<b>1002</b>	<b>159</b>	<b>109</b>	<b>1368</b>	<b>0</b>	<b>1850</b>	<b>139</b>	<b>79</b>	<b>2068</b>	<b>4546</b>
05:00 PM	0	0	0	36	0	174	61	3	238	28	288	44	19	379	0	558	37	19	614	1267
05:15 PM	0	0	0	24	0	193	51	5	249	29	283	46	39	397	0	486	36	16	538	1208
05:30 PM	0	0	0	21	17	154	55	1	227	47	293	34	49	423	0	423	26	22	471	1142
05:45 PM	0	0	0	17	26	200	49	6	281	26	245	34	34	339	0	435	27	39	501	1138
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>98</b>	<b>43</b>	<b>721</b>	<b>216</b>	<b>15</b>	<b>995</b>	<b>130</b>	<b>1109</b>	<b>158</b>	<b>141</b>	<b>1538</b>	<b>0</b>	<b>1902</b>	<b>126</b>	<b>96</b>	<b>2124</b>	<b>4755</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>264</b>	<b>61</b>	<b>2137</b>	<b>765</b>	<b>63</b>	<b>3026</b>	<b>328</b>	<b>3101</b>	<b>490</b>	<b>371</b>	<b>4290</b>	<b>0</b>	<b>5074</b>	<b>346</b>	<b>243</b>	<b>5663</b>	<b>13243</b>
Apprch %	0	0	0	100	2	70.6	25.3	2.1	7.6	72.3	11.4	8.6	2.8	32.4	0	89.6	6.1	4.3	56.3	1324.3
Total %	0	0	0	2	0.5	16.1	5.8	0.5	22.8	2.5	23.4	3.7	2.8	32.4	0	38.3	2.6	1.8	42.8	1324.3

Start Time	Southbound			Kapiolani Boulevard Westbound			Piikoi Street Northbound			Kapiolani Boulevard Eastbound			Int. Total	
	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 04:30 PM														
04:30 PM	0	0	165	75	240	34	263	36	333	0	509	33	542	1115
04:45 PM	0	0	211	84	295	16	241	41	298	0	506	36	542	1135
05:00 PM	0	0	174	61	235	28	288	44	360	0	558	37	595	1190
05:15 PM	0	0	193	51	244	29	283	46	358	0	486	36	522	1124
Total Volume	0	0	743	271	1014	107	1075	167	1349	0	2059	142	2201	4564
% App. Total	.000	.000	.880	.807	.859	.787	.933	.908	.937	.000	.922	.959	.925	.959

# Wilson Okamoto Corporation

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

Counted By: AC, DM  
 Counters: D4-5671, D4-5673  
 Weather: Clear

File Name : WarWai AM  
 Site Code : 00000001  
 Start Date : 4/8/2015  
 Page No : 1

Groups Printed- Unshifted

Start Time	Ward Avenue Southbound				Waimanu Street Westbound				Ward Avenue Northbound				Waimanu Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
06:00 AM	1	152	2	0	155	2	2	18	3	25	0	41	2	2	45	2	0	0	0	2	227
06:15 AM	8	154	5	0	167	7	0	21	4	32	1	57	2	0	60	0	0	0	1	1	260
06:30 AM	14	165	4	0	183	4	1	17	4	26	0	73	1	1	75	2	0	4	1	7	291
06:45 AM	11	213	8	0	232	9	2	21	4	36	0	80	8	0	88	0	0	2	1	3	359
<b>Total</b>	<b>34</b>	<b>684</b>	<b>19</b>	<b>0</b>	<b>737</b>	<b>22</b>	<b>5</b>	<b>77</b>	<b>15</b>	<b>119</b>	<b>1</b>	<b>251</b>	<b>13</b>	<b>3</b>	<b>268</b>	<b>4</b>	<b>0</b>	<b>6</b>	<b>3</b>	<b>13</b>	<b>1137</b>
07:00 AM	13	200	6	0	219	5	2	30	7	44	0	129	4	0	133	0	0	0	0	0	396
07:15 AM	18	237	4	0	259	13	2	25	14	54	0	105	8	3	116	1	0	3	2	6	435
07:30 AM	17	241	7	0	265	5	2	39	11	57	0	124	3	1	128	0	0	2	0	2	452
07:45 AM	22	224	11	0	257	5	5	15	4	29	0	113	7	0	120	2	1	2	0	5	411
<b>Total</b>	<b>70</b>	<b>902</b>	<b>28</b>	<b>0</b>	<b>1000</b>	<b>28</b>	<b>11</b>	<b>109</b>	<b>36</b>	<b>184</b>	<b>0</b>	<b>471</b>	<b>22</b>	<b>4</b>	<b>497</b>	<b>3</b>	<b>1</b>	<b>7</b>	<b>2</b>	<b>13</b>	<b>1694</b>
08:00 AM	16	273	8	0	297	8	0	36	8	52	2	100	5	2	109	0	0	2	1	3	461
08:15 AM	8	205	15	0	228	4	0	21	13	38	3	104	9	3	119	0	2	4	0	6	391
08:30 AM	6	250	10	0	266	8	0	25	6	39	2	127	6	2	137	0	0	7	0	7	449
08:45 AM	15	247	11	0	273	7	0	12	4	23	1	102	1	3	107	1	1	1	0	3	406
<b>Total</b>	<b>45</b>	<b>975</b>	<b>44</b>	<b>0</b>	<b>1064</b>	<b>27</b>	<b>0</b>	<b>94</b>	<b>31</b>	<b>152</b>	<b>8</b>	<b>433</b>	<b>21</b>	<b>10</b>	<b>472</b>	<b>1</b>	<b>3</b>	<b>14</b>	<b>1</b>	<b>19</b>	<b>1707</b>
<b>Grand Total</b>	<b>149</b>	<b>2561</b>	<b>91</b>	<b>0</b>	<b>2801</b>	<b>77</b>	<b>16</b>	<b>280</b>	<b>82</b>	<b>455</b>	<b>9</b>	<b>1155</b>	<b>56</b>	<b>17</b>	<b>1237</b>	<b>8</b>	<b>4</b>	<b>27</b>	<b>6</b>	<b>45</b>	<b>4538</b>
Approch %	5.3	91.4	3.2	0	61.7	16.9	3.5	61.5	18	10	0.7	93.4	4.5	1.4	27.3	17.8	8.9	60	13.3	0.1	1
Total %	3.3	56.4	2	0	61.7	1.7	0.4	6.2	1.8	10	0.2	25.5	1.2	0.4	27.3	0.2	0.1	0.6	0.1	1	

Start Time	Ward Avenue Southbound				Waimanu Street Westbound				Ward Avenue Northbound				Waimanu Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
07:15 AM	18	237	4	0	259	13	2	25	8	40	0	105	8	3	113	1	0	3	4	416	
07:30 AM	17	241	7	0	265	5	2	39	3	46	0	124	3	3	127	0	0	2	2	440	
07:45 AM	22	224	11	0	257	5	5	15	7	25	0	113	7	2	120	2	1	2	5	407	
08:00 AM	16	273	8	0	297	8	0	36	8	44	2	100	5	2	107	0	0	2	2	450	
Total Volume	73	975	30	0	1078	31	9	115	23	155	2	442	23	9	467	3	1	9	13	1713	
% App.	6.8	90.4	2.8	0	61.7	20	5.8	74.2	4.9	10	0.4	94.6	4.9	7.7	69.2	23.1	7.7	69.2	0.1	1	
PHF	.830	.893	.682	0	.907	.596	.450	.737	.719	.842	.250	.891	.719	.250	.919	.375	.250	.750	.650	.952	

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

# Wilson Okamoto Corporation

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

Counted By: AC, DM  
Counters: D4-5671, D4-5673  
Weather: Clear

File Name : WarWai PM  
Site Code : 00000001  
Start Date : 4/8/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Ward Avenue Southbound				Waimanu Street Westbound				Ward Avenue Northbound				Waimanu Street Eastbound								
	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	9	214	6	0	229	4	1	19	5	29	1	188	11	3	203	2	2	6	0	10	471
03:15 PM	17	230	3	0	250	2	1	22	15	40	6	195	9	1	211	4	1	8	0	13	514
03:30 PM	8	180	4	0	192	10	3	25	15	53	2	213	8	2	225	1	3	2	0	6	476
03:45 PM	12	242	0	0	254	5	2	12	10	29	2	187	10	0	199	2	3	7	0	12	494
Total	46	866	13	0	925	21	7	78	45	151	11	783	38	6	838	9	9	23	0	41	1955
04:00 PM	11	198	3	0	212	5	0	15	20	40	3	250	18	4	275	2	4	8	0	14	541
04:15 PM	17	189	9	0	215	7	2	8	20	37	3	244	10	0	257	0	1	8	0	9	518
04:30 PM	14	217	5	0	236	7	4	15	21	47	1	239	15	1	256	5	0	14	4	23	562
04:45 PM	14	185	3	0	202	2	0	13	20	35	0	235	10	0	245	2	4	18	0	24	506
Total	56	789	20	0	865	21	6	51	81	159	7	968	53	5	1033	9	9	48	4	70	2127
05:00 PM	23	207	6	0	236	4	1	29	13	47	1	239	12	3	255	3	3	11	4	21	559
05:15 PM	18	228	11	0	257	4	1	13	19	37	2	203	11	4	220	1	0	16	1	18	532
05:30 PM	13	218	11	0	242	7	4	18	21	50	3	188	6	7	204	2	1	7	2	12	508
05:45 PM	21	200	5	0	226	4	8	14	21	47	2	205	5	0	212	3	0	7	1	11	496
Total	75	853	33	0	961	19	14	74	74	181	8	835	34	14	891	9	4	41	8	62	2095
Grand Total	177	2508	66	0	2751	61	27	203	200	491	26	2586	125	25	2762	27	22	112	12	173	6177
Apprch %	6.4	91.2	2.4	0		12.4	5.5	41.3	40.7	7.9	0.9	93.6	4.5	0.9	15.6	12.7	64.7	6.9	0.2	2.8	
Total %	2.9	40.6	1.1	0	44.5	1	0.4	3.3	3.2	7.9	0.4	41.9	2	0.4	44.7	0.4	0.4	1.8	0.2		

Start Time	Ward Avenue Southbound				Waimanu Street Westbound				Ward Avenue Northbound				Waimanu Street Eastbound								
	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
04:30 PM	14	217	5	0	236	7	4	15	15	26	1	239	15	15	255	5	0	14	19	536	
04:45 PM	14	185	3	0	202	2	0	13	13	15	0	235	10	10	245	2	4	18	24	486	
05:00 PM	23	207	6	0	236	4	1	29	13	34	1	239	12	12	252	3	3	11	17	539	
05:15 PM	18	228	11	0	257	4	1	13	19	18	2	203	11	11	216	1	0	16	17	508	
Total Volume	69	837	25	0	931	17	6	70	48	93	4	916	48	48	968	11	7	59	77	2069	
% App. Total	7.4	89.9	2.7	0		18.3	6.5	75.3	5	14.3	0.4	94.6	5	5	14.3	9.1	76.6				
PHF	.750	.918	.568		.906	.607	.375	.603	.800	.684	.500	.958	.800	.800	.949	.550	.438	.819	.802		.960

Peak Hour for Entire Intersection Begins at 04:30 PM  
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1

# Wilson Okamoto Corporation

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

Counted By: JJ, RJ  
Counters: D4-5672, D4-5677  
Weather: Clear

File Name : WarKaw AM  
Site Code : 00000003  
Start Date : 4/8/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Ward Avenue Southbound						Kawaiahao Street Westbound						Ward Avenue Northbound						Kawaiahao Street Eastbound					
	Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total	
	06:00 AM	9	140	7	2	158	0	2	3	11	16	0	39	1	0	39	1	0	40	1	2	2	1	6
06:15 AM	13	142	7	0	162	2	0	6	11	19	0	52	3	2	52	3	2	57	0	0	3	10	13	251
06:30 AM	7	159	2	0	168	2	1	10	8	21	1	63	4	1	63	4	1	69	1	2	0	5	8	266
06:45 AM	17	197	11	0	225	1	2	10	12	25	2	75	7	0	75	7	0	84	2	2	1	7	12	346
<b>Total</b>	<b>46</b>	<b>638</b>	<b>27</b>	<b>2</b>	<b>713</b>	<b>5</b>	<b>5</b>	<b>29</b>	<b>42</b>	<b>81</b>	<b>3</b>	<b>229</b>	<b>15</b>	<b>3</b>	<b>229</b>	<b>15</b>	<b>3</b>	<b>250</b>	<b>4</b>	<b>6</b>	<b>6</b>	<b>23</b>	<b>39</b>	<b>1083</b>
07:00 AM	7	187	8	0	202	4	2	7	10	23	2	97	5	1	97	5	1	105	5	0	2	4	11	341
07:15 AM	20	222	9	0	251	2	2	7	22	33	5	130	4	2	130	4	2	141	1	0	4	12	17	442
07:30 AM	15	222	15	0	252	0	3	25	19	47	2	99	2	1	99	2	1	104	3	0	4	11	18	421
07:45 AM	7	208	20	0	235	0	1	14	12	27	5	99	5	0	99	5	0	109	7	0	5	8	20	391
<b>Total</b>	<b>49</b>	<b>839</b>	<b>52</b>	<b>0</b>	<b>940</b>	<b>6</b>	<b>8</b>	<b>53</b>	<b>63</b>	<b>130</b>	<b>14</b>	<b>425</b>	<b>16</b>	<b>4</b>	<b>425</b>	<b>16</b>	<b>4</b>	<b>459</b>	<b>16</b>	<b>0</b>	<b>15</b>	<b>35</b>	<b>66</b>	<b>1595</b>
08:00 AM	19	240	26	0	285	2	2	12	13	29	8	95	5	5	95	5	5	113	1	0	4	14	19	446
08:15 AM	13	184	16	0	213	1	1	13	14	29	3	95	5	2	95	5	2	105	8	18	3	7	36	383
08:30 AM	16	231	18	0	265	2	0	7	9	18	8	120	7	3	120	7	3	138	8	0	7	8	23	444
08:45 AM	11	233	15	0	259	6	1	8	10	25	4	90	4	1	90	4	1	99	5	0	3	8	16	399
<b>Total</b>	<b>59</b>	<b>888</b>	<b>75</b>	<b>0</b>	<b>1022</b>	<b>11</b>	<b>4</b>	<b>40</b>	<b>46</b>	<b>101</b>	<b>23</b>	<b>400</b>	<b>21</b>	<b>11</b>	<b>400</b>	<b>21</b>	<b>11</b>	<b>455</b>	<b>22</b>	<b>18</b>	<b>17</b>	<b>37</b>	<b>94</b>	<b>1672</b>
Grand Total	154	2365	154	2	2675	22	17	122	151	312	40	1054	52	18	1054	52	18	1164	42	24	38	95	199	4350
Approch %	5.8	88.4	5.8	0.1		7.1	5.4	39.1	48.4		3.4	90.5	4.5	1.5		4.5	1.5		21.1	12.1	19.1	47.7		
Total %	3.5	54.4	3.5	0	61.5	0.5	0.4	2.8	3.5	7.2	0.9	24.2	1.2	0.4		1.2	0.4		1	0.6	0.9	2.2		4.6

Start Time	Ward Avenue Southbound						Kawaiahao Street Westbound						Ward Avenue Northbound						Kawaiahao Street Eastbound					
	Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total	
	07:15 AM	20	222	9		251		2	2	7	11	5	130	4		130	4		139	1	0	4	5	406
07:30 AM	15	222	15		252		0	3	25	28	2	99	2		99	2		103	3	0	4	7	390	
07:45 AM	7	208	20		235		0	1	14	15	5	99	5		99	5		109	7	0	5	12	371	
08:00 AM	19	240	26		285		2	2	12	16	8	95	5		95	5		108	1	0	4	5	414	
Total Volume	61	892	70		1023		4	8	58	70	20	423	16		423	16		459	12	0	17	29	1581	
% App. Total	6	87.2	6.8				5.7	11.4	82.9		4.4	92.2	3.5		92.2	3.5			41.4	0	58.6			
PHF	.763	.929	.673		.897		.500	.667	.580	.625	.625	.813	.800		.813	.800		.826	.429	.000	.850	.604	.955	

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

# Wilson Okamoto Corporation

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

Counted By: JJ, RJ

Counters: D4-5672, D4-5677

Weather: Clear

File Name : WarKaw PM  
Site Code : 00000003  
Start Date : 4/8/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Ward Avenue Southbound				Kawaiahao Street Westbound				Ward Avenue Northbound				Kawaiahao Street Eastbound				Int. Total				
	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	14	203	9	0	226	4	8	15	19	46	8	187	2	3	200	1	5	5	7	18	490
03:15 PM	9	220	10	0	239	4	1	6	27	38	5	193	4	5	207	13	2	12	15	42	526
03:30 PM	11	178	7	0	196	5	4	17	21	47	3	210	3	3	219	7	7	16	11	41	503
03:45 PM	16	235	2	0	253	3	3	10	27	43	3	185	5	1	194	5	2	10	20	37	527
<b>Total</b>	50	836	28	0	914	16	16	48	94	174	19	775	14	12	820	26	16	43	53	138	2046
04:00 PM	14	188	9	0	211	1	2	11	26	40	4	227	5	2	238	12	4	14	6	36	525
04:15 PM	9	176	12	0	197	0	1	17	23	41	9	222	6	1	238	14	3	8	10	35	511
04:30 PM	12	222	6	2	242	0	2	18	26	46	2	231	8	3	244	7	7	7	22	43	575
04:45 PM	15	182	9	0	206	4	2	15	26	47	5	223	8	0	236	7	3	12	7	29	518
<b>Total</b>	50	768	36	2	856	5	7	61	101	174	20	903	27	6	956	40	17	41	45	143	2129
05:00 PM	10	205	8	0	223	4	2	23	18	47	2	224	6	1	233	8	4	13	13	38	541
05:15 PM	15	227	9	0	251	0	2	18	26	46	2	193	1	1	197	9	6	12	17	44	538
05:30 PM	8	217	9	0	234	1	0	11	24	36	2	183	2	4	191	3	7	9	23	42	503
05:45 PM	16	184	8	0	208	0	3	9	29	41	3	198	7	4	212	7	29	3	10	49	510
<b>Total</b>	49	833	34	0	916	5	7	61	97	170	9	798	16	10	833	27	46	37	63	173	2092
<b>Grand Total</b>	149	2437	98	2	2686	26	30	170	292	518	48	2476	57	28	2609	93	79	121	161	454	6267
Apprch %	5.5	90.7	3.6	0.1		5	5.8	32.8	56.4		1.8	94.9	2.2	1.1		20.5	17.4	26.7	35.5		
Total %	2.4	38.9	1.6	0	42.9	0.4	0.5	2.7	4.7	8.3	0.8	39.5	0.9	0.4	41.6	1.5	1.3	1.9	2.6	7.2	

Start Time	Ward Avenue Southbound				Kawaiahao Street Westbound				Ward Avenue Northbound				Kawaiahao Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
04:30 PM	12	222	6	0	240	0	2	18	8	20	2	231	8	8	241	7	7	7	7	21	522
04:45 PM	15	182	9	0	206	4	2	15	15	21	5	223	8	8	236	7	3	12	12	22	485
05:00 PM	10	205	8	0	223	4	2	23	6	29	2	224	6	6	232	8	4	13	13	25	509
05:15 PM	15	227	9	0	251	0	2	18	21	20	2	193	1	1	196	9	6	12	12	27	494
Total Volume	52	836	32	0	920	8	8	74	74	90	11	871	23	23	905	31	20	44	44	95	2010
% App. Total	5.7	90.9	3.5	0		8.9	8.9	82.2	2.5		1.2	96.2	2.5	2.5		32.6	21.1	46.3	46.3		
PHF	.867	.921	.889		.916	.500	1.00	.804	.719	.776	.550	.943	.719		.939	.861	.714	.846		.880	.963

Peak Hour for Entire Intersection Begins at 04:30 PM

Peak Hour for Entire Intersection Begins at 03:00 PM to 05:45 PM - Peak 1 of 1

# Wilson Okamoto Corporation

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

Counted By: BE, FS  
Counters: TU-0653, TU-1958  
Weather: Clear

File Name : WarQue AM  
Site Code : 00000003  
Start Date : 4/13/2016  
Page No : 1

## Groups Printed- Unshifted

Start Time	Ward Avenue Southbound				Queen Street Westbound				Ward Avenue Northbound				Queen Street Eastbound								
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	3	142	23	1	169	2	6	2	3	13	8	33	7	2	50	1	10	12	3	26	258
06:15 AM	9	140	22	0	171	7	21	1	1	30	1	28	6	0	35	4	10	10	7	31	267
06:30 AM	6	123	33	4	166	5	31	1	4	41	7	67	8	2	84	5	14	7	7	33	324
06:45 AM	7	145	41	2	195	4	36	2	5	47	7	63	5	0	75	7	17	11	6	41	358
Total	25	550	119	7	701	18	94	6	13	131	23	191	26	4	244	17	51	40	23	131	1207
07:00 AM	5	121	23	3	152	15	61	7	12	95	9	70	7	2	88	14	14	6	3	37	372
07:15 AM	4	156	52	9	221	14	72	5	8	99	7	100	4	2	113	9	14	13	7	43	476
07:30 AM	11	151	46	1	209	7	69	6	5	87	8	85	7	0	100	11	23	15	3	52	448
07:45 AM	13	166	55	0	234	20	90	8	15	133	20	75	6	5	106	6	33	17	13	69	542
Total	33	594	176	13	816	56	292	26	40	414	44	330	24	9	407	40	84	51	26	201	1838
08:00 AM	11	151	47	9	218	16	76	4	11	107	14	83	9	4	110	11	26	18	13	68	503
08:15 AM	8	181	52	3	244	15	73	7	8	103	9	93	6	5	113	21	44	24	5	94	554
08:30 AM	15	170	39	9	233	21	65	11	9	106	10	74	6	0	90	12	30	19	7	68	497
08:45 AM	11	193	41	13	258	13	41	3	8	65	18	95	13	2	128	12	27	17	8	64	515
Total	45	695	179	34	953	65	255	25	36	381	51	345	34	11	441	56	127	78	33	294	2069
Grand Total	103	1839	474	54	2470	139	641	57	89	926	118	866	84	24	1092	113	262	169	82	626	5114
Approach %	4.2	74.5	19.2	2.2	48.3	15	69.2	6.2	9.6	18.1	10.8	79.3	7.7	2.2	21.4	18.1	41.9	27	13.1	12.2	
Total %	2	36	9.3	1.1		2.7	12.5	1.1	1.7		2.3	16.9	1.6	0.5		2.2	5.1	3.3	1.6		

Start Time	Ward Avenue Southbound				Queen Street Westbound				Ward Avenue Northbound				Queen Street Eastbound								
	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
07:45 AM	13	166	55	5	234	20	90	8	8	118	20	75	6	6	101	6	33	17	17	56	509
08:00 AM	11	151	47	4	209	16	76	4	4	96	14	83	9	9	106	11	26	18	18	55	466
08:15 AM	8	181	52	5	241	15	73	7	7	95	9	93	6	6	108	21	44	24	24	89	533
08:30 AM	15	170	39	3	224	21	65	11	11	97	10	74	6	6	90	12	30	19	7	61	472
Total Volume	47	668	193	19	908	72	304	30	30	406	53	325	27	27	405	50	133	78	78	261	1980
% App. Total	5.2	73.6	21.3	2.1	94.2	17.7	74.9	7.4	7.4	860	13.1	80.2	6.7	6.7	938	19.2	51	29.9	29.9	733	929
PHF	.783	.923	.877			.857	.844	.682			.663	.874	.750			.595	.756	.813			

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

# Wilson Okamoto Corporation

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

Counted By: BE, FS  
Counters: TU-1958, TU-0653  
Weather: Clear

File Name : WarQue PM  
Site Code : 00000003  
Start Date : 4/13/2016  
Page No : 1

## Groups Printed - Unshifted

Start Time	Ward Avenue Southbound				Queen Street Westbound				Ward Avenue Northbound				Queen Street Eastbound								
	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	11	149	19	9	188	20	55	10	3	88	10	145	22	0	177	22	51	21	9	103	556
03:15 PM	14	136	19	6	175	9	45	18	13	85	18	167	15	6	206	30	50	27	7	114	580
03:30 PM	14	160	33	5	212	22	55	17	17	111	27	168	11	3	209	20	31	20	12	83	615
03:45 PM	15	158	15	4	192	16	74	25	11	126	26	156	6	3	191	22	64	25	8	119	628
Total	54	603	86	24	767	67	229	70	44	410	81	636	54	12	783	94	196	93	36	419	2379
04:00 PM	8	150	18	4	180	24	54	11	12	101	24	195	14	2	235	23	34	22	3	82	598
04:15 PM	9	157	17	4	187	17	64	9	18	108	21	164	12	4	201	20	71	30	7	128	624
04:30 PM	14	160	20	10	204	23	60	8	25	116	15	185	15	4	219	33	84	17	15	149	688
04:45 PM	13	141	16	1	171	23	56	9	17	105	13	165	20	6	204	27	96	32	12	167	647
Total	44	608	71	19	742	87	234	37	72	430	73	709	61	16	859	103	285	101	37	526	2557
05:00 PM	19	164	19	8	210	14	61	16	12	103	14	172	19	5	210	24	84	35	12	155	678
05:15 PM	11	149	17	5	182	11	67	14	11	103	14	158	23	3	198	28	95	28	10	161	644
05:30 PM	11	152	27	3	193	9	58	17	17	101	15	173	17	2	207	29	96	29	5	159	660
05:45 PM	16	179	13	1	209	15	66	6	9	96	24	143	14	9	190	20	91	23	9	143	638
Total	57	644	76	17	794	49	252	53	49	403	67	646	73	19	805	101	366	115	36	618	2620
Grand Total	155	1855	233	60	2303	203	715	160	165	1243	221	1991	188	47	2447	298	847	309	109	1563	7556
Approch %	6.7	80.5	10.1	2.6		16.3	57.5	12.9	13.3		9	81.4	7.7	1.9		19.1	54.2	19.8	7		
Total %	2.1	24.6	3.1	0.8	30.5	2.7	9.5	2.1	2.2	16.5	2.9	26.3	2.5	0.6	32.4	3.9	11.2	4.1	1.4	20.7	

Start Time	Ward Avenue Southbound				Queen Street Westbound				Ward Avenue Northbound				Queen Street Eastbound								
	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
04:30 PM	14	160	20		194	23	60	8		91	15	185	15		215	33	84	17		134	634
04:45 PM	13	141	16		170	23	56	9		88	13	165	20		198	27	96	32		155	611
05:00 PM	19	164	19		202	14	61	16		91	14	172	19		205	24	84	35		143	641
05:15 PM	11	149	17		177	11	67	14		92	14	158	23		195	28	95	28		151	615
Total Volume	57	614	72		743	71	244	47		362	56	680	77		813	112	359	112		583	2501
% App. Total	7.7	82.6	9.7			19.6	67.4	13			6.9	83.6	9.5			19.2	61.6	19.2			
PHF	.750	.936	.900		.920	.772	.910	.734		.984	.933	.919	.837		.945	.848	.935	.800		.940	.975

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



# Wilson Okamoto Corporation

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

Counted By: DY, JC  
Counters: TU-0652, TU-0654  
Weather: Clear

File Name : WarQue AM  
Site Code : 00000002  
Start Date : 4/8/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Ward Avenue Southbound						Queen Street Westbound						Ward Avenue Northbound						Queen Street Eastbound					
	Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total	
06:00 AM	8	119	19	2	148	5	14	5	9	33	6	27	0	3	36	5	17	6	2	30	247			
06:15 AM	11	121	18	2	152	3	22	4	6	35	7	49	3	2	61	2	10	11	9	32	280			
06:30 AM	10	124	27	2	163	9	25	4	3	41	13	66	4	0	83	6	20	6	5	37	324			
06:45 AM	11	149	34	3	197	10	46	4	14	74	7	77	5	3	92	7	15	11	3	36	399			
<b>Total</b>	<b>40</b>	<b>513</b>	<b>98</b>	<b>9</b>	<b>660</b>	<b>27</b>	<b>107</b>	<b>17</b>	<b>32</b>	<b>183</b>	<b>33</b>	<b>219</b>	<b>12</b>	<b>8</b>	<b>272</b>	<b>20</b>	<b>62</b>	<b>34</b>	<b>19</b>	<b>135</b>	<b>1250</b>			
07:00 AM	9	138	43	2	192	10	50	8	16	84	6	78	3	4	91	15	23	13	3	54	421			
07:15 AM	4	154	40	3	201	9	76	13	15	113	9	121	7	7	144	11	28	14	12	65	523			
07:30 AM	9	153	60	5	227	7	70	4	16	97	15	93	7	3	118	7	26	16	4	53	495			
07:45 AM	3	160	50	6	219	13	82	5	11	111	24	94	10	1	129	9	33	19	8	69	528			
<b>Total</b>	<b>25</b>	<b>605</b>	<b>193</b>	<b>16</b>	<b>839</b>	<b>39</b>	<b>278</b>	<b>30</b>	<b>58</b>	<b>405</b>	<b>54</b>	<b>386</b>	<b>27</b>	<b>15</b>	<b>482</b>	<b>42</b>	<b>110</b>	<b>62</b>	<b>27</b>	<b>241</b>	<b>1967</b>			
08:00 AM	9	188	52	7	256	19	66	6	10	101	12	92	6	4	114	8	41	22	10	81	552			
08:15 AM	6	150	37	2	195	12	72	6	10	100	15	94	13	2	124	10	45	18	7	80	499			
08:30 AM	14	181	50	3	248	14	72	9	12	107	19	109	6	2	136	20	33	19	6	78	569			
08:45 AM	13	181	46	2	242	15	52	8	9	84	16	77	6	1	100	9	26	17	7	59	485			
<b>Total</b>	<b>42</b>	<b>700</b>	<b>185</b>	<b>14</b>	<b>941</b>	<b>60</b>	<b>262</b>	<b>29</b>	<b>41</b>	<b>392</b>	<b>62</b>	<b>372</b>	<b>31</b>	<b>9</b>	<b>474</b>	<b>47</b>	<b>145</b>	<b>76</b>	<b>30</b>	<b>298</b>	<b>2105</b>			
<b>Grand Total</b>	<b>107</b>	<b>1818</b>	<b>476</b>	<b>39</b>	<b>2440</b>	<b>126</b>	<b>647</b>	<b>76</b>	<b>131</b>	<b>980</b>	<b>149</b>	<b>977</b>	<b>70</b>	<b>32</b>	<b>1228</b>	<b>109</b>	<b>317</b>	<b>172</b>	<b>76</b>	<b>674</b>	<b>5322</b>			
Apprch %	4.4	74.5	19.5	1.6		12.9	66	7.8	13.4		12.1	79.6	5.7	2.6		16.2	47	25.5	11.3					
Total %	2	34.2	8.9	0.7	45.8	2.4	12.2	1.4	2.5	18.4	2.8	18.4	1.3	0.6	23.1	2	6	3.2	1.4	12.7				

Start Time	Ward Avenue Southbound						Queen Street Westbound						Ward Avenue Northbound						Queen Street Eastbound					
	Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total	
07:45 AM	3	160	50		213	13	82	5		100	24	94	10		128	9	33	19		61	502			
08:00 AM	9	188	52		249	19	66	6		91	12	92	6		110	8	41	22		71	521			
08:15 AM	6	150	37		193	12	72	6		90	15	94	13		122	10	45	18		73	478			
08:30 AM	14	181	50		245	14	72	9		95	19	109	6		134	20	33	19		72	546			
Total Volume	32	679	189		900	58	292	26		376	70	389	35		494	47	152	78		277	2047			
% App. Total	3.6	75.4	21		904	15.4	77.7	6.9		940	14.2	78.7	7.1		922	17	54.9	28.2		949	937			
PHF	.571	.903	.909			.763	.890	.722			.729	.892	.673			.588	.844	.886						

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

# Wilson Okamoto Corporation

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

Counted By: DY, EV  
Counters: TU-0652, TU-0654  
Weather: Clear

File Name : WarQue PM  
Site Code : 00000002  
Start Date : 4/8/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Ward Avenue Southbound				Queen Street Westbound				Ward Avenue Northbound				Queen Street Eastbound				Int. Total				
	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	14	179	25	6	224	14	64	19	19	116	14	161	9	0	184	18	40	23	7	88	612
03:15 PM	23	181	32	3	239	10	64	20	28	122	14	160	9	11	194	16	37	29	7	89	644
03:30 PM	22	177	17	4	220	10	71	24	21	126	17	175	12	7	211	21	44	23	10	98	655
03:45 PM	20	176	29	7	232	24	89	22	35	170	21	150	20	7	198	23	58	26	18	125	725
<b>Total</b>	79	713	103	20	915	58	288	85	103	534	66	646	50	25	787	78	179	101	42	400	2636
04:00 PM	19	157	27	5	208	14	63	19	27	123	24	185	15	4	228	29	60	13	11	113	672
04:15 PM	18	146	24	1	189	15	57	10	17	99	30	198	23	6	257	28	57	31	6	122	667
04:30 PM	16	192	20	2	230	24	55	21	19	119	15	195	21	8	239	25	49	33	22	129	717
04:45 PM	18	160	23	3	204	14	77	16	24	131	16	196	22	5	239	22	96	35	14	167	741
<b>Total</b>	71	655	94	11	831	67	252	66	87	472	85	774	81	23	963	104	262	112	53	531	2797
05:00 PM	28	182	15	3	228	16	74	16	12	118	19	188	21	2	230	28	87	35	8	158	734
05:15 PM	26	185	19	4	234	16	67	17	28	128	16	156	17	6	195	22	83	37	15	157	714
05:30 PM	19	184	22	5	230	14	58	22	23	117	20	136	10	9	175	26	88	27	22	163	685
05:45 PM	23	145	24	3	195	15	60	11	25	111	19	173	23	2	217	16	65	22	7	110	633
<b>Total</b>	96	696	80	15	887	61	259	66	88	474	74	653	71	19	817	92	323	121	52	588	2766
<b>Grand Total</b>	246	2064	277	46	2633	186	799	217	278	1480	225	2073	202	67	2567	274	764	334	147	1519	8199
Approch %	9.3	78.4	10.5	1.7		12.6	54	14.7	18.8		8.8	80.8	7.9	2.6		18	50.3	22	9.7		
Total %	3	25.2	3.4	0.6	32.1	2.3	9.7	2.6	3.4	18.1	2.7	25.3	2.5	0.8	31.3	3.3	9.3	4.1	1.8	18.5	

Start Time	Ward Avenue Southbound				Queen Street Westbound				Ward Avenue Northbound				Queen Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
04:30 PM	16	192	20	20	228	24	55	21	21	100	15	195	21		231	25	49	33		107	666
04:45 PM	18	160	23	23	201	14	77	16	16	107	16	196	22		234	22	96	35		153	695
05:00 PM	28	182	15	15	225	16	74	16	16	106	19	188	21		228	28	87	35		150	709
05:15 PM	26	185	19	19	230	16	67	17	17	100	16	156	17		189	22	83	37		142	661
Total Volume	88	719	77	77	884	70	273	70	70	413	66	735	81		882	97	315	140		552	2731
% App. Total	10	81.3	8.7	8.7		16.9	66.1	16.9	16.9		7.5	83.3	9.2			17.6	57.1	25.4			
PHF	.786	.936	.837	.837	.961	.729	.886	.833	.833	.965	.868	.938	.920		.942	.866	.820	.946		.902	.963

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

# Wilson Okamoto Corporation

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

Counted By: GC, KW  
Counters: D4-3888, D4-3889  
Weather: Clear

File Name : Warlla AM  
Site Code : 00000004  
Start Date : 4/8/2015  
Page No : 1

## Groups Printed - Unshifted

Start Time	Ward Avenue Southbound				Sports Authority Parking Lot - North Driveway Westbound				Ward Avenue Northbound				Ilaniwai Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
	06:00 AM	10	120	2	0	132	0	0	3	0	3	2	30	1	0	33		0	1	1	5
06:15 AM	4	126	3	4	137	2	0	8	0	10	3	52	1	2	58	0	0	1	2	3	208
06:30 AM	9	133	2	1	145	2	0	6	0	8	2	75	1	1	79	0	0	3	7	10	242
06:45 AM	6	165	2	2	175	1	0	1	10	12	2	86	1	3	92	0	0	1	3	4	283
Total	29	544	9	7	589	5	0	18	10	33	9	243	4	6	262	0	1	6	17	24	908
07:00 AM	11	141	5	3	160	0	0	1	7	8	4	101	2	3	110	1	0	2	4	7	285
07:15 AM	7	169	11	4	191	0	0	2	5	7	3	134	0	3	140	2	1	2	13	18	356
07:30 AM	8	161	7	2	178	0	0	4	5	9	0	108	0	0	108	2	1	2	0	5	300
07:45 AM	14	171	7	5	197	0	0	7	10	17	2	119	0	4	125	1	1	5	9	16	355
Total	40	642	30	14	726	0	0	14	27	41	9	462	2	10	483	6	3	11	26	46	1296
08:00 AM	10	208	9	1	228	0	0	3	12	15	5	104	2	1	112	2	0	0	3	5	360
08:15 AM	16	154	14	0	184	2	0	5	3	10	1	113	2	1	117	3	1	1	11	16	327
08:30 AM	15	186	12	3	216	0	0	14	7	21	4	116	3	5	128	2	0	0	8	10	375
08:45 AM	17	191	8	2	218	1	0	16	7	24	7	110	3	3	123	0	0	4	7	11	376
Total	58	739	43	6	846	3	0	38	29	70	17	443	10	10	480	7	1	5	29	42	1438
Grand Total	127	1925	82	27	2161	8	0	70	66	144	35	1148	16	26	1225	13	5	22	72	112	3642
Approach %	5.9	89.1	3.8	1.2		5.6	0	48.6	45.8		2.9	93.7	1.3	2.1		11.6	4.5	19.6	64.3		
Total %	3.5	52.9	2.3	0.7	59.3	0.2	0	1.9	1.8	4	1	31.5	0.4	0.7	33.6	0.4	0.1	0.6	2	3.1	

Start Time	Ward Avenue Southbound				Sports Authority Parking Lot - North Driveway Westbound				Ward Avenue Northbound				Ilaniwai Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
	08:00 AM	10	208	9		227	0	0	3		3	5	104	2		111		2	0	0	
08:15 AM	16	154	14		184	2	0	5		7	1	113	2		116	3	1	1		5	312
08:30 AM	15	186	12		213	0	0	14		14	4	116	3		123	2	0	0		2	352
08:45 AM	17	191	8		216	1	0	16		17	7	110	3		120	0	0	4		4	357
Total Volume	58	739	43		840	3	0	38		41	17	443	10		470	7	1	5		13	1364
% App. Total	6.9	88	5.1			7.3	0	92.7			3.6	94.3	2.1			53.8	7.7	38.5			
PHF	.853	.888	.768		.925	.375	.000	.594		.603	.607	.955	.833		.955	.583	.250	.313		.650	.955

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

# Wilson Okamoto Corporation

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

Counted By: GC, KW  
Counters: D4-3888, D4-3889  
Weather: Clear

File Name : Warlla PM  
Site Code : 00000004  
Start Date : 4/8/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Ward Avenue Southbound						Sports Authority Parking Lot - North Driveway Westbound						Ward Avenue Northbound						Ilaniwai Street Eastbound					
	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	15	193	4	3	215		2	0	12	8	22		3	167	0	3	173		1	0	3	3	7	
03:15 PM	27	184	3	1	215		1	0	5	12	18		2	173	0	1	176		4	0	2	9	15	
03:30 PM	15	186	4	6	211		0	0	2	12	14		0	199	1	6	206		1	1	0	13	15	
03:45 PM	19	205	7	5	236		0	0	4	13	17		4	184	0	5	193		3	0	8	14	25	
<b>Total</b>	76	768	18	15	877		3	0	23	45	71		9	723	1	15	748		9	1	13	39	62	
04:00 PM	19	163	5	4	191		0	0	3	19	22		3	217	0	7	227		3	0	3	9	15	
04:15 PM	19	169	5	2	195		0	0	3	5	8		0	248	0	0	248		1	0	3	8	12	
04:30 PM	17	227	4	7	255		0	0	4	13	17		1	222	0	6	229		3	0	8	17	28	
04:45 PM	19	188	3	1	211		0	0	16	9	25		3	224	0	1	228		2	0	8	12	22	
<b>Total</b>	74	747	17	14	852		0	0	26	46	72		7	911	0	14	932		9	0	22	46	77	
05:00 PM	23	204	7	3	237		0	0	6	7	13		1	218	2	4	225		4	0	5	12	21	
05:15 PM	23	216	2	7	248		1	0	10	15	26		1	175	0	8	184		1	0	7	16	24	
05:30 PM	24	192	2	6	224		1	1	1	8	11		2	159	0	6	167		2	0	4	14	20	
05:45 PM	13	169	2	3	187		0	0	3	10	13		1	207	0	1	209		0	0	0	7	7	
<b>Total</b>	83	781	13	19	896		2	1	20	40	63		5	759	2	19	785		7	0	16	49	72	
<b>Grand Total</b>	233	2296	48	48	2625		5	1	69	131	206		21	2393	3	48	2465		25	1	51	134	211	
Approach %	8.9	87.5	1.8	1.8	47.7		2.4	0.5	33.5	63.6	3.7		0.9	97.1	0.1	1.9	44.8		11.8	0.5	24.2	63.5	3.8	
Total %	4.2	41.7	0.9	0.9			0.1	0	1.3	2.4			0.4	43.5	0.1	0.9			0.5	0	0.9	2.4		

Start Time	Ward Avenue Southbound						Sports Authority Parking Lot - North Driveway Westbound						Ward Avenue Northbound						Ilaniwai Street Eastbound					
	Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total		Left	Thru	Right	Peds	App. Total	
04:15 PM	19	169	5		193		0	0	0	3	3		0	248	0	0	248		1	0	0	3	4	
04:30 PM	17	227	4		248		0	0	4	4	4		1	224	0	0	223		3	0	7	8	11	
04:45 PM	19	188	3		210		0	0	0	16	16		3	224	0	0	227		0	0	0	8	10	
05:00 PM	23	204	7		234		0	0	0	6	6		1	218	2	2	221		4	0	5	5	9	
Total Volume	78	788	19		885		0	0	29	29	29		5	912	2	2	919		10	0	24	34	1867	
% App. Total	8.8	89	2.1		892		0	0	100	100	100		0.5	99.2	0.2	0.2	92.6		29.4	0	70.6	77.3	960	
PHF	.848	.868	.679				.000	.000	.453	.453	.453		.417	.919	.250	.250	.926		.625	.000	.750	.773	.960	

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

# Wilson Okamoto Corporation

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

Counted By: PA, FS  
Counters: TU-0650, TU-0653  
Weather: Clear

File Name : WarHal AM  
Site Code : 00000005  
Start Date : 4/8/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Ward Avenue Southbound				Westbound				Ward Avenue Northbound				Halekaiwila Street Eastbound								
	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	95	23	0	119	0	33	1	3	40	3	0	2	4	9	3	0	2	4	9
06:15 AM	4	93	34	0	131	0	4	52	0	59	8	0	0	2	10	8	0	0	2	10	200
06:30 AM	4	95	38	0	137	0	6	58	2	75	6	2	5	6	25	12	2	5	6	25	237
06:45 AM	1	118	48	0	167	0	8	63	0	77	18	1	4	5	28	18	1	4	5	28	272
Total	10	401	143	0	554	0	21	206	3	251	41	3	11	17	72	41	3	11	17	72	877
07:00 AM	4	100	38	0	142	0	7	81	1	96	7	81	1	7	37	26	3	3	5	37	275
07:15 AM	4	119	59	2	184	0	6	102	0	114	6	102	0	6	40	30	1	6	3	40	338
07:30 AM	1	105	62	0	168	0	10	108	0	128	24	3	5	5	37	24	3	5	5	37	333
07:45 AM	4	123	55	0	182	0	8	86	3	110	35	3	4	12	54	35	3	4	12	54	346
Total	13	447	214	2	676	0	31	377	4	448	115	10	18	25	168	115	10	18	25	168	1292
08:00 AM	6	142	62	0	210	0	7	90	0	101	20	5	5	4	34	20	5	5	4	34	345
08:15 AM	6	113	39	0	157	0	7	90	0	110	26	2	9	15	52	26	2	9	15	52	319
08:30 AM	1	147	39	0	187	0	4	100	0	118	24	4	8	8	44	24	4	8	8	44	349
08:45 AM	9	151	39	0	199	0	8	88	0	101	30	2	8	15	55	30	2	8	15	55	355
Total	22	553	178	0	753	0	26	368	0	430	100	13	30	42	185	100	13	30	42	185	1368
Grand Total	45	1401	535	2	1983	0	78	951	7	1129	256	26	59	84	425	256	26	59	84	425	3537
Approch %	2.3	70.7	27	0.1	56.1	0	6.9	84.2	0.6	31.9	60.2	6.1	13.9	19.8	12	60.2	6.1	13.9	19.8	12	
Total %	1.3	39.6	15.1	0.1			2.2	26.9	0.2		7.2	0.7	1.7	2.4		7.2	0.7	1.7	2.4		

Start Time	Ward Avenue Southbound				Westbound				Ward Avenue Northbound				Halekaiwila Street Eastbound								
	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
	07:15 AM	4	119	59	0	182	0	6	102	0	108	30	1	6	37	30	1	6	6	37	327
07:30 AM	1	105	62	0	168	0	10	108	0	118	24	3	5	32	118	24	3	5	5	32	318
07:45 AM	4	123	55	0	182	0	8	86	3	197	35	3	4	42	97	35	3	4	4	42	321
08:00 AM	6	142	62	0	210	0	7	90	0	97	20	5	5	30	97	20	5	5	5	30	337
Total Volume	15	489	238	0	742	0	31	386	3	420	109	12	20	141	420	109	12	20	20	141	1303
% App. Total	2	65.9	32.1		.883	.000	.775	.894	0.7	.890	.779	8.5	14.2	.833	.839	.779	8.5	14.2	.833	.839	.967
PHF	.625	.861	.960						.250			.600	.833				.600	.833			

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

# Wilson Okamoto Corporation

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

Counted By: FS, PA  
Counters: TU-0650, TU-0653  
Weather: Clear

File Name : WarHal PM  
Site Code : 00000005  
Start Date : 4/8/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Ward Avenue Southbound				Westbound App. Total	Ward Avenue Northbound				Halekiauila Street Eastbound						
	Left	Thru	Right	Peds		App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total
03:00 PM	7	152	43	0	202	0	9	139	0	14	29	0	13	12	54	418
03:15 PM	5	149	35	0	189	0	6	137	3	16	38	5	13	7	63	414
03:30 PM	9	150	25	0	184	0	10	150	5	32	45	3	19	15	82	463
03:45 PM	12	170	27	0	209	0	7	150	3	20	38	9	8	13	68	457
<b>Total</b>	<b>33</b>	<b>621</b>	<b>130</b>	<b>0</b>	<b>784</b>	<b>0</b>	<b>32</b>	<b>576</b>	<b>11</b>	<b>82</b>	<b>150</b>	<b>17</b>	<b>53</b>	<b>47</b>	<b>267</b>	<b>1752</b>
04:00 PM	4	122	40	0	166	0	7	162	3	25	58	5	15	7	85	448
04:15 PM	2	136	34	0	172	0	6	185	3	24	63	4	18	9	94	484
04:30 PM	8	183	45	0	236	0	4	156	0	23	66	5	20	29	120	539
04:45 PM	11	151	34	0	196	0	10	167	3	13	58	4	22	2	86	475
<b>Total</b>	<b>25</b>	<b>592</b>	<b>153</b>	<b>0</b>	<b>770</b>	<b>0</b>	<b>27</b>	<b>670</b>	<b>9</b>	<b>85</b>	<b>245</b>	<b>18</b>	<b>75</b>	<b>47</b>	<b>385</b>	<b>1946</b>
05:00 PM	10	164	36	0	210	0	10	162	0	27	56	8	30	16	110	519
05:15 PM	4	175	31	0	210	0	8	115	1	25	60	6	17	16	99	458
05:30 PM	7	156	38	0	201	0	9	121	2	21	38	4	21	16	79	433
05:45 PM	6	138	28	0	172	0	13	152	1	18	50	4	18	5	77	433
<b>Total</b>	<b>27</b>	<b>633</b>	<b>133</b>	<b>0</b>	<b>793</b>	<b>0</b>	<b>40</b>	<b>550</b>	<b>4</b>	<b>91</b>	<b>204</b>	<b>22</b>	<b>86</b>	<b>53</b>	<b>365</b>	<b>1843</b>
<b>Grand Total</b>	<b>85</b>	<b>1846</b>	<b>416</b>	<b>0</b>	<b>2347</b>	<b>0</b>	<b>99</b>	<b>1796</b>	<b>24</b>	<b>258</b>	<b>599</b>	<b>57</b>	<b>214</b>	<b>147</b>	<b>1017</b>	<b>5541</b>
<b>Approch % Total %</b>	<b>3.6</b>	<b>78.7</b>	<b>17.7</b>	<b>0</b>	<b>42.4</b>	<b>0</b>	<b>4.5</b>	<b>82.5</b>	<b>1.1</b>	<b>11.9</b>	<b>58.9</b>	<b>5.6</b>	<b>21</b>	<b>14.5</b>	<b>18.4</b>	
	<b>1.5</b>	<b>33.3</b>	<b>7.5</b>	<b>0</b>		<b>0</b>	<b>1.8</b>	<b>32.4</b>	<b>0.4</b>	<b>4.7</b>	<b>10.8</b>	<b>1</b>	<b>3.9</b>	<b>2.7</b>		

Start Time	Ward Avenue Southbound				Westbound App. Total	Ward Avenue Northbound				Halekiauila Street Eastbound						
	Left	Thru	Right	Peds		App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total
04:15 PM	2	136	34	0	172	0	6	185	3	25	63	4	18	9	85	451
04:30 PM	8	183	45	0	236	0	4	156	0	23	66	5	20	29	91	487
04:45 PM	11	151	34	0	196	0	10	167	3	16	58	4	22	16	84	460
05:00 PM	10	164	36	0	210	0	10	162	0	17	56	8	30	16	94	476
<b>Total Volume</b>	<b>31</b>	<b>634</b>	<b>149</b>	<b>0</b>	<b>814</b>	<b>0</b>	<b>30</b>	<b>670</b>	<b>6</b>	<b>706</b>	<b>243</b>	<b>21</b>	<b>90</b>	<b>354</b>	<b>1874</b>	
<b>% App. Total</b>	<b>3.8</b>	<b>77.9</b>	<b>18.3</b>	<b>0</b>	<b>42.4</b>	<b>0</b>	<b>4.2</b>	<b>94.9</b>	<b>0.8</b>	<b>11.9</b>	<b>58.6</b>	<b>5.9</b>	<b>25.4</b>	<b>18.4</b>		
<b>PHF</b>	<b>.705</b>	<b>.866</b>	<b>.828</b>	<b>.000</b>	<b>.862</b>	<b>.000</b>	<b>.750</b>	<b>.905</b>	<b>.500</b>	<b>.910</b>	<b>.920</b>	<b>.656</b>	<b>.750</b>	<b>.941</b>	<b>.962</b>	

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

# Wilson Okamoto Corporation

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

Counted By: RJ, JJ  
 Counters: TU-0651, TU-0649  
 Weather: Clear

File Name : CookKaw AM  
 Site Code : 00000001  
 Start Date : 4/9/2015  
 Page No : 1

Groups Printed- Unshifted

Start Time	Cooke Street Southbound				Kawaihaeo Street Westbound				Cooke Street Northbound				Kawaihaeo Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
06:00 AM	1	29	13	4	47	0	4	4	8	16	4	13	4	0	21	7	0	2	4	13	97
06:15 AM	2	29	17	5	53	2	2	5	13	22	3	19	2	0	24	1	0	1	7	9	108
06:30 AM	0	58	29	8	95	1	4	6	13	24	3	33	3	0	39	2	2	5	7	16	174
06:45 AM	3	88	44	7	142	3	10	9	19	41	8	34	2	1	45	3	2	3	10	18	246
<b>Total</b>	<b>6</b>	<b>204</b>	<b>103</b>	<b>24</b>	<b>337</b>	<b>6</b>	<b>20</b>	<b>24</b>	<b>53</b>	<b>103</b>	<b>18</b>	<b>99</b>	<b>11</b>	<b>1</b>	<b>129</b>	<b>13</b>	<b>4</b>	<b>11</b>	<b>28</b>	<b>56</b>	<b>625</b>
07:00 AM	5	75	45	11	136	1	6	15	4	26	9	52	5	1	67	6	0	5	8	19	248
07:15 AM	5	91	57	18	171	4	4	9	19	36	10	36	6	0	52	4	2	4	8	18	277
07:30 AM	5	86	43	16	150	4	14	14	18	50	12	56	15	0	83	7	1	6	8	22	305
07:45 AM	9	91	61	11	172	11	6	11	20	48	13	58	12	0	83	6	0	8	10	24	327
<b>Total</b>	<b>24</b>	<b>343</b>	<b>206</b>	<b>56</b>	<b>629</b>	<b>20</b>	<b>30</b>	<b>49</b>	<b>61</b>	<b>160</b>	<b>44</b>	<b>202</b>	<b>38</b>	<b>1</b>	<b>285</b>	<b>23</b>	<b>3</b>	<b>23</b>	<b>34</b>	<b>83</b>	<b>1157</b>
08:00 AM	9	90	46	13	158	4	4	20	19	47	12	48	7	0	67	7	2	6	14	29	301
08:15 AM	12	78	55	19	164	10	11	13	22	56	8	44	9	0	61	7	4	6	7	24	305
08:30 AM	11	72	26	27	136	8	6	17	18	49	8	41	13	0	62	4	5	7	3	19	266
08:45 AM	12	72	24	21	129	2	8	19	18	47	15	42	6	0	63	4	2	6	6	18	257
<b>Total</b>	<b>44</b>	<b>312</b>	<b>151</b>	<b>80</b>	<b>587</b>	<b>24</b>	<b>29</b>	<b>69</b>	<b>77</b>	<b>199</b>	<b>43</b>	<b>175</b>	<b>35</b>	<b>0</b>	<b>253</b>	<b>22</b>	<b>13</b>	<b>25</b>	<b>30</b>	<b>90</b>	<b>1129</b>
<b>Grand Total</b>	<b>74</b>	<b>859</b>	<b>460</b>	<b>160</b>	<b>1553</b>	<b>50</b>	<b>79</b>	<b>142</b>	<b>191</b>	<b>462</b>	<b>105</b>	<b>476</b>	<b>84</b>	<b>2</b>	<b>667</b>	<b>58</b>	<b>20</b>	<b>59</b>	<b>92</b>	<b>229</b>	<b>2911</b>
<b>Approch % Total</b>	<b>4.8</b>	<b>55.3</b>	<b>29.6</b>	<b>10.3</b>	<b>53.3</b>	<b>10.8</b>	<b>17.1</b>	<b>30.7</b>	<b>41.3</b>	<b>15.9</b>	<b>3.6</b>	<b>16.4</b>	<b>2.9</b>	<b>0.1</b>	<b>22.9</b>	<b>2</b>	<b>0.7</b>	<b>2</b>	<b>3.2</b>	<b>7.9</b>	

Start Time	Cooke Street Southbound				Kawaihaeo Street Westbound				Cooke Street Northbound				Kawaihaeo Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
07:30 AM	5	86	43		134	4	14	14		32	12	56	15		83	7	1	6		14	263
07:45 AM	9	91	61		161	11	6	11		28	13	58	12		83	6	0	8		14	286
08:00 AM	9	90	46		145	4	4	20		28	12	48	7		67	7	2	6		15	255
08:15 AM	12	78	55		145	10	11	13		34	8	44	9		61	7	4	6		17	257
<b>Total Volume</b>	<b>35</b>	<b>345</b>	<b>205</b>	<b>35</b>	<b>585</b>	<b>29</b>	<b>35</b>	<b>58</b>	<b>43</b>	<b>122</b>	<b>45</b>	<b>206</b>	<b>43</b>	<b>294</b>	<b>27</b>	<b>7</b>	<b>26</b>	<b>60</b>	<b>1061</b>		
<b>% App. Total</b>	<b>6</b>	<b>59</b>	<b>35</b>	<b>6</b>	<b>908</b>	<b>23.8</b>	<b>28.7</b>	<b>47.5</b>	<b>14.6</b>	<b>20.6</b>	<b>15.3</b>	<b>70.1</b>	<b>14.6</b>	<b>22.9</b>	<b>45</b>	<b>11.7</b>	<b>43.3</b>	<b>26.5</b>	<b>3.2</b>	<b>7.9</b>	<b>927</b>
<b>PHF</b>	<b>.729</b>	<b>.948</b>	<b>.840</b>	<b>.725</b>	<b>.897</b>	<b>.865</b>	<b>.888</b>	<b>.717</b>	<b>.886</b>	<b>.882</b>	<b>.964</b>	<b>.438</b>	<b>.813</b>	<b>.882</b>	<b>.927</b>						

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

# Wilson Okamoto Corporation

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

Counted By: RJ, JJ  
Counters: TU-0649, TU-0651  
Weather: Clear

File Name : CookKaw PM  
Site Code : 00000001  
Start Date : 4/9/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Cooke Street Southbound				Kawaiahao Street Westbound				Cooke Street Northbound				Kawaiahao Street Eastbound				Int. Total				
	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	8	38	15	5	66	5	8	24	8	45	10	60	8	0	78	8	7	7	6	28	217
03:15 PM	5	64	14	6	89	3	8	11	18	40	8	56	16	0	80	7	4	8	8	27	236
03:30 PM	7	83	19	4	113	2	13	15	12	42	15	66	16	0	97	12	6	6	9	33	285
03:45 PM	7	78	25	6	116	5	4	21	8	38	7	99	12	0	118	6	1	8	5	20	292
Total	27	263	73	21	384	15	33	71	46	165	40	281	52	0	373	33	18	29	28	108	1030
04:00 PM	5	80	19	9	113	4	5	18	21	48	9	79	9	0	97	12	5	13	10	40	298
04:15 PM	9	64	16	17	106	2	5	24	20	51	6	88	13	0	107	7	3	6	13	29	293
04:30 PM	8	83	12	9	112	7	15	22	9	53	4	95	10	0	109	10	4	9	10	33	307
04:45 PM	9	80	15	14	118	8	5	15	18	46	8	84	8	0	100	9	6	8	12	35	299
Total	31	307	62	49	449	21	30	79	68	198	27	346	40	0	413	38	18	36	45	137	1197
05:00 PM	4	67	21	10	102	12	7	26	14	59	15	106	7	0	128	12	2	13	16	43	332
05:15 PM	8	66	14	9	97	5	7	25	15	52	6	87	17	0	110	12	3	8	7	30	289
05:30 PM	8	35	12	9	64	7	4	29	16	56	3	99	5	0	107	7	2	5	11	25	252
05:45 PM	7	41	15	5	68	6	5	17	6	34	7	61	8	0	76	12	1	4	8	25	203
Total	27	209	62	33	331	30	23	97	51	201	31	353	37	0	421	43	8	30	42	123	1076
Grand Total	85	779	197	103	1164	66	86	247	165	564	98	980	129	0	1207	114	44	95	115	368	3303
Apprch %	7.3	66.9	16.9	8.8		11.7	15.2	43.8	29.3		8.1	81.2	10.7	0		3.1	12	25.8	31.2		
Total %	2.6	23.6	6	3.1	35.2	2	2.6	7.5	5	17.1	3	29.7	3.9	0	36.5	3.5	1.3	2.9	3.5	11.1	

Start Time	Cooke Street Southbound				Kawaiahao Street Westbound				Cooke Street Northbound				Kawaiahao Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
04:30 PM	8	83	12		103	7	15	22		44	4	95	10		109	10	4	9		23	279
04:45 PM	9	80	15		104	8	5	15		28	8	84	8		100	9	6	8		23	255
05:00 PM	4	67	21		92	12	7	26		45	15	106	7		128	12	2	13		27	292
05:15 PM	8	66	14		88	5	7	25		37	6	87	17		110	12	3	8		23	258
Total Volume	29	296	62		387	32	34	88		154	33	372	42		447	43	15	38		96	1084
% App. Total	7.5	76.5	16			20.8	22.1	57.1			7.4	83.2	9.4			44.8	15.6	39.6			
PHF	.806	.892	.738		.930	.667	.567	.846		.856	.550	.877	.618		.873	.896	.625	.731		.889	.928

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



# Wilson Okamoto Corporation

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

Counted By: DY, JC  
Counters: D4-5675, D4-5676  
Weather: Clear

File Name : CooQue AM  
Site Code : 00000002  
Start Date : 4/9/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Cooke Street Southbound						Queen Street Westbound						Cooke Street Northbound						Queen Street Eastbound						Int. Total						
	Left		Thru		Right		Peds		App. Total		Left		Thru		Right		Peds		App. Total		Left		Thru			Right		Peds		App. Total	
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds		App. Total	Left	Thru	Right	Peds	App. Total
06:00 AM	3	18	9	3	33	5	25	5	8	43	3	11	2	6	22	5	27	10	7	49	5	27	10	7	49	147					
06:15 AM	2	22	9	1	34	4	36	2	8	50	2	18	5	1	26	4	20	11	7	42	4	20	11	7	42	152					
06:30 AM	3	35	27	4	69	10	50	6	15	81	8	19	2	1	30	5	37	4	6	52	5	37	4	6	52	232					
06:45 AM	2	41	51	6	100	7	54	10	20	91	11	31	5	4	51	6	29	16	6	57	6	29	16	6	57	299					
Total	10	116	96	14	236	26	165	23	51	265	24	79	14	12	129	20	113	41	26	200	20	113	41	26	200	830					
07:00 AM	4	44	36	2	86	14	89	7	6	116	9	39	9	4	61	7	34	12	6	59	7	34	12	6	59	322					
07:15 AM	4	53	41	4	102	10	91	10	25	136	6	37	4	8	55	6	46	11	4	67	6	46	11	4	67	360					
07:30 AM	3	49	44	3	99	10	119	18	19	166	5	55	10	7	77	12	48	18	10	88	12	48	18	10	88	430					
07:45 AM	3	52	54	7	116	13	122	12	15	162	3	66	8	5	82	6	50	10	5	71	6	50	10	5	71	431					
Total	14	198	175	16	403	47	421	47	65	580	23	197	31	24	275	31	178	51	25	285	31	178	51	25	285	1543					
08:00 AM	3	64	36	14	117	20	115	11	11	157	8	48	9	11	76	8	43	17	9	77	8	43	17	9	77	427					
08:15 AM	3	47	41	2	93	12	94	7	11	124	9	43	11	7	70	13	47	16	7	83	13	47	16	7	83	370					
08:30 AM	7	51	29	2	89	18	84	7	13	122	8	41	7	6	62	13	51	18	4	86	13	51	18	4	86	359					
08:45 AM	5	50	26	7	88	22	76	15	8	121	9	43	10	4	66	6	57	21	7	91	6	57	21	7	91	366					
Total	18	212	132	25	387	72	369	40	43	524	34	175	37	28	274	40	198	72	27	337	40	198	72	27	337	1522					
Grand Total	42	526	403	55	1026	145	955	110	159	1369	81	451	82	64	678	91	489	164	78	822	91	489	164	78	822	3895					
Approach %	4.1	51.3	39.3	5.4		10.6	69.8	8	11.6		11.9	66.5	12.1	9.4		11.1	59.5	20	9.5		11.1	59.5	20	9.5							
Total %	1.1	13.5	10.3	1.4	26.3	3.7	24.5	2.8	4.1	35.1	2.1	11.6	2.1	1.6	17.4	2.3	12.6	4.2	2	21.1	2.3	12.6	4.2	2	21.1						

Start Time	Cooke Street Southbound						Queen Street Westbound						Cooke Street Northbound						Queen Street Eastbound						Int. Total				
	Left		Thru		Right		Peds		App. Total		Left		Thru		Right		Peds		App. Total		Left		Thru			Right		App. Total	
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds		App. Total	Left	Thru	Right
07:30 AM	3	49	44		96	10	119	18		147	5	55	10		70	12	48	18		78	12	48	18		78	391			
07:45 AM	3	52	54		109	13	122	12		147	3	66	8		77	6	50	10		66	6	50	10		66	399			
08:00 AM	3	64	36		103	20	115	11		146	8	48	9		65	8	43	17		68	8	43	17		68	382			
08:15 AM	3	47	41		91	12	94	7		113	9	43	11		63	13	47	16		76	13	47	16		76	343			
Total Volume	12	212	175		399	55	450	48		553	25	212	38		275	39	188	61		288	39	188	61		288	1515			
% App. Total	3	53.1	43.9			9.9	81.4	8.7			9.1	77.1	13.8			13.5	65.3	21.2			13.5	65.3	21.2						
PHF	1.00	.828	.810		.915	.688	.922	.667		.940	.694	.803	.864		.893	.750	.940	.847		.923	.750	.940	.847		.923	.949			

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

# Wilson Okamoto Corporation

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

Counted By: DY, EV  
Counters: D4-5675, D4-5676  
Weather: Clear

File Name : CooQue PM  
Site Code : 00000002  
Start Date : 4/9/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Cooke Street Southbound						Queen Street Westbound						Cooke Street Northbound						Queen Street Eastbound						Int. Total						
	Left		Thru		Right		Peds		App. Total		Left		Thru		Right		Peds		App. Total		Left		Thru			Right		Peds		App. Total	
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	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	2	32	16	2	52	11	91	14	11	127	7	60	13	5	85	8	49	16	7	80	8	49	16	7	7	80	344				
03:15 PM	9	46	20	5	80	18	76	14	9	117	7	50	17	5	79	16	58	22	5	101	16	58	22	5	5	101	377				
03:30 PM	4	71	17	2	94	6	112	17	12	147	7	63	10	10	90	17	66	11	5	99	17	66	11	5	5	99	430				
03:45 PM	9	60	22	7	98	22	100	21	10	153	7	84	7	8	106	15	61	21	6	103	15	61	21	6	6	103	460				
<b>Total</b>	24	209	75	16	324	57	379	66	42	544	28	257	47	28	360	56	234	70	23	383	56	234	70	23	37	383	1611				
04:00 PM	5	73	19	8	105	7	70	9	17	103	12	71	19	4	106	15	59	17	10	101	15	59	17	10	10	101	415				
04:15 PM	4	50	18	1	73	18	79	20	20	137	6	68	9	8	91	20	78	22	7	127	20	78	22	7	7	127	428				
04:30 PM	6	64	29	2	101	8	73	7	12	100	8	78	9	5	100	24	101	18	11	154	24	101	18	11	11	154	455				
04:45 PM	11	63	22	3	99	11	67	12	12	102	3	66	14	11	94	25	107	15	9	156	25	107	15	9	9	156	451				
<b>Total</b>	26	250	88	14	378	44	289	48	61	442	29	283	51	28	391	84	345	72	37	538	84	345	72	37	37	538	1749				
05:00 PM	9	56	27	3	95	11	82	14	12	119	10	94	14	14	132	23	98	19	8	148	23	98	19	8	8	148	494				
05:15 PM	7	55	18	0	80	11	80	17	16	124	9	75	12	5	101	19	94	20	3	136	19	94	20	3	3	136	441				
05:30 PM	3	30	14	5	52	13	68	8	16	105	9	72	11	7	99	27	87	15	5	134	27	87	15	5	5	134	390				
05:45 PM	1	25	25	7	58	11	74	7	14	106	13	63	10	8	94	6	84	15	9	114	6	84	15	9	9	114	372				
<b>Total</b>	20	166	84	15	285	46	304	46	58	454	41	304	47	34	426	75	363	69	25	532	75	363	69	25	25	532	1697				
<b>Grand Total</b>	70	625	247	45	987	147	972	160	161	1440	98	844	145	90	1177	215	942	211	85	1453	215	942	211	85	85	1453	5057				
<b>Approch % Total %</b>	7.1	63.3	25	4.6	19.5	10.2	67.5	11.1	11.2	28.5	8.3	71.7	12.3	7.6	23.3	14.8	64.8	14.5	5.8	28.7	4.3	18.6	4.2	1.7	1.7	28.7					

Start Time	Cooke Street Southbound						Queen Street Westbound						Cooke Street Northbound						Queen Street Eastbound						Int. Total				
	Left		Thru		Right		Peds		App. Total		Left		Thru		Right		Peds		App. Total		Left		Thru			Right		App. Total	
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds		App. Total	Left	Thru	Right
04:30 PM	6	64	29	99	99	8	73	7	88	88	8	78	9	95	24	101	18	143	425	24	101	18	143	425					
04:45 PM	11	63	22	96	96	11	67	12	90	90	3	66	14	83	25	107	15	147	416	25	107	15	147	416					
05:00 PM	9	56	27	92	92	11	82	14	107	107	10	94	14	118	23	98	19	140	457	23	98	19	140	457					
05:15 PM	7	55	18	80	80	11	80	17	108	108	9	75	12	96	19	94	20	133	417	19	94	20	133	417					
<b>Total Volume</b>	33	238	96	367	367	41	302	50	393	393	30	313	49	392	91	400	72	563	1715	91	400	72	563	1715					
<b>% App. Total</b>	9	64.9	26.2	92.7	92.7	10.4	76.8	12.7	12.5	12.5	7.7	79.8	12.5	12.8	16.2	71	12.8	9.0	9.38	16.2	71	12.8	9.0	9.38					
<b>PHF</b>	.750	.930	.828	.927	.927	.932	.921	.735	.910	.910	.750	.832	.875	.831	.910	.935	.900	.957	.938	.938	.910	.935	.900	.957	.938				

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

# Wilson Okamoto Corporation

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

Counted By: GC, KW  
Counters: D4-3890, D4-5674  
Weather: Clear

File Name : CooHal AM  
Site Code : 00000004  
Start Date : 4/9/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Cooke Street Southbound				Halekauwila Street Westbound				Cooke Street Northbound				Halekauwila Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
06:00 AM	7	17	9	3	36	6	6	5	3	20	0	11	2	3	16	1	10	1	6	18	90
06:15 AM	6	27	3	3	39	3	2	5	5	15	2	15	0	5	22	5	5	8	5	23	99
06:30 AM	3	32	13	4	52	8	8	5	4	25	4	19	2	4	29	7	18	5	6	36	142
06:45 AM	5	55	5	1	66	4	15	4	9	32	3	31	4	5	43	8	12	2	3	25	166
<b>Total</b>	<b>21</b>	<b>131</b>	<b>30</b>	<b>11</b>	<b>193</b>	<b>21</b>	<b>31</b>	<b>19</b>	<b>21</b>	<b>92</b>	<b>9</b>	<b>76</b>	<b>8</b>	<b>17</b>	<b>110</b>	<b>21</b>	<b>45</b>	<b>16</b>	<b>20</b>	<b>102</b>	<b>497</b>
07:00 AM	11	38	19	4	72	3	21	7	6	37	4	39	2	6	51	10	15	2	6	33	193
07:15 AM	9	44	18	10	81	8	24	9	4	45	4	26	7	4	41	11	12	6	6	35	202
07:30 AM	14	51	12	8	85	13	21	9	5	48	3	51	9	2	65	13	23	10	7	53	251
07:45 AM	6	50	19	8	83	11	23	13	8	55	5	49	13	5	72	14	17	8	4	43	253
<b>Total</b>	<b>40</b>	<b>183</b>	<b>68</b>	<b>30</b>	<b>321</b>	<b>35</b>	<b>89</b>	<b>38</b>	<b>23</b>	<b>185</b>	<b>16</b>	<b>165</b>	<b>31</b>	<b>17</b>	<b>229</b>	<b>48</b>	<b>67</b>	<b>26</b>	<b>23</b>	<b>164</b>	<b>899</b>
08:00 AM	6	81	17	7	111	13	19	7	2	41	4	45	13	2	64	13	18	8	4	43	259
08:15 AM	8	53	12	1	74	14	9	4	0	27	3	49	8	2	62	10	11	5	6	32	195
08:30 AM	10	65	12	3	90	10	10	8	11	39	2	45	10	2	59	4	14	2	4	24	212
08:45 AM	6	77	10	10	103	7	15	3	4	29	2	48	5	3	58	10	13	10	4	37	227
<b>Total</b>	<b>30</b>	<b>276</b>	<b>51</b>	<b>21</b>	<b>378</b>	<b>44</b>	<b>53</b>	<b>22</b>	<b>17</b>	<b>136</b>	<b>11</b>	<b>187</b>	<b>36</b>	<b>9</b>	<b>243</b>	<b>37</b>	<b>56</b>	<b>25</b>	<b>18</b>	<b>136</b>	<b>893</b>
<b>Grand Total</b>	<b>91</b>	<b>590</b>	<b>149</b>	<b>62</b>	<b>892</b>	<b>100</b>	<b>173</b>	<b>79</b>	<b>61</b>	<b>413</b>	<b>36</b>	<b>428</b>	<b>75</b>	<b>43</b>	<b>582</b>	<b>106</b>	<b>168</b>	<b>67</b>	<b>61</b>	<b>402</b>	<b>2289</b>
<b>Approch % Total %</b>	<b>10.2</b>	<b>66.1</b>	<b>16.7</b>	<b>7</b>	<b>24.2</b>	<b>41.9</b>	<b>19.1</b>	<b>14.8</b>	<b>18</b>	<b>1.6</b>	<b>18.7</b>	<b>3.3</b>	<b>1.9</b>	<b>25.4</b>	<b>4.6</b>	<b>7.3</b>	<b>2.9</b>	<b>2.7</b>	<b>17.6</b>		

Start Time	Cooke Street Southbound				Halekauwila Street Westbound				Cooke Street Northbound				Halekauwila Street Eastbound				Int. Total			
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds
07:30 AM	14	51	12	12	77	13	21	9	9	43	3	51	9	9	63	13	23	10	46	229
07:45 AM	6	50	19	17	75	11	23	13	7	47	5	49	13	13	67	14	17	8	39	228
08:00 AM	6	81	17	17	104	13	19	7	7	39	4	45	13	8	62	13	18	8	39	244
08:15 AM	8	53	12	12	73	14	9	4	4	27	3	49	8	8	60	10	11	5	26	186
<b>Total Volume</b>	<b>34</b>	<b>235</b>	<b>60</b>	<b>329</b>	<b>329</b>	<b>51</b>	<b>72</b>	<b>33</b>	<b>156</b>	<b>156</b>	<b>15</b>	<b>194</b>	<b>43</b>	<b>252</b>	<b>252</b>	<b>50</b>	<b>69</b>	<b>31</b>	<b>150</b>	<b>887</b>
<b>% App. Total</b>	<b>10.3</b>	<b>71.4</b>	<b>18.2</b>	<b>18.2</b>	<b>32.7</b>	<b>46.2</b>	<b>21.2</b>	<b>17.1</b>	<b>17.1</b>	<b>33.3</b>	<b>4.6</b>	<b>20.7</b>	<b>17.6</b>	<b>25.4</b>	<b>4.6</b>	<b>7.3</b>	<b>2.9</b>	<b>2.7</b>	<b>17.6</b>	
<b>PHF</b>	<b>.607</b>	<b>.725</b>	<b>.789</b>	<b>.791</b>	<b>.911</b>	<b>.783</b>	<b>.635</b>	<b>.830</b>	<b>.830</b>	<b>.750</b>	<b>.951</b>	<b>.827</b>	<b>.940</b>	<b>.940</b>	<b>.893</b>	<b>.750</b>	<b>.775</b>	<b>.815</b>	<b>.815</b>	<b>.909</b>

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

# Wilson Okamoto Corporation

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

Counted By: GC, KW  
Counters: D4-5674, D4-3890  
Weather: Clear

File Name : CooHal PM  
Site Code : 00000004  
Start Date : 4/9/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Cooke Street Southbound				Halekauwila Street Westbound				Cooke Street Northbound				Halekauwila Street Eastbound				Int. Total				
	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	5	50	7	3	65	5	12	4	7	28	4	69	3	6	82	5	20	8	1	34	209
03:15 PM	11	67	6	3	87	11	15	11	5	42	3	50	9	4	66	11	36	3	6	56	251
03:30 PM	8	71	6	4	89	8	15	4	5	32	7	61	13	2	83	11	20	10	6	47	251
03:45 PM	7	87	7	1	102	3	9	15	11	38	0	67	12	4	83	13	26	10	8	57	280
Total	31	275	26	11	343	27	51	34	28	140	14	247	37	16	314	40	102	31	21	194	991
04:00 PM	14	75	8	1	98	10	15	22	9	56	3	67	8	5	83	12	23	6	2	43	280
04:15 PM	7	69	13	1	90	7	18	7	5	37	4	56	12	6	78	17	27	8	4	56	261
04:30 PM	7	73	9	9	98	8	17	15	11	51	3	59	6	8	76	22	35	14	11	82	307
04:45 PM	8	69	11	9	97	10	12	15	12	49	7	52	10	7	76	24	31	15	8	78	300
Total	36	286	41	20	383	35	62	59	37	193	17	234	36	26	313	75	116	43	25	259	1148
05:00 PM	8	66	9	3	86	13	21	17	8	59	5	83	11	3	102	18	26	19	10	73	320
05:15 PM	9	71	11	6	97	10	22	20	4	56	3	58	6	2	69	16	30	10	11	67	289
05:30 PM	4	41	15	5	65	6	17	14	10	47	5	68	16	7	96	10	28	9	7	54	262
05:45 PM	3	37	7	1	48	9	20	16	9	54	7	58	18	13	96	10	22	10	7	49	247
Total	24	215	42	15	296	38	80	67	31	216	20	267	51	25	363	54	106	48	35	243	1118
Grand Total	91	776	109	46	1022	100	193	160	96	549	51	748	124	67	990	169	324	122	81	696	3257
Approach %	8.9	75.9	10.7	4.5		18.2	35.2	29.1	17.5		5.2	75.6	12.5	6.8		24.3	46.6	17.5	11.6		
Total %	2.8	23.8	3.3	1.4	31.4	3.1	5.9	4.9	2.9	16.9	1.6	23	3.8	2.1	30.4	5.2	9.9	3.7	2.5	21.4	

Start Time	Cooke Street Southbound				Halekauwila Street Westbound				Cooke Street Northbound				Halekauwila Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
04:30 PM	7	73	9	9	98	8	17	15	11	51	3	59	6	8	76	22	35	14	11	82	307
04:45 PM	8	69	11	9	97	10	12	15	12	49	7	52	10	7	76	24	31	15	8	78	300
05:00 PM	8	66	9	3	86	13	21	17	8	59	5	83	11	3	102	18	26	19	10	73	320
05:15 PM	9	71	11	6	97	10	22	20	4	56	3	58	6	2	69	16	30	10	11	67	289
Total Volume	32	279	40	27	378	41	72	67	35	215	18	252	33	20	323	80	122	58	40	300	1216
% App. Total	8.5	73.8	10.6	7.1		19.1	33.5	31.2	16.3		5.6	78	10.2	6.2		26.7	40.7	19.3	13.3		
PHF	.889	.955	.909	.750	.964	.788	.818	.838	.729	.911	.643	.759	.750	.625	.792	.833	.871	.763	.909	.915	.950

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

# Wilson Okamoto Corporation

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

Counted By: FS, PA  
Counters: TU-0654, TU-0652  
Weather: Clear

File Name : CooPoh AM  
Site Code : 00000003  
Start Date : 4/9/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Cooke Street Southbound				Pohukaina Street Westbound				Cooke Street Northbound				Pohukaina Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
06:00 AM	4	13	7	0	24	1	1	2	1	5	0	11	7	0	18	0	7	0	2	9	56
06:15 AM	4	24	10	1	39	4	3	3	1	11	2	16	4	1	23	0	2	1	3	6	79
06:30 AM	3	20	23	1	47	4	13	12	4	33	2	13	5	0	20	1	16	1	6	24	124
06:45 AM	13	29	18	4	64	6	20	4	2	32	3	27	9	1	40	6	10	3	5	24	160
Total	24	86	58	6	174	15	37	21	8	81	7	67	25	2	101	7	35	5	16	63	419
07:00 AM	2	28	14	1	45	6	15	4	2	27	6	25	15	4	50	8	10	4	3	25	147
07:15 AM	14	26	18	3	61	10	31	5	2	48	1	28	13	3	45	6	10	5	5	26	180
07:30 AM	5	52	18	0	75	7	42	14	3	66	3	42	4	4	53	8	9	4	1	22	216
07:45 AM	6	44	17	1	68	11	30	12	2	55	8	46	11	1	66	12	18	4	1	35	224
Total	27	150	67	5	249	34	118	35	9	196	18	141	43	12	214	34	47	17	10	108	767
08:00 AM	10	72	19	1	102	9	17	11	3	40	5	42	13	4	64	9	7	7	2	25	231
08:15 AM	8	37	27	3	75	6	24	9	2	41	0	39	16	4	59	12	14	5	4	35	210
08:30 AM	8	48	21	0	77	8	26	8	5	47	5	36	15	1	57	13	19	4	1	37	218
08:45 AM	8	68	17	3	96	13	17	9	6	45	4	32	14	7	57	13	12	4	1	30	228
Total	34	225	84	7	350	36	84	37	16	173	14	149	58	16	237	47	52	20	8	127	887
Grand Total	85	461	209	18	773	85	239	93	33	450	39	357	126	30	552	88	134	42	34	298	2073
Approch %	11	59.6	27	2.3		18.9	53.1	20.7	7.3		7.1	64.7	22.8	5.4		29.5	45	14.1	11.4		
Total %	4.1	22.2	10.1	0.9	37.3	4.1	11.5	4.5	1.6	21.7	1.9	17.2	6.1	1.4	26.6	4.2	6.5	2	1.6	14.4	

Start Time	Cooke Street Southbound				Pohukaina Street Westbound				Cooke Street Northbound				Pohukaina Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
07:45 AM	6	44	17		67	11	30	12		53	8	46	11		65	12	18	4		34	219
08:00 AM	10	72	19		101	9	17	11		37	5	42	13		60	9	7	7		23	221
08:15 AM	8	37	27		72	6	24	9		39	0	39	16		55	12	14	5		31	197
08:30 AM	8	48	21		77	8	26	8		42	5	36	15		56	13	19	4		36	211
Total Volume	32	201	84		317	34	97	40		171	18	163	55		236	46	58	20		124	848
% App. Total	10.1	63.4	26.5			19.9	56.7	23.4			7.6	69.1	23.3			37.1	46.8	16.1			
PHF	.800	.698	.778		.785	.773	.808	.833		.807	.563	.886	.859		.908	.885	.763	.714		.861	.959

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

# Wilson Okamoto Corporation

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

Counted By: PA, FS  
Counters: TU-0654, TU-0652  
Weather: Clear

File Name : CooPoh PM  
Site Code : 00000003  
Start Date : 4/9/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Cooke Street Southbound				Pohukaina Street Westbound				Cooke Street Northbound				Pohukaina Street Eastbound				Int. Total				
	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	16	37	7	2	62	9	19	10	2	40	4	52	6	2	64	14	21	6	2	43	209
03:15 PM	7	58	15	5	85	9	18	12	5	44	5	37	17	2	61	13	27	5	5	50	240
03:30 PM	15	65	7	0	87	13	27	22	5	67	0	39	11	0	50	18	23	7	5	53	257
03:45 PM	20	66	15	5	106	6	33	12	10	61	5	45	12	3	65	21	29	6	5	61	293
Total	58	226	44	12	340	37	97	56	22	212	14	173	46	7	240	66	100	24	17	207	999
04:00 PM	16	54	14	0	84	19	24	11	2	56	0	41	5	6	52	26	19	6	8	59	251
04:15 PM	15	58	11	3	87	13	26	9	4	52	0	46	3	6	55	15	15	7	2	39	233
04:30 PM	20	59	15	5	99	4	22	12	8	46	3	39	12	8	62	17	49	7	3	76	283
04:45 PM	19	64	13	4	100	10	15	8	3	36	1	40	3	9	53	19	31	9	2	61	250
Total	70	235	53	12	370	46	87	40	17	190	4	166	23	29	222	77	114	29	15	235	1017
05:00 PM	20	65	12	11	108	13	22	22	7	64	5	51	14	10	80	25	22	6	8	61	313
05:15 PM	14	54	19	3	90	12	21	15	8	56	8	40	16	11	75	12	26	6	4	48	269
05:30 PM	15	27	13	4	59	18	17	15	6	56	2	40	20	10	72	31	21	8	62	122	309
05:45 PM	10	30	15	4	59	12	27	24	7	70	4	42	6	11	63	16	18	5	8	47	239
Total	59	176	59	22	316	55	87	76	28	246	19	173	56	42	290	84	87	25	82	278	1130
Grand Total	187	637	156	46	1026	138	271	172	67	648	37	512	125	78	752	227	301	78	114	720	3146
Approch %	18.2	62.1	15.2	4.5		21.3	41.8	26.5	10.3		4.9	68.1	16.6	10.4		31.5	41.8	10.8	15.8		
Total %	5.9	20.2	5	1.5	32.6	4.4	8.6	5.5	2.1	20.6	1.2	16.3	4	2.5	23.9	7.2	9.6	2.5	3.6	22.9	

Start Time	Cooke Street Southbound				Pohukaina Street Westbound				Cooke Street Northbound				Pohukaina Street Eastbound				Int. Total				
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left		Thru	Right	Peds	App. Total
04:30 PM	20	59	15		94	4	22	12		38	3	39	12		54	17	49	7		73	259
04:45 PM	19	64	13		96	10	15	8		33	1	40	3		44	19	31	9		59	232
05:00 PM	20	65	12		97	13	22	22		57	5	51	14		70	25	22	6		53	277
05:15 PM	14	54	19		87	12	21	15		48	8	40	16		64	12	26	6		44	243
Total Volume	73	242	59		374	39	80	57		176	17	170	45		232	73	128	28		229	1011
% App. Total	19.5	64.7	15.8			22.2	45.5	32.4			7.3	73.3	19.4			31.9	55.9	12.2			
PHF	.913	.931	.776		.964	.750	.909	.648		.772	.531	.833	.703		.829	.730	.653	.778		.784	.912

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

# Wilson Okamoto Corporation

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

Counted By: AC, DM  
Counters: TU-0653, TU-0650  
Weather: Clear

File Name : Halkam AM  
Site Code : 00000005  
Start Date : 4/9/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Kauahale Kakaako Drive Thru Southbound			Halekauwila Street Westbound			Kamani Street Northbound			Halekauwila Street Eastbound			Int. Total				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		App. Total			
06:00 AM	0	0	0	1	29	0	3	33	4	0	0	0	4	0	6	0	46
06:15 AM	0	0	0	4	27	1	2	34	3	0	2	3	8	1	5	3	51
06:30 AM	0	0	0	6	35	0	7	48	5	0	4	2	11	1	9	3	73
06:45 AM	0	0	0	6	39	0	6	51	3	0	2	2	7	3	20	2	85
Total	0	0	0	17	130	1	18	166	15	0	8	7	30	5	40	8	255
07:00 AM	0	0	0	9	49	1	6	65	3	0	7	3	13	0	7	1	87
07:15 AM	0	0	0	8	55	1	1	65	5	0	5	5	15	0	9	2	92
07:30 AM	0	0	0	17	55	3	2	77	2	0	0	1	3	0	30	4	116
07:45 AM	0	0	0	11	63	1	1	76	2	0	10	1	13	0	16	5	110
Total	0	0	0	45	222	6	10	283	12	0	22	10	44	0	62	12	405
08:00 AM	0	0	0	12	41	1	2	56	3	0	9	1	13	1	20	3	97
08:15 AM	0	0	0	10	34	1	3	48	13	0	10	4	27	0	13	1	91
08:30 AM	0	0	0	15	28	0	2	45	7	0	11	3	21	1	22	3	98
08:45 AM	0	0	0	16	24	1	0	41	2	0	6	1	9	1	8	0	59
Total	0	0	0	53	127	3	7	190	25	0	36	9	70	3	63	7	345
Grand Total	0	0	0	115	479	10	35	639	52	0	66	26	144	8	165	27	1005
Approch %	0	0	0	18	75	1.6	5.5	36.1	36.1	0	45.8	18.1	14.3	3.8	78.6	12.9	4.8
Total %	0	0	0	11.4	47.7	1	3.5	63.6	5.2	0	6.6	2.6	14.3	0.8	16.4	2.7	1

Start Time	Kauahale Kakaako Drive Thru Southbound			Halekauwila Street Westbound			Kamani Street Northbound			Halekauwila Street Eastbound			Int. Total				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		App. Total			
07:15 AM	0	0	0	8	55	1	1	64	5	0	5	5	10	0	9	2	85
07:30 AM	0	0	0	17	55	3	3	75	2	0	0	0	2	0	30	4	111
07:45 AM	0	0	0	11	63	1	1	75	2	0	10	10	12	0	16	5	108
08:00 AM	0	0	0	12	41	1	1	54	3	0	9	9	12	1	20	3	90
Total Volume	0	0	0	48	214	6	6	268	12	0	24	24	36	1	75	14	394
% App. Total	0.000	0.000	0.000	17.9	79.9	2.2	2.2	33.3	33.3	0.000	66.7	66.7	75.0	1.1	83.3	15.6	.887
PHF	.000	.000	.000	.706	.849	.500	.500	.893	.600	.000	.600	.600	.750	.250	.625	.700	.662

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

# Wilson Okamoto Corporation

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

Counted By: AC, DM  
Counters: TU-0653, TU-0650  
Weather: Clear

File Name : Halkam PM  
Site Code : 00000005  
Start Date : 4/9/2015  
Page No : 1

## Groups Printed- Unshifted

Start Time	Kauahale Kakaako Drive Thru Southbound				Halekauwila Street Westbound				Kamani Street Northbound				Halekauwila Street Eastbound				Int. Total	
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds		App. Total
03:00 PM	0	0	0	0	8	14	2	2	26	2	0	16	0	14	3	0	17	61
03:15 PM	0	0	0	0	9	23	2	1	35	10	1	19	1	6	24	0	32	98
03:30 PM	0	0	0	0	7	14	0	1	22	3	0	12	5	1	23	1	27	69
03:45 PM	0	0	0	0	9	17	2	0	28	4	0	20	1	2	26	2	31	84
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>33</b>	<b>68</b>	<b>6</b>	<b>4</b>	<b>111</b>	<b>19</b>	<b>1</b>	<b>67</b>	<b>7</b>	<b>94</b>	<b>8</b>	<b>3</b>	<b>107</b>	<b>312</b>
04:00 PM	0	0	0	0	8	29	3	7	47	3	0	11	2	16	1	0	19	82
04:15 PM	0	0	0	8	8	15	0	3	26	2	0	19	2	3	60	5	70	127
04:30 PM	0	0	0	1	9	22	1	1	33	5	0	18	5	2	52	2	59	121
04:45 PM	0	0	0	1	5	18	0	0	23	4	0	15	2	2	29	1	34	79
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>30</b>	<b>84</b>	<b>4</b>	<b>11</b>	<b>129</b>	<b>14</b>	<b>0</b>	<b>63</b>	<b>11</b>	<b>88</b>	<b>7</b>	<b>182</b>	<b>409</b>	
05:00 PM	0	0	0	6	8	42	2	1	53	2	0	17	1	4	17	4	28	107
05:15 PM	0	0	0	1	5	32	1	0	38	7	1	14	1	23	5	37	47	109
05:30 PM	0	0	0	1	7	31	2	1	41	5	0	15	4	24	4	37	46	112
05:45 PM	0	0	0	1	1	18	1	0	20	8	0	8	9	25	1	16	24	70
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>21</b>	<b>123</b>	<b>6</b>	<b>2</b>	<b>152</b>	<b>22</b>	<b>1</b>	<b>54</b>	<b>15</b>	<b>92</b>	<b>14</b>	<b>145</b>	<b>398</b>	
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>84</b>	<b>275</b>	<b>16</b>	<b>17</b>	<b>392</b>	<b>55</b>	<b>2</b>	<b>184</b>	<b>33</b>	<b>274</b>	<b>30</b>	<b>353</b>	<b>434</b>	<b>1119</b>
<b>Apprch %</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>21.4</b>	<b>70.2</b>	<b>4.1</b>	<b>4.3</b>	<b>20.1</b>	<b>0.7</b>	<b>67.2</b>	<b>12</b>	<b>2.9</b>	<b>6.9</b>	<b>81.3</b>	<b>7.1</b>	<b>4.6</b>	<b>11.9</b>
<b>Total %</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1.7</b>	<b>7.5</b>	<b>24.6</b>	<b>1.4</b>	<b>1.5</b>	<b>35</b>	<b>4.9</b>	<b>0.2</b>	<b>16.4</b>	<b>2.9</b>	<b>24.5</b>	<b>2.7</b>	<b>31.5</b>	<b>1.8</b>	<b>38.8</b>

Start Time	Kauahale Kakaako Drive Thru Southbound				Halekauwila Street Westbound				Kamani Street Northbound				Halekauwila Street Eastbound				Int. Total	
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds		App. Total
04:15 PM	0	0	0	8	8	15	0	0	23	2	0	0	19	21	3	5	68	120
04:30 PM	0	0	0	1	9	22	1	1	32	5	0	18	2	23	2	52	56	112
04:45 PM	0	0	0	1	5	18	0	0	23	4	0	15	1	19	2	29	32	75
05:00 PM	0	0	0	6	8	42	2	0	52	2	0	17	4	19	4	17	25	102
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>30</b>	<b>97</b>	<b>3</b>	<b>3</b>	<b>130</b>	<b>13</b>	<b>0</b>	<b>69</b>	<b>82</b>	<b>82</b>	<b>11</b>	<b>158</b>	<b>181</b>	<b>409</b>
<b>% App. Total</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>.500</b>	<b>.833</b>	<b>.577</b>	<b>.375</b>	<b>.625</b>	<b>.650</b>	<b>.000</b>	<b>.841</b>	<b>.908</b>	<b>.891</b>	<b>.688</b>	<b>.658</b>	<b>.600</b>	<b>.665</b>	<b>.852</b>
<b>PHF</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.500</b>	<b>.833</b>	<b>.577</b>	<b>.375</b>	<b>.625</b>	<b>.650</b>	<b>.000</b>	<b>.841</b>	<b>.908</b>	<b>.891</b>	<b>.688</b>	<b>.658</b>	<b>.600</b>	<b>.665</b>	<b>.852</b>

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



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**APPENDIX B**

**LEVEL OF SERVICE DEFINITIONS**

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## 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	$\leq 10.0$
B	$>10.0$ and $\leq 20.0$
C	$>20.0$ and $\leq 35.0$
D	$>35.0$ and $\leq 55.0$
E	$>55.0$ and $\leq 80.0$
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**

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

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**APPENDIX C**

**CAPACITY ANALYSIS CALCULATIONS  
EXISTING PEAK HOUR TRAFFIC ANALYSIS**

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# HCM Signalized Intersection Capacity Analysis

## 15: Ward Ave & Queen St

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗		↔	↗	↖	↕		↖	↕	
Traffic Volume (vph)	47	152	78	58	292	26	70	389	35	32	679	189
Future Volume (vph)	47	152	78	58	292	26	70	389	35	32	679	189
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	0.98		1.00	0.97	1.00	0.99		1.00	0.99	
Fipb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected		0.99	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1837	1547		1845	1539	1770	3471		1770	3379	
Flt Permitted		0.69	1.00		0.91	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1282	1547		1689	1539	1770	3471		1770	3379	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	50	162	83	62	311	28	74	414	37	34	722	201
RTOR Reduction (vph)	0	0	58	0	0	20	0	7	0	0	27	0
Lane Group Flow (vph)	0	212	25	0	373	8	74	444	0	34	896	0
Confl. Peds. (#/hr)	21		15	15		21			58			34
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		21.3	21.3		21.3	21.3	6.0	33.2		1.9	29.1	
Effective Green, g (s)		21.3	21.3		21.3	21.3	6.0	33.2		1.9	29.1	
Actuated g/C Ratio		0.30	0.30		0.30	0.30	0.08	0.46		0.03	0.41	
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)		382	461		503	459	148	1613		47	1377	
v/s Ratio Prot							c0.04	c0.13		0.02	c0.27	
v/s Ratio Perm		0.17	0.02		c0.22	0.01						
v/c Ratio		0.55	0.05		0.74	0.02	0.50	0.28		0.72	0.65	
Uniform Delay, d1		21.1	17.9		22.6	17.7	31.3	11.7		34.5	17.1	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.7	0.0		5.8	0.0	2.6	0.1		42.4	1.1	
Delay (s)		22.8	17.9		28.4	17.7	33.9	11.8		76.9	18.2	
Level of Service		C	B		C	B	C	B		E	B	
Approach Delay (s)		21.4			27.6			14.9			20.2	
Approach LOS		C			C			B			C	

### Intersection Summary

HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	71.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 15: Ward Ave & Queen St

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↘	↕		↘	↕	
Traffic Volume (vph)	97	315	140	70	273	70	66	735	121	88	719	77
Future Volume (vph)	97	315	140	70	273	70	66	735	121	88	719	77
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	0.97		1.00	0.98	1.00	0.98		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected		0.99	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1839	1532		1840	1550	1770	3400		1770	3456	
Flt Permitted		0.70	1.00		0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1310	1532		1286	1550	1770	3400		1770	3456	
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)	101	328	146	73	284	73	69	766	126	92	749	80
RTOR Reduction (vph)	0	0	52	0	0	45	0	14	0	0	9	0
Lane Group Flow (vph)	0	429	94	0	357	28	69	878	0	92	820	0
Confl. Peds. (#/hr)	11		25	25		11			88			59
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		29.7	29.7		29.7	29.7	4.3	27.6		5.0	28.3	
Effective Green, g (s)		29.7	29.7		29.7	29.7	4.3	27.6		5.0	28.3	
Actuated g/C Ratio		0.38	0.38		0.38	0.38	0.06	0.36		0.06	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)		503	588		494	595	98	1213		114	1265	
v/s Ratio Prot							0.04	c0.26		c0.05	0.24	
v/s Ratio Perm		c0.33	0.06		0.28	0.02						
v/c Ratio		0.85	0.16		0.72	0.05	0.70	0.72		0.81	0.65	
Uniform Delay, d1		21.8	15.6		20.3	14.9	35.9	21.5		35.7	20.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		13.2	0.1		5.2	0.0	20.5	2.2		32.6	1.2	
Delay (s)		35.0	15.7		25.5	15.0	56.3	23.7		68.3	21.5	
Level of Service		C	B		C	B	E	C		E	C	
Approach Delay (s)		30.1			23.7			26.1			26.2	
Approach LOS		C			C			C			C	

### Intersection Summary

HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	77.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 16: Kamakee St & Queen St

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕		↙	↕↕			↕↕			↕↕	
Traffic Volume (vph)	28	113	7	160	245	25	12	79	36	18	171	99
Future Volume (vph)	28	113	7	160	245	25	12	79	36	18	171	99
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	
Frt		0.99		1.00	0.99			0.96			0.95	
Flt Protected		0.99		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		3482		1770	3489			3374			3347	
Flt Permitted		0.85		0.95	1.00			0.91			0.93	
Satd. Flow (perm)		2985		1770	3489			3101			3138	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	30	120	7	170	261	27	13	84	38	19	182	105
RTOR Reduction (vph)	0	5	0	0	11	0	0	26	0	0	71	0
Lane Group Flow (vph)	0	152	0	170	277	0	0	109	0	0	235	0
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)		11.0		8.5	24.5			16.6			16.6	
Effective Green, g (s)		11.0		8.5	24.5			16.6			16.6	
Actuated g/C Ratio		0.22		0.17	0.48			0.32			0.32	
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)		642		294	1672			1007			1019	
v/s Ratio Prot				c0.10	0.08							
v/s Ratio Perm		c0.05						0.04			c0.07	
v/c Ratio		0.24		0.58	0.17			0.11			0.23	
Uniform Delay, d1		16.6		19.6	7.5			12.1			12.6	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.2		2.7	0.0			0.0			0.1	
Delay (s)		16.8		22.4	7.6			12.1			12.7	
Level of Service		B		C	A			B			B	
Approach Delay (s)		16.8			13.1			12.1			12.7	
Approach LOS		B			B			B			B	

### Intersection Summary

HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	51.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	38.6%	ICU Level of Service	A
Analysis Period (min)	15		

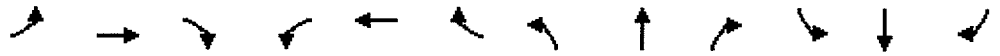
c Critical Lane Group



# HCM Signalized Intersection Capacity Analysis

## 16: Kamakee St & Queen St

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔			↔			↔	
Traffic Volume (vph)	97	368	47	233	299	50	40	152	59	53	124	49
Future Volume (vph)	97	368	47	233	299	50	40	152	59	53	124	49
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	
Frt		0.99		1.00	0.98			0.96			0.97	
Flt Protected		0.99		0.95	1.00			0.99			0.99	
Satd. Flow (prot)		3458		1770	3463			3388			3384	
Flt Permitted		0.79		0.95	1.00			0.87			0.82	
Satd. Flow (perm)		2774		1770	3463			2955			2800	
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)	101	383	49	243	311	52	42	158	61	55	129	51
RTOR Reduction (vph)	0	7	0	0	15	0	0	23	0	0	20	0
Lane Group Flow (vph)	0	526	0	243	348	0	0	238	0	0	215	0
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)		19.9		15.1	40.0			14.3			14.3	
Effective Green, g (s)		19.9		15.1	40.0			14.3			14.3	
Actuated g/C Ratio		0.31		0.23	0.62			0.22			0.22	
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)		858		415	2154			657			622	
v/s Ratio Prot				c0.14	0.10							
v/s Ratio Perm		c0.19						c0.08			0.08	
v/c Ratio		0.61		0.59	0.16			0.36			0.35	
Uniform Delay, d1		18.9		21.8	5.1			21.1			21.1	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		1.3		2.1	0.0			0.3			0.3	
Delay (s)		20.2		23.9	5.1			21.5			21.4	
Level of Service		C		C	A			C			C	
Approach Delay (s)		20.2			12.7			21.5			21.4	
Approach LOS		C			B			C			C	

### Intersection Summary

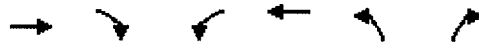
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	64.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 17: Queens Ln & Queen St

5/6/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (veh/h)	171	3	93	417	23	67
Future Volume (Veh/h)	171	3	93	417	23	67
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)	180	3	98	439	24	71
Pedestrians						19
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						2
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage (veh)	2					
Upstream signal (ft)	564			680		
pX, platoon unblocked						
vC, conflicting volume			202			616 110
vC1, stage 1 conf vol						200
vC2, stage 2 conf vol						416
vCu, unblocked vol			202			616 110
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 %			93			96 92
cM capacity (veh/h)			1346			617 937

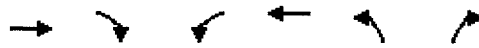
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	120	63	98	220	220	95
Volume Left	0	0	98	0	0	24
Volume Right	0	3	0	0	0	71
cSH	1700	1700	1346	1700	1700	828
Volume to Capacity	0.07	0.04	0.07	0.13	0.13	0.11
Queue Length 95th (ft)	0	0	6	0	0	10
Control Delay (s)	0.0	0.0	7.9	0.0	0.0	9.9
Lane LOS			A			A
Approach Delay (s)	0.0		1.4			9.9
Approach LOS						A

Intersection Summary						
Average Delay			2.1			
Intersection Capacity Utilization			29.4%	ICU Level of Service		A
Analysis Period (min)			15			

\* User Entered Value

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

5/6/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	
Traffic Volume (veh/h)	478	3	71	525	45	185
Future Volume (Veh/h)	478	3	71	525	45	185
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	537	3	80	590	51	208
Pedestrians					19	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage (veh)	2					
Upstream signal (ft)	564			687		
pX, platoon unblocked			0.98		0.98	0.98
vC, conflicting volume			559		1012	289
vC1, stage 1 conf vol					558	
vC2, stage 2 conf vol					455	
vCu, unblocked vol			521		981	247
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 %			92		90	73
cM capacity (veh/h)			1009		508	784

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	358	182	80	295	295	259
Volume Left	0	0	80	0	0	51
Volume Right	0	3	0	0	0	208
cSH	1700	1700	1009	1700	1700	708
Volume to Capacity	0.21	0.11	0.08	0.17	0.17	0.37
Queue Length 95th (ft)	0	0	6	0	0	42
Control Delay (s)	0.0	0.0	8.9	0.0	0.0	13.0
Lane LOS			A			B
Approach Delay (s)	0.0		1.1			13.0
Approach LOS						B

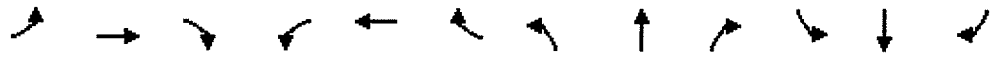
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			41.2%	ICU Level of Service		A
Analysis Period (min)			15			

\* User Entered Value

# HCM Signalized Intersection Capacity Analysis

## 24: Ward Ave & Halekauwila St

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔					↖	↕		↗	↕		
Traffic Volume (vph)	109	12	20	0	0	0	31	386	3	15	489	238	
Future Volume (vph)	109	12	20	0	0	0	31	386	3	15	489	238	
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	0.98		
Flpb, ped/bikes		1.00					0.98	1.00		1.00	1.00		
Frt		0.98					1.00	1.00		1.00	0.95		
Flt Protected		0.96					0.95	1.00		0.95	1.00		
Satd. Flow (prot)		1747					1738	3535		1770	3284		
Flt Permitted		0.96					0.33	1.00		0.52	1.00		
Satd. Flow (perm)		1747					597	3535		961	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)	112	12	21	0	0	0	32	398	3	15	504	245	
RTOR Reduction (vph)	0	5	0	0	0	0	0	1	0	0	62	0	
Lane Group Flow (vph)	0	140	0	0	0	0	32	400	0	15	687	0	
Confl. Peds. (#/hr)	2		44				42					42	
Turn Type	Perm	NA					Perm	NA		Perm	NA		
Protected Phases		4						2			6		
Permitted Phases	4						2			6			
Actuated Green, G (s)		17.6					24.7	24.7		24.7	24.7		
Effective Green, g (s)		17.6					24.7	24.7		24.7	24.7		
Actuated g/C Ratio		0.34					0.47	0.47		0.47	0.47		
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)		587					281	1669		453	1550		
v/s Ratio Prot								0.11			c0.21		
v/s Ratio Perm		0.08					0.05			0.02			
v/c Ratio		0.24					0.11	0.24		0.03	0.44		
Uniform Delay, d1		12.5					7.7	8.2		7.4	9.2		
Progression Factor		1.00					1.00	1.00		1.00	1.00		
Incremental Delay, d2		0.2					0.2	0.1		0.0	0.2		
Delay (s)		12.7					7.9	8.3		7.4	9.4		
Level of Service		B					A	A		A	A		
Approach Delay (s)		12.7			0.0			8.3			9.4		
Approach LOS		B			A			A			A		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			9.4									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.36										
Actuated Cycle Length (s)			52.3							10.0			
Intersection Capacity Utilization			52.7%										A
Analysis Period (min)			15										
c Critical Lane Group													

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

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔					↗	↕		↖	↕	
Traffic Volume (vph)	243	21	90	0	0	0	30	670	6	31	634	149
Future Volume (vph)	243	21	90	0	0	0	30	670	6	31	634	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0					5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00					1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.98					1.00	1.00		1.00	0.98	
Flpb, ped/bikes		1.00					0.98	1.00		1.00	1.00	
Frt		0.97					1.00	1.00		1.00	0.97	
Flt Protected		0.97					0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1710					1728	3535		1770	3372	
Flt Permitted		0.97					0.26	1.00		0.32	1.00	
Satd. Flow (perm)		1710					469	3535		597	3372	
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)	253	22	94	0	0	0	31	698	6	32	660	155
RTOR Reduction (vph)	0	14	0	0	0	0	0	1	0	0	26	0
Lane Group Flow (vph)	0	355	0	0	0	0	31	703	0	32	789	0
Confl. Peds. (#/hr)			91				63					63
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		22.2					20.2	20.2		20.2	20.2	
Effective Green, g (s)		22.2					20.2	20.2		20.2	20.2	
Actuated g/C Ratio		0.42					0.39	0.39		0.39	0.39	
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)		724					180	1362		230	1299	
v/s Ratio Prot								0.20			c0.23	
v/s Ratio Perm		0.21					0.07			0.05		
v/c Ratio		0.49					0.17	0.52		0.14	0.61	
Uniform Delay, d1		11.0					10.6	12.4		10.5	12.9	
Progression Factor		1.00					1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5					0.5	0.3		0.3	0.8	
Delay (s)		11.5					11.1	12.7		10.7	13.7	
Level of Service		B					B	B		B	B	
Approach Delay (s)		11.5			0.0			12.6			13.6	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	52.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 34: Ward Ave & Auahi St

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗	↖	↖		↖	↕↕		↖	↕↕	
Traffic Volume (vph)	24	64	33	84	83	102	56	296	73	85	401	65
Future Volume (vph)	24	64	33	84	83	102	56	296	73	85	401	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	
Frbp, ped/bikes		1.00	1.00	1.00	0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		0.99	1.00		0.98	1.00	
Frt		1.00	0.85	1.00	0.92		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)		3480	1583	1770	1681		1745	3406		1738	3442	
Flt Permitted		0.86	1.00	0.69	1.00		0.47	1.00		0.52	1.00	
Satd. Flow (perm)		3043	1583	1288	1681		855	3406		944	3442	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	70	36	91	90	111	61	322	79	92	436	71
RTOR Reduction (vph)	0	0	25	0	60	0	0	23	0	0	14	0
Lane Group Flow (vph)	0	96	11	91	141	0	61	378	0	92	493	0
Confl. Peds. (#/hr)	37					37	34		63	63		34
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)		14.7	14.7	14.7	14.7		22.2	22.2		22.2	22.2	
Effective Green, g (s)		14.7	14.7	14.7	14.7		22.2	22.2		22.2	22.2	
Actuated g/C Ratio		0.31	0.31	0.31	0.31		0.47	0.47		0.47	0.47	
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)		953	496	403	526		404	1612		446	1629	
v/s Ratio Prot					c0.08			0.11			c0.14	
v/s Ratio Perm		0.03	0.01	0.07			0.07			0.10		
v/c Ratio		0.10	0.02	0.23	0.27		0.15	0.23		0.21	0.30	
Uniform Delay, d1		11.4	11.1	11.9	12.1		7.0	7.3		7.2	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	0.3	0.3		0.2	0.1		0.2	0.1	
Delay (s)		11.5	11.2	12.2	12.3		7.2	7.4		7.4	7.7	
Level of Service		B	B	B	B		A	A		A	A	
Approach Delay (s)		11.4			12.3		7.4			7.7		
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	0.29		
Actuated Cycle Length (s)	46.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 34: Ward Ave & Auahi St

5/6/2016



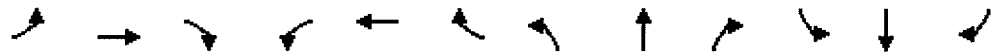
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗	↖	↘		↖	↕↕		↖	↕↕	
Traffic Volume (vph)	29	156	62	129	85	248	45	393	178	279	403	66
Future Volume (vph)	29	156	62	129	85	248	45	393	178	279	403	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00	0.96	1.00	0.96		1.00	0.98		1.00	0.99	
Flpb, ped/bikes		1.00	1.00	0.98	1.00		0.97	1.00		0.97	1.00	
Frt		1.00	0.85	1.00	0.89		1.00	0.95		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)		3497	1523	1733	1584		1722	3294		1721	3429	
Flt Permitted		0.87	1.00	0.63	1.00		0.47	1.00		0.40	1.00	
Satd. Flow (perm)		3081	1523	1152	1584		847	3294		730	3429	
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)	30	161	64	133	88	256	46	405	184	288	415	68
RTOR Reduction (vph)	0	0	41	0	113	0	0	66	0	0	17	0
Lane Group Flow (vph)	0	191	23	133	231	0	46	524	0	288	467	0
Confl. Peds. (#/hr)	67		39	39		67	43		87	87		43
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)		24.4	24.4	24.4	24.4		34.4	34.4		34.4	34.4	
Effective Green, g (s)		24.4	24.4	24.4	24.4		34.4	34.4		34.4	34.4	
Actuated g/C Ratio		0.35	0.35	0.35	0.35		0.50	0.50		0.50	0.50	
Clearance Time (s)		5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1092	540	408	561		423	1647		365	1714	
v/s Ratio Prot					c0.15			0.16				0.14
v/s Ratio Perm		0.06	0.01	0.12			0.05			c0.39		
v/c Ratio		0.17	0.04	0.33	0.41		0.11	0.32		0.79	0.27	
Uniform Delay, d1		15.3	14.5	16.2	16.8		9.1	10.2		14.2	10.0	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1	0.0	0.5	0.5		0.1	0.1		10.8	0.1	
Delay (s)		15.4	14.6	16.7	17.3		9.2	10.3		25.0	10.0	
Level of Service		B	B	B	B		A	B		C	B	
Approach Delay (s)		15.2			17.1			10.3			15.6	
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	0.63		
Actuated Cycle Length (s)	68.8	Sum of lost time (s)	10.0
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

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

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕		↖	↕		↖	↕	↖
Traffic Volume (vph)	38	85	26	9	77	23	36	82	24	23	151	140
Future Volume (vph)	38	85	26	9	77	23	36	82	24	23	151	140
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
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		0.98	1.00		0.98	1.00		0.98	1.00	1.00
Frt	1.00	0.96		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	3385		1734	3416		1735	3394		1741	1863	1526
Flt Permitted	0.95	1.00		0.95	1.00		0.65	1.00		0.68	1.00	1.00
Satd. Flow (perm)	1770	3385		1734	3416		1195	3394		1246	1863	1526
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	41	91	28	10	83	25	39	88	26	25	162	151
RTOR Reduction (vph)	0	22	0	0	20	0	0	14	0	0	0	80
Lane Group Flow (vph)	41	97	0	10	88	0	39	100	0	25	162	71
Confl. Peds. (#/hr)			34	34			43		33	33		43
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases							8			4		4
Actuated Green, G (s)	1.8	11.9		0.7	10.8		24.2	24.2		24.2	24.2	24.2
Effective Green, g (s)	1.8	11.9		0.7	10.8		24.2	24.2		24.2	24.2	24.2
Actuated g/C Ratio	0.03	0.23		0.01	0.21		0.47	0.47		0.47	0.47	0.47
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)	61	777		23	712		558	1585		582	870	712
v/s Ratio Prot	c0.02	c0.03		0.01	0.03		0.03	0.03			c0.09	
v/s Ratio Perm							0.03			0.02		0.05
v/c Ratio	0.67	0.13		0.43	0.12		0.07	0.06		0.04	0.19	0.10
Uniform Delay, d1	24.7	15.8		25.4	16.7		7.6	7.6		7.5	8.1	7.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	25.4	0.1		12.6	0.1		0.1	0.0		0.0	0.1	0.1
Delay (s)	50.1	15.9		38.0	16.7		7.7	7.6		7.5	8.2	7.8
Level of Service	D	B		D	B		A	A		A	A	A
Approach Delay (s)		24.7			18.5			7.6			7.9	
Approach LOS		C			B			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay	13.0		HCM 2000 Level of Service				B					
HCM 2000 Volume to Capacity ratio	0.20											
Actuated Cycle Length (s)	51.8		Sum of lost time (s)				15.0					
Intersection Capacity Utilization	49.6%		ICU Level of Service				A					
Analysis Period (min)	15											
c Critical Lane Group												



# HCM Signalized Intersection Capacity Analysis

## 35: Kamakee St & Auahi St

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↕	↘	↙	↕	↘	↙	↕	↘	↙	↕	↘
Traffic Volume (vph)	88	295	124	4	147	62	63	100	42	71	208	149
Future Volume (vph)	88	295	124	4	147	62	63	100	42	71	208	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.95		1.00	0.96		1.00	0.96		1.00	1.00	0.89
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.93	1.00		0.90	1.00	1.00
Frt	1.00	0.96		1.00	0.96		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3200		1770	3239		1646	3249		1591	1863	1410
Flt Permitted	0.95	1.00		0.95	1.00		0.55	1.00		0.66	1.00	1.00
Satd. Flow (perm)	1770	3200		1770	3239		961	3249		1101	1863	1410
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)	93	311	131	4	155	65	66	105	44	75	219	157
RTOR Reduction (vph)	0	51	0	0	38	0	0	32	0	0	0	113
Lane Group Flow (vph)	93	391	0	4	182	0	66	117	0	75	219	44
Confl. Peds. (#/hr)			167			209	105		137	137		105
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)	7.0	36.3		0.7	30.0		20.5	20.5		20.5	20.5	20.5
Effective Green, g (s)	7.0	36.3		0.7	30.0		20.5	20.5		20.5	20.5	20.5
Actuated g/C Ratio	0.10	0.50		0.01	0.41		0.28	0.28		0.28	0.28	0.28
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)	170	1602		17	1340		271	918		311	526	398
v/s Ratio Prot	c0.05	c0.12		0.00	0.06			0.04			c0.12	
v/s Ratio Perm							0.07			0.07		0.03
v/c Ratio	0.55	0.24		0.24	0.14		0.24	0.13		0.24	0.42	0.11
Uniform Delay, d1	31.2	10.3		35.6	13.2		20.0	19.3		20.0	21.1	19.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.6	0.1		7.0	0.0		0.5	0.1		0.4	0.5	0.1
Delay (s)	34.8	10.4		42.7	13.2		20.5	19.4		20.4	21.7	19.4
Level of Service	C	B		D	B		C	B		C	C	B
Approach Delay (s)		14.6			13.8			19.7			20.7	
Approach LOS		B			B			B			C	

### Intersection Summary

HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	72.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	73.6%	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

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗				↖	↖			↕	
Traffic Volume (vph)	41	7	44	0	0	0	78	72	6	20	30	41
Future Volume (vph)	41	7	44	0	0	0	78	72	6	20	30	41
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	
Frbp, ped/bikes		1.00	0.96				1.00	1.00			0.97	
Flpb, ped/bikes		0.99	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	0.99			0.94	
Flt Protected		0.96	1.00				0.95	1.00			0.99	
Satd. Flow (prot)		1761	1521				1770	1835			1674	
Flt Permitted		0.96	1.00				0.95	1.00			0.94	
Satd. Flow (perm)		1761	1521				1770	1835			1590	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	47	8	51	0	0	0	90	83	7	23	34	47
RTOR Reduction (vph)	0	0	42	0	0	0	0	3	0	0	28	0
Lane Group Flow (vph)	0	55	9	0	0	0	90	87	0	0	76	0
Confl. Peds. (#/hr)	12		34	34		12			16	16		62
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2				6
Permitted Phases	4		4							6		
Actuated Green, G (s)		8.4	8.4				6.4	30.8				19.4
Effective Green, g (s)		8.4	8.4				6.4	30.8				19.4
Actuated g/C Ratio		0.17	0.17				0.13	0.63				0.39
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)		300	259				230	1148				626
v/s Ratio Prot							c0.05	0.05				
v/s Ratio Perm		0.03	0.01									c0.05
v/c Ratio		0.18	0.03				0.39	0.08				0.12
Uniform Delay, d1		17.5	17.0				19.6	3.6				9.5
Progression Factor		1.00	1.00				1.00	1.00				1.00
Incremental Delay, d2		0.3	0.1				1.1	0.0				0.1
Delay (s)		17.8	17.1				20.7	3.6				9.6
Level of Service		B	B				C	A				A
Approach Delay (s)		17.4			0.0			12.2				9.6
Approach LOS		B			A			B				A
<b>Intersection Summary</b>												
HCM 2000 Control Delay			12.9				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.19									
Actuated Cycle Length (s)			49.2				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			36.4%				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

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗				↙	↘			↕	
Traffic Volume (vph)	87	9	167	0	0	0	158	96	10	17	70	45
Future Volume (vph)	87	9	167	0	0	0	158	96	10	17	70	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0				5.0	5.0			5.0	
Lane Util. Factor		1.00	1.00				1.00	1.00			1.00	
Frbp, ped/bikes		1.00	0.92				1.00	0.99			0.96	
Flpb, ped/bikes		0.92	1.00				1.00	1.00			0.99	
Frt		1.00	0.85				1.00	0.99			0.95	
Flt Protected		0.96	1.00				0.95	1.00			0.99	
Satd. Flow (prot)		1635	1455				1770	1820			1690	
Flt Permitted		0.96	1.00				0.95	1.00			0.96	
Satd. Flow (perm)		1635	1455				1770	1820			1631	
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)	96	10	184	0	0	0	174	105	11	19	77	49
RTOR Reduction (vph)	0	0	140	0	0	0	0	5	0	0	19	0
Lane Group Flow (vph)	0	106	44	0	0	0	174	111	0	0	126	0
Confl. Peds. (#/hr)	60		77	77		60			48	48		104
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2				6
Permitted Phases	4		4							6		
Actuated Green, G (s)		13.0	13.0				8.8	31.8				18.0
Effective Green, g (s)		13.0	13.0				8.8	31.8				18.0
Actuated g/C Ratio		0.24	0.24				0.16	0.58				0.33
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	345				284	1056				535
v/s Ratio Prot							c0.10	0.06				
v/s Ratio Perm		0.06	0.03									c0.08
v/c Ratio		0.27	0.13				0.61	0.11				0.23
Uniform Delay, d1		17.0	16.4				21.4	5.1				13.4
Progression Factor		1.00	1.00				1.00	1.00				1.00
Incremental Delay, d2		0.4	0.2				3.9	0.0				0.2
Delay (s)		17.4	16.6				25.3	5.2				13.6
Level of Service		B	B				C	A				B
Approach Delay (s)		16.9			0.0			17.3				13.6
Approach LOS		B			A			B				B

### Intersection Summary

HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	54.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 1: Cooke St & Kapiolani Blvd

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑↑		↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	0	596	100	465	907	203	43	168	55	8	46	16
Future Volume (vph)	0	596	100	465	907	203	43	168	55	8	46	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor		0.95			0.86		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes		0.98			0.99		1.00	1.00	0.95	1.00	0.98	
Fipb, ped/bikes		1.00			0.99		0.95	1.00	1.00	0.97	1.00	
Frt		0.98			0.98		1.00	1.00	0.85	1.00	0.96	
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3409			6099		1681	1863	1500	1713	1759	
Flt Permitted		1.00			0.73		0.71	1.00	1.00	0.62	1.00	
Satd. Flow (perm)		3409			4519		1265	1863	1500	1117	1759	
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)	0	621	104	484	945	211	45	175	57	8	48	17
RTOR Reduction (vph)	0	13	0	0	24	0	0	0	42	0	11	0
Lane Group Flow (vph)	0	712	0	0	1616	0	45	175	15	8	54	0
Confl. Peds. (#/hr)			57	57		29	69		54	54		69
Turn Type		NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases				2			4		4	8		
Actuated Green, G (s)		34.8			44.2		19.6	19.6	19.6	19.6	19.6	
Effective Green, g (s)		34.8			44.2		19.6	19.6	19.6	19.6	19.6	
Actuated g/C Ratio		0.47			0.60		0.27	0.27	0.27	0.27	0.27	
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)		1607			2800		335	494	398	296	467	
v/s Ratio Prot		0.21			c0.03			c0.09			0.03	
v/s Ratio Perm					c0.31		0.04		0.01	0.01		
v/c Ratio		0.44			1.23dl		0.13	0.35	0.04	0.03	0.12	
Uniform Delay, d1		13.0			9.1		20.6	22.0	20.1	20.0	20.5	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2			0.3		0.2	0.4	0.0	0.0	0.1	
Delay (s)		13.2			9.4		20.8	22.4	20.1	20.1	20.6	
Level of Service		B			A		C	C	C	C	C	
Approach Delay (s)		13.2			9.4			21.7			20.6	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	73.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		
dl Defacto Left Lane. Recode with 1 though lane as a left lane.			
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 1: Cooke St & Kapiolani Blvd

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔↔		↔	↔↔		↔	↑	↔	↔	↑	↔
Traffic Volume (vph)	4	1255	75	294	812	124	87	296	206	19	54	33
Future Volume (vph)	4	1255	75	294	812	124	87	296	206	19	54	33
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		0.91		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes		0.99		1.00	0.98		1.00	1.00	0.90	1.00	0.96	
Flpb, ped/bikes		1.00		1.00	1.00		0.92	1.00	1.00	0.95	1.00	
Frt		0.99		1.00	0.98		1.00	1.00	0.85	1.00	0.94	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		4967		1770	3416		1635	1863	1428	1688	1693	
Flt Permitted		0.94		0.09	1.00		0.70	1.00	1.00	0.32	1.00	
Satd. Flow (perm)		4658		168	3416		1202	1863	1428	576	1693	
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)	4	1307	78	306	846	129	91	308	215	20	56	34
RTOR Reduction (vph)	0	6	0	0	10	0	0	0	162	0	18	0
Lane Group Flow (vph)	0	1383	0	306	965	0	91	308	53	20	72	0
Confl. Peds. (#/hr)	36		110	110		36	78		82	82		78
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)		42.5		67.8	67.8		25.5	25.5	25.5	25.5	25.5	
Effective Green, g (s)		42.5		67.8	67.8		25.5	25.5	25.5	25.5	25.5	
Actuated g/C Ratio		0.41		0.66	0.66		0.25	0.25	0.25	0.25	0.25	
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)		1916		425	2242		296	459	352	142	417	
v/s Ratio Prot				c0.14	0.28			c0.17			0.04	
v/s Ratio Perm		0.30		c0.33			0.08		0.04	0.03		
v/c Ratio		0.72		0.72	0.43		0.31	0.67	0.15	0.14	0.17	
Uniform Delay, d1		25.5		24.7	8.5		31.7	35.1	30.4	30.4	30.6	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.4		5.8	0.1		0.6	3.8	0.2	0.5	0.2	
Delay (s)		26.8		30.4	8.6		32.3	38.9	30.6	30.8	30.8	
Level of Service		C		C	A		C	D	C	C	C	
Approach Delay (s)		26.8			13.8			35.1			30.8	
Approach LOS		C			B			D			C	

### Intersection Summary

HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	103.3	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

## 2: Ward Ave & Kapiolani Blvd

5/13/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑↑		↔	↑↑	↔	↔	↑↑	
Traffic Volume (vph)	0	545	110	306	1303	85	123	374	58	131	678	112
Future Volume (vph)	0	545	110	306	1303	85	123	374	58	131	678	112
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	0.91		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		0.98		1.00	0.99		1.00	1.00	0.87	1.00	0.99	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.97		1.00	0.99		1.00	1.00	0.85	1.00	0.98	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3390		1770	5009		1770	3539	1380	1770	3426	
Flt Permitted		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3390		1770	5009		1770	3539	1380	1770	3426	
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)	0	574	116	322	1372	89	129	394	61	138	714	118
RTOR Reduction (vph)	0	14	0	0	6	0	0	0	44	0	11	0
Lane Group Flow (vph)	0	676	0	322	1455	0	129	394	17	138	821	0
Confl. Peds. (#/hr)			82	82		72			110			58
Turn Type		NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases		6		5	2		7	4		3	8	
Permitted Phases									4			
Actuated Green, G (s)		31.4		23.3	59.7		11.4	33.0	33.0	10.9	32.5	
Effective Green, g (s)		31.4		23.3	59.7		11.4	33.0	33.0	10.9	32.5	
Actuated g/C Ratio		0.26		0.20	0.50		0.10	0.28	0.28	0.09	0.27	
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)		897		347	2521		170	984	383	162	938	
v/s Ratio Prot		c0.20		c0.18	0.29		0.07	0.11		c0.08	c0.24	
v/s Ratio Perm									0.01			
v/c Ratio		0.75		0.93	0.58		0.76	0.40	0.04	0.85	0.88	
Uniform Delay, d1		40.0		46.8	20.6		52.3	34.8	31.3	53.1	41.1	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		3.6		30.2	0.3		17.5	0.3	0.0	32.6	9.2	
Delay (s)		43.7		77.0	20.9		69.8	35.0	31.3	85.7	50.3	
Level of Service		D		E	C		E	D	C	F	D	
Approach Delay (s)		43.7			31.1			42.3			55.3	
Approach LOS		D			C			D			E	

### Intersection Summary

HCM 2000 Control Delay	40.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	118.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 2: Ward Ave & Kapiolani Blvd

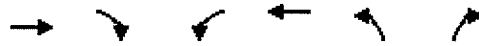
5/13/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑		↙	↑↑	↗	↙	↑↑	
Traffic Volume (vph)	0	1335	161	0	1008	117	151	624	259	236	736	83
Future Volume (vph)	0	1335	161	0	1008	117	151	624	259	236	736	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor		0.91			0.91		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		0.99			0.99		1.00	1.00	0.88	1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.98			0.98		1.00	1.00	0.85	1.00	0.98	
Flt Protected		1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		4931			4957		1770	3539	1401	1770	3460	
Flt Permitted		1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		4931			4957		1770	3539	1401	1770	3460	
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)	0	1391	168	0	1050	122	157	650	270	246	767	86
RTOR Reduction (vph)	0	12	0	0	11	0	0	0	79	0	7	0
Lane Group Flow (vph)	0	1547	0	0	1161	0	157	650	191	246	846	0
Confl. Peds. (#/hr)			118			76			106			59
Turn Type		NA			NA		Prot	NA	Perm	Prot	NA	
Protected Phases		6			2		7	4		3	8	
Permitted Phases									4			
Actuated Green, G (s)		43.8			43.8		14.5	30.1	30.1	20.2	35.8	
Effective Green, g (s)		43.8			43.8		14.5	30.1	30.1	20.2	35.8	
Actuated g/C Ratio		0.40			0.40		0.13	0.28	0.28	0.19	0.33	
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)		1979			1990		235	976	386	327	1135	
v/s Ratio Prot		c0.31			0.23		0.09	0.18		c0.14	c0.24	
v/s Ratio Perm									0.14			
v/c Ratio		0.78			0.58		0.67	0.67	0.50	0.75	0.75	
Uniform Delay, d1		28.5			25.5		45.0	35.0	33.1	42.1	32.6	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.1			0.4		7.0	1.7	1.0	9.4	2.7	
Delay (s)		30.6			26.0		52.0	36.8	34.1	51.5	35.3	
Level of Service		C			C		D	D	C	D	D	
Approach Delay (s)		30.6			26.0			38.3			38.9	
Approach LOS		C			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			33.0				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			109.1				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												

HCM Signalized Intersection Capacity Analysis  
 3: Kamakee St & Kapiolani Blvd

5/6/2016



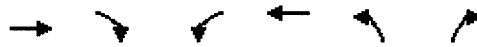
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑↑↑	↘	↗
Traffic Volume (vph)	673	53	210	1623	67	84
Future Volume (vph)	673	53	210	1623	67	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.86	1.00	1.00
Frbp, ped/bikes	0.99			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3483			6358	1770	1524
Flt Permitted	1.00			0.75	0.95	1.00
Satd. Flow (perm)	3483			4804	1770	1524
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	716	56	223	1727	71	89
RTOR Reduction (vph)	6	0	0	0	0	62
Lane Group Flow (vph)	766	0	0	1950	71	27
Confl. Peds. (#/hr)		49	49			26
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases			6			8
Actuated Green, G (s)	52.9			52.9	27.4	27.4
Effective Green, g (s)	52.9			52.9	27.4	27.4
Actuated g/C Ratio	0.59			0.59	0.30	0.30
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2040			2814	537	462
v/s Ratio Prot	0.22				c0.04	
v/s Ratio Perm				c0.41		0.02
v/c Ratio	0.38			0.69	0.13	0.06
Uniform Delay, d1	9.9			13.0	22.8	22.3
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.8	0.1	0.1
Delay (s)	10.0			13.8	22.9	22.4
Level of Service	B			B	C	C
Approach Delay (s)	10.0			13.8	22.6	
Approach LOS	B			B	C	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			13.3		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.50			
Actuated Cycle Length (s)			90.3		Sum of lost time (s)	10.0
Intersection Capacity Utilization			82.3%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						



# HCM Signalized Intersection Capacity Analysis

## 3: Kamakee St & Kapiolani Blvd

5/6/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑	↘	↗
Traffic Volume (vph)	1739	173	0	984	149	307
Future Volume (vph)	1739	173	0	984	149	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.86			0.95	1.00	1.00
Frbp, ped/bikes	0.99			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	6241			3539	1770	1519
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	6241			3539	1770	1519
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1850	184	0	1047	159	327
RTOR Reduction (vph)	13	0	0	0	0	3
Lane Group Flow (vph)	2021	0	0	1047	159	324
Confl. Peds. (#/hr)		110				30
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	47.3			47.3	29.9	29.9
Effective Green, g (s)	47.3			47.3	29.9	29.9
Actuated g/C Ratio	0.54			0.54	0.34	0.34
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	3385			1919	606	520
v/s Ratio Prot	c0.32			0.30	0.09	
v/s Ratio Perm						c0.21
v/c Ratio	0.60			0.55	0.26	0.62
Uniform Delay, d1	13.5			13.0	20.7	23.9
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.3			0.3	0.2	2.3
Delay (s)	13.8			13.3	20.9	26.3
Level of Service	B			B	C	C
Approach Delay (s)	13.8			13.3	24.5	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	87.2	Sum of lost time (s)	10.0
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 5: Piikoi St & Kapiolani Blvd

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑↑↑		↘	↑↑↑	↗			
Traffic Volume (vph)	0	842	42	40	1740	294	45	814	77	0	0	0
Future Volume (vph)	0	842	42	40	1740	294	45	814	77	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.95			0.86		1.00	0.91	1.00			
Frbp, ped/bikes		1.00			0.99		1.00	1.00	0.96			
Flpb, ped/bikes		1.00			1.00		0.94	1.00	1.00			
Frt		0.99			0.98		1.00	1.00	0.85			
Flt Protected		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		3503			6205		1664	5085	1528			
Flt Permitted		1.00			0.89		0.95	1.00	1.00			
Satd. Flow (perm)		3503			5516		1664	5085	1528			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	896	45	43	1851	313	48	866	82	0	0	0
RTOR Reduction (vph)	0	3	0	0	6	0	0	0	60	0	0	0
Lane Group Flow (vph)	0	938	0	0	2201	0	48	866	22	0	0	0
Confl. Peds. (#/hr)			64			60	58		23			
Turn Type		NA		Perm	NA		Perm	NA	Perm			
Protected Phases		2			6			8				
Permitted Phases				6			8		8			
Actuated Green, G (s)		60.1			60.1		25.7	25.7	25.7			
Effective Green, g (s)		60.1			60.1		25.7	25.7	25.7			
Actuated g/C Ratio		0.63			0.63		0.27	0.27	0.27			
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)		2197			3460		446	1364	409			
v/s Ratio Prot		0.27						c0.17				
v/s Ratio Perm					c0.40		0.03		0.01			
v/c Ratio		0.43			0.64		0.11	0.63	0.05			
Uniform Delay, d1		9.1			11.1		26.4	30.9	26.0			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.1			0.4		0.1	1.0	0.1			
Delay (s)		9.2			11.5		26.5	31.9	26.1			
Level of Service		A			B		C	C	C			
Approach Delay (s)		9.2			11.5			31.2			0.0	
Approach LOS		A			B			C			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			15.7									
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			95.8						10.0			
Intersection Capacity Utilization			87.3%									
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 5: Piikoi St & Kapiolani Blvd

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑		↘	↑↑↑	↗			
Traffic Volume (vph)	0	2059	142	0	743	271	107	1215	167	0	0	0
Future Volume (vph)	0	2059	142	0	743	271	107	1215	167	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.86			0.95		1.00	0.91	1.00			
Frbp, ped/bikes		0.99			0.97		1.00	1.00	0.97			
Flpb, ped/bikes		1.00			1.00		0.89	1.00	1.00			
Frt		0.99			0.96		1.00	1.00	0.85			
Flt Protected		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		6283			3288		1571	5085	1537			
Flt Permitted		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)		6283			3288		1571	5085	1537			
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)	0	2145	148	0	774	282	111	1266	174	0	0	0
RTOR Reduction (vph)	0	8	0	0	5	0	0	0	11	0	0	0
Lane Group Flow (vph)	0	2285	0	0	1051	0	111	1266	163	0	0	0
Confl. Peds. (#/hr)			149			102	96		15			
Turn Type		NA			NA		Perm	NA	Perm			
Protected Phases		2			6			8				
Permitted Phases							8		8			
Actuated Green, G (s)		59.2			59.2		40.0	40.0	40.0			
Effective Green, g (s)		59.2			59.2		40.0	40.0	40.0			
Actuated g/C Ratio		0.54			0.54		0.37	0.37	0.37			
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)		3406			1782		575	1862	563			
v/s Ratio Prot		c0.36			0.32			c0.25				
v/s Ratio Perm							0.07		0.11			
v/c Ratio		0.67			0.59		0.19	0.68	0.29			
Uniform Delay, d1		18.0			16.8		23.6	29.2	24.5			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.5			0.5		0.2	1.0	0.3			
Delay (s)		18.5			17.4		23.8	30.2	24.8			
Level of Service		B			B		C	C	C			
Approach Delay (s)		18.5			17.4			29.1			0.0	
Approach LOS		B			B			C			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			21.6				HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			109.2				Sum of lost time (s)		10.0			
Intersection Capacity Utilization			64.5%				ICU Level of Service		C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 14: Cooke St & Queen St

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔↔			↔↔	
Traffic Volume (vph)	39	188	61	55	450	48	25	212	38	12	212	175
Future Volume (vph)	39	188	61	55	450	48	25	212	38	12	212	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frbp, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.97			0.99			0.98			0.93	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		3401			3471			3447			3299	
Flt Permitted		0.84			0.89			0.90			0.94	
Satd. Flow (perm)		2877			3104			3112			3111	
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)	41	198	64	58	474	51	26	223	40	13	223	184
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	303	0	0	583	0	0	289	0	0	420	0
Confl. Peds. (#/hr)	28			31			31			70		
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)		15.9			15.9			15.9			15.9	
Effective Green, g (s)		15.9			15.9			15.9			15.9	
Actuated g/C Ratio		0.38			0.38			0.38			0.38	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1094			1180			1183			1183	
v/s Ratio Prot												
v/s Ratio Perm		0.11			c0.19			0.09			c0.14	
v/c Ratio		0.28			0.49			0.24			0.36	
Uniform Delay, d1		9.0			9.9			8.8			9.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			0.3			0.1			0.2	
Delay (s)		9.1			10.2			9.0			9.5	
Level of Service		A			B			A			A	
Approach Delay (s)		9.1			10.2			9.0			9.5	
Approach LOS		A			B			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		9.6			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.42										
Actuated Cycle Length (s)		41.8			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		60.1%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 14: Cooke St & Queen St

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Traffic Volume (vph)	91	400	72	41	302	50	30	353	49	33	238	96
Future Volume (vph)	91	400	72	41	302	50	30	353	49	33	238	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frbp, ped/bikes		1.00			1.00			1.00			1.00	
Fipb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.98			0.96	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3441			3450			3464			3379	
Flt Permitted		0.81			0.85			0.91			0.89	
Satd. Flow (perm)		2825			2965			3159			3015	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	97	426	77	44	321	53	32	376	52	35	253	102
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	600	0	0	418	0	0	460	0	0	390	0
Conf. Peds. (#/hr)	15			38			37			61		
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)		16.7			16.7			16.1			16.1	
Effective Green, g (s)		16.7			16.7			16.1			16.1	
Actuated g/C Ratio		0.39			0.39			0.38			0.38	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1102			1156			1188			1134	
v/s Ratio Prot												
v/s Ratio Perm		c0.21			0.14			c0.15			0.13	
v/c Ratio		0.54			0.36			0.39			0.34	
Uniform Delay, d1		10.1			9.3			9.7			9.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.6			0.2			0.2			0.2	
Delay (s)		10.7			9.5			10.0			9.7	
Level of Service		B			A			A			A	
Approach Delay (s)		10.7			9.5			10.0			9.7	
Approach LOS		B			A			A			A	

### Intersection Summary

HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	42.8	Sum of lost time (s)	10.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 20: Piikoi St & Waimanu St/Ala Moana Plaza

5/13/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	290	150	144	0	18	36	0	681	76	0	139	41
Future Volume (vph)	290	150	144	0	18	36	0	681	76	0	139	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0		5.0			5.0	
Lane Util. Factor	1.00	0.95	1.00		0.95	0.95		0.86			0.95	
Frbp, ped/bikes	1.00	1.00	0.95		1.00	1.00		1.00			0.99	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85		0.94	0.85		0.98			0.97	
Flt Protected	0.95	1.00	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1770	3539	1512		1672	1504		6286			3373	
Flt Permitted	0.95	1.00	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (perm)	1770	3539	1512		1672	1504		6286			3373	
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)	302	156	150	0	19	38	0	709	79	0	145	43
RTOR Reduction (vph)	0	0	82	0	0	0	0	14	0	0	21	0
Lane Group Flow (vph)	302	156	68	0	30	27	0	774	0	0	167	0
Confl. Peds. (#/hr)			60						49			39
Turn Type	Prot	NA	Perm		NA	Perm		NA			NA	
Protected Phases	7	4			8			2				6
Permitted Phases			4			8						
Actuated Green, G (s)	17.2	26.2	26.2		4.0	4.0		22.0			22.0	
Effective Green, g (s)	17.2	26.2	26.2		4.0	4.0		22.0			22.0	
Actuated g/C Ratio	0.30	0.45	0.45		0.07	0.07		0.38			0.38	
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)	523	1593	680		114	103		2376			1275	
v/s Ratio Prot	c0.17	0.04			0.02			c0.12			0.05	
v/s Ratio Perm			0.04			c0.02						
v/c Ratio	0.58	0.10	0.10		0.26	0.26		0.33			0.13	
Uniform Delay, d1	17.4	9.2	9.2		25.7	25.7		12.8			11.8	
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2	1.5	0.0	0.1		1.2	1.4		0.1			0.0	
Delay (s)	19.0	9.2	9.3		26.9	27.1		12.9			11.9	
Level of Service	B	A	A		C	C		B			B	
Approach Delay (s)		14.1			27.0			12.9			11.9	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	58.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 20: Piikoi St & Waimanu St/Ala Moana Plaza

5/13/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	409	293	264	0	109	272	0	756	77	0	265	58
Future Volume (vph)	409	293	264	0	109	272	0	756	77	0	265	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0		5.0			5.0	
Lane Util. Factor	1.00	0.95	1.00		0.95	0.95		0.86			0.95	
Frbp, ped/bikes	1.00	1.00	0.85		1.00	1.00		0.99			0.97	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85		0.93	0.85		0.99			0.97	
Flt Protected	0.95	1.00	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1770	3539	1347		1650	1504		6232			3355	
Flt Permitted	0.95	1.00	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (perm)	1770	3539	1347		1650	1504		6232			3355	
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)	426	305	275	0	114	283	0	788	80	0	276	60
RTOR Reduction (vph)	0	0	52	0	0	0	0	13	0	0	15	0
Lane Group Flow (vph)	426	305	223	0	207	190	0	855	0	0	321	0
Confl. Peds. (#/hr)			167						158			89
Turn Type	Prot	NA	Perm		NA	Perm		NA			NA	
Protected Phases	7	4			8			2			6	
Permitted Phases			4			8						
Actuated Green, G (s)	27.3	50.0	50.0		17.7	17.7		26.5			26.5	
Effective Green, g (s)	27.3	50.0	50.0		17.7	17.7		26.5			26.5	
Actuated g/C Ratio	0.32	0.58	0.58		0.20	0.20		0.31			0.31	
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)	558	2045	778		337	307		1909			1027	
v/s Ratio Prot	c0.24	0.09			0.13			c0.14			0.10	
v/s Ratio Perm			0.17			c0.13						
v/c Ratio	0.76	0.15	0.29		0.61	0.62		0.45			0.31	
Uniform Delay, d1	26.7	8.4	9.2		31.3	31.3		24.1			23.0	
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2	6.1	0.0	0.2		3.3	3.7		0.2			0.2	
Delay (s)	32.8	8.5	9.4		34.6	35.0		24.3			23.2	
Level of Service	C	A	A		C	D		C			C	
Approach Delay (s)		19.0			34.8			24.3			23.2	
Approach LOS		B			C			C			C	

Intersection Summary

HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	86.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Unsignalized Intersection Capacity Analysis

## 22: Cooke St & Halekauwila St

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	50	69	31	51	72	33	15	194	43	34	235	60
Future Volume (vph)	50	69	31	51	72	33	15	194	43	34	235	60
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	55	76	34	56	79	36	16	213	47	37	258	66
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	165	171	123	154	166	195						
Volume Left (vph)	55	56	16	0	37	0						
Volume Right (vph)	34	36	0	47	0	66						
Hadj (s)	-0.02	-0.03	0.10	-0.18	0.15	-0.20						
Departure Headway (s)	5.8	5.8	6.1	5.8	6.1	5.7						
Degree Utilization, x	0.27	0.27	0.21	0.25	0.28	0.31						
Capacity (veh/h)	568	570	553	578	562	598						
Control Delay (s)	10.9	10.9	9.5	9.6	10.2	10.0						
Approach Delay (s)	10.9	10.9	9.6		10.1							
Approach LOS	B	B	A		B							

### Intersection Summary













Delay	10.2		
Level of Service	B		
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		



# HCM Unsignalized Intersection Capacity Analysis

## 22: Cooke St & Halekauwila St

5/6/2016

												
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	122	58	41	72	67	18	252	33	32	279	40
Future Volume (vph)	80	122	58	41	72	67	18	252	33	32	279	40
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	84	128	61	43	76	71	19	265	35	34	294	42
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	273	190	152	168	181	189						
Volume Left (vph)	84	43	19	0	34	0						
Volume Right (vph)	61	71	0	35	0	42						
Hadj (s)	-0.04	-0.14	0.10	-0.11	0.13	-0.12						
Departure Headway (s)	6.1	6.2	6.7	6.5	6.7	6.4						
Degree Utilization, x	0.46	0.33	0.28	0.30	0.34	0.34						
Capacity (veh/h)	546	523	491	516	507	527						
Control Delay (s)	14.3	12.2	11.1	11.1	11.8	11.4						
Approach Delay (s)	14.3	12.2	11.1	11.6								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay			12.2									
Level of Service			B									
Intersection Capacity Utilization			56.8%		ICU Level of Service		B					
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 25: Cooke St & Pohukaina St

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	46	58	20	34	97	40	18	163	55	32	201	84
Future Volume (vph)	46	58	20	34	97	40	18	163	55	32	201	84
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	48	60	21	35	101	42	19	170	57	33	209	88
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	129	178	104	142	138	193						
Volume Left (vph)	48	35	19	0	33	0						
Volume Right (vph)	21	42	0	57	0	88						
Hadj (s)	0.01	-0.07	0.13	-0.25	0.15	-0.29						
Departure Headway (s)	5.6	5.5	6.0	5.6	5.9	5.4						
Degree Utilization, x	0.20	0.27	0.17	0.22	0.22	0.29						
Capacity (veh/h)	581	605	570	607	581	631						
Control Delay (s)	10.1	10.5	9.0	8.9	9.4	9.4						
Approach Delay (s)	10.1	10.5	9.0	9.4								
Approach LOS	B	B	A	A								

















### Intersection Summary

Delay	9.6		
Level of Service	A		
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

# HCM Unsignalized Intersection Capacity Analysis

## 25: Cooke St & Pohukaina Street/Pohukaina St

5/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	73	128	28	39	80	57	17	170	45	73	242	59
Future Volume (vph)	73	128	28	39	80	57	17	170	45	73	242	59
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	80	141	31	43	88	63	19	187	49	80	266	65
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	252	194	113	143	213	198						
Volume Left (vph)	80	43	19	0	80	0						
Volume Right (vph)	31	63	0	49	0	65						
Hadj (s)	0.02	-0.12	0.12	-0.21	0.22	-0.20						
Departure Headway (s)	6.1	6.1	6.7	6.4	6.6	6.1						
Degree Utilization, x	0.43	0.33	0.21	0.25	0.39	0.34						
Capacity (veh/h)	550	537	497	521	518	554						
Control Delay (s)	13.5	12.0	10.3	10.3	12.5	11.1						
Approach Delay (s)	13.5	12.0	10.3	11.8								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay			11.9									
Level of Service			B									
Intersection Capacity Utilization			52.5%		ICU Level of Service		A					
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

30: Cooke St & Auahi St

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Traffic Volume (veh/h)	45	21	7	12	11	54	35	105	8	34	171	44
Future Volume (Veh/h)	45	21	7	12	11	54	35	105	8	34	171	44
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	47	22	7	13	11	56	36	109	8	35	178	46
Pedestrians		10			17			6			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								419				
pX, platoon unblocked												
vC, conflicting volume	478	487	128	385	506	84	234			134		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	478	487	128	385	506	84	234			134		
tC, single (s)	*6.5	*5.5	*5.9	*6.5	*5.5	*5.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	96	99	98	98	94	97			98		
cM capacity (veh/h)	465	512	920	545	502	960	1319			1428		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	76	80	90	62	124	135
Volume Left	47	13	36	0	35	0
Volume Right	7	56	0	8	0	46
cSH	501	769	1319	1700	1428	1700
Volume to Capacity	0.15	0.10	0.03	0.04	0.02	0.08
Queue Length 95th (ft)	13	9	2	0	2	0
Control Delay (s)	13.5	10.2	3.2	0.0	2.3	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	13.5	10.2	1.9		1.1	
Approach LOS	B	B				

Intersection Summary		
Average Delay		4.3
Intersection Capacity Utilization	38.4%	ICU Level of Service
Analysis Period (min)		15
		A

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

30: Cooke St & Auahi St

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Traffic Volume (veh/h)	41	12	5	17	20	74	13	110	12	40	202	31
Future Volume (Veh/h)	41	12	5	17	20	74	13	110	12	40	202	31
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	43	13	5	18	21	77	14	115	13	42	210	32
Pedestrians		14			18			8			15	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								419				
pX, platoon unblocked												
vC, conflicting volume	512	498	143	376	508	97	256			146		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	512	498	143	376	508	97	256			146		
tC, single (s)	*6.5	*5.5	*5.9	*6.5	*5.5	*5.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	97	99	97	96	92	99			97		
cM capacity (veh/h)	425	510	899	562	505	941	1291			1412		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	61	116	72	70	147	137
Volume Left	43	18	14	0	42	0
Volume Right	5	77	0	13	0	32
cSH	461	746	1291	1700	1412	1700
Volume to Capacity	0.13	0.16	0.01	0.04	0.03	0.08
Queue Length 95th (ft)	11	14	1	0	2	0
Control Delay (s)	14.0	10.7	1.6	0.0	2.4	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	14.0	10.7	0.8		1.2	
Approach LOS	B	B				

### Intersection Summary

Average Delay		4.2				
Intersection Capacity Utilization		38.8%		ICU Level of Service		A
Analysis Period (min)		15				

\* User Entered Value

# HCM Signalized Intersection Capacity Analysis

37: Cooke St & Ala Moana Blvd

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖↖		↖	↖↖↖			↖	↖		↖	↖
Traffic Volume (vph)	94	1578	40	13	1654	27	26	16	3	19	40	120
Future Volume (vph)	94	1578	40	13	1654	27	26	16	3	19	40	120
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
Frb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1770	5057		1770	5070			1785	1531		1820	1533
Flt Permitted	0.95	1.00		0.95	1.00			0.80	1.00		0.89	1.00
Satd. Flow (perm)	1770	5057		1770	5070			1464	1531		1655	1533
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)	97	1627	41	13	1705	28	27	16	3	20	41	124
RTOR Reduction (vph)	0	2	0	0	1	0	0	0	3	0	0	108
Lane Group Flow (vph)	97	1666	0	13	1732	0	0	43	0	0	61	16
Confl. Peds. (#/hr)			38			24	16		17	17		16
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	11.2	65.2		1.0	55.0			12.4	12.4		12.4	12.4
Effective Green, g (s)	11.2	65.2		1.0	55.0			12.4	12.4		12.4	12.4
Actuated g/C Ratio	0.12	0.70		0.01	0.59			0.13	0.13		0.13	0.13
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)	211	3522		18	2979			193	202		219	203
v/s Ratio Prot	c0.05	c0.33		0.01	c0.34							
v/s Ratio Perm								0.03	0.00		c0.04	0.01
v/c Ratio	0.46	0.47		0.72	0.58			0.22	0.00		0.28	0.08
Uniform Delay, d1	38.4	6.4		46.2	12.1			36.3	35.2		36.6	35.6
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.6	0.1		87.1	0.3			0.6	0.0		0.7	0.2
Delay (s)	40.0	6.5		133.2	12.4			36.9	35.2		37.3	35.8
Level of Service	D	A		F	B			D	D		D	D
Approach Delay (s)		8.4			13.3			36.8			36.3	
Approach LOS		A			B			D			D	

## Intersection Summary

HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	93.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

37: Cooke St/Cooke St & Ala Moana Blvd

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	2054	30	9	1627	52	59	45	13	35	28	139
Future Volume (vph)	62	2054	30	9	1627	52	59	45	13	35	28	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	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.96		1.00	0.90
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.97	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5062		1770	5048			1756	1518		1787	1432
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.80	1.00
Satd. Flow (perm)	1770	5062		1770	5048			1435	1518		1476	1432
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)	65	2140	31	9	1695	54	61	47	14	36	29	145
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	11	0	0	93
Lane Group Flow (vph)	65	2170	0	9	1747	0	0	108	3	0	65	52
Confl. Peds. (#/hr)			56			45	52		26	26		52
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	7.8	68.7		0.6	61.5			18.8	18.8		18.8	18.8
Effective Green, g (s)	7.8	68.7		0.6	61.5			18.8	18.8		18.8	18.8
Actuated g/C Ratio	0.08	0.67		0.01	0.60			0.18	0.18		0.18	0.18
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	133	3373		10	3011			261	276		269	261
v/s Ratio Prot	c0.04	c0.43		0.01	0.35							
v/s Ratio Perm							c0.08	0.00			0.04	0.04
v/c Ratio	0.49	0.64		0.90	0.58		0.41	0.01			0.24	0.20
Uniform Delay, d1	45.7	10.0		51.2	12.8		37.3	34.5			36.1	35.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	2.8	0.4		226.0	0.3		1.1	0.0			0.5	0.4
Delay (s)	48.5	10.5		277.2	13.1		38.3	34.5			36.5	36.1
Level of Service	D	B		F	B		D	C			D	D
Approach Delay (s)		11.6			14.5		37.9				36.3	
Approach LOS		B			B		D				D	

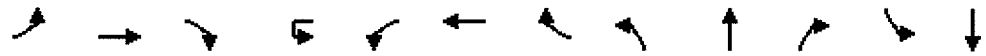
## Intersection Summary

HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	103.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 41: Ala Moana Blvd & Ward Ave

5/6/2016



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖↖↖			↗	↗↗↗	↗		↖↖	↖	↗	↖↖
Traffic Volume (vph)	183	1364	4	12	118	1537	160	1	58	42	113	136
Future Volume (vph)	183	1364	4	12	118	1537	160	1	58	42	113	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0	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	1.00	0.95
Frbp, ped/bikes	1.00	1.00			1.00	1.00	0.96		1.00	0.95	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	0.91
Flt Protected	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	5082			1770	5085	1513		3536	1501	1770	3119
Flt Permitted	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	5082			1770	5085	1513		3536	1501	1770	3119
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)	191	1421	4	12	123	1601	167	1	60	44	118	142
RTOR Reduction (vph)	0	0	0	0	0	0	80	0	0	0	0	161
Lane Group Flow (vph)	191	1425	0	0	136	1601	87	0	61	44	118	177
Confl. Peds. (#/hr)			30				21	36		35	35	
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		8	8		4	4
Permitted Phases							6			8		
Actuated Green, G (s)	17.5	51.7			14.0	48.2	48.2		25.2	25.2	24.4	24.4
Effective Green, g (s)	17.5	51.7			14.0	48.2	48.2		25.2	25.2	24.4	24.4
Actuated g/C Ratio	0.13	0.38			0.10	0.36	0.36		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)	228	1941			183	1811	538		658	279	319	562
v/s Ratio Prot	c0.11	c0.28			0.08	c0.31			0.02		c0.07	0.06
v/s Ratio Perm							0.06			c0.03		
v/c Ratio	0.84	0.73			0.74	0.88	0.16		0.09	0.16	0.37	0.32
Uniform Delay, d1	57.5	35.9			58.9	40.9	29.7		45.6	46.2	48.7	48.2
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	22.6	1.5			15.0	5.5	0.1		0.1	0.3	0.7	0.3
Delay (s)	80.2	37.4			73.9	46.5	29.9		45.6	46.4	49.4	48.5
Level of Service	F	D			E	D	C		D	D	D	D
Approach Delay (s)		42.4				47.0			46.0			48.8
Approach LOS		D				D			D			D

### Intersection Summary

HCM 2000 Control Delay	45.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	135.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



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

5/6/2016

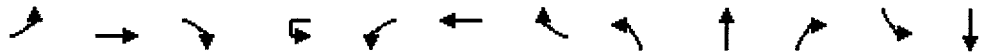


Movement	SBR
<b>Lane Configurations</b>	
Traffic Volume (vph)	188
Future Volume (vph)	188
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	196
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	36
<b>Turn Type</b>	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
<b>Intersection Summary</b>	

# HCM Signalized Intersection Capacity Analysis

41: Ala Moana Blvd & Ward Ave

5/9/2016



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖↖↖			↖	↖↖↖	↗		↖↖	↗	↖	↖↖
Traffic Volume (vph)	256	1803	1	13	40	1407	199	6	139	97	192	66
Future Volume (vph)	256	1803	1	13	40	1407	199	6	139	97	192	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0		5.0	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
Frbp, ped/bikes	1.00	1.00			1.00	1.00	0.92		1.00	0.90	1.00	0.95
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	0.88
Flt Protected	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	5085			1770	5085	1465		3531	1426	1610	2826
Flt Permitted	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	5085			1770	5085	1465		3531	1426	1610	2826
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	281	1981	1	14	44	1546	219	7	153	107	211	73
RTOR Reduction (vph)	0	0	0	0	0	0	114	0	0	0	0	262
Lane Group Flow (vph)	281	1982	0	0	58	1546	105	0	160	107	190	152
Confl. Peds. (#/hr)			45				38	41		71	71	
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		8	8		4	4
Permitted Phases							6			8		
Actuated Green, G (s)	22.0	60.1			5.0	43.1	43.1		35.1	35.1	26.5	26.5
Effective Green, g (s)	22.0	60.1			5.0	43.1	43.1		35.1	35.1	26.5	26.5
Actuated g/C Ratio	0.15	0.41			0.03	0.29	0.29		0.24	0.24	0.18	0.18
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0		5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	265	2083			60	1493	430		844	341	290	510
v/s Ratio Prot	c0.16	0.39			0.03	c0.30			0.05		c0.12	0.05
v/s Ratio Perm							0.07			c0.08		
v/c Ratio	1.06	0.95			0.97	1.04	0.24		0.19	0.31	0.66	0.30
Uniform Delay, d1	62.3	41.9			70.8	51.8	39.4		44.5	45.9	55.9	52.0
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	72.1	10.5			103.3	33.0	0.3		0.1	0.5	5.2	0.3
Delay (s)	134.5	52.4			174.0	84.8	39.7		44.6	46.4	61.1	52.4
Level of Service	F	D			F	F	D		D	D	E	D
Approach Delay (s)		62.6				82.2			45.3			55.1
Approach LOS		E				F			D			E

## Intersection Summary

HCM 2000 Control Delay	68.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	146.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	106.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

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

5/9/2016



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	291
Future Volume (vph)	291
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.91
Adj. Flow (vph)	320
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	41
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

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

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑↑		↖	↑↑↑			↑	↗		↖	↗
Traffic Volume (vph)	53	1423	70	13	1636	49	42	27	13	13	34	125
Future Volume (vph)	53	1423	70	13	1636	49	42	27	13	13	34	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	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.91		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.98	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	1.00
Satd. Flow (prot)	1770	5027		1770	5057			1808	1447		1804	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.82	1.00		0.93	1.00
Satd. Flow (perm)	1770	5027		1770	5057			1534	1447		1707	1583
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)	54	1452	71	13	1669	50	43	28	13	13	35	128
RTOR Reduction (vph)	0	3	0	0	2	0	0	0	10	0	0	93
Lane Group Flow (vph)	54	1520	0	13	1717	0	0	71	3	0	48	35
Confl. Peds. (#/hr)			43			21			76	76		
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2	6		6
Actuated Green, G (s)	7.3	65.9		2.4	61.0			26.4	26.4		26.4	26.4
Effective Green, g (s)	7.3	65.9		2.4	61.0			26.4	26.4		26.4	26.4
Actuated g/C Ratio	0.07	0.60		0.02	0.56			0.24	0.24		0.24	0.24
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	117	3019		38	2812			369	348		410	380
v/s Ratio Prot	c0.03	c0.30		0.01	c0.34							
v/s Ratio Perm								c0.05	0.00		0.03	0.02
v/c Ratio	0.46	0.50		0.34	0.61			0.19	0.01		0.12	0.09
Uniform Delay, d1	49.3	12.5		52.9	16.4			33.2	31.7		32.5	32.4
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.9	0.1		5.3	0.4			0.3	0.0		0.1	0.1
Delay (s)	52.2	12.7		58.2	16.8			33.4	31.7		32.7	32.5
Level of Service	D	B		E	B			C	C		C	C
Approach Delay (s)		14.0			17.1			33.2			32.5	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	109.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	1934	190	23	1237	97	100	54	28	59	84	216
Future Volume (vph)	64	1934	190	23	1237	97	100	54	28	59	84	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	0.98		1.00	0.99			1.00	0.87		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.96	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1770	4928		1770	4991			1804	1370		1755	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.64	1.00		0.78	1.00
Satd. Flow (perm)	1770	4928		1770	4991			1187	1370		1401	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)	66	1994	196	24	1275	100	103	56	29	61	87	223
RTOR Reduction (vph)	0	7	0	0	5	0	0	0	22	0	0	100
Lane Group Flow (vph)	66	2183	0	24	1370	0	0	159	7	0	148	123
Confl. Peds. (#/hr)			82			50			104	104		
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2	6		6
Actuated Green, G (s)	8.7	80.2		3.2	74.7			34.2	34.2		34.2	34.2
Effective Green, g (s)	8.7	80.2		3.2	74.7			34.2	34.2		34.2	34.2
Actuated g/C Ratio	0.07	0.60		0.02	0.56			0.26	0.26		0.26	0.26
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)	116	2980		42	2811			306	353		361	408
v/s Ratio Prot	c0.04	c0.44		0.01	0.27							
v/s Ratio Perm								c0.13	0.01		0.11	0.08
v/c Ratio	0.57	0.73		0.57	0.49			0.52	0.02		0.41	0.30
Uniform Delay, d1	60.1	18.6		64.0	17.4			42.2	36.7		40.8	39.6
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	6.3	1.0		17.4	0.1			1.5	0.0		0.8	0.4
Delay (s)	66.4	19.5		81.4	17.6			43.7	36.7		41.6	40.0
Level of Service	E	B		F	B			D	D		D	D
Approach Delay (s)		20.9			18.7			42.6			40.6	
Approach LOS		C			B			D			D	

Intersection Summary

HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	132.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 44: Ala Moana Blvd & Queens St

5/6/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↑↑↑	↑↑↵		↵↵	↵
Traffic Volume (vph)	15	1446	1694	133	43	19
Future Volume (vph)	15	1446	1694	133	43	19
Ideal Flow (vphpl)	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	0.91	0.91		0.97	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	5085	5012		3433	1484
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	5085	5012		3433	1484
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	15	1491	1746	137	44	20
RTOR Reduction (vph)	0	0	6	0	0	16
Lane Group Flow (vph)	15	1491	1877	0	44	4
Confl. Peds. (#/hr)	39			39		52
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	2.3	76.5	69.2		23.3	23.3
Effective Green, g (s)	2.3	76.5	69.2		23.3	23.3
Actuated g/C Ratio	0.02	0.70	0.63		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)	37	3542	3158		728	314
v/s Ratio Prot	0.01	c0.29	c0.37		c0.01	
v/s Ratio Perm						0.00
v/c Ratio	0.41	0.42	0.59		0.06	0.01
Uniform Delay, d1	53.1	7.1	12.0		34.5	34.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	7.1	0.1	0.3		0.0	0.0
Delay (s)	60.2	7.2	12.3		34.5	34.2
Level of Service	E	A	B		C	C
Approach Delay (s)		7.8	12.3		34.4	
Approach LOS		A	B		C	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	109.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 44: Ala Moana Blvd & Queens St

5/6/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	28	2008	1285	216	184	49
Future Volume (vph)	28	2008	1285	216	184	49
Ideal Flow (vphpl)	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	0.91	0.91		0.97	1.00
Frbp, ped/bikes	1.00	1.00	0.99		1.00	0.92
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	5085	4913		3433	1463
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	5085	4913		3433	1463
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	29	2092	1339	225	192	51
RTOR Reduction (vph)	0	0	15	0	0	39
Lane Group Flow (vph)	29	2092	1549	0	192	12
Confl. Peds. (#/hr)	73			73		64
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	4.6	77.3	67.7		27.8	27.8
Effective Green, g (s)	4.6	77.3	67.7		27.8	27.8
Actuated g/C Ratio	0.04	0.67	0.59		0.24	0.24
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)	70	3415	2889		829	353
v/s Ratio Prot	0.02	c0.41	0.32		c0.06	
v/s Ratio Perm						0.01
v/c Ratio	0.41	0.61	0.54		0.23	0.03
Uniform Delay, d1	53.9	10.5	14.3		35.1	33.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.9	0.3	0.2		0.1	0.0
Delay (s)	57.9	10.9	14.4		35.2	33.4
Level of Service	E	B	B		D	C
Approach Delay (s)		11.5	14.4		34.8	
Approach LOS		B	B		C	

### Intersection Summary

HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	115.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 45: Ala Moana Blvd & Piikoi St

5/6/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	363	1108	1694	325	132	127
Future Volume (vph)	363	1108	1694	325	132	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frbp, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	5085	4944		1770	2787
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	5085	4944		1770	2787
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	378	1154	1765	339	138	132
RTOR Reduction (vph)	0	0	18	0	0	116
Lane Group Flow (vph)	378	1154	2086	0	138	16
Confl. Peds. (#/hr)	12			12	50	
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	9	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	24.6	74.9	74.9		15.5	15.5
Effective Green, g (s)	24.6	74.9	74.9		15.5	15.5
Actuated g/C Ratio	0.19	0.58	0.58		0.12	0.12
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)	649	2929	2848		211	332
v/s Ratio Prot	c0.11	0.23	c0.42		c0.08	
v/s Ratio Perm						0.01
v/c Ratio	0.58	0.39	0.73		0.65	0.05
Uniform Delay, d1	48.0	15.1	20.2		54.7	50.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.3	0.1	1.0		7.1	0.1
Delay (s)	49.4	15.2	21.2		61.8	50.8
Level of Service	D	B	C		E	D
Approach Delay (s)		23.6	21.2		56.4	
Approach LOS		C	C		E	

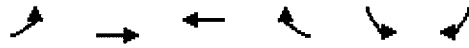
Intersection Summary			
HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Signalized Intersection Capacity Analysis

## 45: Ala Moana Blvd & Piikoi St

5/6/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	318	1896	1307	304	245	194
Future Volume (vph)	318	1896	1307	304	245	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frbp, ped/bikes	1.00	1.00	0.97		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	5085	4798		1770	2787
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	5085	4798		1770	2787
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	331	1975	1361	317	255	202
RTOR Reduction (vph)	0	0	24	0	0	166
Lane Group Flow (vph)	331	1975	1654	0	255	36
Confl. Peds. (#/hr)	139			139	128	
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	9	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	32.4	71.8	71.8		26.1	26.1
Effective Green, g (s)	32.4	71.8	71.8		26.1	26.1
Actuated g/C Ratio	0.22	0.49	0.49		0.18	0.18
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)	765	2512	2370		317	500
v/s Ratio Prot	c0.10	c0.39	0.34		c0.14	
v/s Ratio Perm						0.01
v/c Ratio	0.43	0.79	0.70		0.80	0.07
Uniform Delay, d1	48.5	30.4	28.4		57.2	49.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	1.7	0.9		13.7	0.1
Delay (s)	48.9	32.1	29.3		70.9	49.6
Level of Service	D	C	C		E	D
Approach Delay (s)		34.5	29.3		61.5	
Approach LOS		C	C		E	

### Intersection Summary

HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	145.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

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**APPENDIX D**

**TRIP GENERATION CALCULATIONS**

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**Trip Generation  
Block A - Phase 3**

Land Use No./Type	Number of Units	Units	Land Use Number	Weekday		AM PEAK			PM PEAK												
				Trip Rate per Unit	Total Trips	Trip Rate per Unit	In	Out	Trip Rate per Unit	In	Out	Trip Rate per Unit	In	Out							
<b>Existing</b>																					
General Office Building	43,735	ksf	710	11.03	482	1.56	68	88	1.37	60	12	0.19	8	1.49	65	17	0.25	11	83	1.24	54
Internal Capture					-197		-26		-23				-3		-34			-5			-29
Existing Total					285		42		37				5		31			6			25
<b>Proposed (Residential)</b>																					
Residential Condominium/Townhouse	227	units	230	5.81	1,319	0.44	100	17	0.07	17	83	0.37	83	0.52	118	67	0.35	79	33	0.17	39
Residential Alt Mode Trip Reduction					-304		-26		-4				-22		-24			-17			-7
<b>Residential Total</b>					<b>730</b>		<b>32</b>		<b>-24</b>				<b>56</b>		<b>63</b>			<b>56</b>			<b>7</b>
<b>Proposed (Retail/Restaurant)</b>																					
Shopping Center	15	ksf	820	42.70	641	0.96	14	62	0.60	9	38	0.36	5	3.71	56	48	1.78	27	52	1.93	29
High-Turnover (Sit-Down) Restaurant (formerly #832)	5	ksf	932	127.15	636	10.81	54	55	5.95	30	45	4.86	24	9.85	49	60	5.91	30	40	3.94	19
Retail SubTotal					1,277		68		39				29		105			57			48
Trip Reduction					-1,198		-65		-24				-41		-120			-68			-52
Retail Trip Reduction					-894		-39		-20				-19		-96			-51			-45
<b>Retail Total (to Block G East)</b>					<b>383</b>		<b>29</b>		<b>19</b>				<b>10</b>		<b>9</b>			<b>6</b>			<b>3</b>

**Trip Generation**  
**Block G East - Phase 3**

Land Use No./Type	Number of Units	Units	Land Use Number	Weekday		AM PEAK			PM PEAK													
				Trip Rate per Unit	Total Trips	Trip Rate per Unit	In	Out	Trip Rate per Unit	In	Out											
<b>Existing</b>																						
Shopping Center	79,897	ksf	820	42.70	3412	0.96	77	62	0.60	48	38	0.36	29	3.71	296	48	1.78	142	52	1.93	154	
General Light Industrial	63,963	ksf	110	6.97	446	0.92	59	88	0.81	52	12	0.11	7	0.97	62	12	0.12	7	88	0.85	55	
Existing Subtotal					3858		136		100				36		358			149				209
Internal Capture					-1579		-49		-38				-11		-179			-65				-114
Existing Total					2279		87		62				25		179			84				95
<b>Proposed (Residential)</b>																						
Residential Condominium/Townhouse	160	units	230	5.81	930	0.44	70	17	0.07	12	83	0.37	58	0.52	83	67	0.35	56	33	0.17	27	
Residential Alt Mode Trip Reduction					-215		-19		-3				-16		-17			-12				-5
Residential Total					-1564		-36		-53				17		-113			-40				-73
<b>Proposed (Retail/Restaurant)</b>																						
Shopping Center	67.5	ksf	820	42.70	2882	0.96	65	62	0.60	40	38	0.36	25	3.71	250	48	1.78	120	52	1.93	130	
High-Turnover (Sit-Down) Restaurant (formerly #832)	22.5	ksf	932	127.15	2861	10.81	243	55	5.95	134	45	4.86	109	9.85	222	60	5.91	133	40	3.94	89	
Retail Sub Total					5743		308		174				134		472			253				219
Trip Reduction					-3080		-149		-78				-71		-300			-153				-147
Retail Trip Reduction					-2865		-130		-75				-55		-283			-141				-142
Retail Total					2878		178		99				79		189			112				77

**Trip Generation  
Block F West - Phase 3**

Land Use No./Type	Number of Units	Units	Land Use Number	Weekday		AM PEAK				PM PEAK												
				Trip Rate per Unit	Total Trips	Trip Rate per Unit	In %	In Trips	Out %	Out Trips	Trip Rate per Unit	In %	In Trips	Out %	Out Trips							
<b>Existing</b>																						
Shopping Center	7,104	ksf	820	42.70	303	0.96	7	62	0.60	4	38	0.36	3	3.71	26	48	1.78	13	52	1.93	13	
General Light Industrial	35,59	ksf	110	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					551		40		33				7		61			17				44
Internal Capture					-225		-14		-12				-2		-31			-7				-24
Existing Total					326		26		21				5		30			10				20
<b>Proposed (Residential)</b>																						
Residential Condominium/Townhouse	350	units	230	5.81	2034	0.44	154	17	0.07	26	83	0.37	128	0.52	182	67	0.35	122	33	0.17	60	
Residential Alt Mode Trip Reduction					-469		-41		-6				-35		-36			-26				-10
Residential Total					1239		87		-1				88		116			86				30
<b>Proposed (Retail/Restaurant)</b>																						
Shopping Center	15	ksf	820	42.70	641	0.96	14	62	0.60	9	38	0.36	5	3.71	56	48	1.78	27	52	1.93	29	
High-Turnover (Sit-Down) Restaurant (formerly #832)	5	ksf	932	127.15	636	10.81	54	55	5.95	30	45	4.86	24	9.85	49	60	5.91	30	40	3.94	19	
Retail Sub Total					1277		68		39				29		105			57				48
Trip Reduction					-1528		-85		-27				-58		-153			-89				-64
Retail Trip Reduction					-1059		-44		-21				-23		-117			-63				-54
Retail Total (to Block G Parking)					218		24		18				6		-12			-6				-6

**Trip Generation**  
**Block F East - Phase 3**

Land Use No./Type	Number of Units	Units	Land Use Number	Weekday		AM PEAK			PM PEAK												
				Trip Rate per Unit	Total Trips	Trip Rate per Unit	In Trips	Out Trips	Trip Rate per Unit	In Trips	Out Trips										
<b>Existing</b>																					
Shopping Center	43,543	ksf	820	42.70	1859	0.96	42	62	0.60	26	38	0.36	16	3.71	162	48	1.78	78	52	1.93	84
General Light Industrial	0	ksf	110	6.97	0	0.92	0	88	0.81	0	12	0.11	0	0.97	0	12	0.12	0	88	0.85	0
Existing Subtotal					1859		42	88	0.81	26	38	0.11	0	0.97	162	48	0.12	78	88	0.85	84
Internal Capture					-761		-15			-10			-5		-80				-34		-46
Existing Total					1098		27			16			11		82			44			38
<b>Proposed (Residential)</b>																					
Residential Condominium/Townhouse	310	units	230	5.81	1801	0.44	136	17	0.07	23	83	0.37	113	0.52	161	67	0.35	108	33	0.17	53
Residential Alt Mode Trip Reduction					-416		-37			-6			-31		-32			-23			-9
Residential Total					287		72			1			71		47			41			6
<b>Proposed (Retail/Restaurant)</b>																					
Shopping Center	18.75	ksf	820	42.70	801	0.96	18	62	0.60	11	38	0.36	7	3.71	70	48	1.78	33	52	1.93	37
High-Turnover (Sit-Down) Restaurant (formerly #832)	6.25	ksf	932	127.15	795	10.81	68	55	5.95	37	45	4.86	31	9.85	62	60	5.91	37	40	3.94	25
Retail Sub Total					1596		86			48			38		132			70			62
Trip Reduction					-1568		-85			-30			-55		-157			-88			-69
Retail Trip Reduction					-1152		-48			-24			-24		-125			-65			-60
Retail Total (to Block G Parking)					444		38			24			14		7			5			2

**Trip Generation**  
**Block B East - Phase 4**

Land Use No./Type	Number of Units	Units	Land Use Number	Weekday Trip Rate per Unit	AM PEAK			PM PEAK			
					Trip Rate Number	In %	Out %	Trip Rate Number	In %	Out %	
				per Unit	of Trips	Trips	Rate	of Trips	Trips	Rate	of Trips
<b>Existing</b>											
Retail				2473	55	34	21	215	103	112	
Internal Capture				-1012	-20	-13	-7	-106	-45	-61	
Existing Total				1461	35	21	14	109	58	51	
<b>Proposed (Residential)</b>											
Residential Condominium/Townhouse	111	units	230	5.81	49	17	83	58	67	33	
Residential Alt Mode Trip Reduction				-149	-13	-2	-11	-11	-8	-3	
Residential Total				-965	1	-15	16	-62	-27	-35	
<b>Proposed (Retail/Restaurant)</b>											
Shopping Center	4.865	ksf	820	42.70	5	62	38	18	48	52	
High-Turnover (Sit-Down) Restaurant (formerly #832)	4.865	ksf	932	127.15	53	55	45	48	60	40	
Retail SubTotal				827	58	32	26	66	38	28	
Retail Trip Reduction				-680	-42	-17	-25	-66	-38	-28	
Retail Total (to Block J Parking in phase 4, Block H Parking in phase 5)				-531	-29	-15	-14	-55	-30	-25	
				296	29	17	12	11	8	3	



**Trip Generation**  
**Block G West - Phase 4**

Land Use No./Type	Number of Units	Units	Land Use Number	Weekday		AM PEAK			PM PEAK										
				Trip Rate per Unit	Total Trips	Trip Rate per Unit	In	Out	Trip Rate per Unit	In	Out	Trip Rate per Unit	In	Out					
<b>Existing</b>																			
Shopping Center	1,488	ksf	820	42.70	64	0.96	1	38	0	3.71	6	48	1.78	3	52	1.93	3		
General Light Industrial	77.58	ksf	110	6.97	541	0.92	71	12	8	0.97	75	12	0.12	9	88	0.85	66		
Existing Subtotal					605		72		8		81			12				69	
Internal Capture					-248		-27		-3		-43			-5				-38	
Existing Total					357		45		5		38			7				31	
<b>Proposed (Residential)</b>																			
Residential Condominium/Townhouse	163	units	230	5.81	947	0.44	72	83	60	0.52	85	67	0.35	57	33	0.17	28		
Residential Alt Mode Trip Reduction					-218		-19		-16		-17			-12				-5	
Residential Total					372		8		39		30			38				-8	
<b>Proposed (Retail/Restaurant)</b>																			
Shopping Center	67.5	ksf	820	42.70	2882	0.96	65	38	25	3.71	250	48	1.78	120	52	1.93	130		
High-Turnover (Sit-Down) Restaurant (formerly #832)	22.5	ksf	932	127.15	2861	10.81	243	45	109	9.85	222	60	5.91	133	40	3.94	89		
Retail Sub Total					5743		308		134		472			253				219	
Trip Reduction					-3088		-149		-71		-301			-154				-147	
Retail Trip Reduction					-2870		-130		-55		-284			-142				-142	
Retail Total					2873		178		79		188			111				77	



**Trip Generation**  
**Block N West - Phase 4**

Land Use No./Type	Number of Units	Units	Land Use Number	Weekday Trip Rate per Unit	Weekday Total Trips	AM PEAK			PM PEAK											
						Trip Rate per Unit	Number of Trips	%	Trip Rate per Unit	Number of Trips	%									
<b>Existing</b>																				
Shopping Center	22,11275	ksf	820	42.70	944	0.96	21	62	0.60	13	38	0.36	8	82	48	1.78	39	52	1.93	43
High-Turnover (Sit-Down) Restaurant (formerly #832)	1,93975	ksf	932	127.15	247	10.81	21	55	5.95	12	45	4.86	9	19	60	5.91	11	40	3.94	8
Existing Subtotal					1191		42	25		25		17	17	101			50	50		51
Internal Capture					-487		-14	-9		-9		-5	-5	-50			-22	-22		-28
Existing Total					704		28	16		16		12	12	51			28	28		23
<b>Proposed (Residential)</b>																				
Residential Condominium/Townhouse	600	units	230	5.81	3486	0.44	264	17	0.07	45	83	0.37	219	312	67	0.35	209	33	0.17	103
Residential Alt Mode Trip Reduction					-804		-70	-11		-11		-59	-59	-63			-45	-45		-18
Residential Total					1978		166	18		18		148	148	198			136	136		62
<b>Proposed (Retail/Restaurant)</b>																				
Shopping Center	22.5	ksf	820	42.70	961	0.96	22	62	0.60	13	38	0.36	9	83	48	1.78	40	52	1.93	43
High-Turnover (Sit-Down) Restaurant (formerly #832)	7.5	ksf	932	127.15	954	10.81	81	55	5.95	45	45	4.86	36	74	60	5.91	44	40	3.94	30
Retail SubTotal					1915		103	58		58		45	45	157			84	84		73
Trip Reduction					-2493		-140	-43		-43		-97	-97	-251			-146	-146		-105
Retail Trip Reduction					-1689		-70	-32		-32		-38	-38	-188			-101	-101		-87
Retail Total (to Block M Parking in phase 4, Block H Parking in phase 5)					226		33	26		26		7	7	-31			-17	-17		-14

**Trip Generation  
Block D - Phase 5**

Land Use No./Type	Number of Units	Units	Land Use Number	Weekday		AM PEAK				PM PEAK											
				Land Use Number	Trip Rate per Unit	Trip Rate	Total Trips	Trip Rate per Unit	Number of Trips	%	In	Out	Trip Rate per Unit	Number of Trips	%	In	Out	Trip Rate	Total Trips		
<b>Existing</b>																					
Shopping Center	40,0755	ksf	820	42.70	1711	0.96	38	62	0.60	24	38	0.36	14	3.71	149	48	1.78	71	52	1.93	78
High-Turnover (Sit-Down) Restaurant (formerly #832)	21,9515	ksf	932	127.15	2791	10.81	237	55	5.95	131	45	4.86	106	9.85	216	60	5.91	130	40	3.94	86
Existing Subtotal					4502		275		155				120		365			201			164
Internal Capture					-1842		-97		-59				-38		-178			-88			-90
Existing Total					2660		178		96				82		187			113			74
<b>Proposed (Residential)</b>																					
Residential Condominium/Townhouse	180	units	230	5.81	1046	0.44	79	17	0.07	13	83	0.37	66	0.52	94	67	0.35	63	33	0.17	31
Residential Alt Mode Trip Reduction					-241		-21		-3				-18		-19			-14			-5
Residential Total					-1855		-120		-86				-34		-112			-64			-48
<b>Proposed (Retail/Restaurant)</b>																					
Shopping Center	7.5	ksf	820	42.70	320	0.96	7	62	0.60	4	38	0.36	3	3.71	28	48	1.78	13	52	1.93	15
High-Turnover (Sit-Down) Restaurant (formerly #832)	2.5	ksf	932	127.15	318	10.81	27	55	5.95	15	45	4.86	12	9.85	25	60	5.91	15	40	3.94	10
Retail SubTotal					638		34		19				15		53			28			25
Trip Reduction					-777		-43		-13				-30		-78			-45			-33
Retail Trip Reduction					-536		-22		-10				-12		-59			-31			-28
Retail Total (to Block L Parking)					102		12		9				3		-6			-3			-3

**Trip Generation  
Block H - Phase 5**

Land Use No./Type	Number of Units	Units	Land Use Number	Weekday		AM PEAK				PM PEAK											
				Land Use Number	Trip Rate per Unit	Trip Rate	Total Trips	Trip Rate per Unit	Number of Trips	%	In	Out	Trip Rate per Unit	Number of Trips	%	In	Out	Trip Rate	Total Trips		
<b>Existing</b>																					
Shopping Center	44,2255	ksf	820	42.70	1888	0.96	42	62	0.60	26	38	0.36	16	3.71	164	48	1.78	79	52	1.93	85
High-Turnover (Sit-Down) Restaurant (formerly #832)	3,8795	ksf	932	127.15	493	10.81	42	55	5.95	23	45	4.86	19	9.85	38	60	5.91	23	40	3.94	15
Existing Subtotal					2381		84	49		49			35		202			102			100
Internal Capture					-974		-30	-19		-19			-11		-100			-45			-55
Existing Total					1407		54	30		30			24		102			57			45
<b>Proposed (Residential)</b>																					
Residential Condominium/Townhouse	830	units	230	5.81	4822	0.44	365	17	0.07	62	83	0.37	303	0.52	432	67	0.35	289	33	0.17	143
Residential Alt Mode Trip Reduction					-1113		-97	-15		-15			-82		-87			-62			-25
Residential Total					2302		214	17		17			197		243			170			73
<b>Proposed (Retail/Restaurant)</b>																					
Shopping Center	75	ksf	820	42.70	3203	0.96	72	62	0.60	45	38	0.36	27	3.71	278	48	1.78	134	52	1.93	144
High-Turnover (Sit-Down) Restaurant (formerly #832)	25	ksf	932	127.15	3179	10.81	270	55	5.95	149	45	4.86	121	9.85	246	60	5.91	148	40	3.94	98
Retail SubTotal					6382		342	194		194			148		524			282			242
Trip Reduction					-5172		-274	-108		-108			-166		-514			-284			-230
Retail Trip Reduction					-4059		-177	-93		-93			-84		-427			-222			-205
Retail Total					2323		165	101		101			64		97			60			37

**Trip Generation  
Block E - Phase 5**

Land Use No./Type	Number of Units	Units	Land Use Number	Weekday		AM PEAK				PM PEAK									
				Land Use Number	Trip Rate per Unit	Total Trips	Trip Rate per Unit	In Trips	%	Out Trips	%	Trip Rate per Unit	In Trips	%	Out Trips	%			
<b>Existing</b>																			
Shopping Center	40,0755	ksf	820	42.70	1711	0.96	38	62	0.60	24	38	0.36	14	48	1.78	71	52	1.93	78
High-Turnover (Sit-Down) Restaurant (formerly #832)	21,9515	ksf	932	127.15	2791	10.81	237	55	5.95	131	45	4.86	106	60	5.91	130	40	3.94	86
Existing Subtotal					4502		275		155				120			201			164
Internal Capture					-1842		-97		-59				-38			-88			-90
Existing Total					2660		178		96				82			113			74
<b>Proposed (Residential)</b>																			
Residential Condominium/Townhouse	185	units	230	5.81	1075	0.44	81	17	0.07	14	83	0.37	67	67	0.35	64	33	0.17	32
Residential Alt Mode Trip Reduction					-248		-21		-3				-18			-14			-6
Residential Total					-1833		-118		-85				-33			-63			-48
<b>Proposed (Retail/Restaurant)</b>																			
Shopping Center	6,696	ksf	820	42.70	286	0.96	6	62	0.60	4	38	0.36	2	48	1.78	12	52	1.93	13
High-Turnover (Sit-Down) Restaurant (formerly #832)	2,232	ksf	932	127.15	284	10.81	24	55	5.95	13	45	4.86	11	60	5.91	13	40	3.94	9
Retail SubTotal					570		30		17				13			25			22
Trip Reduction					-759		-42		-13				-29			-44			-32
Retail Trip Reduction					-511		-21		-10				-11			-30			-26
Retail Total (to Block L Parking)					59		9		7				2			-5			-4

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**APPENDIX E**





















**CAPACITY ANALYSIS CALCULATIONS**  
**PROJECTED YEAR 2017 PEAK HOUR TRAFFIC ANALYSIS**

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# HCM Signalized Intersection Capacity Analysis

## 15: Ward Ave & Queen St

5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	177	80	61	318	36	81	413	41	41	688	192
Future Volume (vph)	48	177	80	61	318	36	81	413	41	41	688	192
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	0.98		1.00	0.97	1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected		0.99	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1840	1546		1845	1539	1770	3463		1770	3379	
Flt Permitted		0.69	1.00		0.91	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1275	1546		1685	1539	1770	3463		1770	3379	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	51	188	85	65	338	38	86	439	44	44	732	204
RTOR Reduction (vph)	0	0	58	0	0	26	0	8	0	0	28	0
Lane Group Flow (vph)	0	239	27	0	403	12	86	475	0	44	908	0
Confl. Peds. (#/hr)	21		15	15		21			58			34
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		22.9	22.9		22.9	22.9	6.2	31.2		3.0	28.0	
Effective Green, g (s)		22.9	22.9		22.9	22.9	6.2	31.2		3.0	28.0	
Actuated g/C Ratio		0.32	0.32		0.32	0.32	0.09	0.43		0.04	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)		404	491		535	488	152	1498		73	1312	
v/s Ratio Prot							c0.05	c0.14		0.02	c0.27	
v/s Ratio Perm		0.19	0.02		c0.24	0.01						
v/c Ratio		0.59	0.05		0.75	0.02	0.57	0.32		0.60	0.69	
Uniform Delay, d1		20.7	17.1		22.1	16.9	31.7	13.4		34.0	18.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.3	0.0		5.9	0.0	4.8	0.1		13.2	1.6	
Delay (s)		23.0	17.1		28.0	16.9	36.4	13.6		47.2	20.0	
Level of Service		C	B		C	B	D	B		D	C	
Approach Delay (s)		21.5			27.1			17.0			21.3	
Approach LOS		C			C			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			21.4									
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			72.1						15.0			
Intersection Capacity Utilization			85.1%									
Analysis Period (min)			15									
c Critical Lane Group												

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↘	↕		↘	↕	
Traffic Volume (vph)	98	381	145	71	390	73	71	750	130	100	766	78
Future Volume (vph)	98	381	145	71	390	73	71	750	130	100	766	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	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	0.98	1.00	0.98		1.00	0.99	
Fipb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Fr		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected		0.99	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1842	1527		1846	1548	1770	3386		1770	3456	
Flt Permitted		0.62	1.00		0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1154	1527		1290	1548	1770	3386		1770	3456	
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)	102	397	151	74	406	76	74	781	135	104	798	81
RTOR Reduction (vph)	0	0	47	0	0	42	0	15	0	0	9	0
Lane Group Flow (vph)	0	499	104	0	480	34	74	901	0	104	870	0
Confl. Peds. (#/hr)	11		25	25		11			88			59
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		39.2	39.2		39.2	39.2	3.9	29.5		5.0	30.6	
Effective Green, g (s)		39.2	39.2		39.2	39.2	3.9	29.5		5.0	30.6	
Actuated g/C Ratio		0.44	0.44		0.44	0.44	0.04	0.33		0.06	0.34	
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)		509	674		570	684	77	1126		99	1192	
v/s Ratio Prot							0.04	c0.27		c0.06	0.25	
v/s Ratio Perm		c0.43	0.07		0.37	0.02						
v/c Ratio		0.98	0.15		0.84	0.05	0.96	0.80		1.05	0.73	
Uniform Delay, d1		24.4	14.8		22.0	14.1	42.3	26.9		41.9	25.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		34.7	0.1		10.9	0.0	88.9	4.1		104.8	2.3	
Delay (s)		59.1	14.9		32.9	14.1	131.2	31.0		146.6	27.8	
Level of Service		E	B		C	B	F	C		F	C	
Approach Delay (s)		48.8			30.3			38.5			40.3	
Approach LOS		D			C			D			D	

Intersection Summary

HCM 2000 Control Delay	39.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	88.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	97.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 16: Kamakee St & Queen St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↖	↕			↕			↕	
Traffic Volume (vph)	28	141	8	170	273	27	15	111	55	37	182	100
Future Volume (vph)	28	141	8	170	273	27	15	111	55	37	182	100
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	
Frt		0.99		1.00	0.99			0.95			0.95	
Flt Protected		0.99		0.95	1.00			1.00			0.99	
Satd. Flow (prot)		3486		1770	3491			3363			3354	
Flt Permitted		0.86		0.95	1.00			0.91			0.90	
Satd. Flow (perm)		3016		1770	3491			3089			3044	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	30	150	9	181	290	29	16	118	59	39	194	106
RTOR Reduction (vph)	0	5	0	0	10	0	0	40	0	0	67	0
Lane Group Flow (vph)	0	184	0	181	309	0	0	153	0	0	272	0
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)		11.4		8.8	25.2			17.0			17.0	
Effective Green, g (s)		11.4		8.8	25.2			17.0			17.0	
Actuated g/C Ratio		0.22		0.17	0.48			0.33			0.33	
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)		658		298	1685			1005			991	
v/s Ratio Prot				c0.10	0.09							
v/s Ratio Perm		c0.06						0.05			c0.09	
v/c Ratio		0.28		0.61	0.18			0.15			0.27	
Uniform Delay, d1		17.0		20.1	7.7			12.5			13.0	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.2		3.5	0.1			0.1			0.2	
Delay (s)		17.2		23.6	7.7			12.6			13.2	
Level of Service		B		C	A			B			B	
Approach Delay (s)		17.2			13.5			12.6			13.2	
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	0.35		
Actuated Cycle Length (s)	52.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



# HCM Signalized Intersection Capacity Analysis

## 16: Kamakee St & Queen St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕		↖	↕↕			↕↕			↕↕	
Traffic Volume (vph)	98	449	48	279	416	51	42	166	71	64	129	50
Future Volume (vph)	98	449	48	279	416	51	42	166	71	64	129	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	
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	
Frt		0.99		1.00	0.98			0.96			0.97	
Flt Protected		0.99		0.95	1.00			0.99			0.99	
Satd. Flow (prot)		3468		1770	3481			3379			3385	
Flt Permitted		0.78		0.95	1.00			0.86			0.77	
Satd. Flow (perm)		2717		1770	3481			2934			2641	
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)	102	468	50	291	433	53	44	173	74	67	134	52
RTOR Reduction (vph)	0	6	0	0	10	0	0	27	0	0	19	0
Lane Group Flow (vph)	0	614	0	291	476	0	0	264	0	0	234	0
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)		25.2		18.8	49.0			15.2			15.2	
Effective Green, g (s)		25.2		18.8	49.0			15.2			15.2	
Actuated g/C Ratio		0.34		0.25	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)		922		448	2298			601			541	
v/s Ratio Prot				c0.16	0.14							
v/s Ratio Perm		c0.23						c0.09			0.09	
v/c Ratio		0.67		0.65	0.21			0.44			0.43	
Uniform Delay, d1		20.9		24.8	5.0			25.8			25.7	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		1.8		3.2	0.0			0.5			0.6	
Delay (s)		22.7		28.0	5.0			26.3			26.3	
Level of Service		C		C	A			C			C	
Approach Delay (s)		22.7			13.6			26.3			26.3	
Approach LOS		C			B			C			C	

### Intersection Summary

HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	74.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

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

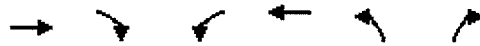
5/5/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↗	
Traffic Volume (veh/h)	228	21	94	451	23	70
Future Volume (Veh/h)	228	21	94	451	23	70
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)	240	22	99	475	24	74
Pedestrians						19
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						2
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh	2					
Upstream signal (ft)	564			680		
pX, platoon unblocked						
vC, conflicting volume			281			706 150
vC1, stage 1 conf vol						270
vC2, stage 2 conf vol						436
vCu, unblocked vol			281			706 150
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 %			92			96 92
cM capacity (veh/h)			1258			589 894
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	160	102	99	238	238	98
Volume Left	0	0	99	0	0	24
Volume Right	0	22	0	0	0	74
cSH	1700	1700	1258	1700	1700	793
Volume to Capacity	0.09	0.06	0.08	0.14	0.14	0.12
Queue Length 95th (ft)	0	0	6	0	0	11
Control Delay (s)	0.0	0.0	8.1	0.0	0.0	10.2
Lane LOS	A			B		
Approach Delay (s)	0.0		1.4			10.2
Approach LOS						B
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			30.8%	ICU Level of Service		A
Analysis Period (min)			15			

\* User Entered Value

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

5/5/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (veh/h)	545	10	73	692	46	188
Future Volume (Veh/h)	545	10	73	692	46	188
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	612	11	82	778	52	211
Pedestrians						19
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						2
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh	2					
Upstream signal (ft)	564			687		
pX, platoon unblocked			0.93		0.93	0.93
vC, conflicting volume			642		1190	330
vC1, stage 1 conf vol					636	
vC2, stage 2 conf vol					553	
vCu, unblocked vol			465		1053	130
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 %			92		89	75
cM capacity (veh/h)			1000		475	851

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	408	215	82	389	389	263
Volume Left	0	0	82	0	0	52
Volume Right	0	11	0	0	0	211
cSH	1700	1700	1000	1700	1700	736
Volume to Capacity	0.24	0.13	0.08	0.23	0.23	0.36
Queue Length 95th (ft)	0	0	7	0	0	41
Control Delay (s)	0.0	0.0	8.9	0.0	0.0	12.6
Lane LOS	A			B		
Approach Delay (s)	0.0		0.9			12.6
Approach LOS						B

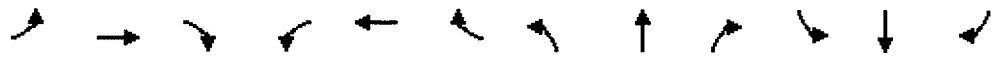
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization			43.6%	ICU Level of Service		A
Analysis Period (min)			15			

\* User Entered Value

# HCM Signalized Intersection Capacity Analysis

24: Ward Ave & Halekauwila St

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔					↖	↕		↗	↕	
Traffic Volume (vph)	125	12	22	0	0	0	43	410	3	15	499	241
Future Volume (vph)	125	12	22	0	0	0	43	410	3	15	499	241
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	0.98	
Ftpb, ped/bikes		1.00					0.98	1.00		1.00	1.00	
Frt		0.98					1.00	1.00		1.00	0.95	
Flt Protected		0.96					0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1747					1739	3535		1770	3286	
Flt Permitted		0.96					0.32	1.00		0.50	1.00	
Satd. Flow (perm)		1747					583	3535		938	3286	
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)	129	12	23	0	0	0	44	423	3	15	514	248
RTOR Reduction (vph)	0	5	0	0	0	0	0	1	0	0	60	0
Lane Group Flow (vph)	0	159	0	0	0	0	44	425	0	15	702	0
Confl. Peds. (#/hr)	2		44				42					42
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		17.7					24.1	24.1		24.1	24.1	
Effective Green, g (s)		17.7					24.1	24.1		24.1	24.1	
Actuated g/C Ratio		0.34					0.47	0.47		0.47	0.47	
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)		596					271	1644		436	1528	
v/s Ratio Prot								0.12			c0.21	
v/s Ratio Perm		0.09					0.08			0.02		
v/c Ratio		0.27					0.16	0.26		0.03	0.46	
Uniform Delay, d1		12.3					8.0	8.4		7.5	9.4	
Progression Factor		1.00					1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2					0.3	0.1		0.0	0.2	
Delay (s)		12.6					8.3	8.5		7.6	9.6	
Level of Service		B					A	A		A	A	
Approach Delay (s)		12.6			0.0			8.5			9.6	
Approach LOS		B			A			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			9.6				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.38									
Actuated Cycle Length (s)			51.8				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			57.3%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 24: Ward Ave & Halekauwila St/Driveway

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔					↗	↕		↖	↕	
Traffic Volume (vph)	253	21	95	0	0	0	35	689	6	31	657	178
Future Volume (vph)	253	21	95	0	0	0	35	689	6	31	657	178
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		0.98					1.00	1.00		1.00	0.98	
Flpb, ped/bikes		1.00					0.98	1.00		1.00	1.00	
Frt		0.97					1.00	1.00		1.00	0.97	
Flt Protected		0.97					0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1708					1731	3535		1770	3350	
Flt Permitted		0.97					0.24	1.00		0.31	1.00	
Satd. Flow (perm)		1708					429	3535		581	3350	
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)	264	22	99	0	0	0	36	718	6	32	684	185
RTOR Reduction (vph)	0	14	0	0	0	0	0	1	0	0	30	0
Lane Group Flow (vph)	0	371	0	0	0	0	36	723	0	32	839	0
Confl. Peds. (#/hr)			91				63					63
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		22.8					22.2	22.2		22.2	22.2	
Effective Green, g (s)		22.8					22.2	22.2		22.2	22.2	
Actuated g/C Ratio		0.41					0.40	0.40		0.40	0.40	
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					173	1426		234	1352	
v/s Ratio Prot								0.20			c0.25	
v/s Ratio Perm		0.22					0.08			0.06		
v/c Ratio		0.52					0.21	0.51		0.14	0.62	
Uniform Delay, d1		12.0					10.7	12.3		10.4	13.0	
Progression Factor		1.00					1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7					0.6	0.3		0.3	0.9	
Delay (s)		12.7					11.3	12.6		10.6	13.9	
Level of Service		B					B	B		B	B	
Approach Delay (s)		12.7			0.0			12.5			13.8	
Approach LOS		B			A			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			13.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			55.0				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			59.8%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 34: Ward Ave & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗	↖	↔		↖	↕↕		↖	↕↕	
Traffic Volume (vph)	24	69	33	86	95	132	57	302	74	91	407	66
Future Volume (vph)	24	69	33	86	95	132	57	302	74	91	407	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00	1.00	1.00	0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		0.99	1.00		0.98	1.00	
Frt		1.00	0.85	1.00	0.91		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)		3483	1583	1770	1672		1745	3406		1738	3442	
Flt Permitted		0.86	1.00	0.69	1.00		0.46	1.00		0.51	1.00	
Satd. Flow (perm)		3035	1583	1282	1672		849	3406		938	3442	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	75	36	93	103	143	62	328	80	99	442	72
RTOR Reduction (vph)	0	0	24	0	67	0	0	23	0	0	14	0
Lane Group Flow (vph)	0	101	12	93	179	0	62	385	0	99	500	0
Confl. Peds. (#/hr)	37					37	34		63	63		34
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)		15.2	15.2	15.2	15.2		21.0	21.0		21.0	21.0	
Effective Green, g (s)		15.2	15.2	15.2	15.2		21.0	21.0		21.0	21.0	
Actuated g/C Ratio		0.33	0.33	0.33	0.33		0.45	0.45		0.45	0.45	
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)		998	520	421	550		385	1548		426	1564	
v/s Ratio Prot					c0.11			0.11			c0.15	
v/s Ratio Perm		0.03	0.01	0.07			0.07			0.11		
v/c Ratio		0.10	0.02	0.22	0.33		0.16	0.25		0.23	0.32	
Uniform Delay, d1		10.8	10.5	11.2	11.6		7.4	7.7		7.7	8.0	
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	0.3	0.3		0.2	0.1		0.3	0.1	
Delay (s)		10.8	10.5	11.5	12.0		7.6	7.8		8.0	8.2	
Level of Service		B	B	B	B		A	A		A	A	
Approach Delay (s)		10.7			11.9			7.8			8.1	
Approach LOS		B			B			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			9.1			HCM 2000 Level of Service					A	
HCM 2000 Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			46.2			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

## 34: Ward Ave & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗	↖	↔		↖	↕↕		↖	↕↕	
Traffic Volume (vph)	29	163	63	131	90	264	46	400	183	300	409	67
Future Volume (vph)	29	163	63	131	90	264	46	400	183	300	409	67
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	
Frbp, ped/bikes		1.00	0.96	1.00	0.96		1.00	0.98		1.00	0.99	
Fipb, ped/bikes		1.00	1.00	0.98	1.00		0.97	1.00		0.97	1.00	
Frt		1.00	0.85	1.00	0.89		1.00	0.95		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)		3499	1521	1732	1581		1721	3290		1720	3428	
Flt Permitted		0.87	1.00	0.63	1.00		0.46	1.00		0.40	1.00	
Satd. Flow (perm)		3073	1521	1144	1581		839	3290		722	3428	
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)	30	168	65	135	93	272	47	412	189	309	422	69
RTOR Reduction (vph)	0	0	43	0	116	0	0	64	0	0	16	0
Lane Group Flow (vph)	0	198	22	135	249	0	47	537	0	309	475	0
Confl. Peds. (#/hr)	67		39	39		67	43		87	87		43
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)		24.3	24.3	24.3	24.3		37.9	37.9		37.9	37.9	
Effective Green, g (s)		24.3	24.3	24.3	24.3		37.9	37.9		37.9	37.9	
Actuated g/C Ratio		0.34	0.34	0.34	0.34		0.52	0.52		0.52	0.52	
Clearance Time (s)		5.0	5.0	5.0	5.0		5.0	5.0		5.0	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)		1034	511	385	532		440	1727		379	1799	
v/s Ratio Prot					c0.16			0.16				0.14
v/s Ratio Perm		0.06	0.01	0.12			0.06			c0.43		
v/c Ratio		0.19	0.04	0.35	0.47		0.11	0.31		0.82	0.26	
Uniform Delay, d1		17.0	16.1	18.0	18.9		8.6	9.7		14.2	9.5	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1	0.0	0.6	0.7		0.1	0.1		12.7	0.1	
Delay (s)		17.1	16.2	18.6	19.5		8.7	9.8		26.9	9.5	
Level of Service		B	B	B	B		A	A		C	A	
Approach Delay (s)		16.8			19.3			9.8			16.2	
Approach LOS		B			B			A			B	

### Intersection Summary

HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	10.0
Intersection Capacity Utilization	101.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 35: Kamakee St & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕		↖	↕		↖	↕	↗
Traffic Volume (vph)	53	90	26	24	99	53	39	91	27	24	161	144
Future Volume (vph)	53	90	26	24	99	53	39	91	27	24	161	144
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
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	0.96
Fipb, ped/bikes	1.00	1.00		1.00	1.00		0.98	1.00		0.98	1.00	1.00
Frt	1.00	0.97		1.00	0.95		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	3393		1770	3354		1736	3394		1742	1863	1527
Flt Permitted	0.95	1.00		0.95	1.00		0.65	1.00		0.67	1.00	1.00
Satd. Flow (perm)	1770	3393		1770	3354		1184	3394		1231	1863	1527
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	57	97	28	26	106	57	42	98	29	26	173	155
RTOR Reduction (vph)	0	21	0	0	43	0	0	17	0	0	0	92
Lane Group Flow (vph)	57	104	0	26	120	0	42	110	0	26	173	63
Confl. Peds. (#/hr)			34	34			43		33	33		43
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6		8			4		4
Permitted Phases							8			4		4
Actuated Green, G (s)	2.1	13.4		1.6	12.9		20.8	20.8		20.8	20.8	20.8
Effective Green, g (s)	2.1	13.4		1.6	12.9		20.8	20.8		20.8	20.8	20.8
Actuated g/C Ratio	0.04	0.26		0.03	0.25		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)	73	895		55	851		484	1389		504	762	625
v/s Ratio Prot	c0.03	0.03		0.01	c0.04		0.03				c0.09	
v/s Ratio Perm							0.04			0.02		0.04
v/c Ratio	0.78	0.12		0.47	0.14		0.09	0.08		0.05	0.23	0.10
Uniform Delay, d1	24.1	14.2		24.2	14.7		9.2	9.2		9.0	9.8	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	40.6	0.1		6.3	0.1		0.1	0.0		0.0	0.2	0.1
Delay (s)	64.7	14.3		30.5	14.7		9.3	9.2		9.1	9.9	9.3
Level of Service	E	B		C	B		A	A		A	A	A
Approach Delay (s)		30.1			16.9			9.2			9.6	
Approach LOS		C			B			A			A	

### Intersection Summary

HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	50.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Signalized Intersection Capacity Analysis

## 35: Kamakee St & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	301	126	9	156	74	75	109	44	96	225	156
Future Volume (vph)	96	301	126	9	156	74	75	109	44	96	225	156
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
Frbp, ped/bikes	1.00	0.95		1.00	0.95		1.00	0.96		1.00	1.00	0.89
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.93	1.00		0.90	1.00	1.00
Frt	1.00	0.96		1.00	0.95		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3200		1770	3212		1650	3257		1593	1863	1409
Flt Permitted	0.95	1.00		0.95	1.00		0.52	1.00		0.65	1.00	1.00
Satd. Flow (perm)	1770	3200		1770	3212		910	3257		1090	1863	1409
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)	101	317	133	9	164	78	79	115	46	101	237	164
RTOR Reduction (vph)	0	51	0	0	46	0	0	33	0	0	0	118
Lane Group Flow (vph)	101	399	0	9	196	0	79	128	0	101	237	46
Confl. Peds. (#/hr)			167			209	105		137	137		105
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)	7.4	36.7		0.7	30.0		20.6	20.6		20.6	20.6	20.6
Effective Green, g (s)	7.4	36.7		0.7	30.0		20.6	20.6		20.6	20.6	20.6
Actuated g/C Ratio	0.10	0.50		0.01	0.41		0.28	0.28		0.28	0.28	0.28
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)	179	1608		16	1320		256	919		307	525	397
v/s Ratio Prot	c0.06	c0.12		0.01	0.06			0.04			c0.13	
v/s Ratio Perm							0.09			0.09		0.03
v/c Ratio	0.56	0.25		0.56	0.15		0.31	0.14		0.33	0.45	0.12
Uniform Delay, d1	31.3	10.3		36.0	13.5		20.6	19.6		20.7	21.6	19.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.0	0.1		38.3	0.1		0.7	0.1		0.6	0.6	0.1
Delay (s)	35.3	10.4		74.3	13.5		21.3	19.6		21.4	22.2	19.6
Level of Service	D	B		E	B		C	B		C	C	B
Approach Delay (s)		15.0			15.7			20.2			21.2	
Approach LOS		B			B			C			C	

### Intersection Summary

HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	73.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.5%	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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗				↖	↖			↕	
Traffic Volume (vph)	44	7	51	0	0	0	90	73	6	20	40	50
Future Volume (vph)	44	7	51	0	0	0	90	73	6	20	40	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	
Lane Util. Factor		1.00	1.00				1.00	1.00			1.00	
Frbp, ped/bikes		1.00	0.96				1.00	1.00			0.97	
Ftpb, ped/bikes		0.99	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	0.99			0.94	
Flt Protected		0.96	1.00				0.95	1.00			0.99	
Satd. Flow (prot)		1760	1521				1770	1835			1679	
Flt Permitted		0.96	1.00				0.95	1.00			0.95	
Satd. Flow (perm)		1760	1521				1770	1835			1606	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	51	8	59	0	0	0	103	84	7	23	46	57
RTOR Reduction (vph)	0	0	49	0	0	0	0	3	0	0	31	0
Lane Group Flow (vph)	0	59	10	0	0	0	103	88	0	0	95	0
Confl. Peds. (#/hr)	12		34	34		12			16	16		62
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2				6
Permitted Phases	4		4							6		
Actuated Green, G (s)		8.4	8.4				6.8	30.5				18.7
Effective Green, g (s)		8.4	8.4				6.8	30.5				18.7
Actuated g/C Ratio		0.17	0.17				0.14	0.62				0.38
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)		302	261				246	1144				614
v/s Ratio Prot							c0.06	0.05				
v/s Ratio Perm		0.03	0.01									c0.06
v/c Ratio		0.20	0.04				0.42	0.08				0.15
Uniform Delay, d1		17.4	16.9				19.2	3.6				9.9
Progression Factor		1.00	1.00				1.00	1.00				1.00
Incremental Delay, d2		0.3	0.1				1.2	0.0				0.1
Delay (s)		17.7	16.9				20.4	3.7				10.0
Level of Service		B	B				C	A				B
Approach Delay (s)		17.3			0.0			12.5				10.0
Approach LOS		B			A			B				B
<b>Intersection Summary</b>												
HCM 2000 Control Delay			13.1				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.22									
Actuated Cycle Length (s)			48.9				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			36.6%				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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗				↙	↘			↕	
Traffic Volume (vph)	88	9	171	0	0	0	178	97	10	17	75	50
Future Volume (vph)	88	9	171	0	0	0	178	97	10	17	75	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	
Lane Util. Factor		1.00	1.00				1.00	1.00			1.00	
Frbp, ped/bikes		1.00	0.92				1.00	0.99			0.96	
Flpb, ped/bikes		0.92	1.00				1.00	1.00			0.99	
Frt		1.00	0.85				1.00	0.99			0.95	
Flt Protected		0.96	1.00				0.95	1.00			0.99	
Satd. Flow (prot)		1633	1454				1770	1821			1685	
Flt Permitted		0.96	1.00				0.95	1.00			0.96	
Satd. Flow (perm)		1633	1454				1770	1821			1629	
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)	97	10	188	0	0	0	196	107	11	19	82	55
RTOR Reduction (vph)	0	0	143	0	0	0	0	5	0	0	21	0
Lane Group Flow (vph)	0	107	45	0	0	0	196	113	0	0	135	0
Confl. Peds. (#/hr)	60		77	77		60			48	48		104
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2				6
Permitted Phases	4		4							6		
Actuated Green, G (s)		13.1	13.1				9.4	32.1				17.7
Effective Green, g (s)		13.1	13.1				9.4	32.1				17.7
Actuated g/C Ratio		0.24	0.24				0.17	0.58				0.32
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	345				301	1058				522
v/s Ratio Prot							c0.11	0.06				
v/s Ratio Perm		0.07	0.03									c0.08
v/c Ratio		0.28	0.13				0.65	0.11				0.26
Uniform Delay, d1		17.2	16.6				21.4	5.2				13.9
Progression Factor		1.00	1.00				1.00	1.00				1.00
Incremental Delay, d2		0.4	0.2				5.0	0.0				0.3
Delay (s)		17.6	16.7				26.3	5.2				14.2
Level of Service		B	B				C	A				B
Approach Delay (s)		17.0			0.0			18.4				14.2
Approach LOS		B			A			B				B

### Intersection Summary

HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	55.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 1: Cooke St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑↑↑		↗	↑	↖	↗	↑	↖
Traffic Volume (vph)	0	620	104	473	928	206	46	171	56	8	47	16
Future Volume (vph)	0	620	104	473	928	206	46	171	56	8	47	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor		0.95			0.86		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes		0.98			0.99		1.00	1.00	0.95	1.00	0.98	
Fipb, ped/bikes		1.00			0.99		0.95	1.00	1.00	0.97	1.00	
Frt		0.98			0.98		1.00	1.00	0.85	1.00	0.96	
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3408			6100		1679	1863	1499	1712	1760	
Flt Permitted		1.00			0.73		0.71	1.00	1.00	0.61	1.00	
Satd. Flow (perm)		3408			4512		1262	1863	1499	1094	1760	
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)	0	646	108	493	967	215	48	178	58	8	49	17
RTOR Reduction (vph)	0	13	0	0	24	0	0	0	43	0	11	0
Lane Group Flow (vph)	0	741	0	0	1651	0	48	178	15	8	55	0
Confl. Peds. (#/hr)			57	57		29	69		54	54		69
Turn Type		NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases				2			4		4	8		
Actuated Green, G (s)		36.7			46.1		19.7	19.7	19.7	19.7	19.7	
Effective Green, g (s)		36.7			46.1		19.7	19.7	19.7	19.7	19.7	
Actuated g/C Ratio		0.48			0.61		0.26	0.26	0.26	0.26	0.26	
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)		1650			2836		327	484	389	284	457	
v/s Ratio Prot		0.22			c0.03			c0.10			0.03	
v/s Ratio Perm					c0.32		0.04		0.01	0.01		
v/c Ratio		0.45			1.27dl		0.15	0.37	0.04	0.03	0.12	
Uniform Delay, d1		12.9			9.0		21.6	23.0	21.0	20.9	21.4	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2			0.3		0.2	0.5	0.0	0.0	0.1	
Delay (s)		13.1			9.3		21.8	23.4	21.0	21.0	21.5	
Level of Service		B			A		C	C	C	C	C	
Approach Delay (s)		13.1			9.3			22.7			21.5	
Approach LOS		B			A			C			C	

### Intersection Summary

HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	75.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 1: Cooke St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		←↑↑↑		↙	↑↑		↘	↑	↗	↙	↑	
Traffic Volume (vph)	4	1326	77	302	772	126	88	300	209	19	55	33
Future Volume (vph)	4	1326	77	302	772	126	88	300	209	19	55	33
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		0.91		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes		0.99		1.00	0.98		1.00	1.00	0.90	1.00	0.96	
Flpb, ped/bikes		1.00		1.00	1.00		0.92	1.00	1.00	0.95	1.00	
Frt		0.99		1.00	0.98		1.00	1.00	0.85	1.00	0.94	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		4968		1770	3407		1630	1863	1423	1687	1693	
Flt Permitted		0.94		0.08	1.00		0.70	1.00	1.00	0.31	1.00	
Satd. Flow (perm)		4659		152	3407		1198	1863	1423	542	1693	
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)	4	1381	80	315	804	131	92	312	218	20	57	34
RTOR Reduction (vph)	0	5	0	0	11	0	0	0	165	0	18	0
Lane Group Flow (vph)	0	1460	0	315	924	0	92	313	53	20	73	0
Confl. Peds. (#/hr)	36		110	110		36	78		82	82		78
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2		4				8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)		44.1		71.2	71.2		26.0	26.0	26.0	26.0	26.0	
Effective Green, g (s)		44.1		71.2	71.2		26.0	26.0	26.0	26.0	26.0	
Actuated g/C Ratio		0.41		0.66	0.66		0.24	0.24	0.24	0.24	0.24	
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)		1916		434	2262		290	451	345	131	410	
v/s Ratio Prot				c0.15	0.27			c0.17			0.04	
v/s Ratio Perm		0.31		c0.33			0.08		0.04	0.04		
v/c Ratio		0.76		0.73	0.41		0.32	0.69	0.15	0.15	0.18	
Uniform Delay, d1		27.0		27.2	8.3		33.3	37.0	31.9	31.9	32.1	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.8		5.9	0.1		0.6	4.6	0.2	0.5	0.2	
Delay (s)		28.9		33.1	8.4		33.9	41.6	32.1	32.5	32.3	
Level of Service		C		C	A		C	D	C	C	C	
Approach Delay (s)		28.9			14.6			37.1			32.4	
Approach LOS		C			B			D			C	

### Intersection Summary

HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	107.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 2: Ward Ave & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑↑		↔	↑↑	↔	↔	↑↑	↔
Traffic Volume (vph)	0	564	115	311	1326	96	129	403	59	138	692	115
Future Volume (vph)	0	564	115	311	1326	96	129	403	59	138	692	115
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		0.95		1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.98		1.00	0.99		1.00	1.00	0.87	1.00	1.00	0.92
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3388		1770	5001		1770	3539	1380	1770	3539	1461
Flt Permitted		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3388		1770	5001		1770	3539	1380	1770	3539	1461
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)	0	594	121	327	1396	101	136	424	62	145	728	121
RTOR Reduction (vph)	0	14	0	0	7	0	0	0	45	0	0	79
Lane Group Flow (vph)	0	701	0	327	1490	0	136	424	17	145	728	42
Confl. Peds. (#/hr)			82	82		72			110			58
Turn Type		NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		6		5	2		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)		31.4		23.5	59.9		11.5	33.0	33.0	11.0	32.5	32.5
Effective Green, g (s)		31.4		23.5	59.9		11.5	33.0	33.0	11.0	32.5	32.5
Actuated g/C Ratio		0.26		0.20	0.50		0.10	0.28	0.28	0.09	0.27	0.27
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)		894		349	2519		171	982	383	163	967	399
v/s Ratio Prot		c0.21		c0.18	0.30		0.08	0.12		c0.08	c0.21	
v/s Ratio Perm									0.01			0.03
v/c Ratio		0.78		0.94	0.59		0.80	0.43	0.04	0.89	0.75	0.10
Uniform Delay, d1		40.6		47.0	20.9		52.5	35.3	31.4	53.3	39.5	32.3
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		4.6		32.0	0.4		22.0	0.3	0.0	39.9	3.4	0.1
Delay (s)		45.2		79.0	21.2		74.5	35.6	31.5	93.2	42.9	32.4
Level of Service		D		E	C		E	D	C	F	D	C
Approach Delay (s)		45.2			31.6			43.7			49.0	
Approach LOS		D			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			39.9			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			118.9			Sum of lost time (s)		20.0				
Intersection Capacity Utilization			94.1%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 2: Ward Ave & Kapiolani Blvd

5/5/2016

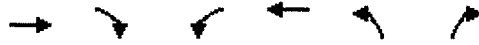


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑		↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	0	1400	170	0	970	122	155	637	263	246	786	88
Future Volume (vph)	0	1400	170	0	970	122	155	637	263	246	786	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	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		0.91			0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.99			0.99		1.00	1.00	0.88	1.00	1.00	0.93
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.98			0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4929			4947		1770	3539	1399	1770	3539	1466
Flt Permitted		1.00			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		4929			4947		1770	3539	1399	1770	3539	1466
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)	0	1458	177	0	1010	127	161	664	274	256	819	92
RTOR Reduction (vph)	0	12	0	0	12	0	0	0	79	0	0	45
Lane Group Flow (vph)	0	1623	0	0	1125	0	161	664	195	256	819	47
Confl. Peds. (#/hr)			118			76			106			59
Turn Type		NA			NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		6			2		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)		44.8			44.8		15.0	30.0	30.0	20.8	35.8	35.8
Effective Green, g (s)		44.8			44.8		15.0	30.0	30.0	20.8	35.8	35.8
Actuated g/C Ratio		0.41			0.41		0.14	0.27	0.27	0.19	0.32	0.32
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)		1996			2003		240	959	379	332	1145	474
v/s Ratio Prot		c0.33			0.23		0.09	0.19		c0.14	c0.23	
v/s Ratio Perm									0.14			0.03
v/c Ratio		0.81			0.56		0.67	0.69	0.51	0.77	0.72	0.10
Uniform Delay, d1		29.2			25.3		45.5	36.2	34.1	42.6	32.9	26.1
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.6			0.4		7.2	2.2	1.2	10.6	2.2	0.1
Delay (s)		31.8			25.7		52.6	38.3	35.3	53.2	35.1	26.2
Level of Service		C			C		D	D	D	D	D	C
Approach Delay (s)		31.8			25.7		39.7				38.3	
Approach LOS		C			C		D				D	

Intersection Summary			
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	110.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 3: Kamakee St & Kapiolani Blvd

5/5/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑↑↑	↘	↗
Traffic Volume (vph)	689	65	231	1635	93	99
Future Volume (vph)	689	65	231	1635	93	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.86	1.00	1.00
Frb, ped/bikes	0.99			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3472			6355	1770	1523
Flt Permitted	1.00			0.74	0.95	1.00
Satd. Flow (perm)	3472			4754	1770	1523
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	733	69	246	1739	99	105
RTOR Reduction (vph)	7	0	0	0	0	74
Lane Group Flow (vph)	795	0	0	1985	99	31
Confl. Peds. (#/hr)		49	49			26
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases			6			8
Actuated Green, G (s)	55.4			55.4	27.5	27.5
Effective Green, g (s)	55.4			55.4	27.5	27.5
Actuated g/C Ratio	0.60			0.60	0.30	0.30
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2070			2835	523	450
v/s Ratio Prot	0.23				c0.06	
v/s Ratio Perm				c0.42		0.02
v/c Ratio	0.38			0.70	0.19	0.07
Uniform Delay, d1	9.8			13.0	24.4	23.5
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.8	0.2	0.1
Delay (s)	9.9			13.8	24.6	23.6
Level of Service	A			B	C	C
Approach Delay (s)	9.9			13.8	24.1	
Approach LOS	A			B	C	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			13.5		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.53			
Actuated Cycle Length (s)			92.9		Sum of lost time (s)	10.0
Intersection Capacity Utilization			83.7%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						



# HCM Signalized Intersection Capacity Analysis

## 3: Kamakee St & Kapiolani Blvd

5/5/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↘			↑↑	↖	↗
Traffic Volume (vph)	1795	198	0	931	169	317
Future Volume (vph)	1795	198	0	931	169	317
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.86			0.95	1.00	1.00
Frbp, ped/bikes	0.99			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	6220			3539	1770	1517
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	6220			3539	1770	1517
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1910	211	0	990	180	337
RTOR Reduction (vph)	15	0	0	0	0	3
Lane Group Flow (vph)	2106	0	0	990	180	334
Confl. Peds. (#/hr)		110				30
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	51.2			51.2	30.6	30.6
Effective Green, g (s)	51.2			51.2	30.6	30.6
Actuated g/C Ratio	0.56			0.56	0.33	0.33
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	3469			1973	590	505
v/s Ratio Prot	c0.34			0.28	0.10	
v/s Ratio Perm						c0.22
v/c Ratio	0.61			0.50	0.31	0.66
Uniform Delay, d1	13.6			12.5	22.7	26.2
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.3			0.2	0.3	3.3
Delay (s)	13.9			12.7	23.0	29.4
Level of Service	B			B	C	C
Approach Delay (s)	13.9			12.7	27.2	
Approach LOS	B			B	C	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			15.4	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.63			
Actuated Cycle Length (s)			91.8	Sum of lost time (s)		10.0
Intersection Capacity Utilization			60.8%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 5: Piikoi St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑↑↑		↘	↑↑↑	↗			
Traffic Volume (vph)	0	875	43	41	1780	298	32	869	87	0	0	0
Future Volume (vph)	0	875	43	41	1780	298	32	869	87	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.95			0.86		1.00	0.91	1.00			
Frbp, ped/bikes		1.00			0.99		1.00	1.00	0.96			
Fipb, ped/bikes		1.00			1.00		0.94	1.00	1.00			
Frt		0.99			0.98		1.00	1.00	0.85			
Flt Protected		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		3503			6204		1659	5085	1526			
Flt Permitted		1.00			0.88		0.95	1.00	1.00			
Satd. Flow (perm)		3503			5492		1659	5085	1526			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	931	46	44	1894	317	34	924	93	0	0	0
RTOR Reduction (vph)	0	3	0	0	4	0	0	0	67	0	0	0
Lane Group Flow (vph)	0	974	0	0	2251	0	34	924	26	0	0	0
Confl. Peds. (#/hr)			64			60	58		23			
Turn Type		NA		Perm	NA		Perm	NA	Perm			
Protected Phases		2			6			8				
Permitted Phases				6			8		8			
Actuated Green, G (s)		62.7			62.7		27.6	27.6	27.6			
Effective Green, g (s)		62.7			62.7		27.6	27.6	27.6			
Actuated g/C Ratio		0.63			0.63		0.28	0.28	0.28			
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)		2189			3433		456	1399	419			
v/s Ratio Prot		0.28						c0.18				
v/s Ratio Perm					c0.41		0.02		0.02			
v/c Ratio		0.44			0.66		0.07	0.66	0.06			
Uniform Delay, d1		9.8			11.9		26.9	32.2	26.8			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.1			0.5		0.1	1.2	0.1			
Delay (s)		9.9			12.4		27.0	33.4	26.9			
Level of Service		A			B		C	C	C			
Approach Delay (s)		9.9			12.4			32.6			0.0	
Approach LOS		A			B			C			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			16.8				HCM 2000 Level of Service		B			
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			100.3				Sum of lost time (s)		10.0			
Intersection Capacity Utilization			89.2%				ICU Level of Service		E			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 5: Piikoi St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		TTT			TTT		T	TTT	T			
Traffic Volume (vph)	0	2121	148	0	764	279	31	1326	173	0	0	0
Future Volume (vph)	0	2121	148	0	764	279	31	1326	173	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.86			0.95		1.00	0.91	1.00			
Frbp, ped/bikes		0.99			0.97		1.00	1.00	0.97			
Fipb, ped/bikes		1.00			1.00		0.88	1.00	1.00			
Frt		0.99			0.96		1.00	1.00	0.85			
Flt Protected		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		6280			3283		1564	5085	1536			
Flt Permitted		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)		6280			3283		1564	5085	1536			
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)	0	2209	154	0	796	291	32	1381	180	0	0	0
RTOR Reduction (vph)	0	8	0	0	4	0	0	0	11	0	0	0
Lane Group Flow (vph)	0	2355	0	0	1083	0	32	1381	169	0	0	0
Confl. Peds. (#/hr)			149			102	96		15			
Turn Type		NA			NA		Perm	NA	Perm			
Protected Phases		2			6			8				
Permitted Phases							8		8			
Actuated Green, G (s)		60.3			60.3		42.7	42.7	42.7			
Effective Green, g (s)		60.3			60.3		42.7	42.7	42.7			
Actuated g/C Ratio		0.53			0.53		0.38	0.38	0.38			
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)		3351			1751		590	1921	580			
v/s Ratio Prot		c0.37			0.33			c0.27				
v/s Ratio Perm							0.02		0.11			
v/c Ratio		0.70			0.62		0.05	0.72	0.29			
Uniform Delay, d1		19.7			18.3		22.3	30.0	24.6			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.7			0.7		0.0	1.3	0.3			
Delay (s)		20.3			19.0		22.4	31.3	24.8			
Level of Service		C			B		C	C	C			
Approach Delay (s)		20.3			19.0			30.4			0.0	
Approach LOS		C			B			C			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			23.2				HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			113.0				Sum of lost time (s)		10.0			
Intersection Capacity Utilization			67.6%				ICU Level of Service		C			
Analysis Period (min)			15									
c	Critical Lane Group											

# HCM Signalized Intersection Capacity Analysis

## 14: Cooke St & Queen St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Traffic Volume (vph)	40	208	62	56	483	55	25	216	41	17	216	178
Future Volume (vph)	40	208	62	56	483	55	25	216	41	17	216	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frbp, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.97			0.99			0.98			0.94	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		3408			3470			3444			3299	
Flt Permitted		0.84			0.89			0.90			0.94	
Satd. Flow (perm)		2873			3101			3109			3092	
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)	42	219	65	59	508	58	26	227	43	18	227	187
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	326	0	0	625	0	0	296	0	0	432	0
Confl. Peds. (#/hr)	28			31			31			70		
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)		16.3			16.3			16.0			16.0	
Effective Green, g (s)		16.3			16.3			16.0			16.0	
Actuated g/C Ratio		0.39			0.39			0.38			0.38	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1107			1194			1175			1169	
v/s Ratio Prot												
v/s Ratio Perm		0.11			c0.20			0.10			c0.14	
v/c Ratio		0.29			0.52			0.25			0.37	
Uniform Delay, d1		9.0			10.0			9.0			9.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			0.4			0.1			0.2	
Delay (s)		9.2			10.4			9.2			9.7	
Level of Service		A			B			A			A	
Approach Delay (s)		9.2			10.4			9.2			9.7	
Approach LOS		A			B			A			A	

### Intersection Summary

HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	42.3	Sum of lost time (s)	10.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 14: Cooke St & Queen St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Traffic Volume (vph)	92	461	73	42	422	53	30	358	55	37	246	97
Future Volume (vph)	92	461	73	42	422	53	30	358	55	37	246	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frbp, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.98			0.96	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		3449			3468			3458			3381	
Flt Permitted		0.80			0.87			0.91			0.88	
Satd. Flow (perm)		2767			3013			3151			2986	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	98	490	78	45	449	56	32	381	59	39	262	103
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	666	0	0	550	0	0	472	0	0	404	0
Confl. Peds. (#/hr)	15			38			37			61		
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)		18.4			18.4			16.3			16.3	
Effective Green, g (s)		18.4			18.4			16.3			16.3	
Actuated g/C Ratio		0.41			0.41			0.36			0.36	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1138			1240			1149			1088	
v/s Ratio Prot												
v/s Ratio Perm		c0.24			0.18			c0.15			0.14	
v/c Ratio		0.59			0.44			0.41			0.37	
Uniform Delay, d1		10.2			9.5			10.6			10.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.8			0.3			0.2			0.2	
Delay (s)		11.0			9.7			10.9			10.6	
Level of Service		B			A			B			B	
Approach Delay (s)		11.0			9.7			10.9			10.6	
Approach LOS		B			A			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		10.6			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.50										
Actuated Cycle Length (s)		44.7			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		72.5%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 20: Piikoi St & Waimanu St/Ala Moana Plaza

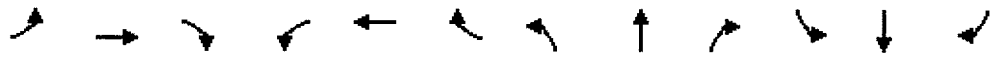
5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	337	159	149	0	34	25	0	700	79	0	142	42	
Future Volume (vph)	337	159	149	0	34	25	0	700	79	0	142	42	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0		5.0			5.0		
Lane Util. Factor	0.91	0.91	1.00		0.95	0.95		0.86			0.95		
Frbp, ped/bikes	1.00	1.00	0.94		1.00	1.00		0.99			0.98		
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00		
Frt	1.00	1.00	0.85		0.99	0.85		0.98			0.97		
Flt Protected	0.95	0.97	1.00		1.00	1.00		1.00			1.00		
Satd. Flow (prot)	1610	3305	1485		1749	1504		6275			3358		
Flt Permitted	0.95	0.73	1.00		1.00	1.00		1.00			1.00		
Satd. Flow (perm)	1610	2477	1485		1749	1504		6275			3358		
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)	351	166	155	0	35	26	0	729	82	0	148	44	
RTOR Reduction (vph)	0	0	64	0	0	0	0	18	0	0	27	0	
Lane Group Flow (vph)	175	342	91	0	38	23	0	793	0	0	165	0	
Confl. Peds. (#/hr)			60						49			39	
Turn Type	Prot	NA	Perm		NA	Perm		NA			NA		
Protected Phases	7	4			8			2			6		
Permitted Phases			4			8							
Actuated Green, G (s)	19.1	51.6	51.6		27.5	27.5		26.5			26.5		
Effective Green, g (s)	19.1	51.6	51.6		27.5	27.5		26.5			26.5		
Actuated g/C Ratio	0.22	0.59	0.59		0.31	0.31		0.30			0.30		
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)	349	1630	869		545	469		1887			1010		
v/s Ratio Prot	c0.11	0.05			0.02			c0.13			0.05		
v/s Ratio Perm		c0.08	0.06			0.02							
v/c Ratio	0.50	0.21	0.10		0.07	0.05		0.42			0.16		
Uniform Delay, d1	30.3	8.6	8.1		21.3	21.2		24.7			22.7		
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			1.00		
Incremental Delay, d2	1.1	0.1	0.1		0.1	0.0		0.2			0.1		
Delay (s)	31.5	8.7	8.1		21.4	21.2		24.8			22.7		
Level of Service	C	A	A		C	C		C			C		
Approach Delay (s)		14.5			21.3			24.8			22.7		
Approach LOS		B			C			C			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			20.5									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.37										
Actuated Cycle Length (s)			88.1									Sum of lost time (s)	15.0
Intersection Capacity Utilization			61.2%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis  
 20: Piikoi St & Waimanu St/Ala Moana Plaza

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	434	328	278	0	223	223	0	797	84	0	282	59
Future Volume (vph)	434	328	278	0	223	223	0	797	84	0	282	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0		5.0			5.0	
Lane Util. Factor	0.91	0.91	1.00		0.95	0.95		0.86			0.95	
Frbp, ped/bikes	1.00	1.00	0.80		1.00	1.00		0.98			0.97	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85		0.99	0.85		0.99			0.97	
Flt Protected	0.95	0.98	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1610	3330	1267		1746	1504		6194			3334	
Flt Permitted	0.95	0.66	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (perm)	1610	2238	1267		1746	1504		6194			3334	
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)	452	342	290	0	232	232	0	830	88	0	294	61
RTOR Reduction (vph)	0	0	35	0	0	0	0	15	0	0	15	0
Lane Group Flow (vph)	258	536	255	0	255	209	0	903	0	0	340	0
Confl. Peds. (#/hr)			167						158			89
Turn Type	Prot	NA	Perm		NA	Perm		NA			NA	
Protected Phases	7	4			8			2			6	
Permitted Phases			4			8						
Actuated Green, G (s)	24.0	78.0	78.0		49.0	49.0		30.4			30.4	
Effective Green, g (s)	24.0	78.0	78.0		49.0	49.0		30.4			30.4	
Actuated g/C Ratio	0.20	0.66	0.66		0.41	0.41		0.26			0.26	
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)	326	1695	834		722	622		1590			856	
v/s Ratio Prot	c0.16	0.06			c0.15			c0.15			0.10	
v/s Ratio Perm		0.14	0.20			0.14						
v/c Ratio	0.79	0.32	0.31		0.35	0.34		0.57			0.40	
Uniform Delay, d1	44.8	8.7	8.6		23.8	23.6		38.3			36.4	
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2	12.3	0.1	0.2		0.3	0.3		0.5			0.3	
Delay (s)	57.2	8.8	8.8		24.1	23.9		38.8			36.7	
Level of Service	E	A	A		C	C		D			D	
Approach Delay (s)		20.3			24.0			38.8			36.7	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	118.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Unsignalized Intersection Capacity Analysis

## 22: Cooke St & Halekauwila St

5/5/2016



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	51	77	31	49	86	34	15	199	53	35	240	61
Future Volume (vph)	51	77	31	49	86	34	15	199	53	35	240	61
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	56	85	34	54	95	37	16	219	58	38	264	67
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	175	186	126	168	170	199						
Volume Left (vph)	56	54	16	0	38	0						
Volume Right (vph)	34	37	0	58	0	67						
Hadj (s)	-0.02	-0.03	0.10	-0.21	0.15	-0.20						
Departure Headway (s)	5.9	5.9	6.3	5.9	6.2	5.9						
Degree Utilization, x	0.29	0.30	0.22	0.28	0.29	0.32						
Capacity (veh/h)	555	559	540	567	549	583						
Control Delay (s)	11.3	11.4	9.8	10.0	10.6	10.4						
Approach Delay (s)	11.3	11.4	9.9		10.5							
Approach LOS	B	B	A		B							
Intersection Summary												
Delay			10.6									
Level of Service			B									
Intersection Capacity Utilization			45.8%		ICU Level of Service		A					
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis

## 22: Cooke St & Halekauwila St

5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	81	135	59	68	78	68	18	261	32	32	287	41
Future Volume (vph)	81	135	59	68	78	68	18	261	32	32	287	41
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	85	142	62	72	82	72	19	275	34	34	302	43
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	289	226	157	172	185	194						
Volume Left (vph)	85	72	19	0	34	0						
Volume Right (vph)	62	72	0	34	0	43						
Hadj (s)	-0.04	-0.09	0.09	-0.10	0.13	-0.12						
Departure Headway (s)	6.4	6.5	7.0	6.8	7.0	6.7						
Degree Utilization, x	0.51	0.41	0.31	0.33	0.36	0.36						
Capacity (veh/h)	518	508	470	480	485	504						
Control Delay (s)	15.9	13.9	11.9	11.9	12.7	12.3						
Approach Delay (s)	15.9	13.9	11.9		12.5							
Approach LOS	C	B	B		B							
Intersection Summary												
Delay			13.4									
Level of Service			B									
Intersection Capacity Utilization			54.7%		ICU Level of Service		A					
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 25: Cooke St & Pohukaina St

5/5/2016















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	58	63	48	35	109	41	2	165	56	32	207	80
Future Volume (vph)	58	63	48	35	109	41	2	165	56	32	207	80
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	60	66	50	36	114	43	2	172	58	33	216	83
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	176	193	88	144	141	191						
Volume Left (vph)	60	36	2	0	33	0						
Volume Right (vph)	50	43	0	58	0	83						
Hadj (s)	-0.07	-0.06	0.05	-0.25	0.15	-0.27						
Departure Headway (s)	5.6	5.6	6.1	5.8	6.1	5.6						
Degree Utilization, x	0.27	0.30	0.15	0.23	0.24	0.30						
Capacity (veh/h)	588	593	550	577	559	602						
Control Delay (s)	10.7	10.9	9.0	9.4	9.8	9.8						
Approach Delay (s)	10.7	10.9	9.2		9.8							
Approach LOS	B	B	A		A							
Intersection Summary												
Delay			10.1									
Level of Service			B									
Intersection Capacity Utilization			47.8%		ICU Level of Service		A					
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 25: Cooke St & Pohukaina Street/Pohukaina St

5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	78	135	26	40	85	58	65	173	46	74	249	87
Future Volume (vph)	78	135	26	40	85	58	65	173	46	74	249	87
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	86	148	29	44	93	64	71	190	51	81	274	96
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	263	201	166	146	218	233						
Volume Left (vph)	86	44	71	0	81	0						
Volume Right (vph)	29	64	0	51	0	96						
Hadj (s)	0.03	-0.11	0.25	-0.21	0.22	-0.25						
Departure Headway (s)	6.5	6.5	7.1	6.7	6.9	6.4						
Degree Utilization, x	0.47	0.36	0.33	0.27	0.42	0.41						
Capacity (veh/h)	510	505	467	505	499	537						
Control Delay (s)	15.1	13.1	12.4	10.9	13.5	12.6						
Approach Delay (s)	15.1	13.1	11.7		13.1							
Approach LOS	C	B	B		B							
Intersection Summary												
Delay			13.2									
Level of Service			B									
Intersection Capacity Utilization			54.9%		ICU Level of Service		A					
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

30: Cooke St & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	46	21	7	12	11	55	36	91	8	35	202	48
Future Volume (Veh/h)	46	21	7	12	11	55	36	91	8	35	202	48
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	48	22	7	13	11	57	38	95	8	36	210	50
Pedestrians		10			17			6			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								419				
pX, platoon unblocked												
vC, conflicting volume	512	513	146	393	534	78	270			120		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	512	513	146	393	534	78	270			120		
tC, single (s)	*6.5	*5.5	*5.9	*6.5	*5.5	*5.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	96	99	98	98	94	97			98		
cM capacity (veh/h)	443	497	900	537	486	968	1280			1445		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	77	81	86	56	141	155
Volume Left	48	13	38	0	36	0
Volume Right	7	57	0	8	0	50
cSH	480	766	1280	1700	1445	1700
Volume to Capacity	0.16	0.11	0.03	0.03	0.02	0.09
Queue Length 95th (ft)	14	9	2	0	2	0
Control Delay (s)	13.9	10.3	3.6	0.0	2.1	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	13.9	10.3	2.2		1.0	
Approach LOS	B	B				

Intersection Summary		
Average Delay		4.2
Intersection Capacity Utilization	39.0%	ICU Level of Service
Analysis Period (min)	15	A

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

30: Cooke St & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	42	12	5	17	20	75	13	160	12	41	203	34
Future Volume (Veh/h)	42	12	5	17	20	75	13	160	12	41	203	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	44	13	5	18	21	78	14	167	13	43	211	35
Pedestrians		14			18			8			15	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								419				
pX, platoon unblocked												
vC, conflicting volume	544	554	145	430	566	123	260			198		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	544	554	145	430	566	123	260			198		
tC, single (s)	*6.5	*5.5	*5.9	*6.5	*5.5	*5.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	97	99	97	96	91	99			97		
cM capacity (veh/h)	404	480	897	521	475	912	1286			1351		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	62	117	98	96	148	140
Volume Left	44	18	14	0	43	0
Volume Right	5	78	0	13	0	35
cSH	438	712	1286	1700	1351	1700
Volume to Capacity	0.14	0.16	0.01	0.06	0.03	0.08
Queue Length 95th (ft)	12	15	1	0	2	0
Control Delay (s)	14.6	11.0	1.2	0.0	2.4	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	14.6	11.0	0.6		1.2	
Approach LOS	B	B				

Intersection Summary		
Average Delay		4.0
Intersection Capacity Utilization	39.7%	ICU Level of Service
Analysis Period (min)	15	A

\* User Entered Value

# HCM Signalized Intersection Capacity Analysis

37: Cooke St & Ala Moana Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑↑		↖	↑↑↑			↑	↗		↑	↗
Traffic Volume (vph)	95	1632	41	13	1707	11	26	16	3	47	41	122
Future Volume (vph)	95	1632	41	13	1707	11	26	16	3	47	41	122
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
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5057		1770	5079			1785	1530		1794	1532
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.81	1.00
Satd. Flow (perm)	1770	5057		1770	5079			1450	1530		1492	1532
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)	98	1682	42	13	1760	11	27	16	3	48	42	126
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	3	0	0	108
Lane Group Flow (vph)	98	1722	0	13	1771	0	0	43	0	0	90	18
Confl. Peds. (#/hr)			38			24	16		17	17		16
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	11.4	64.9		2.2	55.7			13.6	13.6		13.6	13.6
Effective Green, g (s)	11.4	64.9		2.2	55.7			13.6	13.6		13.6	13.6
Actuated g/C Ratio	0.12	0.68		0.02	0.58			0.14	0.14		0.14	0.14
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	210	3429		40	2956			206	217		212	217
v/s Ratio Prot	c0.06	c0.34		0.01	c0.35							
v/s Ratio Perm								0.03	0.00		c0.06	0.01
v/c Ratio	0.47	0.50		0.33	0.60			0.21	0.00		0.42	0.08
Uniform Delay, d1	39.3	7.5		46.0	12.8			36.3	35.2		37.5	35.6
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.6	0.1		4.7	0.3			0.5	0.0		1.4	0.2
Delay (s)	41.0	7.6		50.7	13.2			36.8	35.2		38.8	35.8
Level of Service	D	A		D	B			D	D		D	D
Approach Delay (s)		9.4			13.4			36.7			37.1	
Approach LOS		A			B			D			D	

## Intersection Summary

HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	95.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

37: Cooke St/Cooke St & Ala Moana Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖↖		↖	↖↖↖			↖	↖		↖	↖
Traffic Volume (vph)	63	2130	30	9	1716	101	60	46	13	34	28	141
Future Volume (vph)	63	2130	30	9	1716	101	60	46	13	34	28	141
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
Frbp, ped/bikes	1.00	1.00		1.00	0.99			1.00	0.96		1.00	0.90
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.97	1.00		0.99	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5062		1770	5017			1752	1516		1787	1426
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.80	1.00
Satd. Flow (perm)	1770	5062		1770	5017			1426	1516		1475	1426
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)	66	2219	31	9	1788	105	62	48	14	35	29	147
RTOR Reduction (vph)	0	1	0	0	4	0	0	0	12	0	0	92
Lane Group Flow (vph)	66	2249	0	9	1889	0	0	111	2	0	64	55
Confl. Peds. (#/hr)			56			45	52		26	26		52
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	7.9	73.7		0.6	66.4			19.0	19.0		19.0	19.0
Effective Green, g (s)	7.9	73.7		0.6	66.4			19.0	19.0		19.0	19.0
Actuated g/C Ratio	0.07	0.68		0.01	0.61			0.18	0.18		0.18	0.18
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	129	3444		9	3075			250	265		258	250
v/s Ratio Prot	c0.04	c0.44		0.01	0.38							
v/s Ratio Perm								c0.08	0.00		0.04	0.04
v/c Ratio	0.51	0.65		1.00	0.61			0.44	0.01		0.25	0.22
Uniform Delay, d1	48.3	9.9		53.9	13.0			39.9	36.9		38.5	38.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.4	0.5		300.0	0.4			1.3	0.0		0.5	0.5
Delay (s)	51.7	10.4		353.9	13.4			41.2	36.9		39.0	38.8
Level of Service	D	B		F	B			D	D		D	D
Approach Delay (s)		11.6			15.0			40.7			38.8	
Approach LOS		B			B			D			D	

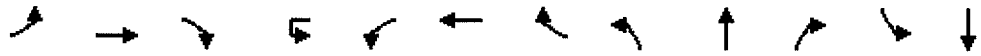
## Intersection Summary

HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	108.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 41: Ala Moana Blvd & Ward Ave

5/6/2016



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖↖↖			↗	↗↗↗	↗		↖↖	↖	↖	↖↖
Traffic Volume (vph)	186	1442	4	12	120	1572	164	1	59	43	115	138
Future Volume (vph)	186	1442	4	12	120	1572	164	1	59	43	115	138
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
Frbp, ped/bikes	1.00	1.00			1.00	1.00	0.96		1.00	0.95	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
Fr	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	0.92
Flt Protected	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	5082			1770	5085	1513		3536	1501	1610	2995
Flt Permitted	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	5082			1770	5085	1513		3536	1501	1610	2995
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)	194	1502	4	12	125	1638	171	1	61	45	120	144
RTOR Reduction (vph)	0	0	0	0	0	0	81	0	0	0	0	159
Lane Group Flow (vph)	194	1506	0	0	138	1638	90	0	62	45	108	197
Confl. Peds. (#/hr)			30				21	36		35	35	
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		8	8		4	4
Permitted Phases							6			8		
Actuated Green, G (s)	17.2	52.1			14.1	49.0	49.0		25.3	25.3	24.4	24.4
Effective Green, g (s)	17.2	52.1			14.1	49.0	49.0		25.3	25.3	24.4	24.4
Actuated g/C Ratio	0.13	0.38			0.10	0.36	0.36		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)	224	1948			183	1833	545		658	279	289	537
v/s Ratio Prot	c0.11	c0.30			0.08	c0.32			0.02		c0.07	0.07
v/s Ratio Perm							0.06			c0.03		
v/c Ratio	0.87	0.77			0.75	0.89	0.17		0.09	0.16	0.37	0.37
Uniform Delay, d1	58.2	36.7			59.2	41.0	29.6		45.8	46.4	49.0	49.0
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	27.6	2.0			16.1	6.0	0.1		0.1	0.3	0.8	0.4
Delay (s)	85.9	38.7			75.3	47.0	29.7		45.9	46.7	49.8	49.4
Level of Service	F	D			E	D	C		D	D	D	D
Approach Delay (s)		44.1				47.5			46.2			49.5
Approach LOS		D				D			D			D

### Intersection Summary

HCM 2000 Control Delay	46.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	135.9	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

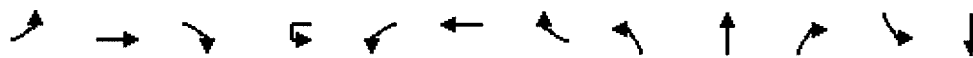
5/6/2016

Movement	SBR
<b>Approach</b>	
Lane Configurations	
Traffic Volume (vph)	192
Future Volume (vph)	192
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	200
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	36
<b>Turn Type</b>	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
<b>Capacity</b>	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
<b>Intersection Summary</b>	

# HCM Signalized Intersection Capacity Analysis

41: Ala Moana Blvd & Ward Ave

5/9/2016



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖↖↖			↗	↗↗↗	↗		↖↖	↖	↖	↖↖
Traffic Volume (vph)	262	1872	1	13	41	1541	203	6	141	98	195	67
Future Volume (vph)	262	1872	1	13	41	1541	203	6	141	98	195	67
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
Frbp, ped/bikes	1.00	1.00			1.00	1.00	0.93		1.00	0.90	1.00	0.95
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	0.88
Flt Protected	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	5085			1770	5085	1465		3532	1426	1610	2826
Flt Permitted	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	5085			1770	5085	1465		3532	1426	1610	2826
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)	273	1950	1	14	43	1605	211	6	147	102	203	70
RTOR Reduction (vph)	0	0	0	0	0	0	106	0	0	0	0	252
Lane Group Flow (vph)	273	1951	0	0	57	1605	105	0	153	102	183	145
Confl. Peds. (#/hr)			45				38	41		71	71	
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		8	8		4	4
Permitted Phases							6			8		
Actuated Green, G (s)	21.0	60.1			5.0	44.1	44.1		35.1	35.1	26.4	26.4
Effective Green, g (s)	21.0	60.1			5.0	44.1	44.1		35.1	35.1	26.4	26.4
Actuated g/C Ratio	0.14	0.41			0.03	0.30	0.30		0.24	0.24	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)	253	2084			60	1529	440		845	341	289	508
v/s Ratio Prot	c0.15	0.38			0.03	c0.32			0.04		c0.11	0.05
v/s Ratio Perm							0.07			c0.07		
v/c Ratio	1.08	0.94			0.95	1.05	0.24		0.18	0.30	0.63	0.29
Uniform Delay, d1	62.8	41.4			70.7	51.2	38.6		44.3	45.7	55.6	52.0
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	79.2	8.6			97.0	37.3	0.3		0.1	0.5	4.5	0.3
Delay (s)	142.0	50.1			167.7	88.5	38.9		44.4	46.2	60.1	52.3
Level of Service	F	D			F	F	D		D	D	E	D
Approach Delay (s)		61.3				85.4			45.1			54.7
Approach LOS		E				F			D			D

Intersection Summary			
HCM 2000 Control Delay	68.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	146.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	109.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

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

5/9/2016



Movement	SBR
<b>Approach Configurations</b>	
Traffic Volume (vph)	295
Future Volume (vph)	295
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	307
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	41
<b>Turn Type</b>	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
<b>Intersection Summary</b>	

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

5/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	1496	71	13	1662	57	43	27	13	39	35	140
Future Volume (vph)	60	1496	71	13	1662	57	43	27	13	39	35	140
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			0.96	1.00
Frpt	1.00	0.99		1.00	1.00		1.00	0.95			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	5028		1770	5053		1770	1725			1745	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.71	1.00			0.85	1.00
Satd. Flow (perm)	1770	5028		1770	5053		1318	1725			1518	1583
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)	61	1527	72	13	1696	58	44	28	13	40	36	143
RTOR Reduction (vph)	0	3	0	0	2	0	0	10	0	0	0	109
Lane Group Flow (vph)	61	1596	0	13	1752	0	44	31	0	0	76	34
Confl. Peds. (#/hr)			43			21			76	76		
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)	7.7	68.1		2.6	63.0		26.5	26.5			26.5	26.5
Effective Green, g (s)	7.7	68.1		2.6	63.0		26.5	26.5			26.5	26.5
Actuated g/C Ratio	0.07	0.61		0.02	0.56		0.24	0.24			0.24	0.24
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)	121	3051		41	2837		311	407			358	373
v/s Ratio Prot	c0.03	c0.32		0.01	c0.35			0.02				
v/s Ratio Perm							0.03				c0.05	0.02
v/c Ratio	0.50	0.52		0.32	0.62		0.14	0.08			0.21	0.09
Uniform Delay, d1	50.4	12.7		53.9	16.5		33.9	33.3			34.5	33.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.3	0.2		4.4	0.4		0.2	0.1			0.3	0.1
Delay (s)	53.7	12.9		58.3	16.9		34.1	33.4			34.8	33.6
Level of Service	D	B		E	B		C	C			C	C
Approach Delay (s)		14.4			17.2			33.8			34.0	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	112.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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

5/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	1996	193	23	1365	110	101	55	28	71	85	224
Future Volume (vph)	74	1996	193	23	1365	110	101	55	28	71	85	224
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
Frbp, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.95			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.95	1.00
Frnt	1.00	0.99		1.00	0.99		1.00	0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1770	4930		1770	4989		1770	1688			1729	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.56	1.00			0.82	1.00
Satd. Flow (perm)	1770	4930		1770	4989		1048	1688			1455	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)	76	2058	199	24	1407	113	104	57	29	73	88	231
RTOR Reduction (vph)	0	7	0	0	6	0	0	13	0	0	0	106
Lane Group Flow (vph)	76	2250	0	24	1514	0	104	73	0	0	161	125
Confl. Peds. (#/hr)			82			50			104	104		
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)	9.3	80.9		3.3	74.9		33.6	33.6			33.6	33.6
Effective Green, g (s)	9.3	80.9		3.3	74.9		33.6	33.6			33.6	33.6
Actuated g/C Ratio	0.07	0.61		0.02	0.56		0.25	0.25			0.25	0.25
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)	123	3003		43	2813		265	427			368	400
v/s Ratio Prot	c0.04	c0.46		0.01	0.30			0.04				
v/s Ratio Perm							0.10				c0.11	0.08
v/c Ratio	0.62	0.75		0.56	0.54		0.39	0.17			0.44	0.31
Uniform Delay, d1	60.0	18.7		64.0	18.1		41.1	38.7			41.7	40.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	8.9	1.1		14.8	0.2		1.0	0.2			0.8	0.4
Delay (s)	68.9	19.7		78.8	18.3		42.1	38.9			42.5	40.7
Level of Service	E	B		E	B		D	D			D	D
Approach Delay (s)		21.3			19.3			40.7			41.4	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	132.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 44: Ala Moana Blvd & Queens St

5/5/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↑↑↑	↑↑↵		↵↵	↵
Traffic Volume (vph)	15	1546	1726	146	59	21
Future Volume (vph)	15	1546	1726	146	59	21
Ideal Flow (vphpl)	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	0.91	0.91		0.97	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	5085	5006		3433	1480
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	5085	5006		3433	1480
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	15	1594	1779	151	61	22
RTOR Reduction (vph)	0	0	6	0	0	17
Lane Group Flow (vph)	15	1594	1924	0	61	5
Confl. Peds. (#/hr)	39			39		52
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	2.3	80.8	73.5		23.5	23.5
Effective Green, g (s)	2.3	80.8	73.5		23.5	23.5
Actuated g/C Ratio	0.02	0.71	0.64		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)	35	3594	3219		705	304
v/s Ratio Prot	0.01	c0.31	c0.38		c0.02	
v/s Ratio Perm						0.00
v/c Ratio	0.43	0.44	0.60		0.09	0.01
Uniform Delay, d1	55.4	7.2	11.8		36.7	36.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	8.2	0.1	0.3		0.1	0.0
Delay (s)	63.6	7.2	12.1		36.8	36.2
Level of Service	E	A	B		D	D
Approach Delay (s)		7.8	12.1		36.6	
Approach LOS		A	B		D	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	114.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 44: Ala Moana Blvd & Queens St

5/5/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	28	2082	1424	237	191	51
Future Volume (vph)	28	2082	1424	237	191	51
Ideal Flow (vphpl)	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	0.91	0.91		0.97	1.00
Frbp, ped/bikes	1.00	1.00	0.99		1.00	0.92
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	5085	4912		3433	1458
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	5085	4912		3433	1458
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	29	2169	1483	247	199	53
RTOR Reduction (vph)	0	0	14	0	0	41
Lane Group Flow (vph)	29	2169	1716	0	199	12
Confl. Peds. (#/hr)	73			73		64
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	4.7	83.5	73.8		28.0	28.0
Effective Green, g (s)	4.7	83.5	73.8		28.0	28.0
Actuated g/C Ratio	0.04	0.69	0.61		0.23	0.23
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	68	3494	2983		791	336
v/s Ratio Prot	0.02	c0.43	0.35		c0.06	
v/s Ratio Perm						0.01
v/c Ratio	0.43	0.62	0.58		0.25	0.04
Uniform Delay, d1	57.1	10.4	14.4		38.2	36.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.3	0.3	0.3		0.2	0.0
Delay (s)	61.3	10.7	14.7		38.4	36.3
Level of Service	E	B	B		D	D
Approach Delay (s)		11.4	14.7		37.9	
Approach LOS		B	B		D	

### Intersection Summary

HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	121.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 45: Ala Moana Blvd & Piikoi St

5/5/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	381	1205	1735	330	134	131
Future Volume (vph)	381	1205	1735	330	134	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frbp, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	5085	4945		1770	2787
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	5085	4945		1770	2787
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	397	1255	1807	344	140	136
RTOR Reduction (vph)	0	0	18	0	0	120
Lane Group Flow (vph)	397	1255	2133	0	140	16
Confl. Peds. (#/hr)	12			12	50	
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	9	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	27.9	76.3	76.3		15.8	15.8
Effective Green, g (s)	27.9	76.3	76.3		15.8	15.8
Actuated g/C Ratio	0.21	0.57	0.57		0.12	0.12
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)	709	2873	2794		207	326
v/s Ratio Prot	c0.12	0.25	c0.43		c0.08	
v/s Ratio Perm						0.01
v/c Ratio	0.56	0.44	0.76		0.68	0.05
Uniform Delay, d1	48.0	16.9	22.4		57.1	52.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.0	0.1	1.3		8.4	0.1
Delay (s)	49.0	17.1	23.7		65.6	53.0
Level of Service	D	B	C		E	D
Approach Delay (s)		24.7	23.7		59.4	
Approach LOS		C	C		E	

Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Signalized Intersection Capacity Analysis

## 45: Ala Moana Blvd & Piikoi St

5/5/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	345	1949	1452	316	256	210
Future Volume (vph)	345	1949	1452	316	256	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frbp, ped/bikes	1.00	1.00	0.97		1.00	1.00
Ftpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	5085	4811		1770	2787
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	5085	4811		1770	2787
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	359	2030	1512	329	267	219
RTOR Reduction (vph)	0	0	21	0	0	179
Lane Group Flow (vph)	359	2030	1821	0	267	40
Confl. Peds. (#/hr)	139			139	128	
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	9	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	32.3	73.1	73.1		27.2	27.2
Effective Green, g (s)	32.3	73.1	73.1		27.2	27.2
Actuated g/C Ratio	0.22	0.50	0.50		0.18	0.18
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)	751	2518	2382		326	513
v/s Ratio Prot	c0.10	c0.40	0.38		c0.15	
v/s Ratio Perm						0.01
v/c Ratio	0.48	0.81	0.76		0.82	0.08
Uniform Delay, d1	50.3	31.3	30.3		57.8	49.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.5	2.0	1.5		14.7	0.1
Delay (s)	50.8	33.3	31.8		72.6	49.9
Level of Service	D	C	C		E	D
Approach Delay (s)		35.9	31.8		62.3	
Approach LOS		D	C		E	

### Intersection Summary

HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	147.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

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**APPENDIX F**

**CAPACITY ANALYSIS CALCULATIONS  
PROJECTED YEAR 2019 PEAK HOUR TRAFFIC ANALYSIS**

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# HCM Signalized Intersection Capacity Analysis

## 15: Ward Ave & Queen St

5/5/2016



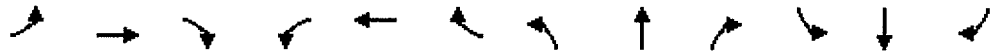
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗		↔	↗	↖	↕		↖	↕	
Traffic Volume (vph)	50	197	83	75	350	57	83	449	63	59	717	200
Future Volume (vph)	50	197	83	75	350	57	83	449	63	59	717	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total 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	0.98		1.00	0.97	1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.97	
Flt Protected		0.99	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1842	1546		1844	1538	1770	3435		1770	3377	
Flt Permitted		0.67	1.00		0.88	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1243	1546		1635	1538	1770	3435		1770	3377	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	53	210	88	80	372	61	88	478	67	63	763	213
RTOR Reduction (vph)	0	0	55	0	0	40	0	12	0	0	28	0
Lane Group Flow (vph)	0	263	33	0	452	21	88	533	0	63	948	0
Confl. Peds. (#/hr)	21		15	15		21			58			34
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		26.1	26.1		26.1	26.1	5.1	28.4		5.1	28.4	
Effective Green, g (s)		26.1	26.1		26.1	26.1	5.1	28.4		5.1	28.4	
Actuated g/C Ratio		0.35	0.35		0.35	0.35	0.07	0.38		0.07	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)		434	540		572	538	121	1307		121	1285	
v/s Ratio Prot							c0.05	0.16		0.04	c0.28	
v/s Ratio Perm		0.21	0.02		c0.28	0.01						
v/c Ratio		0.61	0.06		0.79	0.04	0.73	0.41		0.52	0.74	
Uniform Delay, d1		20.0	16.1		21.8	16.0	34.1	16.9		33.6	19.9	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.4	0.0		7.3	0.0	19.4	0.2		4.0	2.3	
Delay (s)		22.4	16.2		29.1	16.0	53.5	17.1		37.6	22.1	
Level of Service		C	B		C	B	D	B		D	C	
Approach Delay (s)		20.8			27.6			22.2			23.1	
Approach LOS		C			C			C			C	

### Intersection Summary

HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	74.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗		↔	↗	↖	↕		↖	↕	
Traffic Volume (vph)	101	410	147	90	409	86	72	775	143	117	803	81
Future Volume (vph)	101	410	147	90	409	86	72	775	143	117	803	81
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	0.98	1.00	0.98		1.00	0.99	
Fipb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected		0.99	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1843	1527		1843	1548	1770	3376		1770	3457	
Flt Permitted		0.57	1.00		0.59	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1065	1527		1095	1548	1770	3376		1770	3457	
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)	105	427	153	94	426	90	75	807	149	122	836	84
RTOR Reduction (vph)	0	0	47	0	0	47	0	17	0	0	9	0
Lane Group Flow (vph)	0	532	106	0	520	43	75	939	0	122	911	0
Confl. Peds. (#/hr)	11		25	25		11			88			59
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4		8	8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		40.0	40.0		40.0	40.0	3.9	29.7		5.0	30.8	
Effective Green, g (s)		40.0	40.0		40.0	40.0	3.9	29.7		5.0	30.8	
Actuated g/C Ratio		0.45	0.45		0.45	0.45	0.04	0.33		0.06	0.34	
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)		474	680		488	690	76	1117		98	1187	
v/s Ratio Prot							0.04	c0.28		c0.07	0.26	
v/s Ratio Perm		c0.50	0.07		0.47	0.03						
v/c Ratio		1.12	0.16		1.07	0.06	0.99	0.84		1.24	0.77	
Uniform Delay, d1		24.9	14.8		24.9	14.2	42.9	27.8		42.4	26.3	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		79.3	0.1		59.3	0.0	98.0	5.9		170.5	3.0	
Delay (s)		104.1	14.9		84.2	14.2	140.9	33.7		212.9	29.3	
Level of Service		F	B		F	B	F	C		F	C	
Approach Delay (s)		84.2			73.8			41.5			50.8	
Approach LOS		F			E			D			D	

Intersection Summary

HCM 2000 Control Delay	58.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	89.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	103.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕		↙	↕↕			↕↕			↕↕	
Traffic Volume (vph)	29	183	0	184	286	28	16	109	51	38	200	106
Future Volume (vph)	29	183	0	184	286	28	16	109	51	38	200	106
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	
Frt		1.00		1.00	0.99			0.96			0.95	
Flt Protected		0.99		0.95	1.00			1.00			0.99	
Satd. Flow (prot)		3515		1770	3492			3371			3357	
Flt Permitted		0.87		0.95	1.00			0.91			0.90	
Satd. Flow (perm)		3068		1770	3492			3076			3054	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	31	195	0	196	304	30	17	116	54	40	213	113
RTOR Reduction (vph)	0	0	0	0	10	0	0	37	0	0	65	0
Lane Group Flow (vph)	0	226	0	196	324	0	0	150	0	0	301	0
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)		12.0		9.1	26.1			17.2			17.2	
Effective Green, g (s)		12.0		9.1	26.1			17.2			17.2	
Actuated g/C Ratio		0.23		0.17	0.49			0.32			0.32	
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)		690		302	1709			992			985	
v/s Ratio Prot				c0.11	0.09							
v/s Ratio Perm		c0.07						0.05			c0.10	
v/c Ratio		0.33		0.65	0.19			0.15			0.31	
Uniform Delay, d1		17.3		20.6	7.7			12.9			13.6	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.3		4.8	0.1			0.1			0.2	
Delay (s)		17.6		25.4	7.7			12.9			13.7	
Level of Service		B		C	A			B			B	
Approach Delay (s)		17.6			14.2			12.9			13.7	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	53.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔			↔			↔	
Traffic Volume (vph)	104	478	48	275	474	52	43	170	73	65	130	51
Future Volume (vph)	104	478	48	275	474	52	43	170	73	65	130	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor		0.95		1.00	0.95			0.95			0.95	
Frt		0.99		1.00	0.99			0.96			0.97	
Flt Protected		0.99		0.95	1.00			0.99			0.99	
Satd. Flow (prot)		3470		1770	3487			3378			3384	
Flt Permitted		0.76		0.95	1.00			0.86			0.76	
Satd. Flow (perm)		2652		1770	3487			2927			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)	108	498	50	286	494	54	45	177	76	68	135	53
RTOR Reduction (vph)	0	6	0	0	9	0	0	27	0	0	19	0
Lane Group Flow (vph)	0	650	0	286	539	0	0	271	0	0	237	0
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)		27.6		18.9	51.5			15.4			15.4	
Effective Green, g (s)		27.6		18.9	51.5			15.4			15.4	
Actuated g/C Ratio		0.36		0.25	0.67			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)		951		435	2335			586			520	
v/s Ratio Prot				c0.16	0.15							
v/s Ratio Perm		c0.25						c0.09			0.09	
v/c Ratio		0.68		0.66	0.23			0.46			0.46	
Uniform Delay, d1		20.9		26.1	5.0			27.1			27.1	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		2.0		3.6	0.1			0.6			0.6	
Delay (s)		23.0		29.7	5.0			27.7			27.7	
Level of Service		C		C	A			C			C	
Approach Delay (s)		23.0			13.5			27.7			27.7	
Approach LOS		C			B			C			C	

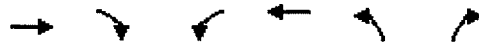
Intersection Summary

HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	76.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

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

5/5/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↘	
Traffic Volume (veh/h)	268	21	97	480	24	72
Future Volume (Veh/h)	268	21	97	480	24	72
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)	282	22	102	505	25	76
Pedestrians						19
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						2
Right turn flare (veh)						
Median type	TWLTL		None			
Median storage veh	2					
Upstream signal (ft)	564		680			
pX, platoon unblocked						
vC, conflicting volume			323			768 171
vC1, stage 1 conf vol					312	
vC2, stage 2 conf vol					456	
vCu, unblocked vol			323			768 171
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 %			92			96 91
cM capacity (veh/h)			1214			567 872

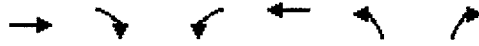
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	188	116	102	252	252	101
Volume Left	0	0	102	0	0	25
Volume Right	0	22	0	0	0	76
cSH	1700	1700	1214	1700	1700	769
Volume to Capacity	0.11	0.07	0.08	0.15	0.15	0.13
Queue Length 95th (ft)	0	0	7	0	0	11
Control Delay (s)	0.0	0.0	8.2	0.0	0.0	10.4
Lane LOS			A	B		
Approach Delay (s)	0.0		1.4	10.4		
Approach LOS				B		

Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			31.8%	ICU Level of Service	A	
Analysis Period (min)			15			

\* User Entered Value

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

5/5/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (veh/h)	578	10	75	743	47	193
Future Volume (Veh/h)	578	10	75	743	47	193
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	649	11	84	835	53	217
Pedestrians						19
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						2
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh	2					
Upstream signal (ft)	564			687		
pX, platoon unblocked			0.92		0.92	0.92
vC, conflicting volume			679		1259	349
vC1, stage 1 conf vol					674	
vC2, stage 2 conf vol					586	
vCu, unblocked vol			473		1105	114
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		88	75
cM capacity (veh/h)			981		458	857

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	433	227	84	418	418	270
Volume Left	0	0	84	0	0	53
Volume Right	0	11	0	0	0	217
cSH	1700	1700	981	1700	1700	732
Volume to Capacity	0.25	0.13	0.09	0.25	0.25	0.37
Queue Length 95th (ft)	0	0	7	0	0	43
Control Delay (s)	0.0	0.0	9.0	0.0	0.0	12.8
Lane LOS	A			B		
Approach Delay (s)	0.0		0.8			12.8
Approach LOS						B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		

\* User Entered Value



# HCM Signalized Intersection Capacity Analysis

## 24: Ward Ave & Halekauwila St

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔					↗	↕		↖	↕	
Traffic Volume (vph)	107	13	9	0	0	0	37	432	3	16	549	249
Future Volume (vph)	107	13	9	0	0	0	37	432	3	16	549	249
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		1.00					1.00	1.00		1.00	0.98	
Flpb, ped/bikes		1.00					0.98	1.00		1.00	1.00	
Frt		0.99					1.00	1.00		1.00	0.95	
Flt Protected		0.96					0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1765					1740	3536		1770	3294	
Flt Permitted		0.96					0.31	1.00		0.49	1.00	
Satd. Flow (perm)		1765					562	3536		918	3294	
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)	110	13	9	0	0	0	38	445	3	16	566	257
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	51	0
Lane Group Flow (vph)	0	130	0	0	0	0	38	448	0	16	772	0
Confl. Peds. (#/hr)	2		44				42					42
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		15.1					29.2	29.2		29.2	29.2	
Effective Green, g (s)		15.1					29.2	29.2		29.2	29.2	
Actuated g/C Ratio		0.28					0.54	0.54		0.54	0.54	
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)		490					302	1901		493	1771	
v/s Ratio Prot								0.13			c0.23	
v/s Ratio Perm		0.07					0.07			0.02		
v/c Ratio		0.26					0.13	0.24		0.03	0.44	
Uniform Delay, d1		15.3					6.2	6.6		5.9	7.6	
Progression Factor		1.00					1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3					0.2	0.1		0.0	0.2	
Delay (s)		15.6					6.4	6.7		5.9	7.8	
Level of Service		B					A	A		A	A	
Approach Delay (s)		15.6			0.0			6.7			7.7	
Approach LOS		B			A			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		8.1										
HCM 2000 Volume to Capacity ratio		0.38										
Actuated Cycle Length (s)		54.3							10.0			
Intersection Capacity Utilization		57.5%									B	
Analysis Period (min)		15										
c Critical Lane Group												

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

5/5/2016

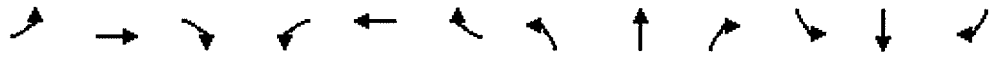


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔					↖	↕		↖	↕	
Traffic Volume (vph)	239	22	85	0	0	0	19	744	6	32	694	156
Future Volume (vph)	239	22	85	0	0	0	19	744	6	32	694	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0					5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00					1.00	0.95		1.00	0.95	
Frb, ped/bikes		0.98					1.00	1.00		1.00	0.98	
Flpb, ped/bikes		1.00					0.98	1.00		1.00	1.00	
Frt		0.97					1.00	1.00		1.00	0.97	
Flt Protected		0.97					0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1711					1732	3535		1770	3375	
Flt Permitted		0.97					0.23	1.00		0.28	1.00	
Satd. Flow (perm)		1711					424	3535		530	3375	
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)	249	23	89	0	0	0	20	775	6	33	723	162
RTOR Reduction (vph)	0	13	0	0	0	0	0	1	0	0	24	0
Lane Group Flow (vph)	0	348	0	0	0	0	20	780	0	33	862	0
Confl. Peds. (#/hr)			91				63					63
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		22.3					22.8	22.8		22.8	22.8	
Effective Green, g (s)		22.3					22.8	22.8		22.8	22.8	
Actuated g/C Ratio		0.40					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)		692					175	1462		219	1396	
v/s Ratio Prot								0.22			c0.26	
v/s Ratio Perm		0.20					0.05			0.06		
v/c Ratio		0.50					0.11	0.53		0.15	0.62	
Uniform Delay, d1		12.3					9.9	12.2		10.1	12.7	
Progression Factor		1.00					1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6					0.3	0.4		0.3	0.8	
Delay (s)		12.8					10.2	12.5		10.4	13.5	
Level of Service		B					B	B		B	B	
Approach Delay (s)		12.8			0.0			12.5			13.4	
Approach LOS		B			A			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			13.0				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			55.1				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			56.6%				ICU Level of Service			B		
Analysis Period (min)			15									
c	Critical Lane Group											

# HCM Signalized Intersection Capacity Analysis

## 34: Ward Ave & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗	↖	↔		↖	↕↕		↖	↕↕	
Traffic Volume (vph)	25	71	35	89	96	136	59	314	76	94	441	68
Future Volume (vph)	25	71	35	89	96	136	59	314	76	94	441	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		0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00	1.00	1.00	0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		0.99	1.00		0.98	1.00	
Frt		1.00	0.85	1.00	0.91		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)		3483	1583	1770	1670		1747	3407		1739	3446	
Flt Permitted		0.86	1.00	0.69	1.00		0.45	1.00		0.50	1.00	
Satd. Flow (perm)		3026	1583	1279	1670		818	3407		924	3446	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	77	38	97	104	148	64	341	83	102	479	74
RTOR Reduction (vph)	0	0	25	0	67	0	0	24	0	0	14	0
Lane Group Flow (vph)	0	104	13	97	185	0	64	400	0	102	539	0
Confl. Peds. (#/hr)	37					37	34		63	63		34
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)		15.3	15.3	15.3	15.3		20.9	20.9		20.9	20.9	
Effective Green, g (s)		15.3	15.3	15.3	15.3		20.9	20.9		20.9	20.9	
Actuated g/C Ratio		0.33	0.33	0.33	0.33		0.45	0.45		0.45	0.45	
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)		1002	524	423	553		370	1541		418	1558	
v/s Ratio Prot					c0.11			0.12			c0.16	
v/s Ratio Perm		0.03	0.01	0.08			0.08			0.11		
v/c Ratio		0.10	0.02	0.23	0.33		0.17	0.26		0.24	0.35	
Uniform Delay, d1		10.7	10.4	11.2	11.6		7.5	7.8		7.8	8.2	
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	0.3	0.4		0.2	0.1		0.3	0.1	
Delay (s)		10.7	10.4	11.5	12.0		7.7	7.9		8.1	8.3	
Level of Service		B	B	B	B		A	A		A	A	
Approach Delay (s)		10.7			11.8			7.9			8.3	
Approach LOS		B			B			A			A	

### Intersection Summary

HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	46.2	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 Signalized Intersection Capacity Analysis

## 34: Ward Ave & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗	↖	↖	↗	↖	↕↕		↖	↕↕	
Traffic Volume (vph)	30	168	65	135	93	273	47	428	188	309	426	69
Future Volume (vph)	30	168	65	135	93	273	47	428	188	309	426	69
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	
Frbp, ped/bikes		1.00	0.96	1.00	0.95		1.00	0.98		1.00	0.99	
Flpb, ped/bikes		1.00	1.00	0.98	1.00		0.97	1.00		0.97	1.00	
Frt		1.00	0.85	1.00	0.89		1.00	0.95		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)		3499	1519	1730	1578		1720	3293		1720	3428	
Flt Permitted		0.85	1.00	0.62	1.00		0.45	1.00		0.38	1.00	
Satd. Flow (perm)		2999	1519	1136	1578		820	3293		694	3428	
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)	31	173	67	139	96	281	48	441	194	319	439	71
RTOR Reduction (vph)	0	0	46	0	120	0	0	56	0	0	14	0
Lane Group Flow (vph)	0	204	21	139	257	0	48	579	0	319	496	0
Confl. Peds. (#/hr)	67		39	39		67	43		87	87		43
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)		24.2	24.2	24.2	24.2		41.5	41.5		41.5	41.5	
Effective Green, g (s)		24.2	24.2	24.2	24.2		41.5	41.5		41.5	41.5	
Actuated g/C Ratio		0.32	0.32	0.32	0.32		0.55	0.55		0.55	0.55	
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)		958	485	363	504		449	1805		380	1879	
v/s Ratio Prot					c0.16			0.18				0.14
v/s Ratio Perm		0.07	0.01	0.12			0.06			c0.46		
v/c Ratio		0.21	0.04	0.38	0.51		0.11	0.32		0.84	0.26	
Uniform Delay, d1		18.8	17.8	20.0	20.9		8.2	9.4		14.3	9.0	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1	0.0	0.7	0.9		0.1	0.1		14.9	0.1	
Delay (s)		18.9	17.8	20.6	21.8		8.3	9.5		29.3	9.1	
Level of Service		B	B	C	C		A	A		C	A	
Approach Delay (s)		18.6			21.5			9.4			16.9	
Approach LOS		B			C			A			B	

### Intersection Summary

HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	75.7	Sum of lost time (s)	10.0
Intersection Capacity Utilization	101.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕	↗	↖	↕	↗	↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	54	93	27	24	102	54	40	115	28	25	182	145
Future Volume (vph)	54	93	27	24	102	54	40	115	28	25	182	145
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
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.98	1.00		0.98	1.00	1.00
Frt	1.00	0.97		1.00	0.95		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	3392		1770	3356		1737	3415		1743	1863	1526
Flt Permitted	0.95	1.00		0.95	1.00		0.63	1.00		0.65	1.00	1.00
Satd. Flow (perm)	1770	3392		1770	3356		1160	3415		1200	1863	1526
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	58	100	29	26	110	58	43	124	30	27	196	156
RTOR Reduction (vph)	0	21	0	0	43	0	0	18	0	0	0	92
Lane Group Flow (vph)	58	108	0	26	125	0	43	136	0	27	196	64
Confl. Peds. (#/hr)			34	34			43		33	33		43
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	4
Permitted Phases							8			4		4
Actuated Green, G (s)	2.1	13.5		1.6	13.0		21.1	21.1		21.1	21.1	21.1
Effective Green, g (s)	2.1	13.5		1.6	13.0		21.1	21.1		21.1	21.1	21.1
Actuated g/C Ratio	0.04	0.26		0.03	0.25		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)	72	894		55	852		478	1407		494	767	628
v/s Ratio Prot	c0.03	0.03		0.01	c0.04			0.04			c0.11	
v/s Ratio Perm							0.04			0.02		0.04
v/c Ratio	0.81	0.12		0.47	0.15		0.09	0.10		0.05	0.26	0.10
Uniform Delay, d1	24.3	14.3		24.4	14.8		9.2	9.2		9.1	9.9	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	46.1	0.1		6.3	0.1		0.1	0.0		0.0	0.2	0.1
Delay (s)	70.5	14.4		30.7	14.9		9.3	9.2		9.1	10.1	9.3
Level of Service	E	B		C	B		A	A		A	B	A
Approach Delay (s)		31.8			17.0			9.3			9.7	
Approach LOS		C			B			A			A	

Intersection Summary

HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	51.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 35: Kamakee St & Auahi St

5/5/2016



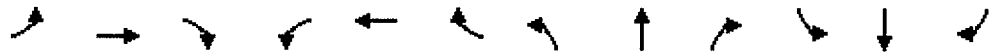
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕		↖	↕		↖	↕	↖
Traffic Volume (vph)	99	310	130	9	161	76	77	132	45	98	246	161
Future Volume (vph)	99	310	130	9	161	76	77	132	45	98	246	161
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total 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
Frbp, ped/bikes	1.00	0.95		1.00	0.95		1.00	0.97		1.00	1.00	0.89
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.94	1.00		0.90	1.00	1.00
Frt	1.00	0.96		1.00	0.95		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3199		1770	3212		1656	3289		1598	1863	1409
Flt Permitted	0.95	1.00		0.95	1.00		0.49	1.00		0.63	1.00	1.00
Satd. Flow (perm)	1770	3199		1770	3212		854	3289		1068	1863	1409
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)	104	326	137	9	169	80	81	139	47	103	259	169
RTOR Reduction (vph)	0	51	0	0	47	0	0	34	0	0	0	121
Lane Group Flow (vph)	104	412	0	9	202	0	81	152	0	103	259	48
Confl. Peds. (#/hr)			167			209	105		137	137		105
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6		8			4		4
Permitted Phases							8			4		4
Actuated Green, G (s)	7.3	36.7		0.7	30.1		20.9	20.9		20.9	20.9	20.9
Effective Green, g (s)	7.3	36.7		0.7	30.1		20.9	20.9		20.9	20.9	20.9
Actuated g/C Ratio	0.10	0.50		0.01	0.41		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)	176	1601		16	1318		243	937		304	531	401
v/s Ratio Prot	c0.06	c0.13		0.01	0.06		0.05				c0.14	
v/s Ratio Perm							0.09			0.10		0.03
v/c Ratio	0.59	0.26		0.56	0.15		0.33	0.16		0.34	0.49	0.12
Uniform Delay, d1	31.6	10.5		36.1	13.6		20.7	19.6		20.7	21.8	19.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.2	0.1		38.3	0.1		0.8	0.1		0.7	0.7	0.1
Delay (s)	36.8	10.6		74.4	13.6		21.5	19.7		21.4	22.5	19.5
Level of Service	D	B		E	B		C	B		C	C	B
Approach Delay (s)		15.4			15.8			20.3			21.3	
Approach LOS		B			B			C			C	

### Intersection Summary

HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	73.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.8%	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

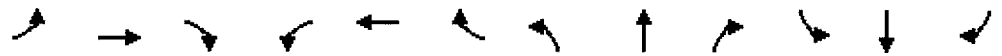
5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗				↖	↗			↕	
Traffic Volume (vph)	45	7	52	0	0	0	93	75	6	21	41	51
Future Volume (vph)	45	7	52	0	0	0	93	75	6	21	41	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0				5.0	5.0			5.0	
Lane Util. Factor		1.00	1.00				1.00	1.00			1.00	
Frb, ped/bikes		1.00	0.96				1.00	1.00			0.97	
Flpb, ped/bikes		0.99	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	0.99			0.94	
Flt Protected		0.96	1.00				0.95	1.00			0.99	
Satd. Flow (prot)		1760	1521				1770	1836			1678	
Flt Permitted		0.96	1.00				0.95	1.00			0.95	
Satd. Flow (perm)		1760	1521				1770	1836			1603	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	52	8	60	0	0	0	107	86	7	24	47	59
RTOR Reduction (vph)	0	0	50	0	0	0	0	3	0	0	30	0
Lane Group Flow (vph)	0	60	10	0	0	0	107	90	0	0	100	0
Confl. Peds. (#/hr)	12		34	34		12			16	16		62
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2			6	
Permitted Phases	4		4							6		
Actuated Green, G (s)		8.4	8.4				6.9	30.5			18.6	
Effective Green, g (s)		8.4	8.4				6.9	30.5			18.6	
Actuated g/C Ratio		0.17	0.17				0.14	0.62			0.38	
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)		302	261				249	1145			609	
v/s Ratio Prot							c0.06	0.05				
v/s Ratio Perm		0.03	0.01								c0.06	
v/c Ratio		0.20	0.04				0.43	0.08			0.16	
Uniform Delay, d1		17.4	16.9				19.2	3.6			10.0	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		0.3	0.1				1.2	0.0			0.1	
Delay (s)		17.7	16.9				20.4	3.7			10.1	
Level of Service		B	B				C	A			B	
Approach Delay (s)		17.3			0.0			12.6			10.1	
Approach LOS		B			A			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			13.2				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.23									
Actuated Cycle Length (s)			48.9				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			36.7%				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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗				↖	↗			↕	
Traffic Volume (vph)	91	9	176	0	0	0	183	100	10	18	77	51
Future Volume (vph)	91	9	176	0	0	0	183	100	10	18	77	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0				5.0	5.0			5.0	
Lane Util. Factor		1.00	1.00				1.00	1.00			1.00	
Frbp, ped/bikes		1.00	0.92				1.00	0.99			0.96	
Flpb, ped/bikes		0.92	1.00				1.00	1.00			0.99	
Frt		1.00	0.85				1.00	0.99			0.95	
Flt Protected		0.96	1.00				0.95	1.00			0.99	
Satd. Flow (prot)		1632	1454				1770	1822			1686	
Flt Permitted		0.96	1.00				0.95	1.00			0.96	
Satd. Flow (perm)		1632	1454				1770	1822			1628	
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)	100	10	193	0	0	0	201	110	11	20	85	56
RTOR Reduction (vph)	0	0	147	0	0	0	0	5	0	0	20	0
Lane Group Flow (vph)	0	110	46	0	0	0	201	116	0	0	141	0
Confl. Peds. (#/hr)	60		77	77		60			48	48		104
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2			6	
Permitted Phases	4		4							6		
Actuated Green, G (s)		13.2	13.2				9.6	32.2			17.6	
Effective Green, g (s)		13.2	13.2				9.6	32.2			17.6	
Actuated g/C Ratio		0.24	0.24				0.17	0.58			0.32	
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)		388	346				306	1058			517	
v/s Ratio Prot							c0.11	0.06				
v/s Ratio Perm		0.07	0.03								c0.09	
v/c Ratio		0.28	0.13				0.66	0.11			0.27	
Uniform Delay, d1		17.2	16.6				21.4	5.2			14.1	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		0.4	0.2				5.0	0.0			0.3	
Delay (s)		17.6	16.8				26.4	5.2			14.4	
Level of Service		B	B				C	A			B	
Approach Delay (s)		17.1			0.0			18.4			14.4	
Approach LOS		B			A			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			17.1				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.37									
Actuated Cycle Length (s)			55.4				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			56.2%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												



# HCM Signalized Intersection Capacity Analysis

## 1: Cooke St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑↑↑		↖	↑	↗	↖	↑	
Traffic Volume (vph)	0	645	109	487	960	212	57	176	58	8	48	17
Future Volume (vph)	0	645	109	487	960	212	57	176	58	8	48	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor		0.95			0.86		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes		0.98			0.99		1.00	1.00	0.94	1.00	0.98	
Flpb, ped/bikes		1.00			0.99		0.95	1.00	1.00	0.97	1.00	
Frt		0.98			0.98		1.00	1.00	0.85	1.00	0.96	
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3404			6100		1676	1863	1496	1711	1756	
Flt Permitted		1.00			0.73		0.71	1.00	1.00	0.59	1.00	
Satd. Flow (perm)		3404			4501		1257	1863	1496	1059	1756	
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)	0	672	114	507	1000	221	59	183	60	8	50	18
RTOR Reduction (vph)	0	13	0	0	23	0	0	0	45	0	11	0
Lane Group Flow (vph)	0	773	0	0	1705	0	59	183	15	8	57	0
Confl. Peds. (#/hr)			57	57		29	69		54	54		69
Turn Type		NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases				2			4		4	8		
Actuated Green, G (s)		39.5			48.9		19.8	19.8	19.8	19.8	19.8	
Effective Green, g (s)		39.5			48.9		19.8	19.8	19.8	19.8	19.8	
Actuated g/C Ratio		0.50			0.62		0.25	0.25	0.25	0.25	0.25	
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)		1708			2886		316	468	376	266	441	
v/s Ratio Prot		0.23			c0.03			c0.10			0.03	
v/s Ratio Perm					c0.33		0.05		0.01	0.01		
v/c Ratio		0.45			1.32dl		0.19	0.39	0.04	0.03	0.13	
Uniform Delay, d1		12.6			8.9		23.1	24.4	22.3	22.2	22.8	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2			0.3		0.3	0.5	0.0	0.0	0.1	
Delay (s)		12.8			9.2		23.4	25.0	22.3	22.3	22.9	
Level of Service		B			A		C	C	C	C	C	
Approach Delay (s)		12.8			9.2		24.1				22.8	
Approach LOS		B			A		C				C	

### Intersection Summary

HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	78.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 1: Cooke St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		←↑↑↑		↖	↑↑		↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	4	1369	88	311	801	130	95	310	215	20	56	35
Future Volume (vph)	4	1369	88	311	801	130	95	310	215	20	56	35
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		0.91		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes		0.98		1.00	0.98		1.00	1.00	0.90	1.00	0.96	
Flpb, ped/bikes		1.00		1.00	1.00		0.92	1.00	1.00	0.95	1.00	
Frt		0.99		1.00	0.98		1.00	1.00	0.85	1.00	0.94	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		4954		1770	3406		1627	1863	1420	1689	1687	
Flt Permitted		0.94		0.08	1.00		0.70	1.00	1.00	0.27	1.00	
Satd. Flow (perm)		4646		143	3406		1192	1863	1420	488	1687	
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)	4	1426	92	324	834	135	99	323	224	21	58	36
RTOR Reduction (vph)	0	6	0	0	10	0	0	0	171	0	19	0
Lane Group Flow (vph)	0	1516	0	324	959	0	99	323	53	21	75	0
Confl. Peds. (#/hr)	36		110	110		36	78		82	82		78
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2			4				8
Permitted Phases	6			2			4		4		8	
Actuated Green, G (s)		47.0		73.7	73.7		25.9	25.9	25.9	25.9	25.9	
Effective Green, g (s)		47.0		73.7	73.7		25.9	25.9	25.9	25.9	25.9	
Actuated g/C Ratio		0.43		0.67	0.67		0.24	0.24	0.24	0.24	0.24	
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)		1992		418	2290		281	440	335	115	398	
v/s Ratio Prot				c0.15	0.28			c0.17			0.04	
v/s Ratio Perm		0.33		c0.37			0.08		0.04	0.04		
v/c Ratio		0.76		0.78	0.42		0.35	0.73	0.16	0.18	0.19	
Uniform Delay, d1		26.5		29.5	8.2		34.9	38.7	33.2	33.4	33.4	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.8		8.7	0.1		0.8	6.2	0.2	0.8	0.2	
Delay (s)		28.3		38.2	8.3		35.6	44.9	33.4	34.2	33.7	
Level of Service		C		D	A		D	D	C	C	C	
Approach Delay (s)		28.3			15.8			39.5			33.8	
Approach LOS		C			B			D			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			26.0			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			109.6			Sum of lost time (s)		15.0				
Intersection Capacity Utilization			91.7%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 2: Ward Ave & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑↑		↖	↑↑	↗	↖	↑↑	↗
Traffic Volume (vph)	0	581	126	323	1361	96	143	434	69	146	715	118
Future Volume (vph)	0	581	126	323	1361	96	143	434	69	146	715	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	5.0	5.0
Lane Util. Factor		0.95		1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.98		1.00	0.99		1.00	1.00	0.87	1.00	1.00	0.92
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Fr t		0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3380		1770	5003		1770	3539	1379	1770	3539	1460
Flt Permitted		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3380		1770	5003		1770	3539	1379	1770	3539	1460
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)	0	612	133	340	1433	101	151	457	73	154	753	124
RTOR Reduction (vph)	0	15	0	0	6	0	0	0	53	0	0	80
Lane Group Flow (vph)	0	730	0	340	1528	0	151	457	20	154	753	44
Confl. Peds. (#/hr)			82	82		72			110			58
Turn Type		NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		6		5	2		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)		31.6		24.0	60.6		12.5	33.0	33.0	11.0	31.5	31.5
Effective Green, g (s)		31.6		24.0	60.6		12.5	33.0	33.0	11.0	31.5	31.5
Actuated g/C Ratio		0.26		0.20	0.51		0.10	0.28	0.28	0.09	0.26	0.26
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)		893		355	2534		184	976	380	162	932	384
v/s Ratio Prot		c0.22		c0.19	0.31		0.09	0.13		c0.09	c0.21	
v/s Ratio Perm									0.01			0.03
v/c Ratio		0.82		0.96	0.60		0.82	0.47	0.05	0.95	0.81	0.11
Uniform Delay, d1		41.3		47.3	21.0		52.5	36.0	31.8	54.0	41.2	33.5
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		5.8		36.3	0.4		24.5	0.4	0.1	55.9	5.2	0.1
Delay (s)		47.1		83.6	21.4		76.9	36.4	31.9	110.0	46.4	33.6
Level of Service		D		F	C		E	D	C	F	D	C
Approach Delay (s)		47.1			32.7			44.9			54.4	
Approach LOS		D			C			D			D	

Intersection Summary

HCM 2000 Control Delay	42.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	119.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 2: Ward Ave & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑		↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	0	1441	179	0	1000	125	163	666	272	250	833	91
Future Volume (vph)	0	1441	179	0	1000	125	163	666	272	250	833	91
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		0.91			0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.98			0.99		1.00	1.00	0.88	1.00	1.00	0.92
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.98			0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4925			4947		1770	3539	1396	1770	3539	1464
Flt Permitted		1.00			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		4925			4947		1770	3539	1396	1770	3539	1464
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)	0	1501	186	0	1042	130	170	694	283	260	868	95
RTOR Reduction (vph)	0	13	0	0	13	0	0	0	80	0	0	44
Lane Group Flow (vph)	0	1674	0	0	1159	0	170	694	203	260	868	51
Confl. Peds. (#/hr)			118			76			106			59
Turn Type		NA			NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		6			2		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)		46.8			46.8		14.9	30.2	30.2	20.8	36.1	36.1
Effective Green, g (s)		46.8			46.8		14.9	30.2	30.2	20.8	36.1	36.1
Actuated g/C Ratio		0.41			0.41		0.13	0.27	0.27	0.18	0.32	0.32
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)		2043			2052		233	947	373	326	1132	468
v/s Ratio Prot		c0.34			0.23		0.10	0.20		c0.15	c0.25	
v/s Ratio Perm									0.15			0.03
v/c Ratio		0.82			0.56		0.73	0.73	0.54	0.80	0.77	0.11
Uniform Delay, d1		29.3			25.2		47.0	37.6	35.4	44.0	34.6	27.0
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.7			0.4		10.9	3.0	1.6	12.7	3.2	0.1
Delay (s)		31.9			25.6		57.9	40.6	37.0	56.7	37.7	27.1
Level of Service		C			C		E	D	D	E	D	C
Approach Delay (s)		31.9			25.6			42.3			40.9	
Approach LOS		C			C			D			D	

### Intersection Summary

HCM 2000 Control Delay	34.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	112.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 3: Kamakee St & Kapiolani Blvd

5/5/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑↑↑	↖	↗
Traffic Volume (vph)	718	69	250	1688	87	105
Future Volume (vph)	718	69	250	1688	87	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.86	1.00	1.00
Frbp, ped/bikes	0.99			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3470			6353	1770	1521
Flt Permitted	1.00			0.74	0.95	1.00
Satd. Flow (perm)	3470			4716	1770	1521
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	764	73	266	1796	93	112
RTOR Reduction (vph)	7	0	0	0	0	80
Lane Group Flow (vph)	830	0	0	2062	93	32
Confl. Peds. (#/hr)		49	49			26
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases			6			8
Actuated Green, G (s)	59.8			59.8	27.5	27.5
Effective Green, g (s)	59.8			59.8	27.5	27.5
Actuated g/C Ratio	0.61			0.61	0.28	0.28
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2132			2898	500	429
v/s Ratio Prot	0.24				c0.05	
v/s Ratio Perm				c0.44		0.02
v/c Ratio	0.39			0.71	0.19	0.07
Uniform Delay, d1	9.5			12.8	26.4	25.6
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.8	0.2	0.1
Delay (s)	9.6			13.7	26.6	25.6
Level of Service	A			B	C	C
Approach Delay (s)	9.6			13.7	26.1	
Approach LOS	A			B	C	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			13.4		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.55			
Actuated Cycle Length (s)			97.3		Sum of lost time (s)	10.0
Intersection Capacity Utilization			85.7%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis  
 3: Kamakee St & Kapiolani Blvd

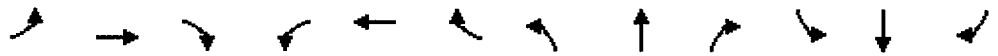
5/5/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↘			↑↑	↘	↗
Traffic Volume (vph)	1849	200	0	961	173	330
Future Volume (vph)	1849	200	0	961	173	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.86			0.95	1.00	1.00
Frbp, ped/bikes	0.99			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	6222			3539	1770	1516
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	6222			3539	1770	1516
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1967	213	0	1022	184	351
RTOR Reduction (vph)	14	0	0	0	0	2
Lane Group Flow (vph)	2166	0	0	1022	184	349
Confl. Peds. (#/hr)		110				30
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	52.6			52.6	31.0	31.0
Effective Green, g (s)	52.6			52.6	31.0	31.0
Actuated g/C Ratio	0.56			0.56	0.33	0.33
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	3496			1988	586	502
v/s Ratio Prot	c0.35			0.29	0.10	
v/s Ratio Perm						c0.23
v/c Ratio	0.62			0.51	0.31	0.70
Uniform Delay, d1	13.8			12.6	23.4	27.2
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.3			0.2	0.3	4.2
Delay (s)	14.1			12.9	23.7	31.4
Level of Service	B			B	C	C
Approach Delay (s)	14.1			12.9	28.7	
Approach LOS	B			B	C	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			15.9	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.65			
Actuated Cycle Length (s)			93.6	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

## 5: Piikoi St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑↑↑		↘	↑↑↑	↗			
Traffic Volume (vph)	0	911	44	42	1848	307	33	922	97	0	0	0
Future Volume (vph)	0	911	44	42	1848	307	33	922	97	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.95			0.86		1.00	0.91	1.00			
Frbp, ped/bikes		1.00			0.99		1.00	1.00	0.96			
Fipb, ped/bikes		1.00			1.00		0.93	1.00	1.00			
Frt		0.99			0.98		1.00	1.00	0.85			
Flt Protected		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		3503			6202		1653	5085	1524			
Flt Permitted		1.00			0.88		0.95	1.00	1.00			
Satd. Flow (perm)		3503			5466		1653	5085	1524			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	969	47	45	1966	327	35	981	103	0	0	0
RTOR Reduction (vph)	0	3	0	0	3	0	0	0	74	0	0	0
Lane Group Flow (vph)	0	1013	0	0	2335	0	35	981	29	0	0	0
Confl. Peds. (#/hr)			64			60	58		23			
Turn Type		NA		Perm	NA		Perm	NA	Perm			
Protected Phases		2			6			8				
Permitted Phases				6			8		8			
Actuated Green, G (s)		66.6			66.6		29.6	29.6	29.6			
Effective Green, g (s)		66.6			66.6		29.6	29.6	29.6			
Actuated g/C Ratio		0.63			0.63		0.28	0.28	0.28			
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)		2196			3427		460	1417	424			
v/s Ratio Prot		0.29						0.19				
v/s Ratio Perm					0.43		0.02		0.02			
v/c Ratio		0.46			0.68		0.08	0.69	0.07			
Uniform Delay, d1		10.4			12.9		28.2	34.2	28.2			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.2			0.6		0.1	1.5	0.1			
Delay (s)		10.5			13.5		28.3	35.7	28.2			
Level of Service		B			B		C	D	C			
Approach Delay (s)		10.5			13.5			34.8			0.0	
Approach LOS		B			B			C			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			18.1									
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			106.2									
Intersection Capacity Utilization			91.5%									
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 5: Piikoi St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑		↘	↑↑↑	↗			
Traffic Volume (vph)	0	2189	152	0	787	287	34	1377	181	0	0	0
Future Volume (vph)	0	2189	152	0	787	287	34	1377	181	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.86			0.95		1.00	0.91	1.00			
Frbp, ped/bikes		0.99			0.97		1.00	1.00	0.97			
Flpb, ped/bikes		1.00			1.00		0.88	1.00	1.00			
Frt		0.99			0.96		1.00	1.00	0.85			
Flt Protected		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		6280			3282		1561	5085	1536			
Flt Permitted		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)		6280			3282		1561	5085	1536			
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)	0	2280	158	0	820	299	35	1434	189	0	0	0
RTOR Reduction (vph)	0	9	0	0	3	0	0	0	11	0	0	0
Lane Group Flow (vph)	0	2429	0	0	1116	0	35	1434	178	0	0	0
Confl. Peds. (#/hr)			149			102	96		15			
Turn Type		NA			NA		Perm	NA	Perm			
Protected Phases		2			6			8				
Permitted Phases							8		8			
Actuated Green, G (s)		60.3			60.3		44.4	44.4	44.4			
Effective Green, g (s)		60.3			60.3		44.4	44.4	44.4			
Actuated g/C Ratio		0.53			0.53		0.39	0.39	0.39			
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)		3301			1725		604	1968	594			
v/s Ratio Prot		c0.39			0.34			c0.28				
v/s Ratio Perm							0.02		0.12			
v/c Ratio		0.74			0.65		0.06	0.73	0.30			
Uniform Delay, d1		21.0			19.5		22.0	30.0	24.4			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.9			0.8		0.0	1.4	0.3			
Delay (s)		21.9			20.4		22.1	31.4	24.7			
Level of Service		C			C		C	C	C			
Approach Delay (s)		21.9			20.4			30.4			0.0	
Approach LOS		C			C			C			A	

### Intersection Summary

HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	114.7	Sum of lost time (s)	10.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Signalized Intersection Capacity Analysis

## 14: Cooke St & Queen St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔↔			↔↔	
Traffic Volume (vph)	41	218	64	63	499	66	31	228	47	21	222	183
Future Volume (vph)	41	218	64	63	499	66	31	228	47	21	222	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frb, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.97			0.98			0.98			0.94	
Flt Protected		0.99			1.00			0.99			1.00	
Satd. Flow (prot)		3410			3462			3437			3299	
Flt Permitted		0.83			0.88			0.88			0.93	
Satd. Flow (perm)		2861			3069			3052			3072	
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)	43	229	67	66	525	69	33	240	49	22	234	193
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	339		0	660		0	322		0	449	
Confl. Peds. (#/hr)	28			31			31			70		
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)		17.0			17.0			16.1			16.1	
Effective Green, g (s)		17.0			17.0			16.1			16.1	
Actuated g/C Ratio		0.39			0.39			0.37			0.37	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1128			1210			1140			1147	
v/s Ratio Prot												
v/s Ratio Perm		0.12			c0.22			0.11			c0.15	
v/c Ratio		0.30			0.55			0.28			0.39	
Uniform Delay, d1		9.0			10.1			9.5			9.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			0.5			0.1			0.2	
Delay (s)		9.1			10.6			9.6			10.1	
Level of Service		A			B			A			B	
Approach Delay (s)		9.1			10.6			9.6			10.1	
Approach LOS		A			B			A			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		10.0			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.47										
Actuated Cycle Length (s)		43.1			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		65.0%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 14: Cooke St & Queen St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Traffic Volume (vph)	95	475	79	45	433	59	33	370	61	49	257	100
Future Volume (vph)	95	475	79	45	433	59	33	370	61	49	257	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frbp, ped/bikes		1.00			1.00			1.00			1.00	
Fipb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.98			0.96	
Flt Protected		0.99			1.00			1.00			0.99	
Satd. Flow (prot)		3447			3464			3454			3380	
Flt Permitted		0.79			0.86			0.90			0.85	
Satd. Flow (perm)		2746			2986			3126			2892	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	101	505	84	48	461	63	35	394	65	52	273	106
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	690	0	0	572	0	0	494	0	0	431	0
Confl. Peds. (#/hr)	15			38			37			61		
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)		19.5			19.5			16.5			16.5	
Effective Green, g (s)		19.5			19.5			16.5			16.5	
Actuated g/C Ratio		0.42			0.42			0.36			0.36	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1164			1265			1121			1037	
v/s Ratio Prot												
v/s Ratio Perm		c0.25			0.19			c0.16			0.15	
v/c Ratio		0.59			0.45			0.44			0.42	
Uniform Delay, d1		10.2			9.4			11.2			11.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.8			0.3			0.3			0.3	
Delay (s)		11.0			9.7			11.5			11.4	
Level of Service		B			A			B			B	
Approach Delay (s)		11.0			9.7			11.5			11.4	
Approach LOS		B			A			B			B	

### Intersection Summary

HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	46.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 20: Piikoi St & Waimanu St/Ala Moana Plaza

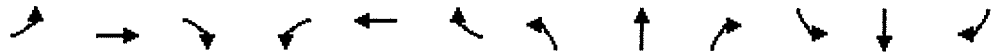
5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	380	164	154	0	35	26	0	721	81	0	146	43
Future Volume (vph)	380	164	154	0	35	26	0	721	81	0	146	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0		5.0			5.0	
Lane Util. Factor	0.91	0.91	1.00		0.95	0.95		0.86			0.95	
Frbp, ped/bikes	1.00	1.00	0.93		1.00	1.00		0.99			0.98	
Fipb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85		0.99	0.85		0.98			0.97	
Flt Protected	0.95	0.97	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1610	3302	1480		1749	1504		6274			3356	
Flt Permitted	0.95	0.71	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (perm)	1610	2417	1480		1749	1504		6274			3356	
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)	396	171	160	0	36	27	0	751	84	0	152	45
RTOR Reduction (vph)	0	0	63	0	0	0	0	18	0	0	26	0
Lane Group Flow (vph)	198	369	97	0	39	24	0	817	0	0	171	0
Confl. Peds. (#/hr)			60						49			39
Turn Type	Prot	NA	Perm		NA	Perm		NA			NA	
Protected Phases	7	4			8			2				6
Permitted Phases			4			8						
Actuated Green, G (s)	31.3	56.7	56.7		20.4	20.4		26.6			26.6	
Effective Green, g (s)	31.3	56.7	56.7		20.4	20.4		26.6			26.6	
Actuated g/C Ratio	0.34	0.61	0.61		0.22	0.22		0.29			0.29	
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)	540	1765	899		382	328		1788			956	
v/s Ratio Prot	c0.12	0.07			0.02			c0.13			0.05	
v/s Ratio Perm		c0.06	0.07			0.02						
v/c Ratio	0.37	0.21	0.11		0.10	0.07		0.46			0.18	
Uniform Delay, d1	23.5	8.2	7.7		29.1	28.9		27.4			25.1	
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.4	0.1	0.1		0.1	0.1		0.2			0.1	
Delay (s)	23.9	8.3	7.7		29.2	29.0		27.6			25.2	
Level of Service	C	A	A		C	C		C			C	
Approach Delay (s)		12.4			29.2			27.6			25.2	
Approach LOS		B			C			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			21.3									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.36									
Actuated Cycle Length (s)			93.3									Sum of lost time (s) 15.0
Intersection Capacity Utilization			61.4%									ICU Level of Service B
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 20: Piikoi St & Waimanu St/Ala Moana Plaza

5/5/2016



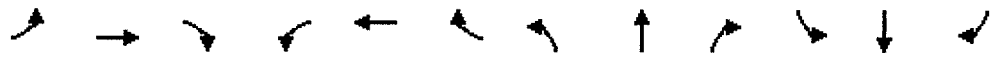
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷	↷		↷	↷		↷			↷	
Traffic Volume (vph)	464	337	286	0	226	231	0	821	87	0	290	61
Future Volume (vph)	464	337	286	0	226	231	0	821	87	0	290	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0		5.0			5.0	
Lane Util. Factor	0.91	0.91	1.00		0.95	0.95		0.86			0.95	
Frbp, ped/bikes	1.00	1.00	0.80		1.00	1.00		0.98			0.97	
Fipb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85		0.99	0.85		0.99			0.97	
Flt Protected	0.95	0.98	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1610	3327	1263		1745	1504		6191			3329	
Flt Permitted	0.95	0.65	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (perm)	1610	2220	1263		1745	1504		6191			3329	
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)	483	351	298	0	235	241	0	855	91	0	302	64
RTOR Reduction (vph)	0	0	28	0	0	0	0	15	0	0	15	0
Lane Group Flow (vph)	270	564	270	0	259	217	0	931	0	0	351	0
Confl. Peds. (#/hr)			167						158			89
Turn Type	Prot	NA	Perm		NA	Perm		NA			NA	
Protected Phases	7	4			8			2			6	
Permitted Phases			4			8						
Actuated Green, G (s)	24.7	80.0	80.0		50.3	50.3		30.0			30.0	
Effective Green, g (s)	24.7	80.0	80.0		50.3	50.3		30.0			30.0	
Actuated g/C Ratio	0.21	0.67	0.67		0.42	0.42		0.25			0.25	
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)	331	1707	842		731	630		1547			832	
v/s Ratio Prot	c0.17	0.07			c0.15			c0.15			0.11	
v/s Ratio Perm		0.15	0.21			0.14						
v/c Ratio	0.82	0.33	0.32		0.35	0.34		0.60			0.42	
Uniform Delay, d1	45.5	8.5	8.5		23.8	23.7		39.7			37.7	
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2	14.3	0.1	0.2		0.3	0.3		0.7			0.3	
Delay (s)	59.8	8.7	8.7		24.1	24.0		40.4			38.1	
Level of Service	E	A	A		C	C		D			D	
Approach Delay (s)		20.9			24.0			40.4			38.1	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	55	82	32	55	94	30	16	211	53	33	250	72
Future Volume (vph)	55	82	32	55	94	30	16	211	53	33	250	72
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	60	90	35	60	103	33	18	232	58	36	275	79

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	185	196	134	174	174	217
Volume Left (vph)	60	60	18	0	36	0
Volume Right (vph)	35	33	0	58	0	79
Hadj (s)	-0.01	-0.01	0.10	-0.20	0.14	-0.22
Departure Headway (s)	6.1	6.1	6.4	6.1	6.3	6.0
Degree Utilization, x	0.31	0.33	0.24	0.29	0.31	0.36
Capacity (veh/h)	540	542	528	553	538	572
Control Delay (s)	11.8	12.0	10.2	10.4	10.9	11.1
Approach Delay (s)	11.8	12.0	10.3		11.0	
Approach LOS	B	B	B		B	













Intersection Summary

Delay	11.1
Level of Service	B
Intersection Capacity Utilization	46.5%
ICU Level of Service	A
Analysis Period (min)	15

# HCM Unsignalized Intersection Capacity Analysis

## 22: Cooke St & Halekauwila St

5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	97	135	61	70	82	65	19	277	34	26	298	47
Future Volume (vph)	97	135	61	70	82	65	19	277	34	26	298	47
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	102	142	64	74	86	68	20	292	36	27	314	49
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	308	228	166	182	184	206						
Volume Left (vph)	102	74	20	0	27	0						
Volume Right (vph)	64	68	0	36	0	49						
Hadj (s)	-0.02	-0.08	0.09	-0.10	0.11	-0.13						
Departure Headway (s)	6.5	6.7	7.2	7.0	7.2	6.9						
Degree Utilization, x	0.56	0.42	0.33	0.35	0.37	0.40						
Capacity (veh/h)	510	482	459	479	473	481						
Control Delay (s)	17.5	14.5	12.6	12.6	13.0	13.1						
Approach Delay (s)	17.5	14.5	12.6	13.1								
Approach LOS	C	B	B	B								
Intersection Summary												
Delay			14.3									
Level of Service			B									
Intersection Capacity Utilization			57.0%		ICU Level of Service		B					
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 25: Cooke St & Pohukaina St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	64	65	49	36	110	42	3	170	58	33	213	91
Future Volume (vph)	64	65	49	36	110	42	3	170	58	33	213	91
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	67	68	51	38	115	44	3	177	60	34	222	95













Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	186	197	92	149	145	206
Volume Left (vph)	67	38	3	0	34	0
Volume Right (vph)	51	44	0	60	0	95
Hadj (s)	-0.06	-0.06	0.05	-0.25	0.15	-0.29
Departure Headway (s)	5.7	5.7	6.2	5.9	6.2	5.7
Degree Utilization, x	0.29	0.31	0.16	0.24	0.25	0.33
Capacity (veh/h)	577	581	540	567	551	595
Control Delay (s)	11.1	11.2	9.2	9.6	10.0	10.3
Approach Delay (s)	11.1	11.2	9.4		10.1	
Approach LOS	B	B	A		B	

### Intersection Summary

Delay	10.4
Level of Service	B
Intersection Capacity Utilization	49.5%
ICU Level of Service	A
Analysis Period (min)	15

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

5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	88	139	27	41	88	60	66	178	47	76	256	92
Future Volume (vph)	88	139	27	41	88	60	66	178	47	76	256	92
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	97	153	30	45	97	66	73	196	52	84	281	101
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	280	208	171	150	225	242						
Volume Left (vph)	97	45	73	0	84	0						
Volume Right (vph)	30	66	0	52	0	101						
Hadj (s)	0.04	-0.11	0.25	-0.21	0.22	-0.26						
Departure Headway (s)	6.6	6.7	7.3	6.8	7.0	6.6						
Degree Utilization, x	0.51	0.38	0.35	0.28	0.44	0.44						
Capacity (veh/h)	503	493	454	491	488	525						
Control Delay (s)	16.3	13.7	12.9	11.3	14.2	13.4						
Approach Delay (s)	16.3	13.7	12.2		13.8							
Approach LOS	C	B	B		B							
Intersection Summary												
Delay			13.9									
Level of Service			B									
Intersection Capacity Utilization			57.3%		ICU Level of Service		B					
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis

30: Cooke St & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	47	22	7	13	12	56	37	94	8	36	207	49
Future Volume (Veh/h)	47	22	7	13	12	56	37	94	8	36	207	49
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	49	23	7	14	13	58	39	98	8	38	216	51
Pedestrians		10			17			6			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								419				
pX, platoon unblocked												
vC, conflicting volume	528	528	150	406	550	79	277			123		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	528	528	150	406	550	79	277			123		
tC, single (s)	*6.5	*5.5	*5.9	*6.5	*5.5	*5.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	95	99	97	97	94	97			97		
cM capacity (veh/h)	430	488	896	526	477	966	1272			1441		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	79	85	88	57	146	159
Volume Left	49	14	39	0	38	0
Volume Right	7	58	0	8	0	51
cSH	468	747	1272	1700	1441	1700
Volume to Capacity	0.17	0.11	0.03	0.03	0.03	0.09
Queue Length 95th (ft)	15	10	2	0	2	0
Control Delay (s)	14.2	10.4	3.6	0.0	2.1	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	14.2	10.4	2.2		1.0	
Approach LOS	B	B				

Intersection Summary		
Average Delay		4.3
Intersection Capacity Utilization	39.3%	ICU Level of Service
Analysis Period (min)		15
		A

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

30: Cooke St & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	43	13	5	18	21	77	14	163	13	42	209	35
Future Volume (Veh/h)	43	13	5	18	21	77	14	163	13	42	209	35
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	45	14	5	19	22	80	15	170	14	44	218	36
Pedestrians		14			18			8			15	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								419				
pX, platoon unblocked												
vC, conflicting volume	559	570	149	442	581	125	268			202		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	559	570	149	442	581	125	268			202		
tC, single (s)	*6.5	*5.5	*5.9	*6.5	*5.5	*5.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	97	99	96	95	91	99			97		
cM capacity (veh/h)	393	472	892	511	466	910	1278			1347		

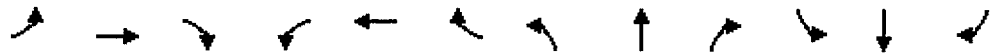
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	64	121	100	99	153	145
Volume Left	45	19	15	0	44	0
Volume Right	5	80	0	14	0	36
cSH	428	702	1278	1700	1347	1700
Volume to Capacity	0.15	0.17	0.01	0.06	0.03	0.09
Queue Length 95th (ft)	13	15	1	0	3	0
Control Delay (s)	14.9	11.2	1.3	0.0	2.4	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	14.9	11.2	0.6		1.2	
Approach LOS	B	B				

Intersection Summary		
Average Delay		4.1
Intersection Capacity Utilization	40.0%	ICU Level of Service
Analysis Period (min)	15	A

\* User Entered Value

HCM Signalized Intersection Capacity Analysis  
 37: Cooke St & Ala Moana Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖↖		↖	↖↖↖			↖	↖		↖	↖
Traffic Volume (vph)	98	1686	42	14	1769	12	27	17	3	48	42	125
Future Volume (vph)	98	1686	42	14	1769	12	27	17	3	48	42	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	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.96		1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5057		1770	5079			1786	1528		1793	1530
Flt Permitted	0.95	1.00		0.95	1.00			0.80	1.00		0.81	1.00
Satd. Flow (perm)	1770	5057		1770	5079			1470	1528		1500	1530
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)	101	1738	43	14	1824	12	28	18	3	49	43	129
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	3	0	0	109
Lane Group Flow (vph)	101	1779	0	14	1836	0	0	46	0	0	92	20
Confl. Peds. (#/hr)			38			24	16		17	17		16
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	11.9	68.7		2.2	59.0			15.8	15.8		15.8	15.8
Effective Green, g (s)	11.9	68.7		2.2	59.0			15.8	15.8		15.8	15.8
Actuated g/C Ratio	0.12	0.68		0.02	0.58			0.16	0.16		0.16	0.16
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	207	3416		38	2946			228	237		233	237
v/s Ratio Prot	c0.06	c0.35		0.01	c0.36							
v/s Ratio Perm								0.03	0.00		c0.06	0.01
v/c Ratio	0.49	0.52		0.37	0.62			0.20	0.00		0.39	0.08
Uniform Delay, d1	42.0	8.3		49.1	14.0			37.5	36.3		38.6	36.8
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.8	0.1		6.0	0.4			0.4	0.0		1.1	0.2
Delay (s)	43.9	8.4		55.0	14.5			37.9	36.3		39.8	36.9
Level of Service	D	A		E	B			D	D		D	D
Approach Delay (s)		10.3			14.8			37.8			38.1	
Approach LOS		B			B			D			D	

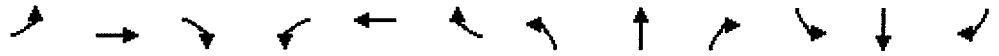
Intersection Summary

HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	101.7	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

## 37: Cooke St/Cooke St & Ala Moana Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑↑		↖	↑↑↑			↑	↗		↑	↗
Traffic Volume (vph)	65	2203	31	9	1771	102	62	47	14	35	29	145
Future Volume (vph)	65	2203	31	9	1771	102	62	47	14	35	29	145
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
Frbp, ped/bikes	1.00	1.00		1.00	0.99			1.00	0.96		1.00	0.90
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.97	1.00		0.99	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5061		1770	5018			1750	1514		1787	1423
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.80	1.00
Satd. Flow (perm)	1770	5061		1770	5018			1416	1514		1468	1423
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	2295	32	9	1845	106	65	49	15	36	30	151
RTOR Reduction (vph)	0	1	0	0	4	0	0	0	12	0	0	100
Lane Group Flow (vph)	68	2326	0	9	1947	0	0	114	3	0	66	51
Confl. Peds. (#/hr)			56			45	52		26	26		52
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	8.2	77.5		0.6	69.9			19.2	19.2		19.2	19.2
Effective Green, g (s)	8.2	77.5		0.6	69.9			19.2	19.2		19.2	19.2
Actuated g/C Ratio	0.07	0.69		0.01	0.62			0.17	0.17		0.17	0.17
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)	129	3492		9	3123			242	258		250	243
v/s Ratio Prot	c0.04	c0.46		0.01	0.39							
v/s Ratio Perm							c0.08	0.00			0.04	0.04
v/c Ratio	0.53	0.67		1.00	0.62		0.47	0.01			0.26	0.21
Uniform Delay, d1	50.2	10.0		55.9	13.1		42.0	38.7			40.4	40.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.9	0.5		300.0	0.4		1.4	0.0			0.6	0.4
Delay (s)	54.0	10.5		355.9	13.5		43.4	38.7			41.0	40.4
Level of Service	D	B		F	B		D	D			D	D
Approach Delay (s)		11.7			15.0		42.9				40.6	
Approach LOS		B			B		D				D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			15.3			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			112.3			Sum of lost time (s)		15.0				
Intersection Capacity Utilization			77.8%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 41: Ala Moana Blvd & Ward Ave

5/6/2016



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↑↑↑			↘	↑↑↑	↗		↖	↗	↖	↗
Traffic Volume (vph)	194	1488	4	12	123	1620	168	1	61	44	131	142
Future Volume (vph)	194	1488	4	12	123	1620	168	1	61	44	131	142
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
Frbp, ped/bikes	1.00	1.00			1.00	1.00	0.96		1.00	0.95	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	0.91
Flt Protected	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	5082			1770	5085	1512		3536	1500	1610	2986
Flt Permitted	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	5082			1770	5085	1512		3536	1500	1610	2986
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)	202	1550	4	12	128	1688	175	1	64	46	136	148
RTOR Reduction (vph)	0	0	0	0	0	0	79	0	0	0	0	166
Lane Group Flow (vph)	202	1554	0	0	141	1688	96	0	65	46	122	212
Confl. Peds. (#/hr)			30				21	36		35	35	
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		8	8		4	4
Permitted Phases						6				8		
Actuated Green, G (s)	17.8	54.0			14.0	50.2	50.2		25.7	25.7	24.6	24.6
Effective Green, g (s)	17.8	54.0			14.0	50.2	50.2		25.7	25.7	24.6	24.6
Actuated g/C Ratio	0.13	0.39			0.10	0.36	0.36		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)	227	1984			179	1845	548		657	278	286	531
v/s Ratio Prot	c0.11	c0.31			0.08	c0.33			0.02		c0.08	0.07
v/s Ratio Perm						0.06				c0.03		
v/c Ratio	0.89	0.78			0.79	0.91	0.18		0.10	0.17	0.43	0.40
Uniform Delay, d1	59.3	37.0			60.7	42.0	30.0		46.7	47.3	50.6	50.3
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	31.6	2.1			20.1	7.5	0.2		0.1	0.3	1.0	0.5
Delay (s)	90.9	39.1			80.8	49.5	30.1		46.8	47.6	51.6	50.8
Level of Service	F	D			F	D	C		D	D	D	D
Approach Delay (s)		45.1				50.0			47.1			51.0
Approach LOS		D				D			D			D

### Intersection Summary

HCM 2000 Control Delay	48.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	138.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

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

5/6/2016

Movement	SBR
<b>Approach Configurations</b>	
Traffic Volume (vph)	207
Future Volume (vph)	207
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Fipb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	216
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	36
<b>Turn Type</b>	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
<b>Intersection Summary</b>	

# HCM Signalized Intersection Capacity Analysis

## 41: Ala Moana Blvd & Ward Ave

5/9/2016



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↵	↑↑↑			↵	↑↑↑	↵		↑↑	↵	↵	↑↑
Traffic Volume (vph)	276	1930	1	13	42	1586	219	6	145	101	203	69
Future Volume (vph)	276	1930	1	13	42	1586	219	6	145	101	203	69
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
Frbp, ped/bikes	1.00	1.00			1.00	1.00	0.92		1.00	0.90	1.00	0.95
Ftpb, 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	0.88
Flt Protected	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	5085			1770	5085	1465		3532	1426	1610	2824
Flt Permitted	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	5085			1770	5085	1465		3532	1426	1610	2824
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)	288	2010	1	14	44	1652	228	6	151	105	211	72
RTOR Reduction (vph)	0	0	0	0	0	0	111	0	0	0	0	262
Lane Group Flow (vph)	288	2011	0	0	58	1652	117	0	157	105	190	151
Confl. Peds. (#/hr)			45				38	41		71	71	
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		8	8		4	4
Permitted Phases							6			8		
Actuated Green, G (s)	21.0	60.1			5.0	44.1	44.1		35.1	35.1	26.5	26.5
Effective Green, g (s)	21.0	60.1			5.0	44.1	44.1		35.1	35.1	26.5	26.5
Actuated g/C Ratio	0.14	0.41			0.03	0.30	0.30		0.24	0.24	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)	253	2083			60	1528	440		845	341	290	510
v/s Ratio Prot	c0.16	0.40			0.03	c0.32			0.04		c0.12	0.05
v/s Ratio Perm							0.08			c0.07		
v/c Ratio	1.14	0.97			0.97	1.08	0.27		0.19	0.31	0.66	0.30
Uniform Delay, d1	62.8	42.3			70.8	51.3	39.0		44.4	45.8	55.9	52.0
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	99.0	12.5			103.3	48.4	0.3		0.1	0.5	5.2	0.3
Delay (s)	161.9	54.8			174.0	99.7	39.3		44.5	46.3	61.1	52.3
Level of Service	F	D			F	F	D		D	D	E	D
Approach Delay (s)		68.2				94.8			45.3			55.1
Approach LOS		E				F			D			E

### Intersection Summary

HCM 2000 Control Delay	75.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	146.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	111.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

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

5/9/2016

Movement	SBR
<b>Approach</b>	
Lane Configurations	
Traffic Volume (vph)	307
Future Volume (vph)	307
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	320
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	41
<b>Turn Type</b>	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
<b>Intersection Summary</b>	



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

5/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	1553	73	14	1711	76	44	28	14	56	36	145
Future Volume (vph)	65	1553	73	14	1711	76	44	28	14	56	36	145
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
Frbp, 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	0.95			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	5028		1770	5043		1770	1720			1725	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.70	1.00			0.81	1.00
Satd. Flow (perm)	1770	5028		1770	5043		1297	1720			1439	1583
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)	66	1585	74	14	1746	78	45	29	14	57	37	148
RTOR Reduction (vph)	0	3	0	0	3	0	0	11	0	0	0	109
Lane Group Flow (vph)	66	1656	0	14	1821	0	45	32	0	0	94	39
Confl. Peds. (#/hr)			43			21			76	76		
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)	8.1	72.0		2.3	66.2		26.6	26.6			26.6	26.6
Effective Green, g (s)	8.1	72.0		2.3	66.2		26.6	26.6			26.6	26.6
Actuated g/C Ratio	0.07	0.62		0.02	0.57		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)	123	3123		35	2880		297	394			330	363
v/s Ratio Prot	c0.04	0.33		0.01	c0.36			0.02				
v/s Ratio Perm							0.03				c0.07	0.02
v/c Ratio	0.54	0.53		0.40	0.63		0.15	0.08			0.28	0.11
Uniform Delay, d1	52.1	12.4		56.1	16.7		35.6	35.1			36.8	35.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	4.4	0.2		7.3	0.5		0.2	0.1			0.5	0.1
Delay (s)	56.5	12.6		63.5	17.1		35.9	35.1			37.3	35.4
Level of Service	E	B		E	B		D	D			D	D
Approach Delay (s)		14.3			17.5			35.5			36.1	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	115.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	82.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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

5/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑↑		↖	↑↑↑		↖	↑			↖	↖
Traffic Volume (vph)	79	2056	199	24	1413	128	105	56	29	85	88	233
Future Volume (vph)	79	2056	199	24	1413	128	105	56	29	85	88	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	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
Frb, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.95			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.94	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1770	4929		1770	4978		1770	1685			1718	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.52	1.00			0.80	1.00
Satd. Flow (perm)	1770	4929		1770	4978		978	1685			1411	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)	81	2120	205	25	1457	132	108	58	30	88	91	240
RTOR Reduction (vph)	0	7	0	0	7	0	0	13	0	0	0	96
Lane Group Flow (vph)	81	2318	0	25	1582	0	108	75	0	0	179	144
Confl. Peds. (#/hr)			82			50			104	104		
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)	11.1	83.1		3.3	75.3		33.4	33.4			33.4	33.4
Effective Green, g (s)	11.1	83.1		3.3	75.3		33.4	33.4			33.4	33.4
Actuated g/C Ratio	0.08	0.62		0.02	0.56		0.25	0.25			0.25	0.25
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)	145	3038		43	2780		242	417			349	392
v/s Ratio Prot	c0.05	c0.47		0.01	0.32			0.04				
v/s Ratio Perm							0.11				c0.13	0.09
v/c Ratio	0.56	0.76		0.58	0.57		0.45	0.18			0.51	0.37
Uniform Delay, d1	59.5	18.7		65.1	19.3		42.9	39.9			43.7	41.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	4.6	1.2		18.4	0.3		1.3	0.2			1.3	0.6
Delay (s)	64.1	19.9		83.5	19.5		44.2	40.1			45.0	42.5
Level of Service	E	B		F	B		D	D			D	D
Approach Delay (s)		21.4			20.5			42.4			43.6	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	134.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 44: Ala Moana Blvd & Queens St

5/5/2016

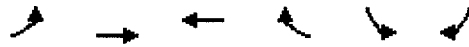


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑↑	↑↑↑		↘	↙
Traffic Volume (vph)	16	1618	1794	150	60	22
Future Volume (vph)	16	1618	1794	150	60	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91	0.91		0.97	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	5085	5006		3433	1478
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	5085	5006		3433	1478
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	16	1668	1849	155	62	23
RTOR Reduction (vph)	0	0	6	0	0	18
Lane Group Flow (vph)	16	1668	1998	0	62	5
Confl. Peds. (#/hr)	39			39		52
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	2.3	84.5	77.2		23.5	23.5
Effective Green, g (s)	2.3	84.5	77.2		23.5	23.5
Actuated g/C Ratio	0.02	0.72	0.65		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)	34	3641	3275		683	294
v/s Ratio Prot	0.01	c0.33	c0.40		c0.02	
v/s Ratio Perm						0.00
v/c Ratio	0.47	0.46	0.61		0.09	0.02
Uniform Delay, d1	57.2	7.1	11.7		38.5	38.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	9.9	0.1	0.3		0.1	0.0
Delay (s)	67.2	7.2	12.1		38.6	38.0
Level of Service	E	A	B		D	D
Approach Delay (s)		7.7	12.1		38.4	
Approach LOS		A	B		D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			10.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.50			
Actuated Cycle Length (s)			118.0		Sum of lost time (s)	15.0
Intersection Capacity Utilization			70.2%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 44: Ala Moana Blvd & Queens St

5/5/2016



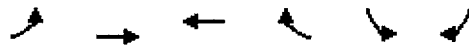
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	29	2157	1489	244	196	52
Future Volume (vph)	29	2157	1489	244	196	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91	0.91		0.97	1.00
Frbp, ped/bikes	1.00	1.00	0.99		1.00	0.92
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	5085	4911		3433	1453
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	5085	4911		3433	1453
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	30	2247	1551	254	204	54
RTOR Reduction (vph)	0	0	13	0	0	42
Lane Group Flow (vph)	30	2247	1792	0	204	12
Confl. Peds. (#/hr)	73			73		64
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	4.6	89.6	80.0		28.0	28.0
Effective Green, g (s)	4.6	89.6	80.0		28.0	28.0
Actuated g/C Ratio	0.04	0.70	0.63		0.22	0.22
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)	63	3570	3078		753	318
v/s Ratio Prot	0.02	c0.44	0.36		c0.06	
v/s Ratio Perm						0.01
v/c Ratio	0.48	0.63	0.58		0.27	0.04
Uniform Delay, d1	60.3	10.1	14.0		41.3	39.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	5.6	0.4	0.3		0.2	0.0
Delay (s)	65.9	10.5	14.3		41.5	39.2
Level of Service	E	B	B		D	D
Approach Delay (s)		11.2	14.3		41.0	
Approach LOS		B	B		D	

Intersection Summary			
HCM 2000 Control Delay		14.3	HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio		0.57	
Actuated Cycle Length (s)		127.6	Sum of lost time (s) 15.0
Intersection Capacity Utilization		75.6%	ICU Level of Service D
Analysis Period (min)		15	
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 45: Ala Moana Blvd & Piikoi St

5/5/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔↔	↑↑↑	↑↑↑		↔	↔↔
Traffic Volume (vph)	393	1267	1803	340	138	135
Future Volume (vph)	393	1267	1803	340	138	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frbp, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	5085	4946		1770	2787
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	5085	4946		1770	2787
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	409	1320	1878	354	144	141
RTOR Reduction (vph)	0	0	17	0	0	124
Lane Group Flow (vph)	409	1320	2215	0	144	17
Confl. Peds. (#/hr)	12			12	50	
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	9	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	28.1	77.6	77.6		16.3	16.3
Effective Green, g (s)	28.1	77.6	77.6		16.3	16.3
Actuated g/C Ratio	0.21	0.57	0.57		0.12	0.12
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)	704	2880	2801		210	331
v/s Ratio Prot	c0.12	0.26	c0.45		c0.08	
v/s Ratio Perm						0.01
v/c Ratio	0.58	0.46	0.79		0.69	0.05
Uniform Delay, d1	49.1	17.4	23.3		57.9	53.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.2	0.1	1.6		8.9	0.1
Delay (s)	50.4	17.5	24.9		66.8	53.6
Level of Service	D	B	C		E	D
Approach Delay (s)		25.3	24.9		60.3	
Approach LOS		C	C		E	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			27.4		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.73			
Actuated Cycle Length (s)			137.0		Sum of lost time (s)	15.0
Intersection Capacity Utilization			74.0%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 45: Ala Moana Blvd & Piikoi St

5/5/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	355	2022	1517	325	263	216
Future Volume (vph)	355	2022	1517	325	263	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frbp, ped/bikes	1.00	1.00	0.97		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	5085	4813		1770	2787
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	5085	4813		1770	2787
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	370	2106	1580	339	274	225
RTOR Reduction (vph)	0	0	20	0	0	183
Lane Group Flow (vph)	370	2106	1899	0	274	42
Confl. Peds. (#/hr)	139			139	128	
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	9	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	32.2	74.6	74.6		27.9	27.9
Effective Green, g (s)	32.2	74.6	74.6		27.9	27.9
Actuated g/C Ratio	0.22	0.50	0.50		0.19	0.19
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)	738	2534	2398		329	519
v/s Ratio Prot	c0.11	c0.41	0.39		c0.15	
v/s Ratio Perm						0.02
v/c Ratio	0.50	0.83	0.79		0.83	0.08
Uniform Delay, d1	51.7	32.2	31.1		58.7	50.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.5	2.5	1.9		16.3	0.1
Delay (s)	52.2	34.6	33.0		75.0	50.4
Level of Service	D	C	C		E	D
Approach Delay (s)		37.3	33.0		63.9	
Approach LOS		D	C		E	

Intersection Summary			
HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	149.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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**APPENDIX G**






















**CAPACITY ANALYSIS CALCULATIONS  
PROJECTED YEAR 2021 PEAK HOUR TRAFFIC ANALYSIS**

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# HCM Signalized Intersection Capacity Analysis

## 15: Ward Ave & Queen St

5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	234	82	93	420	114	86	466	77	78	725	204
Future Volume (vph)	51	234	82	93	420	114	86	466	77	78	725	204
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	0.99		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frnt	1.00	0.96		1.00	0.97		1.00	0.98		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)	1760	1779		1757	1792		1770	3417		1770	3375	
Flt Permitted	0.17	1.00		0.43	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	315	1779		802	1792		1770	3417		1770	3375	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	54	249	87	99	447	121	91	496	82	83	771	217
RTOR Reduction (vph)	0	14	0	0	11	0	0	15	0	0	29	0
Lane Group Flow (vph)	54	322	0	99	557	0	91	563	0	83	959	0
Confl. Peds. (#/hr)	21		15	15		21			58			34
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)	29.0	29.0		29.0	29.0		5.0	30.0		5.0	30.0	
Effective Green, g (s)	29.0	29.0		29.0	29.0		5.0	30.0		5.0	30.0	
Actuated g/C Ratio	0.37	0.37		0.37	0.37		0.06	0.38		0.06	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)	115	653		294	657		112	1297		112	1281	
v/s Ratio Prot		0.18			c0.31		c0.05	0.16		0.05	c0.28	
v/s Ratio Perm	0.17			0.12								
v/c Ratio	0.47	0.49		0.34	0.85		0.81	0.43		0.74	0.75	
Uniform Delay, d1	19.1	19.3		18.1	23.0		36.5	18.2		36.4	21.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.0	0.6		0.7	9.9		34.4	0.2		22.9	2.4	
Delay (s)	22.1	19.9		18.7	32.9		71.0	18.4		59.3	23.7	
Level of Service	C	B		B	C		E	B		E	C	
Approach Delay (s)		20.2			30.8			25.6			26.4	
Approach LOS		C			C			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		26.4										
HCM 2000 Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		79.0								15.0		
Intersection Capacity Utilization		81.4%										
Analysis Period (min)		15										
c Critical Lane Group												



# HCM Signalized Intersection Capacity Analysis

## 15: Ward Ave & Queen St

5/5/2016



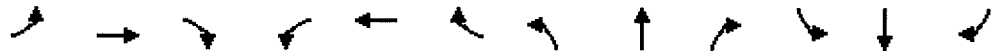
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	487	149	97	442	108	68	792	176	180	820	83
Future Volume (vph)	104	487	149	97	442	108	68	792	176	180	820	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total 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	0.99		1.00	1.00		1.00	0.97		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frnt	1.00	0.96		1.00	0.97		1.00	0.97		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)	1764	1782		1761	1800		1770	3350		1770	3457	
Flt Permitted	0.20	1.00		0.11	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	368	1782		206	1800		1770	3350		1770	3457	
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)	108	507	155	101	460	112	71	825	183	188	854	86
RTOR Reduction (vph)	0	12	0	0	10	0	0	21	0	0	8	0
Lane Group Flow (vph)	108	650	0	101	563	0	71	987	0	188	932	0
Confl. Peds. (#/hr)	11		25	25		11			88			59
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)	36.0	36.0		36.0	36.0		4.7	30.8		8.0	34.1	
Effective Green, g (s)	36.0	36.0		36.0	36.0		4.7	30.8		8.0	34.1	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.05	0.34		0.09	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)	147	714		82	721		92	1148		157	1312	
v/s Ratio Prot		0.36			0.31		0.04	c0.29		c0.11	c0.27	
v/s Ratio Perm	0.29			c0.49								
v/c Ratio	0.73	0.91		1.23	0.78		0.77	0.86		1.20	0.71	
Uniform Delay, d1	22.8	25.4		26.9	23.5		42.0	27.5		40.9	23.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	17.2	15.8		174.1	5.5		32.1	6.6		134.7	1.8	
Delay (s)	40.1	41.1		201.0	29.0		74.2	34.1		175.6	25.5	
Level of Service	D	D		F	C		E	C		F	C	
Approach Delay (s)		41.0			54.8			36.7			50.5	
Approach LOS		D			D			D			D	

### Intersection Summary

HCM 2000 Control Delay	45.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	89.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔		↖	↕↕			↕↕			↕↕	
Traffic Volume (vph)	50	220	1	213	297	29	16	143	94	38	238	112
Future Volume (vph)	50	220	1	213	297	29	16	143	94	38	238	112
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	
Fr <sub>t</sub>		1.00		1.00	0.99			0.94			0.96	
Fl <sub>t</sub> Protected		0.99		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		3505		1770	3492			3331			3370	
Fl <sub>t</sub> Permitted		0.82		0.95	1.00			0.92			0.90	
Satd. Flow (perm)		2908		1770	3492			3064			3041	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	53	234	1	227	316	31	17	152	100	40	253	119
RTOR Reduction (vph)	0	0	0	0	9	0	0	70	0	0	58	0
Lane Group Flow (vph)	0	288	0	227	338	0	0	199	0	0	354	0
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)		13.2		12.7	30.9			17.3			17.3	
Effective Green, g (s)		13.2		12.7	30.9			17.3			17.3	
Actuated g/C Ratio		0.23		0.22	0.53			0.30			0.30	
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)		659		386	1854			910			903	
v/s Ratio Prot				c0.13	0.10							
v/s Ratio Perm		c0.10						0.06			c0.12	
v/c Ratio		0.44		0.59	0.18			0.22			0.39	
Uniform Delay, d <sub>1</sub>		19.3		20.4	7.1			15.4			16.3	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d <sub>2</sub>		0.5		2.3	0.0			0.1			0.3	
Delay (s)		19.8		22.7	7.1			15.5			16.6	
Level of Service		B		C	A			B			B	
Approach Delay (s)		19.8			13.3			15.5			16.6	
Approach LOS		B			B			B			B	

Intersection Summary

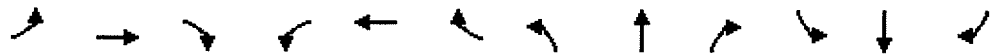
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	58.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 16: Kamakee St & Queen St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕		↙	↕↕			↕↕			↕↕	
Traffic Volume (vph)	113	499	52	329	521	54	44	185	83	67	140	53
Future Volume (vph)	113	499	52	329	521	54	44	185	83	67	140	53
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	
Frt		0.99		1.00	0.99			0.96			0.97	
Flt Protected		0.99		0.95	1.00			0.99			0.99	
Satd. Flow (prot)		3468		1770	3490			3375			3388	
Flt Permitted		0.73		0.95	1.00			0.86			0.72	
Satd. Flow (perm)		2558		1770	3490			2918			2475	
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)	118	520	54	343	543	56	46	193	86	70	146	55
RTOR Reduction (vph)	0	6	0	0	8	0	0	30	0	0	19	0
Lane Group Flow (vph)	0	686	0	343	591	0	0	295	0	0	252	0
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)		31.8		23.1	59.9			16.1			16.1	
Effective Green, g (s)		31.8		23.1	59.9			16.1			16.1	
Actuated g/C Ratio		0.37		0.27	0.70			0.19			0.19	
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)		945		475	2430			546			463	
v/s Ratio Prot				c0.19	0.17							
v/s Ratio Perm		c0.27						0.10			c0.10	
v/c Ratio		0.73		0.72	0.24			0.54			0.54	
Uniform Delay, d1		23.3		28.5	4.8			31.6			31.6	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		2.8		5.4	0.1			1.1			1.3	
Delay (s)		26.2		33.9	4.8			32.7			32.9	
Level of Service		C		C	A			C			C	
Approach Delay (s)		26.2			15.4			32.7			32.9	
Approach LOS		C			B			C			C	

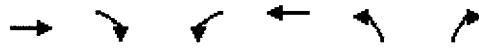
### Intersection Summary

HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

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

5/5/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	
Traffic Volume (veh/h)	347	21	100	518	25	74
Future Volume (Veh/h)	347	21	100	518	25	74
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)	365	22	105	545	26	78
Pedestrians						19
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						2
Right turn flare (veh)						
Median type	TWLTL		None			
Median storage veh	2					
Upstream signal (ft)	564		680			
pX, platoon unblocked						
vC, conflicting volume			406			878 212
vC1, stage 1 conf vol					395	
vC2, stage 2 conf vol					482	
vCu, unblocked vol			406			878 212
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			95 91
cM capacity (veh/h)			1131			533 830

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	243	144	105	272	272	104
Volume Left	0	0	105	0	0	26
Volume Right	0	22	0	0	0	78
cSH	1700	1700	1131	1700	1700	728
Volume to Capacity	0.14	0.08	0.09	0.16	0.16	0.14
Queue Length 95th (ft)	0	0	8	0	0	12
Control Delay (s)	0.0	0.0	8.5	0.0	0.0	10.8
Lane LOS	A			B		
Approach Delay (s)	0.0		1.4		10.8	
Approach LOS					B	

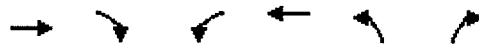
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			33.2%		ICU Level of Service A	
Analysis Period (min)			15			

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

## 17: Queens Ln & Queen St

5/5/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	
Traffic Volume (veh/h)	611	10	77	845	48	199
Future Volume (Veh/h)	611	10	77	845	48	199
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	687	11	87	949	54	224
Pedestrians						19
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						2
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh	2					
Upstream signal (ft)	564			687		
pX, platoon unblocked			0.90		0.90	0.90
vC, conflicting volume			717		1360	368
vC1, stage 1 conf vol					712	
vC2, stage 2 conf vol					648	
vCu, unblocked vol			475		1186	89
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		88	74
cM capacity (veh/h)			964		433	869

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	458	240	87	474	474	278
Volume Left	0	0	87	0	0	54
Volume Right	0	11	0	0	0	224
cSH	1700	1700	964	1700	1700	727
Volume to Capacity	0.27	0.14	0.09	0.28	0.28	0.38
Queue Length 95th (ft)	0	0	7	0	0	45
Control Delay (s)	0.0	0.0	9.1	0.0	0.0	13.0
Lane LOS	A			B		
Approach Delay (s)	0.0		0.8			13.0
Approach LOS						B

Intersection Summary						
Average Delay			2.2			
Intersection Capacity Utilization			46.4%	ICU Level of Service	A	
Analysis Period (min)			15			

\* User Entered Value

# HCM Signalized Intersection Capacity Analysis

## 24: Ward Ave & Halekauwila St

5/6/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔					↖	↕		↗	↕	
Traffic Volume (vph)	119	13	7	0	0	0	48	460	3	16	569	264
Future Volume (vph)	119	13	7	0	0	0	48	460	3	16	569	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	
Lane Util. Factor		1.00					1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00					1.00	1.00		1.00	0.98	
Flpb, ped/bikes		1.00					0.98	1.00		1.00	1.00	
Frt		0.99					1.00	1.00		1.00	0.95	
Flt Protected		0.96					0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1769					1741	3536		1770	3288	
Flt Permitted		0.96					0.28	1.00		0.48	1.00	
Satd. Flow (perm)		1769					512	3536		893	3288	
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)	123	13	7	0	0	0	49	474	3	16	587	272
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	0	0	56	0
Lane Group Flow (vph)	0	142	0	0	0	0	49	477	0	16	803	0
Confl. Peds. (#/hr)	2		44				42					42
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		17.7					28.2	28.2		28.2	28.2	
Effective Green, g (s)		17.7					28.2	28.2		28.2	28.2	
Actuated g/C Ratio		0.32					0.50	0.50		0.50	0.50	
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)		560					258	1783		450	1658	
v/s Ratio Prot								0.13			c0.24	
v/s Ratio Perm		0.08					0.10			0.02		
v/c Ratio		0.25					0.19	0.27		0.04	0.48	
Uniform Delay, d1		14.2					7.6	7.9		7.0	9.1	
Progression Factor		1.00					1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2					0.4	0.1		0.0	0.2	
Delay (s)		14.4					7.9	8.0		7.0	9.3	
Level of Service		B					A	A		A	A	
Approach Delay (s)		14.4			0.0			8.0			9.3	
Approach LOS		B			A			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		9.3										
HCM 2000 Volume to Capacity ratio		0.39										
Actuated Cycle Length (s)		55.9								10.0		
Intersection Capacity Utilization		59.6%								B		
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 24: Ward Ave & Halekauwila St/Driveway

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔					↗	↕		↖	↕	
Traffic Volume (vph)	266	23	85	0	0	0	17	763	6	33	709	161
Future Volume (vph)	266	23	85	0	0	0	17	763	6	33	709	161
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		0.98					1.00	1.00		1.00	0.98	
Flpb, ped/bikes		1.00					0.98	1.00		1.00	1.00	
Frt		0.97					1.00	1.00		1.00	0.97	
Flt Protected		0.97					0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1716					1733	3535		1770	3373	
Flt Permitted		0.97					0.22	1.00		0.27	1.00	
Satd. Flow (perm)		1716					404	3535		509	3373	
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)	277	24	89	0	0	0	18	795	6	34	739	168
RTOR Reduction (vph)	0	12	0	0	0	0	0	1	0	0	25	0
Lane Group Flow (vph)	0	378	0	0	0	0	18	800	0	34	882	0
Confl. Peds. (#/hr)			91				63					63
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		23.0					23.4	23.4		23.4	23.4	
Effective Green, g (s)		23.0					23.4	23.4		23.4	23.4	
Actuated g/C Ratio		0.41					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)		699					167	1466		211	1399	
v/s Ratio Prot								0.23			c0.26	
v/s Ratio Perm		0.22					0.04			0.07		
v/c Ratio		0.54					0.11	0.55		0.16	0.63	
Uniform Delay, d1		12.7					10.1	12.5		10.3	13.1	
Progression Factor		1.00					1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.9					0.3	0.4		0.4	0.9	
Delay (s)		13.5					10.4	12.9		10.7	14.0	
Level of Service		B					B	B		B	B	
Approach Delay (s)		13.5			0.0			12.8			13.9	
Approach LOS		B			A			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			13.4				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			56.4				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			58.2%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis  
 47: Kamakee St & Halekauwila St

5/18/2016



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	66	98	78	194	338	101
Future Volume (Veh/h)	66	98	78	194	338	101
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	107	85	211	367	110
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
				None	None	
Median storage (veh)						
Upstream signal (ft)						
				269	309	
pX, platoon unblocked						
vC, conflicting volume	698	177	477			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	698	177	477			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	83	88	92			
cM capacity (veh/h)	423	879	1082			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	72	107	155	141	147	147	183
Volume Left	72	0	85	0	0	0	0
Volume Right	0	107	0	0	0	0	110
cSH	423	879	1082	1700	1700	1700	1700
Volume to Capacity	0.17	0.12	0.08	0.08	0.09	0.09	0.11
Queue Length 95th (ft)	15	10	6	0	0	0	0
Control Delay (s)	15.3	9.7	5.0	0.0	0.0	0.0	0.0
Lane LOS	C	A	A				
Approach Delay (s)	11.9		2.6		0.0		
Approach LOS	B						

Intersection Summary			
Average Delay			3.1
Intersection Capacity Utilization	30.1%		ICU Level of Service
Analysis Period (min)	15		A

\* User Entered Value



# HCM Unsignalized Intersection Capacity Analysis

## 47: Kamakee St & Halekauwila St

5/18/2016



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	28	43	87	283	478	54
Future Volume (Veh/h)	28	43	87	283	478	54
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	47	95	308	520	59
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked	0.98			269	309	
vC, conflicting volume	894	203	579			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	849	203	579			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	94	90			
cM capacity (veh/h)	339	853	991			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	30	47	198	205	208	208	163
Volume Left	30	0	95	0	0	0	0
Volume Right	0	47	0	0	0	0	59
cSH	339	853	991	1700	1700	1700	1700
Volume to Capacity	0.09	0.06	0.10	0.12	0.12	0.12	0.10
Queue Length 95th (ft)	7	4	8	0	0	0	0
Control Delay (s)	16.6	9.5	4.8	0.0	0.0	0.0	0.0
Lane LOS	C	A	A				
Approach Delay (s)	12.3		2.4		0.0		
Approach LOS	B						

Intersection Summary			
Average Delay		1.8	
Intersection Capacity Utilization	34.1%		ICU Level of Service
Analysis Period (min)	15		A

\* User Entered Value

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

5/5/2016

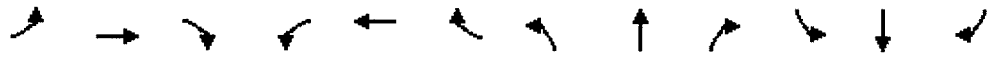


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↑	↗	↖	↗		↖	↗		↖	↗		
Traffic Volume (vph)	26	77	36	124	110	165	60	323	78	92	459	70	
Future Volume (vph)	26	77	36	124	110	165	60	323	78	92	459	70	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95		
Frbp, ped/bikes	1.00	1.00	1.00	1.00	0.98		1.00	0.99		1.00	0.99		
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00		0.99	1.00		0.97	1.00		
Frt	1.00	1.00	0.85	1.00	0.91		1.00	0.97		1.00	0.98		
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1750	1863	1583	1770	1666		1747	3388		1720	3447		
Flt Permitted	0.54	1.00	1.00	0.70	1.00		0.43	1.00		0.50	1.00		
Satd. Flow (perm)	1001	1863	1583	1308	1666		790	3388		903	3447		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	28	84	39	135	120	179	65	351	85	100	499	76	
RTOR Reduction (vph)	0	0	25	0	70	0	0	24	0	0	14	0	
Lane Group Flow (vph)	28	84	14	135	229	0	65	412	0	100	561	0	
Confl. Peds. (#/hr)	37					37	34		63	63		34	
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)	16.1	16.1	16.1	16.1	16.1		19.9	19.9		19.9	19.9		
Effective Green, g (s)	16.1	16.1	16.1	16.1	16.1		19.9	19.9		19.9	19.9		
Actuated g/C Ratio	0.35	0.35	0.35	0.35	0.35		0.43	0.43		0.43	0.43		
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)	350	652	554	457	583		341	1465		390	1491		
v/s Ratio Prot		0.05			c0.14			0.12			c0.16		
v/s Ratio Perm	0.03		0.01	0.10			0.08			0.11			
v/c Ratio	0.08	0.13	0.02	0.30	0.39		0.19	0.28		0.26	0.38		
Uniform Delay, d1	10.0	10.2	9.8	10.8	11.3		8.1	8.4		8.3	8.8		
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	0.1	0.1	0.0	0.4	0.4		0.3	0.1		0.3	0.2		
Delay (s)	10.1	10.3	9.8	11.2	11.7		8.3	8.5		8.7	9.0		
Level of Service	B	B	A	B	B		A	A		A	A		
Approach Delay (s)		10.1			11.6			8.5			9.0		
Approach LOS		B			B			A			A		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			9.6	HCM 2000 Level of Service						A			
HCM 2000 Volume to Capacity ratio			0.38										
Actuated Cycle Length (s)			46.0	Sum of lost time (s)						10.0			
Intersection Capacity Utilization			62.5%	ICU Level of Service						B			
Analysis Period (min)			15										
c Critical Lane Group													

# HCM Signalized Intersection Capacity Analysis

## 34: Ward Ave & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↗	↖	↖	↑↗	↖
Traffic Volume (vph)	31	175	67	146	97	269	48	448	192	308	441	71
Future Volume (vph)	31	175	67	146	97	269	48	448	192	308	441	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.95		1.00	0.96		1.00	0.99	
Flpb, ped/bikes	0.97	1.00	1.00	0.98	1.00		0.97	1.00		0.95	1.00	
Fr t	1.00	1.00	0.85	1.00	0.89		1.00	0.95		1.00	0.98	
Fl t Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1723	1863	1517	1728	1580		1720	3239		1689	3428	
Fl t Permitted	0.33	1.00	1.00	0.62	1.00		0.44	1.00		0.37	1.00	
Satd. Flow (perm)	604	1863	1517	1124	1580		802	3239		660	3428	
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)	32	180	69	151	100	277	49	462	198	318	455	73
RTOR Reduction (vph)	0	0	48	0	114	0	0	53	0	0	14	0
Lane Group Flow (vph)	32	180	21	151	263	0	49	607	0	318	514	0
Confl. Peds. (#/hr)	67		39	39		67	43		87	87		43
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)	24.3	24.3	24.3	24.3	24.3		43.8	43.8		43.8	43.8	
Effective Green, g (s)	24.3	24.3	24.3	24.3	24.3		43.8	43.8		43.8	43.8	
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31		0.56	0.56		0.56	0.56	
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)	187	579	471	349	491		449	1816		370	1922	
v/s Ratio Prot		0.10			c0.17			0.19			0.15	
v/s Ratio Perm	0.05		0.01	0.13			0.06			c0.48		
v/c Ratio	0.17	0.31	0.05	0.43	0.53		0.11	0.33		0.86	0.27	
Uniform Delay, d1	19.6	20.5	18.8	21.4	22.2		8.0	9.3		14.5	8.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.3	0.0	0.9	1.1		0.1	0.1		17.7	0.1	
Delay (s)	20.0	20.8	18.8	22.3	23.4		8.1	9.4		32.2	8.9	
Level of Service	C	C	B	C	C		A	A		C	A	
Approach Delay (s)		20.2			23.0			9.3			17.7	
Approach LOS		C			C			A			B	

### Intersection Summary

HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	78.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 35: Kamakee St & Auahi St

5/5/2016

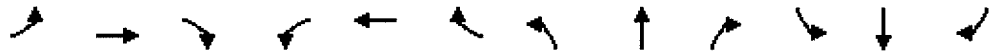


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	96	35	25	104	55	42	161	29	26	247	150
Future Volume (vph)	65	96	35	25	104	55	42	161	29	26	247	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.97	1.00		0.98	1.00	1.00
Frt	1.00	0.96		1.00	0.95		1.00	0.98		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	3361		1770	3356		1716	3442		1742	1863	1483
Flt Permitted	0.95	1.00		0.95	1.00		0.57	1.00		0.62	1.00	1.00
Satd. Flow (perm)	1770	3361		1770	3356		1037	3442		1144	1863	1483
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	70	103	38	27	112	59	45	173	31	28	266	161
RTOR Reduction (vph)	0	26	0	0	44	0	0	14	0	0	0	97
Lane Group Flow (vph)	70	115	0	27	127	0	45	190	0	28	266	64
Confl. Peds. (#/hr)			34	34			43		33	33		43
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6		8			4		4
Permitted Phases							8			4		4
Actuated Green, G (s)	4.3	17.2		1.2	14.1		22.1	22.1		22.1	22.1	22.1
Effective Green, g (s)	4.3	17.2		1.2	14.1		22.1	22.1		22.1	22.1	22.1
Actuated g/C Ratio	0.08	0.31		0.02	0.25		0.40	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	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)	137	1041		38	852		412	1370		455	741	590
v/s Ratio Prot	c0.04	c0.03		0.02	c0.04		0.06				c0.14	
v/s Ratio Perm							0.04			0.02		0.04
v/c Ratio	0.51	0.11		0.71	0.15		0.11	0.14		0.06	0.36	0.11
Uniform Delay, d1	24.6	13.7		27.0	16.0		10.5	10.6		10.3	11.7	10.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.2	0.0		47.3	0.1		0.1	0.0		0.1	0.3	0.1
Delay (s)	27.8	13.7		74.2	16.1		10.6	10.7		10.4	12.0	10.6
Level of Service	C	B		E	B		B	B		B	B	B
Approach Delay (s)		18.4			24.1			10.7			11.4	
Approach LOS		B			C			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			14.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			55.5			Sum of lost time (s)		15.0				
Intersection Capacity Utilization			56.9%			ICU Level of Service				B		
Analysis Period (min)			15									
c	Critical Lane Group											

# HCM Signalized Intersection Capacity Analysis

## 35: Kamakee St & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖	↖↗	↖	↖↗		↖	↖	↖↗
Traffic Volume (vph)	96	320	121	9	165	78	92	197	46	100	275	160
Future Volume (vph)	96	320	121	9	165	78	92	197	46	100	275	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.95		1.00	1.00	0.86	1.00	0.97		1.00	1.00	0.82
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.90	1.00		0.91	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3223		1770	1863	1354	1593	3352		1613	1863	1291
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.44	1.00		0.59	1.00	1.00
Satd. Flow (perm)	1770	3223		1770	1863	1354	745	3352		1009	1863	1291
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)	101	337	127	9	174	82	97	207	48	105	289	168
RTOR Reduction (vph)	0	44	0	0	0	48	0	22	0	0	0	120
Lane Group Flow (vph)	101	420	0	9	174	34	97	233	0	105	289	48
Confl. Peds. (#/hr)			167			209	105		137	137		105
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	7.2	36.7		0.7	30.2	30.2	21.1	21.1		21.1	21.1	21.1
Effective Green, g (s)	7.2	36.7		0.7	30.2	30.2	21.1	21.1		21.1	21.1	21.1
Actuated g/C Ratio	0.10	0.50		0.01	0.41	0.41	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
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	173	1609		16	765	556	213	962		289	534	370
v/s Ratio Prot	c0.06	c0.13		0.01	0.09			0.07			c0.16	
v/s Ratio Perm						0.02	0.13			0.10		0.04
v/c Ratio	0.58	0.26		0.56	0.23	0.06	0.46	0.24		0.36	0.54	0.13
Uniform Delay, d1	31.7	10.6		36.2	14.1	13.1	21.5	20.1		20.9	22.1	19.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.9	0.1		38.3	0.2	0.0	1.5	0.1		0.8	1.1	0.2
Delay (s)	36.7	10.7		74.5	14.2	13.1	23.0	20.2		21.6	23.2	19.6
Level of Service	D	B		E	B	B	C	C		C	C	B
Approach Delay (s)		15.3			15.9			21.0			21.8	
Approach LOS		B			B			C			C	

### Intersection Summary

HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	73.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.7%	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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗				↘	↙			↕	
Traffic Volume (vph)	46	8	53	0	0	0	95	78	6	22	42	52
Future Volume (vph)	46	8	53	0	0	0	95	78	6	22	42	52
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	
Frbp, ped/bikes		1.00	0.96				1.00	1.00			0.97	
Flpb, ped/bikes		0.99	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	0.99			0.94	
Flt Protected		0.96	1.00				0.95	1.00			0.99	
Satd. Flow (prot)		1761	1521				1770	1837			1679	
Flt Permitted		0.96	1.00				0.95	1.00			0.94	
Satd. Flow (perm)		1761	1521				1770	1837			1600	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	53	9	61	0	0	0	109	90	7	25	48	60
RTOR Reduction (vph)	0	0	50	0	0	0	0	3	0	0	31	0
Lane Group Flow (vph)	0	62	11	0	0	0	109	94	0	0	102	0
Confl. Peds. (#/hr)	12		34	34		12			16	16		62
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				7.0	30.4			18.4	
Effective Green, g (s)		8.5	8.5				7.0	30.4			18.4	
Actuated g/C Ratio		0.17	0.17				0.14	0.62			0.38	
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)		306	264				253	1142			602	
v/s Ratio Prot							c0.06	0.05				
v/s Ratio Perm		0.04	0.01								c0.06	
v/c Ratio		0.20	0.04				0.43	0.08			0.17	
Uniform Delay, d1		17.3	16.8				19.1	3.7			10.2	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		0.3	0.1				1.2	0.0			0.1	
Delay (s)		17.6	16.9				20.3	3.7			10.3	
Level of Service		B	B				C	A			B	
Approach Delay (s)		17.3			0.0			12.5			10.3	
Approach LOS		B			A			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			13.1				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.23									
Actuated Cycle Length (s)			48.9				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			36.9%				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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗				↖	↕			↕	
Traffic Volume (vph)	94	10	181	0	0	0	188	103	11	18	79	52
Future Volume (vph)	94	10	181	0	0	0	188	103	11	18	79	52
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	
Frbp, ped/bikes		1.00	0.92				1.00	0.99			0.96	
Fipb, ped/bikes		0.92	1.00				1.00	1.00			0.99	
Frt		1.00	0.85				1.00	0.99			0.95	
Flt Protected		0.96	1.00				0.95	1.00			0.99	
Satd. Flow (prot)		1632	1453				1770	1819			1686	
Flt Permitted		0.96	1.00				0.95	1.00			0.96	
Satd. Flow (perm)		1632	1453				1770	1819			1623	
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)	103	11	199	0	0	0	207	113	12	20	87	57
RTOR Reduction (vph)	0	0	152	0	0	0	0	5	0	0	22	0
Lane Group Flow (vph)	0	114	47	0	0	0	207	120	0	0	142	0
Confl. Peds. (#/hr)	60		77	77		60			48	48		104
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2				6
Permitted Phases	4		4							6		
Actuated Green, G (s)		13.1	13.1				12.3	32.9				15.6
Effective Green, g (s)		13.1	13.1				12.3	32.9				15.6
Actuated g/C Ratio		0.23	0.23				0.22	0.59				0.28
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)		381	339				388	1068				452
v/s Ratio Prot							c0.12	0.07				
v/s Ratio Perm		0.07	0.03									c0.09
v/c Ratio		0.30	0.14				0.53	0.11				0.31
Uniform Delay, d1		17.7	17.0				19.3	5.1				16.0
Progression Factor		1.00	1.00				1.00	1.00				1.00
Incremental Delay, d2		0.4	0.2				1.4	0.0				0.4
Delay (s)		18.1	17.2				20.7	5.1				16.4
Level of Service		B	B				C	A				B
Approach Delay (s)		17.5			0.0			14.9				16.4
Approach LOS		B			A			B				B
<b>Intersection Summary</b>												
HCM 2000 Control Delay			16.2				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.37									
Actuated Cycle Length (s)			56.0				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			56.2%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 1: Cooke St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑↑		↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	0	664	129	502	1010	219	77	181	59	9	50	17
Future Volume (vph)	0	664	129	502	1010	219	77	181	59	9	50	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor		0.95			0.86		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes		0.98			0.99		1.00	1.00	0.94	1.00	0.98	
Flpb, ped/bikes		1.00			1.00		0.94	1.00	1.00	0.97	1.00	
Frt		0.98			0.98		1.00	1.00	0.85	1.00	0.96	
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3385			6102		1671	1863	1492	1709	1758	
Flt Permitted		1.00			0.72		0.71	1.00	1.00	0.56	1.00	
Satd. Flow (perm)		3385			4486		1251	1863	1492	1014	1758	
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)	0	692	134	523	1052	228	80	189	61	9	52	18
RTOR Reduction (vph)	0	15	0	0	22	0	0	0	46	0	11	0
Lane Group Flow (vph)	0	811	0	0	1781	0	80	189	15	9	59	0
Confl. Peds. (#/hr)			57	57		29	69		54	54		69
Turn Type		NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2			4				8
Permitted Phases				2			4		4	8		
Actuated Green, G (s)		43.4			52.8		20.1	20.1	20.1	20.1	20.1	
Effective Green, g (s)		43.4			52.8		20.1	20.1	20.1	20.1	20.1	
Actuated g/C Ratio		0.52			0.64		0.24	0.24	0.24	0.24	0.24	
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)		1772			2942		303	451	361	245	426	
v/s Ratio Prot		0.24			c0.03			c0.10			0.03	
v/s Ratio Perm					c0.35		0.06		0.01	0.01		
v/c Ratio		0.46			1.38dl		0.26	0.42	0.04	0.04	0.14	
Uniform Delay, d1		12.4			8.9		25.4	26.5	24.0	24.0	24.6	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2			0.4		0.5	0.6	0.0	0.1	0.2	
Delay (s)		12.6			9.2		25.9	27.1	24.1	24.1	24.8	
Level of Service		B			A		C	C	C	C	C	
Approach Delay (s)		12.6			9.2			26.3			24.7	
Approach LOS		B			A			C			C	

### Intersection Summary

HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	82.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group



# HCM Signalized Intersection Capacity Analysis

## 1: Cooke St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔↔		↔	↔↔		↔	↑	↗	↔	↖	
Traffic Volume (vph)	4	1417	114	321	830	134	104	319	222	20	58	36
Future Volume (vph)	4	1417	114	321	830	134	104	319	222	20	58	36
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		0.91		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes		0.98		1.00	0.98		1.00	1.00	0.89	1.00	0.96	
Flpb, ped/bikes		1.00		1.00	1.00		0.92	1.00	1.00	0.95	1.00	
Frt		0.99		1.00	0.98		1.00	1.00	0.85	1.00	0.94	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		4922		1770	3405		1625	1863	1417	1690	1684	
Flt Permitted		0.94		0.07	1.00		0.69	1.00	1.00	0.25	1.00	
Satd. Flow (perm)		4616		138	3405		1186	1863	1417	446	1684	
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)	4	1476	119	334	865	140	108	332	231	21	60	38
RTOR Reduction (vph)	0	7	0	0	10	0	0	0	177	0	19	0
Lane Group Flow (vph)	0	1592	0	334	995	0	108	332	54	21	79	0
Confl. Peds. (#/hr)	36		110	110		36	78		82	82		78
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2		4				8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)		48.9		75.9	75.9		26.1	26.1	26.1	26.1	26.1	
Effective Green, g (s)		48.9		75.9	75.9		26.1	26.1	26.1	26.1	26.1	
Actuated g/C Ratio		0.44		0.68	0.68		0.23	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)		2015		414	2307		276	434	330	103	392	
v/s Ratio Prot				c0.16	0.29			c0.18			0.05	
v/s Ratio Perm		0.34		c0.39			0.09		0.04	0.05		
v/c Ratio		0.79		0.81	0.43		0.39	0.76	0.16	0.20	0.20	
Uniform Delay, d1		27.1		31.4	8.2		36.2	40.1	34.2	34.6	34.6	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.1		11.0	0.1		0.9	7.8	0.2	1.0	0.3	
Delay (s)		29.3		42.4	8.3		37.2	47.9	34.5	35.6	34.8	
Level of Service		C		D	A		D	D	C	D	C	
Approach Delay (s)		29.3			16.8			41.6			34.9	
Approach LOS		C			B			D			C	

### Intersection Summary

HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	94.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 2: Ward Ave & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑↑		↔	↑↑	↔	↔	↑↑	↔
Traffic Volume (vph)	0	598	130	334	1400	105	170	488	69	159	747	122
Future Volume (vph)	0	598	130	334	1400	105	170	488	69	159	747	122
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		0.95		1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.98		1.00	0.99		1.00	1.00	0.87	1.00	1.00	0.92
Fipb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3379		1770	4998		1770	3539	1378	1770	3539	1460
Flt Permitted		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3379		1770	4998		1770	3539	1378	1770	3539	1460
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)	0	629	137	352	1474	111	179	514	73	167	786	128
RTOR Reduction (vph)	0	16	0	0	7	0	0	0	53	0	0	80
Lane Group Flow (vph)	0	750	0	352	1578	0	179	514	20	167	786	48
Confl. Peds. (#/hr)			82	82		72			110			58
Turn Type		NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		6		5	2		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)		31.0		24.0	60.0		13.0	33.0	33.0	12.0	32.0	32.0
Effective Green, g (s)		31.0		24.0	60.0		13.0	33.0	33.0	12.0	32.0	32.0
Actuated g/C Ratio		0.26		0.20	0.50		0.11	0.28	0.28	0.10	0.27	0.27
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)		872		354	2499		191	973	378	177	943	389
v/s Ratio Prot		c0.22		c0.20	0.32		c0.10	0.15		0.09	c0.22	
v/s Ratio Perm									0.01			0.03
v/c Ratio		0.86		0.99	0.63		0.94	0.53	0.05	0.94	0.83	0.12
Uniform Delay, d1		42.4		47.9	21.9		53.1	36.9	32.0	53.7	41.5	33.4
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		8.7		46.1	0.5		46.9	0.5	0.1	51.0	6.4	0.1
Delay (s)		51.1		94.0	22.4		100.0	37.4	32.1	104.7	47.9	33.5
Level of Service		D		F	C		F	D	C	F	D	C
Approach Delay (s)		51.1			35.4			51.5			55.0	
Approach LOS		D			D			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			45.4			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			96.7%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 2: Ward Ave & Kapiolani Blvd

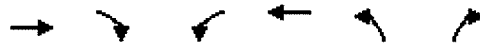
5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑		↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	0	1483	193	0	1031	132	173	693	280	263	898	93
Future Volume (vph)	0	1483	193	0	1031	132	173	693	280	263	898	93
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		0.91			0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.98			0.99		1.00	1.00	0.88	1.00	1.00	0.92
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.98			0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4916			4942		1770	3539	1390	1770	3539	1461
Flt Permitted		1.00			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		4916			4942		1770	3539	1390	1770	3539	1461
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)	0	1545	201	0	1074	138	180	722	292	274	935	97
RTOR Reduction (vph)	0	14	0	0	13	0	0	0	78	0	0	42
Lane Group Flow (vph)	0	1732	0	0	1199	0	180	722	214	274	935	55
Confl. Peds. (#/hr)			118			76			106			59
Turn Type		NA			NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		6			2		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)		46.5			46.5		15.3	33.2	33.2	21.8	39.7	39.7
Effective Green, g (s)		46.5			46.5		15.3	33.2	33.2	21.8	39.7	39.7
Actuated g/C Ratio		0.40			0.40		0.13	0.28	0.28	0.19	0.34	0.34
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)		1962			1972		232	1008	396	331	1205	497
v/s Ratio Prot		c0.35			0.24		0.10	0.20		c0.15	c0.26	
v/s Ratio Perm									0.15			0.04
v/c Ratio		0.88			0.61		0.78	0.72	0.54	0.83	0.78	0.11
Uniform Delay, d1		32.5			27.8		48.9	37.4	35.2	45.5	34.4	26.3
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		5.1			0.5		14.9	2.5	1.5	15.5	3.2	0.1
Delay (s)		37.6			28.3		63.9	39.9	36.7	61.1	37.6	26.4
Level of Service		D			C		E	D	D	E	D	C
Approach Delay (s)		37.6			28.3			42.7			41.7	
Approach LOS		D			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			37.6				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			116.5				Sum of lost time (s)				15.0	
Intersection Capacity Utilization			88.1%				ICU Level of Service				E	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 3: Kamakee St & Kapiolani Blvd

5/5/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑↑↑	↖	↗
Traffic Volume (vph)	738	80	282	1740	93	155
Future Volume (vph)	738	80	282	1740	93	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.86	1.00	1.00
Frbp, ped/bikes	0.99			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3460			6349	1770	1518
Flt Permitted	1.00			0.73	0.95	1.00
Satd. Flow (perm)	3460			4674	1770	1518
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	785	85	300	1851	99	165
RTOR Reduction (vph)	8	0	0	0	0	121
Lane Group Flow (vph)	862	0	0	2151	99	44
Confl. Peds. (#/hr)		49	49			26
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases			6			8
Actuated Green, G (s)	64.9			64.9	27.4	27.4
Effective Green, g (s)	64.9			64.9	27.4	27.4
Actuated g/C Ratio	0.63			0.63	0.27	0.27
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2195			2965	474	406
v/s Ratio Prot	0.25				c0.06	
v/s Ratio Perm				c0.46		0.03
v/c Ratio	0.39			0.89dl	0.21	0.11
Uniform Delay, d1	9.1			12.7	29.0	28.2
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.9	0.2	0.1
Delay (s)	9.2			13.6	29.3	28.4
Level of Service	A			B	C	C
Approach Delay (s)	9.2			13.6	28.7	
Approach LOS	A			B	C	

Intersection Summary

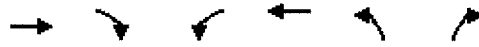
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	102.3	Sum of lost time (s)	10.0
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 3: Kamakee St & Kapiolani Blvd

5/5/2016



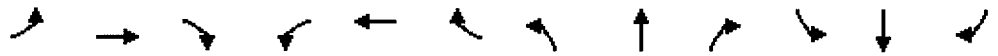
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑	↘	↗
Traffic Volume (vph)	1904	210	0	992	179	354
Future Volume (vph)	1904	210	0	992	179	354
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.86			0.95	1.00	1.00
Frbp, ped/bikes	0.98			1.00	1.00	0.96
Fipb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	6215			3539	1770	1514
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	6215			3539	1770	1514
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	2026	223	0	1055	190	377
RTOR Reduction (vph)	14	0	0	0	0	1
Lane Group Flow (vph)	2235	0	0	1055	190	376
Confl. Peds. (#/hr)		110				30
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	54.9			54.9	32.5	32.5
Effective Green, g (s)	54.9			54.9	32.5	32.5
Actuated g/C Ratio	0.56			0.56	0.33	0.33
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	3503			1994	590	505
v/s Ratio Prot	c0.36			0.30	0.11	
v/s Ratio Perm						c0.25
v/c Ratio	0.64			0.53	0.32	0.74
Uniform Delay, d1	14.5			13.2	24.2	28.8
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.4			0.3	0.3	5.9
Delay (s)	14.9			13.5	24.5	34.6
Level of Service	B			B	C	C
Approach Delay (s)	14.9			13.5	31.3	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	97.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 5: Piikoi St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑↑↑		↘	↑↑↑	↗			
Traffic Volume (vph)	0	985	45	43	1923	317	34	1024	99	0	0	0
Future Volume (vph)	0	985	45	43	1923	317	34	1024	99	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.95			0.86		1.00	0.91	1.00			
Frbp, ped/bikes		1.00			0.99		1.00	1.00	0.96			
Flpb, ped/bikes		1.00			1.00		0.93	1.00	1.00			
Fr		0.99			0.98		1.00	1.00	0.85			
Flt Protected		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		3505			6201		1647	5085	1522			
Flt Permitted		1.00			0.87		0.95	1.00	1.00			
Satd. Flow (perm)		3505			5424		1647	5085	1522			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1048	48	46	2046	337	36	1089	105	0	0	0
RTOR Reduction (vph)	0	3	0	0	2	0	0	0	61	0	0	0
Lane Group Flow (vph)	0	1093	0	0	2427	0	36	1089	44	0	0	0
Confl. Peds. (#/hr)			64			60	58		23			
Turn Type		NA		Perm	NA		Perm	NA	Perm			
Protected Phases		2			6			8				
Permitted Phases				6			8		8			
Actuated Green, G (s)		69.2			69.2		32.5	32.5	32.5			
Effective Green, g (s)		69.2			69.2		32.5	32.5	32.5			
Actuated g/C Ratio		0.62			0.62		0.29	0.29	0.29			
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)		2171			3360		479	1479	442			
v/s Ratio Prot		0.31						c0.21				
v/s Ratio Perm					c0.45		0.02		0.03			
v/c Ratio		0.50			0.72		0.08	0.74	0.10			
Uniform Delay, d1		11.8			14.6		28.7	35.7	28.9			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.2			0.8		0.1	1.9	0.1			
Delay (s)		11.9			15.4		28.8	37.7	29.0			
Level of Service		B			B		C	D	C			
Approach Delay (s)		11.9			15.4			36.7			0.0	
Approach LOS		B			B			D			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			20.1									
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			111.7									
Intersection Capacity Utilization			94.3%									
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 5: Piikoi St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑		↘	↑↑↑	↗			
Traffic Volume (vph)	0	2268	157	0	810	296	37	1432	183	0	0	0
Future Volume (vph)	0	2268	157	0	810	296	37	1432	183	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.86			0.95		1.00	0.91	1.00			
Frbp, ped/bikes		0.99			0.97		1.00	1.00	0.97			
Flpb, ped/bikes		1.00			1.00		0.88	1.00	1.00			
Frt		0.99			0.96		1.00	1.00	0.85			
Flt Protected		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		6278			3280		1556	5085	1535			
Flt Permitted		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)		6278			3280		1556	5085	1535			
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)	0	2362	164	0	844	308	39	1492	191	0	0	0
RTOR Reduction (vph)	0	9	0	0	3	0	0	0	11	0	0	0
Lane Group Flow (vph)	0	2518	0	0	1149	0	39	1492	180	0	0	0
Confl. Peds. (#/hr)			149			102	96		15			
Turn Type		NA			NA		Perm	NA	Perm			
Protected Phases		2			6			8				
Permitted Phases							8		8			
Actuated Green, G (s)		61.7			61.7		45.6	45.6	45.6			
Effective Green, g (s)		61.7			61.7		45.6	45.6	45.6			
Actuated g/C Ratio		0.53			0.53		0.39	0.39	0.39			
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)		3302			1725		604	1976	596			
v/s Ratio Prot		c0.40			0.35			c0.29				
v/s Ratio Perm							0.03		0.12			
v/c Ratio		0.76			0.67		0.06	0.76	0.30			
Uniform Delay, d1		22.0			20.3		22.5	31.0	24.8			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		1.1			1.0		0.0	1.7	0.3			
Delay (s)		23.1			21.3		22.5	32.7	25.1			
Level of Service		C			C		C	C	C			
Approach Delay (s)		23.1			21.3			31.6			0.0	
Approach LOS		C			C			C			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			25.4				HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			117.3				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

## 14: Cooke St & Queen St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Traffic Volume (vph)	42	232	66	83	533	96	31	234	54	39	228	189
Future Volume (vph)	42	232	66	83	533	96	31	234	54	39	228	189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frbp, ped/bikes		1.00			1.00			1.00			1.00	
Ftpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.97			0.98			0.97			0.94	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3413			3443			3429			3297	
Flt Permitted		0.83			0.86			0.88			0.90	
Satd. Flow (perm)		2835			2983			3036			2979	
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)	44	244	69	87	561	101	33	246	57	41	240	199
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	357	0	0	749	0	0	336	0	0	480	0
Confl. Peds. (#/hr)	28			31			31			70		
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)		19.6			19.6			16.5			16.5	
Effective Green, g (s)		19.6			19.6			16.5			16.5	
Actuated g/C Ratio		0.43			0.43			0.36			0.36	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1205			1268			1086			1066	
v/s Ratio Prot												
v/s Ratio Perm		0.13			c0.25			0.11			c0.16	
v/c Ratio		0.30			0.59			0.31			0.45	
Uniform Delay, d1		8.7			10.2			10.7			11.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			0.7			0.2			0.3	
Delay (s)		8.9			10.9			10.8			11.6	
Level of Service		A			B			B			B	
Approach Delay (s)		8.9			10.9			10.8			11.6	
Approach LOS		A			B			B			B	

### Intersection Summary

HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	46.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Signalized Intersection Capacity Analysis

## 14: Cooke St & Queen St

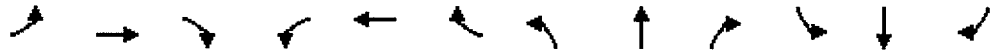
5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Traffic Volume (vph)	98	504	82	53	447	69	34	380	82	79	263	103
Future Volume (vph)	98	504	82	53	447	69	34	380	82	79	263	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frbp, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.98			0.97	
Flt Protected		0.99			1.00			1.00			0.99	
Satd. Flow (prot)		3449			3456			3437			3374	
Flt Permitted		0.78			0.84			0.90			0.78	
Satd. Flow (perm)		2723			2915			3099			2667	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	104	536	87	56	476	73	36	404	87	84	280	110
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	727	0	0	605	0	0	527	0	0	474	0
Confl. Peds. (#/hr)	15			38			37			61		
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)		21.5			21.5			17.6			17.6	
Effective Green, g (s)		21.5			21.5			17.6			17.6	
Actuated g/C Ratio		0.44			0.44			0.36			0.36	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1192			1276			1110			955	
v/s Ratio Prot												
v/s Ratio Perm		c0.27			0.21			0.17			c0.18	
v/c Ratio		0.61			0.47			0.47			0.50	
Uniform Delay, d1		10.6			9.8			12.2			12.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			0.3			0.3			0.4	
Delay (s)		11.5			10.1			12.5			12.7	
Level of Service		B			B			B			B	
Approach Delay (s)		11.5			10.1			12.5			12.7	
Approach LOS		B			B			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		11.6			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.56										
Actuated Cycle Length (s)		49.1			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		79.1%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 20: Piikoi St & Waimanu St/Ala Moana Plaza

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	464	169	158	0	35	27	0	745	84	0	151	44
Future Volume (vph)	464	169	158	0	35	27	0	745	84	0	151	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0		5.0			5.0	
Lane Util. Factor	0.91	0.91	1.00		0.95	0.95		0.86			0.95	
Frbp, ped/bikes	1.00	1.00	0.93		1.00	1.00		0.99			0.98	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85		0.99	0.85		0.98			0.97	
Flt Protected	0.95	0.97	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1610	3295	1476		1749	1504		6271			3355	
Flt Permitted	0.95	0.70	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (perm)	1610	2386	1476		1749	1504		6271			3355	
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)	483	176	165	0	36	28	0	776	88	0	157	46
RTOR Reduction (vph)	0	0	62	0	0	0	0	19	0	0	26	0
Lane Group Flow (vph)	241	418	103	0	39	25	0	845	0	0	177	0
Confl. Peds. (#/hr)			60						49			39
Turn Type	Prot	NA	Perm		NA	Perm		NA			NA	
Protected Phases	7	4			8			2			6	
Permitted Phases			4			8						
Actuated Green, G (s)	36.4	61.0	61.0		19.6	19.6		26.8			26.8	
Effective Green, g (s)	36.4	61.0	61.0		19.6	19.6		26.8			26.8	
Actuated g/C Ratio	0.37	0.62	0.62		0.20	0.20		0.27			0.27	
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)	599	1826	920		350	301		1718			919	
v/s Ratio Prot	c0.15	0.09			0.02			c0.13			0.05	
v/s Ratio Perm		c0.06	0.07			0.02						
v/c Ratio	0.40	0.23	0.11		0.11	0.08		0.49			0.19	
Uniform Delay, d1	22.7	8.1	7.4		32.0	31.8		29.8			27.2	
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.4	0.1	0.1		0.1	0.1		0.2			0.1	
Delay (s)	23.1	8.1	7.5		32.1	31.9		30.0			27.3	
Level of Service	C	A	A		C	C		C			C	
Approach Delay (s)		12.4			32.0			30.0			27.3	
Approach LOS		B			C			C			C	

Intersection Summary

HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	97.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 20: Piikoi St & Waimanu St/Ala Moana Plaza

5/5/2016



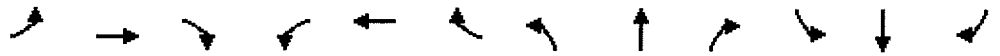
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	495	347	294	0	229	240	0	840	89	0	298	62
Future Volume (vph)	495	347	294	0	229	240	0	840	89	0	298	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0		5.0			5.0	
Lane Util. Factor	0.91	0.91	1.00		0.95	0.95		0.86			0.95	
Frbp, ped/bikes	1.00	1.00	0.80		1.00	1.00		0.98			0.97	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85		0.99	0.85		0.99			0.97	
Flt Protected	0.95	0.98	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1610	3326	1263		1744	1504		6192			3331	
Flt Permitted	0.95	0.65	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (perm)	1610	2188	1263		1744	1504		6192			3331	
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)	516	361	306	0	239	250	0	875	93	0	310	65
RTOR Reduction (vph)	0	0	27	0	0	0	0	15	0	0	15	0
Lane Group Flow (vph)	289	588	279	0	264	225	0	953	0	0	360	0
Confl. Peds. (#/hr)			167						158			89
Turn Type	Prot	NA	Perm		NA	Perm		NA			NA	
Protected Phases	7	4			8			2			6	
Permitted Phases			4			8						
Actuated Green, G (s)	26.5	80.0	80.0		48.5	48.5		30.0			30.0	
Effective Green, g (s)	26.5	80.0	80.0		48.5	48.5		30.0			30.0	
Actuated g/C Ratio	0.22	0.67	0.67		0.40	0.40		0.25			0.25	
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)	355	1709	842		704	607		1548			832	
v/s Ratio Prot	c0.18	0.08			c0.15			c0.15			0.11	
v/s Ratio Perm		0.15	0.22			0.15						
v/c Ratio	0.81	0.34	0.33		0.38	0.37		0.62			0.43	
Uniform Delay, d1	44.4	8.7	8.6		25.1	25.1		39.9			37.8	
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2	13.3	0.1	0.2		0.3	0.4		0.7			0.4	
Delay (s)	57.7	8.8	8.8		25.4	25.4		40.6			38.2	
Level of Service	E	A	A		C	C		D			D	
Approach Delay (s)		20.7			25.4			40.6			38.2	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	57	95	33	56	117	31	16	222	55	33	269	82
Future Volume (vph)	57	95	33	56	117	31	16	222	55	33	269	82
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	63	104	36	62	129	34	18	244	60	36	296	90

















Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	203	225	140	182	184	238
Volume Left (vph)	63	62	18	0	36	0
Volume Right (vph)	36	34	0	60	0	90
Hadj (s)	-0.01	0.00	0.10	-0.20	0.13	-0.23
Departure Headway (s)	6.3	6.3	6.7	6.4	6.6	6.2
Degree Utilization, x	0.36	0.39	0.26	0.32	0.34	0.41
Capacity (veh/h)	517	524	503	526	516	549
Control Delay (s)	12.8	13.3	10.8	11.2	11.7	12.3
Approach Delay (s)	12.8	13.3	11.1		12.0	
Approach LOS	B	B	B		B	

Intersection Summary						
Delay			12.1			
Level of Service			B			
Intersection Capacity Utilization		48.4%		ICU Level of Service		A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 22: Cooke St & Halekauwila St













5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	106	153	62	71	88	66	19	296	39	26	311	50
Future Volume (vph)	106	153	62	71	88	66	19	296	39	26	311	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	112	161	65	75	93	69	20	312	41	27	327	53
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	338	237	176	197	191	217						
Volume Left (vph)	112	75	20	0	27	0						
Volume Right (vph)	65	69	0	41	0	53						
Hadj (s)	-0.02	-0.08	0.09	-0.11	0.10	-0.14						
Departure Headway (s)	6.8	7.0	7.5	7.3	7.5	7.2						
Degree Utilization, x	0.64	0.46	0.37	0.40	0.39	0.43						
Capacity (veh/h)	495	462	443	452	454	461						
Control Delay (s)	20.8	15.9	13.6	13.9	14.0	14.4						
Approach Delay (s)	20.8	15.9	13.7		14.2							
Approach LOS	C	C	B		B							
Intersection Summary												
Delay			16.0									
Level of Service			C									
Intersection Capacity Utilization			59.5%		ICU Level of Service		B					
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis













## 25: Cooke St & Pohukaina St

5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	72	70	50	37	125	43	3	176	59	34	220	105
Future Volume (vph)	72	70	50	37	125	43	3	176	59	34	220	105
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	75	73	52	39	130	45	3	183	61	35	229	109
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	200	214	95	153	150	224						
Volume Left (vph)	75	39	3	0	35	0						
Volume Right (vph)	52	45	0	61	0	109						
Hadj (s)	-0.05	-0.06	0.05	-0.25	0.15	-0.31						
Departure Headway (s)	5.9	5.8	6.4	6.1	6.3	5.8						
Degree Utilization, x	0.33	0.35	0.17	0.26	0.26	0.36						
Capacity (veh/h)	562	567	523	548	537	582						
Control Delay (s)	11.7	11.9	9.5	10.0	10.3	10.9						
Approach Delay (s)	11.7	11.9	9.8		10.7							
Approach LOS	B	B	A		B							
Intersection Summary												
Delay			10.9									
Level of Service			B									
Intersection Capacity Utilization			52.4%		ICU Level of Service		A					
Analysis Period (min)			15									

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

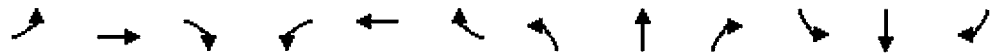
5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	108	145	28	42	91	61	66	183	48	79	264	97
Future Volume (vph)	108	145	28	42	91	61	66	183	48	79	264	97
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	119	159	31	46	100	67	73	201	53	87	290	107
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	309	213	174	154	232	252						
Volume Left (vph)	119	46	73	0	87	0						
Volume Right (vph)	31	67	0	53	0	107						
Hadj (s)	0.05	-0.11	0.24	-0.21	0.22	-0.26						
Departure Headway (s)	6.7	6.9	7.5	7.1	7.3	6.8						
Degree Utilization, x	0.58	0.41	0.36	0.30	0.47	0.47						
Capacity (veh/h)	495	467	440	473	475	510						
Control Delay (s)	18.6	14.5	13.6	11.9	15.3	14.5						
Approach Delay (s)	18.6	14.5	12.8		14.9							
Approach LOS	C	B	B		B							
Intersection Summary												
Delay			15.2									
Level of Service			C									
Intersection Capacity Utilization			61.5%	ICU Level of Service	B							
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 30: Cooke St & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Traffic Volume (veh/h)	48	23	8	13	12	58	38	97	9	37	212	50
Future Volume (Veh/h)	48	23	8	13	12	58	38	97	9	37	212	50
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	50	24	8	14	13	60	40	101	9	39	221	52
Pedestrians		10			17			6			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								419				
pX, platoon unblocked												
vC, conflicting volume	541	542	152	417	564	81	283			127		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	541	542	152	417	564	81	283			127		
tC, single (s)	*6.5	*5.5	*5.9	*6.5	*5.5	*5.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	95	99	97	97	94	97			97		
cM capacity (veh/h)	421	480	893	516	470	964	1266			1436		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	82	87	90	60	150	162
Volume Left	50	14	40	0	39	0
Volume Right	8	60	0	9	0	52
cSH	462	743	1266	1700	1436	1700
Volume to Capacity	0.18	0.12	0.03	0.04	0.03	0.10
Queue Length 95th (ft)	16	10	2	0	2	0
Control Delay (s)	14.5	10.5	3.7	0.0	2.1	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	14.5	10.5	2.2		1.0	
Approach LOS	B	B				

Intersection Summary		
Average Delay		4.4
Intersection Capacity Utilization	39.6%	ICU Level of Service A
Analysis Period (min)		15

\* User Entered Value



# HCM Unsignalized Intersection Capacity Analysis

30: Cooke St & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	44	13	5	18	22	80	14	167	13	43	216	36
Future Volume (Veh/h)	44	13	5	18	22	80	14	167	13	43	216	36
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	46	14	5	19	23	83	15	174	14	45	225	38
Pedestrians		14			18			8			15	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								419				
pX, platoon unblocked												
vC, conflicting volume	574	584	154	452	596	127	277			206		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	574	584	154	452	596	127	277			206		
tC, single (s)	*6.5	*5.5	*5.9	*6.5	*5.5	*5.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	97	99	96	95	91	99			97		
cM capacity (veh/h)	382	464	888	504	459	908	1268			1342		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	65	125	102	101	158	150
Volume Left	46	19	15	0	45	0
Volume Right	5	83	0	14	0	38
cSH	417	697	1268	1700	1342	1700
Volume to Capacity	0.16	0.18	0.01	0.06	0.03	0.09
Queue Length 95th (ft)	14	16	1	0	3	0
Control Delay (s)	15.2	11.3	1.2	0.0	2.4	0.0
Lane LOS	C	B	A		A	
Approach Delay (s)	15.2	11.3	0.6		1.2	
Approach LOS	C	B				

Intersection Summary		
Average Delay		4.2
Intersection Capacity Utilization	40.3%	ICU Level of Service A
Analysis Period (min)		15

\* User Entered Value

# HCM Signalized Intersection Capacity Analysis

## 37: Cooke St & Ala Moana Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↑↑↑		↵	↑↑↑			↵	↗		↵	↗
Traffic Volume (vph)	101	1748	43	14	1849	13	28	17	3	48	43	129
Future Volume (vph)	101	1748	43	14	1849	13	28	17	3	48	43	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	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
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.96		1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5057		1770	5079			1784	1526		1793	1528
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.81	1.00
Satd. Flow (perm)	1770	5057		1770	5079			1456	1526		1497	1528
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)	104	1802	44	14	1906	13	29	18	3	49	44	133
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	3	0	0	113
Lane Group Flow (vph)	104	1844	0	14	1919	0	0	47	0	0	93	20
Confl. Peds. (#/hr)			38			24	16		17	17		16
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	12.3	74.5		2.2	64.4			15.9	15.9		15.9	15.9
Effective Green, g (s)	12.3	74.5		2.2	64.4			15.9	15.9		15.9	15.9
Actuated g/C Ratio	0.11	0.69		0.02	0.60			0.15	0.15		0.15	0.15
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)	202	3501		36	3039			215	225		221	225
v/s Ratio Prot	c0.06	c0.36		0.01	c0.38							
v/s Ratio Perm								0.03	0.00		c0.06	0.01
v/c Ratio	0.51	0.53		0.39	0.63			0.22	0.00		0.42	0.09
Uniform Delay, d1	44.8	8.0		52.0	13.9			40.4	39.1		41.7	39.6
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.2	0.1		6.8	0.4			0.5	0.0		1.3	0.2
Delay (s)	47.1	8.2		58.9	14.4			40.9	39.1		43.0	39.8
Level of Service	D	A		E	B			D	D		D	D
Approach Delay (s)		10.2			14.7			40.8			41.1	
Approach LOS		B			B			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			14.3			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			107.6			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			71.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c	Critical Lane Group											

# HCM Signalized Intersection Capacity Analysis

37: Cooke St/Cooke St & Ala Moana Blvd

5/5/2016



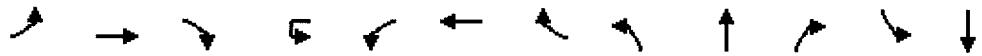
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑↑↑		↙	↑↑↑			↑	↗		↑	↗
Traffic Volume (vph)	67	2289	32	10	1830	104	64	48	14	36	30	150
Future Volume (vph)	67	2289	32	10	1830	104	64	48	14	36	30	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Frbp, ped/bikes	1.00	1.00		1.00	0.99			1.00	0.96		1.00	0.90
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.97	1.00		0.98	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5061		1770	5018			1748	1512		1785	1419
Flt Permitted	0.95	1.00		0.95	1.00			0.78	1.00		0.79	1.00
Satd. Flow (perm)	1770	5061		1770	5018			1410	1512		1455	1419
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)	70	2384	33	10	1906	108	67	50	15	38	31	156
RTOR Reduction (vph)	0	1	0	0	4	0	0	0	12	0	0	80
Lane Group Flow (vph)	70	2416	0	10	2010	0	0	117	3	0	69	76
Confl. Peds. (#/hr)			56			45	52		26	26		52
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	8.0	81.0		0.7	73.7			19.4	19.4		19.4	19.4
Effective Green, g (s)	8.0	81.0		0.7	73.7			19.4	19.4		19.4	19.4
Actuated g/C Ratio	0.07	0.70		0.01	0.63			0.17	0.17		0.17	0.17
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)	121	3530		10	3185			235	252		243	237
v/s Ratio Prot	c0.04	c0.48		0.01	0.40							
v/s Ratio Perm								c0.08	0.00		0.05	0.05
v/c Ratio	0.58	0.68		1.00	0.63			0.50	0.01		0.28	0.32
Uniform Delay, d1	52.4	10.2		57.7	12.9			43.9	40.3		42.3	42.6
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	6.6	0.6		284.6	0.4			1.7	0.0		0.6	0.8
Delay (s)	59.0	10.7		342.3	13.3			45.6	40.4		42.9	43.3
Level of Service	E	B		F	B			D	D		D	D
Approach Delay (s)		12.1			15.0			45.0			43.2	
Approach LOS		B			B			D			D	

## Intersection Summary

HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	116.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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

5/6/2016



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↑↑↑			↘	↑↑↑	↗		↖	↗	↖	↑↑↑
Traffic Volume (vph)	200	1543	4	13	127	1672	173	1	62	45	149	147
Future Volume (vph)	200	1543	4	13	127	1672	173	1	62	45	149	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	5.0
Lane Util. Factor	1.00	0.91			1.00	0.91	1.00		0.95	1.00	0.91	0.91
Frbp, ped/bikes	1.00	1.00			1.00	1.00	0.96		1.00	0.95	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	1.00
Satd. Flow (prot)	1770	5083			1770	5085	1512		3537	1500	1610	2970
Flt Permitted	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	5083			1770	5085	1512		3537	1500	1610	2970
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)	208	1607	4	14	132	1742	180	1	65	47	155	153
RTOR Reduction (vph)	0	0	0	0	0	0	79	0	0	0	0	184
Lane Group Flow (vph)	208	1611	0	0	146	1742	101	0	66	47	139	233
Confl. Peds. (#/hr)			30				21	36		35	35	
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		8	8		4	4
Permitted Phases						6				8		
Actuated Green, G (s)	16.7	54.3			13.6	51.2	51.2		25.7	25.7	25.0	25.0
Effective Green, g (s)	16.7	54.3			13.6	51.2	51.2		25.7	25.7	25.0	25.0
Actuated g/C Ratio	0.12	0.39			0.10	0.37	0.37		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)	213	1991			173	1878	558		655	278	290	535
v/s Ratio Prot	c0.12	c0.32			0.08	c0.34			0.02		c0.09	0.08
v/s Ratio Perm						0.07				c0.03		
v/c Ratio	0.98	0.81			0.84	0.93	0.18		0.10	0.17	0.48	0.43
Uniform Delay, d1	60.8	37.5			61.5	41.9	29.5		46.9	47.5	51.0	50.5
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	54.4	2.5			29.5	8.5	0.2		0.1	0.3	1.3	0.6
Delay (s)	115.2	40.1			90.9	50.4	29.7		46.9	47.8	52.2	51.1
Level of Service	F	D			F	D	C		D	D	D	D
Approach Delay (s)		48.7				51.5			47.3			51.4
Approach LOS		D				D			D			D

Intersection Summary

HCM 2000 Control Delay	50.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	138.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	97.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

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

5/6/2016



Movement	SBR
<b>Input</b>	
Approach	
Lane Configurations	
Traffic Volume (vph)	238
Future Volume (vph)	238
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Fipb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	248
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	36
<b>Output</b>	
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
<b>Intersection Summary</b>	

# HCM Signalized Intersection Capacity Analysis

## 41: Ala Moana Blvd & Ward Ave

5/6/2016



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	291	2001	1	14	43	1632	224	6	150	104	213	71
Future Volume (vph)	291	2001	1	14	43	1632	224	6	150	104	213	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0		5.0	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
Frbp, ped/bikes	1.00	1.00			1.00	1.00	0.92		1.00	0.89	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	0.88
Flt Protected	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	5085			1770	5085	1457		3533	1416	1610	2813
Flt Permitted	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	5085			1770	5085	1457		3533	1416	1610	2813
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)	303	2084	1	15	45	1700	233	6	156	108	222	74
RTOR Reduction (vph)	0	0	0	0	0	0	104	0	0	0	0	277
Lane Group Flow (vph)	303	2085	0	0	60	1700	129	0	162	108	200	153
Confl. Peds. (#/hr)			45				38	41		71	71	
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		8	8		4	4
Permitted Phases							6			8		
Actuated Green, G (s)	25.0	70.1			5.0	50.1	50.1		35.1	35.1	26.9	26.9
Effective Green, g (s)	25.0	70.1			5.0	50.1	50.1		35.1	35.1	26.9	26.9
Actuated g/C Ratio	0.16	0.45			0.03	0.32	0.32		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)	281	2268			56	1621	464		789	316	275	481
v/s Ratio Prot	c0.17	0.41			0.03	c0.33			0.05		c0.12	0.05
v/s Ratio Perm							0.09			c0.08		
v/c Ratio	1.08	0.92			1.07	1.05	0.28		0.21	0.34	0.73	0.32
Uniform Delay, d1	66.0	40.8			76.0	53.5	40.0		49.6	51.3	61.6	57.1
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	76.1	6.6			141.6	36.3	0.3		0.1	0.6	9.2	0.4
Delay (s)	142.1	47.4			217.6	89.8	40.3		49.8	51.9	70.8	57.4
Level of Service	F	D			F	F	D		D	D	E	E
Approach Delay (s)		59.4				87.9			50.6			61.7
Approach LOS		E				F			D			E

### Intersection Summary

HCM 2000 Control Delay	70.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	157.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	113.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

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

5/6/2016



Movement	SBR
<b>Input</b>	
Lane Configurations	
Traffic Volume (vph)	321
Future Volume (vph)	321
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
<b>Output</b>	
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	334
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	41
<b>Control</b>	
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
<b>Performance</b>	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
<b>Intersection Summary</b>	

# HCM Signalized Intersection Capacity Analysis

## 43: Ala Moana Park Dr/Kamakee St & Ala Moana Blvd

5/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	1612	75	14	1762	110	45	29	14	120	37	152
Future Volume (vph)	79	1612	75	14	1762	110	45	29	14	120	37	152
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
Frbp, 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			0.94	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.95			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	5027		1770	5026		1770	1720			1684	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.55	1.00			0.75	1.00
Satd. Flow (perm)	1770	5027		1770	5026		1029	1720			1308	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	81	1645	77	14	1798	112	46	30	14	122	38	155
RTOR Reduction (vph)	0	3	0	0	4	0	0	11	0	0	0	101
Lane Group Flow (vph)	81	1719	0	14	1906	0	46	33	0	0	160	54
Confl. Peds. (#/hr)			43			21			76	76		
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)	11.1	79.5		1.7	70.1		27.8	27.8			27.8	27.8
Effective Green, g (s)	11.1	79.5		1.7	70.1		27.8	27.8			27.8	27.8
Actuated g/C Ratio	0.09	0.64		0.01	0.57		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)	158	3222		24	2841		230	385			293	354
v/s Ratio Prot	c0.05	c0.34		0.01	c0.38			0.02				
v/s Ratio Perm							0.04				c0.12	0.03
v/c Ratio	0.51	0.53		0.58	0.67		0.20	0.09			0.55	0.15
Uniform Delay, d1	53.9	12.1		60.8	18.9		39.1	38.1			42.5	38.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	2.8	0.2		31.3	0.6		0.4	0.1			2.1	0.2
Delay (s)	56.7	12.3		92.1	19.5		39.5	38.1			44.6	38.8
Level of Service	E	B		F	B		D	D			D	D
Approach Delay (s)		14.3			20.0			38.8			41.8	
Approach LOS		B			C			D			D	

### Intersection Summary

HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	124.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	84.2%	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

5/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	2121	205	25	1451	191	108	58	30	95	90	241
Future Volume (vph)	96	2121	205	25	1451	191	108	58	30	95	90	241
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
Frb, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.95			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.94	1.00
Fr	1.00	0.99		1.00	0.98		1.00	0.95			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	4928		1770	4934		1770	1684			1710	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.50	1.00			0.78	1.00
Satd. Flow (perm)	1770	4928		1770	4934		931	1684			1366	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)	99	2187	211	26	1496	197	111	60	31	98	93	248
RTOR Reduction (vph)	0	7	0	0	11	0	0	13	0	0	0	112
Lane Group Flow (vph)	99	2391	0	26	1682	0	111	78	0	0	191	136
Confl. Peds. (#/hr)			82			50			104	104		
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)	12.5	85.4		3.4	76.3		33.9	33.9			33.9	33.9
Effective Green, g (s)	12.5	85.4		3.4	76.3		33.9	33.9			33.9	33.9
Actuated g/C Ratio	0.09	0.62		0.02	0.55		0.25	0.25			0.25	0.25
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	3056		43	2733		229	414			336	389
v/s Ratio Prot	c0.06	c0.49		0.01	0.34			0.05				
v/s Ratio Perm							0.12				c0.14	0.09
v/c Ratio	0.62	0.78		0.60	0.62		0.48	0.19			0.57	0.35
Uniform Delay, d1	60.3	19.3		66.5	20.8		44.4	41.0			45.5	42.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	6.9	1.4		21.7	0.4		1.6	0.2			2.2	0.5
Delay (s)	67.3	20.7		88.2	21.2		46.0	41.3			47.7	43.4
Level of Service	E	C		F	C		D	D			D	D
Approach Delay (s)		22.5			22.2			43.9			45.3	
Approach LOS		C			C			D			D	

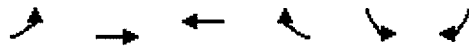
Intersection Summary

HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	137.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 44: Ala Moana Blvd & Queens St

5/5/2016



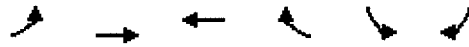
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑↑	↑↑↗		↘↖	↘
Traffic Volume (vph)	16	1743	1880	154	61	22
Future Volume (vph)	16	1743	1880	154	61	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91	0.91		0.97	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	5085	5007		3433	1475
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	5085	5007		3433	1475
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	16	1797	1938	159	63	23
RTOR Reduction (vph)	0	0	5	0	0	19
Lane Group Flow (vph)	16	1797	2092	0	63	4
Confl. Peds. (#/hr)	39			39		52
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	2.3	88.3	81.0		23.6	23.6
Effective Green, g (s)	2.3	88.3	81.0		23.6	23.6
Actuated g/C Ratio	0.02	0.72	0.66		0.19	0.19
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)	33	3683	3327		664	285
v/s Ratio Prot	0.01	c0.35	c0.42		c0.02	
v/s Ratio Perm						0.00
v/c Ratio	0.48	0.49	0.63		0.09	0.02
Uniform Delay, d1	59.2	7.2	11.8		40.4	39.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	10.8	0.1	0.4		0.1	0.0
Delay (s)	70.0	7.3	12.2		40.4	39.8
Level of Service	E	A	B		D	D
Approach Delay (s)		7.8	12.2		40.3	
Approach LOS		A	B		D	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	121.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 44: Ala Moana Blvd & Queens St

5/5/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗↗↗	↖↖↖		↘↘	↙
Traffic Volume (vph)	30	2232	1588	251	202	54
Future Volume (vph)	30	2232	1588	251	202	54
Ideal Flow (vphpl)	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	0.91	0.91		0.97	1.00
Frbp, ped/bikes	1.00	1.00	0.99		1.00	0.91
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	5085	4915		3433	1448
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	5085	4915		3433	1448
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	31	2325	1654	261	210	56
RTOR Reduction (vph)	0	0	12	0	0	44
Lane Group Flow (vph)	31	2325	1903	0	210	12
Confl. Peds. (#/hr)	73			73		64
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	4.6	94.6	85.0		28.0	28.0
Effective Green, g (s)	4.6	94.6	85.0		28.0	28.0
Actuated g/C Ratio	0.03	0.71	0.64		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)	61	3627	3150		724	305
v/s Ratio Prot	0.02	c0.46	0.39		c0.06	
v/s Ratio Perm						0.01
v/c Ratio	0.51	0.64	0.60		0.29	0.04
Uniform Delay, d1	62.9	10.0	13.9		43.9	41.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	6.5	0.4	0.3		0.2	0.1
Delay (s)	69.4	10.4	14.3		44.2	41.6
Level of Service	E	B	B		D	D
Approach Delay (s)		11.2	14.3		43.6	
Approach LOS		B	B		D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			14.4		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.58			
Actuated Cycle Length (s)			132.6		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

## 45: Ala Moana Blvd & Piikoi St

5/5/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖↗	↑↑↑	↑↑↑		↘	↖↗
Traffic Volume (vph)	406	1378	1889	350	142	139
Future Volume (vph)	406	1378	1889	350	142	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frbp, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Fr	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	5085	4948		1770	2787
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	5085	4948		1770	2787
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	423	1435	1968	365	148	145
RTOR Reduction (vph)	0	0	17	0	0	128
Lane Group Flow (vph)	423	1435	2316	0	148	17
Confl. Peds. (#/hr)	12			12	50	
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	9	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	28.4	79.0	79.0		16.6	16.6
Effective Green, g (s)	28.4	79.0	79.0		16.6	16.6
Actuated g/C Ratio	0.20	0.57	0.57		0.12	0.12
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)	701	2890	2812		211	332
v/s Ratio Prot	c0.12	0.28	c0.47		c0.08	
v/s Ratio Perm						0.01
v/c Ratio	0.60	0.50	0.82		0.70	0.05
Uniform Delay, d1	50.2	18.0	24.3		58.8	54.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.5	0.1	2.1		10.1	0.1
Delay (s)	51.7	18.2	26.4		68.9	54.3
Level of Service	D	B	C		E	D
Approach Delay (s)		25.8	26.4		61.7	
Approach LOS		C	C		E	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			28.5		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.76			
Actuated Cycle Length (s)			139.0		Sum of lost time (s)	15.0
Intersection Capacity Utilization			76.4%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 45: Ala Moana Blvd & Piikoi St

5/9/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	361	2098	1617	334	271	222
Future Volume (vph)	361	2098	1617	334	271	222
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frbp, ped/bikes	1.00	1.00	0.97		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	5085	4824		1770	2787
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	5085	4824		1770	2787
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	376	2185	1684	348	282	231
RTOR Reduction (vph)	0	0	21	0	0	188
Lane Group Flow (vph)	376	2185	2011	0	282	43
Confl. Peds. (#/hr)	139			139	128	
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	9	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	32.0	71.6	71.6		27.0	27.0
Effective Green, g (s)	32.0	71.6	71.6		27.0	27.0
Actuated g/C Ratio	0.22	0.49	0.49		0.19	0.19
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)	754	2500	2372		328	516
v/s Ratio Prot	c0.11	c0.43	0.42		c0.16	
v/s Ratio Perm						0.02
v/c Ratio	0.50	0.87	0.85		0.86	0.08
Uniform Delay, d1	49.8	33.0	32.3		57.5	49.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.5	3.7	3.0		19.5	0.1
Delay (s)	50.3	36.7	35.3		77.0	49.1
Level of Service	D	D	D		E	D
Approach Delay (s)		38.7	35.3		64.4	
Approach LOS		D	D		E	

Intersection Summary			
HCM 2000 Control Delay	39.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	145.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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**APPENDIX H**






















**CAPACITY ANALYSIS CALCULATIONS**  
**PROJECTED YEAR 2023 PEAK HOUR TRAFFIC ANALYSIS**

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# HCM Signalized Intersection Capacity Analysis

## 15: Ward Ave & Queen St






















5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	187	89	69	364	80	83	588	55	62	824	210
Future Volume (vph)	52	187	89	69	364	80	83	588	55	62	824	210
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	0.99		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frnt	1.00	0.95		1.00	0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1758	1759		1756	1803		1770	3465		1770	3388	
Flt Permitted	0.22	1.00		0.46	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	402	1759		841	1803		1770	3465		1770	3388	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	55	199	95	73	387	85	88	626	59	66	877	223
RTOR Reduction (vph)	0	20	0	0	9	0	0	8	0	0	25	0
Lane Group Flow (vph)	55	274	0	73	463	0	88	677	0	66	1075	0
Confl. Peds. (#/hr)	21		15	15		21			58			34
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)	24.7	24.7		24.7	24.7		5.8	31.9		6.0	32.1	
Effective Green, g (s)	24.7	24.7		24.7	24.7		5.8	31.9		6.0	32.1	
Actuated g/C Ratio	0.32	0.32		0.32	0.32		0.07	0.41		0.08	0.41	
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)	127	559		267	573		132	1424		136	1401	
v/s Ratio Prot		0.16			c0.26		c0.05	0.20		0.04	c0.32	
v/s Ratio Perm	0.14			0.09								
v/c Ratio	0.43	0.49		0.27	0.81		0.67	0.48		0.49	0.77	
Uniform Delay, d1	20.9	21.4		19.7	24.3		35.0	16.7		34.3	19.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	0.7		0.6	8.2		12.0	0.3		2.7	2.6	
Delay (s)	23.3	22.0		20.3	32.5		47.0	17.0		37.0	22.1	
Level of Service	C	C		C	C		D	B		D	C	
Approach Delay (s)		22.2			30.9			20.4			23.0	
Approach LOS		C			C			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		23.7					HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		77.6					Sum of lost time (s)		15.0			
Intersection Capacity Utilization		79.1%					ICU Level of Service		D			
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 15: Ward Ave & Queen St

5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	390	160	96	319	99	73	833	142	151	945	85
Future Volume (vph)	108	390	160	96	319	99	73	833	142	151	945	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		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	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frft	1.00	0.96		1.00	0.96		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)	1762	1764		1758	1787		1770	3390		1770	3466	
Flt Permitted	0.30	1.00		0.15	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	562	1764		273	1787		1770	3390		1770	3466	
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)	112	406	167	100	332	103	76	868	148	157	984	89
RTOR Reduction (vph)	0	17	0	0	13	0	0	15	0	0	7	0
Lane Group Flow (vph)	113	556	0	100	422	0	76	1001	0	157	1066	0
Confl. Peds. (#/hr)	11		25	25		11			88			59
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)	30.4	30.4		30.4	30.4		4.6	30.3		9.1	34.8	
Effective Green, g (s)	30.4	30.4		30.4	30.4		4.6	30.3		9.1	34.8	
Actuated g/C Ratio	0.36	0.36		0.36	0.36		0.05	0.36		0.11	0.41	
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)	201	632		97	640		96	1211		189	1422	
v/s Ratio Prot		0.32			0.24		0.04	c0.30		c0.09	c0.31	
v/s Ratio Perm	0.20			c0.37								
v/c Ratio	0.56	0.88		1.03	0.66		0.79	0.83		0.83	0.75	
Uniform Delay, d1	21.9	25.5		27.2	22.9		39.6	24.9		37.1	21.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.6	13.2		100.0	2.5		34.6	4.8		25.5	2.2	
Delay (s)	25.4	38.7		127.2	25.3		74.3	29.6		62.6	23.5	
Level of Service	C	D		F	C		E	C		E	C	
Approach Delay (s)		36.5			44.4			32.7			28.5	
Approach LOS		D			D			C			C	

### Intersection Summary

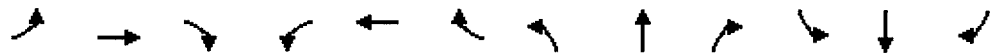
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	84.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Signalized Intersection Capacity Analysis

## 16: Kamakee St & Queen St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕		↗	↕↕			↕↕			↕↕	
Traffic Volume (vph)	49	207	0	217	286	30	16	143	117	38	240	114
Future Volume (vph)	49	207	0	217	286	30	16	143	117	38	240	114
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	
Frt		1.00		1.00	0.99			0.94			0.96	
Flt Protected		0.99		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		3506		1770	3489			3305			3369	
Flt Permitted		0.82		0.95	1.00			0.92			0.90	
Satd. Flow (perm)		2906		1770	3489			3047			3032	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	52	220	0	231	304	32	17	152	124	40	255	121
RTOR Reduction (vph)	0	0	0	0	10	0	0	87	0	0	59	0
Lane Group Flow (vph)	0	272	0	231	326	0	0	206	0	0	357	0
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)		12.9		12.8	30.7			17.4			17.4	
Effective Green, g (s)		12.9		12.8	30.7			17.4			17.4	
Actuated g/C Ratio		0.22		0.22	0.53			0.30			0.30	
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)		645		389	1843			912			908	
v/s Ratio Prot				c0.13	0.09							
v/s Ratio Perm		c0.09						0.07			c0.12	
v/c Ratio		0.42		0.59	0.18			0.23			0.39	
Uniform Delay, d1		19.4		20.3	7.1			15.3			16.2	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.4		2.4	0.0			0.1			0.3	
Delay (s)		19.8		22.7	7.2			15.4			16.4	
Level of Service		B		C	A			B			B	
Approach Delay (s)		19.8			13.5			15.4			16.4	
Approach LOS		B			B			B			B	

### Intersection Summary

HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕		↖	↕↕			↕↕			↕↕	
Traffic Volume (vph)	116	451	49	366	422	55	45	186	90	68	142	54
Future Volume (vph)	116	451	49	366	422	55	45	186	90	68	142	54
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	
Frt		0.99		1.00	0.98			0.96			0.97	
Flt Protected		0.99		0.95	1.00			0.99			0.99	
Satd. Flow (prot)		3464		1770	3478			3367			3387	
Flt Permitted		0.75		0.95	1.00			0.86			0.72	
Satd. Flow (perm)		2619		1770	3478			2909			2454	
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)	121	470	51	381	440	57	47	194	94	71	148	56
RTOR Reduction (vph)	0	5	0	0	10	0	0	34	0	0	19	0
Lane Group Flow (vph)	0	637	0	381	487	0	0	301	0	0	256	0
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)		29.1		25.0	59.1			16.2			16.2	
Effective Green, g (s)		29.1		25.0	59.1			16.2			16.2	
Actuated g/C Ratio		0.34		0.29	0.69			0.19			0.19	
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)		893		518	2409			552			466	
v/s Ratio Prot				c0.22	0.14							
v/s Ratio Perm		c0.24						0.10			c0.10	
v/c Ratio		0.71		0.74	0.20			0.55			0.55	
Uniform Delay, d1		24.5		27.2	4.7			31.2			31.3	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		2.7		5.4	0.0			1.1			1.4	
Delay (s)		27.2		32.6	4.7			32.3			32.7	
Level of Service		C		C	A			C			C	
Approach Delay (s)		27.2			16.8			32.3			32.7	
Approach LOS		C			B			C			C	

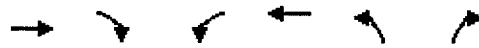
Intersection Summary

HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	85.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

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

5/5/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↘	
Traffic Volume (veh/h)	359	20	103	513	26	76
Future Volume (Veh/h)	359	20	103	513	26	76
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)	378	21	108	540	27	80
Pedestrians						19
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						2
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh	2					
Upstream signal (ft)	564			680		
pX, platoon unblocked						
vC, conflicting volume			418			894 218
vC1, stage 1 conf vol						408
vC2, stage 2 conf vol						486
vCu, unblocked vol			418			894 218
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			95 90
cM capacity (veh/h)			1120			527 824

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	252	147	108	270	270	107
Volume Left	0	0	108	0	0	27
Volume Right	0	21	0	0	0	80
cSH	1700	1700	1120	1700	1700	721
Volume to Capacity	0.15	0.09	0.10	0.16	0.16	0.15
Queue Length 95th (ft)	0	0	8	0	0	13
Control Delay (s)	0.0	0.0	8.6	0.0	0.0	10.9
Lane LOS	A			B		
Approach Delay (s)	0.0		1.4			10.9
Approach LOS						B

Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			33.7%	ICU Level of Service	A	
Analysis Period (min)			15			

\* User Entered Value

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

5/5/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑↑	
Traffic Volume (veh/h)	574	9	80	782	50	205
Future Volume (Veh/h)	574	9	80	782	50	205
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	645	10	90	879	56	230
Pedestrians					19	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh	2					
Upstream signal (ft)	564			687		
pX, platoon unblocked			0.92		0.92	0.92
vC, conflicting volume			674		1288	346
vC1, stage 1 conf vol					669	
vC2, stage 2 conf vol					620	
vCu, unblocked vol			471		1139	115
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		87	73
cM capacity (veh/h)			984		447	857

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	430	225	90	440	440	286
Volume Left	0	0	90	0	0	56
Volume Right	0	10	0	0	0	230
cSH	1700	1700	984	1700	1700	726
Volume to Capacity	0.25	0.13	0.09	0.26	0.26	0.39
Queue Length 95th (ft)	0	0	8	0	0	47
Control Delay (s)	0.0	0.0	9.0	0.0	0.0	13.1
Lane LOS			A			B
Approach Delay (s)	0.0		0.8			13.1
Approach LOS						B

Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			46.0%	ICU Level of Service		A
Analysis Period (min)			15			

\* User Entered Value

# HCM Signalized Intersection Capacity Analysis

## 24: Ward Ave & Halekauwila St

5/13/2016

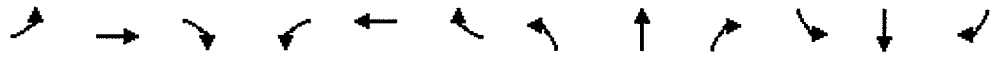


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷			↕		↶	↷		↶	↷	
Traffic Volume (vph)	161	85	28	32	72	52	48	465	15	54	570	303
Future Volume (vph)	161	85	28	32	72	52	48	465	15	54	570	303
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total 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	
Frbp, ped/bikes	1.00	0.99			1.00		1.00	1.00		1.00	0.97	
Ftpb, ped/bikes	1.00	1.00			1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.96			0.95		1.00	1.00		1.00	0.95	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1767	1777			1760		1746	3523		1770	3271	
Flt Permitted	0.73	1.00			0.93		0.25	1.00		0.47	1.00	
Satd. Flow (perm)	1353	1777			1653		454	3523		878	3271	
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)	166	88	29	33	74	54	49	479	15	56	588	312
RTOR Reduction (vph)	0	10	0	0	15	0	0	2	0	0	70	0
Lane Group Flow (vph)	166	107	0	0	146	0	49	492	0	56	830	0
Confl. Peds. (#/hr)	2		44				42					42
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)	18.2	18.2			18.2		23.1	23.1		23.1	23.1	
Effective Green, g (s)	18.2	18.2			18.2		23.1	23.1		23.1	23.1	
Actuated g/C Ratio	0.35	0.35			0.35		0.45	0.45		0.45	0.45	
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)	480	630			586		204	1586		395	1472	
v/s Ratio Prot		0.06						0.14			c0.25	
v/s Ratio Perm	c0.12				0.09		0.11			0.06		
v/c Ratio	0.35	0.17			0.25		0.24	0.31		0.14	0.56	
Uniform Delay, d1	12.2	11.4			11.7		8.7	9.0		8.3	10.4	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1			0.2		0.6	0.1		0.2	0.5	
Delay (s)	12.6	11.5			11.9		9.3	9.1		8.4	10.9	
Level of Service	B	B			B		A	A		A	B	
Approach Delay (s)		12.1			11.9			9.1			10.7	
Approach LOS		B			B			A			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			10.6				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			51.3				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			74.1%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 24: Ward Ave & Halekauwila St/Driveway

5/13/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	246	81	87	28	41	14	27	779	28	70	774	193
Future Volume (vph)	246	81	87	28	41	14	27	779	28	70	774	193
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	
Frb, ped/bikes	1.00	0.96			1.00		1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00			1.00		0.98	1.00		1.00	1.00	
Frt	1.00	0.92			0.98		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1652			1790		1737	3521		1770	3357	
Flt Permitted	0.70	1.00			0.89		0.19	1.00		0.27	1.00	
Satd. Flow (perm)	1305	1652			1611		356	3521		497	3357	
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)	256	84	91	29	43	15	28	811	29	73	806	201
RTOR Reduction (vph)	0	42	0	0	8	0	0	3	0	0	28	0
Lane Group Flow (vph)	256	133	0	0	79	0	28	837	0	73	979	0
Confl. Peds. (#/hr)			91				63					63
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.5	22.5			22.5		27.1	27.1		27.1	27.1	
Effective Green, g (s)	22.5	22.5			22.5		27.1	27.1		27.1	27.1	
Actuated g/C Ratio	0.38	0.38			0.38		0.45	0.45		0.45	0.45	
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)	492	623			608		161	1600		225	1526	
v/s Ratio Prot		0.08						0.24			c0.29	
v/s Ratio Perm	c0.20				0.05		0.08			0.15		
v/c Ratio	0.52	0.21			0.13		0.17	0.52		0.32	0.64	
Uniform Delay, d1	14.4	12.6			12.1		9.6	11.6		10.4	12.5	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.2			0.1		0.5	0.3		0.8	0.9	
Delay (s)	15.4	12.7			12.2		10.1	11.9		11.2	13.4	
Level of Service	B	B			B		B	B		B	B	
Approach Delay (s)		14.3			12.2			11.9			13.3	
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	0.59		
Actuated Cycle Length (s)	59.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Unsignalized Intersection Capacity Analysis

## 47: Kamakee St & Halekauwila St

5/18/2016



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	86	87	66	199	348	92
Future Volume (Veh/h)	86	87	66	199	348	92
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	93	95	72	216	378	100
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				269	309	
pX, platoon unblocked						
vC, conflicting volume	680	176	478			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	680	176	478			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	79	89	93			
cM capacity (veh/h)	437	880	1081			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	93	95	144	144	151	151	176
Volume Left	93	0	72	0	0	0	0
Volume Right	0	95	0	0	0	0	100
cSH	437	880	1081	1700	1700	1700	1700
Volume to Capacity	0.21	0.11	0.07	0.08	0.09	0.09	0.10
Queue Length 95th (ft)	20	9	5	0	0	0	0
Control Delay (s)	15.5	9.6	4.6	0.0	0.0	0.0	0.0
Lane LOS	C	A	A				
Approach Delay (s)	12.5		2.3		0.0		
Approach LOS	B						

Intersection Summary			
Average Delay			3.2
Intersection Capacity Utilization	31.0%		ICU Level of Service A
Analysis Period (min)	15		

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

## 47: Kamakee St & Halekauwila St

5/18/2016



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	31	34	70	291	503	67
Future Volume (Veh/h)	31	34	70	291	503	67
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	37	76	316	547	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				269	309	
pX, platoon unblocked	0.99					
vC, conflicting volume	894	219	620			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	862	219	620			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	96	92			
cM capacity (veh/h)	342	837	956			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	34	37	181	211	219	219	182
Volume Left	34	0	76	0	0	0	0
Volume Right	0	37	0	0	0	0	73
cSH	342	837	956	1700	1700	1700	1700
Volume to Capacity	0.10	0.04	0.08	0.12	0.13	0.13	0.11
Queue Length 95th (ft)	8	3	6	0	0	0	0
Control Delay (s)	16.7	9.5	4.3	0.0	0.0	0.0	0.0
Lane LOS	C	A	A				
Approach Delay (s)	12.9		2.0		0.0		
Approach LOS	B						

Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization		34.6%	ICU Level of Service A
Analysis Period (min)		15	

\* User Entered Value



# HCM Signalized Intersection Capacity Analysis

## 34: Ward Ave & Pohukaina St/Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	33	74	37	96	179	127	62	372	79	93	511	72
Future Volume (vph)	33	74	37	96	179	127	62	372	79	93	511	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	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	1.00		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		0.97	1.00	
Frt	1.00	0.95		1.00	0.94		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)	1751	1770		1770	1726		1749	3402		1722	3453	
Flt Permitted	0.50	1.00		0.68	1.00		0.39	1.00		0.47	1.00	
Satd. Flow (perm)	926	1770		1266	1726		709	3402		858	3453	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	80	40	104	195	138	67	404	86	101	555	78
RTOR Reduction (vph)	0	23	0	0	32	0	0	21	0	0	13	0
Lane Group Flow (vph)	36	97	0	104	301	0	67	469	0	101	620	0
Confl. Peds. (#/hr)	37					37	34		63	63		34
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)	17.7	17.7		17.7	17.7		20.0	20.0		20.0	20.0	
Effective Green, g (s)	17.7	17.7		17.7	17.7		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.37	0.37		0.37	0.37		0.42	0.42		0.42	0.42	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	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)	343	656		469	640		297	1426		359	1447	
v/s Ratio Prot		0.06			c0.17			0.14			c0.18	
v/s Ratio Perm	0.04			0.08			0.09			0.12		
v/c Ratio	0.10	0.15		0.22	0.47		0.23	0.33		0.28	0.43	
Uniform Delay, d1	9.8	10.0		10.3	11.4		8.9	9.3		9.1	9.8	
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		0.2	0.5		0.4	0.1		0.4	0.2	
Delay (s)	10.0	10.1		10.5	12.0		9.3	9.5		9.5	10.0	
Level of Service	A	B		B	B		A	A		A	B	
Approach Delay (s)		10.1			11.6			9.4			9.9	
Approach LOS		B			B			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			10.2									
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			47.7									
Intersection Capacity Utilization			67.2%									
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 34: Ward Ave & Pohukaina St/Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕		↖	↕	
Traffic Volume (vph)	47	178	69	153	137	270	50	476	195	314	527	73
Future Volume (vph)	47	178	69	153	137	270	50	476	195	314	527	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	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	0.99		1.00	0.96		1.00	0.96		1.00	0.99	
Flpb, ped/bikes	0.98	1.00		0.98	1.00		0.97	1.00		0.95	1.00	
Frt	1.00	0.96		1.00	0.90		1.00	0.96		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)	1726	1763		1733	1604		1725	3243		1690	3440	
Flt Permitted	0.27	1.00		0.50	1.00		0.39	1.00		0.36	1.00	
Satd. Flow (perm)	488	1763		909	1604		713	3243		632	3440	
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)	48	184	71	158	141	278	52	491	201	324	543	75
RTOR Reduction (vph)	0	16	0	0	82	0	0	48	0	0	12	0
Lane Group Flow (vph)	48	239	0	158	337	0	52	644	0	324	606	0
Confl. Peds. (#/hr)	67		39	39		67	43		87	87		43
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)	25.3	25.3		25.3	25.3		46.6	46.6		46.6	46.6	
Effective Green, g (s)	25.3	25.3		25.3	25.3		46.6	46.6		46.6	46.6	
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.57	0.57		0.57	0.57	
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)	150	544		280	495		405	1845		359	1957	
v/s Ratio Prot		0.14			c0.21			0.20			0.18	
v/s Ratio Perm	0.10			0.17			0.07			c0.51		
v/c Ratio	0.32	0.44		0.56	0.68		0.13	0.35		0.90	0.31	
Uniform Delay, d1	21.7	22.6		23.7	24.8		8.2	9.5		15.6	9.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.6		2.6	3.9		0.1	0.1		24.9	0.1	
Delay (s)	22.9	23.2		26.3	28.6		8.4	9.6		40.5	9.3	
Level of Service	C	C		C	C		A	A		D	A	
Approach Delay (s)		23.2			28.0			9.5			20.1	
Approach LOS		C			C			A			C	

### Intersection Summary

HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	81.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 35: Kamakee St & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↕	↘	↙	↕	↘	↙	↕	↘	↙	↕	↘
Traffic Volume (vph)	60	98	36	24	157	55	42	160	30	27	249	146
Future Volume (vph)	60	98	36	24	157	55	42	160	30	27	249	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.97	1.00		0.99	1.00	1.00
Frt	1.00	0.96		1.00	0.96		1.00	0.98		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	3361		1770	3402		1718	3439		1743	1863	1485
Flt Permitted	0.95	1.00		0.95	1.00		0.55	1.00		0.62	1.00	1.00
Satd. Flow (perm)	1770	3361		1770	3402		998	3439		1145	1863	1485
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	65	105	39	26	169	59	45	172	32	29	268	157
RTOR Reduction (vph)	0	25	0	0	41	0	0	17	0	0	0	104
Lane Group Flow (vph)	65	119	0	26	187	0	45	187	0	29	268	53
Confl. Peds. (#/hr)			34	34			43		33	33		43
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6		8			4		4
Permitted Phases							8			4		4
Actuated Green, G (s)	4.3	19.8		1.2	16.7		18.1	18.1		18.1	18.1	18.1
Effective Green, g (s)	4.3	19.8		1.2	16.7		18.1	18.1		18.1	18.1	18.1
Actuated g/C Ratio	0.08	0.37		0.02	0.31		0.33	0.33		0.33	0.33	0.33
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)	140	1230		39	1050		333	1150		383	623	496
v/s Ratio Prot	c0.04	c0.04		0.01	c0.06			0.05			c0.14	
v/s Ratio Perm							0.05			0.03		0.04
v/c Ratio	0.46	0.10		0.67	0.18		0.14	0.16		0.08	0.43	0.11
Uniform Delay, d1	23.8	11.3		26.3	13.7		12.5	12.7		12.3	14.0	12.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.4	0.0		35.5	0.1		0.2	0.1		0.1	0.5	0.1
Delay (s)	26.2	11.3		61.8	13.8		12.7	12.7		12.4	14.5	12.5
Level of Service	C	B		E	B		B	B		B	B	B
Approach Delay (s)		15.9			18.7			12.7			13.7	
Approach LOS		B			B			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			15.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			54.1			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			57.0%			ICU Level of Service				B		
Analysis Period (min)			15									
c	Critical Lane Group											

# HCM Signalized Intersection Capacity Analysis

## 35: Kamakee St & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↕	↘	↙	↕	↘	↙	↕	↘	↙	↕	↘
Traffic Volume (vph)	95	328	124	9	211	80	91	186	48	102	275	173
Future Volume (vph)	95	328	124	9	211	80	91	186	48	102	275	173
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
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.95		1.00	1.00	0.86	1.00	0.97		1.00	1.00	0.82
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.90	1.00		0.91	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3221		1770	1863	1354	1593	3334		1612	1863	1291
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.44	1.00		0.60	1.00	1.00
Satd. Flow (perm)	1770	3221		1770	1863	1354	745	3334		1015	1863	1291
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)	100	345	131	9	222	84	96	196	51	107	289	182
RTOR Reduction (vph)	0	44	0	0	0	49	0	26	0	0	0	130
Lane Group Flow (vph)	100	432	0	9	222	35	96	221	0	107	289	52
Confl. Peds. (#/hr)			167			209	105		137	137		105
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	7.2	36.7		0.7	30.2	30.2	21.1	21.1		21.1	21.1	21.1
Effective Green, g (s)	7.2	36.7		0.7	30.2	30.2	21.1	21.1		21.1	21.1	21.1
Actuated g/C Ratio	0.10	0.50		0.01	0.41	0.41	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
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	173	1608		16	765	556	213	957		291	534	370
v/s Ratio Prot	c0.06	c0.13		0.01	0.12			0.07			c0.16	
v/s Ratio Perm						0.03	0.13			0.11		0.04
v/c Ratio	0.58	0.27		0.56	0.29	0.06	0.45	0.23		0.37	0.54	0.14
Uniform Delay, d1	31.7	10.6		36.2	14.5	13.1	21.5	20.0		20.9	22.1	19.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.6	0.1		38.3	0.2	0.0	1.5	0.1		0.8	1.1	0.2
Delay (s)	36.3	10.7		74.5	14.7	13.1	23.0	20.1		21.7	23.2	19.6
Level of Service	D	B		E	B	B	C	C		C	C	B
Approach Delay (s)		15.2			16.0			20.9			21.8	
Approach LOS		B			B			C			C	

### Intersection Summary

HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	73.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.8%	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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗				↘	↙			↕	
Traffic Volume (vph)	48	8	55	0	0	0	148	80	7	22	42	54
Future Volume (vph)	48	8	55	0	0	0	148	80	7	22	42	54
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	
Frbp, ped/bikes		1.00	0.96				1.00	1.00			0.97	
Flpb, ped/bikes		0.99	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	0.99			0.94	
Flt Protected		0.96	1.00				0.95	1.00			0.99	
Satd. Flow (prot)		1760	1520				1770	1834			1675	
Flt Permitted		0.96	1.00				0.95	1.00			0.94	
Satd. Flow (perm)		1760	1520				1770	1834			1595	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	55	9	63	0	0	0	170	92	8	25	48	62
RTOR Reduction (vph)	0	0	52	0	0	0	0	3	0	0	31	0
Lane Group Flow (vph)	0	64	11	0	0	0	170	97	0	0	104	0
Confl. Peds. (#/hr)	12		34	34		12			16	16		62
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				8.6	32.0				18.4
Effective Green, g (s)		8.5	8.5				8.6	32.0				18.4
Actuated g/C Ratio		0.17	0.17				0.17	0.63				0.36
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)		296	255				301	1162				581
v/s Ratio Prot							c0.10	0.05				
v/s Ratio Perm		0.04	0.01									c0.07
v/c Ratio		0.22	0.04				0.56	0.08				0.18
Uniform Delay, d1		18.1	17.6				19.2	3.6				10.9
Progression Factor		1.00	1.00				1.00	1.00				1.00
Incremental Delay, d2		0.4	0.1				2.4	0.0				0.1
Delay (s)		18.5	17.7				21.7	3.6				11.1
Level of Service		B	B				C	A				B
Approach Delay (s)		18.1			0.0			15.0				11.1
Approach LOS		B			A			B				B
<b>Intersection Summary</b>												
HCM 2000 Control Delay			14.7				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.28									
Actuated Cycle Length (s)			50.5				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			37.1%				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

5/5/2016

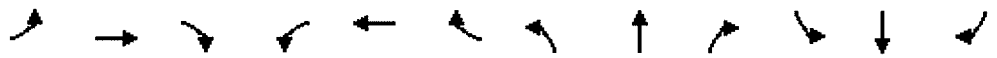


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗				↖	↕			↔	
Traffic Volume (vph)	97	10	185	0	0	0	232	107	11	19	82	54
Future Volume (vph)	97	10	185	0	0	0	232	107	11	19	82	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0				5.0	5.0			5.0	
Lane Util. Factor		1.00	1.00				1.00	1.00			1.00	
Frbp, ped/bikes		1.00	0.91				1.00	0.99			0.96	
Flpb, ped/bikes		0.91	1.00				1.00	1.00			0.99	
Frt		1.00	0.85				1.00	0.99			0.95	
Flt Protected		0.96	1.00				0.95	1.00			0.99	
Satd. Flow (prot)		1621	1445				1770	1820			1681	
Flt Permitted		0.96	1.00				0.95	1.00			0.95	
Satd. Flow (perm)		1621	1445				1770	1820			1614	
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)	107	11	203	0	0	0	255	118	12	21	90	59
RTOR Reduction (vph)	0	0	151	0	0	0	0	5	0	0	21	0
Lane Group Flow (vph)	0	118	52	0	0	0	255	125	0	0	149	0
Confl. Peds. (#/hr)	60		77	77		60			48	48		104
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2				6
Permitted Phases	4		4							6		
Actuated Green, G (s)		15.2	15.2				14.2	34.7				15.5
Effective Green, g (s)		15.2	15.2				14.2	34.7				15.5
Actuated g/C Ratio		0.25	0.25				0.24	0.58				0.26
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)		411	366				419	1054				417
v/s Ratio Prot							c0.14	0.07				
v/s Ratio Perm		0.07	0.04									c0.09
v/c Ratio		0.29	0.14				0.61	0.12				0.36
Uniform Delay, d1		18.0	17.3				20.4	5.7				18.1
Progression Factor		1.00	1.00				1.00	1.00				1.00
Incremental Delay, d2		0.4	0.2				2.5	0.1				0.5
Delay (s)		18.4	17.5				22.9	5.7				18.7
Level of Service		B	B				C	A				B
Approach Delay (s)		17.8			0.0			17.1				18.7
Approach LOS		B			A			B				B
<b>Intersection Summary</b>												
HCM 2000 Control Delay			17.7				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			59.9				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			56.7%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 1: Cooke St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑↑		↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	0	702	110	517	1075	225	82	186	80	9	51	18
Future Volume (vph)	0	702	110	517	1075	225	82	186	80	9	51	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor		0.95			0.86		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes		0.98			0.99		1.00	1.00	0.94	1.00	0.98	
Flpb, ped/bikes		1.00			1.00		0.94	1.00	1.00	0.96	1.00	
Frt		0.98			0.98		1.00	1.00	0.85	1.00	0.96	
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3407			6105		1665	1863	1488	1707	1753	
Flt Permitted		1.00			0.72		0.71	1.00	1.00	0.54	1.00	
Satd. Flow (perm)		3407			4464		1245	1863	1488	963	1753	
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)	0	731	115	539	1120	234	85	194	83	9	53	19
RTOR Reduction (vph)	0	11	0	0	21	0	0	0	54	0	12	0
Lane Group Flow (vph)	0	835	0	0	1872	0	85	194	29	9	60	0
Confl. Peds. (#/hr)			57	57		29	69		54	54		69
Turn Type		NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases				2			4		4	8		
Actuated Green, G (s)		48.3			57.7		20.3	20.3	20.3	20.3	20.3	
Effective Green, g (s)		48.3			57.7		20.3	20.3	20.3	20.3	20.3	
Actuated g/C Ratio		0.55			0.66		0.23	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	
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1869			3009		287	429	343	222	404	
v/s Ratio Prot		0.24			c0.03			c0.10			0.03	
v/s Ratio Perm					c0.38		0.07		0.02	0.01		
v/c Ratio		0.45			1.41dl		0.30	0.45	0.08	0.04	0.15	
Uniform Delay, d1		11.9			8.8		28.0	29.1	26.6	26.3	27.0	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2			0.4		0.6	0.8	0.1	0.1	0.2	
Delay (s)		12.0			9.2		28.5	29.8	26.7	26.4	27.1	
Level of Service		B			A		C	C	C	C	C	
Approach Delay (s)		12.0			9.2		28.8				27.1	
Approach LOS		B			A		C				C	

### Intersection Summary

HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	88.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 1: Cooke St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↑↑↔		↔	↑↑		↔	↑	↔	↔	↑	↔
Traffic Volume (vph)	4	1438	110	330	916	138	104	329	233	21	60	37
Future Volume (vph)	4	1438	110	330	916	138	104	329	233	21	60	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	5.0	5.0	5.0	
Lane Util. Factor		0.91		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes		0.98		1.00	0.98		1.00	1.00	0.89	1.00	0.96	
Flpb, ped/bikes		1.00		1.00	1.00		0.92	1.00	1.00	0.96	1.00	
Fr t		0.99		1.00	0.98		1.00	1.00	0.85	1.00	0.94	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		4928		1770	3413		1625	1863	1416	1692	1686	
Flt Permitted		0.94		0.07	1.00		0.69	1.00	1.00	0.24	1.00	
Satd. Flow (perm)		4621		139	3413		1175	1863	1416	424	1686	
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)	4	1498	115	344	954	144	108	343	243	22	62	39
RTOR Reduction (vph)	0	7	0	0	9	0	0	0	185	0	19	0
Lane Group Flow (vph)	0	1610	0	344	1089	0	108	343	58	22	83	0
Confl. Peds. (#/hr)	36		110	110		36	78		82	82		78
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2		4				8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)		48.7		76.0	76.0		26.7	26.7	26.7	26.7	26.7	
Effective Green, g (s)		48.7		76.0	76.0		26.7	26.7	26.7	26.7	26.7	
Actuated g/C Ratio		0.43		0.67	0.67		0.24	0.24	0.24	0.24	0.24	
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)		1996		416	2301		278	441	335	100	399	
v/s Ratio Prot				c0.16	0.32			c0.18			0.05	
v/s Ratio Perm		0.35		c0.39			0.09		0.04	0.05		
v/c Ratio		0.81		0.83	0.47		0.39	0.78	0.17	0.22	0.21	
Uniform Delay, d1		27.9		32.1	8.8		36.1	40.2	34.2	34.6	34.5	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.5		12.7	0.2		0.9	8.4	0.2	1.1	0.3	
Delay (s)		30.4		44.8	8.9		37.0	48.6	34.5	35.7	34.8	
Level of Service		C		D	A		D	D	C	D	C	
Approach Delay (s)		30.4			17.5			41.9			34.9	
Approach LOS		C			B			D			C	

### Intersection Summary

HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	112.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	97.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Signalized Intersection Capacity Analysis

## 2: Ward Ave & Kapiolani Blvd

5/9/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↙	↑↑↑		↙	↑↑	↗	↙	↑↑	↗
Traffic Volume (vph)	0	627	160	368	1451	106	201	536	85	162	778	125
Future Volume (vph)	0	627	160	368	1451	106	201	536	85	162	778	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	5.0
Lane Util. Factor		0.95		1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.98		1.00	0.99		1.00	1.00	0.87	1.00	1.00	0.92
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3358		1770	5000		1770	3539	1378	1770	3539	1460
Flt Permitted		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3358		1770	5000		1770	3539	1378	1770	3539	1460
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)	0	646	165	379	1496	109	207	553	88	167	802	129
RTOR Reduction (vph)	0	19	0	0	7	0	0	0	64	0	0	81
Lane Group Flow (vph)	0	792	0	379	1598	0	207	553	24	167	802	48
Confl. Peds. (#/hr)			82	82		72			110			58
Turn Type		NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		6		5	2		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)		31.8		24.0	60.8		13.0	33.0	33.0	11.0	31.0	31.0
Effective Green, g (s)		31.8		24.0	60.8		13.0	33.0	33.0	11.0	31.0	31.0
Actuated g/C Ratio		0.27		0.20	0.51		0.11	0.28	0.28	0.09	0.26	0.26
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)		891		354	2537		192	974	379	162	915	377
v/s Ratio Prot		c0.24		c0.21	0.32		c0.12	0.16		0.09	c0.23	
v/s Ratio Perm									0.02			0.03
v/c Ratio		0.89		1.07	0.63		1.08	0.57	0.06	1.03	0.88	0.13
Uniform Delay, d1		42.3		47.9	21.4		53.4	37.3	32.0	54.4	42.6	34.0
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		10.7		67.9	0.5		87.3	0.8	0.1	79.1	9.5	0.2
Delay (s)		53.0		115.8	21.9		140.7	38.0	32.1	133.5	52.0	34.2
Level of Service		D		F	C		F	D	C	F	D	C
Approach Delay (s)		53.0			39.8			62.5			62.3	
Approach LOS		D			D			E			E	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			51.3			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			119.8			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			99.1%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 2: Ward Ave & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑		↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	0	1493	217	0	1121	134	180	717	288	269	977	96
Future Volume (vph)	0	1493	217	0	1121	134	180	717	288	269	977	96
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		0.91			0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.98			0.99		1.00	1.00	0.88	1.00	1.00	0.92
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.98			0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4897			4950		1770	3539	1387	1770	3539	1460
Flt Permitted		1.00			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		4897			4950		1770	3539	1387	1770	3539	1460
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)	0	1555	226	0	1168	140	188	747	300	280	1018	100
RTOR Reduction (vph)	0	16	0	0	12	0	0	0	78	0	0	43
Lane Group Flow (vph)	0	1765	0	0	1296	0	188	747	222	280	1018	57
Confl. Peds. (#/hr)			118			76			106			59
Turn Type		NA			NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		6			2		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)		48.6			48.6		15.2	33.2	33.2	21.5	39.5	39.5
Effective Green, g (s)		48.6			48.6		15.2	33.2	33.2	21.5	39.5	39.5
Actuated g/C Ratio		0.41			0.41		0.13	0.28	0.28	0.18	0.33	0.33
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)		2011			2033		227	993	389	321	1181	487
v/s Ratio Prot		c0.36			0.26		0.11	0.21		c0.16	c0.29	
v/s Ratio Perm									0.16			0.04
v/c Ratio		0.88			0.64		0.83	0.75	0.57	0.87	0.86	0.12
Uniform Delay, d1		32.1			27.8		50.3	38.8	36.4	47.1	36.9	27.3
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		4.7			0.7		21.3	3.3	1.9	21.9	6.7	0.1
Delay (s)		36.8			28.5		71.6	42.1	38.3	69.0	43.5	27.4
Level of Service		D			C		E	D	D	E	D	C
Approach Delay (s)		36.8			28.5			45.7			47.5	
Approach LOS		D			C			D			D	

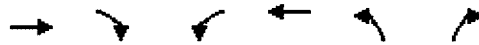
### Intersection Summary

HCM 2000 Control Delay	39.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	118.3	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

## 3: Kamakee St & Kapiolani Blvd

5/5/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑↑↑	↘	↗
Traffic Volume (vph)	787	79	284	1829	91	155
Future Volume (vph)	787	79	284	1829	91	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.86	1.00	1.00
Frbp, ped/bikes	0.99			1.00	1.00	0.96
Fipb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3465			6351	1770	1516
Flt Permitted	1.00			0.73	0.95	1.00
Satd. Flow (perm)	3465			4652	1770	1516
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	837	84	302	1946	97	165
RTOR Reduction (vph)	7	0	0	0	0	123
Lane Group Flow (vph)	914	0	0	2248	97	42
Confl. Peds. (#/hr)		49	49			26
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases			6			8
Actuated Green, G (s)	70.1			70.1	27.3	27.3
Effective Green, g (s)	70.1			70.1	27.3	27.3
Actuated g/C Ratio	0.65			0.65	0.25	0.25
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2261			3036	449	385
v/s Ratio Prot	0.26				c0.05	
v/s Ratio Perm				c0.48		0.03
v/c Ratio	0.40			0.92dl	0.22	0.11
Uniform Delay, d1	8.8			12.5	31.6	30.7
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			1.0	0.2	0.1
Delay (s)	8.9			13.5	31.8	30.8
Level of Service	A			B	C	C
Approach Delay (s)	8.9			13.5	31.2	
Approach LOS	A			B	C	

### Intersection Summary

HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	107.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 3: Kamakee St & Kapiolani Blvd

5/5/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑			↑↑	↖	↗
Traffic Volume (vph)	1935	205	0	1092	172	361
Future Volume (vph)	1935	205	0	1092	172	361
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.86			0.95	1.00	1.00
Frbp, ped/bikes	0.98			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	6221			3539	1770	1513
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	6221			3539	1770	1513
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	2059	218	0	1162	183	384
RTOR Reduction (vph)	13	0	0	0	0	1
Lane Group Flow (vph)	2264	0	0	1162	183	383
Confl. Peds. (#/hr)		110				30
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	55.5			55.5	33.0	33.0
Effective Green, g (s)	55.5			55.5	33.0	33.0
Actuated g/C Ratio	0.56			0.56	0.34	0.34
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	3505			1994	592	506
v/s Ratio Prot	c0.36			0.33	0.10	
v/s Ratio Perm						c0.25
v/c Ratio	0.65			0.58	0.31	0.76
Uniform Delay, d1	14.8			14.0	24.3	29.2
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.4			0.4	0.3	6.4
Delay (s)	15.2			14.4	24.6	35.5
Level of Service	B			B	C	D
Approach Delay (s)	15.2			14.4	32.0	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	98.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 5: Piikoi St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑↑		↘	↑↑↑	↗			
Traffic Volume (vph)	0	1037	47	44	1983	326	50	1097	105	0	0	0
Future Volume (vph)	0	1037	47	44	1983	326	50	1097	105	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.95			0.86		1.00	0.91	1.00			
Frbp, ped/bikes		1.00			0.99		1.00	1.00	0.96			
Flpb, ped/bikes		1.00			1.00		0.93	1.00	1.00			
Frt		0.99			0.98		1.00	1.00	0.85			
Flt Protected		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		3505			6199		1643	5085	1520			
Flt Permitted		1.00			0.87		0.95	1.00	1.00			
Satd. Flow (perm)		3505			5382		1643	5085	1520			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1103	50	47	2110	347	53	1167	112	0	0	0
RTOR Reduction (vph)	0	3	0	0	2	0	0	0	54	0	0	0
Lane Group Flow (vph)	0	1150	0	0	2502	0	53	1167	58	0	0	0
Confl. Peds. (#/hr)			64			60	58		23			
Turn Type		NA		Perm	NA		Perm	NA	Perm			
Protected Phases		2			6			8				
Permitted Phases				6			8		8			
Actuated Green, G (s)		71.2			71.2		34.0	34.0	34.0			
Effective Green, g (s)		71.2			71.2		34.0	34.0	34.0			
Actuated g/C Ratio		0.62			0.62		0.30	0.30	0.30			
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)		2166			3326		484	1500	448			
v/s Ratio Prot		0.33						c0.23				
v/s Ratio Perm					c0.46		0.03		0.04			
v/c Ratio		0.53			0.75		0.11	0.78	0.13			
Uniform Delay, d1		12.5			15.7		29.6	37.1	29.8			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.3			1.0		0.1	2.6	0.1			
Delay (s)		12.8			16.7		29.7	39.8	29.9			
Level of Service		B			B		C	D	C			
Approach Delay (s)		12.8			16.7			38.5			0.0	
Approach LOS		B			B			D			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			21.6				HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			115.2				Sum of lost time (s)		10.0			
Intersection Capacity Utilization			96.7%				ICU Level of Service		F			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 5: Piikoi St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑		↘	↑↑↑	↗			
Traffic Volume (vph)	0	2311	158	0	825	301	119	1393	188	0	0	0
Future Volume (vph)	0	2311	158	0	825	301	119	1393	188	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.86			0.95		1.00	0.91	1.00			
Frbp, ped/bikes		0.99			0.97		1.00	1.00	0.97			
Flpb, ped/bikes		1.00			1.00		0.88	1.00	1.00			
Frt		0.99			0.96		1.00	1.00	0.85			
Flt Protected		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		6280			3279		1555	5085	1535			
Flt Permitted		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)		6280			3279		1555	5085	1535			
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)	0	2407	165	0	859	314	124	1451	196	0	0	0
RTOR Reduction (vph)	0	8	0	0	3	0	0	0	11	0	0	0
Lane Group Flow (vph)	0	2564	0	0	1170	0	124	1451	185	0	0	0
Confl. Peds. (#/hr)			149			102	96		15			
Turn Type		NA			NA		Perm	NA	Perm			
Protected Phases		2			6			8				
Permitted Phases							8		8			
Actuated Green, G (s)		62.8			62.8		44.9	44.9	44.9			
Effective Green, g (s)		62.8			62.8		44.9	44.9	44.9			
Actuated g/C Ratio		0.53			0.53		0.38	0.38	0.38			
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)		3350			1749		593	1939	585			
v/s Ratio Prot		c0.41			0.36			c0.29				
v/s Ratio Perm							0.08		0.12			
v/c Ratio		0.77			0.67		0.21	0.75	0.32			
Uniform Delay, d1		21.6			19.9		24.5	31.5	25.6			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		1.1			1.0		0.2	1.6	0.3			
Delay (s)		22.7			20.9		24.6	33.1	25.9			
Level of Service		C			C		C	C	C			
Approach Delay (s)		22.7			20.9			31.7			0.0	
Approach LOS		C			C			C			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			25.2				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			117.7				Sum of lost time (s)				10.0	
Intersection Capacity Utilization			71.8%				ICU Level of Service				C	
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 14: Cooke St & Queen St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Traffic Volume (vph)	43	225	73	61	521	75	57	295	42	17	240	194
Future Volume (vph)	43	225	73	61	521	75	57	295	42	17	240	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	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frbp, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.97			0.98			0.98			0.94	
Flt Protected		0.99			1.00			0.99			1.00	
Satd. Flow (prot)		3401			3459			3453			3302	
Flt Permitted		0.83			0.88			0.83			0.93	
Satd. Flow (perm)		2838			3075			2901			3082	
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)	45	237	77	64	548	79	60	311	44	18	253	204
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	359		0	0	691	0	0	415	0	0	475
Confl. Peds. (#/hr)	28			31				31			70	
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)		17.9			17.9			16.3			16.3	
Effective Green, g (s)		17.9			17.9			16.3			16.3	
Actuated g/C Ratio		0.40			0.40			0.37			0.37	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1149			1245			1069			1136	
v/s Ratio Prot												
v/s Ratio Perm		0.13			c0.22			0.14			c0.15	
v/c Ratio		0.31			0.56			0.39			0.42	
Uniform Delay, d1		9.0			10.1			10.3			10.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			0.5			0.2			0.3	
Delay (s)		9.1			10.6			10.5			10.7	
Level of Service		A			B			B			B	
Approach Delay (s)		9.1			10.6			10.5			10.7	
Approach LOS		A			B			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		10.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.49										
Actuated Cycle Length (s)		44.2			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		69.5%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 14: Cooke St & Queen St

5/5/2016

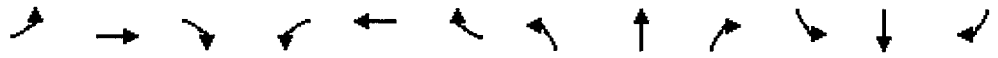


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔↔			↔↔	
Traffic Volume (vph)	101	467	97	46	343	64	37	401	54	59	296	107
Future Volume (vph)	101	467	97	46	343	64	37	401	54	59	296	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frbp, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.98			0.97	
Flt Protected		0.99			0.99			1.00			0.99	
Satd. Flow (prot)		3433			3444			3465			3386	
Flt Permitted		0.80			0.84			0.89			0.83	
Satd. Flow (perm)		2779			2911			3099			2837	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	107	497	103	49	365	68	39	427	57	63	315	114
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	707	0	0	482	0	0	523	0	0	492	0
Confl. Peds. (#/hr)	15			38			37			61		
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)		19.8			19.8			16.9			16.9	
Effective Green, g (s)		19.8			19.8			16.9			16.9	
Actuated g/C Ratio		0.42			0.42			0.36			0.36	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1178			1234			1121			1026	
v/s Ratio Prot												
v/s Ratio Perm		c0.25			0.17			0.17			c0.17	
v/c Ratio		0.60			0.39			0.47			0.48	
Uniform Delay, d1		10.4			9.3			11.4			11.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			0.2			0.3			0.4	
Delay (s)		11.3			9.5			11.7			11.9	
Level of Service		B			A			B			B	
Approach Delay (s)		11.3			9.5			11.7			11.9	
Approach LOS		B			A			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		11.1			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.54										
Actuated Cycle Length (s)		46.7			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		75.7%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												



HCM Signalized Intersection Capacity Analysis  
 20: Piikoi St & Waimanu St/Ala Moana Plaza

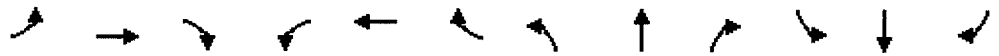
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	489	166	160	0	20	40	0	803	84	0	154	46
Future Volume (vph)	489	166	160	0	20	40	0	803	84	0	154	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0		5.0			5.0	
Lane Util. Factor	0.91	0.91	1.00		0.95	0.95		0.86			0.95	
Frbp, ped/bikes	1.00	1.00	0.93		1.00	1.00		0.99			0.98	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85		0.95	0.85		0.99			0.97	
Flt Protected	0.95	0.97	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1610	3292	1474		1673	1504		6279			3351	
Flt Permitted	0.95	0.70	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (perm)	1610	2386	1474		1673	1504		6279			3351	
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)	509	173	167	0	21	42	0	836	88	0	160	48
RTOR Reduction (vph)	0	0	62	0	0	0	0	17	0	0	27	0
Lane Group Flow (vph)	254	428	105	0	33	30	0	907	0	0	181	0
Confl. Peds. (#/hr)			60						49			39
Turn Type	Prot	NA	Perm		NA	Perm		NA			NA	
Protected Phases	7	4			8			2				6
Permitted Phases			4			8						
Actuated Green, G (s)	37.9	62.6	62.6		19.7	19.7		27.2			27.2	
Effective Green, g (s)	37.9	62.6	62.6		19.7	19.7		27.2			27.2	
Actuated g/C Ratio	0.38	0.63	0.63		0.20	0.20		0.27			0.27	
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)	611	1840	924		330	296		1711			913	
v/s Ratio Prot	c0.16	0.09			0.02			c0.14			0.05	
v/s Ratio Perm		c0.06	0.07			0.02						
v/c Ratio	0.42	0.23	0.11		0.10	0.10		0.53			0.20	
Uniform Delay, d1	22.8	8.1	7.5		32.8	32.8		30.9			27.9	
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.5	0.1	0.1		0.1	0.2		0.3			0.1	
Delay (s)	23.3	8.2	7.5		32.9	33.0		31.2			28.0	
Level of Service	C	A	A		C	C		C			C	
Approach Delay (s)		12.6			32.9			31.2			28.0	
Approach LOS		B			C			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			23.2									
HCM 2000 Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			99.8									
Intersection Capacity Utilization			62.1%									
Analysis Period (min)			15									
c Critical Lane Group												
HCM 2000 Level of Service									C			
Sum of lost time (s)									15.0			
ICU Level of Service									B			

HCM Signalized Intersection Capacity Analysis  
 20: Piikoi St & Waimanu St/Ala Moana Plaza

5/5/2016



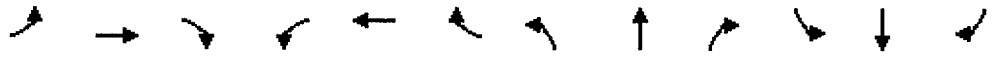
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕	↗		↖	↗		↑↑↑			↕	
Traffic Volume (vph)	496	325	293	0	121	302	0	845	85	0	294	64
Future Volume (vph)	496	325	293	0	121	302	0	845	85	0	294	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0		5.0			5.0	
Lane Util. Factor	0.91	0.91	1.00		0.95	0.95		0.86			0.95	
Frb, ped/bikes	1.00	1.00	0.80		1.00	1.00		0.98			0.97	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85		0.93	0.85		0.99			0.97	
Flt Protected	0.95	0.98	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1610	3322	1267		1650	1504		6203			3325	
Flt Permitted	0.95	0.66	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (perm)	1610	2237	1267		1650	1504		6203			3325	
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)	517	339	305	0	126	315	0	880	89	0	306	67
RTOR Reduction (vph)	0	0	33	0	0	0	0	14	0	0	16	0
Lane Group Flow (vph)	279	577	272	0	230	211	0	955	0	0	357	0
Confl. Peds. (#/hr)			167						158			89
Turn Type	Prot	NA	Perm		NA	Perm		NA			NA	
Protected Phases	7	4			8			2			6	
Permitted Phases			4			8						
Actuated Green, G (s)	25.6	78.0	78.0		47.4	47.4		30.4			30.4	
Effective Green, g (s)	25.6	78.0	78.0		47.4	47.4		30.4			30.4	
Actuated g/C Ratio	0.22	0.66	0.66		0.40	0.40		0.26			0.26	
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)	348	1708	834		660	602		1592			853	
v/s Ratio Prot	c0.17	0.07			0.14			c0.15			0.11	
v/s Ratio Perm		c0.15	0.21			0.14						
v/c Ratio	0.80	0.34	0.33		0.35	0.35		0.60			0.42	
Uniform Delay, d1	44.0	8.9	8.8		24.7	24.8		38.7			36.6	
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2	12.5	0.1	0.2		0.3	0.4		0.6			0.3	
Delay (s)	56.5	9.0	9.0		25.1	25.1		39.3			37.0	
Level of Service	E	A	A		C	C		D			D	
Approach Delay (s)		20.4			25.1			39.3			37.0	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	118.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	57	104	34	81	128	46	40	282	97	46	263	71
Future Volume (vph)	57	104	34	81	128	46	40	282	97	46	263	71
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	63	114	37	89	141	51	44	310	107	51	289	78

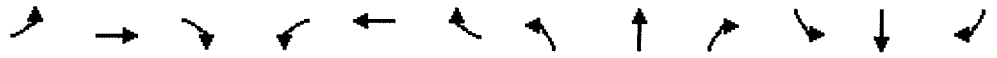
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	214	281	199	262	196	223
Volume Left (vph)	63	89	44	0	51	0
Volume Right (vph)	37	51	0	107	0	78
Hadj (s)	-0.01	-0.01	0.14	-0.25	0.16	-0.21
Departure Headway (s)	7.1	6.9	7.3	6.9	7.4	7.0
Degree Utilization, x	0.42	0.54	0.40	0.50	0.40	0.43
Capacity (veh/h)	456	489	465	493	463	480
Control Delay (s)	15.1	17.5	13.9	15.3	14.0	13.9
Approach Delay (s)	15.1	17.5	14.7		14.0	
Approach LOS	C	C	B		B	

Intersection Summary

Delay	15.1
Level of Service	C
Intersection Capacity Utilization	55.0%
ICU Level of Service	B
Analysis Period (min)	15

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	97	168	78	88	93	70	24	297	60	40	341	46
Future Volume (vph)	97	168	78	88	93	70	24	297	60	40	341	46
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	102	177	82	93	98	74	25	313	63	42	359	48

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	361	265	182	220	222	228
Volume Left (vph)	102	93	25	0	42	0
Volume Right (vph)	82	74	0	63	0	48
Hadj (s)	-0.05	-0.06	0.10	-0.17	0.13	-0.11
Departure Headway (s)	7.2	7.5	8.0	7.8	8.0	7.7
Degree Utilization, x	0.72	0.55	0.41	0.47	0.49	0.49
Capacity (veh/h)	474	440	417	430	430	436
Control Delay (s)	26.8	19.4	15.2	16.3	17.2	16.7
Approach Delay (s)	26.8	19.4	15.8		16.9	
Approach LOS	D	C	C		C	

















Intersection Summary

Delay	19.5
Level of Service	C
Intersection Capacity Utilization	59.6%
ICU Level of Service	B
Analysis Period (min)	15

# HCM Unsignalized Intersection Capacity Analysis

## 25: Cooke St & Pohukaina St

5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	83	66	50	38	177	65	14	267	67	36	223	119
Future Volume (vph)	83	66	50	38	177	65	14	267	67	36	223	119
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	86	69	52	40	184	68	15	278	70	38	232	124
Direction Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	207	292	154	209	154	240						
Volume Left (vph)	86	40	15	0	38	0						
Volume Right (vph)	52	68	0	70	0	124						
Hadj (s)	-0.03	-0.08	0.08	-0.20	0.16	-0.33						
Departure Headway (s)	6.7	6.4	7.0	6.7	7.0	6.5						
Degree Utilization, x	0.38	0.52	0.30	0.39	0.30	0.44						
Capacity (veh/h)	480	525	474	493	482	510						
Control Delay (s)	13.7	16.1	11.8	12.8	11.9	13.3						
Approach Delay (s)	13.7	16.1	12.4		12.8							
Approach LOS	B	C	B		B							
Intersection Summary												
Delay			13.6									
Level of Service			B									
Intersection Capacity Utilization			60.6%		ICU Level of Service		B					
Analysis Period (min)			15									

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	107	155	37	43	133	62	69	208	59	82	320	99
Future Volume (vph)	107	155	37	43	133	62	69	208	59	82	320	99
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	118	170	41	47	146	68	76	229	65	90	352	109

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	329	261	191	180	266	285
Volume Left (vph)	118	47	76	0	90	0
Volume Right (vph)	41	68	0	65	0	109
Hadj (s)	0.03	-0.09	0.23	-0.22	0.20	-0.23
Departure Headway (s)	7.4	7.5	8.2	7.8	7.9	7.4
Degree Utilization, x	0.68	0.55	0.44	0.39	0.58	0.59
Capacity (veh/h)	461	439	408	427	441	462
Control Delay (s)	24.4	19.2	16.2	14.4	20.1	19.3
Approach Delay (s)	24.4	19.2	15.3		19.7	
Approach LOS	C	C	C		C	

Intersection Summary

Delay	19.6
Level of Service	C
Intersection Capacity Utilization	66.9%
ICU Level of Service	C
Analysis Period (min)	15

# HCM Unsignalized Intersection Capacity Analysis

## 30: Cooke St & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Traffic Volume (veh/h)	50	23	8	26	12	154	39	108	9	35	218	52
Future Volume (Veh/h)	50	23	8	26	12	154	39	108	9	35	218	52
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	52	24	8	27	13	160	41	113	9	36	227	54
Pedestrians		10			17			6			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								419				
pX, platoon unblocked												
vC, conflicting volume	650	557	156	428	580	87	291			139		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	650	557	156	428	580	87	291			139		
tC, single (s)	*6.5	*5.5	*5.9	*6.5	*5.5	*5.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	95	99	95	97	83	97			97		
cM capacity (veh/h)	322	473	889	508	463	957	1257			1422		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	84	200	98	66	150	168
Volume Left	52	27	41	0	36	0
Volume Right	8	160	0	9	0	54
cSH	380	805	1257	1700	1422	1700
Volume to Capacity	0.22	0.25	0.03	0.04	0.03	0.10
Queue Length 95th (ft)	21	24	3	0	2	0
Control Delay (s)	17.1	10.9	3.5	0.0	2.0	0.0
Lane LOS	C	B	A		A	
Approach Delay (s)	17.1	10.9	2.1		0.9	
Approach LOS	C	B				

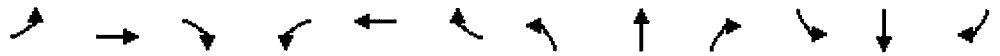
Intersection Summary		
Average Delay	5.6	
Intersection Capacity Utilization	43.0%	ICU Level of Service A
Analysis Period (min)	15	

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

30: Cooke St & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	46	13	6	23	22	103	14	179	20	100	222	37
Future Volume (Veh/h)	46	13	6	23	22	103	14	179	20	100	222	37
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	48	14	6	24	23	107	15	186	21	104	231	39
Pedestrians		14			18			8			15	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								419				
pX, platoon unblocked												
vC, conflicting volume	729	728	157	589	736	136	284			225		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	729	728	157	589	736	136	284			225		
tC, single (s)	*6.5	*5.5	*5.9	*6.5	*5.5	*5.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	83	96	99	94	94	88	99			92		
cM capacity (veh/h)	287	381	884	401	378	897	1260			1321		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	68	154	108	114	220	154
Volume Left	48	24	15	0	104	0
Volume Right	6	107	0	21	0	39
cSH	323	642	1260	1700	1321	1700
Volume to Capacity	0.21	0.24	0.01	0.07	0.08	0.09
Queue Length 95th (ft)	20	23	1	0	6	0
Control Delay (s)	19.1	12.4	1.2	0.0	4.1	0.0
Lane LOS	C	B	A		A	
Approach Delay (s)	19.1	12.4	0.6		2.4	
Approach LOS	C	B				

Intersection Summary		
Average Delay		5.2
Intersection Capacity Utilization	43.3%	ICU Level of Service
Analysis Period (min)		15
		A

\* User Entered Value



HCM Signalized Intersection Capacity Analysis  
 37: Cooke St & Ala Moana Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑↑		↖	↑↑↑			↑	↗		↑	↗
Traffic Volume (vph)	110	1789	44	14	1858	16	29	18	3	54	44	142
Future Volume (vph)	110	1789	44	14	1858	16	29	18	3	54	44	142
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
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.96		1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5057		1770	5077			1785	1525		1788	1527
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.80	1.00
Satd. Flow (perm)	1770	5057		1770	5077			1448	1525		1472	1527
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)	113	1844	45	14	1915	16	30	19	3	56	45	146
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	3	0	0	125
Lane Group Flow (vph)	113	1887	0	14	1931	0	0	49	0	0	101	21
Confl. Peds. (#/hr)			38			24	16		17	17		16
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	13.0	76.9		2.2	66.1			16.2	16.2		16.2	16.2
Effective Green, g (s)	13.0	76.9		2.2	66.1			16.2	16.2		16.2	16.2
Actuated g/C Ratio	0.12	0.70		0.02	0.60			0.15	0.15		0.15	0.15
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)	208	3525		35	3042			212	223		216	224
v/s Ratio Prot	c0.06	0.37		0.01	c0.38							
v/s Ratio Perm								0.03	0.00		c0.07	0.01
v/c Ratio	0.54	0.54		0.40	0.63			0.23	0.00		0.47	0.10
Uniform Delay, d1	45.9	8.1		53.4	14.3			41.6	40.2		43.1	40.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.9	0.2		7.3	0.4			0.6	0.0		1.6	0.2
Delay (s)	48.7	8.2		60.7	14.7			42.1	40.2		44.7	40.9
Level of Service	D	A		E	B			D	D		D	D
Approach Delay (s)		10.5			15.1			42.0			42.5	
Approach LOS		B			B			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			14.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			110.3			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			72.3%			ICU Level of Service			C			
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis  
 37: Cooke St/Cooke St & Ala Moana Blvd

5/5/2016

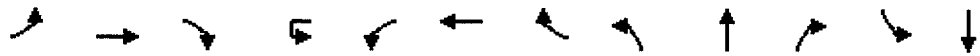


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↗↗		↖	↖↖↖			↖	↖		↖	↖
Traffic Volume (vph)	85	2328	33	10	1814	106	65	50	14	39	31	156
Future Volume (vph)	85	2328	33	10	1814	106	65	50	14	39	31	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Frbp, ped/bikes	1.00	1.00		1.00	0.99			1.00	0.96		1.00	0.90
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.97	1.00		0.98	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5061		1770	5016			1749	1512		1784	1420
Flt Permitted	0.95	1.00		0.95	1.00			0.78	1.00		0.78	1.00
Satd. Flow (perm)	1770	5061		1770	5016			1410	1512		1439	1420
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)	89	2425	34	10	1890	110	68	52	15	41	32	162
RTOR Reduction (vph)	0	1	0	0	4	0	0	0	12	0	0	90
Lane Group Flow (vph)	89	2458	0	10	1996	0	0	120	3	0	73	73
Confl. Peds. (#/hr)			56			45	52		26	26		52
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	10.8	81.0		0.7	70.9			19.5	19.5		19.5	19.5
Effective Green, g (s)	10.8	81.0		0.7	70.9			19.5	19.5		19.5	19.5
Actuated g/C Ratio	0.09	0.70		0.01	0.61			0.17	0.17		0.17	0.17
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)	164	3527		10	3060			236	253		241	238
v/s Ratio Prot	c0.05	c0.49		0.01	0.40							
v/s Ratio Perm							c0.09	0.00			0.05	0.05
v/c Ratio	0.54	0.70		1.00	0.65			0.51	0.01		0.30	0.31
Uniform Delay, d1	50.3	10.4		57.8	14.7			44.0	40.3		42.4	42.4
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.6	0.6		284.6	0.5			1.7	0.0		0.7	0.7
Delay (s)	54.0	11.0		342.4	15.2			45.7	40.3		43.1	43.2
Level of Service	D	B		F	B			D	D		D	D
Approach Delay (s)		12.5			16.8			45.1			43.1	
Approach LOS		B			B			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		16.6										
HCM 2000 Volume to Capacity ratio		0.67										
Actuated Cycle Length (s)		116.2						15.0				
Intersection Capacity Utilization		80.1%							D			
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 41: Ala Moana Blvd & Ward Ave

5/6/2016



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↑↑↑			↙	↑↑↑	↗		↑↑	↗	↖	↑↑
Traffic Volume (vph)	209	1607	4	13	131	1662	189	1	64	47	214	151
Future Volume (vph)	209	1607	4	13	131	1662	189	1	64	47	214	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0		5.0	5.0	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
Frbp, ped/bikes	1.00	1.00			1.00	1.00	0.95		1.00	0.95	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	1.00
Satd. Flow (prot)	1770	5083			1770	5085	1512		3537	1500	1610	2966
Flt Permitted	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	5083			1770	5085	1512		3537	1500	1610	2966
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)	218	1674	4	14	136	1731	197	1	67	49	223	157
RTOR Reduction (vph)	0	0	0	0	0	0	87	0	0	0	0	186
Lane Group Flow (vph)	218	1678	0	0	150	1731	110	0	68	49	201	260
Confl. Peds. (#/hr)			30				21	36		35	35	
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		8	8		4	4
Permitted Phases							6			8		
Actuated Green, G (s)	17.7	54.0			13.5	49.8	49.8		25.8	25.8	25.9	25.9
Effective Green, g (s)	17.7	54.0			13.5	49.8	49.8		25.8	25.8	25.9	25.9
Actuated g/C Ratio	0.13	0.39			0.10	0.36	0.36		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)	225	1971			171	1819	540		655	278	299	551
v/s Ratio Prot	c0.12	c0.33			0.08	c0.34			0.02		c0.12	0.09
v/s Ratio Perm							0.07			c0.03		
v/c Ratio	0.97	0.85			0.88	0.95	0.20		0.10	0.18	0.67	0.47
Uniform Delay, d1	60.5	38.9			62.0	43.5	31.0		47.1	47.8	52.7	50.5
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	50.6	3.8			36.0	11.7	0.2		0.1	0.3	5.8	0.6
Delay (s)	111.0	42.7			98.1	55.2	31.1		47.2	48.1	58.5	51.2
Level of Service	F	D			F	E	C		D	D	E	D
Approach Delay (s)		50.6				56.0			47.5			53.5
Approach LOS		D				E			D			D

### Intersection Summary

HCM 2000 Control Delay	53.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	139.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	99.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

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

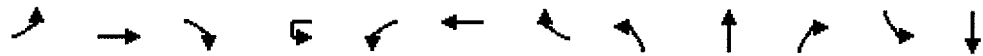
5/6/2016

Movement	SBR
<b>Approach</b>	
Lane Configurations	
Traffic Volume (vph)	256
Future Volume (vph)	256
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Fipb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	267
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	36
<b>Turn Type</b>	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
<b>Intersection Summary</b>	

# HCM Signalized Intersection Capacity Analysis

## 41: Ala Moana Blvd & Ward Ave

5/9/2016



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	303	2032	1	14	44	1625	252	7	154	108	228	73
Future Volume (vph)	303	2032	1	14	44	1625	252	7	154	108	228	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0		5.0	5.0	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
Frbp, ped/bikes	1.00	1.00			1.00	1.00	0.92		1.00	0.90	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	0.88
Flt Protected	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	5085			1770	5085	1464		3532	1425	1610	2823
Flt Permitted	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	5085			1770	5085	1464		3532	1425	1610	2823
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)	316	2117	1	15	46	1693	262	7	160	112	238	76
RTOR Reduction (vph)	0	0	0	0	0	0	125	0	0	0	0	283
Lane Group Flow (vph)	316	2118	0	0	61	1693	138	0	167	113	214	163
Confl. Peds. (#/hr)			45				38	41		71	71	
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		8	8		4	4
Permitted Phases						6				8		
Actuated Green, G (s)	21.0	60.1			5.0	44.1	44.1		35.1	35.1	26.9	26.9
Effective Green, g (s)	21.0	60.1			5.0	44.1	44.1		35.1	35.1	26.9	26.9
Actuated g/C Ratio	0.14	0.41			0.03	0.30	0.30		0.24	0.24	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)	252	2077			60	1524	438		842	340	294	516
v/s Ratio Prot	c0.18	0.42			0.03	c0.33			0.05		c0.13	0.06
v/s Ratio Perm							0.09			c0.08		
v/c Ratio	1.25	1.02			1.02	1.11	0.31		0.20	0.33	0.73	0.32
Uniform Delay, d1	63.0	43.5			71.0	51.5	39.8		44.8	46.3	56.7	52.1
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	142.6	24.9			121.0	59.8	0.4		0.1	0.6	8.7	0.4
Delay (s)	205.6	68.4			192.0	111.3	40.2		44.9	46.9	65.3	52.5
Level of Service	F	E			F	F	D		D	D	E	D
Approach Delay (s)		86.2				104.5			45.7			56.6
Approach LOS		F				F			D			E

### Intersection Summary

HCM 2000 Control Delay	87.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	147.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	114.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

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

5/9/2016

Movement	SBR
<b>Approach Configurations</b>	
Traffic Volume (vph)	332
Future Volume (vph)	332
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Fipb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	346
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	41
<b>Turn Type</b>	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
<b>Lane Grp Cap (vph)</b>	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
<b>Intersection Summary</b>	

# HCM Signalized Intersection Capacity Analysis

## 43: Ala Moana Park Dr/Kamakee St & Ala Moana Blvd

5/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑↑		↖	↑↑↑		↖	↗			↖	↗
Traffic Volume (vph)	74	1746	78	14	1770	112	47	30	14	118	38	153
Future Volume (vph)	74	1746	78	14	1770	112	47	30	14	118	38	153
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
Frbp, 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			0.94	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.95			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	1724			1688	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.56	1.00			0.75	1.00
Satd. Flow (perm)	1770	5030		1770	5026		1040	1724			1313	1583
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)	76	1782	80	14	1806	114	48	31	14	120	39	156
RTOR Reduction (vph)	0	3	0	0	4	0	0	11	0	0	0	100
Lane Group Flow (vph)	76	1859	0	14	1916	0	48	34	0	0	159	56
Confl. Peds. (#/hr)			43			21			76	76		
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	77.5		1.7	70.5		27.7	27.7			27.7	27.7
Effective Green, g (s)	8.7	77.5		1.7	70.5		27.7	27.7			27.7	27.7
Actuated g/C Ratio	0.07	0.64		0.01	0.58		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)	126	3197		24	2906		236	391			298	359
v/s Ratio Prot	c0.04	0.37		0.01	c0.38			0.02				
v/s Ratio Perm							0.05				c0.12	0.04
v/c Ratio	0.60	0.58		0.58	0.66		0.20	0.09			0.53	0.15
Uniform Delay, d1	54.9	12.8		59.7	17.5		38.2	37.1			41.4	37.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	7.9	0.3		31.3	0.5		0.4	0.1			1.8	0.2
Delay (s)	62.8	13.1		91.1	18.1		38.6	37.2			43.3	37.9
Level of Service	E	B		F	B		D	D			D	D
Approach Delay (s)		15.1			18.6			37.9			40.6	
Approach LOS		B			B			D			D	

### Intersection Summary

HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	121.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	84.4%	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

5/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	2176	211	26	1461	189	111	60	31	91	93	246
Future Volume (vph)	87	2176	211	26	1461	189	111	60	31	91	93	246
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
Frbp, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.95			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.94	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1770	4925		1770	4935		1770	1682			1715	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.50	1.00			0.78	1.00
Satd. Flow (perm)	1770	4925		1770	4935		923	1682			1362	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)	90	2243	218	27	1506	195	114	62	32	94	96	254
RTOR Reduction (vph)	0	7	0	0	10	0	0	13	0	0	0	103
Lane Group Flow (vph)	90	2454	0	27	1691	0	114	81	0	0	190	151
Confl. Peds. (#/hr)			82			50			104	104		
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	88.0		3.4	79.5		33.8	33.8			33.8	33.8
Effective Green, g (s)	11.9	88.0		3.4	79.5		33.8	33.8			33.8	33.8
Actuated g/C Ratio	0.08	0.63		0.02	0.57		0.24	0.24			0.24	0.24
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)	150	3091		42	2798		222	405			328	381
v/s Ratio Prot	c0.05	c0.50		0.02	0.34			0.05				
v/s Ratio Perm							0.12				c0.14	0.10
v/c Ratio	0.60	0.79		0.64	0.60		0.51	0.20			0.58	0.40
Uniform Delay, d1	61.9	19.4		67.8	20.0		46.1	42.4			46.9	44.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	6.3	1.5		29.0	0.4		2.0	0.2			2.5	0.7
Delay (s)	68.2	20.8		96.8	20.4		48.1	42.7			49.4	45.3
Level of Service	E	C		F	C		D	D			D	D
Approach Delay (s)		22.5			21.6			45.6			47.1	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Signalized Intersection Capacity Analysis

## 44: Ala Moana Blvd & Queens St

5/5/2016

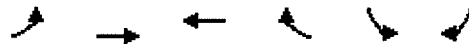


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗↗↗	↖↖↖		↘↘↘	↙
Traffic Volume (vph)	17	1876	1891	199	61	23
Future Volume (vph)	17	1876	1891	199	61	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91	0.91		0.97	1.00
Frbp, ped/bikes	1.00	1.00	0.99		1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	5085	4987		3433	1473
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	5085	4987		3433	1473
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	18	1934	1949	205	63	24
RTOR Reduction (vph)	0	0	7	0	0	19
Lane Group Flow (vph)	18	1934	2147	0	63	5
Confl. Peds. (#/hr)	39			39		52
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	2.3	90.8	83.5		23.6	23.6
Effective Green, g (s)	2.3	90.8	83.5		23.6	23.6
Actuated g/C Ratio	0.02	0.73	0.67		0.19	0.19
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)	32	3711	3347		651	279
v/s Ratio Prot	0.01	c0.38	c0.43		c0.02	
v/s Ratio Perm						0.00
v/c Ratio	0.56	0.52	0.64		0.10	0.02
Uniform Delay, d1	60.6	7.3	11.8		41.6	41.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	20.7	0.1	0.4		0.1	0.0
Delay (s)	81.2	7.5	12.2		41.7	41.0
Level of Service	F	A	B		D	D
Approach Delay (s)		8.1	12.2		41.5	
Approach LOS		A	B		D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			10.9		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.53			
Actuated Cycle Length (s)			124.4		Sum of lost time (s)	15.0
Intersection Capacity Utilization			73.2%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 44: Ala Moana Blvd & Queens St

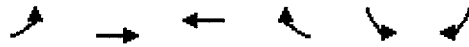
5/5/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↑↑↑	↑↑↑		↵↵	↵
Traffic Volume (vph)	31	2284	1595	297	207	55
Future Volume (vph)	31	2284	1595	297	207	55
Ideal Flow (vphpl)	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	0.91	0.91		0.97	1.00
Frbp, ped/bikes	1.00	1.00	0.98		1.00	0.91
Fipb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	5085	4887		3433	1445
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	5085	4887		3433	1445
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	32	2379	1661	309	216	57
RTOR Reduction (vph)	0	0	15	0	0	45
Lane Group Flow (vph)	32	2379	1955	0	216	12
Confl. Peds. (#/hr)	73			73		64
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	4.7	98.7	89.0		28.0	28.0
Effective Green, g (s)	4.7	98.7	89.0		28.0	28.0
Actuated g/C Ratio	0.03	0.72	0.65		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)	60	3671	3181		703	295
v/s Ratio Prot	0.02	c0.47	0.40		c0.06	
v/s Ratio Perm						0.01
v/c Ratio	0.53	0.65	0.61		0.31	0.04
Uniform Delay, d1	64.9	9.9	13.9		46.1	43.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	8.8	0.4	0.4		0.2	0.1
Delay (s)	73.7	10.3	14.2		46.4	43.6
Level of Service	E	B	B		D	D
Approach Delay (s)		11.2	14.2		45.8	
Approach LOS		B	B		D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			14.5		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.60			
Actuated Cycle Length (s)			136.7		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  
 45: Ala Moana Blvd & Piikoi St

5/5/2016

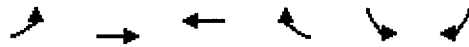


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖↗	↖↖↖	↖↖↖		↘	↘↘
Traffic Volume (vph)	450	1467	1952	361	146	141
Future Volume (vph)	450	1467	1952	361	146	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frbp, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	5085	4948		1770	2787
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	5085	4948		1770	2787
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	469	1528	2033	376	152	147
RTOR Reduction (vph)	0	0	17	0	0	130
Lane Group Flow (vph)	469	1528	2392	0	152	17
Conf. Peds. (#/hr)	12			12	50	
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	9	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	28.8	81.9	81.9		16.3	16.3
Effective Green, g (s)	28.8	81.9	81.9		16.3	16.3
Actuated g/C Ratio	0.20	0.58	0.58		0.11	0.11
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)	696	2932	2853		203	319
v/s Ratio Prot	c0.14	0.30	c0.48		c0.09	
v/s Ratio Perm						0.01
v/c Ratio	0.67	0.52	0.84		0.75	0.05
Uniform Delay, d1	52.3	18.2	24.6		60.9	56.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.6	0.2	2.3		14.0	0.1
Delay (s)	54.8	18.4	26.9		74.9	56.0
Level of Service	D	B	C		E	E
Approach Delay (s)		26.9	26.9		65.6	
Approach LOS		C	C		E	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			29.4		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.79			
Actuated Cycle Length (s)			142.0		Sum of lost time (s)	15.0
Intersection Capacity Utilization			79.4%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 45: Ala Moana Blvd & Piikoi St

5/5/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	359	2157	1677	337	272	215
Future Volume (vph)	359	2157	1677	337	272	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frbp, ped/bikes	1.00	1.00	0.97		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	5085	4823		1770	2787
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	5085	4823		1770	2787
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	374	2247	1747	351	283	224
RTOR Reduction (vph)	0	0	18	0	0	182
Lane Group Flow (vph)	374	2247	2080	0	283	42
Confl. Peds. (#/hr)	139			139	128	
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	9	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	32.1	78.4	78.4		28.7	28.7
Effective Green, g (s)	32.1	78.4	78.4		28.7	28.7
Actuated g/C Ratio	0.21	0.51	0.51		0.19	0.19
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)	714	2585	2452		329	518
v/s Ratio Prot	c0.11	c0.44	0.43		c0.16	
v/s Ratio Perm						0.01
v/c Ratio	0.52	0.87	0.85		0.86	0.08
Uniform Delay, d1	54.3	33.4	32.8		60.8	51.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.7	3.4	2.9		19.9	0.1
Delay (s)	55.0	36.8	35.7		80.7	51.9
Level of Service	D	D	D		F	D
Approach Delay (s)		39.4	35.7		68.0	
Approach LOS		D	D		E	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			40.7		HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.79			
Actuated Cycle Length (s)			154.2		Sum of lost time (s)	15.0
Intersection Capacity Utilization			78.9%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

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**APPENDIX I**






















**CAPACITY ANALYSIS CALCULATIONS**  
**PROJECTED YEAR 2024 PEAK HOUR TRAFFIC ANALYSIS**

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# HCM Signalized Intersection Capacity Analysis

## 15: Ward Ave & Queen St

5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	189	86	74	369	80	91	666	69	62	856	213
Future Volume (vph)	53	189	86	74	369	80	91	666	69	62	856	213
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	0.99		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1758	1762		1756	1804		1770	3459		1770	3390	
Flt Permitted	0.21	1.00		0.46	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	388	1762		845	1804		1770	3459		1770	3390	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	56	201	91	79	393	85	97	709	73	66	911	227
RTOR Reduction (vph)	0	18	0	0	9	0	0	8	0	0	24	0
Lane Group Flow (vph)	56	274	0	79	469	0	97	774	0	66	1114	0
Confl. Peds. (#/hr)	21		15	15		21			58			34
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)	25.1	25.1		25.1	25.1		5.8	32.4		6.1	32.7	
Effective Green, g (s)	25.1	25.1		25.1	25.1		5.8	32.4		6.1	32.7	
Actuated g/C Ratio	0.32	0.32		0.32	0.32		0.07	0.41		0.08	0.42	
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)	123	562		269	576		130	1425		137	1410	
v/s Ratio Prot		0.16			c0.26		c0.05	0.22		0.04	c0.33	
v/s Ratio Perm	0.14			0.09								
v/c Ratio	0.46	0.49		0.29	0.81		0.75	0.54		0.48	0.79	
Uniform Delay, d1	21.3	21.6		20.1	24.6		35.7	17.5		34.7	20.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.7	0.7		0.6	8.7		20.6	0.4		2.7	3.1	
Delay (s)	24.0	22.2		20.7	33.3		56.2	17.9		37.4	23.1	
Level of Service	C	C		C	C		E	B		D	C	
Approach Delay (s)		22.5			31.5			22.1			23.8	
Approach LOS		C			C			C			C	






















### Intersection Summary

HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	78.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 15: Ward Ave & Queen St

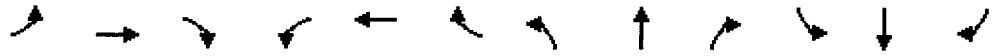
5/5/2016

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	109	395	166	123	324	100	74	861	150	152	1015	87	
Future Volume (vph)	109	395	166	123	324	100	74	861	150	152	1015	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	5.0		5.0	5.0		
Lane Util. Factor	0.95	0.95		1.00	1.00		1.00	0.95		1.00	0.95		
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.99		
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00		
Frt	1.00	0.96		1.00	0.96		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)	1674	1673		1759	1788		1770	3384		1770	3467		
Flt Permitted	0.34	0.99		0.16	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (perm)	594	1659		289	1788		1770	3384		1770	3467		
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)	114	411	173	128	338	104	77	897	156	158	1057	91	
RTOR Reduction (vph)	0	17	0	0	12	0	0	16	0	0	7	0	
Lane Group Flow (vph)	103	578	0	128	430	0	77	1037	0	158	1141	0	
Confl. Peds. (#/hr)	11		25	25		11			88			59	
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)	37.0	37.0		37.0	37.0		4.0	31.4		7.0	34.4		
Effective Green, g (s)	37.0	37.0		37.0	37.0		4.0	31.4		7.0	34.4		
Actuated g/C Ratio	0.41	0.41		0.41	0.41		0.04	0.35		0.08	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)	243	679		118	731		78	1175		137	1319		
v/s Ratio Prot					0.24		0.04	0.31		c0.09	c0.33		
v/s Ratio Perm	0.17	0.35		c0.44									
v/c Ratio	0.42	0.85		1.08	0.59		0.99	0.88		1.15	0.87		
Uniform Delay, d1	19.1	24.2		26.7	20.8		43.2	27.8		41.7	25.9		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	1.2	10.1		107.4	1.2		96.8	8.1		124.0	6.2		
Delay (s)	20.3	34.3		134.1	22.0		139.9	35.9		165.7	32.0		
Level of Service	C	C		F	C		F	D		F	C		
Approach Delay (s)		32.2			47.2			42.9			48.2		
Approach LOS		C			D			D			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			43.4									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			1.03										
Actuated Cycle Length (s)			90.4									Sum of lost time (s)	15.0
Intersection Capacity Utilization			100.8%									ICU Level of Service	G
Analysis Period (min)			15										
c Critical Lane Group													

# HCM Signalized Intersection Capacity Analysis

## 16: Kamakee St & Queen St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕		↗	↕↕			↕↕			↕↕	
Traffic Volume (vph)	50	223	0	208	293	30	17	144	155	38	231	116
Future Volume (vph)	50	223	0	208	293	30	17	144	155	38	231	116
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	
Frt		1.00		1.00	0.99			0.93			0.95	
Flt Protected		0.99		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		3507		1770	3490			3270			3363	
Flt Permitted		0.82		0.95	1.00			0.92			0.89	
Satd. Flow (perm)		2915		1770	3490			3021			3005	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	53	237	0	221	312	32	18	153	165	40	246	123
RTOR Reduction (vph)	0	0	0	0	10	0	0	116	0	0	64	0
Lane Group Flow (vph)	0	290	0	221	334	0	0	220	0	0	345	0
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)		13.2		12.6	30.8			17.3			17.3	
Effective Green, g (s)		13.2		12.6	30.8			17.3			17.3	
Actuated g/C Ratio		0.23		0.22	0.53			0.30			0.30	
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)		662		383	1850			899			894	
v/s Ratio Prot				c0.12	0.10							
v/s Ratio Perm		c0.10						0.07			c0.11	
v/c Ratio		0.44		0.58	0.18			0.24			0.39	
Uniform Delay, d1		19.3		20.4	7.1			15.5			16.2	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.5		2.1	0.0			0.1			0.3	
Delay (s)		19.7		22.5	7.1			15.6			16.5	
Level of Service		B		C	A			B			B	
Approach Delay (s)		19.7			13.1			15.6			16.5	
Approach LOS		B			B			B			B	

### Intersection Summary

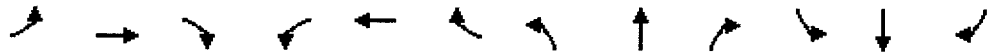
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕		↖	↕↕			↕↕			↕↕	
Traffic Volume (vph)	117	464	50	376	452	56	46	184	101	69	144	55
Future Volume (vph)	117	464	50	376	452	56	46	184	101	69	144	55
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	
Frt		0.99		1.00	0.98			0.95			0.97	
Flt Protected		0.99		0.95	1.00			0.99			0.99	
Satd. Flow (prot)		3465		1770	3481			3354			3387	
Flt Permitted		0.74		0.95	1.00			0.85			0.70	
Satd. Flow (perm)		2591		1770	3481			2876			2412	
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)	122	483	52	392	471	58	48	192	105	72	150	57
RTOR Reduction (vph)	0	5	0	0	9	0	0	41	0	0	19	0
Lane Group Flow (vph)	0	652	0	392	520	0	0	304	0	0	260	0
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)		30.5		25.7	61.2			16.4			16.4	
Effective Green, g (s)		30.5		25.7	61.2			16.4			16.4	
Actuated g/C Ratio		0.35		0.29	0.70			0.19			0.19	
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)		902		519	2431			538			451	
v/s Ratio Prot				c0.22	0.15							
v/s Ratio Perm		c0.25						0.11			c0.11	
v/c Ratio		0.72		0.76	0.21			0.57			0.58	
Uniform Delay, d1		24.9		28.1	4.7			32.4			32.4	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		2.9		6.2	0.0			1.4			1.8	
Delay (s)		27.8		34.3	4.7			33.7			34.2	
Level of Service		C		C	A			C			C	
Approach Delay (s)		27.8			17.3			33.7			34.2	
Approach LOS		C			B			C			C	

Intersection Summary

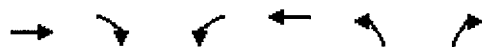
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	87.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 17: Queens Ln & Queen St

5/5/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↘	
Traffic Volume (veh/h)	412	20	105	512	26	77
Future Volume (Veh/h)	412	20	105	512	26	77
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)	434	21	111	539	27	81
Pedestrians						19
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						2
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh	2					
Upstream signal (ft)	564			680		
pX, platoon unblocked						
vC, conflicting volume			474			246
vC1, stage 1 conf vol						464
vC2, stage 2 conf vol						492
vCu, unblocked vol			474			246
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			95 90
cM capacity (veh/h)			1067			508 797

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	289	166	111	270	270	108
Volume Left	0	0	111	0	0	27
Volume Right	0	21	0	0	0	81
cSH	1700	1700	1067	1700	1700	697
Volume to Capacity	0.17	0.10	0.10	0.16	0.16	0.15
Queue Length 95th (ft)	0	0	9	0	0	14
Control Delay (s)	0.0	0.0	8.8	0.0	0.0	11.1
Lane LOS	A			B		
Approach Delay (s)	0.0		1.5			11.1
Approach LOS						B

Intersection Summary			
Average Delay		1.8	
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

5/5/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↘	
Traffic Volume (veh/h)	598	9	81	822	51	208
Future Volume (Veh/h)	598	9	81	822	51	208
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	672	10	91	924	57	234
Pedestrians						19
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						2
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh	2					
Upstream signal (ft)	564			687		
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			701		1340	360
vC1, stage 1 conf vol					696	
vC2, stage 2 conf vol					644	
vCu, unblocked vol			484		1183	110
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		87	73
cM capacity (veh/h)			967		434	856




















Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	448	234	91	462	462	291
Volume Left	0	0	91	0	0	57
Volume Right	0	10	0	0	0	234
cSH	1700	1700	967	1700	1700	719
Volume to Capacity	0.26	0.14	0.09	0.27	0.27	0.40
Queue Length 95th (ft)	0	0	8	0	0	49
Control Delay (s)	0.0	0.0	9.1	0.0	0.0	13.4
Lane LOS			A			B
Approach Delay (s)	0.0		0.8			13.4
Approach LOS						B

Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			47.0%	ICU Level of Service	A	
Analysis Period (min)			15			

\* User Entered Value

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




















5/13/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	117	26	43	109	121	49	468	17	75	551	333
Future Volume (vph)	191	117	26	43	109	121	49	468	17	75	551	333
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	
Frbp, ped/bikes	1.00	0.99			1.00		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00			1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.97			0.94		1.00	0.99		1.00	0.94	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1767	1799			1737		1746	3520		1770	3244	
Flt Permitted	0.58	1.00			0.94		0.23	1.00		0.46	1.00	
Satd. Flow (perm)	1077	1799			1640		430	3520		866	3244	
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)	197	121	27	44	112	125	51	482	18	77	568	343
RTOR Reduction (vph)	0	7	0	0	26	0	0	2	0	0	82	0
Lane Group Flow (vph)	197	141	0	0	255	0	51	498	0	77	829	0
Confl. Peds. (#/hr)	2		44				42					42
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)	20.3	20.3			20.3		23.7	23.7		23.7	23.7	
Effective Green, g (s)	20.3	20.3			20.3		23.7	23.7		23.7	23.7	
Actuated g/C Ratio	0.38	0.38			0.38		0.44	0.44		0.44	0.44	
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)	404	676			616		188	1544		380	1423	
v/s Ratio Prot		0.08						0.14			c0.26	
v/s Ratio Perm	c0.18				0.16		0.12			0.09		
v/c Ratio	0.49	0.21			0.41		0.27	0.32		0.20	0.58	
Uniform Delay, d1	12.9	11.4			12.5		9.6	9.9		9.3	11.4	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.2			0.5		0.8	0.1		0.3	0.6	
Delay (s)	13.8	11.6			12.9		10.4	10.0		9.6	12.0	
Level of Service	B	B			B		B	B		A	B	
Approach Delay (s)		12.8			12.9			10.1			11.8	
Approach LOS		B			B			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		11.7										
HCM 2000 Volume to Capacity ratio		0.54										
Actuated Cycle Length (s)		54.0							10.0			
Intersection Capacity Utilization		81.8%										
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 24: Ward Ave & Halekauwila St/Driveway

5/13/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	267	125	85	32	83	41	25	769	37	145	760	232
Future Volume (vph)	267	125	85	32	83	41	25	769	37	145	760	232
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	
Frbp, ped/bikes	1.00	0.97			1.00		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00			1.00		0.98	1.00		1.00	1.00	
Frt	1.00	0.94			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	1693			1778		1737	3515		1770	3319	
Flt Permitted	0.69	1.00			0.91		0.19	1.00		0.27	1.00	
Satd. Flow (perm)	1279	1693			1640		348	3515		503	3319	
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)	278	130	89	33	86	43	26	801	39	151	792	242
RTOR Reduction (vph)	0	27	0	0	14	0	0	4	0	0	37	0
Lane Group Flow (vph)	278	192	0	0	148	0	26	836	0	151	997	0
Confl. Peds. (#/hr)			91				63					63
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	23.9	23.9			23.9		30.9	30.9		30.9	30.9	
Effective Green, g (s)	23.9	23.9			23.9		30.9	30.9		30.9	30.9	
Actuated g/C Ratio	0.37	0.37			0.37		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	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	471	624			604		165	1676		239	1582	
v/s Ratio Prot		0.11						0.24			c0.30	
v/s Ratio Perm	c0.22				0.09		0.07			0.30		
v/c Ratio	0.59	0.31			0.25		0.16	0.50		0.63	0.63	
Uniform Delay, d1	16.5	14.6			14.2		9.6	11.6		12.7	12.7	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	0.3			0.2		0.4	0.2		5.4	0.8	
Delay (s)	18.5	14.8			14.4		10.0	11.9		18.0	13.5	
Level of Service	B	B			B		B	B		B	B	
Approach Delay (s)		16.9			14.4			11.8			14.1	
Approach LOS		B			B			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		13.9										
HCM 2000 Volume to Capacity ratio		0.61										
Actuated Cycle Length (s)		64.8						10.0				
Intersection Capacity Utilization		79.5%									D	
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis

## 23: Kamakee St & Halekauwila St

5/18/2016



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↶	↷		↕	↕	↷
Traffic Volume (veh/h)	126	116	69	198	324	98
Future Volume (Veh/h)	126	116	69	198	324	98
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	137	126	75	215	352	107
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	663	171	459			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	663	171	459			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	69	86	93			
cM capacity (veh/h)	445	886	1098			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	137	126	147	143	141	141	177
Volume Left	137	0	75	0	0	0	0
Volume Right	0	126	0	0	0	0	107
cSH	445	886	1098	1700	1700	1700	1700
Volume to Capacity	0.31	0.14	0.07	0.08	0.08	0.08	0.10
Queue Length 95th (ft)	32	12	5	0	0	0	0
Control Delay (s)	16.6	9.7	4.7	0.0	0.0	0.0	0.0
Lane LOS	C	A	A				
Approach Delay (s)	13.3		2.4		0.0		
Approach LOS	B						

Intersection Summary			
Average Delay		4.1	
Intersection Capacity Utilization	32.9%		ICU Level of Service
Analysis Period (min)	15		A

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

## 47: Kamakee St & Halekauwila St

5/18/2016



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	50	45	95	282	488	96
Future Volume (Veh/h)	50	45	95	282	488	96
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	49	103	307	530	104
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
				None	None	
Median storage (veh)						
Upstream signal (ft)						
				269	309	
pX, platoon unblocked						
pX, platoon unblocked	0.97					
vC, conflicting volume						
vC, conflicting volume	942	229	634			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol						
vCu, unblocked vol	885	229	634			
tC, single (s)						
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %						
p0 queue free %	83	94	89			
cM capacity (veh/h)						
cM capacity (veh/h)	318	827	945			

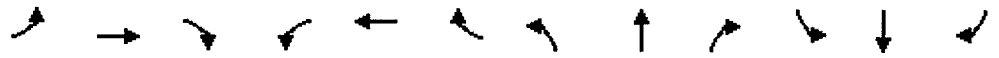
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	54	49	205	205	212	212	210
Volume Left	54	0	103	0	0	0	0
Volume Right	0	49	0	0	0	0	104
cSH	318	827	945	1700	1700	1700	1700
Volume to Capacity	0.17	0.06	0.11	0.12	0.12	0.12	0.12
Queue Length 95th (ft)	15	5	9	0	0	0	0
Control Delay (s)	18.6	9.6	5.2	0.0	0.0	0.0	0.0
Lane LOS	C	A	A				
Approach Delay (s)	14.3		2.6		0.0		
Approach LOS	B						

Intersection Summary			
Average Delay			2.2
Intersection Capacity Utilization	35.5%		ICU Level of Service
Analysis Period (min)	15		A

\* User Entered Value

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕		↖	↕	
Traffic Volume (vph)	35	70	37	97	180	134	63	368	67	65	528	74
Future Volume (vph)	35	70	37	97	180	134	63	368	67	65	528	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	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	1.00		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		0.97	1.00	
Frt	1.00	0.95		1.00	0.94		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)	1751	1766		1770	1722		1749	3418		1720	3454	
Flt Permitted	0.49	1.00		0.68	1.00		0.37	1.00		0.48	1.00	
Satd. Flow (perm)	904	1766		1271	1722		684	3418		871	3454	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	76	40	105	196	146	68	400	73	71	574	80
RTOR Reduction (vph)	0	24	0	0	34	0	0	17	0	0	13	0
Lane Group Flow (vph)	38	92	0	105	308	0	68	456	0	71	641	0
Confl. Peds. (#/hr)	37					37	34		63	63		34
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)	17.9	17.9		17.9	17.9		20.2	20.2		20.2	20.2	
Effective Green, g (s)	17.9	17.9		17.9	17.9		20.2	20.2		20.2	20.2	
Actuated g/C Ratio	0.37	0.37		0.37	0.37		0.42	0.42		0.42	0.42	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	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)	336	657		472	640		287	1435		365	1450	
v/s Ratio Prot		0.05			c0.18			0.13			c0.19	
v/s Ratio Perm	0.04			0.08			0.10			0.08		
v/c Ratio	0.11	0.14		0.22	0.48		0.24	0.32		0.19	0.44	
Uniform Delay, d1	9.9	10.0		10.3	11.5		9.0	9.3		8.8	9.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1		0.2	0.6		0.4	0.1		0.3	0.2	
Delay (s)	10.0	10.1		10.6	12.1		9.4	9.5		9.1	10.2	
Level of Service	B	B		B	B		A	A		A	B	
Approach Delay (s)		10.1			11.8			9.5			10.0	
Approach LOS		B			B			A			B	

Intersection Summary

HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	48.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	175	70	142	129	263	51	479	174	292	538	74
Future Volume (vph)	47	175	70	142	129	263	51	479	174	292	538	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	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	0.99		1.00	0.96		1.00	0.96		1.00	0.99	
Flpb, ped/bikes	0.98	1.00		0.98	1.00		0.98	1.00		0.96	1.00	
Frt	1.00	0.96		1.00	0.90		1.00	0.96		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)	1726	1762		1734	1605		1728	3274		1691	3443	
Flt Permitted	0.31	1.00		0.52	1.00		0.38	1.00		0.36	1.00	
Satd. Flow (perm)	564	1762		945	1605		699	3274		646	3443	
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)	48	180	72	146	133	271	53	494	179	301	555	76
RTOR Reduction (vph)	0	16	0	0	83	0	0	42	0	0	12	0
Lane Group Flow (vph)	48	236	0	146	321	0	53	631	0	301	619	0
Confl. Peds. (#/hr)	67		39	39		67	43		87	87		43
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	24.9	24.9		24.9	24.9		42.4	42.4		42.4	42.4	
Effective Green, g (s)	24.9	24.9		24.9	24.9		42.4	42.4		42.4	42.4	
Actuated g/C Ratio	0.32	0.32		0.32	0.32		0.55	0.55		0.55	0.55	
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)	181	567		304	517		383	1795		354	1888	
v/s Ratio Prot		0.13			c0.20			0.19			0.18	
v/s Ratio Perm	0.09			0.15			0.08			c0.47		
v/c Ratio	0.27	0.42		0.48	0.62		0.14	0.35		0.85	0.33	
Uniform Delay, d1	19.4	20.5		21.0	22.2		8.5	9.8		14.8	9.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.5		1.2	2.3		0.2	0.1		17.4	0.1	
Delay (s)	20.2	21.0		22.2	24.5		8.7	9.9		32.2	9.7	
Level of Service	C	C		C	C		A	A		C	A	
Approach Delay (s)		20.9			23.9			9.8			17.0	
Approach LOS		C			C			A			B	

Intersection Summary

HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	77.3	Sum of lost time (s)	10.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕	↗	↖	↕	↗	↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	58	100	30	24	159	55	43	164	30	27	279	120
Future Volume (vph)	58	100	30	24	159	55	43	164	30	27	279	120
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
Frb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.97	1.00		0.99	1.00	1.00
Frt	1.00	0.97		1.00	0.96		1.00	0.98		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	3388		1770	3403		1721	3441		1743	1863	1484
Flt Permitted	0.95	1.00		0.95	1.00		0.51	1.00		0.62	1.00	1.00
Satd. Flow (perm)	1770	3388		1770	3403		923	3441		1140	1863	1484
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	62	108	32	26	171	59	46	176	32	29	300	129
RTOR Reduction (vph)	0	20	0	0	41	0	0	16	0	0	0	85
Lane Group Flow (vph)	62	120	0	26	189	0	46	192	0	29	300	44
Confl. Peds. (#/hr)			34	34			43		33	33		43
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)	4.1	19.6		1.3	16.8		18.6	18.6		18.6	18.6	18.6
Effective Green, g (s)	4.1	19.6		1.3	16.8		18.6	18.6		18.6	18.6	18.6
Actuated g/C Ratio	0.08	0.36		0.02	0.31		0.34	0.34		0.34	0.34	0.34
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)	133	1218		42	1048		315	1174		389	635	506
v/s Ratio Prot	c0.04	c0.04		0.01	c0.06			0.06			c0.16	
v/s Ratio Perm							0.05			0.03		0.03
v/c Ratio	0.47	0.10		0.62	0.18		0.15	0.16		0.07	0.47	0.09
Uniform Delay, d1	24.2	11.6		26.4	13.8		12.4	12.5		12.1	14.1	12.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.6	0.0		24.2	0.1		0.2	0.1		0.1	0.6	0.1
Delay (s)	26.7	11.6		50.5	13.9		12.7	12.6		12.2	14.7	12.3
Level of Service	C	B		D	B		B	B		B	B	B
Approach Delay (s)		16.3			17.6			12.6			13.8	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	54.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 35: Kamakee St & Auahi St

5/5/2016




















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖	↖	↖	↖↗		↖	↖	↖
Traffic Volume (vph)	83	333	107	10	214	81	90	214	48	103	283	161
Future Volume (vph)	83	333	107	10	214	81	90	214	48	103	283	161
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
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.96		1.00	1.00	0.86	1.00	0.98		1.00	1.00	0.82
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.90	1.00		0.92	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3259		1770	1863	1356	1598	3356		1619	1863	1294
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.43	1.00		0.58	1.00	1.00
Satd. Flow (perm)	1770	3259		1770	1863	1356	731	3356		992	1863	1294
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)	87	351	113	11	225	85	95	225	51	108	298	169
RTOR Reduction (vph)	0	35	0	0	0	50	0	22	0	0	0	120
Lane Group Flow (vph)	87	429	0	11	225	35	95	254	0	108	298	49
Confl. Peds. (#/hr)			167			209	105		137	137		105
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	6.4	35.9		0.7	30.2	30.2	21.1	21.1		21.1	21.1	21.1
Effective Green, g (s)	6.4	35.9		0.7	30.2	30.2	21.1	21.1		21.1	21.1	21.1
Actuated g/C Ratio	0.09	0.49		0.01	0.42	0.42	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
Vehicle Extension (s)	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	1609		17	773	563	212	974		287	540	375
v/s Ratio Prot	c0.05	0.13		0.01	c0.12			0.08			c0.16	
v/s Ratio Perm						0.03	0.13			0.11		0.04
v/c Ratio	0.56	0.27		0.65	0.29	0.06	0.45	0.26		0.38	0.55	0.13
Uniform Delay, d1	31.8	10.7		35.9	14.1	12.8	21.0	19.8		20.6	21.8	19.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.6	0.1		62.0	0.2	0.0	1.5	0.1		0.8	1.2	0.2
Delay (s)	36.4	10.8		97.9	14.3	12.8	22.6	20.0		21.4	23.0	19.2
Level of Service	D	B		F	B	B	C	B		C	C	B
Approach Delay (s)		14.9			16.8			20.6			21.6	
Approach LOS		B			B			C			C	

### Intersection Summary

HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	72.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.2%	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

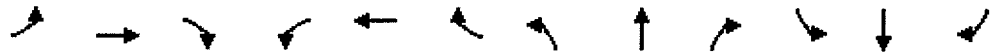
5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	8	56	0	0	0	150	81	7	23	43	54
Future Volume (vph)	48	8	56	0	0	0	150	81	7	23	43	54
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	
Frb, ped/bikes		1.00	0.96				1.00	1.00			0.97	
Flpb, ped/bikes		0.99	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	0.99			0.94	
Flt Protected		0.96	1.00				0.95	1.00			0.99	
Satd. Flow (prot)		1760	1520				1770	1834			1677	
Flt Permitted		0.96	1.00				0.95	1.00			0.94	
Satd. Flow (perm)		1760	1520				1770	1834			1594	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	55	9	64	0	0	0	172	93	8	26	49	62
RTOR Reduction (vph)	0	0	53	0	0	0	0	3	0	0	30	0
Lane Group Flow (vph)	0	64	11	0	0	0	172	98	0	0	107	0
Confl. Peds. (#/hr)	12		34	34		12			16	16		62
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				8.7	32.1			18.4	
Effective Green, g (s)		8.5	8.5				8.7	32.1			18.4	
Actuated g/C Ratio		0.17	0.17				0.17	0.63			0.36	
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)		295	255				304	1163			579	
v/s Ratio Prot							c0.10	0.05				
v/s Ratio Perm		0.04	0.01								c0.07	
v/c Ratio		0.22	0.04				0.57	0.08			0.18	
Uniform Delay, d1		18.2	17.6				19.2	3.6			11.0	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		0.4	0.1				2.4	0.0			0.2	
Delay (s)		18.5	17.7				21.6	3.6			11.1	
Level of Service		B	B				C	A			B	
Approach Delay (s)		18.1			0.0			15.0			11.1	
Approach LOS		B			A			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			14.7				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.29									
Actuated Cycle Length (s)			50.6				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			37.2%				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

5/5/2016





















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗				↖	↕			↕	
Traffic Volume (vph)	98	10	188	0	0	0	236	108	11	19	83	55
Future Volume (vph)	98	10	188	0	0	0	236	108	11	19	83	55
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	
Frb, ped/bikes		1.00	0.91				1.00	0.99			0.96	
Flpb, ped/bikes		0.91	1.00				1.00	1.00			0.99	
Frt		1.00	0.85				1.00	0.99			0.95	
Flt Protected		0.96	1.00				0.95	1.00			0.99	
Satd. Flow (prot)		1620	1445				1770	1821			1680	
Flt Permitted		0.96	1.00				0.95	1.00			0.96	
Satd. Flow (perm)		1620	1445				1770	1821			1614	
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)	108	11	207	0	0	0	259	119	12	21	91	60
RTOR Reduction (vph)	0	0	155	0	0	0	0	5	0	0	22	0
Lane Group Flow (vph)	0	119	52	0	0	0	259	126	0	0	150	0
Confl. Peds. (#/hr)	60		77	77		60			48	48		104
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2			6	
Permitted Phases	4		4							6		
Actuated Green, G (s)		15.2	15.2				14.3	34.9			15.6	
Effective Green, g (s)		15.2	15.2				14.3	34.9			15.6	
Actuated g/C Ratio		0.25	0.25				0.24	0.58			0.26	
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)		409	365				421	1057			418	
v/s Ratio Prot							c0.15	0.07				
v/s Ratio Perm		0.07	0.04								c0.09	
v/c Ratio		0.29	0.14				0.62	0.12			0.36	
Uniform Delay, d1		18.1	17.4				20.4	5.7			18.2	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		0.4	0.2				2.7	0.1			0.5	
Delay (s)		18.5	17.6				23.1	5.7			18.7	
Level of Service		B	B				C	A			B	
Approach Delay (s)		17.9			0.0			17.3			18.7	
Approach LOS		B			A			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			17.8				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			60.1				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

## 1: Cooke St & Kapiolani Blvd

5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	707	119	525	1099	229	100	189	81	9	52	18
Future Volume (vph)	0	707	119	525	1099	229	100	189	81	9	52	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor		0.95			0.86		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes		0.98			0.99		1.00	1.00	0.94	1.00	0.98	
Flpb, ped/bikes		1.00			1.00		0.94	1.00	1.00	0.96	1.00	
Frt		0.98			0.98		1.00	1.00	0.85	1.00	0.96	
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3398			6105		1663	1863	1486	1706	1754	
Flt Permitted		1.00			0.72		0.71	1.00	1.00	0.52	1.00	
Satd. Flow (perm)		3398			4456		1242	1863	1486	939	1754	
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)	0	736	124	547	1145	239	104	197	84	9	54	19
RTOR Reduction (vph)	0	12	0	0	21	0	0	0	54	0	11	0
Lane Group Flow (vph)	0	848	0	0	1910	0	104	197	30	9	62	0
Confl. Peds. (#/hr)			57	57		29	69		54	54		69
Turn Type		NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases				2			4		4	8		
Actuated Green, G (s)		50.3			59.7		20.4	20.4	20.4	20.4	20.4	
Effective Green, g (s)		50.3			59.7		20.4	20.4	20.4	20.4	20.4	
Actuated g/C Ratio		0.56			0.66		0.23	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	
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1896			3033		281	421	336	212	397	
v/s Ratio Prot		0.25			c0.03			c0.11			0.04	
v/s Ratio Perm					c0.39		0.08		0.02	0.01		
v/c Ratio		0.45			1.43dl		0.37	0.47	0.09	0.04	0.16	
Uniform Delay, d1		11.7			8.8		29.4	30.2	27.5	27.2	28.0	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2			0.4		0.8	0.8	0.1	0.1	0.2	
Delay (s)		11.9			9.2		30.3	31.0	27.6	27.3	28.1	
Level of Service		B			A		C	C	C	C	C	
Approach Delay (s)		11.9			9.2			30.1			28.0	
Approach LOS		B			A			C			C	

### Intersection Summary

HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 1: Cooke St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↑↑↔		↔	↑↑		↔	↑	↔	↔	↔	
Traffic Volume (vph)	5	1459	131	335	929	140	111	333	236	21	61	37
Future Volume (vph)	5	1459	131	335	929	140	111	333	236	21	61	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	5.0	5.0	5.0	
Lane Util. Factor		0.91		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes		0.98		1.00	0.98		1.00	1.00	0.89	1.00	0.96	
Flpb, ped/bikes		1.00		1.00	1.00		0.92	1.00	1.00	0.96	1.00	
Frt		0.99		1.00	0.98		1.00	1.00	0.85	1.00	0.94	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		4904		1770	3412		1624	1863	1414	1693	1687	
Flt Permitted		0.94		0.07	1.00		0.68	1.00	1.00	0.22	1.00	
Satd. Flow (perm)		4593		135	3412		1166	1863	1414	393	1687	
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)	5	1520	136	349	968	146	116	347	246	22	64	39
RTOR Reduction (vph)	0	8	0	0	10	0	0	0	189	0	18	0
Lane Group Flow (vph)	0	1653	0	349	1104	0	116	347	57	22	85	0
Confl. Peds. (#/hr)	36		110	110		36	78		82	82		78
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2		4		4		8	
Permitted Phases	6			2			4		4		8	
Actuated Green, G (s)		50.2		77.6	77.6		26.5	26.5	26.5	26.5	26.5	
Effective Green, g (s)		50.2		77.6	77.6		26.5	26.5	26.5	26.5	26.5	
Actuated g/C Ratio		0.44		0.68	0.68		0.23	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)		2020		412	2320		270	432	328	91	391	
v/s Ratio Prot				c0.17	0.32			c0.19				0.05
v/s Ratio Perm		0.36		c0.41			0.10		0.04	0.06		
v/c Ratio		0.82		0.85	0.48		0.43	0.80	0.17	0.24	0.22	
Uniform Delay, d1		28.0		33.2	8.6		37.4	41.3	35.0	35.6	35.4	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.7		14.8	0.2		1.1	10.4	0.3	1.4	0.3	
Delay (s)		30.7		48.1	8.8		38.5	51.7	35.3	37.0	35.7	
Level of Service		C		D	A		D	D	D	D	D	
Approach Delay (s)		30.7			18.2			43.8			35.9	
Approach LOS		C			B			D			D	

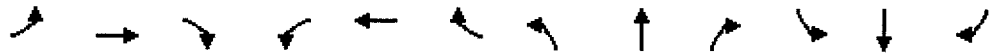
### Intersection Summary

HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	114.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	98.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 2: Ward Ave & Kapiolani Blvd

5/9/2016

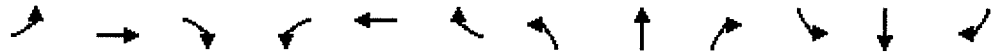


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↘	↑↑↑		↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	0	636	157	398	1473	108	211	573	119	165	792	127
Future Volume (vph)	0	636	157	398	1473	108	211	573	119	165	792	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	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		0.95		1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.98		1.00	0.99		1.00	1.00	0.87	1.00	1.00	0.92
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frft		0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3362		1770	5000		1770	3539	1378	1770	3539	1460
Flt Permitted		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3362		1770	5000		1770	3539	1378	1770	3539	1460
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)	0	656	162	410	1519	111	218	591	123	170	816	131
RTOR Reduction (vph)	0	18	0	0	7	0	0	0	89	0	0	81
Lane Group Flow (vph)	0	800	0	410	1623	0	218	591	34	170	816	50
Confl. Peds. (#/hr)			82	82		72			110			58
Turn Type		NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		6		5	2		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)		31.0		25.0	61.0		13.0	33.0	33.0	11.0	31.0	31.0
Effective Green, g (s)		31.0		25.0	61.0		13.0	33.0	33.0	11.0	31.0	31.0
Actuated g/C Ratio		0.26		0.21	0.51		0.11	0.28	0.28	0.09	0.26	0.26
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)		868		368	2541		191	973	378	162	914	377
v/s Ratio Prot		c0.24		c0.23	0.32		c0.12	0.17		0.10	c0.23	
v/s Ratio Perm									0.02			0.03
v/c Ratio		0.92		1.11	0.64		1.14	0.61	0.09	1.05	0.89	0.13
Uniform Delay, d1		43.3		47.5	21.5		53.5	37.9	32.3	54.5	42.9	34.2
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		15.0		81.5	0.5		108.3	1.1	0.1	84.4	11.0	0.2
Delay (s)		58.3		129.0	22.0		161.8	38.9	32.4	138.9	53.9	34.3
Level of Service		E		F	C		F	D	C	F	D	C
Approach Delay (s)		58.3			43.5			66.8			64.5	
Approach LOS		E			D			E			E	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			55.2			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			0.99									
Actuated Cycle Length (s)		120.0				Sum of lost time (s)		20.0				
Intersection Capacity Utilization		101.4%				ICU Level of Service			G			
Analysis Period (min)		15										
c Critical Lane Group												



HCM Signalized Intersection Capacity Analysis  
 2: Ward Ave & Kapiolani Blvd

5/5/2016



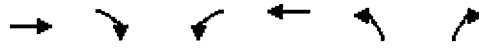
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑		↖	↑↑	↗	↖	↑↑	↗
Traffic Volume (vph)	0	1515	220	0	1138	136	181	733	304	273	1046	97
Future Volume (vph)	0	1515	220	0	1138	136	181	733	304	273	1046	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	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		0.91			0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.98			0.99		1.00	1.00	0.88	1.00	1.00	0.92
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.98			0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4897			4950		1770	3539	1387	1770	3539	1459
Flt Permitted		1.00			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		4897			4950		1770	3539	1387	1770	3539	1459
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)	0	1578	229	0	1185	142	189	764	317	284	1090	101
RTOR Reduction (vph)	0	15	0	0	12	0	0	0	78	0	0	42
Lane Group Flow (vph)	0	1792	0	0	1315	0	189	764	239	284	1090	59
Confl. Peds. (#/hr)			118			76			106			59
Turn Type		NA			NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		6			2		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)		48.0			48.0		15.2	33.5	33.5	22.0	40.3	40.3
Effective Green, g (s)		48.0			48.0		15.2	33.5	33.5	22.0	40.3	40.3
Actuated g/C Ratio		0.41			0.41		0.13	0.28	0.28	0.19	0.34	0.34
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)		1983			2005		227	1000	392	328	1203	496
v/s Ratio Prot		c0.37			0.27		0.11	0.22		c0.16	c0.31	
v/s Ratio Perm									0.17			0.04
v/c Ratio		0.90			0.66		0.83	0.76	0.61	0.87	0.91	0.12
Uniform Delay, d1		33.1			28.6		50.4	38.9	36.8	46.8	37.3	26.9
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		6.2			0.8		22.2	3.5	2.7	20.5	9.8	0.1
Delay (s)		39.3			29.3		72.6	42.4	39.5	67.3	47.1	27.0
Level of Service		D			C		E	D	D	E	D	C
Approach Delay (s)		39.3			29.3			46.2			49.6	
Approach LOS		D			C			D			D	

Intersection Summary

HCM 2000 Control Delay	41.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	118.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 3: Kamakee St & Kapiolani Blvd

5/5/2016

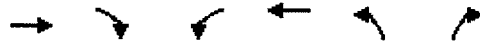


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑↑↑	↑	↑
Traffic Volume (vph)	831	80	276	1881	92	157
Future Volume (vph)	831	80	276	1881	92	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.86	1.00	1.00
Frbp, ped/bikes	0.99			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3467			6355	1770	1515
Flt Permitted	1.00			0.72	0.95	1.00
Satd. Flow (perm)	3467			4635	1770	1515
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	884	85	294	2001	98	167
RTOR Reduction (vph)	6	0	0	0	0	124
Lane Group Flow (vph)	963	0	0	2295	98	43
Confl. Peds. (#/hr)		49	49			26
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases			6			8
Actuated Green, G (s)	72.1			72.1	27.3	27.3
Effective Green, g (s)	72.1			72.1	27.3	27.3
Actuated g/C Ratio	0.66			0.66	0.25	0.25
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2284			3054	441	378
v/s Ratio Prot	0.28				c0.06	
v/s Ratio Perm				c0.50		0.03
v/c Ratio	0.42			0.94dl	0.22	0.11
Uniform Delay, d1	8.8			12.6	32.6	31.7
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			1.1	0.3	0.1
Delay (s)	8.9			13.7	32.9	31.8
Level of Service	A			B	C	C
Approach Delay (s)	8.9			13.7	32.2	
Approach LOS	A			B	C	

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	109.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		
dl Defacto Left Lane. Recode with 1 though lane as a left lane.			
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 3: Kamakee St & Kapiolani Blvd

5/5/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑	↵	↵
Traffic Volume (vph)	1976	208	0	1108	175	362
Future Volume (vph)	1976	208	0	1108	175	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.86			0.95	1.00	1.00
Frbp, ped/bikes	0.98			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	6221			3539	1770	1512
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	6221			3539	1770	1512
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	2102	221	0	1179	186	385
RTOR Reduction (vph)	13	0	0	0	0	1
Lane Group Flow (vph)	2310	0	0	1179	186	384
Confl. Peds. (#/hr)		110				30
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	57.2			57.2	33.2	33.2
Effective Green, g (s)	57.2			57.2	33.2	33.2
Actuated g/C Ratio	0.57			0.57	0.33	0.33
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	3544			2016	585	499
v/s Ratio Prot	c0.37			0.33	0.11	
v/s Ratio Perm						c0.25
v/c Ratio	0.65			0.58	0.32	0.77
Uniform Delay, d1	14.8			13.9	25.1	30.2
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.4			0.4	0.3	7.0
Delay (s)	15.2			14.4	25.4	37.2
Level of Service	B			B	C	D
Approach Delay (s)	15.2			14.4	33.4	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 5: Piikoi St & Kapiolani Blvd

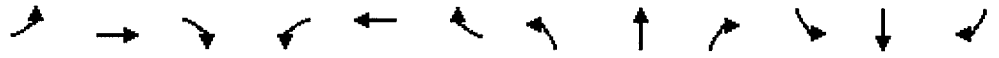
5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑↑↑		↖	↑↑↑	↗			
Traffic Volume (vph)	0	1084	47	45	2014	331	51	1162	106	0	0	0
Future Volume (vph)	0	1084	47	45	2014	331	51	1162	106	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.95			0.86		1.00	0.91	1.00			
Frb, ped/bikes		1.00			0.99		1.00	1.00	0.96			
Flpb, ped/bikes		1.00			1.00		0.93	1.00	1.00			
Frt		0.99			0.98		1.00	1.00	0.85			
Flt Protected		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		3506			6199		1641	5085	1520			
Flt Permitted		1.00			0.85		0.95	1.00	1.00			
Satd. Flow (perm)		3506			5294		1641	5085	1520			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1153	50	48	2143	352	54	1236	113	0	0	0
RTOR Reduction (vph)	0	2	0	0	2	0	0	0	43	0	0	0
Lane Group Flow (vph)	0	1201	0	0	2541	0	54	1236	70	0	0	0
Confl. Peds. (#/hr)			64			60	58		23			
Turn Type		NA		Perm	NA		Perm	NA	Perm			
Protected Phases		2			6			8				
Permitted Phases				6			8		8			
Actuated Green, G (s)		70.5			70.5		36.3	36.3	36.3			
Effective Green, g (s)		70.5			70.5		36.3	36.3	36.3			
Actuated g/C Ratio		0.60			0.60		0.31	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)		2116			3195		510	1580	472			
v/s Ratio Prot		0.34						0.24				
v/s Ratio Perm					0.48		0.03		0.05			
v/c Ratio		0.57			0.80		0.11	0.78	0.15			
Uniform Delay, d1		14.0			17.7		28.7	36.7	29.1			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.4			1.4		0.1	2.6	0.1			
Delay (s)		14.3			19.1		28.8	39.3	29.2			
Level of Service		B			B		C	D	C			
Approach Delay (s)		14.3			19.1			38.0			0.0	
Approach LOS		B			B			D			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			23.1									
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			116.8						10.0			
Intersection Capacity Utilization			98.5%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 5: Piikoi St & Kapiolani Blvd

5/5/2016

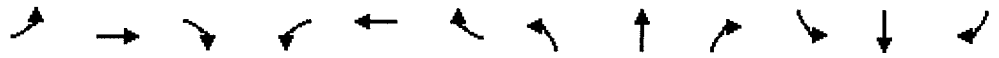


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑			↑↑		↖	↑↑↑	↗			
Traffic Volume (vph)	0	2352	160	0	837	305	121	1424	190	0	0	0
Future Volume (vph)	0	2352	160	0	837	305	121	1424	190	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.86			0.95		1.00	0.91	1.00			
Frb, ped/bikes		0.99			0.97		1.00	1.00	0.97			
Flpb, ped/bikes		1.00			1.00		0.88	1.00	1.00			
Frt		0.99			0.96		1.00	1.00	0.85			
Flt Protected		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		6280			3279		1554	5085	1535			
Flt Permitted		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)		6280			3279		1554	5085	1535			
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)	0	2450	167	0	872	318	126	1483	198	0	0	0
RTOR Reduction (vph)	0	8	0	0	2	0	0	0	11	0	0	0
Lane Group Flow (vph)	0	2609	0	0	1188	0	126	1483	187	0	0	0
Confl. Peds. (#/hr)			149			102	96		15			
Turn Type		NA			NA		Perm	NA	Perm			
Protected Phases		2			6			8				
Permitted Phases							8		8			
Actuated Green, G (s)		64.0			64.0		44.4	44.4	44.4			
Effective Green, g (s)		64.0			64.0		44.4	44.4	44.4			
Actuated g/C Ratio		0.54			0.54		0.37	0.37	0.37			
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)		3394			1772		582	1906	575			
v/s Ratio Prot		c0.42			0.36			c0.29				
v/s Ratio Perm							0.08		0.12			
v/c Ratio		0.77			0.67		0.22	0.78	0.32			
Uniform Delay, d1		21.4			19.6		25.2	32.7	26.3			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		1.1			1.0		0.2	2.1	0.3			
Delay (s)		22.5			20.6		25.4	34.7	26.7			
Level of Service		C			C		C	C	C			
Approach Delay (s)		22.5			20.6			33.2			0.0	
Approach LOS		C			C			C			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			25.5									C
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			118.4						10.0			
Intersection Capacity Utilization			73.1%									D
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 14: Cooke St & Queen St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Traffic Volume (vph)	44	225	77	62	536	77	63	325	43	17	252	197
Future Volume (vph)	44	225	77	62	536	77	63	325	43	17	252	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frbp, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.97			0.98			0.99			0.94	
Flt Protected		0.99			1.00			0.99			1.00	
Satd. Flow (prot)		3397			3459			3456			3306	
Flt Permitted		0.83			0.88			0.83			0.93	
Satd. Flow (perm)		2820			3074			2876			3083	
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)	46	237	81	65	564	81	66	342	45	18	265	207
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	364	0	0	710	0	0	453	0	0	490	0
Confl. Peds. (#/hr)	28			31			31			70		
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)		18.2			18.2			16.4			16.4	
Effective Green, g (s)		18.2			18.2			16.4			16.4	
Actuated g/C Ratio		0.41			0.41			0.37			0.37	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1150			1254			1057			1133	
v/s Ratio Prot												
v/s Ratio Perm		0.13			0.23			0.16			0.16	
v/c Ratio		0.32			0.57			0.43			0.43	
Uniform Delay, d1		9.0			10.2			10.6			10.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			0.6			0.3			0.3	
Delay (s)		9.1			10.8			10.9			10.9	
Level of Service		A			B			B			B	
Approach Delay (s)		9.1			10.8			10.9			10.9	
Approach LOS		A			B			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			10.5									
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			44.6									
Intersection Capacity Utilization			71.7%						10.0			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 14: Cooke St & Queen St

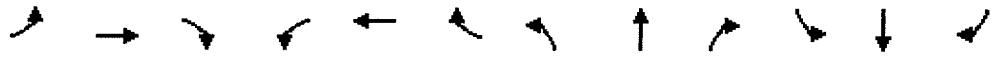
5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Traffic Volume (vph)	103	478	104	46	350	63	39	417	55	57	328	108
Future Volume (vph)	103	478	104	46	350	63	39	417	55	57	328	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frbp, ped/bikes		1.00			1.00			1.00			1.00	
Fipb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.98			0.97	
Flt Protected		0.99			1.00			1.00			0.99	
Satd. Flow (prot)		3430			3446			3466			3396	
Flt Permitted		0.80			0.84			0.89			0.84	
Satd. Flow (perm)		2767			2906			3080			2863	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	110	509	111	49	372	67	41	444	59	61	349	115
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	730	0	0	488	0	0	544	0	0	525	0
Confl. Peds. (#/hr)	15			38			37			61		
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)		20.8			20.8			17.4			17.4	
Effective Green, g (s)		20.8			20.8			17.4			17.4	
Actuated g/C Ratio		0.43			0.43			0.36			0.36	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1194			1254			1111			1033	
v/s Ratio Prot												
v/s Ratio Perm		c0.26			0.17			0.18			c0.18	
v/c Ratio		0.61			0.39			0.49			0.51	
Uniform Delay, d1		10.6			9.4			12.0			12.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			0.2			0.3			0.4	
Delay (s)		11.5			9.6			12.3			12.4	
Level of Service		B			A			B			B	
Approach Delay (s)		11.5			9.6			12.3			12.4	
Approach LOS		B			A			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		11.5			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.56										
Actuated Cycle Length (s)		48.2			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		77.8%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 20: Piikoi St & Waimanu St/Ala Moana Plaza

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	545	169	162	0	20	41	0	813	86	0	157	46
Future Volume (vph)	545	169	162	0	20	41	0	813	86	0	157	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0		5.0			5.0	
Lane Util. Factor	0.91	0.91	1.00		0.95	0.95		0.86			0.95	
Frbp, ped/bikes	1.00	1.00	0.93		1.00	1.00		0.99			0.98	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85		0.95	0.85		0.99			0.97	
Flt Protected	0.95	0.97	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1610	3289	1470		1673	1504		6277			3352	
Flt Permitted	0.95	0.70	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (perm)	1610	2373	1470		1673	1504		6277			3352	
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)	568	176	169	0	21	43	0	847	90	0	164	48
RTOR Reduction (vph)	0	0	61	0	0	0	0	17	0	0	26	0
Lane Group Flow (vph)	284	460	108	0	33	31	0	920	0	0	186	0
Confl. Peds. (#/hr)			60						49			39
Turn Type	Prot	NA	Perm		NA	Perm		NA			NA	
Protected Phases	7	4			8			2			6	
Permitted Phases			4			8						
Actuated Green, G (s)	42.7	67.2	67.2		19.5	19.5		27.7			27.7	
Effective Green, g (s)	42.7	67.2	67.2		19.5	19.5		27.7			27.7	
Actuated g/C Ratio	0.41	0.64	0.64		0.19	0.19		0.26			0.26	
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)	655	1893	941		310	279		1657			885	
v/s Ratio Prot	c0.18	0.10			0.02			c0.15			0.06	
v/s Ratio Perm		c0.06	0.07			0.02						
v/c Ratio	0.43	0.24	0.12		0.11	0.11		0.56			0.21	
Uniform Delay, d1	22.4	8.0	7.3		35.5	35.5		33.3			30.1	
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.5	0.1	0.1		0.2	0.2		0.4			0.1	
Delay (s)	22.9	8.1	7.4		35.6	35.7		33.7			30.2	
Level of Service	C	A	A		D	D		C			C	
Approach Delay (s)		12.5			35.6			33.7			30.2	
Approach LOS		B			D			C			C	

Intersection Summary




















HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	104.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Signalized Intersection Capacity Analysis

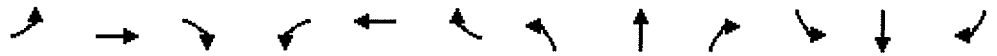
## 20: Piikoi St & Waimanu St/Ala Moana Plaza

5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	520	330	297	0	123	306	0	850	87	0	299	65
Future Volume (vph)	520	330	297	0	123	306	0	850	87	0	299	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	
Lane Util. Factor	0.91	0.91	1.00		0.95	0.95		0.86			0.95	
Frbp, ped/bikes	1.00	1.00	0.80		1.00	1.00		0.98			0.97	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85		0.93	0.85		0.99			0.97	
Flt Protected	0.95	0.98	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1610	3320	1267		1650	1504		6199			3325	
Flt Permitted	0.95	0.65	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (perm)	1610	2217	1267		1650	1504		6199			3325	
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)	542	344	309	0	128	319	0	885	91	0	311	68
RTOR Reduction (vph)	0	0	33	0	0	0	0	14	0	0	16	0
Lane Group Flow (vph)	287	599	276	0	233	214	0	962	0	0	363	0
Confl. Peds. (#/hr)			167						158			89
Turn Type	Prot	NA	Perm		NA	Perm		NA			NA	
Protected Phases	7	4			8			2				6
Permitted Phases			4			8						
Actuated Green, G (s)	26.0	78.0	78.0		47.0	47.0		30.4			30.4	
Effective Green, g (s)	26.0	78.0	78.0		47.0	47.0		30.4			30.4	
Actuated g/C Ratio	0.22	0.66	0.66		0.40	0.40		0.26			0.26	
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)	353	1702	834		654	597		1591			853	
v/s Ratio Prot	c0.18	0.08			0.14			c0.16			0.11	
v/s Ratio Perm		c0.15	0.22			0.14						
v/c Ratio	0.81	0.35	0.33		0.36	0.36		0.60			0.43	
Uniform Delay, d1	43.9	9.0	8.8		25.1	25.1		38.7			36.7	
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2	13.3	0.1	0.2		0.3	0.4		0.7			0.3	
Delay (s)	57.2	9.1	9.1		25.4	25.5		39.4			37.1	
Level of Service	E	A	A		C	C		D			D	
Approach Delay (s)		20.6			25.4			39.4			37.1	
Approach LOS		C			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			29.5									
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			118.4						15.0			
Intersection Capacity Utilization			75.3%									
Analysis Period (min)			15									
c Critical Lane Group												

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	58	111	34	90	149	80	40	284	99	62	263	72
Future Volume (vph)	58	111	34	90	149	80	40	284	99	62	263	72
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	64	122	37	99	164	88	44	312	109	68	289	79

















Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	223	351	200	265	213	224
Volume Left (vph)	64	99	44	0	68	0
Volume Right (vph)	37	88	0	109	0	79
Hadj (s)	-0.01	-0.06	0.14	-0.25	0.19	-0.21
Departure Headway (s)	7.5	7.1	7.8	7.4	7.9	7.4
Degree Utilization, x	0.47	0.69	0.43	0.54	0.46	0.46
Capacity (veh/h)	429	475	434	458	433	449
Control Delay (s)	17.0	24.3	15.3	17.5	16.3	15.5
Approach Delay (s)	17.0	24.3	16.6		15.9	
Approach LOS	C	C	C		C	

Intersection Summary

Delay	18.3
Level of Service	C
Intersection Capacity Utilization	59.8%
ICU Level of Service	B
Analysis Period (min)	15

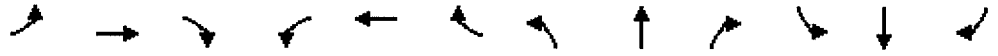
HCM Unsignalized Intersection Capacity Analysis  
 22: Cooke St & Halekauwila St

5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	98	188	78	92	100	89	23	294	69	78	341	47
Future Volume (vph)	98	188	78	92	100	89	23	294	69	78	341	47
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	103	198	82	97	105	94	24	309	73	82	359	49
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	383	296	179	228	262	229						
Volume Left (vph)	103	97	24	0	82	0						
Volume Right (vph)	82	94	0	73	0	49						
Hadj (s)	-0.04	-0.09	0.10	-0.19	0.19	-0.12						
Departure Headway (s)	7.6	7.9	8.6	8.3	8.5	8.2						
Degree Utilization, x	0.81	0.65	0.42	0.52	0.62	0.52						
Capacity (veh/h)	454	424	392	405	400	416						
Control Delay (s)	36.1	24.5	16.5	18.7	23.0	18.4						
Approach Delay (s)	36.1	24.5	17.7		20.8							
Approach LOS	E	C	C		C							
Intersection Summary												
Delay			24.4									
Level of Service			C									
Intersection Capacity Utilization			61.7%	ICU Level of Service	B							
Analysis Period (min)			15									

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

5/5/2016



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	72	51	38	188	65	14	270	68	32	226	130
Future Volume (vph)	86	72	51	38	188	65	14	270	68	32	226	130
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	90	75	53	40	196	68	15	281	71	33	235	135

















Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	218	304	156	212	151	253
Volume Left (vph)	90	40	15	0	33	0
Volume Right (vph)	53	68	0	71	0	135
Hadj (s)	-0.03	-0.07	0.08	-0.20	0.14	-0.34
Departure Headway (s)	6.8	6.5	7.2	6.9	7.2	6.7
Degree Utilization, x	0.41	0.55	0.31	0.40	0.30	0.47
Capacity (veh/h)	473	517	462	480	473	501
Control Delay (s)	14.5	17.2	12.2	13.3	12.0	14.2
Approach Delay (s)	14.5	17.2	12.8		13.4	
Approach LOS	B	C	B		B	

Intersection Summary

Delay	14.3
Level of Service	B
Intersection Capacity Utilization	62.5%
ICU Level of Service	B
Analysis Period (min)	15

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

5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	116	165	38	44	137	55	69	211	60	79	324	104
Future Volume (vph)	116	165	38	44	137	55	69	211	60	79	324	104
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	127	181	42	48	151	60	76	232	66	87	356	114
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	350	259	192	182	265	292						
Volume Left (vph)	127	48	76	0	87	0						
Volume Right (vph)	42	60	0	66	0	114						
Hadj (s)	0.03	-0.07	0.23	-0.22	0.20	-0.24						
Departure Headway (s)	7.5	7.7	8.4	7.9	8.0	7.6						
Degree Utilization, x	0.73	0.55	0.45	0.40	0.59	0.61						
Capacity (veh/h)	460	430	401	420	434	454						
Control Delay (s)	27.8	19.9	16.8	14.9	20.7	20.7						
Approach Delay (s)	27.8	19.9	15.8		20.7							
Approach LOS	D	C	C		C							
Intersection Summary												
Delay			21.0									
Level of Service			C									
Intersection Capacity Utilization			68.9%		ICU Level of Service				C			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 30: Cooke St & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	51	24	8	27	12	155	39	110	9	35	221	53
Future Volume (Veh/h)	51	24	8	27	12	155	39	110	9	35	221	53
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	53	25	8	28	13	161	41	115	9	36	230	55
Pedestrians		10			17			6			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)								419				
pX, platoon unblocked												
vC, conflicting volume	656	562	158	432	586	88	295			141		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	656	562	158	432	586	88	295			141		
tC, single (s)	*6.5	*5.5	*5.9	*6.5	*5.5	*5.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	83	95	99	94	97	83	97			97		
cM capacity (veh/h)	319	471	887	504	460	956	1253			1419		

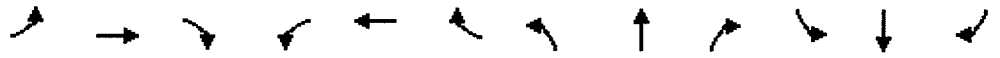
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	86	202	98	66	151	170
Volume Left	53	28	41	0	36	0
Volume Right	8	161	0	9	0	55
cSH	377	801	1253	1700	1419	1700
Volume to Capacity	0.23	0.25	0.03	0.04	0.03	0.10
Queue Length 95th (ft)	22	25	3	0	2	0
Control Delay (s)	17.3	11.0	3.5	0.0	2.0	0.0
Lane LOS	C	B	A		A	
Approach Delay (s)	17.3	11.0	2.1		0.9	
Approach LOS	C	B				

Intersection Summary		
Average Delay		5.6
Intersection Capacity Utilization	43.2%	ICU Level of Service A
Analysis Period (min)		15

\* User Entered Value

HCM Unsignalized Intersection Capacity Analysis  
 30: Cooke St & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	46	14	6	23	23	104	15	181	21	101	226	38
Future Volume (Veh/h)	46	14	6	23	23	104	15	181	21	101	226	38
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	48	15	6	24	24	108	16	189	22	105	235	40
Pedestrians		14			18			8			15	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)								419				
pX, platoon unblocked												
vC, conflicting volume	740	740	160	599	749	138	289			229		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	740	740	160	599	749	138	289			229		
tC, single (s)	*6.5	*5.5	*5.9	*6.5	*5.5	*5.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	83	96	99	94	94	88	99			92		
cM capacity (veh/h)	281	376	881	394	372	895	1255			1316		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	69	156	110	116	222	158
Volume Left	48	24	16	0	105	0
Volume Right	6	108	0	22	0	40
cSH	317	634	1255	1700	1316	1700
Volume to Capacity	0.22	0.25	0.01	0.07	0.08	0.09
Queue Length 95th (ft)	20	24	1	0	6	0
Control Delay (s)	19.5	12.5	1.2	0.0	4.1	0.0
Lane LOS	C	B	A		A	
Approach Delay (s)	19.5	12.5	0.6		2.4	
Approach LOS	C	B				

Intersection Summary		
Average Delay	5.2	
Intersection Capacity Utilization	43.5%	ICU Level of Service A
Analysis Period (min)	15	

\* User Entered Value

# HCM Signalized Intersection Capacity Analysis

## 37: Cooke St & Ala Moana Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖↖		↖	↖↖↖			↖	↖		↖	↖
Traffic Volume (vph)	112	1807	45	15	1899	16	29	18	3	54	45	144
Future Volume (vph)	112	1807	45	15	1899	16	29	18	3	54	45	144
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
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.96		1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5056		1770	5078			1784	1524		1789	1526
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.80	1.00
Satd. Flow (perm)	1770	5056		1770	5078			1446	1524		1474	1526
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	1863	46	15	1958	16	30	19	3	56	46	148
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	3	0	0	127
Lane Group Flow (vph)	115	1908	0	15	1974	0	0	49	0	0	102	21
Confl. Peds. (#/hr)			38			24	16		17	17		16
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	13.3	78.8		2.2	67.7			16.3	16.3		16.3	16.3
Effective Green, g (s)	13.3	78.8		2.2	67.7			16.3	16.3		16.3	16.3
Actuated g/C Ratio	0.12	0.70		0.02	0.60			0.15	0.15		0.15	0.15
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)	209	3547		34	3061			209	221		213	221
v/s Ratio Prot	c0.06	0.38		0.01	c0.39							
v/s Ratio Perm								0.03	0.00		c0.07	0.01
v/c Ratio	0.55	0.54		0.44	0.64			0.23	0.00		0.48	0.10
Uniform Delay, d1	46.7	8.0		54.4	14.5			42.5	41.0		44.1	41.6
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.1	0.2		8.9	0.5			0.6	0.0		1.7	0.2
Delay (s)	49.8	8.2		63.3	15.0			43.1	41.0		45.8	41.8
Level of Service	D	A		E	B			D	D		D	D
Approach Delay (s)		10.5			15.3			42.9			43.4	
Approach LOS		B			B			D			D	

### Intersection Summary

HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	112.3	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  
 37: Cooke St/Cooke St & Ala Moana Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖↖		↖	↖↖↖			↖	↖		↖	↖
Traffic Volume (vph)	86	2371	34	10	1840	107	66	51	15	39	32	159
Future Volume (vph)	86	2371	34	10	1840	107	66	51	15	39	32	159
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
Frbp, ped/bikes	1.00	1.00		1.00	0.99			1.00	0.95		1.00	0.90
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.97	1.00		0.98	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5060		1770	5016			1748	1511		1785	1419
Flt Permitted	0.95	1.00		0.95	1.00			0.78	1.00		0.78	1.00
Satd. Flow (perm)	1770	5060		1770	5016			1409	1511		1426	1419
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)	90	2470	35	10	1917	111	69	53	16	41	33	166
RTOR Reduction (vph)	0	1	0	0	4	0	0	0	13	0	0	100
Lane Group Flow (vph)	90	2504	0	10	2024	0	0	122	3	0	74	66
Confl. Peds. (#/hr)			56			45	52		26	26		52
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	11.2	82.7		0.7	72.2			19.6	19.6		19.6	19.6
Effective Green, g (s)	11.2	82.7		0.7	72.2			19.6	19.6		19.6	19.6
Actuated g/C Ratio	0.09	0.70		0.01	0.61			0.17	0.17		0.17	0.17
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)	168	3546		10	3069			234	250		236	235
v/s Ratio Prot	c0.05	c0.49		0.01	0.40							
v/s Ratio Perm							c0.09	0.00			0.05	0.05
v/c Ratio	0.54	0.71		1.00	0.66			0.52	0.01		0.31	0.28
Uniform Delay, d1	50.9	10.5		58.6	14.9			44.9	41.1		43.3	43.0
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.3	0.7		284.6	0.5			2.1	0.0		0.8	0.7
Delay (s)	54.2	11.1		343.3	15.4			47.0	41.1		44.0	43.7
Level of Service	D	B		F	B			D	D		D	D
Approach Delay (s)		12.6			17.0			46.3			43.8	
Approach LOS		B			B			D			D	

Intersection Summary

HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	118.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 41: Ala Moana Blvd & Ward Ave

5/6/2016



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖↗↘			↘	↖↗↘	↗		↖↗	↗	↖	↖↗
Traffic Volume (vph)	199	1653	5	13	133	1700	178	1	65	47	219	153
Future Volume (vph)	199	1653	5	13	133	1700	178	1	65	47	219	153
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
Frbp, ped/bikes	1.00	1.00			1.00	1.00	0.95		1.00	0.95	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	1.00
Satd. Flow (prot)	1770	5082			1770	5085	1512		3537	1499	1610	2962
Flt Permitted	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	5082			1770	5085	1512		3537	1499	1610	2962
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)	207	1722	5	14	139	1771	185	1	68	49	228	159
RTOR Reduction (vph)	0	0	0	0	0	0	80	0	0	0	0	188
Lane Group Flow (vph)	207	1727	0	0	153	1771	105	0	69	49	205	271
Confl. Peds. (#/hr)			30				21	36		35	35	
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		8	8		4	4
Permitted Phases						6				8		
Actuated Green, G (s)	16.6	54.0			13.5	50.9	50.9		25.9	25.9	25.9	25.9
Effective Green, g (s)	16.6	54.0			13.5	50.9	50.9		25.9	25.9	25.9	25.9
Actuated g/C Ratio	0.12	0.39			0.10	0.37	0.37		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)	210	1970			171	1858	552		657	278	299	550
v/s Ratio Prot	c0.12	c0.34			0.09	c0.35			0.02		c0.13	0.09
v/s Ratio Perm						0.07				c0.03		
v/c Ratio	0.99	0.88			0.89	0.95	0.19		0.11	0.18	0.69	0.49
Uniform Delay, d1	61.2	39.6			62.2	43.0	30.1		47.1	47.7	52.9	50.8
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	57.5	4.7			40.0	11.7	0.2		0.1	0.3	6.4	0.7
Delay (s)	118.8	44.3			102.2	54.7	30.3		47.1	48.0	59.3	51.5
Level of Service	F	D			F	D	C		D	D	E	D
Approach Delay (s)		52.3				56.0			47.5			53.9
Approach LOS		D				E			D			D

### Intersection Summary

HCM 2000 Control Delay	54.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	139.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	100.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

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

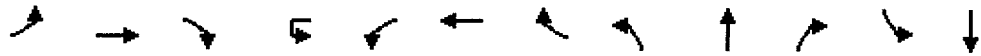
5/6/2016

Movement	SBR
<b>Intersection Summary</b>	
Lane Configurations	
Traffic Volume (vph)	266
Future Volume (vph)	266
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Fipb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	277
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	36
<b>Turn Type</b>	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
<b>Performance Metrics</b>	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
<b>Intersection Summary</b>	

# HCM Signalized Intersection Capacity Analysis

## 41: Ala Moana Blvd & Ward Ave

5/9/2016



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	306	2075	1	14	45	1676	236	7	157	109	227	74
Future Volume (vph)	306	2075	1	14	45	1676	236	7	157	109	227	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		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
Frbp, ped/bikes	1.00	1.00			1.00	1.00	0.92		1.00	0.90	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	0.88
Flt Protected	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	5085			1770	5085	1464		3532	1425	1610	2824
Flt Permitted	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	5085			1770	5085	1464		3532	1425	1610	2824
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)	319	2161	1	15	47	1746	246	7	164	114	236	77
RTOR Reduction (vph)	0	0	0	0	0	0	113	0	0	0	0	282
Lane Group Flow (vph)	319	2162	0	0	62	1746	133	0	171	114	212	164
Confl. Peds. (#/hr)			45				38	41		71	71	
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		8	8		4	4
Permitted Phases						6				8		
Actuated Green, G (s)	21.0	60.1			5.0	44.1	44.1		35.1	35.1	26.9	26.9
Effective Green, g (s)	21.0	60.1			5.0	44.1	44.1		35.1	35.1	26.9	26.9
Actuated g/C Ratio	0.14	0.41			0.03	0.30	0.30		0.24	0.24	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)	252	2077			60	1524	438		842	340	294	516
v/s Ratio Prot	c0.18	0.43			0.04	c0.34			0.05		c0.13	0.06
v/s Ratio Perm							0.09			c0.08		
v/c Ratio	1.27	1.04			1.03	1.15	0.30		0.20	0.34	0.72	0.32
Uniform Delay, d1	63.0	43.5			71.0	51.5	39.7		44.8	46.3	56.6	52.1
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	147.3	31.4			125.8	73.8	0.4		0.1	0.6	8.4	0.4
Delay (s)	210.3	74.9			196.9	125.3	40.1		44.9	46.9	65.0	52.5
Level of Service	F	E			F	F	D		D	D	E	D
Approach Delay (s)		92.3				117.3			45.7			56.5
Approach LOS		F				F			D			E

### Intersection Summary

HCM 2000 Control Delay	94.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	147.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	115.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

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

5/9/2016



Movement	SBR
<b>Signal Configurations</b>	
Traffic Volume (vph)	331
Future Volume (vph)	331
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Fipb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	345
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	41
<b>Turn Type</b>	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
<b>Intersection Summary</b>	

# HCM Signalized Intersection Capacity Analysis

## 43: Ala Moana Park Dr/Kamakee St & Ala Moana Blvd

5/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑↑		↖	↑↑↑		↖	↗			↖	↗
Traffic Volume (vph)	75	1796	79	15	1796	117	47	30	15	142	38	155
Future Volume (vph)	75	1796	79	15	1796	117	47	30	15	142	38	155
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
Frbp, 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			0.94	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.95			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	5024		1770	1716			1679	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.51	1.00			0.74	1.00
Satd. Flow (perm)	1770	5030		1770	5024		955	1716			1293	1583
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)	77	1833	81	15	1833	119	48	31	15	145	39	158
RTOR Reduction (vph)	0	3	0	0	4	0	0	12	0	0	0	101
Lane Group Flow (vph)	77	1911	0	15	1948	0	48	34	0	0	184	57
Confl. Peds. (#/hr)			43			21			76	76		
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)	8.8	77.9		1.7	70.8		28.7	28.7			28.7	28.7
Effective Green, g (s)	8.8	77.9		1.7	70.8		28.7	28.7			28.7	28.7
Actuated g/C Ratio	0.07	0.63		0.01	0.57		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)	126	3177		24	2884		222	399			300	368
v/s Ratio Prot	c0.04	0.38		0.01	c0.39			0.02				
v/s Ratio Perm							0.05				c0.14	0.04
v/c Ratio	0.61	0.60		0.62	0.68		0.22	0.09			0.61	0.15
Uniform Delay, d1	55.6	13.5		60.5	18.3		38.2	37.0			42.3	37.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	8.5	0.3		41.4	0.6		0.5	0.1			3.7	0.2
Delay (s)	64.1	13.8		101.8	18.9		38.7	37.1			46.0	37.8
Level of Service	E	B		F	B		D	D			D	D
Approach Delay (s)		15.8			19.5			37.9			42.2	
Approach LOS		B			B			D			D	

### Intersection Summary

HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	123.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	85.2%	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

5/18/2016



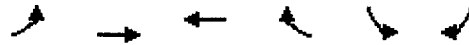
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑↑↑		↙	↑↑↑		↙	↑			↘	↘
Traffic Volume (vph)	88	2218	214	26	1498	214	113	61	32	85	95	243
Future Volume (vph)	88	2218	214	26	1498	214	113	61	32	85	95	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	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
Frbp, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.95			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.95	1.00
Frft	1.00	0.99		1.00	0.98		1.00	0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1770	4925		1770	4920		1770	1680			1721	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.50	1.00			0.78	1.00
Satd. Flow (perm)	1770	4925		1770	4920		929	1680			1374	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)	91	2287	221	27	1544	221	116	63	33	88	98	251
RTOR Reduction (vph)	0	7	0	0	12	0	0	13	0	0	0	102
Lane Group Flow (vph)	91	2501	0	27	1753	0	116	83	0	0	186	149
Confl. Peds. (#/hr)			82			50			104	104		
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	89.5		3.4	80.9		33.6	33.6			33.6	33.6
Effective Green, g (s)	12.0	89.5		3.4	80.9		33.6	33.6			33.6	33.6
Actuated g/C Ratio	0.08	0.63		0.02	0.57		0.24	0.24			0.24	0.24
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)	150	3115		42	2812		220	398			326	375
v/s Ratio Prot	c0.05	c0.51		0.02	0.36			0.05				
v/s Ratio Perm							0.12				c0.14	0.09
v/c Ratio	0.61	0.80		0.64	0.62		0.53	0.21			0.57	0.40
Uniform Delay, d1	62.5	19.4		68.4	20.2		47.0	43.3			47.6	45.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	6.8	1.6		29.0	0.4		2.3	0.3			2.4	0.7
Delay (s)	69.2	21.0		97.5	20.6		49.3	43.5			50.0	46.1
Level of Service	E	C		F	C		D	D			D	D
Approach Delay (s)		22.7			21.8			46.7			47.8	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	141.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	91.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 44: Ala Moana Blvd & Queens St

5/5/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↑↑↑	↑↑↑		↵↵	↗
Traffic Volume (vph)	17	1949	1920	202	61	23
Future Volume (vph)	17	1949	1920	202	61	23
Ideal Flow (vphpl)	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	0.91	0.91		0.97	1.00
Frb, ped/bikes	1.00	1.00	0.99		1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	5085	4987		3433	1472
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	5085	4987		3433	1472
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	18	2009	1979	208	63	24
RTOR Reduction (vph)	0	0	7	0	0	19
Lane Group Flow (vph)	18	2009	2180	0	63	5
Confl. Peds. (#/hr)	39			39		52
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	2.3	91.7	84.4		23.6	23.6
Effective Green, g (s)	2.3	91.7	84.4		23.6	23.6
Actuated g/C Ratio	0.02	0.73	0.67		0.19	0.19
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)	32	3721	3359		646	277
v/s Ratio Prot	0.01	c0.40	c0.44		c0.02	
v/s Ratio Perm						0.00
v/c Ratio	0.56	0.54	0.65		0.10	0.02
Uniform Delay, d1	61.0	7.4	11.9		42.0	41.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	20.7	0.2	0.4		0.1	0.0
Delay (s)	81.7	7.6	12.3		42.1	41.4
Level of Service	F	A	B		D	D
Approach Delay (s)		8.3	12.3		41.9	
Approach LOS		A	B		D	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	125.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Signalized Intersection Capacity Analysis

## 44: Ala Moana Blvd & Queens St

5/5/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑↑	↑↑↗		↘↖	↗
Traffic Volume (vph)	32	2320	1656	301	210	56
Future Volume (vph)	32	2320	1656	301	210	56
Ideal Flow (vphpl)	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	0.91	0.91		0.97	1.00
Frbp, ped/bikes	1.00	1.00	0.98		1.00	0.91
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	5085	4890		3433	1443
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	5085	4890		3433	1443
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	33	2417	1725	314	219	58
RTOR Reduction (vph)	0	0	14	0	0	46
Lane Group Flow (vph)	33	2417	2025	0	219	12
Confl. Peds. (#/hr)	73			73		64
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	4.7	100.5	90.8		28.0	28.0
Effective Green, g (s)	4.7	100.5	90.8		28.0	28.0
Actuated g/C Ratio	0.03	0.73	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)	60	3689	3205		694	291
v/s Ratio Prot	0.02	c0.48	0.41		c0.06	
v/s Ratio Perm						0.01
v/c Ratio	0.55	0.66	0.63		0.32	0.04
Uniform Delay, d1	65.9	9.9	14.0		47.1	44.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	10.5	0.4	0.4		0.3	0.1
Delay (s)	76.3	10.4	14.4		47.3	44.5
Level of Service	E	B	B		D	D
Approach Delay (s)		11.3	14.4		46.8	
Approach LOS		B	B		D	

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	138.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 45: Ala Moana Blvd & Piikoi St

5/5/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	←	↑↑↑	↑↑↑		←	↑↑
Traffic Volume (vph)	455	1536	1983	366	149	143
Future Volume (vph)	455	1536	1983	366	149	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frbp, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	5085	4948		1770	2787
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	5085	4948		1770	2787
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	474	1600	2066	381	155	149
RTOR Reduction (vph)	0	0	17	0	0	132
Lane Group Flow (vph)	474	1600	2430	0	155	17
Confl. Peds. (#/hr)	12			12	50	
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	9	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	28.8	81.7	81.7		16.7	16.7
Effective Green, g (s)	28.8	81.7	81.7		16.7	16.7
Actuated g/C Ratio	0.20	0.57	0.57		0.12	0.12
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)	695	2921	2842		207	327
v/s Ratio Prot	c0.14	0.31	c0.49		c0.09	
v/s Ratio Perm						0.01
v/c Ratio	0.68	0.55	0.86		0.75	0.05
Uniform Delay, d1	52.5	18.8	25.3		60.7	55.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.8	0.2	2.7		13.8	0.1
Delay (s)	55.2	19.0	28.0		74.5	55.8
Level of Service	E	B	C		E	E
Approach Delay (s)		27.3	28.0		65.3	
Approach LOS		C	C		E	

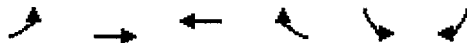
### Intersection Summary

HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	142.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 45: Ala Moana Blvd & Piikoi St

5/5/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖↗	↑↑↑	↑↑↓		↘	↗↖
Traffic Volume (vph)	356	2199	1737	342	276	219
Future Volume (vph)	356	2199	1737	342	276	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.97		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	5085	4826		1770	2787
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	5085	4826		1770	2787
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	371	2291	1809	356	288	228
RTOR Reduction (vph)	0	0	18	0	0	186
Lane Group Flow (vph)	371	2291	2147	0	288	42
Confl. Peds. (#/hr)	139			139	128	
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	9	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	32.0	79.8	79.8		29.0	29.0
Effective Green, g (s)	32.0	79.8	79.8		29.0	29.0
Actuated g/C Ratio	0.21	0.51	0.51		0.19	0.19
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)	705	2604	2471		329	518
v/s Ratio Prot	c0.11	c0.45	0.44		c0.16	
v/s Ratio Perm						0.02
v/c Ratio	0.53	0.88	0.87		0.88	0.08
Uniform Delay, d1	55.1	33.7	33.4		61.6	52.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.7	3.7	3.5		21.9	0.1
Delay (s)	55.9	37.5	36.9		83.5	52.5
Level of Service	E	D	D		F	D
Approach Delay (s)		40.0	36.9		69.8	
Approach LOS		D	D		E	

### Intersection Summary

HCM 2000 Control Delay	41.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	155.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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



















**APPENDIX J**

**CAPACITY ANALYSIS CALCULATIONS  
PROJECTED YEAR 2027 PEAK HOUR TRAFFIC ANALYSIS**

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

5/5/2016

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	55	189	90	77	381	83	99	760	71	65	934	223	
Future Volume (vph)	55	189	90	77	381	83	99	760	71	65	934	223	
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	0.99		1.00	0.99		1.00	0.99		1.00	0.99		
Flpb, ped/bikes	0.99	1.00		0.99	1.00		1.00	1.00		1.00	1.00		
Frt	1.00	0.95		1.00	0.97		1.00	0.99		1.00	0.97		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1758	1758		1756	1803		1770	3464		1770	3393		
Flt Permitted	0.18	1.00		0.44	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (perm)	332	1758		814	1803		1770	3464		1770	3393		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Adj. Flow (vph)	59	201	96	82	405	88	105	809	76	69	994	237	
RTOR Reduction (vph)	0	19	0	0	9	0	0	7	0	0	23	0	
Lane Group Flow (vph)	59	278	0	82	484	0	105	878	0	69	1208	0	
Confl. Peds. (#/hr)	21		15	15		21			58			34	
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)	26.3	26.3		26.3	26.3		5.9	35.8		6.3	36.2		
Effective Green, g (s)	26.3	26.3		26.3	26.3		5.9	35.8		6.3	36.2		
Actuated g/C Ratio	0.32	0.32		0.32	0.32		0.07	0.43		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)	104	554		256	568		125	1486		133	1472		
v/s Ratio Prot		0.16			c0.27		c0.06	0.25		0.04	c0.36		
v/s Ratio Perm	0.18			0.10									
v/c Ratio	0.57	0.50		0.32	0.85		0.84	0.59		0.52	0.82		
Uniform Delay, d1	23.8	23.2		21.7	26.7		38.3	18.2		37.1	20.7		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	6.9	0.7		0.7	11.8		36.5	0.6		3.4	3.8		
Delay (s)	30.7	23.9		22.5	38.5		74.8	18.8		40.5	24.6		
Level of Service	C	C		C	D		E	B		D	C		
Approach Delay (s)		25.1			36.2			24.8			25.4		
Approach LOS		C			D			C			C		

Intersection Summary

HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	83.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 15: Ward Ave & Queen St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	404	175	126	333	102	80	917	157	156	1109	91
Future Volume (vph)	114	404	175	126	333	102	80	917	157	156	1109	91
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	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frft	1.00	0.95		1.00	0.96		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)	1762	1759		1758	1788		1770	3386		1770	3471	
Flt Permitted	0.32	1.00		0.18	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	601	1759		325	1788		1770	3386		1770	3471	
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)	119	421	182	131	347	106	83	955	164	162	1155	95
RTOR Reduction (vph)	0	17	0	0	12	0	0	15	0	0	7	0
Lane Group Flow (vph)	119	586	0	131	441	0	83	1104	0	163	1243	0
Confl. Peds. (#/hr)	11		25	25		11			88			59
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)	36.3	36.3		36.3	36.3		4.0	30.0		8.0	34.0	
Effective Green, g (s)	36.3	36.3		36.3	36.3		4.0	30.0		8.0	34.0	
Actuated g/C Ratio	0.41	0.41		0.41	0.41		0.04	0.34		0.09	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)	244	715		132	726		79	1137		158	1321	
v/s Ratio Prot		0.33			0.25		0.05	0.33		c0.09	c0.36	
v/s Ratio Perm	0.20			c0.40								
v/c Ratio	0.49	0.82		0.99	0.61		1.05	0.97		1.03	0.94	
Uniform Delay, d1	19.6	23.6		26.4	20.9		42.6	29.2		40.6	26.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	7.3		75.7	1.4		115.8	19.9		80.2	13.2	
Delay (s)	21.2	30.9		102.1	22.3		158.5	49.1		120.8	39.8	
Level of Service	C	C		F	C		F	D		F	D	
Approach Delay (s)		29.3			40.2			56.7			49.2	
Approach LOS		C			D			E			D	

### Intersection Summary

HCM 2000 Control Delay	46.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	89.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 16: Kamakee St & Queen St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕		↙	↕↕			↕↕			↕↕	
Traffic Volume (vph)	51	232	0	206	307	31	13	147	205	44	205	121
Future Volume (vph)	51	232	0	206	307	31	13	147	205	44	205	121
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	
Frt		1.00		1.00	0.99			0.92			0.95	
Flt Protected		0.99		0.95	1.00			1.00			0.99	
Satd. Flow (prot)		3508		1770	3491			3235			3345	
Flt Permitted		0.82		0.95	1.00			0.93			0.86	
Satd. Flow (perm)		2908		1770	3491			3027			2908	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	54	247	0	219	327	33	14	156	218	47	218	129
RTOR Reduction (vph)	0	0	0	0	10	0	0	154	0	0	79	0
Lane Group Flow (vph)	0	301	0	219	350	0	0	234	0	0	315	0
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)		13.4		12.5	30.9			17.0			17.0	
Effective Green, g (s)		13.4		12.5	30.9			17.0			17.0	
Actuated g/C Ratio		0.23		0.22	0.53			0.29			0.29	
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)		673		382	1863			888			853	
v/s Ratio Prot				c0.12	0.10							
v/s Ratio Perm		c0.10						0.08			c0.11	
v/c Ratio		0.45		0.57	0.19			0.26			0.37	
Uniform Delay, d1		19.1		20.3	7.0			15.7			16.2	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.5		2.1	0.0			0.2			0.3	
Delay (s)		19.6		22.4	7.0			15.8			16.5	
Level of Service		B		C	A			B			B	
Approach Delay (s)		19.6			12.9			15.8			16.5	
Approach LOS		B			B			B			B	

### Intersection Summary

HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	57.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 16: Kamakee St & Queen St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↖	↗			↕			↕	
Traffic Volume (vph)	122	480	46	399	466	59	44	179	117	70	137	58
Future Volume (vph)	122	480	46	399	466	59	44	179	117	70	137	58
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	
Frt		0.99		1.00	0.98			0.95			0.97	
Flt Protected		0.99		0.95	1.00			0.99			0.99	
Satd. Flow (prot)		3469		1770	3480			3335			3379	
Flt Permitted		0.73		0.95	1.00			0.85			0.69	
Satd. Flow (perm)		2569		1770	3480			2867			2350	
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)	127	500	48	416	485	61	46	186	122	73	143	60
RTOR Reduction (vph)	0	5	0	0	9	0	0	56	0	0	21	0
Lane Group Flow (vph)	0	670	0	416	537	0	0	298	0	0	255	0
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)		31.6		27.7	64.3			16.5			16.5	
Effective Green, g (s)		31.6		27.7	64.3			16.5			16.5	
Actuated g/C Ratio		0.35		0.31	0.71			0.18			0.18	
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)		894		539	2464			520			427	
v/s Ratio Prot				c0.24	0.15							
v/s Ratio Perm		c0.26						0.10			c0.11	
v/c Ratio		0.75		0.77	0.22			0.57			0.60	
Uniform Delay, d1		26.1		28.7	4.6			33.9			34.1	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		3.5		6.8	0.0			1.5			2.2	
Delay (s)		29.6		35.4	4.6			35.5			36.3	
Level of Service		C		D	A			D			D	
Approach Delay (s)		29.6			17.9			35.5			36.3	
Approach LOS		C			B			D			D	

### Intersection Summary

HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.8	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

5/5/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	
Traffic Volume (veh/h)	469	21	97	524	27	67
Future Volume (Veh/h)	469	21	97	524	27	67
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)	494	22	102	552	28	71
Pedestrians						19
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						2
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh	2					
Upstream signal (ft)	564			680		
pX, platoon unblocked						
vC, conflicting volume			535			1004
vC1, stage 1 conf vol						524
vC2, stage 2 conf vol						480
vCu, unblocked vol			535			1004
tC, single (s)			4.1			*5.8
tC, 2 stage (s)						4.8
tF (s)			2.2			3.5
p0 queue free %			90			94
cM capacity (veh/h)			1013			497

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	329	187	102	276	276	99
Volume Left	0	0	102	0	0	28
Volume Right	0	22	0	0	0	71
cSH	1700	1700	1013	1700	1700	665
Volume to Capacity	0.19	0.11	0.10	0.16	0.16	0.15
Queue Length 95th (ft)	0	0	8	0	0	13
Control Delay (s)	0.0	0.0	9.0	0.0	0.0	11.4
Lane LOS	A			B		
Approach Delay (s)	0.0		1.4			11.4
Approach LOS						B

Intersection Summary						
Average Delay			1.6			
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

5/5/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	
Traffic Volume (veh/h)	635	10	74	859	53	198
Future Volume (Veh/h)	635	10	74	859	53	198
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	713	11	83	965	60	222
Pedestrians						19
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						2
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh	2					
Upstream signal (ft)	564			687		
pX, platoon unblocked			0.90		0.90	0.90
vC, conflicting volume			743		1386	381
vC1, stage 1 conf vol					738	
vC2, stage 2 conf vol					648	
vCu, unblocked vol			502		1213	101
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		86	74
cM capacity (veh/h)			941		428	856
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	475	249	83	482	482	282
Volume Left	0	0	83	0	0	60
Volume Right	0	11	0	0	0	222
cSH	1700	1700	941	1700	1700	706
Volume to Capacity	0.28	0.15	0.09	0.28	0.28	0.40
Queue Length 95th (ft)	0	0	7	0	0	48
Control Delay (s)	0.0	0.0	9.2	0.0	0.0	13.5
Lane LOS	A			B		
Approach Delay (s)	0.0		0.7			13.5
Approach LOS						B
Intersection Summary						
Average Delay			2.2			
Intersection Capacity Utilization			47.1%	ICU Level of Service	A	
Analysis Period (min)			15			

\* User Entered Value

# HCM Signalized Intersection Capacity Analysis

## 24: Ward Ave & Halekauwila St

5/9/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↔		↖	↗		↖	↗	
Traffic Volume (vph)	196	133	24	56	153	208	50	478	26	141	555	345
Future Volume (vph)	196	133	24	56	153	208	50	478	26	141	555	345
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	
Frbp, ped/bikes	1.00	0.99			1.00		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00			1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.98			0.93		1.00	0.99		1.00	0.94	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1768	1808			1726		1744	3512		1770	3229	
Flt Permitted	0.44	1.00			0.94		0.22	1.00		0.44	1.00	
Satd. Flow (perm)	820	1808			1631		403	3512		820	3229	
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)	202	137	25	58	158	214	52	493	27	145	572	356
RTOR Reduction (vph)	0	6	0	0	34	0	0	3	0	0	82	0
Lane Group Flow (vph)	202	156	0	0	396	0	52	517	0	145	846	0
Confl. Peds. (#/hr)	2		44				42					42
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	24.3	24.3			24.3		27.1	27.1		27.1	27.1	
Effective Green, g (s)	24.3	24.3			24.3		27.1	27.1		27.1	27.1	
Actuated g/C Ratio	0.40	0.40			0.40		0.44	0.44		0.44	0.44	
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)	324	715			645		177	1550		361	1425	
v/s Ratio Prot		0.09						0.15			c0.26	
v/s Ratio Perm	c0.25				0.24		0.13			0.18		
v/c Ratio	0.62	0.22			0.61		0.29	0.33		0.40	0.59	
Uniform Delay, d1	14.9	12.3			14.8		11.0	11.2		11.6	13.0	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.7	0.2			1.7		0.9	0.1		0.7	0.7	
Delay (s)	18.6	12.4			16.6		11.9	11.4		12.4	13.7	
Level of Service	B	B			B		B	B		B	B	
Approach Delay (s)		15.8			16.6			11.4			13.5	
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	0.61		
Actuated Cycle Length (s)	61.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

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

5/9/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	279	156	88	37	93	76	25	789	48	222	777	240
Future Volume (vph)	279	156	88	37	93	76	25	789	48	222	777	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	0.95	0.95			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.97			1.00		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00			1.00		0.98	1.00		1.00	1.00	
Frt	1.00	0.95			0.95		1.00	0.99		1.00	0.96	
Flt Protected	0.95	0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1625			1754		1733	3509		1770	3302	
Flt Permitted	0.58	0.95			0.90		0.20	1.00		0.27	1.00	
Satd. Flow (perm)	1031	1558			1591		367	3509		505	3302	
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)	291	162	92	39	97	79	26	822	50	231	809	250
RTOR Reduction (vph)	0	19	0	0	23	0	0	5	0	0	34	0
Lane Group Flow (vph)	262	265	0	0	192	0	26	867	0	231	1025	0
Confl. Peds. (#/hr)			91				63					63
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	25.2	25.2			25.2		42.1	42.1		42.1	42.1	
Effective Green, g (s)	25.2	25.2			25.2		42.1	42.1		42.1	42.1	
Actuated g/C Ratio	0.33	0.33			0.33		0.54	0.54		0.54	0.54	
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)	336	507			518		199	1911		275	1798	
v/s Ratio Prot								0.25				0.31
v/s Ratio Perm	c0.25	0.17			0.12		0.07			c0.46		
v/c Ratio	0.78	0.52			0.37		0.13	0.45		0.84	0.57	
Uniform Delay, d1	23.5	21.2			20.0		8.6	10.6		14.8	11.6	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.9	1.0			0.4		0.3	0.2		19.7	0.4	
Delay (s)	34.4	22.1			20.4		8.9	10.8		34.4	12.0	
Level of Service	C	C			C		A	B		C	B	
Approach Delay (s)		28.0			20.4			10.8			16.0	
Approach LOS		C			C			B			B	

Intersection Summary

HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	77.3	Sum of lost time (s)	10.0
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis  
 47: Kamakee St & Halekauwila St

5/18/2016



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	186	104	64	189	274	111
Future Volume (Veh/h)	186	104	64	189	274	111
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	202	113	70	205	298	121
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	601	160	419			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	601	160	419			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	58	87	94			
cM capacity (veh/h)	482	897	1137			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	202	113	138	137	119	119	181
Volume Left	202	0	70	0	0	0	0
Volume Right	0	113	0	0	0	0	121
cSH	482	897	1137	1700	1700	1700	1700
Volume to Capacity	0.42	0.13	0.06	0.08	0.07	0.07	0.11
Queue Length 95th (ft)	51	11	5	0	0	0	0
Control Delay (s)	17.8	9.6	4.5	0.0	0.0	0.0	0.0
Lane LOS	C	A	A				
Approach Delay (s)	14.8		2.3		0.0		
Approach LOS	B						

Intersection Summary			
Average Delay		5.2	
Intersection Capacity Utilization	35.2%		ICU Level of Service
Analysis Period (min)		15	A

\* User Entered Value

# HCM Unsignalized Intersection Capacity Analysis

## 47: Kamakee St & Halekauwila St

5/18/2016



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	68	37	88	273	460	137
Future Volume (Veh/h)	68	37	88	273	460	137
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	74	40	96	297	500	149
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked	0.98					
vC, conflicting volume	915	241	649			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	869	241	649			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	77	95	90			
cM capacity (veh/h)	329	815	933			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	74	40	195	198	200	200	249
Volume Left	74	0	96	0	0	0	0
Volume Right	0	40	0	0	0	0	149
cSH	329	815	933	1700	1700	1700	1700
Volume to Capacity	0.23	0.05	0.10	0.12	0.12	0.12	0.15
Queue Length 95th (ft)	21	4	9	0	0	0	0
Control Delay (s)	19.1	9.6	5.1	0.0	0.0	0.0	0.0
Lane LOS	C	A	A				
Approach Delay (s)	15.8		2.5		0.0		
Approach LOS	C						

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

\* User Entered Value

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	65	39	146	185	128	66	383	96	45	548	91
Future Volume (vph)	43	65	39	146	185	128	66	383	96	45	548	91
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	1.00		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		0.97	1.00	
Frt	1.00	0.94		1.00	0.94		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)	1750	1759		1770	1727		1750	3382		1722	3439	
Flt Permitted	0.49	1.00		0.68	1.00		0.35	1.00		0.46	1.00	
Satd. Flow (perm)	899	1759		1275	1727		641	3382		832	3439	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	71	42	159	201	139	72	416	104	49	596	99
RTOR Reduction (vph)	0	27	0	0	32	0	0	25	0	0	15	0
Lane Group Flow (vph)	47	86	0	159	308	0	72	495	0	49	680	0
Confl. Peds. (#/hr)	37					37	34		63	63		34
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)	18.0	18.0		18.0	18.0		21.0	21.0		21.0	21.0	
Effective Green, g (s)	18.0	18.0		18.0	18.0		21.0	21.0		21.0	21.0	
Actuated g/C Ratio	0.37	0.37		0.37	0.37		0.43	0.43		0.43	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)	330	646		468	634		274	1449		356	1473	
v/s Ratio Prot		0.05			c0.18			0.15			c0.20	
v/s Ratio Perm	0.05			0.12			0.11			0.06		
v/c Ratio	0.14	0.13		0.34	0.49		0.26	0.34		0.14	0.46	
Uniform Delay, d1	10.3	10.3		11.2	11.9		9.0	9.4		8.5	10.0	
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	0.6		0.5	0.1		0.2	0.2	
Delay (s)	10.5	10.4		11.6	12.5		9.5	9.5		8.7	10.2	
Level of Service	B	B		B	B		A	A		A	B	
Approach Delay (s)		10.4			12.2			9.5			10.1	
Approach LOS		B			B			A			B	

Intersection Summary

HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	49.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 34: Ward Ave & Pohukaina St/Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕		↖	↕	
Traffic Volume (vph)	60	174	73	164	130	260	53	499	219	289	559	83
Future Volume (vph)	60	174	73	164	130	260	53	499	219	289	559	83
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	0.99		1.00	0.96		1.00	0.96		1.00	0.99	
Flpb, ped/bikes	0.97	1.00		0.98	1.00		0.98	1.00		0.96	1.00	
Frt	1.00	0.96		1.00	0.90		1.00	0.95		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)	1725	1758		1733	1604		1728	3229		1697	3434	
Flt Permitted	0.29	1.00		0.50	1.00		0.37	1.00		0.33	1.00	
Satd. Flow (perm)	533	1758		915	1604		674	3229		594	3434	
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)	62	179	75	169	134	268	55	514	226	298	576	86
RTOR Reduction (vph)	0	17	0	0	83	0	0	54	0	0	13	0
Lane Group Flow (vph)	62	237	0	169	319	0	55	686	0	298	649	0
Confl. Peds. (#/hr)	67		39	39		67	43		87	87		43
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)	25.1	25.1		25.1	25.1		45.9	45.9		45.9	45.9	
Effective Green, g (s)	25.1	25.1		25.1	25.1		45.9	45.9		45.9	45.9	
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.57	0.57		0.57	0.57	
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)	165	544		283	497		381	1829		336	1945	
v/s Ratio Prot		0.13			c0.20			0.21			0.19	
v/s Ratio Perm	0.12			0.18			0.08			c0.50		
v/c Ratio	0.38	0.44		0.60	0.64		0.14	0.37		0.89	0.33	
Uniform Delay, d1	21.8	22.3		23.7	24.1		8.3	9.7		15.3	9.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.6		3.4	2.8		0.2	0.1		23.3	0.1	
Delay (s)	23.3	22.9		27.0	26.9		8.5	9.8		38.6	9.5	
Level of Service	C	C		C	C		A	A		D	A	
Approach Delay (s)		22.9			27.0			9.7			18.5	
Approach LOS		C			C			A			B	






















### Intersection Summary

HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	81.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



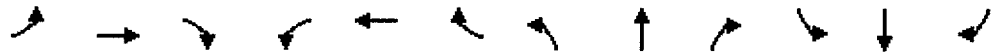
HCM Signalized Intersection Capacity Analysis  
 35: Kamakee St & Auahi St

5/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	71	45	24	157	48	44	155	26	0	287	127
Future Volume (vph)	60	71	45	24	157	48	44	155	26	0	287	127
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	0.95		1.00	0.95		1.00	0.95			1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00			1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.97	1.00			1.00	1.00
Frt	1.00	0.94		1.00	0.96		1.00	0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1770	3284		1770	3414		1721	3447			1863	1483
Flt Permitted	0.95	1.00		0.95	1.00		0.50	1.00			1.00	1.00
Satd. Flow (perm)	1770	3284		1770	3414		906	3447			1863	1483
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	65	76	48	26	169	52	47	167	28	0	309	137
RTOR Reduction (vph)	0	31	0	0	36	0	0	14	0	0	0	89
Lane Group Flow (vph)	65	93	0	26	185	0	47	181	0	0	309	48
Confl. Peds. (#/hr)			34	34			43		33	33		43
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases							8			4		4
Actuated Green, G (s)	4.1	19.6		1.3	16.8		19.3	19.3			19.3	19.3
Effective Green, g (s)	4.1	19.6		1.3	16.8		19.3	19.3			19.3	19.3
Actuated g/C Ratio	0.07	0.36		0.02	0.30		0.35	0.35			0.35	0.35
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)	131	1166		41	1039		316	1205			651	518
v/s Ratio Prot	c0.04	c0.03		0.01	c0.05			0.05			c0.17	
v/s Ratio Perm							0.05					0.03
v/c Ratio	0.50	0.08		0.63	0.18		0.15	0.15			0.47	0.09
Uniform Delay, d1	24.6	11.8		26.7	14.1		12.3	12.3			14.0	12.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	2.9	0.0		27.9	0.1		0.2	0.1			0.5	0.1
Delay (s)	27.5	11.8		54.6	14.2		12.5	12.4			14.5	12.1
Level of Service	C	B		D	B		B	B			B	B
Approach Delay (s)		17.2			18.5			12.4			13.8	
Approach LOS		B			B			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay	15.1		HCM 2000 Level of Service				B					
HCM 2000 Volume to Capacity ratio	0.35											
Actuated Cycle Length (s)	55.2		Sum of lost time (s)				15.0					
Intersection Capacity Utilization	57.4%		ICU Level of Service				B					
Analysis Period (min)	15											
c Critical Lane Group												

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖	↖	↖	↖↗		↖	↖	↖
Traffic Volume (vph)	88	320	117	7	209	73	94	199	42	49	294	169
Future Volume (vph)	88	320	117	7	209	73	94	199	42	49	294	169
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
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.95		1.00	1.00	0.86	1.00	0.98		1.00	1.00	0.82
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.90	1.00		0.91	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3231		1770	1863	1355	1601	3366		1614	1863	1293
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.42	1.00		0.60	1.00	1.00
Satd. Flow (perm)	1770	3231		1770	1863	1355	706	3366		1011	1863	1293
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)	93	337	123	7	220	77	99	209	44	52	309	178
RTOR Reduction (vph)	0	41	0	0	0	45	0	20	0	0	0	126
Lane Group Flow (vph)	93	419	0	7	220	32	99	233	0	52	309	52
Confl. Peds. (#/hr)			167			209	105		137	137		105
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	6.5	36.0		0.7	30.2	30.2	21.3	21.3		21.3	21.3	21.3
Effective Green, g (s)	6.5	36.0		0.7	30.2	30.2	21.3	21.3		21.3	21.3	21.3
Actuated g/C Ratio	0.09	0.49		0.01	0.41	0.41	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
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	157	1593		16	770	560	205	982		294	543	377
v/s Ratio Prot	c0.05	0.13		0.00	c0.12			0.07			c0.17	
v/s Ratio Perm						0.02	0.14			0.05		0.04
v/c Ratio	0.59	0.26		0.44	0.29	0.06	0.48	0.24		0.18	0.57	0.14
Uniform Delay, d1	32.0	10.8		36.0	14.2	12.8	21.3	19.7		19.3	22.0	19.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.9	0.1		18.0	0.2	0.0	1.8	0.1		0.3	1.4	0.2
Delay (s)	37.9	10.9		53.9	14.4	12.9	23.1	19.8		19.6	23.3	19.2
Level of Service	D	B		D	B	B	C	B		B	C	B
Approach Delay (s)		15.4			15.0			20.7			21.6	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	73.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.1%	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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗				↖	↕			↕	
Traffic Volume (vph)	36	8	43	0	0	0	140	85	7	24	44	42
Future Volume (vph)	36	8	43	0	0	0	140	85	7	24	44	42
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	
Frbp, ped/bikes		1.00	0.96				1.00	1.00			0.98	
Flpb, ped/bikes		0.99	1.00				1.00	1.00			1.00	
Frt		1.00	0.85				1.00	0.99			0.95	
Flt Protected		0.96	1.00				0.95	1.00			0.99	
Satd. Flow (prot)		1765	1520				1770	1836			1700	
Flt Permitted		0.96	1.00				0.95	1.00			0.93	
Satd. Flow (perm)		1765	1520				1770	1836			1600	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	41	9	49	0	0	0	161	98	8	28	51	48
RTOR Reduction (vph)	0	0	41	0	0	0	0	3	0	0	22	0
Lane Group Flow (vph)	0	50	8	0	0	0	161	103	0	0	105	0
Confl. Peds. (#/hr)	12		34	34		12			16	16		62
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2				6
Permitted Phases	4		4							6		
Actuated Green, G (s)		8.4	8.4				8.4	31.9				18.5
Effective Green, g (s)		8.4	8.4				8.4	31.9				18.5
Actuated g/C Ratio		0.17	0.17				0.17	0.63				0.37
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)		294	253				295	1164				588
v/s Ratio Prot							c0.09	0.06				
v/s Ratio Perm		0.03	0.01									c0.07
v/c Ratio		0.17	0.03				0.55	0.09				0.18
Uniform Delay, d1		18.0	17.5				19.2	3.6				10.8
Progression Factor		1.00	1.00				1.00	1.00				1.00
Incremental Delay, d2		0.3	0.1				2.1	0.0				0.1
Delay (s)		18.2	17.6				21.3	3.6				10.9
Level of Service		B	B				C	A				B
Approach Delay (s)		17.9			0.0			14.3				10.9
Approach LOS		B			A			B				B
<b>Intersection Summary</b>												
HCM 2000 Control Delay			14.1				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.26									
Actuated Cycle Length (s)			50.3				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			36.4%				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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗				↖	↔			↕	
Traffic Volume (vph)	82	11	173	0	0	0	230	113	12	20	86	46
Future Volume (vph)	82	11	173	0	0	0	230	113	12	20	86	46
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	
Frbp, ped/bikes		1.00	0.91				1.00	0.99			0.97	
Flpb, ped/bikes		0.91	1.00				1.00	1.00			0.99	
Frt		1.00	0.85				1.00	0.99			0.96	
Flt Protected		0.96	1.00				0.95	1.00			0.99	
Satd. Flow (prot)		1627	1445				1770	1819			1699	
Flt Permitted		0.96	1.00				0.95	1.00			0.95	
Satd. Flow (perm)		1627	1445				1770	1819			1626	
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)	90	12	190	0	0	0	253	124	13	22	95	51
RTOR Reduction (vph)	0	0	142	0	0	0	0	5	0	0	18	0
Lane Group Flow (vph)	0	102	48	0	0	0	253	132	0	0	150	0
Confl. Peds. (#/hr)	60		77	77		60			48	48		104
Turn Type	Perm	NA	Perm				Prot	NA		Perm	NA	
Protected Phases		4					5	2			6	
Permitted Phases	4		4							6		
Actuated Green, G (s)		15.1	15.1				14.1	34.7			15.6	
Effective Green, g (s)		15.1	15.1				14.1	34.7			15.6	
Actuated g/C Ratio		0.25	0.25				0.24	0.58			0.26	
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)		410	364				417	1055			424	
v/s Ratio Prot							c0.14	0.07				
v/s Ratio Perm		0.06	0.03								c0.09	
v/c Ratio		0.25	0.13				0.61	0.13			0.35	
Uniform Delay, d1		17.8	17.3				20.4	5.7			18.0	
Progression Factor		1.00	1.00				1.00	1.00			1.00	
Incremental Delay, d2		0.3	0.2				2.5	0.1			0.5	
Delay (s)		18.1	17.4				22.9	5.7			18.5	
Level of Service		B	B				C	A			B	
Approach Delay (s)		17.7			0.0			16.9			18.5	
Approach LOS		B			A			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			17.5				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.40									
Actuated Cycle Length (s)			59.8				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			56.7%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 1: Cooke St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑↑↑		↖	↑	↗	↖	↑	
Traffic Volume (vph)	0	737	124	549	1165	239	103	198	84	9	54	19
Future Volume (vph)	0	737	124	549	1165	239	103	198	84	9	54	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor		0.95			0.86		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes		0.98			0.99		1.00	1.00	0.94	1.00	0.98	
Flpb, ped/bikes		1.00			1.00		0.94	1.00	1.00	0.96	1.00	
Frt		0.98			0.98		1.00	1.00	0.85	1.00	0.96	
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3395			6105		1657	1863	1482	1704	1751	
Flt Permitted		1.00			0.72		0.71	1.00	1.00	0.49	1.00	
Satd. Flow (perm)		3395			4443		1234	1863	1482	877	1751	
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)	0	768	129	572	1214	249	107	206	88	9	56	20
RTOR Reduction (vph)	0	11	0	0	19	0	0	0	55	0	12	0
Lane Group Flow (vph)	0	886	0	0	2016	0	107	206	33	9	64	0
Confl. Peds. (#/hr)			57	57		29	69		54	54		69
Turn Type		NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases				2			4		4		8	
Actuated Green, G (s)		55.2			64.5		20.8	20.8	20.8	20.8	20.8	
Effective Green, g (s)		55.2			64.5		20.8	20.8	20.8	20.8	20.8	
Actuated g/C Ratio		0.58			0.68		0.22	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	
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1966			3082		269	406	323	191	382	
v/s Ratio Prot		0.26			c0.03			c0.11			0.04	
v/s Ratio Perm					c0.41		0.09		0.02	0.01		
v/c Ratio		0.45			1.53dl		0.40	0.51	0.10	0.05	0.17	
Uniform Delay, d1		11.4			8.9		31.9	32.7	29.8	29.4	30.2	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2			0.5		1.0	1.0	0.1	0.1	0.2	
Delay (s)		11.6			9.4		32.9	33.7	29.9	29.5	30.4	
Level of Service		B			A		C	C	C	C	C	
Approach Delay (s)		11.6			9.4			32.7			30.3	
Approach LOS		B			A			C			C	

Intersection Summary

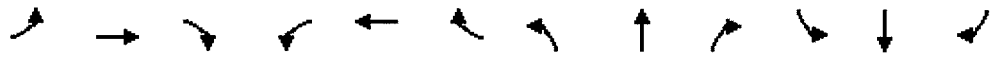
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	95.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.  
 c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 1: Cooke St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔↔		↖	↕		↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	5	1531	135	350	969	146	115	349	247	22	64	39
Future Volume (vph)	5	1531	135	350	969	146	115	349	247	22	64	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor		0.91		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes		0.98		1.00	0.98		1.00	1.00	0.89	1.00	0.96	
Flpb, ped/bikes		1.00		1.00	1.00		0.92	1.00	1.00	0.96	1.00	
Frt		0.99		1.00	0.98		1.00	1.00	0.85	1.00	0.94	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		4901		1770	3411		1621	1863	1408	1695	1684	
Flt Permitted		0.94		0.07	1.00		0.67	1.00	1.00	0.21	1.00	
Satd. Flow (perm)		4591		132	3411		1144	1863	1408	380	1684	
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)	5	1595	141	365	1009	152	120	364	257	23	67	41
RTOR Reduction (vph)	0	8	0	0	10	0	0	0	194	0	18	0
Lane Group Flow (vph)	0	1733	0	365	1151	0	120	364	63	23	90	0
Confl. Peds. (#/hr)	36		110	110		36	78		82	82		78
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2		4		4		8	
Permitted Phases	6			2			4		4		8	
Actuated Green, G (s)		51.6		79.4	79.4		29.0	29.0	29.0	29.0	29.0	
Effective Green, g (s)		51.6		79.4	79.4		29.0	29.0	29.0	29.0	29.0	
Actuated g/C Ratio		0.44		0.67	0.67		0.24	0.24	0.24	0.24	0.24	
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)		2000		403	2287		280	456	344	93	412	
v/s Ratio Prot				c0.17	0.34			c0.20			0.05	
v/s Ratio Perm		0.38		c0.43			0.10		0.04	0.06		
v/c Ratio		0.87		0.91	0.50		0.43	0.80	0.18	0.25	0.22	
Uniform Delay, d1		30.3		36.4	9.7		37.7	42.0	35.3	35.9	35.7	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		4.2		23.3	0.2		1.1	9.4	0.3	1.4	0.3	
Delay (s)		34.5		59.6	9.9		38.8	51.4	35.6	37.3	35.9	
Level of Service		C		E	A		D	D	D	D	D	
Approach Delay (s)		34.5			21.8			43.9			36.2	
Approach LOS		C			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			31.5			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)		118.4				Sum of lost time (s)		15.0				
Intersection Capacity Utilization		101.3%				ICU Level of Service			G			
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 2: Ward Ave & Kapiolani Blvd

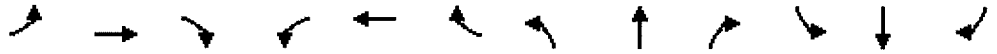
5/9/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑		↖	↑↑↑		↖	↑↑	↗	↖	↑↑	↗	
Traffic Volume (vph)	0	652	174	444	1535	112	242	618	146	167	830	133	
Future Volume (vph)	0	652	174	444	1535	112	242	618	146	167	830	133	
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		0.95		1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	
Frbp, ped/bikes		0.98		1.00	0.99		1.00	1.00	0.87	1.00	1.00	0.92	
Fipb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		3352		1770	5001		1770	3539	1379	1770	3539	1460	
Flt Permitted		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		3352		1770	5001		1770	3539	1379	1770	3539	1460	
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)	0	672	179	458	1582	115	249	637	151	172	856	137	
RTOR Reduction (vph)	0	20	0	0	7	0	0	0	107	0	0	80	
Lane Group Flow (vph)	0	831	0	458	1690	0	249	637	44	172	856	57	
Confl. Peds. (#/hr)			82	82		72			110			58	
Turn Type		NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm	
Protected Phases		6		5	2		7	4		3	8		
Permitted Phases									4			8	
Actuated Green, G (s)		31.0		23.0	59.0		14.0	34.6	34.6	11.0	31.6	31.6	
Effective Green, g (s)		31.0		23.0	59.0		14.0	34.6	34.6	11.0	31.6	31.6	
Actuated g/C Ratio		0.26		0.19	0.49		0.12	0.29	0.29	0.09	0.26	0.26	
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)		868		340	2467		207	1023	398	162	935	385	
v/s Ratio Prot		c0.25		c0.26	0.34		c0.14	c0.18		0.10	c0.24		
v/s Ratio Perm									0.03			0.04	
v/c Ratio		0.96		1.35	0.69		1.20	0.62	0.11	1.06	0.92	0.15	
Uniform Delay, d1		43.6		48.3	23.2		52.8	36.8	31.2	54.3	42.7	33.7	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		20.6		174.6	0.8		128.1	1.2	0.1	88.1	13.2	0.2	
Delay (s)		64.3		222.9	24.0		180.9	38.0	31.3	142.4	55.9	33.9	
Level of Service		E		F	C		F	D	C	F	E	C	
Approach Delay (s)		64.3			66.3			71.3			66.1		
Approach LOS		E			E			E			E		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			66.9									HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			1.06										
Actuated Cycle Length (s)			119.6						20.0				
Intersection Capacity Utilization			105.8%										G
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis  
 2: Ward Ave & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑		↖	↑↑	↗	↖	↑↑	↗
Traffic Volume (vph)	0	1573	247	0	1182	142	196	764	329	280	1123	102
Future Volume (vph)	0	1573	247	0	1182	142	196	764	329	280	1123	102
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		0.91			0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.98			0.99		1.00	1.00	0.88	1.00	1.00	0.92
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.98			0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4883			4949		1770	3539	1386	1770	3539	1458
Flt Permitted		1.00			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		4883			4949		1770	3539	1386	1770	3539	1458
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)	0	1639	257	0	1231	148	204	796	343	292	1170	106
RTOR Reduction (vph)	0	18	0	0	12	0	0	0	77	0	0	42
Lane Group Flow (vph)	0	1878	0	0	1367	0	204	796	266	292	1170	64
Confl. Peds. (#/hr)			118			76			106			59
Turn Type		NA			NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		6			2		7	4		3	8	
Permitted Phases									4			8
Actuated Green, G (s)		47.0			47.0		15.6	35.1	35.1	22.4	41.9	41.9
Effective Green, g (s)		47.0			47.0		15.6	35.1	35.1	22.4	41.9	41.9
Actuated g/C Ratio		0.39			0.39		0.13	0.29	0.29	0.19	0.35	0.35
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)		1920			1946		231	1039	407	331	1240	511
v/s Ratio Prot		c0.38			0.28		0.12	0.22		c0.17	c0.33	
v/s Ratio Perm									0.19			0.04
v/c Ratio		0.98			0.70		0.88	0.77	0.65	0.88	0.94	0.13
Uniform Delay, d1		35.7			30.4		51.1	38.5	36.9	47.3	37.7	26.4
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		15.5			1.2		30.2	3.4	3.7	23.0	14.1	0.1
Delay (s)		51.3			31.6		81.3	41.9	40.6	70.2	51.8	26.5
Level of Service		D			C		F	D	D	E	D	C
Approach Delay (s)		51.3			31.6			47.6			53.5	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	46.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	119.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Signalized Intersection Capacity Analysis

## 3: Kamakee St & Kapiolani Blvd

5/5/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑↑↑	↖	↗
Traffic Volume (vph)	890	66	274	1996	91	165
Future Volume (vph)	890	66	274	1996	91	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.95			0.86	1.00	1.00
Frbp, ped/bikes	0.99			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3482			6359	1770	1513
Flt Permitted	1.00			0.72	0.95	1.00
Satd. Flow (perm)	3482			4623	1770	1513
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	947	70	291	2123	97	176
RTOR Reduction (vph)	5	0	0	0	0	111
Lane Group Flow (vph)	1012	0	0	2414	97	65
Confl. Peds. (#/hr)		49	49			26
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases			6			8
Actuated Green, G (s)	76.4			76.4	27.1	27.1
Effective Green, g (s)	76.4			76.4	27.1	27.1
Actuated g/C Ratio	0.67			0.67	0.24	0.24
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2343			3111	422	361
v/s Ratio Prot	0.29				c0.05	
v/s Ratio Perm				c0.52		0.04
v/c Ratio	0.43			0.96dl	0.23	0.18
Uniform Delay, d1	8.6			12.7	34.8	34.4
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			1.3	0.3	0.2
Delay (s)	8.7			14.0	35.1	34.6
Level of Service	A			B	D	C
Approach Delay (s)	8.7			14.0	34.8	
Approach LOS	A			B	C	

### Intersection Summary

HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	113.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 3: Kamakee St & Kapiolani Blvd

5/5/2016



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑			↑↑	↘	↗
Traffic Volume (vph)	2076	203	0	1159	175	372
Future Volume (vph)	2076	203	0	1159	175	372
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	5.0
Lane Util. Factor	0.86			0.95	1.00	1.00
Frbp, ped/bikes	0.99			1.00	1.00	0.95
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	6230			3539	1770	1511
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	6230			3539	1770	1511
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	2209	216	0	1233	186	396
RTOR Reduction (vph)	11	0	0	0	0	1
Lane Group Flow (vph)	2414	0	0	1233	186	395
Confl. Peds. (#/hr)		110				30
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	59.3			59.3	33.9	33.9
Effective Green, g (s)	59.3			59.3	33.9	33.9
Actuated g/C Ratio	0.57			0.57	0.33	0.33
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	3579			2033	581	496
v/s Ratio Prot	c0.39			0.35	0.11	
v/s Ratio Perm						c0.26
v/c Ratio	0.67			0.61	0.32	0.80
Uniform Delay, d1	15.2			14.3	26.0	31.5
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.5			0.5	0.3	8.7
Delay (s)	15.8			14.8	26.3	40.2
Level of Service	B			B	C	D
Approach Delay (s)	15.8			14.8	35.8	
Approach LOS	B			B	D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			18.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.72			
Actuated Cycle Length (s)			103.2		Sum of lost time (s)	10.0
Intersection Capacity Utilization			68.1%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 5: Piikoi St & Kapiolani Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑↑↑		↖	↑↑↑	↗			
Traffic Volume (vph)	0	1155	49	47	2102	346	53	1243	107	0	0	0
Future Volume (vph)	0	1155	49	47	2102	346	53	1243	107	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.95			0.86		1.00	0.91	1.00			
Frbp, ped/bikes		1.00			0.99		1.00	1.00	0.96			
Flpb, ped/bikes		1.00			1.00		0.93	1.00	1.00			
Frt		0.99			0.98		1.00	1.00	0.85			
Flt Protected		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		3507			6197		1639	5085	1519			
Flt Permitted		1.00			0.84		0.95	1.00	1.00			
Satd. Flow (perm)		3507			5192		1639	5085	1519			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1229	52	50	2236	368	56	1322	114	0	0	0
RTOR Reduction (vph)	0	2	0	0	1	0	0	0	36	0	0	0
Lane Group Flow (vph)	0	1279	0	0	2653	0	56	1322	78	0	0	0
Confl. Peds. (#/hr)			64			60	58		23			
Turn Type		NA		Perm	NA		Perm	NA	Perm			
Protected Phases		2			6			8				
Permitted Phases				6			8		8			
Actuated Green, G (s)		72.0			72.0		37.2	37.2	37.2			
Effective Green, g (s)		72.0			72.0		37.2	37.2	37.2			
Actuated g/C Ratio		0.60			0.60		0.31	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)		2118			3136		511	1586	474			
v/s Ratio Prot		0.36						c0.26				
v/s Ratio Perm					c0.51		0.03		0.05			
v/c Ratio		0.60			0.85		0.11	0.83	0.16			
Uniform Delay, d1		14.7			19.1		29.2	38.1	29.7			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.5			2.3		0.1	3.9	0.2			
Delay (s)		15.2			21.4		29.3	42.1	29.9			
Level of Service		B			C		C	D	C			
Approach Delay (s)		15.2			21.4			40.6			0.0	
Approach LOS		B			C			D			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			25.2				HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			119.2				Sum of lost time (s)		10.0			
Intersection Capacity Utilization			102.6%				ICU Level of Service		G			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 5: Piikoi St & Kapiolani Blvd

5/5/2016

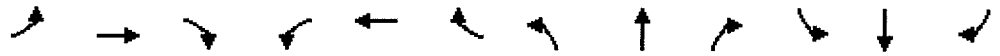


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑			↑↑		↙	↑↑↑↑	↗			
Traffic Volume (vph)	0	2464	167	0	875	319	126	1485	192	0	0	0
Future Volume (vph)	0	2464	167	0	875	319	126	1485	192	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0	5.0			
Lane Util. Factor		0.86			0.95		1.00	0.91	1.00			
Frbp, ped/bikes		0.99			0.97		1.00	1.00	0.97			
Flpb, ped/bikes		1.00			1.00		0.88	1.00	1.00			
Frt		0.99			0.96		1.00	1.00	0.85			
Flt Protected		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)		6280			3279		1553	5085	1535			
Flt Permitted		1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)		6280			3279		1553	5085	1535			
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)	0	2567	174	0	911	332	131	1547	200	0	0	0
RTOR Reduction (vph)	0	8	0	0	2	0	0	0	11	0	0	0
Lane Group Flow (vph)	0	2733	0	0	1241	0	131	1547	189	0	0	0
Confl. Peds. (#/hr)			149			102	96		15			
Turn Type		NA			NA		Perm	NA	Perm			
Protected Phases		2			6			8				
Permitted Phases							8		8			
Actuated Green, G (s)		64.0			64.0		45.0	45.0	45.0			
Effective Green, g (s)		64.0			64.0		45.0	45.0	45.0			
Actuated g/C Ratio		0.54			0.54		0.38	0.38	0.38			
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)		3377			1763		587	1922	580			
v/s Ratio Prot		c0.44			0.38			c0.30				
v/s Ratio Perm							0.08		0.12			
v/c Ratio		0.81			0.70		0.22	0.80	0.33			
Uniform Delay, d1		22.5			20.5		25.1	33.1	26.2			
Progression Factor		1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2		1.5			1.3		0.2	2.6	0.3			
Delay (s)		24.0			21.8		25.3	35.6	26.6			
Level of Service		C			C		C	D	C			
Approach Delay (s)		24.0			21.8			33.9			0.0	
Approach LOS		C			C			C			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			26.7				HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			119.0				Sum of lost time (s)		10.0			
Intersection Capacity Utilization			76.0%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 14: Cooke St & Queen St

5/5/2016

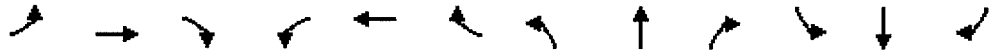


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↕↕			↕↕			↕↕			↕↕			
Traffic Volume (vph)	46	228	85	65	561	79	72	343	45	15	265	206		
Future Volume (vph)	46	228	85	65	561	79	72	343	45	15	265	206		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Total Lost time (s)		5.0			5.0			5.0			5.0			
Lane Util. Factor		0.95			0.95			0.95			0.95			
Frbp, ped/bikes		1.00			1.00			1.00			1.00			
Flpb, ped/bikes		1.00			1.00			1.00			1.00			
Frt		0.96			0.98			0.99			0.94			
Flt Protected		0.99			1.00			0.99			1.00			
Satd. Flow (prot)		3390			3460			3455			3307			
Flt Permitted		0.82			0.88			0.81			0.93			
Satd. Flow (perm)		2791			3064			2810			3092			
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)	48	240	89	68	591	83	76	361	47	16	279	217		
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0		
Lane Group Flow (vph)	0	377	0	0	742	0	0	484	0	0	512	0		
Confl. Peds. (#/hr)	28			31			31			70				
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)		19.1			19.1			16.8			16.8			
Effective Green, g (s)		19.1			19.1			16.8			16.8			
Actuated g/C Ratio		0.42			0.42			0.37			0.37			
Clearance Time (s)		5.0			5.0			5.0			5.0			
Vehicle Extension (s)		3.0			3.0			3.0			3.0			
Lane Grp Cap (vph)		1161			1274			1028			1131			
v/s Ratio Prot														
v/s Ratio Perm		0.14			0.24			0.17			0.17			
v/c Ratio		0.32			0.58			0.47			0.45			
Uniform Delay, d1		9.0			10.3			11.1			11.1			
Progression Factor		1.00			1.00			1.00			1.00			
Incremental Delay, d2		0.2			0.7			0.3			0.3			
Delay (s)		9.2			11.0			11.5			11.3			
Level of Service		A			B			B			B			
Approach Delay (s)		9.2			11.0			11.5			11.3			
Approach LOS		A			B			B			B			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			10.9									HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.53											
Actuated Cycle Length (s)			45.9							10.0				
Intersection Capacity Utilization			74.3%										ICU Level of Service	D
Analysis Period (min)			15											
c Critical Lane Group														

# HCM Signalized Intersection Capacity Analysis

## 14: Cooke St & Queen St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↔			↔			↔			↔			
Traffic Volume (vph)	107	495	115	48	363	65	42	436	58	58	343	113		
Future Volume (vph)	107	495	115	48	363	65	42	436	58	58	343	113		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Total Lost time (s)		5.0			5.0			5.0			5.0			
Lane Util. Factor		0.95			0.95			0.95			0.95			
Frbp, ped/bikes		1.00			1.00			1.00			1.00			
Flpb, ped/bikes		1.00			1.00			1.00			1.00			
Frt		0.98			0.98			0.98			0.97			
Flt Protected		0.99			0.99			1.00			0.99			
Satd. Flow (prot)		3426			3447			3465			3396			
Flt Permitted		0.79			0.83			0.88			0.83			
Satd. Flow (perm)		2744			2883			3052			2851			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94		
Adj. Flow (vph)	114	527	122	51	386	69	45	464	62	62	365	120		
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0		
Lane Group Flow (vph)	0	763	0	0	506	0	0	571	0	0	547	0		
Confl. Peds. (#/hr)	15			38			37			61				
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)		22.2			22.2			18.3			18.3			
Effective Green, g (s)		22.2			22.2			18.3			18.3			
Actuated g/C Ratio		0.44			0.44			0.36			0.36			
Clearance Time (s)		5.0			5.0			5.0			5.0			
Vehicle Extension (s)		3.0			3.0			3.0			3.0			
Lane Grp Cap (vph)		1206			1267			1105			1033			
v/s Ratio Prot														
v/s Ratio Perm		c0.28			0.18			0.19			c0.19			
v/c Ratio		0.63			0.40			0.52			0.53			
Uniform Delay, d1		11.0			9.6			12.6			12.7			
Progression Factor		1.00			1.00			1.00			1.00			
Incremental Delay, d2		1.1			0.2			0.4			0.5			
Delay (s)		12.1			9.8			13.0			13.2			
Level of Service		B			A			B			B			
Approach Delay (s)		12.1			9.8			13.0			13.2			
Approach LOS		B			A			B			B			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			12.1									HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.59											
Actuated Cycle Length (s)			50.5							10.0				
Intersection Capacity Utilization			80.5%										ICU Level of Service	D
Analysis Period (min)			15											
c	Critical Lane Group													

HCM Signalized Intersection Capacity Analysis  
 20: Piikoi St & Waimanu St/Ala Moana Plaza

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	596	177	170	0	21	42	0	848	90	0	164	48
Future Volume (vph)	596	177	170	0	21	42	0	848	90	0	164	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0		5.0			5.0	
Lane Util. Factor	0.91	0.91	1.00		0.95	0.95		0.86			0.95	
Frbp, ped/bikes	1.00	1.00	0.93		1.00	1.00		0.99			0.98	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85		0.94	0.85		0.99			0.97	
Flt Protected	0.95	0.97	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1610	3287	1465		1671	1504		6275			3349	
Flt Permitted	0.95	0.70	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (perm)	1610	2367	1465		1671	1504		6275			3349	
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)	621	184	177	0	22	44	0	883	94	0	171	50
RTOR Reduction (vph)	0	0	61	0	0	0	0	16	0	0	25	0
Lane Group Flow (vph)	310	495	116	0	35	31	0	961	0	0	196	0
Confl. Peds. (#/hr)			60						49			39
Turn Type	Prot	NA	Perm		NA	Perm		NA			NA	
Protected Phases	7	4			8			2			6	
Permitted Phases			4			8						
Actuated Green, G (s)	47.4	72.2	72.2		19.8	19.8		28.3			28.3	
Effective Green, g (s)	47.4	72.2	72.2		19.8	19.8		28.3			28.3	
Actuated g/C Ratio	0.43	0.65	0.65		0.18	0.18		0.26			0.26	
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)	690	1941	957		299	269		1607			857	
v/s Ratio Prot	c0.19	0.11			0.02			c0.15			0.06	
v/s Ratio Perm		c0.06	0.08			0.02						
v/c Ratio	0.45	0.26	0.12		0.12	0.12		0.60			0.23	
Uniform Delay, d1	22.3	8.0	7.2		38.0	38.0		36.1			32.5	
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.5	0.1	0.1		0.2	0.2		0.6			0.1	
Delay (s)	22.8	8.0	7.3		38.2	38.2		36.7			32.6	
Level of Service	C	A	A		D	D		D			C	
Approach Delay (s)		12.6			38.2			36.7			32.6	
Approach LOS		B			D			D			C	

Intersection Summary

HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	110.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 20: Piikoi St & Waimanu St/Ala Moana Plaza

5/5/2016



Movement	EBL	ÉBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↕	↘		↕	↘		↕			↕	
Traffic Volume (vph)	533	345	311	0	128	320	0	888	91	0	312	68
Future Volume (vph)	533	345	311	0	128	320	0	888	91	0	312	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	
Lane Util. Factor	0.91	0.91	1.00		0.95	0.95		0.86			0.95	
Frbp, ped/bikes	1.00	1.00	0.80		1.00	1.00		0.98			0.97	
Fipb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85		0.93	0.85		0.99			0.97	
Flt Protected	0.95	0.98	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1610	3321	1265		1649	1504		6199			3325	
Flt Permitted	0.95	0.65	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (perm)	1610	2201	1265		1649	1504		6199			3325	
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)	555	359	324	0	133	333	0	925	95	0	325	71
RTOR Reduction (vph)	0	0	28	0	0	0	0	14	0	0	16	0
Lane Group Flow (vph)	300	614	296	0	243	223	0	1006	0	0	380	0
Confl. Peds. (#/hr)			167						158			89
Turn Type	Prot	NA	Perm		NA	Perm		NA			NA	
Protected Phases	7	4			8			2			6	
Permitted Phases			4			8						
Actuated Green, G (s)	26.9	79.0	79.0		47.1	47.1		30.4			30.4	
Effective Green, g (s)	26.9	79.0	79.0		47.1	47.1		30.4			30.4	
Actuated g/C Ratio	0.23	0.66	0.66		0.39	0.39		0.25			0.25	
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)	362	1708	836		650	593		1578			846	
v/s Ratio Prot	c0.19	0.08			0.15			c0.16			0.11	
v/s Ratio Perm		c0.16	0.23			0.15						
v/c Ratio	0.83	0.36	0.35		0.37	0.38		0.64			0.45	
Uniform Delay, d1	44.1	9.0	8.9		25.7	25.7		39.6			37.5	
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2	14.4	0.1	0.3		0.4	0.4		0.9			0.4	
Delay (s)	58.5	9.1	9.2		26.0	26.1		40.4			37.8	
Level of Service	E	A	A		C	C		D			D	
Approach Delay (s)		21.1			26.1			40.4			37.8	
Approach LOS		C			C			D			D	

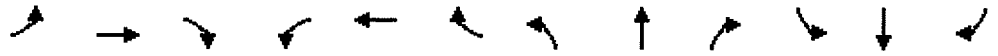
Intersection Summary

HCM 2000 Control Delay	30.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	119.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



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

5/5/2016



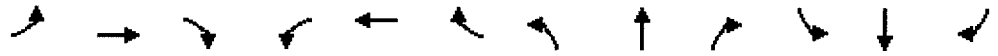
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	57	111	34	98	168	95	40	280	103	68	259	71
Future Volume (vph)	57	111	34	98	168	95	40	280	103	68	259	71
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	63	122	37	108	185	104	44	308	113	75	285	78

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	222	397	198	267	218	221
Volume Left (vph)	63	108	44	0	75	0
Volume Right (vph)	37	104	0	113	0	78
Hadj (s)	-0.01	-0.07	0.15	-0.26	0.21	-0.21
Departure Headway (s)	7.9	7.2	8.1	7.7	8.2	7.8
Degree Utilization, x	0.49	0.79	0.44	0.57	0.50	0.48
Capacity (veh/h)	412	477	419	443	410	433
Control Delay (s)	18.1	32.5	16.2	19.1	17.8	16.4
Approach Delay (s)	18.1	32.5	17.9		17.1	
Approach LOS	C	D	C		C	

Intersection Summary						
Delay			21.5			
Level of Service			C			
Intersection Capacity Utilization		62.7%		ICU Level of Service		B
Analysis Period (min)			15			

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	102	205	81	97	106	96	23	306	77	92	355	49
Future Volume (vph)	102	205	81	97	106	96	23	306	77	92	355	49
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	107	216	85	102	112	101	24	322	81	97	374	52

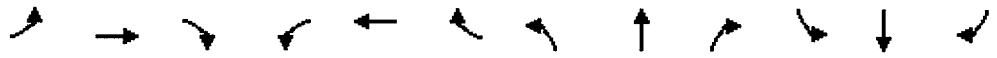
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	408	315	185	242	284	239
Volume Left (vph)	107	102	24	0	97	0
Volume Right (vph)	85	101	0	81	0	52
Hadj (s)	-0.04	-0.09	0.10	-0.20	0.20	-0.12
Departure Headway (s)	8.1	8.4	9.0	8.7	9.0	8.6
Degree Utilization, x	0.91	0.73	0.46	0.59	0.71	0.57
Capacity (veh/h)	438	406	372	386	382	397
Control Delay (s)	52.4	31.3	18.5	22.2	29.7	21.4
Approach Delay (s)	52.4	31.3	20.6		25.9	
Approach LOS	F	D	C		D	

Intersection Summary

Delay	32.0
Level of Service	D
Intersection Capacity Utilization	64.2%
ICU Level of Service	C
Analysis Period (min)	15

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	92	73	52	40	206	67	15	278	71	34	237	142
Future Volume (vph)	92	73	52	40	206	67	15	278	71	34	237	142
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	96	76	54	42	215	70	16	290	74	35	247	148

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	226	327	161	219	159	272
Volume Left (vph)	96	42	16	0	35	0
Volume Right (vph)	54	70	0	74	0	148
Hadj (s)	-0.02	-0.07	0.08	-0.20	0.14	-0.35
Departure Headway (s)	7.1	6.7	7.4	7.1	7.4	6.9
Degree Utilization, x	0.44	0.61	0.33	0.43	0.33	0.52
Capacity (veh/h)	456	503	446	463	457	485
Control Delay (s)	15.6	19.7	12.9	14.3	12.8	16.0
Approach Delay (s)	15.6	19.7	13.7		14.8	
Approach LOS	C	C	B		B	

Intersection Summary

Delay	15.8
Level of Service	C
Intersection Capacity Utilization	65.1%
ICU Level of Service	C
Analysis Period (min)	15

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

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	127	175	39	46	143	57	70	219	62	81	336	110
Future Volume (vph)	127	175	39	46	143	57	70	219	62	81	336	110
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	140	192	43	51	157	63	77	241	68	89	369	121

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	375	271	198	189	274	306
Volume Left (vph)	140	51	77	0	89	0
Volume Right (vph)	43	63	0	68	0	121
Hadj (s)	0.04	-0.07	0.23	-0.22	0.20	-0.24
Departure Headway (s)	7.7	8.0	8.7	8.2	8.3	7.9
Degree Utilization, x	0.80	0.60	0.48	0.43	0.63	0.67
Capacity (veh/h)	451	415	388	405	410	440
Control Delay (s)	35.5	22.5	18.2	16.1	23.5	24.2
Approach Delay (s)	35.5	22.5	17.2		23.9	
Approach LOS	E	C	C		C	

Intersection Summary

Delay	24.7
Level of Service	C
Intersection Capacity Utilization	72.2%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
 30: Cooke St & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	53	25	8	27	13	158	41	116	9	37	229	55
Future Volume (Veh/h)	53	25	8	27	13	158	41	116	9	37	229	55
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	55	26	8	28	14	165	43	121	9	39	239	57
Pedestrians		10			17			6			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								419				
pX, platoon unblocked												
vC, conflicting volume	683	588	164	453	612	91	306			147		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	683	588	164	453	612	91	306			147		
tC, single (s)	*6.5	*5.5	*5.9	*6.5	*5.5	*5.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	82	94	99	94	97	83	97			97		
cM capacity (veh/h)	304	456	881	487	445	953	1241			1412		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	89	207	104	70	158	176
Volume Left	55	28	43	0	39	0
Volume Right	8	165	0	9	0	57
cSH	360	790	1241	1700	1412	1700
Volume to Capacity	0.25	0.26	0.03	0.04	0.03	0.10
Queue Length 95th (ft)	24	26	3	0	2	0
Control Delay (s)	18.2	11.2	3.5	0.0	2.0	0.0
Lane LOS	C	B	A		A	
Approach Delay (s)	18.2	11.2	2.1		1.0	
Approach LOS	C	B				

Intersection Summary		
Average Delay	5.7	
Intersection Capacity Utilization	44.3%	ICU Level of Service A
Analysis Period (min)	15	

\* User Entered Value

HCM Unsignalized Intersection Capacity Analysis  
30: Cooke St & Auahi St

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	48	14	6	24	24	108	15	187	21	103	236	40
Future Volume (Veh/h)	48	14	6	24	24	108	15	187	21	103	236	40
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	50	15	6	25	25	113	16	195	22	107	246	42
Pedestrians		14			18			8			15	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)								419				
pX, platoon unblocked												
vC, conflicting volume	765	762	166	614	772	142	302			235		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	765	762	166	614	772	142	302			235		
tC, single (s)	*6.5	*5.5	*5.9	*6.5	*5.5	*5.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	81	96	99	93	93	87	99			92		
cM capacity (veh/h)	268	366	875	384	363	892	1241			1310		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	71	163	114	120	230	165
Volume Left	50	25	16	0	107	0
Volume Right	6	113	0	22	0	42
cSH	303	625	1241	1700	1310	1700
Volume to Capacity	0.23	0.26	0.01	0.07	0.08	0.10
Queue Length 95th (ft)	22	26	1	0	7	0
Control Delay (s)	20.5	12.8	1.2	0.0	4.1	0.0
Lane LOS	C	B	A		A	
Approach Delay (s)	20.5	12.8	0.6		2.4	
Approach LOS	C	B				

Intersection Summary		
Average Delay	5.4	
Intersection Capacity Utilization	44.2%	ICU Level of Service A
Analysis Period (min)	15	

\* User Entered Value

HCM Signalized Intersection Capacity Analysis  
 37: Cooke St & Ala Moana Blvd

5/5/2016



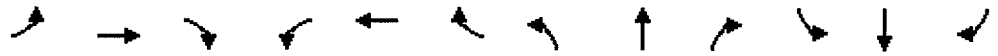
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑↑		↖	↑↑↑			↑	↗		↑	↗
Traffic Volume (vph)	117	1881	47	15	1984	18	31	19	4	55	47	150
Future Volume (vph)	117	1881	47	15	1984	18	31	19	4	55	47	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.96		1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		0.99	1.00
Fr	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5056		1770	5076			1783	1522		1788	1524
Flt Permitted	0.95	1.00		0.95	1.00			0.78	1.00		0.80	1.00
Satd. Flow (perm)	1770	5056		1770	5076			1430	1522		1474	1524
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)	121	1939	48	15	2045	19	32	20	4	57	48	155
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	3	0	0	133
Lane Group Flow (vph)	121	1986	0	15	2064	0	0	52	1	0	105	22
Confl. Peds. (#/hr)			38			24	16		17	17		16
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	14.0	84.5		2.3	72.8			16.4	16.4		16.4	16.4
Effective Green, g (s)	14.0	84.5		2.3	72.8			16.4	16.4		16.4	16.4
Actuated g/C Ratio	0.12	0.71		0.02	0.62			0.14	0.14		0.14	0.14
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	209	3614		34	3126			198	211		204	211
v/s Ratio Prot	c0.07	0.39		0.01	c0.41						c0.07	0.01
v/s Ratio Perm							0.04	0.00				0.01
v/c Ratio	0.58	0.55		0.44	0.66		0.26	0.00			0.51	0.10
Uniform Delay, d1	49.3	7.9		57.3	14.7		45.5	43.9			47.2	44.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	3.9	0.2		8.9	0.5		0.7	0.0			2.2	0.2
Delay (s)	53.2	8.1		66.2	15.2		46.2	43.9			49.4	44.7
Level of Service	D	A		E	B		D	D			D	D
Approach Delay (s)		10.7			15.6		46.0				46.6	
Approach LOS		B			B		D				D	

Intersection Summary

HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	118.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 37: Cooke St/Cooke St & Ala Moana Blvd

5/5/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑↑		↖	↑↑↑			↑	↗		↑	↗
Traffic Volume (vph)	89	2473	35	11	1916	109	69	53	15	41	33	166
Future Volume (vph)	89	2473	35	11	1916	109	69	53	15	41	33	166
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
Frbp, ped/bikes	1.00	1.00		1.00	0.99			1.00	0.95		1.00	0.89
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.96	1.00		0.98	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5060		1770	5016			1745	1509		1783	1414
Flt Permitted	0.95	1.00		0.95	1.00			0.78	1.00		0.73	1.00
Satd. Flow (perm)	1770	5060		1770	5016			1403	1509		1337	1414
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)	93	2576	36	11	1996	114	72	55	16	43	34	173
RTOR Reduction (vph)	0	1	0	0	4	0	0	0	13	0	0	98
Lane Group Flow (vph)	93	2611	0	11	2106	0	0	127	3	0	77	75
Confl. Peds. (#/hr)			56			45	52		26	26		52
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	11.3	87.4		1.4	77.5			19.9	19.9		19.9	19.9
Effective Green, g (s)	11.3	87.4		1.4	77.5			19.9	19.9		19.9	19.9
Actuated g/C Ratio	0.09	0.71		0.01	0.63			0.16	0.16		0.16	0.16
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	161	3575		20	3142			225	242		215	227
v/s Ratio Prot	c0.05	c0.52		0.01	0.42							
v/s Ratio Perm								c0.09	0.00		0.06	0.05
v/c Ratio	0.58	0.73		0.55	0.67			0.56	0.01		0.36	0.33
Uniform Delay, d1	53.9	11.0		60.8	14.9			47.9	43.6		46.2	46.0
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	4.9	0.8		28.9	0.6			3.2	0.0		1.0	0.9
Delay (s)	58.9	11.8		89.7	15.4			51.1	43.6		47.2	46.8
Level of Service	E	B		F	B			D	D		D	D
Approach Delay (s)		13.4			15.8			50.3			47.0	
Approach LOS		B			B			D			D	

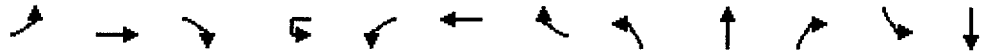
Intersection Summary

HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	123.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



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

5/6/2016



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	212	1712	5	14	139	1772	206	1	68	49	264	160
Future Volume (vph)	212	1712	5	14	139	1772	206	1	68	49	264	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0		5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.91			1.00	0.91	1.00		0.95	1.00	0.91	0.91
Frbp, ped/bikes	1.00	1.00			1.00	1.00	0.95		1.00	0.95	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
Fr	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	5082			1770	5085	1511		3537	1499	1610	2962
Flt Permitted	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	5082			1770	5085	1511		3537	1499	1610	2962
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)	221	1783	5	15	145	1846	215	1	71	51	275	167
RTOR Reduction (vph)	0	0	0	0	0	0	91	0	0	0	0	182
Lane Group Flow (vph)	221	1788	0	0	160	1846	124	0	72	51	247	306
Confl. Peds. (#/hr)			30				21	36		35	35	
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		8	8		4	4
Permitted Phases						6				8		
Actuated Green, G (s)	16.3	53.0			13.2	49.9	49.9		28.0	28.0	27.0	27.0
Effective Green, g (s)	16.3	53.0			13.2	49.9	49.9		28.0	28.0	27.0	27.0
Actuated g/C Ratio	0.12	0.38			0.09	0.35	0.35		0.20	0.20	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)	204	1907			165	1797	533		701	297	307	566
v/s Ratio Prot	c0.12	c0.35			0.09	c0.36			0.02		c0.15	0.10
v/s Ratio Perm						0.08				c0.03		
v/c Ratio	1.08	0.94			0.97	1.03	0.23		0.10	0.17	0.80	0.54
Uniform Delay, d1	62.4	42.5			63.8	45.6	32.2		46.3	47.0	54.6	51.5
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	87.0	9.4			60.3	28.5	0.2		0.1	0.3	14.1	1.1
Delay (s)	149.4	51.9			124.1	74.2	32.4		46.4	47.3	68.7	52.6
Level of Service	F	D			F	E	C		D	D	E	D
Approach Delay (s)		62.7				73.7			46.7			58.0
Approach LOS		E				E			D			E

Intersection Summary

HCM 2000 Control Delay	66.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	141.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	102.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

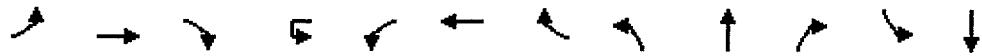
HCM Signalized Intersection Capacity Analysis  
 41: Ala Moana Blvd & Ward Ave

5/6/2016

Movement	SBR
<b>Approach Configurations</b>	
Traffic Volume (vph)	281
Future Volume (vph)	281
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Fipb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	293
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	36
<b>Turn Type</b>	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
<b>Intersection Summary</b>	

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

5/6/2016



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖↗			↖	↖↗	↖		↖↗	↖	↖	↖↗
Traffic Volume (vph)	325	2158	1	15	47	1740	276	7	164	114	251	78
Future Volume (vph)	325	2158	1	15	47	1740	276	7	164	114	251	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		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
Frbp, ped/bikes	1.00	1.00			1.00	1.00	0.92		1.00	0.89	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	0.88
Flt Protected	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	5085			1770	5085	1457		3532	1415	1610	2816
Flt Permitted	0.95	1.00			0.95	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	5085			1770	5085	1457		3532	1415	1610	2816
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)	339	2248	1	16	49	1812	288	7	171	119	261	81
RTOR Reduction (vph)	0	0	0	0	0	0	120	0	0	0	0	297
Lane Group Flow (vph)	339	2249	0	0	65	1813	168	0	178	119	235	171
Confl. Peds. (#/hr)			45				38	41		71	71	
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		8	8		4	4
Permitted Phases						6				8		
Actuated Green, G (s)	25.0	69.0			6.0	50.0	50.0		35.0	35.0	27.9	27.9
Effective Green, g (s)	25.0	69.0			6.0	50.0	50.0		35.0	35.0	27.9	27.9
Actuated g/C Ratio	0.16	0.44			0.04	0.32	0.32		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)	280	2222			67	1610	461		782	313	284	497
v/s Ratio Prot	c0.19	0.44			0.04	c0.36			0.05		c0.15	0.06
v/s Ratio Perm							0.12			c0.08		
v/c Ratio	1.21	1.01			0.97	1.13	0.36		0.23	0.38	0.83	0.34
Uniform Delay, d1	66.5	44.5			75.9	54.0	41.7		50.4	52.2	62.7	57.0
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	123.2	22.1			99.2	65.4	0.5		0.1	0.8	17.6	0.4
Delay (s)	189.7	66.6			175.0	119.4	42.2		50.5	53.0	80.3	57.4
Level of Service	F	E			F	F	D		D	D	F	E
Approach Delay (s)		82.7				110.8			51.5			65.1
Approach LOS		F				F			D			E

Intersection Summary

HCM 2000 Control Delay	89.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	157.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	117.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

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

5/6/2016



Movement	SBR
<b>LANE CONFIGURATIONS</b>	
Traffic Volume (vph)	347
Future Volume (vph)	347
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	361
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	41
<b>TURN TYPE</b>	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
<b>Intersection Summary</b>	

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

5/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑↑↑		↙	↑↑↑		↙	↑			↙	↘
Traffic Volume (vph)	69	1904	82	15	1895	110	49	32	15	154	40	160
Future Volume (vph)	69	1904	82	15	1895	110	49	32	15	154	40	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	5.0
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			0.94	1.00
Fr <sub>t</sub>	1.00	0.99		1.00	0.99		1.00	0.95			1.00	0.85
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	5031		1770	5030		1770	1721			1676	1583
Fl <sub>t</sub> Permitted	0.95	1.00		0.95	1.00		0.48	1.00			0.74	1.00
Satd. Flow (perm)	1770	5031		1770	5030		899	1721			1286	1583
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)	70	1943	84	15	1934	112	50	33	15	157	41	163
RTOR Reduction (vph)	0	3	0	0	4	0	0	12	0	0	0	91
Lane Group Flow (vph)	70	2024	0	15	2042	0	50	36	0	0	198	72
Confl. Peds. (#/hr)			43			21			76	76		
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	80.1		1.7	73.4		29.3	29.3			29.3	29.3
Effective Green, g (s)	8.4	80.1		1.7	73.4		29.3	29.3			29.3	29.3
Actuated g/C Ratio	0.07	0.64		0.01	0.58		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)	117	3195		23	2927		208	399			298	367
v/s Ratio Prot	c0.04	c0.40		0.01	c0.41			0.02				
v/s Ratio Perm							0.06				c0.15	0.05
v/c Ratio	0.60	0.63		0.65	0.70		0.24	0.09			0.66	0.20
Uniform Delay, d1	57.2	14.0		61.9	18.5		39.4	38.0			43.9	38.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	8.0	0.4		50.9	0.7		0.6	0.1			5.5	0.3
Delay (s)	65.2	14.5		112.8	19.3		40.0	38.1			49.4	39.2
Level of Service	E	B		F	B		D	D			D	D
Approach Delay (s)		16.2			20.0			39.0			44.8	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	126.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	87.2%	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

5/18/2016



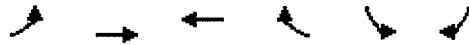
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	2329	224	27	1584	217	118	64	33	92	99	251
Future Volume (vph)	84	2329	224	27	1584	217	118	64	33	92	99	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total 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
Frbp, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.95			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.94	1.00
Frft	1.00	0.99		1.00	0.98		1.00	0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1770	4925		1770	4925		1770	1680			1717	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.47	1.00			0.76	1.00
Satd. Flow (perm)	1770	4925		1770	4925		882	1680			1339	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	2401	231	28	1633	224	122	66	34	95	102	259
RTOR Reduction (vph)	0	7	0	0	11	0	0	12	0	0	0	100
Lane Group Flow (vph)	87	2625	0	28	1846	0	122	88	0	0	197	159
Confl. Peds. (#/hr)			82			50			104	104		
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)	11.8	91.8		3.5	83.5		33.8	33.8			33.8	33.8
Effective Green, g (s)	11.8	91.8		3.5	83.5		33.8	33.8			33.8	33.8
Actuated g/C Ratio	0.08	0.64		0.02	0.58		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)	144	3137		42	2853		206	394			314	371
v/s Ratio Prot	c0.05	c0.53		0.02	0.37			0.05				
v/s Ratio Perm							0.14				c0.15	0.10
v/c Ratio	0.60	0.84		0.67	0.65		0.59	0.22			0.63	0.43
Uniform Delay, d1	63.9	20.3		69.7	20.4		49.0	44.5			49.5	46.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	7.0	2.1		33.4	0.5		4.5	0.3			3.9	0.8
Delay (s)	70.9	22.4		103.1	20.9		53.5	44.8			53.4	47.7
Level of Service	E	C		F	C		D	D			D	D
Approach Delay (s)		24.0			22.1			49.6			50.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	144.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 44: Ala Moana Blvd & Queens St

5/5/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑↑	↑↑↗		↘↖	↘
Traffic Volume (vph)	15	2074	2016	197	53	20
Future Volume (vph)	15	2074	2016	197	53	20
Ideal Flow (vphpl)	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	0.91	0.91		0.97	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	5085	4993		3433	1472
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	5085	4993		3433	1472
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	15	2138	2078	203	55	21
RTOR Reduction (vph)	0	0	7	0	0	17
Lane Group Flow (vph)	15	2138	2274	0	55	4
Confl. Peds. (#/hr)	39			39		52
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	1.7	92.0	85.3		23.8	23.8
Effective Green, g (s)	1.7	92.0	85.3		23.8	23.8
Actuated g/C Ratio	0.01	0.73	0.68		0.19	0.19
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)	23	3718	3385		649	278
v/s Ratio Prot	0.01	c0.42	c0.46		c0.02	
v/s Ratio Perm						0.00
v/c Ratio	0.65	0.58	0.67		0.08	0.01
Uniform Delay, d1	61.8	7.8	12.0		42.0	41.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	50.9	0.2	0.5		0.1	0.0
Delay (s)	112.7	8.1	12.5		42.1	41.5
Level of Service	F	A	B		D	D
Approach Delay (s)		8.8	12.5		41.9	
Approach LOS		A	B		D	

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	125.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 44: Ala Moana Blvd & Queens St

5/5/2016



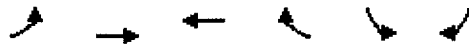
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑↑	↑↑↑		↘	↖
Traffic Volume (vph)	31	2441	1748	300	201	54
Future Volume (vph)	31	2441	1748	300	201	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.91	0.91		0.97	1.00
Frbp, ped/bikes	1.00	1.00	0.98		1.00	0.91
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	5085	4895		3433	1436
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	5085	4895		3433	1436
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	32	2543	1821	312	209	56
RTOR Reduction (vph)	0	0	13	0	0	45
Lane Group Flow (vph)	32	2543	2121	0	209	11
Confl. Peds. (#/hr)	73			73		64
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	6.2	107.9	96.7		28.1	28.1
Effective Green, g (s)	6.2	107.9	96.7		28.1	28.1
Actuated g/C Ratio	0.04	0.74	0.66		0.19	0.19
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)	75	3758	3242		660	276
v/s Ratio Prot	0.02	c0.50	0.43		c0.06	
v/s Ratio Perm						0.01
v/c Ratio	0.43	0.68	0.65		0.32	0.04
Uniform Delay, d1	68.2	9.9	14.7		50.7	48.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.9	0.5	0.5		0.3	0.1
Delay (s)	72.0	10.4	15.2		51.0	48.0
Level of Service	E	B	B		D	D
Approach Delay (s)		11.2	15.2		50.3	
Approach LOS		B	B		D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			15.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.63			
Actuated Cycle Length (s)			146.0		Sum of lost time (s)	15.0
Intersection Capacity Utilization			81.2%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						



# HCM Signalized Intersection Capacity Analysis

## 45: Ala Moana Blvd & Piikoi St

5/5/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖↗	↑↑↑	↑↑↔		↘	↙↘
Traffic Volume (vph)	474	1632	2068	383	155	150
Future Volume (vph)	474	1632	2068	383	155	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frbp, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	5085	4947		1770	2787
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	5085	4947		1770	2787
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	494	1700	2154	399	161	156
RTOR Reduction (vph)	0	0	17	0	0	138
Lane Group Flow (vph)	494	1700	2536	0	161	18
Confl. Peds. (#/hr)	12			12	50	
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	9	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	29.1	84.3	84.3		16.8	16.8
Effective Green, g (s)	29.1	84.3	84.3		16.8	16.8
Actuated g/C Ratio	0.20	0.58	0.58		0.12	0.12
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)	688	2952	2872		204	322
v/s Ratio Prot	c0.14	0.33	c0.51		c0.09	
v/s Ratio Perm						0.01
v/c Ratio	0.72	0.58	0.88		0.79	0.06
Uniform Delay, d1	54.2	19.2	26.2		62.5	57.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.6	0.3	3.6		18.1	0.1
Delay (s)	57.8	19.5	29.8		80.6	57.2
Level of Service	E	B	C		F	E
Approach Delay (s)		28.1	29.8		69.1	
Approach LOS		C	C		E	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			31.5		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.83			
Actuated Cycle Length (s)			145.2		Sum of lost time (s)	15.0
Intersection Capacity Utilization			83.3%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 45: Ala Moana Blvd & Piikoi St

5/5/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↕↕	↕↕↕	↕↕↕		↕	↕↕
Traffic Volume (vph)	373	2294	1820	358	289	229
Future Volume (vph)	373	2294	1820	358	289	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	0.97	0.91	0.91		1.00	0.88
Frbp, ped/bikes	1.00	1.00	0.97		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	5085	4825		1770	2787
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	5085	4825		1770	2787
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	389	2390	1896	373	301	239
RTOR Reduction (vph)	0	0	18	0	0	194
Lane Group Flow (vph)	389	2390	2251	0	301	45
Confl. Peds. (#/hr)	139			139	128	
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	9	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	32.0	81.0	81.0		29.6	29.6
Effective Green, g (s)	32.0	81.0	81.0		29.6	29.6
Actuated g/C Ratio	0.20	0.51	0.51		0.19	0.19
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)	697	2613	2479		332	523
v/s Ratio Prot	c0.11	c0.47	0.47		c0.17	
v/s Ratio Perm						0.02
v/c Ratio	0.56	0.91	0.91		0.91	0.09
Uniform Delay, d1	56.4	35.1	34.9		62.6	52.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.0	5.5	5.3		26.9	0.1
Delay (s)	57.4	40.7	40.2		89.6	52.9
Level of Service	E	D	D		F	D
Approach Delay (s)		43.0	40.2		73.4	
Approach LOS		D	D		E	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			44.8		HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.83			
Actuated Cycle Length (s)			157.6		Sum of lost time (s)	15.0
Intersection Capacity Utilization			83.4%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						