

Traffic Impact Report

Vida at 888 Ala Moana



Prepared for:
Kobayashi Group, LLC

Prepared by:
Wilson Okamoto Corporation

June 2014

TRAFFIC IMPACT REPORT

FOR

VIDA AT 888 ALA MOANA

Prepared for:

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I. INTRODUCTION

A. Purpose of Study

The purpose of this study is to identify and assess the traffic impacts resulting from the proposed Vida at 888 Ala Moana development (hereinafter referred to as the “Vida development”) in Kakaako on the island of Oahu. The project entails the replacement of an existing car dealership with a new multi-use development which will include residential and commercial uses.

B. Scope of Study

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

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

II. PROJECT DESCRIPTION

A. Location

The project site for the Vida development is located adjacent to Ala Moana Boulevard between Koula Street and Ward Avenue in Kakaako on the island of Oahu (see Figure 1). The project site is bounded by Ala Moana Boulevard to the south, Koula Street to the west, Auahi Street to the north, and other commercial uses to the east. Access to the proposed Vida development will be provided via new driveways off Ala Moana Boulevard, Koula Street, and Auahi Street.

B. Project Characteristics

The project site for the Vida development currently houses the Cutter Auto car dealership. The proposed project entails the replacement of the existing

dealership with a multi-use development that is expected to include the following:

- Multi-family residential units (approximately 265 units)
- Commercial uses (approximately 20,000 square feet)
- Recreational amenities and on-site parking

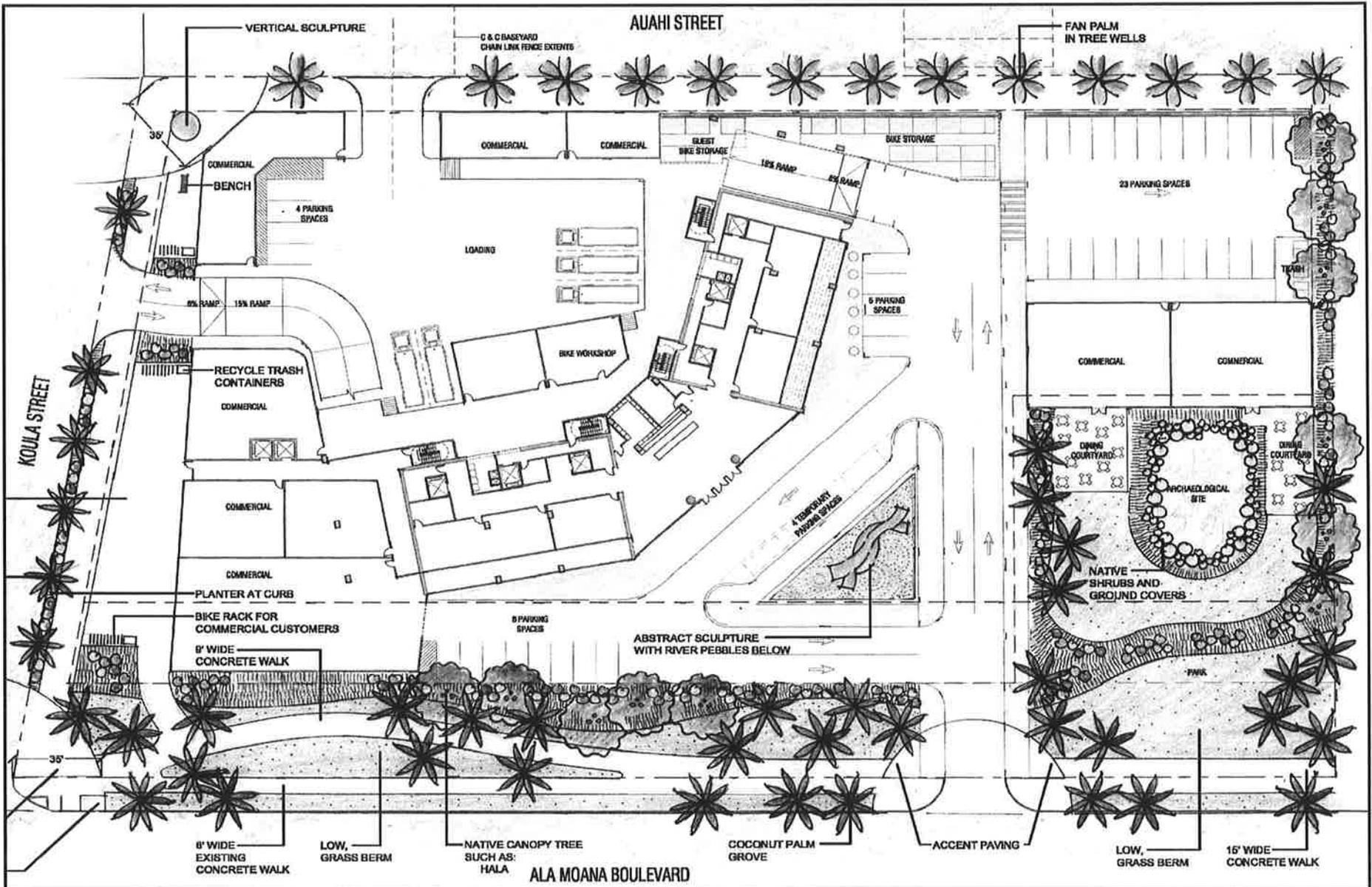
The proposed development is expected to be completed and occupied by the Year 2017. Primary access will be provided via new driveways off Ala Moana Boulevard and Koula Street with access to the proposed loading area provided via a new driveway off Auahi Street. Figure 2 shows the proposed site plan.

III. BASELINE TRAFFIC CONDITIONS

A. Area Roadway System

The proposed development will be located adjacent to Ala Moana Boulevard in Kakaako. In the vicinity of the project site, Ala Moana Boulevard is a predominantly six-lane, two-way roadway generally oriented in the east-west direction that serves as a major east-west corridor through Kakaako. West of the project site, Ala Moana Boulevard intersects Cooke Street. At this signalized intersection, both approaches of Ala Moana Boulevard have an exclusive left-turn lane, two through lanes, and a shared through and right-turn lane. Cooke Street is a predominantly four-lane, two-way roadway generally oriented in the north-south direction that serves as a connector road between the east-west corridors in the region. At the intersection with Ala Moana Boulevard, the northbound and southbound approaches of Cooke Street have a shared left-turn and through lane, and an exclusive right-turn lane.

North of the intersection with Ala Moana Boulevard, Cooke Street intersects Auahi Street. At this all-way stop-controlled intersection, the northbound and southbound approaches of Cooke Street have two lanes that serve all traffic movements. In the vicinity of the project site, Auahi Street is a two-lane, two-way roadway generally oriented in the east-west direction. At the intersection with Cooke Street, the eastbound and westbound approaches of Auahi Street have one lane that serves all traffic movements.



VIDA AT 888 ALA MOANA

PROPOSED SITE PLAN

FIGURE

2



East of the intersection with Cooke Street, Ala Moana Boulevard intersects Koula Street. At this signalized intersection, both approaches of Ala Moana Boulevard have an exclusive left-turn lane, two through lanes, and a shared through and right-turn lane. Koula Street is a predominately two-lane, two-way roadway oriented generally in the north-south direction. At the intersection with Ala Moana Boulevard, the northbound and southbound approaches of Koula Street have one lane that serves all traffic movements.

Further east, Ala Moana Boulevard intersects Ahui Street. At this unsignalized T-intersection, the eastbound approach has two through lanes and a shared through and right-turn lane while the westbound approach of Ala Moana Boulevard has three through lanes. Ahui Street is a predominately two-lane, two-way roadway generally oriented in the north-south direction. At the intersection with Ala Moana Boulevard, the northbound approach of Ahui Street has one stop-controlled lane that serves right-turn traffic movements.

B. Traffic Volumes and Conditions

1. General

a. Field Investigation

Field investigations were conducted in April and May 2011, as well as, November 2012 and consisted of manual turning movement count surveys during the morning peak hours between 6:00 AM and 9:00 AM, and the afternoon peak hours between 3:00 PM and 6:00 PM at the following intersections:

- Ala Moana Boulevard and Cooke Street
- Cooke Street and Auahi Street
- Ala Moana Boulevard and Koula Street
- Ala Moana Boulevard and Ahui Street

Appendix A includes the baseline 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.

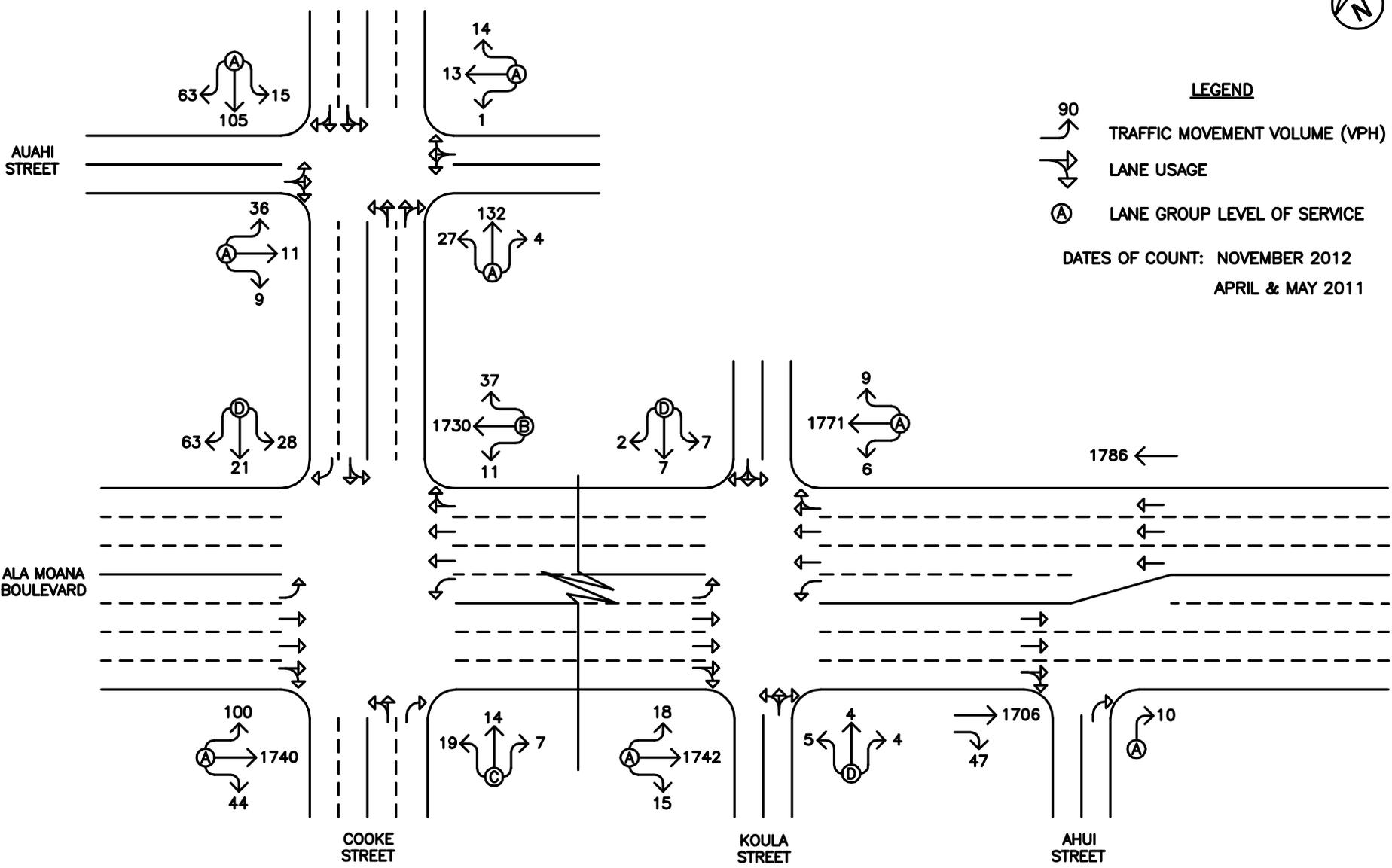
LOS is a quantitative and qualitative assessment of traffic operations. Levels of Service are defined by LOS “A” through “F”; LOS “A” representing ideal or free-flow traffic operating conditions and LOS “F” unacceptable or potentially congested traffic operating conditions.

“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.

2. Baseline Peak Hour Traffic

a. General

Figures 3 and 4 show the baseline AM and PM peak period traffic volumes and operating conditions. The AM peak hour of traffic generally occurs between 7:45 AM and 8:45 AM. The PM peak hour of traffic generally occurs between the hours of 4:15 PM and 5:15 PM. The analysis is based on these peak hour time periods for each intersection to identify the traffic impacts resulting from the proposed project. LOS calculations are included in Appendix C.



VIDA AT 888 ALA MOANA

BASELINE AM PEAK HOUR OF TRAFFIC

FIGURE

3

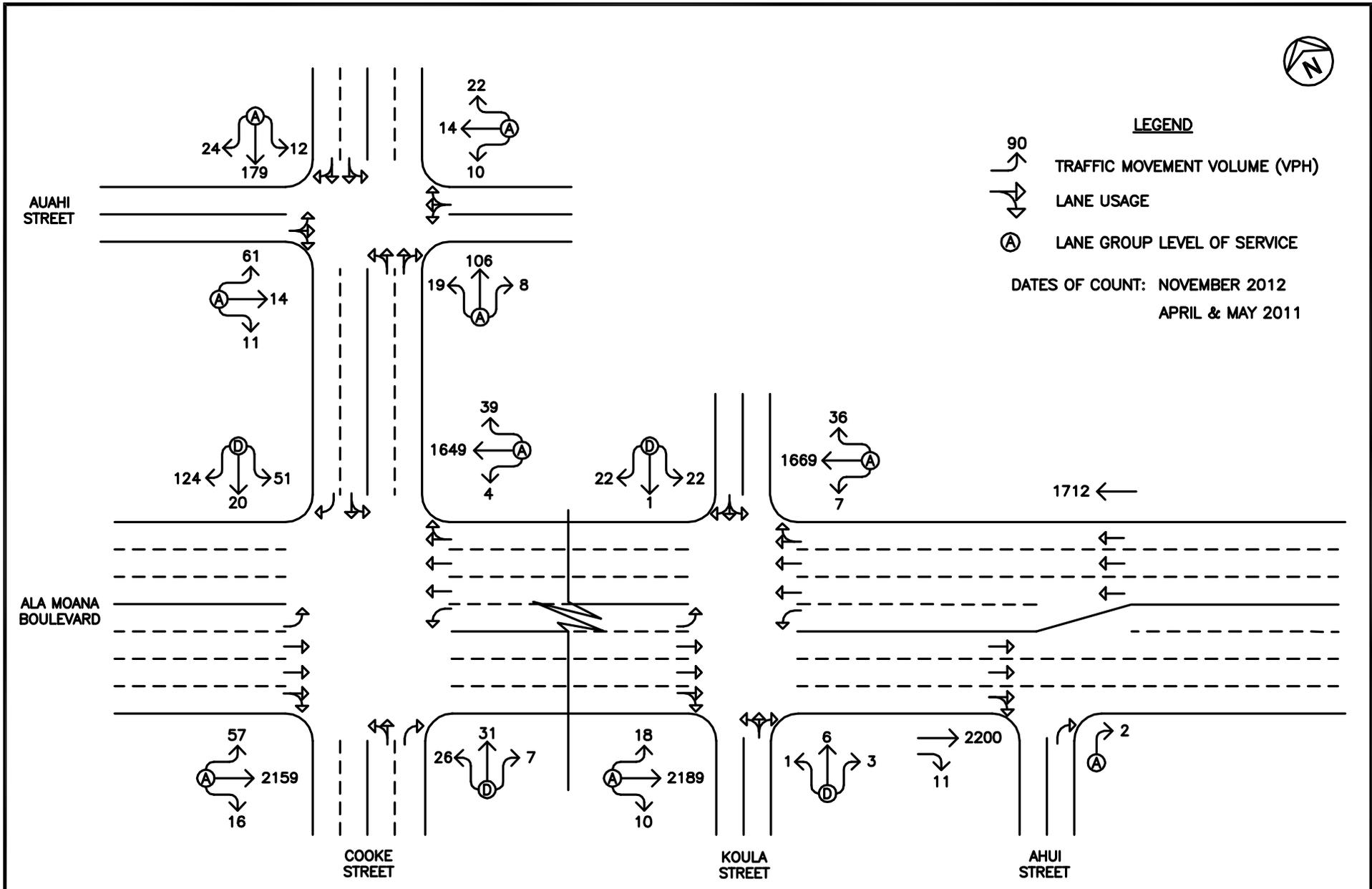




LEGEND

-  90 TRAFFIC MOVEMENT VOLUME (VPH)
-  LANE USAGE
-  LANE GROUP LEVEL OF SERVICE

DATES OF COUNT: NOVEMBER 2012
APRIL & MAY 2011



VIDA AT 888 ALA MOANA

BASELINE PM PEAK HOUR OF TRAFFIC

FIGURE

4



b. Ala Moana Boulevard and Cooke Street

At the intersection with Cooke Street, Ala Moana Boulevard carries 1,884 vehicles eastbound and 1,778 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume was higher with 2,232 vehicles traveling eastbound and 1,692 vehicles traveling westbound. The eastbound approach of Ala Moana Boulevard operates at LOS “A” during both peak periods while the westbound approach operates at LOS “B” and LOS “A” during the AM and PM peak periods, respectively.

Cooke Street carries 40 vehicles northbound and 112 vehicles southbound during the AM peak period. During the PM peak period, traffic volumes were higher with 64 vehicles traveling northbound and 195 vehicles traveling southbound. The northbound approach of Cooke Street operates at LOS “C” during both peak periods while the southbound approach operates at LOS “B” during both peak periods.

c. Cooke Street and Auahi Street

At the intersection with Auahi Street, Cooke Street carries 163 vehicles northbound and 183 vehicles southbound during the AM peak period. During the PM peak period, the overall traffic volume is approximately the same with 133 vehicles traveling northbound and 215 vehicles traveling southbound. Both approaches of Cooke Street both operate at LOS “A” during both peak periods.

Auahi Street carries 56 vehicles eastbound and 28 vehicles westbound at this intersection during the AM peak period. During the PM peak period, traffic volumes were higher with 86 vehicles traveling eastbound and 46 vehicles traveling westbound. Both approaches both operate at LOS “A” during both peak periods.

d. Ala Moana Boulevard and Koula Street

At the intersection with Koula Street, Ala Moana Boulevard carries 1,775 vehicles eastbound and 1,786 vehicles westbound during

the AM peak period. During the PM peak period, the overall traffic volume was higher with 2,217 vehicles traveling eastbound and 1,712 vehicles traveling westbound. Both approaches of Ala Moana Boulevard operate at LOS “A” during both peak periods.

Koula Street carries 13 vehicles northbound and 16 vehicles southbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 10 vehicles traveling northbound and 45 vehicles traveling southbound. Both approaches of Koula Street operates at LOS “C” during both peak periods.

e. Ala Moana Boulevard and Ahui Street

At the intersection with Ahui Street, Ala Moana Boulevard carries 1,753 vehicles eastbound and 1,786 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is higher with 2,211 vehicles traveling eastbound and 1,712 vehicles traveling westbound.

The northbound approach of Ahui Street carries 10 vehicles during the AM peak period and 2 vehicles during the PM peak period. The northbound approach of Ahui Street operates at LOS “A” during both peak periods.

IV. PROJECTED TRAFFIC CONDITIONS

A. Site-Generated Traffic

1. Trip Generation Methodology

The trip generation methodology used in this study is based upon generally accepted techniques developed by the Institute of Transportation Engineers (ITE) and published in “Trip Generation, 9th 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. It should be noted that although the proposed development is expected to replace an existing car dealership, all site-generated trips were

conservatively assumed to be new trips in the project vicinity. The trip generation methodology developed by ITE also includes provisions for internal capture of trips. Internal capture of trips accounts for vehicles that visit more than one destination within the same area without adding external vehicular trips to the surrounding roadways. As such, the proposed peak hour trip generation for the development was adjusted for internal capture of trips. Table 1 summarizes the adjusted project site trip generation characteristics of the proposed project.

Table 1: Peak Hour Trip Generation

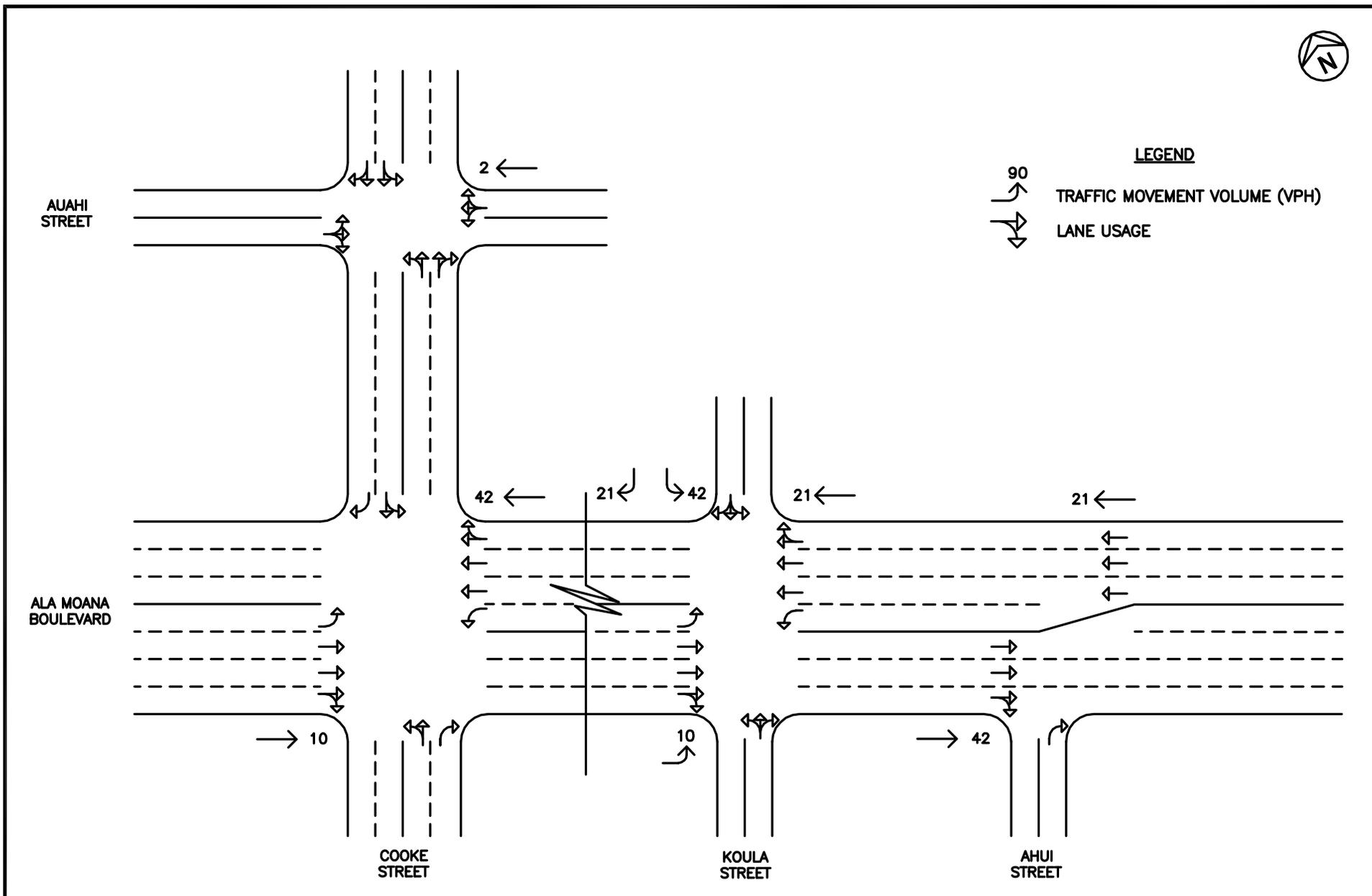
HIGH-RISE RESIDENTIAL CONDOMINIUM/TOWNHOUSE		
INDEPENDENT VARIABLES: # of dwelling units = 265		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	20
	EXIT	86
	TOTAL	106
PM PEAK	ENTER	62
	EXIT	38
	TOTAL	100
SPECIALTY RETAIL CENTER		
INDEPENDENT VARIABLE: 1,000 sf of development = 20		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	0
	EXIT	0
	TOTAL	0
PM PEAK	ENTER	22
	EXIT	26
	TOTAL	48
TOTALS		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	20
	EXIT	86
	TOTAL	106
PM PEAK	ENTER	84
	EXIT	64
	TOTAL	148

2. Trip Distribution

Figures 5 and 6 show the distribution of site-generated vehicular trips at the study intersections during the Year 2017 peak periods. Primary access to the Vida development will be provided via new driveways off Koula Street and Ala Moana Boulevard. Due to the close proximity of the proposed driveway off Ala Moana Boulevard to the adjacent intersection with Ahui Street and high volume of traffic along Ala Moana Boulevard, the turning movements at that driveway are assumed to be restricted to right-turn-in and right-turn-out traffic movements. The direction distribution of site-generated vehicles was based on the baseline distribution of traffic along Ala Moana Boulevard. As such, 51.0% of trips were assumed to be traveling westbound and 49.0% of trips were assumed to be traveling eastbound during the AM peak period while 43.7% of trips were assumed to be traveling westbound and 56.3% were assumed to be traveling eastbound during the PM peak period. The trips were distributed between the two project driveways and at the study intersections based on their assumed origin/destination, relative convenience of the available routes, and allowed turning movements at the driveways.

B. Through Traffic Forecasting Methodology

The travel forecast utilized for this study is based on the Oahu Metropolitan Planning Organization (OMPO) regional forecasting model which includes the development of other projects such as the adjacent Ward developments by Howard Hughes Corporation to the east. The use of the OMPO model more accurately reflects the anticipated impacts of traffic growth on the island more than the use of historical traffic count data. 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. As such, 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. Consequently, the traffic forecast from the OMPO model was scaled appropriately to determine Year 2017 traffic volumes.



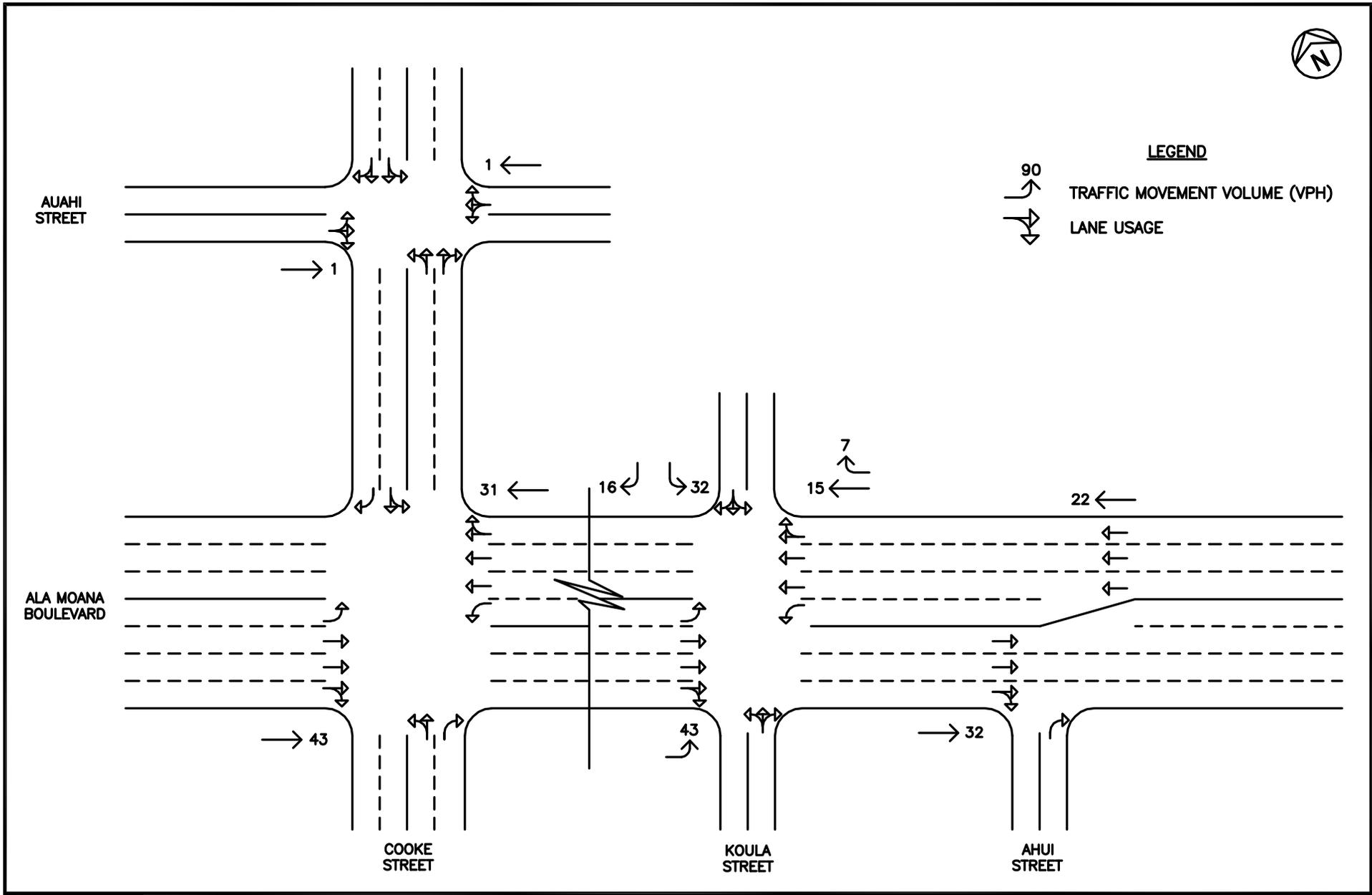
VIDA AT 888 ALA MOANA

YEAR 2017 DISTRIBUTION OF SITE-GENERATE VEHICLES
AM PEAK HOUR OF TRAFFIC

FIGURE

5





VIDA AT 888 ALA MOANA

YEAR 2017 DISTRIBUTION OF SITE-GENERATE VEHICLES
PM PEAK HOUR OF TRAFFIC

FIGURE

6



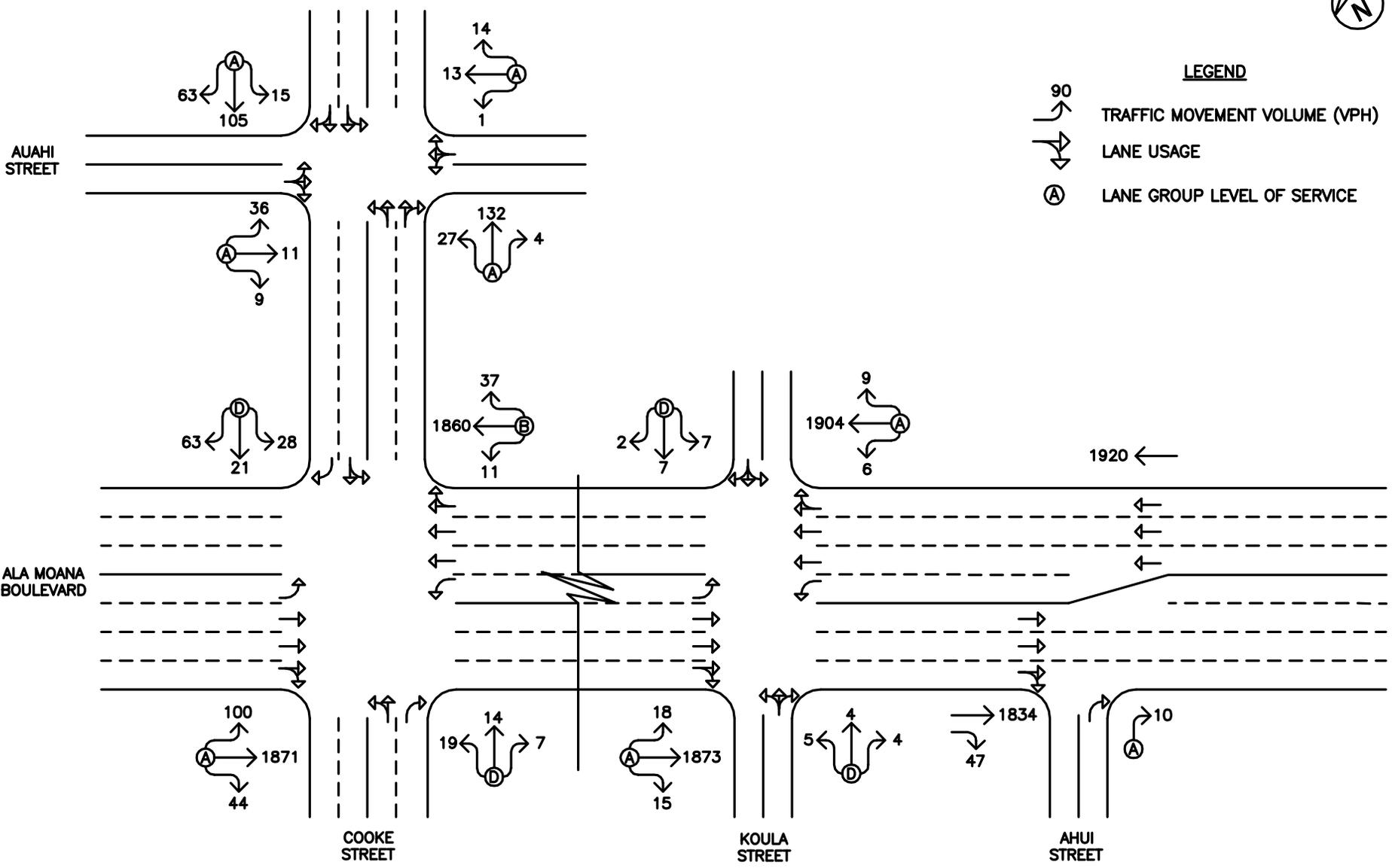
C. Total Traffic Volumes Without Project

The projected Year 2017 AM and PM peak period traffic volumes and operating conditions without the Vida development are shown in Figures 7 and 8, and summarized in Table 2. The baseline levels of service are provided for comparison purposes. LOS calculations are included in Appendix D.

Table 2: Baseline and Projected Year 2017 (Without Project) LOS Traffic Operating Conditions

Intersection	Approach	AM		PM	
		Base-line	Year 2017 w/out Proj	Base-line	Year 2017 w/out Proj
Ala Moana Blvd/ Cooke St	Eastbound	A	A	A	A
	Westbound	B	B	A	A
	Northbound	D	D	D	D
	Southbound	D	D	D	D
Cooke St/ Auahi St	Eastbound	A	A	A	A
	Westbound	A	A	A	A
	Northbound	A	A	A	A
	Southbound	A	A	A	A
Ala Moana Blvd/ Koula	Eastbound	A	A	A	A
	Westbound	A	A	A	A
	Northbound	D	D	D	D
	Southbound	D	D	D	D
Ala Moana Blvd/Ahui St	Northbound	A	A	A	A

Under Year 2017 without project conditions, traffic operations are expected to remain similar to baseline conditions. Along Cooke Street, traffic operations at the intersection with Auahi Street are expected to continue operating at LOS “A” during both peak periods while those at the intersection with Ala Moana Boulevard are expected to continue operating at LOS “D” or better during both peak periods. Along Ala Moana Boulevard, traffic operations at the intersection with Koula Street are expected to continue operating at LOS “D” or better during both peak periods while



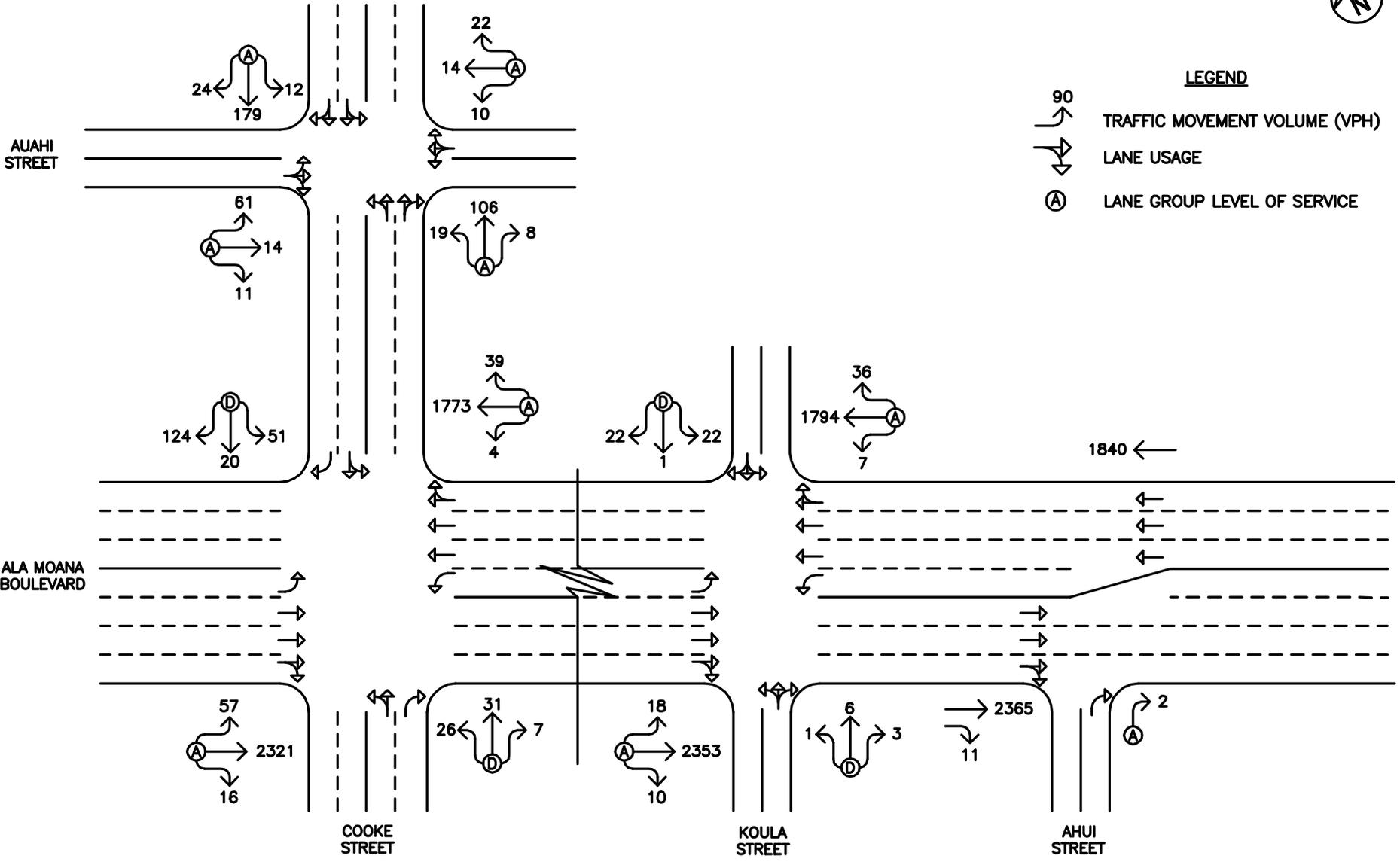
VIDA AT 888 ALA MOANA

YEAR 2017 AM PEAK HOUR OF TRAFFIC WITHOUT PROJECT

FIGURE

7





VIDA AT 888 ALA MOANA

YEAR 2017 PM PEAK HOUR OF TRAFFIC WITHOUT PROJECT

FIGURE

8



the northbound approach of the intersection with Ahui Street is expected to continue operating at LOS “A” during both peak periods.

D. Total Traffic Volumes With Project

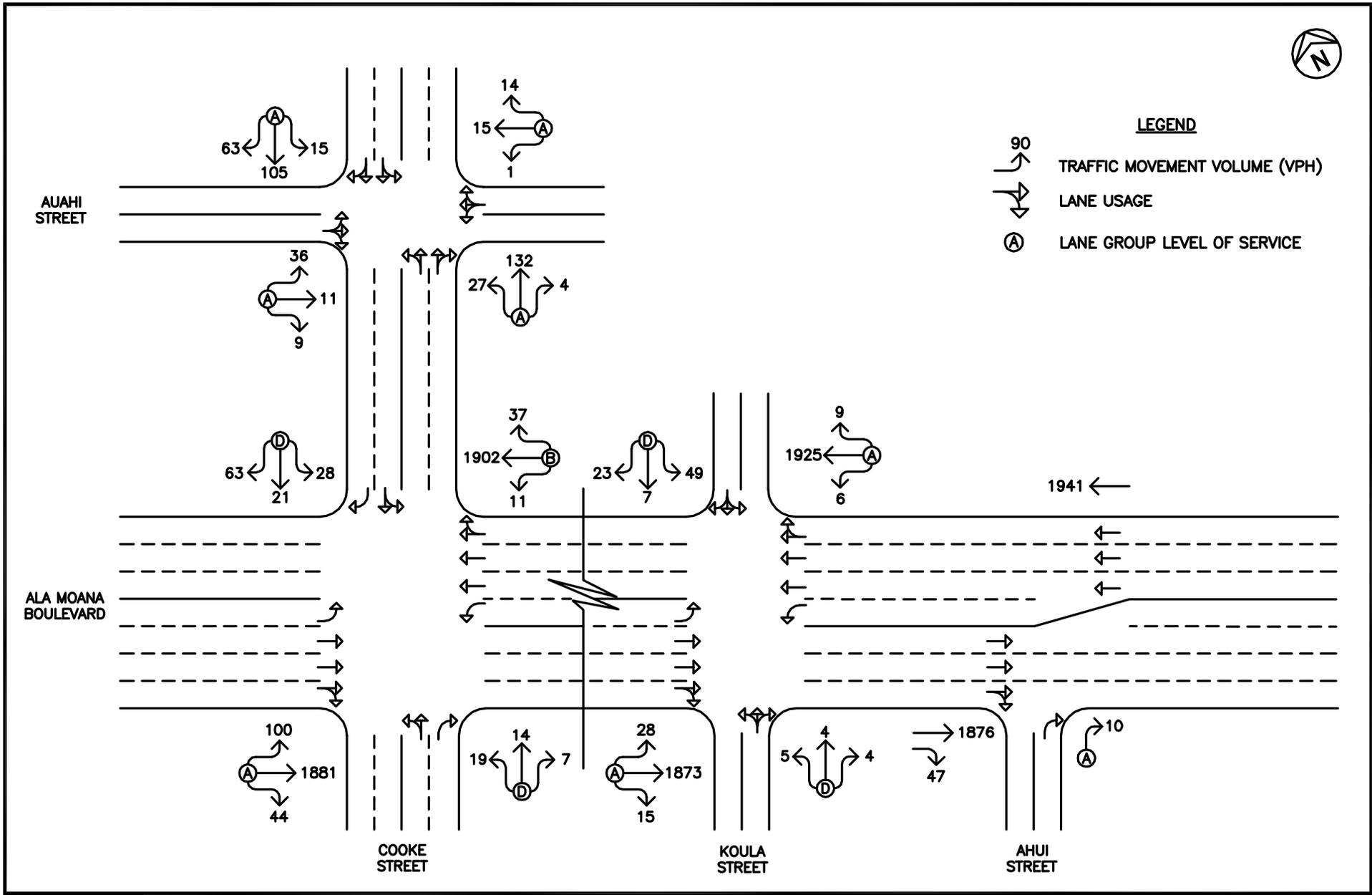
Figures 9 and 10 show the Year 2017 cumulative AM and PM peak hour traffic conditions resulting from the projected external traffic and the proposed Vida development. The cumulative volumes consist of site-generated traffic superimposed over Year 2017 projected traffic demands. The traffic impacts resulting from the proposed project are addressed in the following section.

V. TRAFFIC IMPACT ANALYSIS

The Year 2017 cumulative AM and PM peak hour traffic conditions with the Vida development are summarized in Table 3. The existing and projected Year 2017 (Without Project) operating conditions are provided for comparison purposes. LOS calculations are included in Appendix E.

Table 3: Baseline and Projected Year 2017 (Without and With Project) LOS Traffic Operating Conditions

Intersection	Approach	AM			PM		
		Base-line	Year 2017 w/out Proj	Year 2017 w/ Proj	Base-line	Year 2017 w/out Proj	Year 2017 w/ Proj
Ala Moana Blvd/ Cooke St	Eastbound	A	A	A	A	A	A
	Westbound	B	B	B	A	A	A
	Northbound	D	D	D	D	D	D
	Southbound	D	D	D	D	D	D
Cooke St/ Auahi St	Eastbound	A	A	A	A	A	A
	Westbound	A	A	A	A	A	A
	Northbound	A	A	A	A	A	A
	Southbound	A	A	A	A	A	A
Ala Moana Blvd/ Koula St	Eastbound	A	A	A	A	A	A
	Westbound	A	A	A	A	A	A
	Northbound	D	D	D	D	D	D
	Southbound	D	D	D	D	D	D
Ala Moana Blvd/ Ahui St	Northbound	A	A	A	A	A	A



VIDA AT 888 ALA MOANA

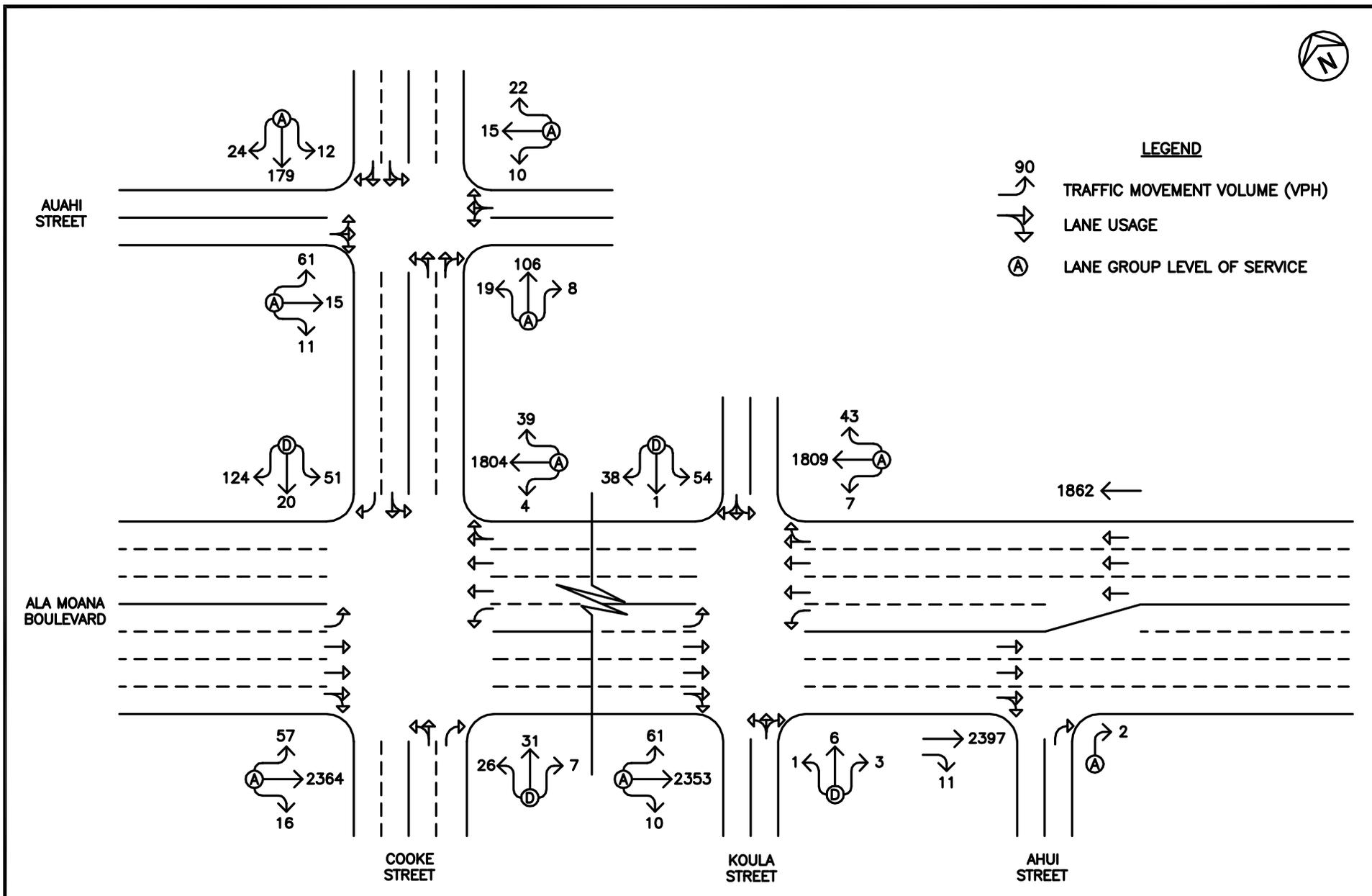
YEAR 2017 AM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE

9



WILSON OKAMOTO CORPORATION



VIDA AT 888 ALA MOANA

YEAR 2017 PM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE

10



WILSON OKAMOTO CORPORATION

Under Year 2017 with project conditions, traffic operations in the project vicinity are generally expected to remain similar to baseline and without project conditions despite the anticipated increases in traffic along the surrounding roadways. Along Cooke Street, at the intersection with Ala Moana Boulevard, traffic operations are expected to continue operating at LOS “D” or better during both peak periods while those at the intersection with Auahi Street are expected to continue operating at LOS “A” during both peak periods. Along Ala Moana Boulevard, traffic operations at the intersection with Koula Street are expected to continue operating at LOS “D” or better during both peak periods while the northbound approach of the intersection with Ahui Street is expected to continue operating at LOS “A” during both peak periods.

VI. RECOMMENDATIONS

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

1. Maintain sufficient sight distance for motorists to safely enter and exit all project driveways.
2. Provide adequate on-site loading and off-loading service areas and prohibit off-site loading operations.
3. Provide adequate turn-around area for service, delivery, and refuse collection vehicles to maneuver on the project site to avoid vehicle-reversing maneuvers onto public roadways.
4. Provide sufficient turning radii at all project driveways to avoid or minimize vehicle encroachments to oncoming traffic lanes.
5. During the design phase of the project, consider the incorporation of complete streets concepts if possible.
6. Restrict turning movements at the project driveway along Ala Moana Boulevard to right-turn-in and right-turn-out movements.
7. At the intersection of Auahi Street and Koula Street, provide sufficient turning radii for all approaches of the intersection. Due to the development of the proposed project, traffic along Koula Street is expected to increase. In addition, access to the loading area for the proposed development is expected to be provided via Auahi Street. As such, the turning radii at the adjacent intersection should be assessed during the design phase of the project to ensure that all design vehicles will be able to navigate the intersection.

VII. CONCLUSION

The proposed Vida development entails the replacement of an existing car dealership with a new multi-use development that will include residential and commercial uses. Traffic in the vicinity of the proposed development is expected to operate at levels of service similar to baseline and without project conditions. As such, with the implementation of the aforementioned recommendations, the proposed Vida development is not expected to have a significant impact on traffic operations in the vicinity.

APPENDIX A

BASELINE TRAFFIC COUNT DATA

Wilson Okamoto Corporation

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

Counter: D1-0768, D4-3889
Counted By: DY, JH
Weather: Clear

File Name : CooAua AM
Site Code : 00000001
Start Date : 4/18/2011
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	1	10	11	2	24		0	0	0	3	3		0	12	2	2	16		1	2	3	1	7	
06:15 AM	3	10	7	0	20		0	0	1	1	2		0	17	2	2	21		5	2	1	4	12	
06:30 AM	2	14	3	3	22		1	1	0	3	5		2	18	2	3	25		12	5	0	1	18	
06:45 AM	1	17	6	4	28		0	0	3	0	3		1	30	2	0	33		10	1	3	1	15	
Total	7	51	27	9	94		1	1	4	7	13		3	77	8	7	95		28	10	7	7	52	
07:00 AM	1	20	7	2	30		0	3	3	2	8		3	21	4	1	29		11	3	4	2	20	
07:15 AM	1	24	14	1	40		0	6	1	3	10		1	41	0	2	44		1	0	3	3	7	
07:30 AM	5	32	11	1	49		1	3	4	2	10		8	32	2	2	44		11	5	2	1	19	
07:45 AM	1	24	15	4	44		0	3	5	1	9		14	29	1	0	44		13	4	3	7	27	
Total	8	100	47	8	163		1	15	13	8	37		26	123	7	5	161		36	12	12	13	73	
08:00 AM	7	25	23	5	60		0	1	4	1	6		4	30	1	2	37		11	2	1	0	14	
08:15 AM	4	40	23	0	67		4	1	2	0	7		6	39	2	0	47		9	3	3	3	18	
08:30 AM	3	42	23	0	68		0	5	4	0	9		4	33	6	2	45		6	4	4	2	15	
08:45 AM	6	37	16	1	60		3	4	9	1	17		3	26	2	2	33		8	1	4	4	17	
Total	20	144	85	6	255		7	11	19	2	39		17	128	11	6	162		34	10	11	9	64	
Grand Total	35	295	159	23	512		9	27	36	17	89		46	328	26	18	418		98	32	30	29	189	
Apprch %	6.8	57.6	31.1	4.5			10.1	30.3	40.4	19.1			11	78.5	6.2	4.3		51.9	16.9	15.9	15.3			
Total %	2.9	24.4	13.2	1.9	42.4		0.7	2.2	3	1.4	7.4		3.8	27.2	2.2	1.5	34.6		8.1	2.6	2.5	2.4	15.6	

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	7	25	23	5	60		0	1	4	1	6		4	30	1	2	37		11	2	1	0	14	
08:15 AM	4	40	23	0	67		4	1	2	0	7		6	39	2	0	47		9	3	3	3	18	
08:30 AM	3	42	23	0	68		0	5	4	0	9		4	33	6	2	45		6	4	4	2	15	
08:45 AM	6	37	16	1	60		3	4	9	1	17		3	26	2	2	33		8	1	4	4	17	
Total	20	144	85	6	255		7	11	19	2	39		17	128	11	6	162		34	10	11	9	64	
Grand Total	35	295	159	23	512		9	27	36	17	89		46	328	26	18	418		98	32	30	29	189	
Apprch %	6.8	57.6	31.1	4.5			10.1	30.3	40.4	19.1			11	78.5	6.2	4.3		51.9	16.9	15.9	15.3			
Total %	2.9	24.4	13.2	1.9	42.4		0.7	2.2	3	1.4	7.4		3.8	27.2	2.2	1.5	34.6		8.1	2.6	2.5	2.4	15.6	

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	7	25	23	5	60		0	1	4	1	6		4	30	1	2	37		11	2	1	0	14	
08:15 AM	4	40	23	0	67		4	1	2	0	7		6	39	2	0	47		9	3	3	3	15	
08:30 AM	3	42	23	0	68		0	5	4	0	9		4	33	6	2	45		6	4	4	2	13	
08:45 AM	6	37	16	1	60		3	4	9	1	17		3	26	2	2	33		8	1	4	4	13	
Total	20	144	85	6	255		7	11	19	2	39		17	128	11	6	162		34	10	11	9	64	
Grand Total	35	295	159	23	512		9	27	36	17	89		46	328	26	18	418		98	32	30	29	189	
Apprch %	6.8	57.6	31.1	4.5			10.1	30.3	40.4	19.1			11	78.5	6.2	4.3		51.9	16.9	15.9	15.3			
Total %	2.9	24.4	13.2	1.9	42.4		0.7	2.2	3	1.4	7.4		3.8	27.2	2.2	1.5	34.6		8.1	2.6	2.5	2.4	15.6	

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	7	25	23	5	60		0	1	4	1	6		4	30	1	2	37		11	2	1	0	14	
08:15 AM	4	40	23	0	67		4	1	2	0	7		6	39	2	0	47		9	3	3	3	15	
08:30 AM	3	42	23	0	68		0	5	4	0	9		4	33	6	2	45		6	4	4	2	13	
08:45 AM	6	37	16	1	60		3	4	9	1	17		3	26	2	2	33		8	1	4	4	13	
Total	20	144	85	6	255		7	11	19	2	39		17	128	11	6	162		34	10	11	9	64	
Grand Total	35	295	159	23	512		9	27	36	17	89		46	328	26	18	418		98	32	30	29	189	
Apprch %	6.8	57.6	31.1	4.5			10.1	30.3	40.4	19.1			11	78.5	6.2	4.3		51.9	16.9	15.9	15.3			
Total %	2.9	24.4	13.2	1.9	42.4		0.7	2.2	3	1.4	7.4		3.8	27.2	2.2	1.5	34.6		8.1	2.6	2.5	2.4	15.6	

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	7	25	23	5	60		0	1	4	1	6		4	30	1	2	37		11	2	1	0	14	
08:15 AM	4	40	23	0	67		4	1	2	0	7		6	39	2	0	47		9	3	3	3	15	
08:30 AM	3	42	23	0	68		0	5	4	0	9		4	33	6	2	45		6	4	4	2	13	
08:45 AM	6	37	16	1	60		3	4	9	1	17		3	26	2	2	33		8	1	4	4	13	
Total	20	144	85	6	255		7	11	19	2	39		17	128	11	6	162		34	10	11	9	64	
Grand Total	35	295	159	23	512		9	27	36	17	89		46	328	26	18	418		98	32	30	29	189	
Apprch %	6.8	57.6	31.1	4.5			10.1	30.3	40.4	19.1			11	78.5	6.2	4.3		51.9	16.9	15.9	15.3			
Total %	2.9	24.4	13.2	1.9	42.4		0.7	2.2	3	1.4	7.4		3.8	27.2	2.2	1.5	34.6		8.1	2.6	2.5	2.4	15.6	

Wilson Okamoto Corporation

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

Counter:D1-0768, D4-3889
Counted By: DY, JH
Weather: Clear

File Name : CooAua PM
Site Code : 00000001
Start Date : 4/18/2011
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	Int. Total
03:00 PM	4	33	18	0	55	3	3	9	0	15	5	26	5	0	36	15	6	4	4	29	135
03:15 PM	9	30	7	1	47	6	6	8	4	24	8	28	1	6	43	11	4	2	3	20	134
03:30 PM	4	40	7	5	56	3	6	6	2	17	3	33	4	0	40	8	5	2	3	18	131
03:45 PM	6	49	9	0	64	1	5	7	3	16	4	27	3	1	35	12	1	2	1	16	131
Total	23	152	41	6	222	13	20	30	9	72	20	114	13	7	154	46	16	10	11	83	531
04:00 PM	3	49	6	1	59	3	4	5	0	12	4	24	1	1	30	15	5	2	1	23	124
04:15 PM	1	38	6	0	45	4	6	9	0	19	5	29	3	0	37	13	1	4	1	19	120
04:30 PM	7	45	4	1	57	4	1	5	4	14	6	21	3	4	34	18	6	2	3	29	134
04:45 PM	2	56	4	6	68	2	1	8	1	12	4	32	1	3	40	13	0	2	7	22	142
Total	13	188	20	8	229	13	12	27	5	57	19	106	8	8	141	59	12	10	12	93	520
05:00 PM	2	40	10	0	52	0	6	0	2	8	4	24	1	0	29	17	7	3	4	31	120
05:15 PM	3	34	10	2	49	0	5	2	1	8	3	21	1	2	27	10	2	2	5	19	103
05:30 PM	1	31	7	3	42	1	0	3	4	8	5	27	0	2	34	12	4	4	1	21	105
05:45 PM	3	25	6	2	36	1	0	2	1	4	0	25	1	0	26	12	4	3	2	21	87
Total	9	130	33	7	179	2	11	7	8	28	12	97	3	4	116	51	17	12	12	92	415
Grand Total	45	470	94	21	630	28	43	64	22	157	51	317	24	19	411	156	45	32	35	268	1466
Approach %	7.1	74.6	14.9	3.3		17.8	27.4	40.8	14		12.4	77.1	5.8	4.6		58.2	16.8	11.9	13.1		
Total %	3.1	32.1	6.4	1.4	43	1.9	2.9	4.4	1.5	10.7	3.5	21.6	1.6	1.3	28	10.6	3.1	2.2	2.4	18.3	

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	Int. Total
03:00 PM	4	33	18	0	55	3	3	9	0	15	5	26	5	0	36	15	6	4	4	29	135
03:15 PM	9	30	7	1	47	6	6	8	4	24	8	28	1	6	43	11	4	2	3	20	134
03:30 PM	4	40	7	5	56	3	6	6	2	17	3	33	4	0	40	8	5	2	3	18	131
03:45 PM	6	49	9	0	64	1	5	7	3	16	4	27	3	1	35	12	1	2	1	16	131
Total	23	152	41	6	222	13	20	30	9	72	20	114	13	7	154	46	16	10	11	83	531
05:00 PM	2	40	10	0	52	0	6	0	2	8	4	24	1	0	29	17	7	3	4	31	120
05:15 PM	3	34	10	2	49	0	5	2	1	8	3	21	1	2	27	10	2	2	5	19	103
05:30 PM	1	31	7	3	42	1	0	3	4	8	5	27	0	2	34	12	4	4	1	21	105
05:45 PM	3	25	6	2	36	1	0	2	1	4	0	25	1	0	26	12	4	3	2	21	87
Total	9	130	33	7	179	2	11	7	8	28	12	97	3	4	116	51	17	12	12	92	415
Grand Total	45	470	94	21	630	28	43	64	22	157	51	317	24	19	411	156	45	32	35	268	1466
Approach %	7.1	74.6	14.9	3.3		17.8	27.4	40.8	14		12.4	77.1	5.8	4.6		58.2	16.8	11.9	13.1		
Total %	3.1	32.1	6.4	1.4	43	1.9	2.9	4.4	1.5	10.7	3.5	21.6	1.6	1.3	28	10.6	3.1	2.2	2.4	18.3	

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	Int. Total
03:00 PM	4	33	18	0	55	3	3	9	0	15	5	26	5	0	36	15	6	4	4	29	135
03:15 PM	9	30	7	1	47	6	6	8	4	24	8	28	1	6	43	11	4	2	3	20	134
03:30 PM	4	40	7	5	56	3	6	6	2	17	3	33	4	0	40	8	5	2	3	18	131
03:45 PM	6	49	9	0	64	1	5	7	3	16	4	27	3	1	35	12	1	2	1	16	131
Total	23	152	41	6	222	13	20	30	9	72	20	114	13	7	154	46	16	10	11	83	531
Total Volume	23	152	41	6	216	13	20	30	7	63	20	114	13	13	147	46	16	10	10	72	498
% App. Total	10.6	70.4	19			20.6	31.7	47.6	8.8		13.6	77.6	8.8		63.9	22.2	13.9				
PHF	.639	.776	.569		.844	.542	.833	.833		.788	.625	.864	.650		.919	.767	.667	.625		.720	.950

Wilson Okamoto Corporation

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

Counted By: CM, MA
Counter: D4-5677,D4-5673
Weather: Clear

File Name : AlaCoo AM
Site Code : 00000003
Start Date : 11/7/2012
Page No : 1

Groups Printed- Unshifted

Start Time	Cooke Street Southbound					Ala Moana Boulevard Westbound					Cooke 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	1	3	4	1	9	0	181	4	1	186	2	0	0	3	5	6	232	2	4
06:15 AM	4	3	9	2	18	4	195	2	5	206	2	2	0	0	4	18	259	5	2	284
06:30 AM	3	2	15	4	24	0	306	2	1	309	3	3	1	2	9	19	336	7	2	364
06:45 AM	3	1	15	1	20	1	275	4	3	283	3	3	1	3	10	31	430	12	1	474
Total	11	9	43	8	71	5	957	12	10	984	10	8	2	8	28	74	1257	26	9	1366
07:00 AM	3	4	13	3	23	0	409	5	3	417	2	3	0	4	9	16	413	7	1	437
07:15 AM	8	5	10	5	28	3	459	5	0	467	4	5	1	5	15	20	427	5	2	454
07:30 AM	7	4	16	3	30	1	444	9	2	456	10	3	2	3	18	22	443	8	1	474
07:45 AM	6	10	15	2	33	3	485	8	2	498	5	2	0	3	10	25	382	14	2	423
Total	24	23	54	13	114	7	1797	27	7	1838	21	13	3	15	52	83	1665	34	6	1788
08:00 AM	6	6	13	6	31	3	449	9	0	461	4	2	0	2	8	24	391	13	2	430
08:15 AM	9	2	20	3	34	3	384	11	1	399	4	5	2	2	13	23	478	13	1	515
08:30 AM	7	3	15	1	26	2	412	9	2	425	6	5	5	1	17	28	489	4	0	521
08:45 AM	5	3	15	3	26	3	342	15	1	361	1	7	4	2	14	27	469	7	2	505
Total	27	14	63	13	117	11	1587	44	4	1646	15	19	11	7	52	102	1827	37	5	1971
Grand Total	62	46	160	34	302	23	4341	83	21	4468	46	40	16	30	132	259	4749	97	20	5125
Approch %	20.5	15.2	53	11.3		0.5	97.2	1.9	0.5		34.8	30.3	12.1	22.7		5.1	92.7	1.9	0.4	
Total %	0.6	0.5	1.6	0.3	3	0.2	43.3	0.8	0.2	44.6	0.5	0.4	0.2	0.3	1.3	2.6	47.4	1	0.2	51.1

Start Time	Cooke Street Southbound					Ala Moana Boulevard Westbound					Cooke 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
	07:45 AM	6	10	15	1	31	3	485	8	8	496	5	2	0	0	7	25	382	14	4
08:00 AM	6	6	13	13	25	3	449	9	9	461	4	2	0	0	6	24	391	13	13	428
08:15 AM	9	2	20	2	31	3	384	11	1	398	4	5	2	2	11	23	478	13	13	514
08:30 AM	7	3	15	3	25	2	412	9	2	423	6	5	5	5	16	28	489	4	4	521
Total Volume	28	21	63	63	112	11	1730	37	37	1778	19	14	7	7	40	100	1740	44	44	1884
% App. Total	.778	.525	.788	.788	.903	.917	.892	.841	.841	.896	.792	.700	.350	.350	.625	.893	.890	.786	.786	.904
PHF																				

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, Hawaii

Counter:CM, MA

Counted By:D4-5673, D4-5677

Weather:Clear

File Name : AlaCoo PM
Site Code : 00000003
Start Date : 11/7/2012
Page No : 1

Groups Printed- Unshifted

Start Time	Cooke Street Southbound					Ala Moana Boulevard Westbound					Cooke 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
03:00 PM	7	3	18	2	30	2	415	10	2	429	12	5	1	1	19	14	427	4	1	446	924
03:15 PM	8	3	29	9	49	4	437	9	5	455	10	5	5	1	21	11	510	2	1	524	1049
03:30 PM	9	4	27	6	46	1	409	11	3	424	13	6	0	2	21	15	496	8	2	521	1012
03:45 PM	11	6	24	6	47	0	471	5	2	478	9	11	0	6	26	6	530	2	0	538	1089
Total	35	16	98	23	172	7	1732	35	12	1786	44	27	6	10	87	46	1963	16	4	2029	4074
04:00 PM	15	7	40	5	67	1	376	10	4	391	9	10	3	2	24	13	522	1	1	537	1019
04:15 PM	13	2	28	3	46	1	425	13	5	444	2	5	1	8	16	14	553	2	0	569	1075
04:30 PM	15	5	32	5	57	0	416	11	3	430	7	15	2	3	27	12	518	7	3	540	1054
04:45 PM	12	7	28	6	53	2	416	8	2	428	10	4	3	6	23	21	561	2	1	585	1089
Total	55	21	128	19	223	4	1633	42	14	1693	28	34	9	19	90	60	2154	12	5	2231	4237
05:00 PM	11	6	36	6	59	1	392	7	6	406	7	7	1	8	23	10	527	5	0	542	1030
05:15 PM	22	6	30	9	67	4	383	13	3	403	5	6	2	4	17	6	514	7	2	529	1016
05:30 PM	12	5	24	7	48	0	360	7	0	367	6	3	2	7	18	8	552	3	2	563	996
05:45 PM	17	1	22	8	48	1	369	6	1	377	3	1	0	4	8	8	485	3	0	496	929
Total	62	18	112	30	222	6	1504	33	10	1553	21	17	5	23	66	30	2078	18	4	2130	3971
Grand Total	152	55	338	72	617	17	4869	110	36	5032	93	78	20	52	243	136	6195	46	13	6390	12282
Approach %	24.6	8.9	54.8	11.7	5	0.3	96.8	2.2	0.7	41	38.3	32.1	8.2	21.4	2	2.1	96.9	0.7	0.2	52	
Total %	1.2	0.4	2.8	0.6	5	0.1	39.6	0.9	0.3	41	0.8	0.6	0.2	0.4	2	1.1	50.4	0.4	0.1	52	

Start Time	Cooke Street Southbound					Ala Moana Boulevard Westbound					Cooke 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
04:15 PM	13	2	28	2	43	1	425	13	13	439	2	5	1	8	8	14	553	2	2	569	1059
04:30 PM	15	5	32	5	52	0	416	11	11	427	7	15	2	24	24	12	518	7	7	537	1040
04:45 PM	12	7	28	4	47	2	416	8	8	426	10	4	3	17	17	21	561	2	2	584	1074
05:00 PM	11	6	36	6	53	1	392	7	7	400	7	7	1	15	15	10	527	5	5	542	1010
Total Volume	51	20	124	19	195	4	1649	39	39	1692	26	31	7	64	64	57	2159	16	16	2232	4163
% App. Total	26.2	10.3	63.6	6	5	0.2	97.5	2.3	0.7	41	40.6	48.4	10.9	2	2	2.6	96.7	0.7	0.2	52	
PHF	.850	.714	.861	.920	.920	.500	.970	.750	.750	.964	.650	.517	.583	.667	.667	.679	.962	.571	.955	.955	.974

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

File Name : AlaKou AM
Site Code : 00000011
Start Date : 5/2/2011
Page No : 1

Counter: D4--5673, D4-3890
Counted By: AE, JL
Weather: Clear

Groups Printed- Unshifted

Start Time	Koula Street Southbound				Ala Moana Boulevard Westbound				Koula Street Northbound				Ala Moana Boulevard Eastbound					
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds		
	App. Total				App. Total				App. Total				App. Total					
06:00 AM	0	0	1	11	1	0	0	2	0	0	0	4	0	0	1	0	1	20
06:15 AM	0	0	0	5	1	0	0	0	0	0	0	1	0	0	1	0	3	10
06:30 AM	1	1	0	4	1	0	0	1	0	1	0	4	4	0	2	0	6	19
06:45 AM	2	1	2	4	0	0	0	5	1	0	1	3	4	0	2	0	6	25
Total	3	2	3	24	3	0	0	8	1	1	1	12	10	0	6	0	16	74
07:00 AM	2	5	0	11	1	0	0	2	0	0	3	5	2	0	3	0	5	34
07:15 AM	1	0	1	7	1	0	0	3	0	1	0	2	0	0	6	0	11	27
07:30 AM	2	1	1	6	1	0	3	1	2	1	0	3	6	0	1	0	7	28
07:45 AM	2	1	0	10	3	0	6	3	3	2	1	5	11	0	5	0	10	46
Total	7	7	2	34	6	0	9	9	24	4	4	15	18	0	15	0	33	135
08:00 AM	3	2	1	5	1	0	4	0	5	1	0	4	0	0	0	0	15	36
08:15 AM	1	0	2	4	3	0	4	12	19	0	0	4	3	0	9	0	12	42
08:30 AM	1	1	1	7	3	0	9	5	17	1	3	4	6	0	3	0	9	44
08:45 AM	3	1	2	4	0	0	9	4	13	0	0	1	6	0	5	0	11	35
Total	8	4	6	20	7	0	26	21	54	1	4	13	18	0	17	0	47	157
Grand Total	18	13	11	78	16	0	35	38	89	7	9	40	61	0	38	0	96	366
Approach %	15	10.8	9.2	65	11.5	14.8	8.2	65.6	16.7	15.8	10.4	0	0	0	0	0	26.2	
Total %	4.9	3.6	3	21.3	4.4	0	9.6	10.4	24.3	1.9	2.5	1.4	10.9	0	10.4	0		

Start Time	Koula Street Southbound				Ala Moana Boulevard Westbound				Koula Street Northbound				Ala Moana Boulevard Eastbound					
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds		
	App. Total				App. Total				App. Total				App. Total					
07:45 AM	2	1	1	0	3	0	0	6	9	3	2	1	6	0	0	5	10	28
08:00 AM	3	2	1	1	1	0	4	4	5	0	1	0	15	0	0	0	15	27
08:15 AM	1	0	0	2	3	0	4	4	7	0	0	0	3	0	9	0	12	22
08:30 AM	1	1	1	1	3	0	9	4	12	1	3	0	6	0	3	0	9	28
Total Volume	7	4	4	4	10	0	23	33	33	4	6	1	11	29	0	17	46	105
% App. Total	46.7	26.7	26.7	26.7	30.3	0	69.7	68.8	36.4	54.5	9.1	11	63	63	0	37	76.7	938
PHF	.583	.500	.500	.500	.833	.000	.639	.688	.333	.500	.250	.458	.483	.000	.472	.000	.767	

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

Counter:D4-5673, D4-3890

Counted By:AE, JL

Weather:Clear

File Name : AlaKou PM

Site Code : 00000013

Start Date : 5/2/2011

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	5	1	12		7	0	8	0	15		0	1	1	1	2	4	6	0	0	0	6			
03:15 PM	4	0	5	7	16		2	0	5	0	7		1	0	0	5	6	6	5	0	1	0	6			
03:30 PM	5	0	2	3	10		2	0	5	0	7		1	0	1	3	5	5	4	0	0	0	4			
03:45 PM	1	1	6	7	15		1	0	28	3	32		2	1	1	0	4	4	4	0	1	0	5			
Total	16	1	18	18	53		12	0	46	3	61		4	2	3	10	19	19	19	0	2	0	21			
04:00 PM	7	1	10	5	23		2	0	11	3	16		0	0	0	4	4	4	4	0	4	0	8			
04:15 PM	2	0	5	4	11		4	0	9	1	14		0	1	2	4	7	7	6	0	1	0	7			
04:30 PM	4	0	2	13	19		1	0	5	7	13		1	2	0	7	10	10	5	0	2	0	7			
04:45 PM	9	0	5	6	20		0	0	11	2	13		0	3	1	5	9	9	3	0	3	0	6			
Total	22	1	22	28	73		7	0	36	13	56		1	6	3	20	30	30	18	0	10	0	28			
05:00 PM	1	0	5	10	16		1	0	6	7	14		0	1	0	8	9	9	4	0	1	0	5			
05:15 PM	7	1	2	9	19		5	0	10	6	21		3	4	1	4	12	12	3	0	1	0	4			
05:30 PM	2	1	3	9	15		2	0	8	4	14		3	1	1	2	7	7	4	0	0	0	4			
05:45 PM	3	1	2	12	18		11	0	6	3	20		4	2	2	5	13	13	6	0	1	0	7			
Total	13	3	12	40	68		19	0	30	20	69		10	8	4	19	41	41	17	0	3	0	20			
Grand Total	51	5	52	86	194		38	0	112	36	186		15	16	10	49	90	90	54	0	15	0	69			
Approch %	26.3	2.6	26.8	44.3		20.4	0	60.2	19.4		16.7	17.8	11.1	54.4		78.3	0	21.7	0		10	0	2.8	0	12.8	
Total %	9.5	0.9	9.6	16	36		7.1	0	20.8	6.7	34.5		2.8	3	1.9	9.1	16.7	16.7	10	0	2.8	0	12.8			

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	
03:45 PM	1	1	1	6	8		1	0	0	28	29		2	1	1	1	4	4	4	0	0	1	5	
04:00 PM	7	1	10	10	18		2	0	11	13	13		0	0	0	0	0	0	4	0	0	4	8	
04:15 PM	2	0	0	5	7		4	0	0	9	13		0	1	2	2	3	3	6	0	1	1	7	
04:30 PM	4	0	0	2	6		1	0	5	5	6		0	1	0	0	1	1	5	0	2	2	7	
04:45 PM	14	2	23	23	39		8	0	53	61	61		3	4	3	3	10	10	19	0	8	8	27	
Total Volume	35.9	5.1	59	59	137		13.1	0	86.9	137	137		30	40	30	30	100	100	70.4	0	29.6	0	100	
% App. Total	.500	.500	.500	.575	.542		.500	.000	.473	.526	.526		.375	.500	.375	.625	.625	.625	.792	.000	.500	.844	.844	
PHF																								

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

Counter: D4-3891, D4-5676
 Counted By: PA, BO
 Weather: Clear

File Name : AlaAhu AM
 Site Code : 00000008
 Start Date : 5/2/2011
 Page No : 1

Groups Printed- Unshifted

Start Time	Southbound			Ala Moana Boulevard Westbound						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	Int. Total	
06:00 AM	0	0	0	0	0	0	0	0	1	1	2	0	0	7	0	7	0	0	0	0	0	7	9
06:15 AM	0	0	0	0	0	0	0	0	0	5	5	0	0	5	0	5	0	0	0	0	5	10	
06:30 AM	0	2	0	0	0	2	0	0	1	6	7	0	0	5	0	5	0	0	0	0	5	14	
06:45 AM	0	0	0	0	0	0	0	0	1	3	4	0	0	9	0	9	0	0	0	0	9	13	
Total	0	2	0	0	0	2	0	0	3	15	18	0	0	26	0	26	0	0	0	0	26	46	
07:00 AM	0	0	0	0	0	0	0	0	2	5	7	0	0	10	0	10	0	0	0	0	10	17	
07:15 AM	0	0	0	0	0	0	0	0	3	6	9	0	0	18	0	18	0	0	0	0	18	27	
07:30 AM	0	0	0	0	0	0	0	0	0	5	5	0	0	10	0	10	0	0	0	0	10	15	
07:45 AM	0	0	0	0	0	0	0	0	5	5	10	0	0	9	0	9	0	0	0	0	9	19	
Total	0	0	0	0	0	0	0	0	10	21	31	0	0	47	0	47	0	0	0	0	47	78	
08:00 AM	0	0	0	0	0	0	0	0	0	3	3	0	0	8	0	8	0	0	0	0	8	11	
08:15 AM	0	0	0	0	0	0	0	0	3	2	5	0	0	11	0	11	0	0	0	0	11	16	
08:30 AM	0	0	0	0	0	0	0	0	1	2	3	0	0	8	0	8	0	0	0	0	8	11	
08:45 AM	0	0	0	0	0	0	0	0	0	1	1	0	0	7	0	7	0	0	0	0	7	8	
Total	0	0	0	0	0	0	0	0	4	8	12	0	0	34	0	34	0	0	0	0	34	46	
Grand Total	0	2	0	0	0	2	0	0	17	44	61	0	0	107	0	107	0	0	0	0	107	170	
Approch %		100	0	0	0	0	0	0	27.9	72.1	0	0	0	100	0	100	0	0	0	0	0	0	0
Total %		1.2	0	0	0	1.2	0	0	10	25.9	35.9	0	0	62.9	0	62.9	0	0	0	0	0	62.9	0

Start Time	Southbound			Ala Moana Boulevard Westbound						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	Int. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	12
07:15 AM	0	0	0	0	0	0	0	0	0	3	3	0	0	18	0	18	0	0	0	0	18	21	
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10	0	0	0	0	10	10	
07:45 AM	0	0	0	0	0	0	0	0	5	5	5	0	0	9	0	9	0	0	0	0	9	14	
Total Volume	0	0	0	0	0	0	0	0	10	10	10	0	0	47	0	47	0	0	0	0	47	57	
% App. Total		.000	0	0	0	.000	.000	0	100	.500	.500	.000	0	100	.653	.653	.000	0	100	.653	.653	.679	
PHF		.000	.000	.000	.000	.000	.000	.000	.500	.500	.500	.000	.000	.653	.653	.653	.000	.000	.653	.653	.653	.679	

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

Peak Hour for Entire Intersection Begins at 07:00 AM

Wilson Okamoto Corporation

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

Counter: D4-3891, D4-5676
 Counted By: PA, BO
 Weather: Clear

File Name : AlaAhu PM
 Site Code : 00000008
 Start Date : 5/2/2011
 Page No : 1

Groups Printed- Unshifted

Start Time	Southbound			Westbound			Ahui Street Northbound			Ala Moana Boulevard Eastbound						
	App. Total	Thru	Left	App. Total	Thru	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	6	6	0	0	3	0	3	9
03:15 PM	0	0	0	0	0	0	1	15	16	0	0	7	0	0	7	23
03:30 PM	0	0	0	0	0	0	2	7	9	0	0	6	0	0	6	15
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
Total	0	0	0	0	0	0	3	28	31	0	0	18	0	0	18	49
04:00 PM	0	0	0	0	0	0	1	0	1	0	0	3	0	0	3	4
04:15 PM	0	0	0	0	0	0	1	4	5	0	0	5	0	0	5	10
04:30 PM	0	0	0	0	0	0	0	8	8	0	0	1	0	0	1	9
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	2	12	14	0	0	9	0	0	9	23
05:00 PM	0	0	0	0	0	0	4	10	14	0	0	1	0	0	1	15
05:15 PM	0	0	0	0	0	0	2	6	8	0	0	2	0	0	2	10
05:30 PM	0	0	0	0	0	0	1	11	12	0	0	5	0	0	5	17
05:45 PM	0	0	0	0	0	0	9	7	16	0	0	3	0	0	3	19
Total	0	0	0	0	0	0	16	34	50	0	0	11	0	0	11	61
Grand Total	0	0	0	0	0	0	21	74	95	0	0	38	0	0	38	133
Approch %	0	0	0	0	0	0	22.1	77.9	71.4	0	0	100	0	0	100	
Total %	0	0	0	0	0	0	15.8	55.6	71.4	0	0	28.6	0	0	28.6	

Start Time	Southbound			Westbound			Ahui Street Northbound			Ala Moana Boulevard Eastbound						
	App. Total	Thru	Left	App. Total	Thru	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
05:00 PM	0	0	0	0	0	0	0	4	4	0	0	0	1	0	1	5
05:15 PM	0	0	0	0	0	0	2	2	2	0	0	0	2	0	2	4
05:30 PM	0	0	0	0	0	0	1	1	1	0	0	0	5	0	5	6
05:45 PM	0	0	0	0	0	0	9	9	9	0	0	0	3	0	3	12
Total Volume	0	0	0	0	0	0	16	16	16	0	0	0	11	0	11	27
% App. Total	.000	.000	.000	.000	.000	.000	.444	.444	.444	.000	.000	.000	.550	.550	.550	.563
PHF																

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

APPENDIX B
LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR MULTILANE HIGHWAY

A multilane highway is characterized by three performance measures:

- Density, in terms of passenger cars per mile per lane
- Speed, in terms of mean passenger car speed; and
- Volume to capacity ratio

Each of these measures indicates how well the highway accommodates traffic flow.

Density is the assigned primary performance measure for estimating the level-of-service. The three measures of speed, density, and flow or volume are interrelated. If the values of two of these measures are known, the remaining measure can be computed.

Level of Service A describes completely free-flow conditions. The operation of vehicles is virtually unaffected by the presence of other vehicles, and operations are constrained only by the geometric features of the highway and by driver preferences. Maneuverability within the traffic stream is good. Minor disruptions to flow are easily absorbed without a change in travel speed.

Level of Service B also indicates free flow, although the presence of other vehicles becomes noticeable. Average travel speeds are the same as in LOS A, but drivers have slightly less freedom to maneuver. Minor disruptions are still easily absorbed, although local deterioration in LOS will be more obvious.

In **Level of Service C**, the influence of traffic density on operations become marked. The ability to maneuver within the traffic stream is now clearly affected by other vehicles. On multilane highways with a free-flow speed above 50 mi/h, the travel speeds reduce somewhat. Minor disruptions can cause serious local deterioration in service, and queues will form behind any significant traffic disruption.

At **Level of Service D**, the ability to maneuver is severely restricted due to traffic congestion. Travel speed is reduced by increasing volume. Only minor disruptions can be absorbed without extensive queues forming and the service deteriorating.

Level of Service E represents operations at or near capacity, an unstable level. The densities vary depending on the free-flow speed. Vehicles are operating with the minimum spacing for maintaining uniform flow. Disruptions cannot be dissipated readily, often causing queues to form and service to deteriorate to LOS F. For the majority of multilane highways with free-flow speeds between 45 and 60 mi/h, passenger-car mean speeds at capacity range from 42 to 55 mi/h but are highly variable and unpredictable.

Level of Service F represents forced or breakdown flow. It occurs either when vehicles arrive at a rate greater than the rate at which they are discharged or when the forecast demand exceeds the computed capacity of a planned facility. Although operations at these points--and on sections immediately downstream--appear to be at capacity, queues form behind these breakdowns. Operations within queues are highly unstable, with vehicles experiencing brief periods of movement followed by stoppages. Travel speeds within queues are generally less than 30 mi/h. Note that the term LOS F may be used to characterize both the point of the breakdown and the operating condition within the queue.

APPENDIX C

**CAPACITY ANALYSIS CALCULATIONS
BASELINE PEAK PERIOD TRAFFIC ANALYSIS**

HCM Signalized Intersection Capacity Analysis

5: Ala Moana Blvd & Cooke St

6/19/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	1740	44	11	1730	37	19	14	7	28	21	63
Ideal Flow (vphpl)	1900	1900	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	0.98		1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	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	5066			1804	1551		1806	1544
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.80	1.00
Satd. Flow (perm)	1770	5062		1770	5066			1467	1551		1495	1544
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)	103	1794	45	11	1784	38	20	14	7	29	22	65
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	6	0	0	60
Lane Group Flow (vph)	103	1838	0	11	1820	0	0	34	1	0	51	5
Confl. Peds. (#/hr)			8			12	5		8	5		12
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						8			8	4		4
Actuated Green, G (s)	11.0	62.4		1.0	52.4			7.0	7.0		7.0	7.0
Effective Green, g (s)	11.0	62.4		1.0	52.4			7.0	7.0		7.0	7.0
Actuated g/C Ratio	0.13	0.73		0.01	0.61			0.08	0.08		0.08	0.08
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)	228	3699		21	3108			120	127		123	127
v/s Ratio Prot	c0.06	c0.36		0.01	c0.36							
v/s Ratio Perm								0.02	0.00		c0.03	0.00
v/c Ratio	0.45	0.50		0.52	0.59			0.28	0.00		0.41	0.04
Uniform Delay, d1	34.4	4.9		42.0	10.0			36.8	36.0		37.3	36.1
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.4	0.1		21.6	0.3			1.3	0.0		2.3	0.1
Delay (s)	35.8	5.0		63.5	10.2			38.1	36.0		39.5	36.2
Level of Service	D	A		E	B			D	D		D	D
Approach Delay (s)		6.6			10.6			37.8			37.7	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	9.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	85.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

8: Ala Moana Blvd & Koula St

6/19/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  							
Volume (vph)	18	1742	15	6	1771	9	5	4	4	7	7	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Frt	1.00	1.00		1.00	1.00			0.96			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1770	5077		1770	5080			1736			1772	
Flt Permitted	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (perm)	1770	5077		1770	5080			1770			1810	
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)	19	1796	15	6	1826	9	5	4	4	7	7	2
RTOR Reduction (vph)	0	0	0	0	0	0	0	4	0	0	2	0
Lane Group Flow (vph)	19	1811	0	6	1835	0	0	9	0	0	14	0
Confl. Peds. (#/hr)			17			26			20	20		26
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	2.2	50.7		0.8	49.3			1.1			1.1	
Effective Green, g (s)	2.2	50.7		0.8	49.3			1.1			1.1	
Actuated g/C Ratio	0.03	0.75		0.01	0.73			0.02			0.02	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	58	3808		21	3705			29			29	
v/s Ratio Prot	c0.01	0.36		0.00	c0.36							
v/s Ratio Perm								0.01			c0.01	
v/c Ratio	0.33	0.48		0.29	0.50			0.31			0.48	
Uniform Delay, d1	32.0	3.3		33.1	3.9			32.9			33.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	3.3	0.1		7.4	0.1			6.1			12.2	
Delay (s)	35.3	3.4		40.5	4.0			39.0			45.1	
Level of Service	D	A		D	A			D			D	
Approach Delay (s)		3.7			4.1			39.0			45.1	
Approach LOS		A			A			D			D	

Intersection Summary

HCM Average Control Delay	4.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	67.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

10: Ala Moana Blvd & Ahui St

6/19/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑↑		↑
Volume (veh/h)	1706	47	0	1786	0	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.65	0.25	0.87	0.25	0.50
Hourly flow rate (vph)	1796	72	0	2053	0	20
Pedestrians				21	21	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				2	2	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	431					
pX, platoon unblocked			0.86		0.86	0.86
vC, conflicting volume			1889		2537	677
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1470		2223	64
tC, single (s)			4.1		6.8	*5.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			385		31	837

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	718	718	431	684	684	684	20
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	72	0	0	0	20
cSH	1700	1700	1700	1700	1700	1700	837
Volume to Capacity	0.42	0.42	0.25	0.40	0.40	0.40	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.4
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.4
Approach LOS							A

Intersection Summary

Average Delay	0.0
Intersection Capacity Utilization	49.5%
Analysis Period (min)	15
ICU Level of Service	A

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis

17: Auahi St & Cooke St

6/19/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	36	11	9	1	13	14	27	132	4	15	105	63
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	40	12	10	1	14	16	30	147	4	17	117	70

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	62	31	103	78	75	128
Volume Left (vph)	40	1	30	0	17	0
Volume Right (vph)	10	16	0	4	0	70
Hadj (s)	0.07	-0.26	0.18	-0.01	0.15	-0.35
Departure Headway (s)	4.9	4.6	5.1	4.9	5.0	4.5
Degree Utilization, x	0.08	0.04	0.15	0.11	0.11	0.16
Capacity (veh/h)	685	719	688	712	690	768
Control Delay (s)	8.3	7.8	7.8	7.3	7.4	7.2
Approach Delay (s)	8.3	7.8	7.5		7.3	
Approach LOS	A	A	A		A	

Intersection Summary

Delay	7.6
HCM Level of Service	A
Intersection Capacity Utilization	34.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis

5: Ala Moana Blvd & Cooke St

6/19/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑		↰	↑↑↑			↑	↰		↑	↰
Volume (vph)	57	2159	16	4	1649	39	26	31	7	51	20	124
Ideal Flow (vphpl)	1900	1900	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			1.00	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.97	1.00
Satd. Flow (prot)	1770	5077		1770	5063			1818	1522		1777	1530
Flt Permitted	0.95	1.00		0.95	1.00			0.83	1.00		0.75	1.00
Satd. Flow (perm)	1770	5077		1770	5063			1538	1522		1381	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)	59	2226	16	4	1700	40	27	32	7	53	21	128
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	6	0	0	91
Lane Group Flow (vph)	59	2241	0	4	1738	0	0	59	1	0	74	37
Confl. Peds. (#/hr)			25			20	4		25	16		20
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	7.3	61.8		0.5	55.0			10.8	10.8		10.8	10.8
Effective Green, g (s)	7.3	61.8		0.5	55.0			10.8	10.8		10.8	10.8
Actuated g/C Ratio	0.08	0.70		0.01	0.62			0.12	0.12		0.12	0.12
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	3561		10	3161			189	187		169	188
v/s Ratio Prot	c0.03	c0.44		0.00	0.34						c0.05	0.02
v/s Ratio Perm								0.04	0.00			0.02
v/c Ratio	0.40	0.63		0.40	0.55			0.31	0.00		0.44	0.20
Uniform Delay, d1	38.3	7.0		43.7	9.5			35.3	33.9		35.8	34.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.8	0.4		24.2	0.2			0.9	0.0		1.8	0.5
Delay (s)	40.1	7.4		67.9	9.7			36.2	33.9		37.6	35.3
Level of Service	D	A		E	A			D	C		D	D
Approach Delay (s)		8.2			9.8			36.0			36.1	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	10.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	88.1	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

8: Ala Moana Blvd & Koula St

6/19/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	2189	10	7	1669	36	1	6	3	22	1	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Frt	1.00	1.00		1.00	1.00			0.96			0.93	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.98	
Satd. Flow (prot)	1770	5080		1770	5059			1761			1652	
Flt Permitted	0.95	1.00		0.95	1.00			0.96			0.84	
Satd. Flow (perm)	1770	5080		1770	5059			1699			1421	
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)	19	2257	10	7	1721	37	1	6	3	23	1	23
RTOR Reduction (vph)	0	0	0	0	1	0	0	3	0	0	21	0
Lane Group Flow (vph)	19	2267	0	7	1757	0	0	7	0	0	26	0
Confl. Peds. (#/hr)			20			28			20	13		28
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	2.4	66.3		0.7	64.6			5.9			5.9	
Effective Green, g (s)	2.4	66.3		0.7	64.6			5.9			5.9	
Actuated g/C Ratio	0.03	0.75		0.01	0.73			0.07			0.07	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	48	3832		14	3718			114			95	
v/s Ratio Prot	c0.01	c0.45		0.00	0.35							
v/s Ratio Perm								0.00			c0.02	
v/c Ratio	0.40	0.59		0.50	0.47			0.06			0.27	
Uniform Delay, d1	42.0	4.8		43.4	4.7			38.4			39.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	5.3	0.2		25.4	0.1			0.2			1.5	
Delay (s)	47.3	5.0		68.8	4.8			38.6			40.5	
Level of Service	D	A		E	A			D			D	
Approach Delay (s)		5.4			5.1			38.6			40.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	5.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	87.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

10: Ala Moana Blvd & Ahui St

6/19/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑↑		↑
Volume (veh/h)	2200	11	0	1712	0	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	2268	11	0	1765	0	2
Pedestrians				12	12	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				1	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	440					
pX, platoon unblocked			0.79		0.79	0.79
vC, conflicting volume			2291		2874	786
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1691		2432	0
tC, single (s)			4.1		6.8	*5.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			291		21	836

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	907	907	465	588	588	588	2
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	11	0	0	0	2
cSH	1700	1700	1700	1700	1700	1700	836
Volume to Capacity	0.53	0.53	0.27	0.35	0.35	0.35	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.3
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.3
Approach LOS							A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		56.1%	ICU Level of Service B
Analysis Period (min)		15	

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
 17: Auahi St & Cooke St

6/19/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	61	14	11	10	14	22	19	106	8	12	179	24
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)	64	15	11	10	15	23	20	110	8	12	186	25

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	90	48	75	64	106	118
Volume Left (vph)	64	10	20	0	13	0
Volume Right (vph)	11	23	0	8	0	25
Hadj (s)	0.10	-0.21	0.17	-0.06	0.09	-0.11
Departure Headway (s)	4.9	4.6	5.2	5.0	5.1	4.9
Degree Utilization, x	0.12	0.06	0.11	0.09	0.15	0.16
Capacity (veh/h)	684	712	662	690	682	713
Control Delay (s)	8.6	8.0	7.7	7.3	7.8	7.6
Approach Delay (s)	8.6	8.0	7.5		7.7	
Approach LOS	A	A	A		A	

Intersection Summary	
Delay	7.8
HCM Level of Service	A
Intersection Capacity Utilization	36.7%
ICU Level of Service	A
Analysis Period (min)	15

APPENDIX D

**CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2017 PEAK PERIOD TRAFFIC
ANALYSIS WITHOUT PROJECT**

HCM Signalized Intersection Capacity Analysis

5: Ala Moana Blvd & Cooke St

6/19/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	1871	44	11	1860	37	19	14	7	28	21	63
Ideal Flow (vphpl)	1900	1900	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			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5063		1770	5067			1804	1543		1803	1543
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.80	1.00
Satd. Flow (perm)	1770	5063		1770	5067			1467	1543		1492	1543
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)	103	1929	45	11	1918	38	20	14	7	29	22	65
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	6	0	0	60
Lane Group Flow (vph)	103	1973	0	11	1955	0	0	34	1	0	51	5
Confl. Peds. (#/hr)			8			12	5		8	5		12
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	11.4	69.5		1.1	59.2			7.3	7.3		7.3	7.3
Effective Green, g (s)	11.4	69.5		1.1	59.2			7.3	7.3		7.3	7.3
Actuated g/C Ratio	0.12	0.75		0.01	0.64			0.08	0.08		0.08	0.08
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)	217	3788		21	3229			115	121		117	121
v/s Ratio Prot	c0.06	c0.39		0.01	c0.39						c0.03	0.00
v/s Ratio Perm								0.02	0.00			0.00
v/c Ratio	0.47	0.52		0.52	0.61			0.30	0.00		0.44	0.04
Uniform Delay, d1	38.0	4.8		45.6	10.0			40.4	39.5		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	1.6	0.1		21.6	0.3			1.4	0.0		2.6	0.1
Delay (s)	39.6	5.0		67.2	10.3			41.8	39.5		43.4	39.7
Level of Service	D	A		E	B			D	D		D	D
Approach Delay (s)		6.7			10.6			41.4			41.3	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	9.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	92.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

8: Ala Moana Blvd & Koula St

6/19/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	1873	15	6	1904	9	5	4	4	7	7	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Frt	1.00	1.00		1.00	1.00			0.96			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1770	5077		1770	5080			1735			1770	
Flt Permitted	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (perm)	1770	5077		1770	5080			1769			1809	
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)	19	1931	15	6	1963	9	5	4	4	7	7	2
RTOR Reduction (vph)	0	0	0	0	0	0	0	4	0	0	2	0
Lane Group Flow (vph)	19	1946	0	6	1972	0	0	9	0	0	14	0
Confl. Peds. (#/hr)			17			26			20	20		26
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases							8			4		
Actuated Green, G (s)	2.2	56.0		0.8	54.6			2.2				2.2
Effective Green, g (s)	2.2	56.0		0.8	54.6			2.2				2.2
Actuated g/C Ratio	0.03	0.76		0.01	0.74			0.03				0.03
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0				5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0				3.0
Lane Grp Cap (vph)	53	3842		19	3748			53				54
v/s Ratio Prot	c0.01	0.38		0.00	c0.39							
v/s Ratio Perm								0.01				c0.01
v/c Ratio	0.36	0.51		0.32	0.53			0.17				0.26
Uniform Delay, d1	35.2	3.5		36.3	4.2			35.0				35.1
Progression Factor	1.00	1.00		1.00	1.00			1.00				1.00
Incremental Delay, d2	4.1	0.1		9.3	0.1			1.5				2.6
Delay (s)	39.3	3.7		45.7	4.3			36.6				37.7
Level of Service	D	A		D	A			D				D
Approach Delay (s)		4.0			4.4			36.6				37.7
Approach LOS		A			A			D				D

Intersection Summary

HCM Average Control Delay	4.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	74.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 10: Ala Moana Blvd & Ahui St

6/19/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑↑		↑
Volume (veh/h)	1834	47	0	1920	0	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	1891	48	0	1979	0	10
Pedestrians				21	21	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				2	2	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	431					
pX, platoon unblocked			0.84		0.84	0.84
vC, conflicting volume			1960		2596	696
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1492		2245	0
tC, single (s)			4.1		6.8	*5.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			370		29	884

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	756	756	427	660	660	660	10
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	48	0	0	0	10
cSH	1700	1700	1700	1700	1700	1700	884
Volume to Capacity	0.44	0.44	0.25	0.39	0.39	0.39	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.1
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.1
Approach LOS							A

Intersection Summary

Average Delay	0.0	
Intersection Capacity Utilization	52.1%	ICU Level of Service A
Analysis Period (min)	15	

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis

17: Auahi St & Cooke St

6/19/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	36	11	9	1	13	14	27	132	4	15	105	63
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	40	12	10	1	14	16	30	147	4	17	117	70
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	62	31	103	78	75	128						
Volume Left (vph)	40	1	30	0	17	0						
Volume Right (vph)	10	16	0	4	0	70						
Hadj (s)	0.07	-0.26	0.18	-0.01	0.15	-0.35						
Departure Headway (s)	4.9	4.6	5.1	4.9	5.0	4.5						
Degree Utilization, x	0.08	0.04	0.15	0.11	0.11	0.16						
Capacity (veh/h)	685	719	688	712	690	768						
Control Delay (s)	8.3	7.8	7.8	7.3	7.4	7.2						
Approach Delay (s)	8.3	7.8	7.5		7.3							
Approach LOS	A	A	A		A							
Intersection Summary												
Delay			7.6									
HCM Level of Service			A									
Intersection Capacity Utilization			34.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

5: Ala Moana Blvd & Cooke St

6/19/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	2321	16	4	1773	39	26	31	7	51	20	124
Ideal Flow (vphpl)	1900	1900	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			1.00	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.97	1.00
Satd. Flow (prot)	1770	5077		1770	5064			1817	1517		1775	1526
Flt Permitted	0.95	1.00		0.95	1.00			0.83	1.00		0.75	1.00
Satd. Flow (perm)	1770	5077		1770	5064			1535	1517		1379	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)	59	2393	16	4	1828	40	27	32	7	53	21	128
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	6	0	0	87
Lane Group Flow (vph)	59	2409	0	4	1867	0	0	59	1	0	74	41
Confl. Peds. (#/hr)			25			20	4		25	16		20
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	7.5	71.1		0.6	64.2			11.2	11.2		11.2	11.2
Effective Green, g (s)	7.5	71.1		0.6	64.2			11.2	11.2		11.2	11.2
Actuated g/C Ratio	0.08	0.73		0.01	0.66			0.11	0.11		0.11	0.11
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	136	3687		11	3321			176	174		158	175
v/s Ratio Prot	c0.03	c0.47		0.00	0.37							
v/s Ratio Perm								0.04	0.00		c0.05	0.03
v/c Ratio	0.43	0.65		0.36	0.56			0.34	0.00		0.47	0.24
Uniform Delay, d1	43.2	7.0		48.5	9.2			39.9	38.4		40.6	39.5
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.2	0.4		19.3	0.2			1.1	0.0		2.2	0.7
Delay (s)	45.4	7.4		67.7	9.4			41.1	38.4		42.8	40.1
Level of Service	D	A		E	A			D	D		D	D
Approach Delay (s)		8.3			9.5			40.8			41.1	
Approach LOS		A			A			D			D	

Intersection Summary

HCM Average Control Delay	10.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	97.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

8: Ala Moana Blvd & Koula St

6/19/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Volume (vph)	18	2353	10	7	1794	36	1	6	3	22	1	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Frt	1.00	1.00		1.00	1.00			0.96			0.93	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.98	
Satd. Flow (prot)	1770	5081		1770	5061			1760			1651	
Flt Permitted	0.95	1.00		0.95	1.00			0.97			0.84	
Satd. Flow (perm)	1770	5081		1770	5061			1714			1420	
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)	19	2426	10	7	1849	37	1	6	3	23	1	23
RTOR Reduction (vph)	0	0	0	0	1	0	0	3	0	0	21	0
Lane Group Flow (vph)	19	2436	0	7	1885	0	0	7	0	0	26	0
Confl. Peds. (#/hr)			20			28			20	13		28
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases							8			4		
Actuated Green, G (s)	1.9	66.2		0.8	65.1			7.7				7.7
Effective Green, g (s)	1.9	66.2		0.8	65.1			7.7				7.7
Actuated g/C Ratio	0.02	0.74		0.01	0.73			0.09				0.09
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0				5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0				3.0
Lane Grp Cap (vph)	37	3750		16	3673			147				122
v/s Ratio Prot	c0.01	c0.48		0.00	0.37							
v/s Ratio Perm								0.00				c0.02
v/c Ratio	0.51	0.65		0.44	0.51			0.05				0.21
Uniform Delay, d1	43.4	5.9		44.2	5.4			37.6				38.2
Progression Factor	1.00	1.00		1.00	1.00			1.00				1.00
Incremental Delay, d2	11.5	0.4		18.0	0.1			0.1				0.9
Delay (s)	55.0	6.3		62.2	5.5			37.8				39.1
Level of Service	D	A		E	A			D				D
Approach Delay (s)		6.7			5.7			37.8				39.1
Approach LOS		A			A			D				D
Intersection Summary												
HCM Average Control Delay			6.7			HCM Level of Service					A	
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			89.7			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			69.9%			ICU Level of Service					C	
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 10: Ala Moana Blvd & Ahui St

6/19/2014

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑↑		↗
Volume (veh/h)	2365	11	0	1840	0	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	2438	11	0	1897	0	2
Pedestrians				12	12	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				1	1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	440					
pX, platoon unblocked				0.74	0.74	0.74
vC, conflicting volume				2461	3088	842
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				1729	2581	0
tC, single (s)				4.1	6.8	*5.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				100	100	100
cM capacity (veh/h)				263	15	782

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	975	975	499	632	632	632	2
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	11	0	0	0	2
cSH	1700	1700	1700	1700	1700	1700	782
Volume to Capacity	0.57	0.57	0.29	0.37	0.37	0.37	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.6
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.6
Approach LOS							A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
 17: Auahi St & Cooke St

6/19/2014

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Sign Control		Stop			Stop			Stop			Stop		
Volume (vph)	61	14	11	10	14	22	19	106	8	12	179	24	
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)	64	15	11	10	15	23	20	110	8	12	186	25	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2							
Volume Total (vph)	90	48	75	64	106	118							
Volume Left (vph)	64	10	20	0	13	0							
Volume Right (vph)	11	23	0	8	0	25							
Hadj (s)	0.10	-0.21	0.17	-0.06	0.09	-0.11							
Departure Headway (s)	4.9	4.6	5.2	5.0	5.1	4.9							
Degree Utilization, x	0.12	0.06	0.11	0.09	0.15	0.16							
Capacity (veh/h)	684	712	662	690	682	713							
Control Delay (s)	8.6	8.0	7.7	7.3	7.8	7.6							
Approach Delay (s)	8.6	8.0	7.5		7.7								
Approach LOS	A	A	A		A								
Intersection Summary													
Delay			7.8										
HCM Level of Service			A										
Intersection Capacity Utilization			36.7%	ICU Level of Service									A
Analysis Period (min)			15										

APPENDIX E

**CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2017 PEAK PERIOD TRAFFIC
ANALYSIS WITH PROJECT**

HCM Signalized Intersection Capacity Analysis

5: Ala Moana Blvd & Cooke St

6/19/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	1881	44	11	1902	37	19	14	7	28	21	63
Ideal Flow (vphpl)	1900	1900	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	0.98		1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	5063		1770	5068			1804	1550		1805	1542
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.80	1.00
Satd. Flow (perm)	1770	5063		1770	5068			1466	1550		1495	1542
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)	103	1939	45	11	1961	38	20	14	7	29	22	65
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	6	0	0	60
Lane Group Flow (vph)	103	1983	0	11	1998	0	0	34	1	0	51	5
Confl. Peds. (#/hr)			8			12	5		8	5		12
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	11.5	71.9		1.1	61.5			7.3	7.3		7.3	7.3
Effective Green, g (s)	11.5	71.9		1.1	61.5			7.3	7.3		7.3	7.3
Actuated g/C Ratio	0.12	0.75		0.01	0.65			0.08	0.08		0.08	0.08
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)	214	3820		20	3271			112	119		115	118
v/s Ratio Prot	c0.06	c0.39		0.01	c0.39							
v/s Ratio Perm								0.02	0.00		c0.03	0.00
v/c Ratio	0.48	0.52		0.55	0.61			0.30	0.00		0.44	0.04
Uniform Delay, d1	39.1	4.7		46.9	9.9			41.6	40.6		42.1	40.8
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.7	0.1		28.9	0.3			1.5	0.0		2.7	0.1
Delay (s)	40.8	4.8		75.7	10.2			43.1	40.7		44.8	40.9
Level of Service	D	A		E	B			D	D		D	D
Approach Delay (s)		6.6			10.6			42.7			42.6	
Approach LOS		A			B			D			D	

Intersection Summary

HCM Average Control Delay	9.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	95.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

8: Ala Moana Blvd & Koula St

6/19/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Volume (vph)	28	1873	15	6	1925	9	5	4	4	49	7	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Frt	1.00	1.00		1.00	1.00			0.96			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1770	5077		1770	5080			1734			1693	
Flt Permitted	0.95	1.00		0.95	1.00			0.91			0.80	
Satd. Flow (perm)	1770	5077		1770	5080			1603			1402	
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)	29	1931	15	6	1985	9	5	4	4	51	7	24
RTOR Reduction (vph)	0	1	0	0	0	0	0	4	0	0	12	0
Lane Group Flow (vph)	29	1945	0	6	1994	0	0	9	0	0	70	0
Confl. Peds. (#/hr)			17			26			20	20		26
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases							8			4		
Actuated Green, G (s)	3.9	61.7		0.9	58.7			8.3				8.3
Effective Green, g (s)	3.9	61.7		0.9	58.7			8.3				8.3
Actuated g/C Ratio	0.05	0.72		0.01	0.68			0.10				0.10
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0				5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0				3.0
Lane Grp Cap (vph)	80	3647		19	3471			155				135
v/s Ratio Prot	c0.02	c0.38		0.00	c0.39							
v/s Ratio Perm								0.01				c0.05
v/c Ratio	0.36	0.53		0.32	0.57			0.06				0.52
Uniform Delay, d1	39.8	5.5		42.2	7.1			35.3				36.9
Progression Factor	1.00	1.00		1.00	1.00			1.00				1.00
Incremental Delay, d2	2.8	0.2		9.3	0.2			0.2				3.6
Delay (s)	42.6	5.7		51.5	7.3			35.4				40.5
Level of Service	D	A		D	A			D				D
Approach Delay (s)		6.2			7.5			35.4				40.5
Approach LOS		A			A			D				D
Intersection Summary												
HCM Average Control Delay			7.6			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			85.9			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			60.7%			ICU Level of Service				B		
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 10: Ala Moana Blvd & Ahui St

6/19/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑↑		↑
Volume (veh/h)	1876	47	0	1941	0	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	1934	48	0	2001	0	10
Pedestrians				21	21	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				2	2	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	431					
pX, platoon unblocked			0.82		0.82	0.82
vC, conflicting volume			2003		2646	711
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1454		2238	0
tC, single (s)			4.1		6.8	*5.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			371		29	858

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	774	774	435	667	667	667	10
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	48	0	0	0	10
cSH	1700	1700	1700	1700	1700	1700	858
Volume to Capacity	0.46	0.46	0.26	0.39	0.39	0.39	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.2
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.2
Approach LOS							A

Intersection Summary							
Average Delay			0.0				
Intersection Capacity Utilization			52.5%		ICU Level of Service		A
Analysis Period (min)			15				

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis

17: Auahi St & Cooke St

6/19/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	36	11	9	1	15	14	27	132	4	15	105	63
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	40	12	10	1	17	16	30	147	4	17	117	70

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	62	33	103	78	75	128
Volume Left (vph)	40	1	30	0	17	0
Volume Right (vph)	10	16	0	4	0	70
Hadj (s)	0.07	-0.24	0.18	-0.01	0.15	-0.35
Departure Headway (s)	4.9	4.6	5.1	4.9	5.0	4.6
Degree Utilization, x	0.08	0.04	0.15	0.11	0.11	0.16
Capacity (veh/h)	685	716	687	711	689	767
Control Delay (s)	8.3	7.8	7.8	7.3	7.4	7.2
Approach Delay (s)	8.3	7.8	7.6		7.3	
Approach LOS	A	A	A		A	

Intersection Summary	
Delay	7.6
HCM Level of Service	A
Intersection Capacity Utilization	34.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis
 5: Ala Moana Blvd & Cooke St

6/19/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	2364	16	4	1804	39	26	31	7	51	20	124
Ideal Flow (vphpl)	1900	1900	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			1.00	1.00		0.99	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.97	1.00
Satd. Flow (prot)	1770	5077		1770	5064			1817	1516		1775	1525
Flt Permitted	0.95	1.00		0.95	1.00			0.83	1.00		0.75	1.00
Satd. Flow (perm)	1770	5077		1770	5064			1534	1516		1379	1525
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)	59	2437	16	4	1860	40	27	32	7	53	21	128
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	6	0	0	86
Lane Group Flow (vph)	59	2453	0	4	1899	0	0	59	1	0	74	42
Confl. Peds. (#/hr)			25			20	4		25	16		20
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	7.5	73.5		0.6	66.6			11.3	11.3		11.3	11.3
Effective Green, g (s)	7.5	73.5		0.6	66.6			11.3	11.3		11.3	11.3
Actuated g/C Ratio	0.07	0.73		0.01	0.66			0.11	0.11		0.11	0.11
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	132	3717		11	3359			173	171		155	172
v/s Ratio Prot	c0.03	c0.48		0.00	0.37							
v/s Ratio Perm								0.04	0.00		c0.05	0.03
v/c Ratio	0.45	0.66		0.36	0.57			0.34	0.00		0.48	0.24
Uniform Delay, d1	44.5	7.0		49.7	9.1			41.1	39.6		41.8	40.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.4	0.4		19.3	0.2			1.2	0.0		2.3	0.7
Delay (s)	46.9	7.4		69.0	9.3			42.3	39.6		44.1	41.4
Level of Service	D	A		E	A			D	D		D	D
Approach Delay (s)		8.3			9.4			42.0			42.4	
Approach LOS		A			A			D			D	

Intersection Summary

HCM Average Control Delay	10.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.4	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

8: Ala Moana Blvd & Koula St

6/19/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	61	2353	10	7	1809	43	1	6	3	54	1	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Frt	1.00	1.00		1.00	1.00			0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.97	
Satd. Flow (prot)	1770	5080		1770	5055			1764			1663	
Flt Permitted	0.95	1.00		0.95	1.00			0.97			0.81	
Satd. Flow (perm)	1770	5080		1770	5055			1726			1394	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	63	2426	10	7	1865	44	1	6	3	56	1	39
RTOR Reduction (vph)	0	0	0	0	2	0	0	3	0	0	20	0
Lane Group Flow (vph)	63	2436	0	7	1907	0	0	7	0	0	76	0
Confl. Peds. (#/hr)			20			28			13	13		28
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases							8			4		
Actuated Green, G (s)	7.6	72.5		1.1	66.0			11.3				11.3
Effective Green, g (s)	7.6	72.5		1.1	66.0			11.3				11.3
Actuated g/C Ratio	0.08	0.73		0.01	0.66			0.11				0.11
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0				5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0				3.0
Lane Grp Cap (vph)	135	3687		19	3340			195				158
v/s Ratio Prot	c0.04	c0.48		0.00	0.38							
v/s Ratio Perm								0.00				c0.05
v/c Ratio	0.47	0.66		0.37	0.57			0.04				0.48
Uniform Delay, d1	44.2	7.2		49.1	9.2			39.5				41.6
Progression Factor	1.00	1.00		1.00	1.00			1.00				1.00
Incremental Delay, d2	2.5	0.5		11.7	0.2			0.1				2.3
Delay (s)	46.7	7.7		60.7	9.5			39.5				43.9
Level of Service	D	A		E	A			D				D
Approach Delay (s)		8.7			9.7			39.5				43.9
Approach LOS		A			A			D				D
Intersection Summary												
HCM Average Control Delay			9.9			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			99.9			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			76.3%			ICU Level of Service				D		
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 10: Ala Moana Blvd & Ahui St

6/19/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑↑		↗
Volume (veh/h)	2397	11	0	1862	0	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	2471	11	0	1920	0	2
Pedestrians				12	12	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				1	1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	431					
pX, platoon unblocked			0.73		0.73	0.73
vC, conflicting volume			2494		3129	853
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1741		2614	0
tC, single (s)			4.1		6.8	*5.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			257		14	773

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	988	988	506	640	640	640	2
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	11	0	0	0	2
cSH	1700	1700	1700	1700	1700	1700	773
Volume to Capacity	0.58	0.58	0.30	0.38	0.38	0.38	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.7
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.7
Approach LOS							A

Intersection Summary							
Average Delay			0.0				
Intersection Capacity Utilization			59.9%		ICU Level of Service		B
Analysis Period (min)			15				

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
 17: Auahi St & Cooke St

6/19/2014

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Sign Control		Stop			Stop			Stop			Stop		
Volume (vph)	61	15	11	10	15	22	19	106	8	12	179	24	
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)	64	16	11	10	16	23	20	110	8	12	186	25	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2							
Volume Total (vph)	91	49	75	64	106	118							
Volume Left (vph)	64	10	20	0	13	0							
Volume Right (vph)	11	23	0	8	0	25							
Hadj (s)	0.10	-0.20	0.17	-0.06	0.09	-0.11							
Departure Headway (s)	4.9	4.7	5.2	5.0	5.1	4.9							
Degree Utilization, x	0.12	0.06	0.11	0.09	0.15	0.16							
Capacity (veh/h)	684	711	661	689	681	712							
Control Delay (s)	8.6	8.0	7.7	7.3	7.8	7.6							
Approach Delay (s)	8.6	8.0	7.5		7.7								
Approach LOS	A	A	A		A								
Intersection Summary													
Delay			7.8										
HCM Level of Service			A										
Intersection Capacity Utilization			36.7%	ICU Level of Service									A
Analysis Period (min)			15										