Appendix D

Traffic Impact Report for the Island School Master Plan
Prepared by
Wilson Okamoto Corporation
December 2010

TRAFFIC IMPACT REPORT

FOR THE

ISLAND SCHOOL MASTER PLAN

Prepared for:

Island School 3-1875 Kaumualii Highway Lihue, Hawaii 96766

Prepared by:

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December 2010

Traffic Impact Report for the Island School Master Plan

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Traffic Impact Report for the Island School Master Plan

I. INTRODUCTION

A. Purpose of Study

The purpose of this study is to identify and assess the traffic impacts resulting from the implementation of Island School's master plan. Island School is a private Pre-K to 12th grade school located adjacent the Kauai Community College on the island of Kauai.

B. Scope of Study

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

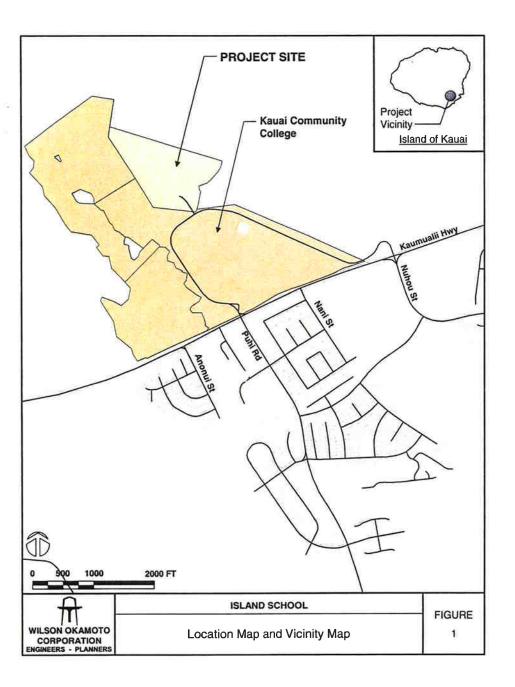
- 1. Description of the proposed project.
- 2. Evaluation of existing roadway and traffic operations in the vicinity.
- Analysis of future roadway and traffic conditions without the proposed project.
- Analysis and development of trip generation characteristics for the proposed project.
- 5. Superimposing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

II. PROJECT DESCRIPTION

A. Location

Island School is located adjacent to Kauai Community College (KCC) north of Kaumualii Highway in Puhi on the island of Kauai, and is further identified as Tax Map Key: 3-8-02: 16 (see Figure 1). The project site is bounded by agricultural uses to the north and east, Gaylord's Restaurant to the south, and KCC to the west. Access to Island School is provided via access roads shared with Kauai Community College at the intersections of Kaumualii Highway with Puhi Road and Nuhou Street.

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B. Project Characteristics

The master plan for Island School entails the expansion the private school's campus over the next 10 years to provide additional classrooms and facilities. The site plan for the proposed expansion is shown in Figure 2 and includes the construction of the following:

- Classroom buildings
- Science building
- Dining hall
- · Campus Center with a library, computer rooms, and a bookstore
- Auditorium and stage
- Locker rooms
- · Arts Education building
- Sports fields
- Additional Visual Arts facilities
- Additional administrative facilities
- · Additional parking areas

In conjunction with the proposed expansion, enrollment at the school is expected to increase until the expected completion of the project in the Year 2020. Island School currently serves 20 Pre-K students and 340 students from grades K to 12. By the Year 2020, Pre-K enrollment is not expected to increase, but enrollment for students from grades K to 12 is expected to increase to 480.

HI. EXISTING TRAFFIC CONDITIONS

A. Area Roadway System

In the vicinity of Island School, Kaumualii Highway is a predominantly two-lane, two-way roadway generally oriented in the east-west direction. At the signalized intersection with Puhi Road, both approaches of Kaumualii Highway have exclusive turning lanes and one through lane. Puhi Road is a predominantly two-lane, two-way roadway generally oriented in the north-south direction. At the intersection with Kaumualii Highway, the northbound approach of Puhi Road has a shared left-turn and through lane, and an exclusive right-turn lane. The southbound approach of the intersection is comprised of the western access road for KCC and Island School which

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Project Site Plan	ISLAND SCHOOL	EEY Some a secret The secret secret secret The secret secret secret secret The secret secret secret secret The secret secret secret secret secret The secret secret secret secret secret secret secret The secret secr
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has a shared left-turn and though lane, and an exclusive right-turn lane. An additional westbound departure lane is provided along Kaumualii Highway at this intersection to allow southbound right-turning vehicles to proceed freely through the intersection.

Northeast of the intersection with Puhi Road, Kaumualii Highway intersects

Nani Street. At this unsignalized T-intersection, the eastbound approach of the
highway has one lane that serves through and right-turn traffic movements while the
westbound approach has one lane that serves left-turn and through traffic movements.

Nani Street is a two-lane, two-way roadway generally oriented in the north-south
direction. At the intersection with the highway, the Nani Street approach has one lane
that serves left-turn and right-turn traffic movements.

Further northeast, Kaumualii Highway intersects Nuhou Street. At this signalized intersection, the eastbound approach of the highway has exclusive turning lanes and one through lane while the westbound approach has one through lane and a shared through and right-turn lane. Nuhou Street is a four-lane, two-way roadway generally oriented in the north-south direction. At the intersection with the highway, the northbound approach of Nuhou Street has a shared left-turn and through lane, and an exclusive right-turn lane. The southbound approach of the intersection is comprised of the eastern access for KCC and Island School which has one lane that serves all traffic movements.

B. Traffic Volumes and Conditions

1. General

a. Field Investigation

Field investigations were conducted on September 14-16, 2010 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:

- · Kaumualii Highway and Puhi Road
- Kaumualii Highway and Nani Street
- · Kaumualii Highway and Nuhou Street

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In addition, a 24-hour mechanical count survey was conducted along the main access for KCC north of the Kaumualii Highway and Puhi Road intersection. Appendix A includes the existing traffic count data.

b. Capacity Analysis Methodology

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

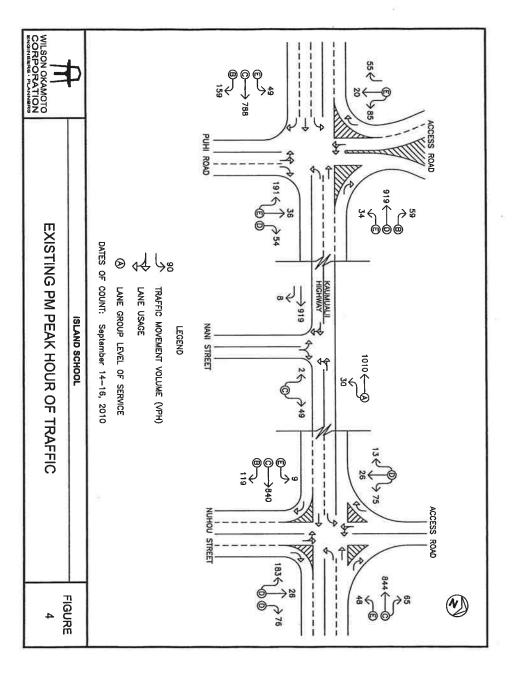
2. Existing Peak Hour Traffic

a. General

Figures 3 and 4 show the existing AM and PM peak hour traffic volumes and operating traffic conditions in the vicinity of the proposed project. The morning peak hour of traffic generally occurs between 7:15 AM and 8:15 AM in the vicinity of the project. In the afternoon, the peak hour of traffic generally occurs between the hours of 4:00 PM and 5:00 PM. The analysis is based on these commuter

EXISTING AM PEAK HOUR OF COUNT: LANE GROUP LEVEL OF SERVICE LANE USAGE TRAFFIC MOVEMENT VOLUME (VPH) ISLAND SCHOOL September 14-16, LEGEND 2010 TRAFFIC FIGURE ယ

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

b. Kaumualii Highway and Puhi Road

At the intersection with Puhi Road, Kaumualii Highway carries 933 vehicles eastbound and 728 vehicles westbound during the AM peak period. During the PM peak period, traffic volumes are higher with 996 vehicles traveling eastbound and 1,012 vehicles traveling westbound. The left-turn traffic movement on both approaches of the highway operate at LOS "D" and LOS "E" during the AM and PM peak periods, respectively, while the right-turn traffic movements operate at LOS "B" during both peak periods. The eastbound through traffic movement operates at LOS "C" during both peak periods while the westbound through traffic movement operates at LOS "C" and LOS "D" during the AM and PM peak periods, respectively. Traffic queues periodically formed on the eastbound and westbound approaches of the intersection with average queue lengths of 10-12 vehicles observed on both approaches during both peak periods. These queues were observed to clear the intersection after each traffic signal cycle change.

The Puhi Road approach of the intersection carries 230 vehicles and 281 vehicles northbound during the AM and PM peak periods, respectively. The northbound left-turn and through traffic movement on this approach operates at LOS "D" and LOS "E" during the AM and PM peak periods, respectively, while the right-turn traffic movement operates at LOS "C" and LOS "D" during the AM and PM peak periods, respectively. Traffic queues periodically formed on the Puhi Road approach of the intersection with average queue lengths of 9-11 vehicles observed during both peak periods. These queues were observed to clear the intersection after each traffic signal cycle change.

The southbound approach of the intersection is comprised of the western access road for KCC and Island School which carries 104 vehicles and 160 vehicles southbound during the AM and PM peak periods, respectively. The southbound left-turn and through traffic movement on this approach operates at LOS "C" and LOS "E" during the AM and PM peak periods, respectively. Traffic queues periodically formed on the access road approach of the intersection with average queue lengths of 2-3 vehicles observed during both peak periods. These queues were observed to clear the intersection after each traffic signal cycle change.

c. Kaumualii Highway and Nani Street

At the intersection with Nani Street, Kaumualii Highway carries 808 vehicles eastbound and 766 vehicles westbound during the AM peak period. During the PM peak period, traffic volumes are higher with 927 vehicles traveling eastbound and 1,040 vehicles traveling westbound. The critical traffic movement along the highway at this intersection is the westbound approach which operates at LOS "A" during both peak periods.

The Nani Street approach of the intersection carries 95 vehicles and 51 vehicles northbound during the AM and PM peak periods, respectively. Traffic queues periodically formed on the Nani Street approach of the intersection with average queue lengths of 1-3 vehicles observed during both peak periods.

d. Kaumualii Highway and Nuhou Street

At the intersection with Nuhou Street, Kaumualii Highway carries 897 vehicles eastbound and 1,008 vehicles westbound during the AM peak period. During the PM peak period, the overall traffic volume is approximately the same with 968 vehicles traveling eastbound and 957 vehicles traveling westbound. The left-turn traffic movement on both approaches of the highway operate LOS "E" during

Traffic Impact Report for the Island School Master Plan

both peak periods while the eastbound through and westbound through and right-turn traffic movements operate at LOS "C" during both peak periods. The eastbound right-turn traffic movement along the highway operates at LOS "B" during both peak periods. Traffic queues periodically formed on the eastbound and westbound approaches of the intersection with the most significant queuing occurring on the eastbound approach of the intersection. Queue lengths in excess of 15 vehicles were observed on the eastbound approach during this peak period. Most of these queues cleared after each traffic signal cycle change, but occasionally vehicles had to wait for more than one traffic signal cycle length.

The Nuhou Street approach of the intersection carries 283 vehicles and 285 vehicles northbound during the AM and PM peak periods, respectively. The traffic movements on this approach operate at LOS "D" during both peak periods. Traffic queues periodically formed on the Puhi Road approach of the intersection with the most significant queuing occurring during the PM peak period. Average queue lengths of 10-12 vehicles were observed during this peak period with these queues observed to clear the intersection after each traffic signal cycle change.

The southbound approach of the intersection is comprised of the eastern access road for KCC and Island School which carries 113 vehicles and 114 vehicles southbound during the AM and PM peak periods, respectively. This approach operates at LOS "E" and LOS "D" during the AM and PM peak periods, respectively. Traffic queues periodically formed on the access road approach of the intersection with average queue lengths of 1-3 vehicles observed during both peak periods. These queues were observed to clear the intersection after each traffic signal cycle change.

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, 8th Edition," 2008. 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 student. Table 1 summarizes the project site trip generation characteristics applied to the AM and PM peak hours of traffic.

Table 1: Peak Hour Trip Generation

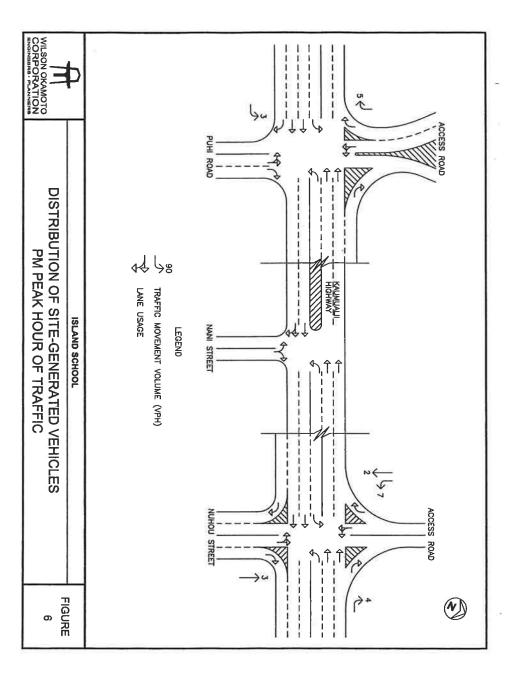
PRIVATE SCHOOL INDEPENDENT VAI	•	n enrollment = 140 students
		PROJECTED TRIP ENDS
AM PEAK	ENTER	69
	EXIT	44
	TOTAL	113
PM PEAK	ENTER	10
	EXIT	14
	TOTAL	24

2. Trip Distribution

Figures 5 and 6 show the distribution of site-generated vehicular trips at the study intersections during the AM and PM peak hours of traffic. Vehicular access to Island School is provided via two access roadways off Kaumualii Highway. The directional distribution of new site-generated vehicles was based upon the existing distribution of traffic at the more heavily utilized intersection with Puhi Street. As such, 39.1% of entering vehicles were assumed to be headed from areas to the west during the AM peak period, 43.2% were assumed to be headed from areas to the south. Similarly, 37.5% of exiting vehicles were assumed to be headed to area to the west, 33.7% were

DISTRIBUTION OF SITE-GENERATED VEHICLES
AM PEAK HOUR OF TRAFFIC LANE USAGE TRAFFIC MOVEMENT VOLUME (VPH) ISLAND SCHOOL LEGEND FIGURE

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assumed to be headed to areas to the east, ad 28.8% were assumed to be headed to areas to the south. During the PM peak period, 34.0% of entering vehicles were assumed to be headed from areas from the west, 41.0% were assumed to be headed from areas to the east, and 25.0% were assumed to be headed from areas to the south. Similarly, 34.4% of exiting vehicles were assumed to be headed to areas in the west, 53.1% were assumed to be headed to areas in the east, and 12.5% were assumed to be headed to areas to the south. Based upon the relative convenience of the available routes and the anticipated volume of conflicting traffic, all vehicles headed to and from the west were assumed to utilize the western access at the intersection of Kaumualii Highway with Puhi Street while all vehicles headed to and from the east and south were assumed to utilize the eastern access at the intersection of Kaumualii Highway with Nuhou Street.

B. Through Traffic Forecasting Methodology

The travel forecast is based upon historical traffic count data obtained from the State Department of Transportation (SDOT), Highway Division survey stations in the vicinity of the project site. The historical data indicates a stable or declining growth in traffic and, as such, an annual traffic growth rate of approximately 0.5% per year was conservatively assumed along Kaumualii Highway in the project vicinity. Using 2010 as the Base Year, a growth factor of 1.05 was applied to the existing through traffic demands along Kaumualii Highway achieve the projected Year 2020 traffic demands.

C. Other Considerations

1. Kauai Community College

Kauai Community College's Long-Range Development Plan (LRDP) includes the construction of a number of new facilities to allow the expansion of existing programs. In conjunction with the planned expansion, enrollment at the school is expected to increase from the current enrollment of 864 students to an enrollment of 1,038 students by the Year 2020. As described in the "Traffic Impact Report for the Kauai Community College Long Range

Development Plan" dated December 2010, the increase in enrollment at the college is expected to result in approximately 35 new trips during the AM peak period and 35 new trips during the PM peak period. These trips were assigned to the street network in the study area in the Year 2020 without project scenario to account for new trips generated the implementation of the college's LRDP.

2. Kaumualii Highway Widening

The State of Hawaii Department of Transportation is currently widening Kaumualii Highway from a two-lane undivided highway to a four-lane divided highway between Anonui Road and the Lihue Mill Bridge. The highway will have two travel lanes in each direction with auxiliary lanes provided at the intersections along this segment once construction is completed near the end of 2012.

D. Total Traffic Volumes Without Project

The projected Year 2020 AM and PM peak hour traffic volumes and operating conditions without the implementation Island School's master plan are shown on Figures 7 and 8, and summarized in Table 2. Kaumualii Highway is assumed to be widened to a four-lane divided highway by the Year 2020 with a westbound left-turn bay provided at the intersection with Nani Street. The existing levels of service are provided for comparison purposes. LOS calculations are included in Appendix D.

Table 2: Existing and Projected Year 2020 (Without Project)
Traffic Operating Conditions

Intersection	Critical Traffic	Movement	A	M	P	PM			
			Exist	Year 2020 w/out Proj	Exist	Year 2020 w/out Proj			
Kaumualii Hwy/	Eastbound	LT	D	C	Е	D			
Puhi Rd		TH	С	В	C	В			
		RT	В	В	В	В			
	Westbound	LT	D	С	E	D			
		TH	С	В	D	В			
	I	RT	В	В	В	В			

YEAR 2020 $\stackrel{\mathsf{A}}{\leq}$ PEAK HOUR OF TRAFFIC WITHOUT PROJECT TRAFFIC LANE GROUP LEVEL OF SERVICE LANE USAGE ISLAND SCHOOL MOVEMENT VOLUME (VPH) LEGEND FIGURE **(V)**

WILSON OKAMOTO CORPORATION	59 () 92 / 32 / 30 / 30 / 30 / 30 / 30 / 30 / 3
YEAR 2020 PM PEAK HOUR OF TRAFFIC WITHOUT PROJECT	PUHI ROAD PUHI ROAD ACCESS RO
FIGURE 8	

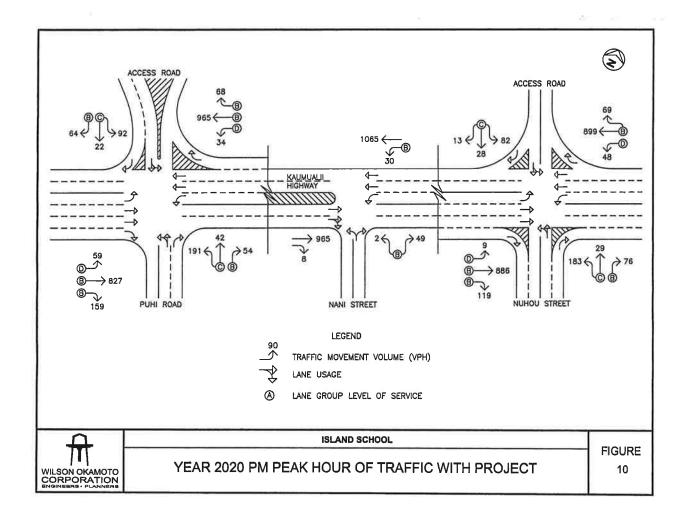
Table 2: Existing and Projected Year 2020 (Without Project)
Traffic Operating Conditions (Cont'd)

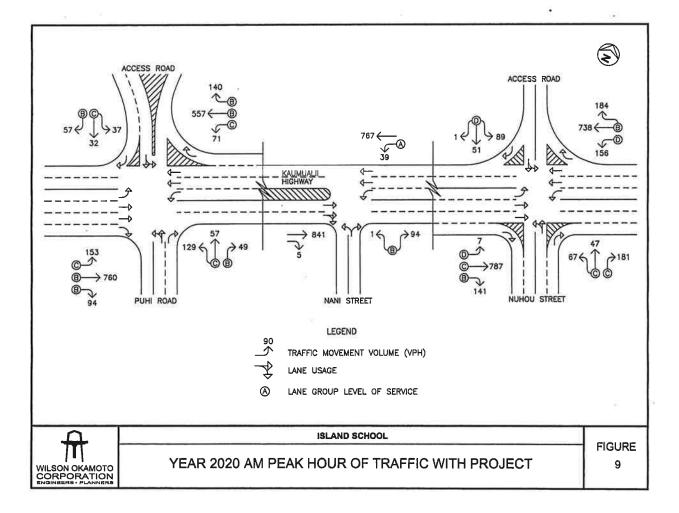
Intersection	Critical Traff	ic Movement	A	M	P	M
			Exist	Year 2020 w/out Proj	Exist	Year 2020 w/out Proj
Kaumualii Hwy/	Northbound	LT-TH	D	C	E	С
Puhi Rd (Cont'd)		RT	С	В	D	В
,	Southbound	LT-TH	C	В	E	C
		RT	-	В	-	В
Kaumualii Hwy/	Westbound	LT	A	A	A	В
Nani St		TH				
	Northbound	LT-RT	C	В	С	В
Kaumualii Hwy/	Eastbound	LT	E	D	Е	D
Nuhou St		TH	С	В	С	В
		RT	В	В	В	В
	Westbound	LT	Е	С	Е	D
		TH-RT	C	В	C	В
	Northbound	LT-TH	D	С	D	С
		RT	D	C	D	В
	Southbound	LT-TH-RT	Е	C	D	С

Traffic operations in the vicinity of Island School without the implementation of their master plan are expected to improve during both peak hours of traffic due to the widening of Kaumualii Highway to a four-lane divided highway. The traffic movements at the intersection of Kaumualii Highway with Puhi Road are expected to operate at LOS "C" or better during the AM peak period and LOS "D" or better during the PM peak period while those at the intersection with Nani Street are expected to operate at LOS "B" or better during both peak periods. At the intersection with Nuhou Street, the traffic movements are expected to operate at LOS "D" or better during both peak periods.

E. Total Traffic Volumes With Project

Figures 9 and 10 show the projected Year 2020 cumulative AM and PM peak hour traffic conditions resulting from the implementation of Island School's master plan. The cumulative volumes consist of site-generated traffic superimposed over





Year 2020 projected traffic demands. The traffic impacts resulting from the proposed project are addressed in the following section.

V. TRAFFIC IMPACT ANALYSIS

The Year 2020 cumulative AM and PM peak hour traffic conditions with the implementation of Island School's master plan are summarized in Table 3. The projected Year 2020 operating conditions without the proposed project are provided for comparison purposes. LOS calculations are included in Appendix E.

Table 3: Projected Year 2020 (Without and With Project)
Traffic Operation Conditions

Intersection	Critical Traffi	c Movement	A	M	PM			
			Year 2020 w/out Proj	Year 2020 w/ Proj	Year 2020 w/out Proj	Year 2020 w/ Proj		
Kaumualii Hwy/Puhi Rd	Eastbound	LT	С	С	D	D		
		TH	В	В	В	В		
		RT	В	В	В	В		
	Westbound	LT	С	C	D	D		
		TH	В	В	В	В		
		RT	В	В	В	B		
	Northbound	LT-TH	C	C	С	C		
		RT	В	В	В	В		
	Southbound	LT-TH	В	C	C	C		
		RT	В	В	В	В		
Kaumualii Hwy/Nani St	Westbound	LT	A	A	В	В		
	Northbound	LT-RT	В	В	В	В		
Kaumualii Hwy/Nuhou	Eastbound	LT	D	D	D	D		
St		TH	В	C	В	В		
		RT	В	В	В	В		
	Westbound	LT	C	D	D	D		
		TH-RT	В	В	В	В		
	Northbound	LT-TH	С	С	С	С		
		RT	C	С	В	В		
	Southbound	LT-TH-RT	C	D	C	C		

Traffic operations in the vicinity of Island School with the implementation of their master plan are expected, in general, to operate at levels of service similar to Year 2020 without project conditions despite the addition of site-generated traffic to the surrounding

Traffic Impact Report for the Island School Master Plan

roadways. The southbound left-turn and through traffic movement at the intersection of Kaumualii Highway with Puhi Street is expected to operate at a slightly lower level of service during the AM peak period. Similarly, at the intersection of Kaumualii Highway with Nuhou Street, the eastbound through and westbound left-turn traffic movements, as well as, the southbound approach are expected to operate at slightly slower levels of service during the AM peak period. The remaining critical movements at these intersections, as well as, the other study intersection are expected to continue operating at levels of service similar to without project conditions. In addition, the total traffic volumes entering the study intersections are expected to increase by 2-3% during the AM peak period and less than 1% during the PM peak period with the proposed project. These increases in the total traffic volumes are in the range of daily volume fluctuations along Kaumualii Highway and represent a minimal increase in the overall traffic volumes.

VI. RECOMMENDATIONS

Based on the analysis of the traffic data, the following are the recommendations of this study associated with the project:

- Maintain sufficient sight distance for motorists to safely enter and exit all project roadways.
- Maintain adequate on-site loading and off-loading service areas and prohibit off-site loading operations.
- Maintain adequate turn-around area for service, delivery, and refuse collection vehicles to maneuver on-site to avoid vehicle-reversing maneuvers onto public roadways.
- Maintain sufficient turning radii at all project roadways to avoid or minimize vehicle encroachments to oncoming traffic lanes.
- If the implementation of Island School's master plan is not completed by the Year 2020, prepare an updated Traffic Impact Report that incorporates a revised project completion year.

VII. CONCLUSION

The master plan for Island School entails the expansion the private school's campus over the next 10 years to provide additional classrooms and facilities. With the implementation of the aforementioned recommendations, Island School's master plan is not

expected to have a significant impact on traffic operations in the vicinity. The traffic movements at the study intersections along Kaumualii Highway are expected to continue operating at levels of service similar to without project conditions. In addition, the total traffic volumes entering the study intersections are expected to increase by 2-3% during the AM peak period and less than 1% during the PM peak period with the proposed project. These increases in the total traffic volumes are in the range of daily volume fluctuations along Kaumualii Highway and represent a minimal increase in the overall traffic volumes.

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APPENDIX A EXISTING TRAFFIC COUNT DATA

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400 Honolulu, Hi 96826

Counter:D4-3890, D4-5677 Counted By:RY, ER Weather:Clear

File Name: KauPuhi PM Site Code : 00000001 Start Date : 9/14/2010 Page No : 1

										s Printed-	Unshifte	d					17	ET 1 E-			
			C Drive					nualii Hi Vestbou					Puhi Stre Iorthbou					mualii Hig Eastbour			
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	To
03:00 PM	43	6	21	0	70	19	171	8	0	198	37	4	22	3	66	4	160	34	2	200	- 5
03:15 PM	16	3	5	1	25	20	206	3	1	230	51	4	15	1	71	5	177	46	1	229	5
03:30 PM	18	4	6	'n	28	8	234	4	0	246	46	4	17	0	67	2	193	30	0	225	5
03:45 PM	21	6	ä	1	37	12	231	12	0	255	-33	7	9	2	51	5	206	45	1_	257	- 6
Total	98	19	41	2	160	59	842	27	1	929	167	19	63	6	255	16	736	155	4	911	22
	1000	_		•	oo l	40	226	11	0	249	51	6	19	0	76	14	189	37	0	240	ŧ
04:00 PM	15	5	13	0	33	12	239	44	ő	262	43	11	9	ō	63	4	197	42	0	243	6
04:15 PM	18	5	11	Ü	34	12		17	0	249	48	à	8	ñ	64	16	198	44	1	259	6
04:30 PM	38	5	23	0	66	4	228	20	0	253	49	11	17	ň	77	15	196	38	110	248	
04:45 PM	14	5	- 8		28	6				1013	191	36	53	ő	280	49	780	159	2	990	24
Total	85	20	55	1	161	34	920	59	0	1013 [191	30	.00		200 [40			9.50	270.70	
05:00 PM I	13	0	10	0	23	7	220	12	0	239	43	9	7	0	59	10	190	40	0	240	
05:15 PM	6	4	10	ŏ	19	6	223	11	0	240	55	4	12	0	71	2	198	23	1	224	
05:30 PM	12	7	6	ĭ	21	5	222	6	0	233	42	4	7	0	53	4	134	17	2	157	
05:45 PM	2	0	6	0	8	8	173	13	0	194	30	4	20	0	54	9	202	37	0	248	
Total	32	6	32	1	71	26	838	42	0	906	170	21	46	0	237	25	724	117	3	869	2
			100		non l	440	2600	128		2848	528	76	162	6	772	90	2240	431	9	2770	6
Grand Total	215	45	128	4	392	119			,	2040	68.4	9.8	21	0.8		3.2	80,9	15.6	0.3		
Apprch %	54.8	11.5	32,7	1		4.2	91.3	4.5	0	42	7.8	1.1	2.4	0.1	11.4	1.3	33	6.4	0.1	40.8	
Total %	3.2	0.7	1.9	0.1	5.8	1.8	38.3	1.9	U	44	7.0	1.1	2.4	0.1	11047	1,0	-	0	211		

T		KCC Dr South				Kaumuali		/		Puhi S North				Kaumuali Eastb			
Ctest Time	Left	Thru		App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Start Time					Cont		7.0.3.00										
eak Hour Analysis Fr	om 03:00	PM to 05:4	15 PM - I	Peak 1 of 1													
Peak Hour for Entire In	ntersection	n Begins al	04:00 P	M			.000		-4	•	40	76 [1.4	189	37	240	598
04:00 PM	15	5	13	33	12	226	11	249	51	6	19		17			243	60
04:15 PM	18	5	11	34	12	239	11	262	43	11	9	63	4	197	42		
		ž	23	66	- 4	228	17	249	48	8	8	64	16	198	44	258	637
04:30 PM	38	2	23	27		227	20	253	49	11	17	77	15	196	36	247	604
04:45 PM	14_	5	8		- 0			1013	191	36	53	280	49	780	159	988	2441
Total Volume	85	20	55	160	34	920	59	1013			*0.0			78.9	16.1		
% App. Total	53.1	12.5	34.4		3.4	90.8	5.8		68.2	12.9	18,9	200	700		.903	.957	.958
PHF	.559	1.000	.598	.606	.708	.962	.738	.967	.936	.818	.697	.909	.766	.985	,903	,957	.900

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

Counter: D4-3890, D4-5677 Counted By:RY, ER Weather:Clear

File Name: KauPuhi AM Site Code : 00000001 Start Date : 9/15/2010

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			CC Drive			Groups Printed- U Kaurnualii Highway Westbound						Puhi Street Northbound						Kaumualii Highway Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Loft	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Tota		
06:00 AM	2	2	1	0	5	14	99	2	0	115	20 36	0	6	0	26	2	95	19	0	116	26		
08:15 AM	1	1	1	1	4	28	181	3	0	210	36	0	4	2	42	8	152	17	2	180	43		
06:30 AM	1	0	1	0	2	26	169	4	0	199	33	2	11	0	46	8	181	36	0	225	47		
06:45 AM	3	2	0	0	5	30	128	12	0	170	25	2	9	0	36	9	208	40	0	257	46		
Total	7	5	3	1	16	96	577	21	0	694	114	4	30	2	150	28	636	112	2	778	163		
07:00 AM I	1	0	1	0	21	18	92	14	0	124	29	5	3	0	37	15	202	28	6	251	41		
07:15 AM	8	1	7	ō	16	25	149	21	0	195	28	11	19	0	58	18	200	23	3	244	5		
07:30 AM	8	7	Á	ŏ	23	12	131	42	ō	185	25	20	5	0	50	52	171	24	6	253	5		
07:45 AM	14	14	18	0	46	16	128	43	- 3	188	34	16	9	1	60	35	163	21	4	223	51		
Total	31	22	34	0	87	71	498	120	1	690	116	52	36	1	205	120	736	96	19	971	19		
08:00 AM I	5	8	6	3	22	18	123	21	0	162	42	5	15	0	62	10	183	26	3	222	44		
08:15 AM	7	2	ő	ō	9	20	126	26	ō	172	27	10	13	0	50	16	179	49	1	245	4		
08:30 AM	10	5	1	ō	13	19	132	44	ō	195	37	6	24	0	67	23	200	27	8	258	53		
08:45 AM	7	2	6	0	15	16	121	55	0	192	21	12	25	0	58	24	167	32	0	223	4		
Total	29	14	13	3	59	73	502	146	0	721	127	33	77	0	237	73	729	134	12	948	19		
Grand Total	67	41	50	4	162	240	1577	287	1	2105	357	89	143	3	592	221	2101	342	33	2697	55		
Apprch %	41.4	25.3	30.9	2.5		11.4	74.9	13.6	0		60.3	15	24.2	0.5		8.2	77.9	12.7	1.2				
Total %	1.2	0.7	0.9	0.1	2.9	4.3	28.4	5.2	0	37.9	6.4	1.6	2.6	0.1	10.7	4	37.8	6.2	0.6	48.5			

		KCC Dr Southt				Kaumualii Westh		y		Puhi S North				Kaumualil Eastb			
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
eak Hour Analysis Fr	om 06:00	AM to 08:4	15 AM - P	eak 1 of 1									The state of the s	JOSHEYELLI			
eak Hour for Entire In	tersection	Begins al	07:15 AM	M.												-	
07:15 AM	8	1	7	16 [25	149	21	195	28	11	19	58	18	200	23	241	510
07:30 AM	8	7	8	23	12	131	42	185	25	20	5	50	52	171	24	247	505
07:45 AM	14	14	18	48	16 18	126	43	185	34	16	9	59	35	163 183	21 26	219	509
08:00 AM	5	8	6	19	18	123	21	162	42	5	15	62	10	183	26	219	462
Total Volume	35	30	39	104	71	529	127	727	129	52	48	229	115	717	94	926	1986
% App. Total	33.7	28.8	37.5		9.8	72.8	17.5		56.3	22.7	21		12.4	77.4	10.2		
PHF	.625	.536	.542	.565	.710	.888	.738	.932	.768	.650	.632	.923	.553	.896	.904	.937	.974

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

Counter:D4-5675 Counted By:TO Weather:Clear

File Name: KauNani PM Site Code: 00000001 Start Date: 9/14/2010

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							Groups	Printed- L	Inshifted			_					
	Southbou			nualii High Vestbound					Nani Street Northbound				0 212 5 0 217 0 215 2 0 217 0 225 1 0 223 0 241 5 0 246 0 890 13 0 903 0 220 2 0 222 0 217 2 0 219 0 235 3 0 236 0 225 1 0 226 0 897 8 0 905 0 214 0 0 214 0 0 225 3 0 228 0 166 2 0 168 0 222 2 0 224 0 827 7 0 834				
Start Time	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App, Total	Left		Right	Peds	App. Total	Int. Total 436
03:00 PM	0	11	199	0	0	210	1	0	8	0	9	0		5	0	217	471
03:15 PM	0	12	226	0	0	238	0	0	16	0	16	0		2	0	217	
03:30 PM	0	6	244	0	0	250	1	0	17	0	18	0		12	0		491
03:45 PM	0	9	256	0	0	265	0	0	22	0	22	0		5	0		533
Total	0	38	925	0	0	963	2	0	63	0	65	0	890	13	0	903	1931
04:00 PM	01	7	244	0	0	251	0	0	16	0	16	0	220	2			489
04:05 PM	0	7	247	0	ñ	254	0	0	10	0	10	0	217	2	0		483
04:13 PM	ŏ	11	242	o o	ő	253	1	0	11	0	12	0	235	3	0		503
	0	-04	251	ő	0	255	- 1	0	11	0	12	0	225	1	0		493
04:45 PM		29	984	- 0	0	1013	2	0	48	0	50	0	897	В	0	905	1988
Total	0	20	504			10.01		7.									
05:00 PM	01	7	230	0	0	237 [0	0	19	0	19	0		0	0		470
05:15 PM	ő	á	235	1	ő	244	ñ	ō	13	0	13	0	225	3	0		485
05:15 PM		11	235	ò	ň	246	2	0	9	1	12	0	166	2	0		426
	0	2	196	0	ő	199	ō	0	11	0	11	0	222	2	0	224	434
05:45 PM	0	29	896	1	0	926	2	0	52	1	55	0	827	7	0	834	1815
Total	60	29	330			220	~	- 5	225		- 0						
Grand Total	01	96	2805	1	0	2902	6	0	163	1	170	0				2642	5714
Approh %	×	3.3	96.7	o.	0		3.5	0	95.9	0.6		0	98.9	1.1	0		
Total %	0	1.7	49.1	ŏ	ō	60.8	0.1	Ó	2.9	0	3	0	45.7	0.5	0	46.2	j.

	Southbound		Kaumualii Westb				Nani S Northb				Kaumualii Eastbo			
Start Time	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
eak Hour Analysis Fro		45 PM - Pea	k 1 of 1											
eak Hour for Entire Int	ersection Begins a	t 03:45 PM			-								out.	533
03:45 PM	0	9	256	0	265	0	0	22	22	0	241	5	246	489
04:00 PM	0	7	244	0	251	0	0	16	16	0	220 217	2	222	
04:15 PM	ا ا	7	247	0	254	0	0	10	10	0		2	219	483
04:30 PM	0	11	242	0	253	1	0	11	12	0	235	3	238	503
Total Volume	0	34	989	0	1023	- 1	0	59	60	0	913 98.7	12	925	2008
% App. Total	1/34	3.3	96.7	0	5790000	1.7	0	98.3		0		1.3		
PHE	.000	.773	.966	.000	.965	.250	.000	.670	.682	.000	.947	.600	.940	.942

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

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File Name: KauNani AM Site Code : 00000001 Start Date : 9/15/2010 Page No : 1

	Southbou			mualii High Westbound		1			Vani Street Vorthbound					nualii High Eastbound	(252). 		
Start Time	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App, Total	Int. Tota
06:00 AM	App. Total	0	110	O.	0	110	3	0	13	0	16	0	109	2	0	111	23
	0	2	210	0	0	213	1	0	11	2	14	0	149	0	0	149	37
06:15 AM	8	3	197	0	0	203	1	ō	В	2	11	0	197	2	0	199	41
06:30 AM	ő	2	170	0	0	177	0	0	14	0	14	0	220	0	0	220	41
06:45 AM Total	0	16	687	0	0	703	5	0	46	4	55	0	675	4	0	679	143
1,100,000		388	500000	99		137	0	0	19	0	19	0	213	2	0	215	37
07:00 AM	0	10	127	0	0		U	0	28	ň	28	o.	223	0	0	223	45
07:15 AM	0	11	191	0	Ü	202	0	0	26	0	26	ő	192	2	0	194	41
07:30 AM	0	6	184	0	0	190	ů	, v	19	0	26 20	0	190	0	0	190	39
07:45 AM	0	10	178	0	0	188	!_	0	92	0	93	Ů,	818	4	0	822	163
Total	0	37	680	0	0	717	- 3	0	92	0	93	8	5.0	1.00	1.75	(534311)	
08:00 AM	0 0	11	166	0	0	177	0	0	21	0	21	0	205	3	0	208	4
08:15 AM	l ŏl	10	168	0	0	178	1	0	12	0	13	0	224	5	0	226	4
08:30 AM	0	5	192	0	0	197	0	0	17	0	17	0	235	0	0	235	4
08:45 AM	o l	9	194	0	0	203	1	0	16	0	17	0	199	- 6	0	205	16
Total	0	35	720	0	0	755	2	0	66	0	68	0	863	11	0	874	16
		20	0007		0	2175	8	0	204	4	216	0	2356	19	0	2375	47
Grand Total		88	2087	Ü	, o	21/5	3.7	ő	94.4	1.9	2.0	0	99.2	0.8	0		
Apprch %		. 4	96	0	ŏ	45.6	0.2	0	4.3	0.1	4.5	Õ	49.4	0.4	0	49.8	
Total %	0	1.8	43.8	0	0	45.0	0.2	U	4.5	0.1	4.01	•		• • • • • • • • • • • • • • • • • • • •			

	n. 45		Kaumualii Westb				Nani S Northb				Kaumualil Eastb			
Start Time	Southbound App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis Fro	m 06:00 AM to 05			-										
Peak Hour for Entire Int	ersection Begins a	MA 00:80 to				_			01		205	3	208	406
08:00 AM		11	166	0	177	0	0	21	21 13	ŏ	224	2	226	417
08:15 AM	0	10	168	0	178	1	U	12	13	0	235	o.		44
08:30 AM	0	5	192	0	197	0	0	17	17	ŏ	199	6	235	42
08:45 AM	0	9	194	0_	203	1	0	10	20	0	863	11	874	1697
Total Volume	0	35	720	0	755	2	0	66 97.1	68	ŏ	98.7	1.3	70.0	255
% App. Total		4.8	95.4	0_		2.9	0		.810	.000	.918	.458	.930	.945
PHF	.000	.795	.928	.000	.930	.500	.000	.786	,610	.000	.510	,400	1,000	70.10

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

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File Name: KauNuh PM Site Code : 00000002 Start Date : 9/15/2010

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									Group	s Printed-	Unshifte										
	Sec		rance/Ex	dt From K nd	CC			mualii Hi Meslbou					uhou Str Iorthbou					nuaill Hig Eastbour			
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	In Tota
03:00 PM	34	12	3	0	49	16	179	26	0	221	42	4	18	0	64	2	192	30	0	224	55
03:15 PM	29	14	- 1	0	44	27	214	11	0	252	55	3	19	0	77	0	165	32	0	217	59
03:30 PM	9	4	2	O.	15	18	209	9	0	236	51	8	26	0	85	2	208	21	0	231	56
03:45 PM	13	7	5	0	25	19	220	17	0	256	43	2	24	0	69	1	211	31	0	243	59
Total	85	37	11	0	133	80	822	63	0	965	191	17	87	0	295	5	796	114	0	915	230
04:00 PM [17	4	1	0	22	13	225	10	0	248	45	4	20	0	69	1	238	24	0	263	60
04:15 PM	21	10	3	0	34	16	210	19	0	245	42	8	22	0	72	1	198	36	1	236	56
04:30 PM	22	9	2	0	33	.11	208	12	0	231	55	7	18	0	80	5	219	37	0	261	60
04:45 PM	15	3	7	0	25	8	222	24	0	254	46	7	16	0	69	2	215	26	1_	244	59
Total	75	28	13	o	114	48	865	65	0	978	188	26	76	0	290	9	870	123	2	1004	238
05:00 PM I	17	7	1	0	25	21	204	11	0	236	42	12	18	0	72	3	204	29	0	236	56
05:15 PM	8	9	2	0	19	15	233	8	0	256	43	2*	19	0	64	1	168	26	0	195	50
05:30 PM	6	3	0	0	9	23	176	4	0	203	41	2	21	0	64	.1.	196	24	0	221	49
05:45 PM	8	4	2	0	14	28	189	11	0	228	25	2	16	0	43	0	183	15	0	198	48
Total	39	23	5	0	67	87	802	34	0	923	151	18	74	0	243	5	751	94	0	850	20
Grand Total	199	86	29	0	314	215	2489	162	0	2866	530	61	237	0	828	19	2417	331	2	2769	67
Apprch %	63.4	27.4	9.2	0		7.5	86.8	5.7	0	- 1	64	7.4	28.6	0		0.7	87.3	12	0.1		
Total %	2.0	1.3	0.4	٥	4.6	32	36.7	24	0	42.3	7.8	0.9	3.5	0	12.2	0.3	35.7	4.9	0	40.9	

	Secon	d Entrance South		m KCC		Kaumuali Westi		y		Nuhou North				Kaumualii Eastb	ound		
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Loft	Thru	Right	App. Total	Int. Total
Peak Hour Analysis Fr	om 03:00	PM to 05:4	45 PM - F	Peak 1 of 1													
Peak Hour for Entire In	ntersection	Begins at	03:45 P	M												-	
03:45 PM	13	7	5	25	19	220	17	256	43	2	24	69	1	211	31	243	593
04:00 PM	17	4	1	22	13	225	10	248	45	4	20	69		238	24	263	602
04:15 PM	21	10	3	34	16	210	19	245	42	6	22	. 72	1	198	36	235	586
04:30 PM	22	9	2	. 33	11	208	12	231	55	. 7	18	80	5	219	37	261	605
Total Volume	73	30	11	114	59	863	58	980	185	21	84	290	- 8	866	128	1002	2386
% App. Total	64	26.3	9.6	UNAGO	6	68.1	5.9	28023	63.8	7.2	29	- 200	0.8	86.4	12.8		
PHF	.830	.750	.550	.838	.776	.959	.763	.957	.841	.656	.875	.906	.400	.910	.865	.952	.986

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400 Honolulu, Hi 96826

Counter:D4-3890, D4-5677, D4-5675 Counted By:RY, ER, TO Weather:Clear

File Name: KauNuh AM Site Code : 00000002 Start Date : 9/16/2010 Page No : 1

	Sec		rance/Ex	dt From K	cc			nualii Hiç Vəstbou	phway	s Printed-		N	uhou Str Iorthbou					nualii Hig Eastbour			Les
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Tota 272
06:00 AM	0	1	0	0	1	8	122	1	0	131	6	0	13	0	19	0	115	6	0	121	429
06:15 AM	0	0	1	0	1	17	188	9	0	214	3	0	28	0	31	0	176		0	192	411
06:30 AM	1	0	1	0	2	15	175	5	0	195	5	0	17	0	22	1	180	11 35	ŏ	247	445
06:45 AM	1	0	0	0	1	17	147	5	0	169	6		21	0	28	2		59	0	743	1557
Total	2	1	2	0	5	57	632	20	0	709	20	1	79	0	100	3	681	59	0	743	1001
		-			74	OF	165	14	0	204	9	3	35	0	47	. 1	210	24	0	235	483
07:00 AM	. 1	0	0	0	40	25 42	175	32	ő	249	15	В	77	0	100	1	180	39	0	220	582
07:15 AM	11	2	0	0	13	49	181	59	ŏ	289	16	13	63	0	92	1	162	42	2	207	615
07:30 AM	16	10	1	0	27 49	42	173	47	ő	262	21	12	23	0	56	2	191	32	1_	228	593
07:45 AM	30 58	19	- 1	0	90	158	694	152	0	1004	61	36	198	0	295	- 5	743	137	3	888	227
1 Otto	38	31		•	00 [100			11.75.1	05554					W1000001		10000	000		4	
08:00 AM i	17	7	Λ	0	24	23	179	16	0	218	16	2	18	0	36	3	216	28	0	247	525
08:15 AM	17	,	1	Õ	12	12	171	12	0	195	10	1	12	0	23	1	215	16	0	232	46
08:30 AM	1	3	- 1	ñ	` <u>a</u>	14	146	19	0	179	13	2	10	0	25	2	223	8	0	233	44.
08:45 AM	- 2		0	o	7	7	154	21	0	182	12	1	11	0	24	3	184	22	0	209	42
Total	33	16	2	0	51	56	650	68	0	774	51	6	51	0	108	9	838	74	0	921	185
0 - 17 - 1	00	40	-	0	146	271	1976	240	0	2487	132	43	328	0	503	17	2262	270	3	2552	568
Grand Total	93	48	2.4		140	10.9	79.5	9.7	ő	_,,,,,	26.2	8.5	65.2	0	-	0.7	88.6	10.6	0.1		
Apprch %	63.7	32.9	3.4	0	ا م م	4.8	34.7	4.2	0	43.7	2.3	0.8	5.8	ŏ	8.8	0.3	39.8	4.7	0.1	44.9	
Total %	1.6	0.8	0.1	U	2.6	4.6	34.7	4.2		70.7	2.0	0.0	0.0	-							

	Secon	d Entrance South	Exit From F	KCC	_	Kaumualii Westi		,		Nuhou				Kaumualii Eastb	ound		
Start Time	Left	Thru		pp. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Tota
eak Hour Analysis Fr	om 06:00 ntersection	AM to 08:4	45 AM - Pea 1 07:15 AM	k 1 of 1								4001		100	39	220	588
07:15 AM	11	2	0	13 27	42 49	175 1 81	32 59	249 289	15 16	13	77 63	100 92	1	180 162	42	205	61:
07:30 AM 07:45 AM	16 30	10 19	0	49	42	173	47	262	21	12	23	56	2	191	32	225	59
08:00 AM	17	7	0	24	23	179	16	218	16	2	18	36 284	3	216 749	141	897	528 2312
Total Volume	74	38 33.6	0.9	113	158	708 69.5	154	1018	68 23.9	12.3	181 63.7	204	0.8	83.5	15.7	05380	19800
% App. Total	65.5	.500	.250	.577	.796	.978	.653	.881	,810	.673	.588	.710	,583	,867	,839	.908	.94

Site Code: Station ID: KCC Driveway At Kaumuatii Highway

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Honolulu, HI 96826

Site Code: Stalion ID: KCC Driveway At Kaumualii Highway

Latitude: 0' 0,000 Undefined

VVIISON	Okamoto	Corporation
190	7 S. Beretania S	St., Suite 400

Start	14-Sep-10		NB .		Totals		SB	Hour 1		Combined Totals
Time	Tue	Morning	Afternoon	Morning	Afternoon	Morning	Afternoor 44	Morning	Afternoon	Morning Afternoon
12:00 12:15	endietike)	100	22	enitriti.	Choetha be	0.00	46	15000	746 54	the the appropria
12:30 12:45	Her Best	Contract	16	0.	93	100	19		135	0 220
01:00 01:15	San on the To	1111,4254	20	odsa sa	arakir.	-2	32	145	100	grassist design
01:30 01:45	all it is	0.00	28	0	96	200	53 38	0	. 147	0 243
02:00	J. 1130 .	ac iso	26 22	S 26	- 12/2 to 12	- Kg /	54 33 22	1244 C	JAKT 6	PERMIT
02:30 02:45	eggartina.		36 28	0	112		53	- O. V	162	0 274
03:00 03:15	44 :	os wie	26	3-13-1	101, 4	- 1	68	(a) (b) (b) (b)	June 1 100	compage case ()
03:30			13	0	70	•	24 34	. 0.	148	0 0 218
04:00 04:15	AH H	1100	28 27	3	- 2	•	26 32	LANGE OF	108	DANGER STATE
04:30 04:45			27 49		131	n ji	42 29	0	129	0 260
05:00 05:15	1.6	- 1	38 20	2 4 7 . 1	2 1		24 16		200	
05:30 05:45			12	0.	96		10	0	72	0 166
06:00			14	W 2			18		- 1	
06:30 06:45			15	0	48		12	0	85	0 13
07:00 07:15			4	er e		- 2	17		4	distant
07:30 07:45	(1) Tall		3	0	- 11	•	7 28	0	. 63	. 0 7
08:00		. vin	6	10 - 10 TAG			59 32			The Color of the
08:30 08:45		V a	3	0	-10		7 21	0	119	0 12
09:00		do III perso	1	1000	W/111/25		6		11070110	e fourtails
09:30	10 EV		0		1		6	0	16	0 1
10:00		:	0	er i garan.			0		1000	
10:30 10:45		52 56	0	108	0	24 49	0	73	- 0	181
11:00 11:15		21 14	0			18 16	0	(65)	7.0	OF THE RESERVE
11:30 11:45		28	1	- 99	3	18	1	. 72	5.41	171

									T-1-1-	O	ad Tabela
Start	15-Sep-10		NΒ		Totals		SB		Totals		ed Totals
Time	Wed	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon 82	Morning	Afternoo	n Morning	Afternoon
12:00 12:15	enside etc	0	27 19 24	20-19-19	क्रमां विक्री हैं।	0	34	100	24440	r. Takar	STREET!
12:30 12:45	alage Mari	0	28	. 0	98	0	22	15	160	. P. M.	258
01:00 01:15 01:30		1.	53 32	o make	1 1 1 1	5-15-11-5	34	4.9	4570	1.00000	Addition S
01:45 02:00	Straphy and	0	25 24	1.	141.	0 0	17	1	92	2	233
02:15 02:30	enverteb se	0	202 800	20 11 11 12	ua ti Masa	0.000	23	1.000000	1.821	9 1.5 Har 2	installe.
02.45 03:00		0	31	. 0		0	68 53	0	150	0	262
03,15 03,30	f er -	0	17		15	0:	23.		-128	1714-488A (A	A Shirt States
03.30 03:45 04:00		1 0	30		80	0	20	0	120	102 354 3	
04:15 04:30		0	33 46		-90	0	54 47		13,185	Accorde	53/207557
04:45 05:00	4	0	58 44	0	162	0	33 27	3	168.	j=15762 1 3.	330
05:15 05:30	H 1	1	22			0	24 12			STEEL STATE	11 40 11
05;45 06:00		4	15 14	e = 7	89	1 4	9 35	1	72	- ' 8	161
06:15 06:30		12 12	19 16	,	- "- "	1 4	14 12	25	- (*)	W. Steel	
06:45	DSV II	21 26	14	49	63	5 3	23 58	14	84	63	147
07:15 07:30	N	44 99	6		1	9 21	42 24		796	Sec. 136	200 -0 200
07:45 08:00		120 42	5 '	289	23	46 20	36 50	79	160	368	183
08:15 08:30	GMINE III	47 51	0		- 1	12 12	20 15	1	River Par	200	MATERIAL SECTIONS
08:45 09:00	10 mg/m 81	110 41	0	250	5	12 14	22 10	56	107	306	112
09:15 09:30		17 41	2	and the same	100	.6 10	0			212	25
09:45 10:00	Region 2 -	58 30	1 0	157	3	25 28	4 5	55	22	212	
10:15 10:30	*** * 1	17 27	0			14	6	00	and the same	199	13
10:45 11:00		43 26	0	117	2	32 52	0	82			2.00 13 2.00 2.00
11:15 11:30	The state of	33 24	0			24 22	0	100	0	249	
11:45	4	36	1	119	14	420	1146	130	.0	1410	1925
Total Percent		990 56.0%	779 44.0%			26.8%	73.2%			42.3%	57.7%

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

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Site Code: Station ID: KCC Driveway At Kaumualii Highway

Latitude: 0' 0.000 Undefined

Start	16-Sep-10	- Table 1	NB	Hour	Totals		SB		Totals		ed Totals
Time	Thu	Morning	Afternoon	Morning	Afternoon	Morning	Afternoor	n Morning	Afternoon	Morning	Afternoon
12:00	Y	1				2	- 1				2002000000
12:15	the page	0	3.2 C .	1 1/18	570/700	0,41	400	9	- 2	11-12-12-12	tide of the
12:30	Service of the	0	- 2	0.0		0	- 1	2	0	3	· 1.33 % C
12:45	Section of	0			0	0		2,		3	COLUMN STATE
01:00	Da. 11/102	. 0			a distance of	0		and the Res		SP ST	HIGH SHARE
01:30	medical transfer	.0			1	Ö					
01:45	97.338.250			0	0	, o	1 4 2	0	0	0	- To 100
02:00	4.6	0			0.51	0		- 5			
02:15	195000 110000	. 0	25 le •	65 W 34	7.50	0		7	6.1	1000	Service Contract
02:30		0	•			0			1		
02:45	1 15 1	0		0	0	. 0		0	. 0	0	10-1-22
03:00	III LEVEL STA	0				1					niles or minority
03:15	1820	0			-	0	100			-21-44	0.57
03:30	Section 1	0	-	0	0	o		E . E .	0	. 4.1	7.15
03:45	STEELING .	0	- 1	· ·		0				14.25.97	10 10 100
04:15	36,485,000.0	0			27.29	. 0	-			JANES DE	1 10 March 2
04:30	4337.10	1				0	•				
. 04:45	4 1 Sel 11	. 0	•	1	0	0		0	0	1	
05:00		0	•			0					
05:15		1	•		100	0	100		67	3	1000
05:30		0	- 1			0	- 31	0	0	3	
05:45	200	2		3	0	0		0	- 01	3	
06:00		6			. 1	3				9.6	
06:30		7				2	•				
06:45	2 0 0 0 m	13		31	0	2		12	0	43	
07:00		10				2	•		- 1		
07:15		49				10	250			19	937/
07:30		104	- 1			26 31	(2)	69	. 0	353	
07:45		121	- 1	284	0	28		09		303	
08:00 08:15		51 35				4			11.0		77 040
08:30		28				8					
08:45	200	44	•	158	0	14		54	0	212	
09:00		74	•	1155	37.1	6	•		190	2286	21 2 202
09:15		31			.75	. 5	•		- 1	17 Page 1	
09:30				_ *	•		•	•	•		
09:45	6 10 EST		*1	•	•					1 1	12 - 5
10:00			8			ou ož			Here	100	-704
10:15		100	11	- 0	EO 100						WELL BY
10:30 10:45					3.0			2			
11:00							S.**				OF THE STATE OF
- 11:15	0.000		- 19							1334 74	5 1 1 1 1 1 1
11:30			•		•				•		
11:45	Mag			•		-				Name of	11111
Total		583	0			149	0			616	2.00
Percent		100.0%	0.0%			100.0%	0.0%	0000		100.0%	0.09 378 3
Grand To	(a)		780 14 .1% 44.9	50				2223 5.7%			378 3 3% 60

APPENDIX B

LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

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

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

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

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

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

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

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

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

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

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

[&]quot;Highway Capacity Manual," Transportation Research Board, 2000.

[&]quot;Highway Capacity Manual," Transportation Research Board, 2000.

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

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

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

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

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

APPENDIX C

CAPACITY ANALYSIS CALCULATIONS EXISTING PEAK HOUR TRAFFIC ANALYSIS

[&]quot;Highway Capacity Manual," Transportation Research Board, 2000.

AM Peak 10/19/2010 Baseline

	*	\rightarrow	*	1	+	•	1	Ť	1	-	¥	4
WHERE THE STREET	7	v 5		NO.		177 B			04/45/0			, A 16
Lane Configurations	ኝ	^	7	7	†	7		र्स	7		र्स	7
Volume (vph)	115	724	94	. 71	530	127	129	52	49	35	30	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	-	5.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	3 2 3	1.00	0,85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583		1799	1583		1814	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.71	1.00		0.68	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583		1317	1583	91.1	1276	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.93	0.93	0.93	0.92	0.92	0.92	0.57	0.57	0.57
Adj. Flow (vph)	122	770	100	. 76 .	570	137	140	57	53	61	- 53	68
RTOR Reduction (vph)	0	0	19	0	0	36	0	0	40	0	0	0
Lane Group Flow (vph)	122	770	81	76	570	101	0	197	13	0	114	- 68
Tum Type	Prot		Perm	Prot		Perm	Perm		Perm	Perm		Free
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2		2	6		Free
Actuated Green, G (s)	14.4	56.2	56.2	8.6	50.4	50.4		25.4	25.4		25.4	105.2
Effective Green, g (s)	14.4	56.2	56.2	8.6	50.4	50.4		25.4	25.4		25.4	105.2
Actuated g/C Ratio	0.14	0.53	0.53	0.08	0.48	0.48		0.24	0.24		0.24	1.00
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	242	995	846	145	893	758		318	382		308	1583
v/s Ratio Prot	c0.07	c0.41		0.04	0.31							
v/s Ratio Perm			0.05			0.06		c0.15	0.01		0.09	0.04
v/c Ratio	0.50	0.77	0.10	0.52	0.64	0.13		0.62	0.03		0.37	0.04
Uniform Delay, d1	42.1	19.5	12.0	46.3	20.6	15.2		35.6	30.5		33.2	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	1.7	3.8	0.0	3.4	1.5	0.1		3.6	0.0		0.8	0.1
Delay (s)	43.7	23.3	12.1	49.7	22.1	15.3		39.2	30.5		34.0	0.1
Level of Service	D	С	В	D	С	В		D	C		C	A
Approach Delay (s)		24.7			23.6			37.3			21.3	
Approach LOS		C			С			D			С	
PALOS TO TO THE WAR THE					7.000	M						13.13
HCM Average Control Delay			25.4	ŀ	ICM Leve	of Service	e :		C			
HCM Volume to Capacity ra	itio		0.72	_					45.0			
Actuated Cycle Length (s)			105.2		ium of los				15.0			
Intersection Capacity Utiliza	tion		71.1%	Н	CU Level	of Service	9		С			
Analysis Period (min)			15									
 Critical Lane Group 												

Synchro 7 - Report Page 1

HCM Signalized Intersection Capacity Analysis 3: Kaumualii & KCC

12/3/2010

Synchro 7 - Report

Page 1

	۶	-	*	1	+	4	1	†	1	1	Ţ	1
Michigan Company	學觀察	100	1201	NO THE	NUMBER OF		涂神灰	经通过	Nion.	101		1 8 1
Lane Configurations	ጎ	†	7	ሻ	1	7		4	7		4	7
Volume (vph)	49	788	159	34.	919	59	191	. 36	. 54	85	20	- 55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	- 5.0	N. X.	5.0	5.0	8000	5.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Fit.	1.00	1.00	0.85	1.00	1.00	0.85	100	1.00	0.85		1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	192	1788	1583		1790	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.56	1.00		0.44	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	54.7	1035	1583		823	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.97	0.97	0.97	0.91	0.91	0.91	0.61	0.61	0.61
Adi. Flow (vph)	51	821	166	-35	947	61	210	40	59	139	33	. 90
RTOR Reduction (vph)	0	0	28	0	0	9	0	0	42	0	0	0
Lane Group Flow (vph)	51	821	138	- 35	947	52	. 0	250	17	0	172	90
Turn Type	Prot		Perm	Prot		Perm	Perm		Perm	Perm		Free
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2		2	6		Free
Actuated Green, G (s)	7.2	84.8	84.8	5.6	83.2	83.2		43.4	43.4		43.4	148.8
Effective Green, g (s)	7.2	84.8	84.8	5.6	83.2	83.2		43.4	43.4		43.4	148.8
Actuated g/C Ratio	0.05	0.57	0.57	0.04	0.56	0.56		0.29	0.29	-	0.29	1.00
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	127	3.0	3.0		3.0	
Lane Grp Cap (vph)	86	1062	902	67	1042	885		302	462		240	1583
v/s Ratio Prot	c0.03	0.44		0.02	c0.51							
v/s Ratio Perm			0.09			0.03		c0.24	0.01		0.21	c0.06
v/c Ratio	0.59	0.77	0.15	0.52	0.91	0.06		0.83	0.04		0.72	0.06
Uniform Delay, d1	69.4	24.6	15.1	70.3	29.4	15.0		49.2	37.7		47.2	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	10.5	3.6	0.1	7.2	11.3	0.0		16.8	0.0		9.8	0.1
Delay (s)	79.9	28.2	15.2	77.5	40.7	15.0		66.0	37.8		57.0	0.1
Level of Service	E	С	В	E	D	В		E	D		E	A
Approach Delay (s)		28.6			40.5			60.6			37.4	
Approach LOS		C			D			Ε			D	
784. 1874英国建		COSSER	cms / K		ans file	(C) 7.00	4		12.5			200
HCM Average Control Delay			37.9	H	ICM Leve	of Service	e		D			
HCM Volume to Capacity ratio)		0.87									
Actuated Cycle Length (s)			148.8	S	sum of los	st time (s)			15.0			
Intersection Capacity Utilization	n		75.8%	- 10	CU Level	of Service	•		D			
Analysis Period (min)			15									

c Critical Lane Group

PM Peak 10/19/2010 Baseline

HCM Unsignalized Intersection Capacity Analysis 9: Kaumualii & Nani

12/3/2010

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			# # *	,	ż					ž.		
Johnno (web/h)	1 508	ď	90	12.	۲	70				3		
sign Control	Free	•	3	Free	Stop							
Grade	%0		20	%	%0							90
Peak Hour Factor	0.91	0.91	0.94	0.94	0.85	0.85						
Hourly flow rate (vph)	885	c)	4	773	-	Ε						i o
edestrians												
Walking Speed (ft/s)							8					
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh)												
Jostream signal (ft)	1175											
X, platoon unblocked			09.0		0.60	0.60						
C, conflicting volume			888		1742	882						
C1, stage 1 conf vol												
C2, stage 2 conf vol						Ų,						
'Cu, unblocked vol			484		1901	479						
C, single (s)			4.1		.5.4	*5.2						
C, 2 stage (s)												
F (s)			2.2		3.5	3.3						
00 queue free %			8		86	73						
M capacity (veh/h)			920		e	405						
を できる できる									(%)			
/olume Total	888	815	112									
/olume Left	0	41	-									
/olume Right	ç,	0	11									
SH	1700	650	386									
/olume to Capacity	0.52	90.0	0.29									
Quene Length 95th (ft)	0	വ	8									
Control Delay (s)	0.0	1.8	18.1									
ane LOS		V	ပ									
Approach Delay (s)	0.0	1.8	18.1									
Approach LOS			O									
	100	E	Towns of	作の部門	1 19 M							\$100 C
Average Delay			1.9									
ntersection Capacity Utilization	E		85.6%	೦	ICU Level of Service	f Service	•		ш			
Analysis Period (min)			15									

* User Entered Value

Synchro 7 - Report Page 3

AM Peak 10/19/2010 Baseline

HCM Unsignalized Intersection Capacity Analysis 9: Kaumualii & Nani

12/3/2010

	t	-	4	Ļ	•	•						
がは、これを選ば	y				Name of							
ane Configurations	.			4	% -							
olume (veh/h)	919	00	30	1010	2	49						
ign Control	Free			Free	Stop							
irade	8	4	2'-	%0	%	3	100	7		S		
eak Hour Factor	0.95	0.95	0.99	0.99	0.78	0.78						
lourly flow rate (vph)	296	00	30	1020	9	8	1000	,				
edestrians												
ane Width (ft):		r,			1							
Valking Speed (ft/s)												
ercent Blockage				ia.							7.	
light turn flare (veh)												
ledian type	None			None			į			ľ		
fedian storage veh)												
pstream signal (ft)	1175											
X, platoon unblocked			0.61		0.61	0.61						
C, conflicting volume			926		2052	972						
C1, stage 1 conf vol												
C2, stage 2 conf vol												
Cu, unblocked vol			646		2400	940						
C. single (s)			4.1		*5.4	5.2						
2, 2 stade (s)												
(2)			22		3.5	33						
(e)			1 8		8 8	8						
o dnene nee vo			8 [ξ \$	3 5						
M capacity (ven/h)		000000000000000000000000000000000000000	//c		42	320	900000000000000000000000000000000000000	THE PERSON NAMED IN	Periodology Base	0.000	SOUND STATE OF THE PERSONS NAMED IN	
folime Total	976	1051	A.									
Column Total	010	3	3									
folume Left	0	8	n									
Volume Right	œ	0	g									
-SE	1700	277	272									
folume to Capacity	0.57	0.05	0.24									
Queue Lenath 95th (ft)	0	4	23									
Control Delay (s)	0.0	8	22.4									
ane LOS		«	Q									
Anomach Dolay (c)	0	4	20 4								0.00	
Approach I OS	2	2	C									
pproduction			,				-	-	-	ACTOR ASSESSMENT	STATE	
	100											
werage Delay			1.6	,					ě			
ntersection Capacity Utilization			87.3%	೦	ICU Level of Service	Service			ш			
vnarysis Period (min)			2									

User Entered Value

PM Peak 10/19/2010 Baseline

Synchro 7 - Report Page 3

12/3/2010	
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	۶	-	*	1	-	*	1	1	-	1	. ↓	1
Marines J. 185 St. Rich	: 158E	3000	20 E 1980	- MAK	THE K	White or	27 mg		0 (4)(10)		a vitez	a"SØ
Lane Configurations	7	4	7	7	1	-		नी	7		4	
Volume (vph)	7	749	1.41	156	698	154	67	35	181	74	38	. 1
ideal Flow (vphpl)	1900	1900	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	2. 71
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frt	1:00	1.00	0.85	1.00	0.97			1.00	0.85	0.00	1.00	12 mg
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.97	1.00		0.97	
Satd. Flow (prot)	1770	1863	1583	1770	1812		9.00	1803	1583		1801	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.71	1.00		0.62	
Satd. Flow (perm)	1770	1863	1583	1770	1812			1323	1583		1147	
Peak-hour factor, PHF	0.91	0,91	0.91	0.88	0.88	0.88	0.71	0.71	0.71	0.58	0.58	0.58
Adj. Flow (vph)	8	823	155	177	793	175	94	49	255	128	66	- 2
RTOR Reduction (vph)	Ó	Ó	26	0	4	0	0	0	199	0	0	0
Lane Group Flow (viph)	- 8	823	129	177	964	0	0	143	56	0	196	.0
Turn Type	Prot		Perm	Prot			Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)	1.8	72.9	72.9	19.5	90.6			30.2	30.2		30.2	
Effective Green, g (s)	1.8	72.9	72.9	19.5	90.6			30.2	30.2		30.2	
Actuated g/C Ratio	0.01	0.53	0.53	0.14	0.66			0.22	0.22		0.22	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0			5.0	5.0		5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	23	987	839	251	1193			290	347		252	
v/s Ratio Prot	0.00	0.44		c0.10	c0.53							
v/s Ratio Perm			0.08					0.11	0.04		c0.17	
v/c Ratio	0.35	0.83	0.15	0.71	0.81			0.49	0.16		0.78	
Uniform Delay, d1	67.3	27.2	16.6	56.3	17.2			47.0	43.5		50.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1,00	
Incremental Delay, d2	8.9	6.2	0.1	8.7	4.1			1.3	0.2		14.0	
Delay (s)	76.2	33,4	16.6	65.0	21.3			48.3	43.7		64.5	
Level of Service	E	С	В	E	С			D	D		E	
Approach Delay (s)		31.1			28.0			45.3			64.5	
Approach LOS		С			С			D			Е	
NAMED TO A STREET OF THE PARTY	III II	OTHER DES		ME HAN		No. of the last of	g SS/M	SHEET IN	SECTION .	04.00	ESTAGE STA	
HCM Average Control Delay		_	34.3	Н	CM Level	of Service	e		С		and the same of	T. C. H.
HCM Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			137.6	S	um of lost	time (s)			15.0			
Intersection Capacity Utilization			74.7%		CU Level o				D			
Analysis Period (min)			15									
c Critical Lane Group												
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there is a state of the	-45	THE STATE	30	- Wige	SULE?	Oplose.	(O)	NAME:			100	
Lane Configurations	ሻ	1	7	7	7.			4	۴		4	u
Volume (vph)	9	840	119	48	844	65	183	26	76	75	26	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		8	5.0	5.0	3 7 -	5,0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Tal.	1.00	1.00		1.00	0.99			1.00	0.85	200	0.98	1977
Fit Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.97	
Satd. Flow (prot)	1770	1863	1583	1770	1843			1785	1583		17.76	*
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.67	1.00		0.50	
Satd. Flow (perm)	1770	1863	1583	1770	1843		-3	1249	1583		920	
Peak-hour factor, PHF	0.95	0.95	0.95	0.96	0.96	0.96	0.91	0.91	0.91	0.84	0.84	0.84
Adj: Flow (vph)	9	884	125	50	879	68	201	29	84	89	31	15
RTOR Reduction (vph)	0	0	21	0	2	0	0	0	63	0	2	(
Lane Group Flow (vph)	9	884	104	50	945	0	0	230	21	0	133	′(
Turn Type	Prot		Perm	Prot			Perm		Perm	Perm		
Protected Phases	7	4	100	3	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)	1.5	70,8	70.8	6.7	76.0			31.2	31.2		31.2	
Effective Green, g (s)	1.5	70.8	70.8	6.7	76.0			31.2	31.2		31.2	
Actuated g/C Ratio	0.01	0.57	0.57	0.05	0.61			0.25	0.25	1.0	0.25	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0			5.0	5.0		5.0	
Vehicle Extension (s)	3.0	3.0	- 3.0	3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	21	1066	906	96	1132			315	399		232	
v/s Ratio Prot	0.01	0.47		c0.03	c0.51							
v/s Ratio Perm			0.07					c0.18	0.01		0.14	
v/c Ratio	0.43	0.83	0.12	0.52	0.84			0.73	0.05		0.57	
Uniform Delay, d1	60.7	21.5	12.1	56.9	18.9			42.4	35.1		40.4	
Progression Factor	1.00	- 1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	13.4	5.5	0.1	5.0	5.5			8.4	0.1		3.4	
Delay (s)	74.1	27.0	12.2	62.0	24.4			50.8	35.1		43.8	
Level of Service	Е	C	В	E	C			D	D		D	
Approach Delay (s)		25.6			26.2			46.6			43.8	- 83
Approach LOS		C			C			D			D	
The last the same of the last	100		\$\V_2\$.	W 5	MOP IN	0.4	378		2001		K#W	10.78
HCM Average Control Delay			29.5	H	CM Level	of Servi	ce		С		1.554.5	
HCM Volume to Capacity ratio			0.81						100			
Actuated Cycle Length (s)			123.7	S	um of los	time (s)			15.0			
Intersection Capacity Utilization	1		71,7%	10	CU Level	of Service	Ð		C			
Analysis Period (min)			15									
c Critical Lane Group		-										

HCM Signalized Intersection Capacity Analysis 6: Kaumualii & KCC

APPENDIX D

CAPACITY ANALYSIS CALCULATIONS PROJECTED YEAR 2020 PEAK HOUR TRAFFIC ANALYSIS WITHOUT PROJECT

HCM Signalized Intersection Capacity Analysis 3: Kaumualii & KCC

12/3/2010

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Victoria de la compansión	2017日116	188	3 (4)		的原理	ly (milities	STATE OF	(A.11)	-Miles	180	5 1460	MARK.
Lane Configurations	7	44	ř	ሻ	44	۴		4	7		स	7
Volume (vph)	126	760	94	71	557	140	129	57.	49	37	32	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	75	5.0	5.0		- 5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	ALC: N	1.00	0.85		1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770.	3539	1583	1770	3539	1583		1800	1583		1814	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.72	1.00		0.75	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	7320	1339	1583		1402	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.93	0.93	0.93	0.92	0.92	0.92	0.57	0.57	0.57
Adi, Flow (vph)	134	809	100	. 76	599	. 151	140	62	53	65	56	72
RTOR Reduction (vph)	0	0	51	0	0	97	0	0	39	0	0	53
Lane Group Flow (vph)	134	809	49	76	599	54	. 0	202	14	0	121	19
Turn Type	Prot		Perm	Prot		Perm	Perm		Perm	Perm		Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)	8.8	24.7	24.7	6.9	22.8	22.8	NY 1	16.9	16.9	3	16.9	16.9
Effective Green, g (s)	8.8	24.7	24.7	6.9	22.8	22.8		16.9	16.9		16.9	16.9
Actuated g/C Ratio	0.14	0.39	0.39	0.11	0.36	0.36		0.27	0.27		0.27	0.27
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	245	1377	616	192	1271	568		356	421		373	421
v/s Ratio Prot	c0.08	c0.23		0.04	0.17							
v/s Ratio Perm			0.03			0.03		c0.15	0.01		0.09	0.01
v/c Ratio	0.55	0.59	0.08	0.40	0.47	0.10		0.57	0.03		0.32	0.05
Uniform Delay, d1	25.5	15.4	12.2	26.4	15.7	13.5		20.1	17.3		18.7	17.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	2.5	0.6	0.1	1.3	0.3	0.1		2.1	0.0		0.5	0.0
Delay (s)	28.0	16.0	12.3	27.7	16.0	13.6		22.2	17.3		19,2	17.4
Level of Service	C	В	В	C	В	В		C	В		В	8
Approach Delay (s)		17.2	_		16.6			21.2	1.00		18,5	
Approach LOS		В			В			С			В	
চিত্ৰ স্কৰ্মে আন্তৰ্ভান্ত		1960						NACTA:		SW(0.5)		
HCM Average Control Del HCM Volume to Capacity			17.5 0.54	H	ICM Leve	of Servi	ce		В			
Actuated Cycle Length (s)			63.5	c	um of los	t time (c)			10.0			
Intersection Capacity Utilia		2 - 15	54.2%			of Service			A			
Analysis Period (min)	46.0		15							2		

c Critical Lane Group

AM Peak 10/19/2010 Year 2020 w/out project

Synchro 7 - Report Page 1

	1	→	7	1	—	4	1	1	1	1	1	1
	ich inala		S HV	Walls.	(West)	- Walk		NEW Y	1200	(60)	0.00100	
Lane Configurations	1	44	7	ሻ	ተተ	7		4	ř		स	7
Volume (vph)	56	827	159	34	965	68	191	42	54	92	22	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5,0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd, Flow (prot)	1770	3539	1583	1770	3539	1583		1789	1583		1790	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.61	1.00		0.51	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1141	1583		958	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.97	0.97	0.97	0.91	0.91	0.91	0.61	0.61	0.61
Adj. Flow (vph)	58	861	166	35	995	70	210	46	59	151	36	97
RTOR Reduction (vph)	0	0	72	0	0	27	0	0	40	0	0	66
Lane Group Flow (vph)	. 58	861	94	. 35	995	43	0	256	19	0	187	31
Turn Type	Prot		Perm	Prot		Perm	Perm		Perm	Perm		Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)	5.7	35.7	35.7	3.0	33.0	33.0		25.3	25.3		25.3	25.3
Effective Green, g (s)	5.7	35.7	35.7	3.0	33.0	33.0		25.3	25.3		25.3	25.3
Actuated g/C Ratio	0.07	0.45	0.45	0.04	0.42	0.42		0.32	0.32		0.32	0.32
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	128	1599	715	67	1478	661		365	507		307	507
v/s Ratio Prot	c0.03	c0.24		0.02	c0.28							
v/s Ratio Perm			0.06			0.03		c0.22	0.01	30	0.20	0.02
v/c Ratio	0.45	0.54	0.13	0.52	0.67	0.06		0.70	0.04		0.61	0.06
Uniform Delay, d1	35.2	15.7	12.6	37.3	18.6	13.8		23.5	18.5		22.7	18.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	2.5	0.4	0.1	7.2	1.2	0.0		6.0	0.0		3.4	0.1
Delay (s)	37.7	16.0	12.7	44.5	19.9	13.8		29.5	18.5		26.1	18.7
Level of Service	D	В	В	D	В	В		C	В		C	В
Approach Delay (s)		16.7			20.3	96		27.5			23.5	
Approach LOS		В			С			С			С	
	THE HEAD	1250005			Messen	SHALISAN.	ANSWA		and the same			2031/0000
HCM Average Control Delay	/		20.0	-	CM Leve	of Service		E7106100	С			100
HCM Volume to Capacity ra			0.72					- 6				
Actuated Cycle Length (s)			79.0	9	um of los	t time (s)			20.0			
Intersection Capacity Utiliza	tion		62.0%			of Service			20.0			
	uori				JO LOVE!	OF OCIAICO						
			15									
Analysis Period (min) c Critical Lane Group			15									

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Pharmacon of the state	1000		E VIDE	EMBIN .	SE VINE	ENGREE	
Lane Configurations	17		*	ተተ	34		
Volume (veh/h)	841	5	39	767	-1	94	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.91	0.91	0.94	0.94	0.85	0.85	
Hourty flow rate (vph) Pedestrians	924	5	41	816	- 1	111	
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None		28	None			5 - 1 - 2 - 1
Median storage veh)							
Upstream signal (ft)	1175						
pX, platoon unblocked			0.89		0.89	0.89	
vC, conflicting volume			930		1418	465	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			675		1223	153	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)							
tF(s)			2.2		3.5	3.3	
p0 queue free %			95		99	86	
cM capacity (veh/h)			812		145	771	
	100						
Volume Total	616	314	41	408	408	112	The state of the state of
Volume Left	0	0	41	0	0	1	
Volume Right	0	5	0	0	0	111	
cSH	1700	1700	812	1700	1700	738	
Volume to Capacity	0.36	0.18	0.05	0.24	0.24	0.15	
Queue Length 95th (ft)	0	0	4	0	0	13	
Control Delay (s)	0.0	0.0	9.7	0.0	0.0	10.8	
Lane LOS			A			В	
Approach Delay (s)	0.0		0.5			10.8	
Approach LOS						В	
THE MUNICIPAL PROPERTY.	4.7			NEW T			
Average Delay			0.8				V
Intersection Capacity Utilization	1		42.6%	- 10	CU Level	of Service	A
Analysis Period (min)			15				
MAIL DATE			To The	93			32

HCM Unsignalized Intersection Capacity Analysis 9: Kaumualii & Nani

Page 3

	-	*	1	•	1				
Metalogical Control	经 国际		- 91E	E William	THE STATE OF	- da			
Lane Configurations	44		7	十十	Y				
Volume (veh/h)	965	8	30	1065	2	49			-A-C-
Sign Control	Free			Free	Stop				
Grade	0%			0%	0%	+		× 100	
Peak Hour Factor	0.95	0.95	0.99	0.99	0.78	0.78			
Hourly flow rate (vph)	1016	8	30	1076	-3	63		- 61	
Pedestrians									
Lane Width (ft)									
Walking Speed (ft/s)									
Percent Blockage									
Right turn flare (veh)									
Median type	None			None					
Median storage veh)									
Upstream signal (ft)	1175					5.11			
pX, platoon unblocked			88.0		0.88	0.88			
vC, conflicting volume			1024		1618	512			
vC1, stage 1 conf vol									
vC2, stage 2 conf vol									
vCu, unblocked vol			754		1429	171			
tC, single (s)			4.1		6.8	6.9		5.5	
tC, 2 stage (s)									
tF(s)			2.2		3.5	3.3			
p0 queue free %			96		98	92			
cM capacity (veh/h)			750		106	741			
dentities - partitioned		(C.C.)			OFFICE PROPERTY.			CENTRAL SA	亚克克克斯
Volume Total	677	347	- 30	538	538	65	100,000		The second of th
Volume Left	0	0	30	0	0	3			
Volume Right	. 0	8	0	- 0	0	63			
cSH	1700	1700	750	1700	1700	600			
Volume to Capacity	0.40	0.20	0.04	0.32	0.32	0.11			
Queue Length 95th (ft)	0	0	3	0	0	9			
Control Delay (s)	0.0	0.0	10:0	0.0	0.0	11.7		1.0	
Lane LOS			В			В			
Approach Delay (s)	0.0		0.3			11.7			
Approach LOS						В			
			8			Section 1	11.0		
Average Delay			0.5						W 22
Intersection Capacity Utiliz	ation		39.4%	. R	CU Level	ot Servic	e		4
Analysis Period (min)			15						

HCM Signalized Intersection Capacity Analysis 6: Kaumualii & KCC

12/3/2010

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(Application of the last	e de la			Wat	N) iff A	Wille		4 4 1	Mark		3.6 %	
Lane Configurations	ሻ	44	7	ሻ	44			स	T.		4	
Volume (vph)	7	787	141	156	738	154	67	35	181	74	. 38	- 1
Ideal Flow (vphpl)	1900	1900	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	38.77	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.97	100		1.00	0.85		1.00	7
Fit Protected	0.95	1.00	1.00	0.95	1.00			0.97	1.00		0.97	
Satd. Flow (prot)	1770	3539	1583	1770	3448			1803	1583		1801	
Fit Permitted	0.95	1.00	1.00	0.95	1.00			0.71	1.00		0.70	
Satd. Flow (perm)	1770	3539	1583	1770	3448	361	100	1327	1583		1306	
Peak-hour factor, PHF	0.91	0.91	0.91	0.88	0.88	0.88	0.71	0.71	0.71	0.58	0.58	0.58
Adi. Flow (vph)	- 8	865	155	177	839	-175	- 94	49	255	128	66	2
RTOR Reduction (vph)	0	0	67	0	12	0	0	0	196	0	0	0
Lane Group Flow (vph)	8	865	88	177	1002	0	. 0	143	59	. 0	196	0
Turn Type	Prot		Perm	Prot			Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4	_			2		2	6		
Actuated Green, G (s)	1.0	33.8	33.8	14.1	46.9			18.8	18.8		18.8	
Effective Green, q (s)	1.0	33.8	33.8	14.1	46.9			18.8	18.8		18.8	
Actuated g/C Ratio	0.01	0.41	0.41	0.17	0.57			0.23	0.23		0.23	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0			5.0	5.0		5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	22	1464	655	305	1979			305	364		301	
v/s Ratio Prot	0.00	c0.24		c0.10	0.29							
v/s Ratio Perm			0.06		•			0.11	0.04		c0.15	
v/c Ratio	0.36	0.59	0.13	0.58	0.51			0.47	0.16		0.65	
Uniform Delay, d1	40.0	18.6	14.9	31.1	10.4			27.1	25.1		28.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	9.9	0.6	0.1	2.8	0.2			1.1	0.2		5.0	
Delay (s)	50.0	19.2	15.0	33.9	10.7			28.3	25.4		33.5	
Level of Service	D	В	В	C	В			C	C		C	
Approach Delay (s)	_	18.8	_	Ĭ	14.1			26.4	-		33.5	
Approach LOS		В			В			С			С	
	烧 声外				0.7							
HCM Average Control Delay			18.9	Н	CM Leve	of Service	ce		В			
HCM Volume to Capacity ratio			0.61			4 4i /-\			15.0			
Actuated Cycle Length (s)			81.7			t time (s)			15.0			
Intersection Capacity Utilization	n		55.7%	IC	U Level	of Service	•		В			

Analysis Period (min) c Critical Lane Group

HCM Signalized Intersection Capacity Analysis 6: Kaumualii & KCC

6.	Kau	mua	lii &	KCC

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的声响使 对对对对数	411	- C-		100	1000	EWAY.		1.0000			14 9 D T	医宫膜
Lane Configurations	ኘ	++	7	ľ	† }			ब	7		4	
Volume (vph)	. 9	886	119	48	899	65	183	26	7.6	75	26	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	C		5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99	- E		1.00	0.85		0.98	
Fit Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.97	
Satd. Flow (prot)	1770	3539	1583	1770	3503			1785	1583		1776	
Fit Permitted	0.95	1.00	1.00	0.95	1.00			0.69	1.00		0.64	
Satd. Flow (perm)	1770	3539	1583	1770	3503		160	1287	1583	100	1166	
Peak-hour factor, PHF	0.95	0.95	0.95	0.96	0.96	0.96	0.91	0.91	0.91	0.84	0.84	0.84
Adj. Flow (yph)	9	933	125	50	936	68	201	29	84	89	31	15
RTOR Reduction (vph)	0	Ö	50	0	4	0	0	0	60	0	4	0
Lane Group Flow (vph)	9	933	75	50	1000	0	. 0	230	24	0	131	. 0
Turn Type	Prot		Perm	Prot			Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green; G (s)	0.8	32.0	32.0	4.4	35.6			20.7	20.7		20.7	
Effective Green, q (s)	0.8	32.0	32.0	4.4	35.6			20.7	20.7		20.7	
Actuated g/C Ratio	0.01	0.44	0.44	0.06	0.49			0.29	0.29		0.29	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0			5.0	5.0		5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	20	1571	703	108	1730			369	454		335	
v/s Ratio Prot	0.01	0.26		c0.03	c0.29							
v/s Ratio Perm			0.05					c0.18	0.02		0.11	
v/c Ratio	0.45	0.59	0.11	0.46	0.58			0.62	0.05		0.39	
Uniform Delay, d1	35.4	15.1	11.7	32.7	12.9			22.3	18.6		20.6	
Progression Factor	1:00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	15.3	0.6	0.1	3.1	0.5			3.3	0.0		0.8	
Delay (s)	50.7	15.8	11.8	35.8	13.4			25.6	18.7		21.4	
Level of Service	D	В	В	D	В			С	В		C	
Approach Delay (s)		15.6	_	_	14.5			23.7			21.4	Q =
Approach LOS		В			В			C			С	
统沙州"5大"等							. Trees			1000	Marie	
HCM Average Control Delay			16.4	ŀ	ICM Leve	of Servi	ce		В			
HCM Volume to Capacity ratio)		0.61			150						
Actuated Cycle Length (s)			72.1		Sum of los				15.0			
Intersection Capacity Utilization Analysis Period (min)	าก		57.8% 15	- 1	CU Level	of Servic	е		В			
c Critical Lane Group							- 10					

PM Peak 10/19/2010 Year 2020 w/out project

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APPENDIX E

CAPACITY ANALYSIS CALCULATIONS PROJECTED YEAR 2020 PEAK HOUR TRAFFIC ANALYSIS WITH PROJECT

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Milesey versions		的問題	THE REAL PROPERTY.		Miles	(中)		No.	PHONE:	251	der	大型旗
Lane Configurations	7	44	7	7	*	7		र्भ	7		र्	7
Volume (vph)	153	760	94	71	- 557	140	129	57.	49	37	32	57
ideal Flow (vphpl)	1900	1900	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	7-14	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1,00	0.85	1.00	1.00	0.85	' ; . ` . ·	1.00	0.85	4.4	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	3539	1583	1770 -	3539	1583		1800	1583		1814	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.72	1.00		0.75	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	-3553	1339	1583	143	1395	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.93	0.93	0.93	0.92	0.92	0.92	0.57	0.57	0.57
Adj. Flow (vph)	163	809	100	76	599	151	140	62	53	65	56	100
RTOR Reduction (vph)	0	0	49	0	0	100	0	0	40	0	0	75
Lane Group Flow (vph)	163	809	51	76	599	51	. 0	202	13	7.0	121	25
Turn Type	Prot		Perm	Prot		Perm	Perm		Perm	Perm		Perm
Protected Phases	7	4		3	8			2		J. 1927	6	- 2
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)	12.4	27.2	27.2	7.1	21.9	21.9		16.7	16.7		16.7	16.7
Effective Green, g (s)	12.4	27.2	27.2	7.1	21.9	21.9		16.7	16.7		16.7	16.7
Actuated o/C Ratio	0.19	0.41	0.41 -	0.11	0.33	0.33		0.25	0.25		0.25	0.25
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Vehicle Extension (s)	3:0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	333	1458	652	190	1174	525		339	401		353	401
v/s Ratio Prot	c0.09	c0.23		0.04	0.17			150			25	
v/s Ratio Perm			0.03			0.03		c0.15	0.01		0.09	0.02
v/c Ratio	0.49	0.55	0.08	0.40	0.51	0.10		0.60	0.03	7.	0.34	0.06
Uniform Delay, d1	24.0	14.8	11.8	27.5	17.7	15.2		21.7	18.6	10 (20)	20.2	18.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1:00	1.00	. 9	1.00	1.00
Incremental Delay, d2	1.1	0.5	0.1	1.4	0.4	0.1		2.8	0.0		0.6	0.1
Delay (s)	25.1	15.2	11.8	28.8	18.1	15.3	W 65	24,5	18.6		20,7	18.8
Level of Service	C	В	В	C	В	В		C	В		C	В
Approach Delay (s)		16.4		·	18.6	1740		23,3	65 X		19.9	OBT
Approach LOS		В			В			C			. В	
pproduct 200		سعده	and the same	SSE STO		W 15 15	To Print	de no		13.05		S A Ide
HCM Average Control Dela	V		18.2	Н	CM Leve	I of Servic	е		В			30000
HCM Volume to Capacity ra			0.58		VI ST	100		7.04 (010	C1/3-3	E	0,1	
Actuated Cycle Length (s)			66.0	S	um of los	t time (s)			15.0			
Intersection Capacity Utiliza	ation		54.2%			of Service			. A		4	
Analysis Period (min)			15									
c Critical Lane Group			.5						174	n air		

Lane Configurations	ħ	44	7	ኝ	44	1	and the second	4	7		सै	7
Volume (vph)	59	827	159	.34	965	68	191	42	54	92	22	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	(E	5.0	5.0	SE 47 0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	- 1.00	1.00	0.85	200	1,00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	0.00	1789	1583		1790	1583
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.61	1.00		0.51	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	The same	1140	1583		957	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.97	0.97	0,97	0.91	0.91	0.91	0.61	0,61	0.61
Adj. Flow (vph)	61	861	166	35	995	70	210	46	59	151	36	105
RTOR Reduction (vph)	0	0	72	0	0	27	0	0	40	0	0	71
Lane Group Flow (vph)	61	861	94	35	995	43	0	256	19	0	187	. 34
Turn Type	Prot		Perm	Prot		Perm	Perm		Perm	Perm		Perm
Protected Phases	7	4		3	8			- 2			6	
Permitted Phases			4			. 8	2		2	6		6
Actuated Green, G (s)	5.7	35.8	35.8	3.0	33.1	33.1		25.3	25.3	41,15	25.3	25.3
Effective Green, g (s)	5.7	35.8	35.8	3.0	33.1	33.1		25.3	25.3		25.3	25.3
Actuated g/C Ratio	0.07	0.45	0.45	0.04	0,42	0.42		0.32	0.32	12	0.32	0.32
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	6.1 5	3.0	- 3.0
Lane Grp Cap (vph)	128	1602	716	67	1481	662		365	506		306	506
v/s Ratio Prot	c0.03	c0.24		0.02	c0.28				12.00		151,11	
v/s Ratio Perm			0.06			0.03		c0.22	0.01		0.20	0.02
v/c Ratio	0.48	0.54	0.13	0.52	0.67	.0.06		0,70	0.04	South Acres	0.61	0.07
Uniform Delay, d1	35.3	15.7	12.6	37.3	18.6	13.7		23.6	18.5		22.7	18.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1	1.00	1.00
Incremental Delay, d2	2.8	0.3	0.1	7.2	1.2	0.0		6.0	0.0		3.6	0.1
Delay (s)	38.1	16.0	12.7	44.5	19.8	. 13.8		29.6	18.5		26.3 C	18.7 B
Level of Service	D	8	В	D	В	В		27.5	B		23.6	
Approach Delay (s)		16.7. B			20,2 Č			. 21.5 C		٠,	23.0 C	9.5
Approach LOS		В			Ü			U				
						10000			3.130		OV, MI	
HCM Average Control Delay			20.0	H	ICM Leve	of Service	:8		C			
HCM Volume to Capacity ratio)		0.72					2 11		8.5	200	
Actuated Cycle Length (s)			79.1			st time (s)			20.0			
Intersection Capacity Utilization	in		62.0%	1	CU Level	of Service	•	4	В	- Line	7. A.Y.	
Analysis Period (min)			15									
c Critical Lane Group					1127		12	100		100	7 .	2 0
All 40 0 5 5												

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HCM Signalized Intersection Capacity Analysis 3: Kaumualii & KCC

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Lane Configurations	44		7	44	Sta	3				
Volume (yeh/h)	841	5	39	767	- 1	94	3/10/12		1000	16
Sign Control	Free			Free	Stop					
Grade	0%			0%	'0%	100		1.77		
Peak Hour Factor	0.91	0,91	0,94	0.94	0.85	0.85				
Hourly flow rate (vph) Pedestrians	924	5	41	816	1	111.			A. A. A.	
Lane Width (ft)				i neen			17000			
Walking Speed (ft/s)										
Percent Blockage										
Right turn flare (veh)					10		20			
Median type	None			None		85				4.5
Median storage veh)	MOTIC			MOUG		2				
Upstream signal (ft)	1175									
pX, platoon unblocked	1173		0.89		0.89	0.89				
vC, conflicting volume			930		1418	465				
vC1, stage 1 conf vol			930		1410	400				
vC2, stage 2 conf vol					f w)				100 OOH 10	
			000			400				
vCu, unblocked vol			686		1231	166				
tC, single (s)			4.1		.6.8	6.9				
tC, 2 stage (s)			772727		102020	02727				
tF (s)			2.2		3.5	3.3				
p0 queue free %			95		99	85				
cM capacity (veh/h)			809		144	760		2 -		
					and the					
Volume Total	616	314	41	408	408	112		20	NEW METERSTANCE	150
Volume Left	0	0	41	0	0	1				
Volume Right	0	5	0	0	.0	111		= 17	- The 2011 - 17 TO	
cSH	1700	1700	809	1700	1700	727				
Volume to Capacity	0.36	0.18	0.05	0.24	0.24	0.15			West of the second	¥ ()
Queue Length 95th (ft)	0	0	4	0	0	14				
Control Delay (s)	0.0	0.0	9.7	0.0	0.0	10.8		100	AND THE RESERVE OF	57.07
Lane LOS			Α			В				
Approach Delay (s)	0.0		0,5	24.30	C 1000	10.8		1411	The second of the second	20
Approach LOS				2		В				
man road districts					ARDA	19	Colors	表 管		OW)
Average Delay			0.9							
Intersection Capacity Utiliza	ation		42.6%	IC	U Level	of Service			A	
Analysis Period (min)			15							

The resident of the region of

		\rightarrow	7	1	+	1	~	
Michigan To 18	G TX		137	OTT PRES	WHEN			
Lane Configurations		44		7	44	¥		
Volume (veh/h)	2015	965	- 8	30	1065	2	: 49	parties processed to be the
Sign Control		Free			Free	Stop		30
Grade		0%			- 0%	0%	6 6	
Peak Hour Factor		0.95	0.95	0.99	0.99	0.78	0.78	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Hourly flow rate (vph) Pedestrians	191	1016	8	30	1076		63	
Lane Width (ft) Walking Speed (ft/s)					-6		2 10	1000 A PAIR NO LONG THE PAIR
Percent Blockage Right turn flare (veh)								A. L. S. L.
Median type Median storage veh)		None.	S 7.		None	017	. 28 ·	
Upstream signal (ft)	100	1175				100		
pX, platoon unblocked				0.88		0.88	0.88	
vC, conflicting volume vC1, stage 1 conf vol				1024		-1618	512	
vC2, stage 2 conf vol					- 3	-1 10		1 2 20 20
vCu, unblocked vol				754		1429	171	
tC, single (s) tC, 2 stage (s)				4.1		6.8	6.9	4V 17
tF(s)				2.2	- 2	3.5	3.3	
p0 queue free %				96		98	92	
cM capacity (veh/h)				750	. 1	.106	741	
Volume Total		677	347	30	COO.	538	TO THE REAL PROPERTY.	
Volume Left	100		347	30	538		65	Manufacture and the Proposition of the Person
Volume Right		0	8	0.	0	0	63	and the second of the second of
cSH		1700	1700	750	1700	1700		COMMON DESCRIPTION OF THE COMMON OF THE COMM
Volume to Capacity		0.40	0.20	0.04	0.32	0.32	600 0:11	V 100
Queue Length 95th (ft)		0.40	0.20	3	0.32	0.32	0.11	e i wandpite
Control Delay (s)		0.0	0.0	10.0		-		PERMITTED TO THE PERMITTED AND ADDRESS OF THE PERMITTED
		0.0	0.0	10.0 B	0.0	0.0	1.1,7 B	edeserver of the street expenses
I nno LOC		0.0		0.3			11.7	en la se a la sur
Lane LOS		u.u		0.3			HIV.	Property and the second of the second
Approach Delay (s) Approach LOS		2					_	
Approach Delay (s) Approach LOS			2.5 A)	0.5				
Approach Delay (s) Approach LOS Average Delay	tilizatio		2.850	0.5		PLL qual		
Approach Delay (s) Approach LOS	tilizatio		- 9-01-	0.5 39.4% 15		CU Level		

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	*	-	7	1	4-	4	1	1	-	-	.↓	4
	注: 排:			100	红期 原	Willet		DATE:	10 1/100			Marsell .
Lane Configurations	ሻ	44	7	ሻ	1			4	7		4	
Volume (vph)	7	787	141	156	738	184	. 67	47	181	89	- 51	SUPERIOR I
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	- 5.0	5.0	5.0	100	2.0	5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Fitt, says 1 to	1.00	1.00	0.85	1.00	0.97		5-1, 1	1.00	0.85		1,00	ceĝe:
Fit Protected	0.95	1.00	1.00	0.95	1.00			0.97	1.00		0.97	
Satd. Flow (prot)	1770	3539	1583	1770	3433		15 15	1810	1583		1804	39
Fit Permitted	0.95	1.00	1.00	0.95	1.00			0.72	1.00		0.68	
Satd. Flow (perm)	1770	3539	1583	1770	3433	30 JUL 10	ACT IN	1335	1583		1263	1300 P
Peak-hour factor, PHF	0.91	0.91	0.91	0.88	0.88	0.88	0.71	0.71	0.71	0.58	0.58	0.58
Adj, Flow (vph)	8	865	155	177	839	209	94	66	255	153	88	. 2
RTOR Reduction (vph)	0	0	66	0	15	0	0	0	188	0	0	0
Lane Group Flow (vph)	. 8	865	89	177	1033	0-	.0	160	67	0	243	
Turn Type	Prot		Perm	Prot			Perm		Perm	Perm		
Protected Phases	7	4		3	8		1.00	2		0 120	6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)	1.0	34.0	34.0	14.5	47.5			22.8	22.8		22.8	
Effective Green, g (s)	1.0	34.0	34.0	14.5	47.5			22.8	22.8		22.8	
Actuated g/C Ratio	0.01	0,39	0.39	0.17	0.55	40		0.26	0.26		0.26	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0			5.0	5.0		5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		7	3.0	3.0		3.0	9.
Lane Grp Cap (vph)	21	1394	624	297	1890			353	418		334	
v/s Ratio Prot	0.00	c0.24		c0.10	0.30			1	CA.		- 120	5.7
v/s Ratio Perm			0.06		117.00			0.12	0.04		c0.19	
//c Ratio	0.38	0.62	0.14	0.60	0.55			0.45	0.16		0.73	Szn
Uniform Delay, d1	42.3	21.0	16.8	33.2	12.5			26.5	24.4	17	28.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	2600		1.00	1.00		1.00	
ncremental Delay, d2	11.2	0.9	0.1	3.2	0.3			0.9	0.2		7.7	
Delay (s)	53.5	21.8	16.9	36.4	12.8	177	L. 7	27.5	24.6		36,6	Mag
evel of Service	D	C	В	D	В	3.2		C	C		D	
Approach Delay (s)		21.3			16.2	-Disk		25.7	o f		36.6	010
Approach LOS		С			В			C			D	21
	8 9			#DV#		in ares		2 July 2		1,65		
HCM Average Control Delay			21.1	H	CM Level	of Service	R		C			

HCM Average Control Delay	21.1	HCM Level of Service	С	
HCM Volume to Capacity ratio	0.65	CONTRACTOR SAFORES	400	
Actuated Cycle Length (s)	86.3	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	57.2%	ICU Level of Service	В	37. 20.20
Analysis Period (min)	15			
c Critical Lane Group	- III OII - 55	THE PART OF THE PART OF		

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Note that the second		131	or - 12/4	金加雅			W ME	5000 SIMP		Sal	V-201	T. OT
Lane Configurations	7	44	7	ሻ	47			ब	7	and a second	4	
Volume (vph)	9	-886	119	48	899	69	183	29	76	82	28	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	200	15	5.0	5.0	250	5.0	-142
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt (2011)	1.00	1.00	0.85	1.00	0.99	343	임생님	1.00	0.85	100	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.97	
Satd. Flow (prot)	1770	3539	1583	1770	3501	4	J. J. S	1786	1583		1777	10
Flt Permitted	0.95	1.00	1,00	0.95	1.00			0.68	1.00		0.61	
Satd. Flow (perm)	1770	3539	. 1583	1770	3501	. X		1276	1583		1121	
Peak-hour factor, PHF	0.95	0.95	0.95	0.96	0.96	0.96	0.91	0.91	0.91	0.84	0.84	0.84
Adj. Flow (vph)	9	933	125	50	936	. 72	201	32	84	98	33	15
RTOR Reduction (vph)	0	0	50	0	- 5	0	0	0	60	0	4	Ô
Lane Group Flow (vph)	9	933	75	50	1003	. 0	0	233	24	. 0	142	. 0
Turn Type	Prot		Perm	Prot	1,500		Perm	200	Perm	Perm	1.74	
Protected Phases	7	4	. 01111	3	8	F	1 01111	-2	Citi	Citt	6	
Permitted Phases		-	4		0.		2		2	8	U	
Actuated Green, G (s)	0.8	32.0	32.0	4.4	35.6			21.1	21.1		21.1	
Effective Green, g (s)	0.8	32.0	32.0	4.4	35.6			21.1	21.1		21.1	
Actuated g/C Ratio	0.01	0.44	0.44	0.06	0.49			0.29	0.29		0.29	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0			5.0	5.0		5.0	1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		This .	3.0	3.0		3.0	
Lane Grp Cap (vph)	20	1562	699	107	1719			371	461		326	
v/s Ratio Prot	0.01	0.26	000	c0.03	c0.29			0/1	401		UZU	
v/s Ratio Perm	0.01	0.20	0.05	00,00	00.23			c0.18	0.02		0.13	
v/c Ratio	0.45	0.60	0.11	0.47	0.58	58100	31	0.63	0.05	8 11	0.10	
Uniform Delay, d1	35.6	15.4	11.9	32.9	13.2			22.3	18.5		20.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	15.3	0.6	0.1	3.2	0.5			3.3	0.0		0.9	
Delay (s)	50.9	16.0	11.9	36.1	13.7			25.6	18.6		21.8	100
Level of Service	D	В	В	D	В			C	В		C	0.000
Approach Delay (s)		15.8	1111/1/201		14.7			23.7			21.8	
Approach LOS		В	1111		В	100	30	C			C C	
	100000000000000000000000000000000000000		SECTION SECTION						Commence	- Commission		METODINA
HCM Average Control Delay		C. 1502	16.7	U	CMLlow	l of Service			В	32.00	COLUMN TO SERVICE STREET	
HCM Volume to Capacity ration			0.62		CIMI LEVE	I OI SEIVIC	e The second	S. Lak	D D			
Actuated Cycle Length (s)	J		72.5		um of too	t time (s)	13	HI Co. Co.	15.0			100
Intersection Capacity Utilization	20					t time (s) of Service		T 180%	15.0			
miersection Capacity Othization Analysis Period (min)	л		57.8%	10	ro revel	or Service	4	75 TH. 1	В			
Critical Lane Group			15									

HCM Signalized Intersection Capacity Analysis

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