#### **Exhibit H**

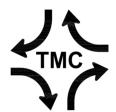
Response to State Department of Transportation

Comments by State Department of Transportation

Response to County Department of Public Works

Comments by County Department of Public Works

Updated Traffic Impact Analysis Report by Traffic Management Consultant



### THE TRAFFIC MANAGEMENT CONSULTANT

Randall S. Okaneku, P.E., Principal \* 1188 Bishop Street, Suite 1907 \* Honolulu, Hawaii 96813 Telephone: (808) 536-0223 \* Facsimile: (808) 537-2985 \* Email: TMCHawaii@aol.com

TMC Job No. 201708 October 3, 2017

State of Hawaii Department of Transportation Highways Division-Kauai District 1720 Haleukana Street Lihu'e, Kauai, Hawai'i 96766

Attn.: Mr. Larry Dill, P.E., District Engineer

Dear Mr. Dill:

# Subject: Traffic Impact Analysis Report Update For the Proposed Hokua Place Tax Map Key: (4) 4-3-003: Portion of 001 Kapa`a, Kauai, Hawaii

Thank you for the review comments in your letter, dated September 29, 2017, on the subject traffic study. Our responses follow:

#### Comment No. 1

Noted.

#### Comment No. 2

Noted.

#### Comment No. 3

The AM and PM Peak Hour Traffic Without Project rows of Table 6 summarize the capacity analysis under existing roadway conditions. The AM and PM Peak Hour Traffic With Project rows of Table 6 summarize the capacity analysis with the recommended site access improvements under Section V.B. of the TIAR Update. The AM and PM Peak Hour Traffic With Project – Improved rows in Table 6 summarize the capacity analysis of the recommended traffic improvements under Section V.A. of the TIAR Update.

#### Comment No. 4

Noted.

#### Comment No. 5

Noted.

If you require clarification on any of the above material or have any other questions, please do not hesitate to call me.

Very truly yours,

The Traffic Management Consultant

By Randon Randall S. Okaneku, P. E. **Principal** 



# STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION

KAUAI DISTRICT 1720 HALEUKANA STREET LIHUE, HAWAII 96766

September 29, 2017

FORD N. FUCHIGAMI DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:

HWAY-K 4.170445

Randall S. Okaneku, P.E. The Traffic Management Consultant 1188 Bishop Street, Suite 1907 Honolulu, Hawaii 96813

Dear Mr. Okaneku:

Subject:

Traffic Impact Analysis Report Update

Hokua Place

Kapa'a, Kawaihau District, Island of Kaua'i

TMK: (4) 4-3-03: Por. 001

Thank you for submitting the updated Traffic Impact Analysis Report(TIAR) update that was transmitted via email on June 15, 2017. We have circulated the TIAR for comment through the Highways Division Planning Branch as well as the Traffic Branch. We have also reviewed the comments provided by the County of Kauai Department of Public Works Engineering Division on September 1, 2017.

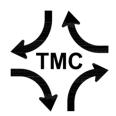
The combined comments for the Hawaii Department of Transportation Highways Division are as follows:

- 1. The report discussed the projects that are proposed in the Kapaa Transportation Solutions Report dated August 2015. It should be noted that these projects may not be completed on schedule. Therefore, they should not be considered in this report.
- 2. It is understood that the proposed Road A will be funded and constructed by the developer.
- 3. Please clarify the scenarios in Table 7, Summary of Capacity Analysis. What assumed improvements are completed for AM/PM peak hour traffic without project, with project, and with project-improved.
- 4. Section V of the TIAR recommends traffic improvements without the project. Although these recommendations are appreciated, they are not a consideration for this development.
- 5. We concur with the comments provided by the County of Kauai Department of Engineering Division.

Please contact Raymond McCormick at 808-241-3015 by telephone or by email at <a href="mailto:Raymond.j.mccormick@hawaii.gov">Raymond.j.mccormick@hawaii.gov</a> if you have comments or questions regarding this letter.

Sincerely,

Larry Dill, P.E. District Engineer



#### THE TRAFFIC MANAGEMENT CONSULTANT

Randall S. Okaneku, P.E., Principal \* 1188 Bishop Street, Suite 1907 \* Honolulu, Hawaii 96813 Telephone: (808) 536-0223 \* Facsimile: (808) 537-2985 \* Email: TMCHawaii@aol.com

**TMC Job No. 201708**October 3, 2017

**Department of Public Works County of Kauai**4444 Rice Street, Suite 275

Lihu'e, Kauai, Hawai'i 96766

Attn.: Mr. Michael Moule, P.E., Chief, Engineering Division

Dear Mr. Moule:

Subject: Traffic Impact Analysis Report Update
For the Proposed Hokua Place
Tax Map Key: (4) 4-3-003: Portion of 001
Kapa'a, Kauai, Hawaii

Thank you for the thorough review comments in your letter, dated September 1, 2017, on the subject traffic study. Our responses follow:

#### Comment No. 1 – Introduction, Project Description

a. Concur. The design of the intersection between the Phase 1 access road and Olohena Road, mauka of its intersection with Ka'apuni Road, will include the appropriate vertical and horizontal sight distances in accordance with the AASHTO A Policy on Geometric Design of Highways and Streets and the Hawaii Statewide Uniform Design Manual for Streets and Highways.

#### **Comment No. 2 – Existing Roadways**

- a. Concur. The stated speed limits are intended to provide guidance to the design of the intersection of Road A and the Kapa'a Bypass Road.
- b. Concur.
- c. Concur.

#### Comment No. 3 – Existing Peak Hour Traffic Volumes and Operation Conditions

a. Noted. The traffic impact analysis is based upon the methodology presented in the <u>Highway Capacity Manual</u> (HCM). The HCM methodology consists of a series of mathematical calculations to determine roadway capacity, vehicle delay, vehicle queuing, etc. The LOS concept was defined in the HCM to translate the results of the complex calculations into a simplified "A" through "F" grading system.

- b. Corrected. The second sentence in the last paragraph on Page 10 should read "South of Ulu Street, Kuhio Highway carried over 1,700 vph...".
- c. Corrected. The revised Figure 6 is attached. The PM peak hour of traffic from 3:45 PM to 4:45 PM on March 15, 2015 was selected for the intersection of Kuhio Highway and the Kapa'a Bypass Road because it corresponded with of the commuter PM peak hour traffic at the intersections in Kapa'a Town. The revised traffic data sheets for the intersection of Kuhio Highway and Kapa'a Bypass Road also are attached.
- d. LOS, by definition, is the result of a series of mathematical calculations. For the purpose of the traffic impact analysis, the HCM methodology provides a common basis for comparing future traffic conditions without the proposed project and future traffic conditions with the proposed project.

#### Comment No. 4 - Kapa'a Transportation Solutions

- a. Noted. The <u>Kapa'a Transportation Solutions</u>, cited in the TIAR Update, is dated August 2015. Please transmit the latest version of the Kapa'a traffic study.
- b. Noted.

#### **Comment No. 5 – Trip Generation Characteristics**

a. Noted. The revised Table 6 is shown below:

Table 1. Hokua Place Trip Generation Characteristics										
Land Use	WT *4	AM Pe	eak Hour	r (vph)	PM Peak Hour (vph)					
(ITE Code)	Units	Enter	Exit	Total	Enter	Exit	Total			
Single-Family Phase 1 (265)	16 DU	5	16	21	13	7	20			
Single-Family Phase 2 (265)	100 DU	20	60	80	66	38	104			
Condominium/ Townhouse (230)	700 DU	52	256	308	244	120	364			
Retail Center	8,000 SFGFA	21	13	34	53	57	110			
(820)	Pass-By	0	0	0	(-)45	(-)45	(-)90			
Total External T	rips	98	345	443	331	177	509			

b. The ITE <u>Trip Generation Handbook</u> cites a 9,000-square foot retail center, where 20 percent of the trip generation were primary trips. Comparing the retail center to smaller convenience markets, the <u>Trip Generation Handbook</u> listed sites where the primary trip percentages ranged from 8 percent to 28 percent of the PM peak period trip generation. The retail center is described in the DEIS as a neighborhood-oriented commercial center. Therefore, it is reasonable to assume that a significant portion of the retail trips will be generated from within the proposed project, which can be defined as "internal capture" or "diverted trips".

#### **Comment No. 6 – Site Access Improvements**

a. Noted. The AM and PM peak hour traffic demands at the Olohena Road intersections at the Phase 1 Driveway and at Road A do <u>not</u> meet the AASHTO left-turn lane guidelines. During the AM peak hour of traffic, the advancing (mauka bound) volumes on Olohena Road do not meet the AASHTO minimum requirements. The left-turn demands at Road A and at the Phase 1 Driveway do <u>not</u> meet the AASHTO minimum left-turn volumes, during the PM peak hour of traffic. The Olohena Road intersections at Road A and the Phase 1 Driveway are expected to operate at satisfactory LOS during the AM peak hour of traffic. The Phase 1 Driveway also is expected to operate at satisfactory LOS at Olohena Road, during the PM peak hour of traffic. Road A is expected to operate at LOS "D", during the PM peak hour of traffic. However, the average delay of 26.7 seconds/vehicle on Road A is in the upper range of LOS "D". Therefore, a median refuge lane at Road A was <u>not</u> recommended at this time. Furthermore, separate left-turn and right-turn lanes on Road A would not improve the LOS.

#### Comment No. 7 – Traffic Assignment

- a. The traffic assignment for the proposed project was primarily based upon the direction of peak hour traffic at the roundabout intersection of the Kapa'a Bypass Road and Olohena Road, where only about one third of Olohena Road traffic turns to/from the south leg of the Kapa'a Bypass Road. The Phase 2 development is concentrated on the makai half of the project site. Only the trips generated from the mauka-most portion of the site and the estimated AM peak hour school trips are expected to use the mauka access of Road A at Olohena Road.
- b. The peak hour trip destinations, mauka of the Ka`apuni Road/Olohena Road intersection, are virtually nil, as observed in mauka bound/makai bound directional splits on Olohena Road. The retail trips generated from the mauka neighboring communities are represented in the "pass-by" trips using Road A.

#### Comment No. 8 – Figures 11 through 14 (Traffic Assignment)

- a. The diverted peak hour trips on Road A are depicted on the attached Figures 12.1 and 14.1.
- b. The revised Figure 11 is attached.
- c. The revised Figure 13 is attached.
- d. The revised Figure 14 is attached.

#### Comment No. 9 – PM Peak Hour Traffic Analysis With Project

a. The recommendation of extending the median refuge lane/two-way left-turn lane in Section V.A.7. of the TIAR Update is expected to mitigate the "bottle-neck" on Kuhio Highway, north of Lehua Street. Ultimately, the improvement of the north leg of the Kapa'a Bypass Road from a one-way roadway to a two-way bypass road is expected to improve traffic operations in Kapa'a Town.

#### Comment No. 10 - Recommendation of Traffic Improvements Without Project

a. Noted.

#### Comment No. 11 – Recommendation of Traffic Improvements With Project

a. Noted. While the MUTCD does not provide warrants for roundabout intersections, it does advise that a roundabout intersection can be considered as an alternative to traffic signal control. Based upon the TIAR Update, the intersection of Olohena Road and Road A is not expected to warrant all-way stop controls or traffic signals. Therefore, a roundabout intersection was not considered. However, a reassessment of the traffic operations at the Road A intersection at Olohena Road may be considered after the project is fully built out and occupied. A roundabout intersection was considered at the intersection of Olohena Road, Ka'apuni Road, and Kaehulua Road. However, based upon a preliminary assessment of the horizontal and vertical alignments of the intersecting roadways, it was determined that a roundabout intersection would not be feasible. The realignment of Kaehulua Road to form a four-legged intersection with the Olohena Road and Ka'apuni Road was recommended in Section V.A.6.

If you require clarification on any of the above material or have any other questions, please do not hesitate to call me.

Very truly yours,

The Traffic Management Consultant

By Randett

Randall S. Okaneku, P. E. Principal

#### Attachments:

Figure 6-Revised

Kuhio Hwy Kapa'a Bypass Rd Traffic Count Data-Revised

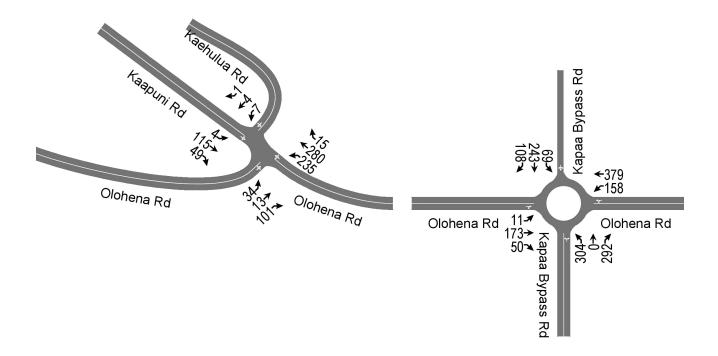
Figure 12.1

Figure 14.1

Figure 11-Revised

Figure 13-Revised

Figure 14-Revised



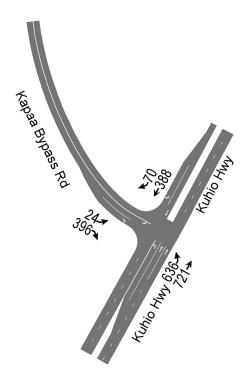


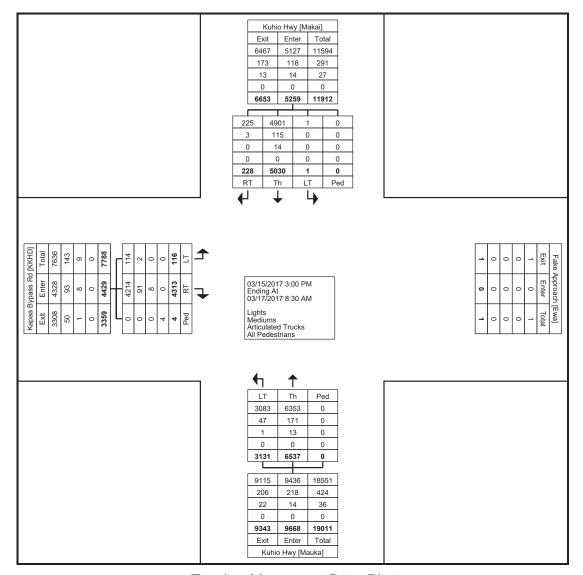
Figure 6. Existing PM Peak Hour Traffic (Cont'd.)

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 1

**Turning Movement Data** 

					Turnin	g Mov	/emen	ıt Data						
		Kapaa By	/pass Rd				Hwy				Kuhio Hwy			
		Koko Hea	ad Bound			Mauka	Bound				Makai Bound			
Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
3:00 PM	1	105	0	106	99	191	0	290	0	106	5	0	111	507
3:15 PM	3	100	0	103	122	210	0	332	0	88	7	0	95	530
3:30 PM	8	93	0	101	120	207	0	327	0	73	8	0	81	509
3:45 PM	8	104	0	112	148	201	0	349	0	88	21	0	109	570
Hourly Total	20	402	0	422	489	809	0	1298	0	355	41	0	396	2116
4:00 PM	1	108	0	109	168	161	0	329	0	91	16	0	107	545
4:15 PM	9	94	0	103	154	172	0	326	0	97	14	0	111	540
4:30 PM	6	90	0	96	166	187	0	353	0	112	19	0	131	580
4:45 PM	2	95	0	97	146	176	0	322	0	112	15	0	127	546
Hourly Total	18	387	0	405	634	696	0	1330	0	412	64	0	476	2211
5:00 PM	5	88	0	93	149	232	0	381	0	138	27	0	165	639
5:15 PM	2	91	0	93	149	192	0	341	0	152	25	0	177	611
*** BREAK ***	-	_	_	_	_	-	_	_	-	_	_	_	_	_
Hourly Total	7	179	0	186	298	424	0	722	0	290	52	0	342	1250
6:30 AM	0	78	0	78	14	124	0	138	0	203	0	0	203	419
6:45 AM	2	116	0	118	8	124	0	132	0	190	1	0	191	441
Hourly Total	2	194	0	196	22	248	0	270	0	393	1	0	394	860
7:00 AM	1	161	0	162	20	129	0	149	0	233	0	0	233	544
7:15 AM	1	184	0	185	25	155	0	180	0	200	1	0	201	566
7:30 AM	2	152	0	154	24	152	0	176	0	167	0	0	167	497
7:45 AM	1	155	1	156	33	180	0	213	0	135	0	0	135	504
Hourly Total	5	652	1	657	102	616	0	718	0	735	1	0	736	2111
8:00 AM	0	150	0	150	24	187	0	211	0	132	1	0	133	494
8:15 AM	3	131	0	134	21	177	0	198	0	165	0	0	165	497
8:30 AM	3	130	0	133	33	191	0	224	0	161	1	0	162	519
8:45 AM	1	108	0	109	25	209	0	234	0	189	0	0	189	532
Hourly Total	7	519	0	526	103	764	0	867	0	647	2	0	649	2042
*** BREAK ***	-	-	-	-	-	-		-	-	-		-	-	2042
3:00 PM	5	103	0	108	97	217	0	314	0	96	6	0	102	524
3:15 PM	8	117	0	125	131	156	0	287	0	84	9	0	93	505
3:30 PM	6	83	0	89	138	227	0	365	1	76	8	0	85	539
3:45 PM	2	87	1	89	119	182	0	301	0	76	7	0	83	473
	21	390	1	411	485	782	0		1	332	30	0	363	2041
Hourly Total 4:00 PM	2	122	0	124	126	152	0	1267 278	0	96	7	0	103	505
4:15 PM	6	109	1	115	136	158	0	294	0	95	6	0	103	510
4:15 PM 4:30 PM	6	96	1	102	143	174	0	317	0	78	2	0	80	499
	5	93	0	98	138	181	0	317	0	83	6	0	89	506
4:45 PM			2	•			0	•	0			0	-	
Hourly Total	19 2	420		439	543	665	0	1208	0	352	21 3	0	373	2020
5:00 PM		98	0	100	146	204		350	-	85 92			88	538
5:15 PM	4	113	0	117	121	159	0	280	0	92	2	0	94	491
*** BREAK ***	-		-	- 047	- 007	-	-		-	477	-	-	400	4000
Hourly Total	6	211	0	217	267	363	0	630	0	177	5	0	182	1029
6:30 AM	0	82	0	82	11	115	0	126	0	185	0	0	185	393
6:45 AM	0	89	0	89	10	126	0	136	0	164	3	0	167	392
Hourly Total	0	171	0	171	21	241	0	262	0	349	3	0	352	785
7:00 AM	1	131	0	132	17	133	0	150	0	219	1	0	220	502
7:15 AM	3	168	0	171	32	158	0	190	0	182	3	0	185	546
7:30 AM	1	125	0	126	40	146	0	186	0	166	2	0	168	480
7:45 AM	1	123	0	124	30	165	0	195	0	138	0	0	138	457
Hourly Total	6	547	0	553	119	602	0	721	0	705	6	0	711	1985
8:00 AM	4	116	0	120	20	169	. 0	189	0	150	0	0	150	459
8:15 AM	1	125	0	126	28	158	0	186	0	133	2	0	135	447
Grand Total	116	4313	4	4429	3131	6537	0	9668	1	5030	228	0	5259	19356
Approach %	2.6	97.4	-	-	32.4	67.6	-	-	0.0	95.6	4.3	-	-	-
Total %	0.6	22.3	-	22.9	16.2	33.8	-	49.9	0.0	26.0	1.2	-	27.2	
Lights	114	4214	-	4328	3083	6353	-	9436	1	4901	225	-	5127	18891
% Lights	98.3	97.7	-	97.7	98.5	97.2	-	97.6	100.0	97.4	98.7	-	97.5	97.6
Mediums	2	91	-	93	47	171		218	0	115	3	-	118	429
% Mediums	1.7	2.1	-	2.1	1.5	2.6	-	2.3	0.0	2.3	1.3	-	2.2	2.2
Articulated Trucks	0	8	-	8	1	13	-	14	0	14	0	-	14	36
% Articulated Trucks	0.0	0.2	-	0.2	0.0	0.2	-	0.1	0.0	0.3	0.0	-	0.3	0.2
All Pedestrians	-	-	4	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 2



**Turning Movement Data Plot** 

#### The Traffic Management Consultant 1188 Bishop Street, Suite 1907

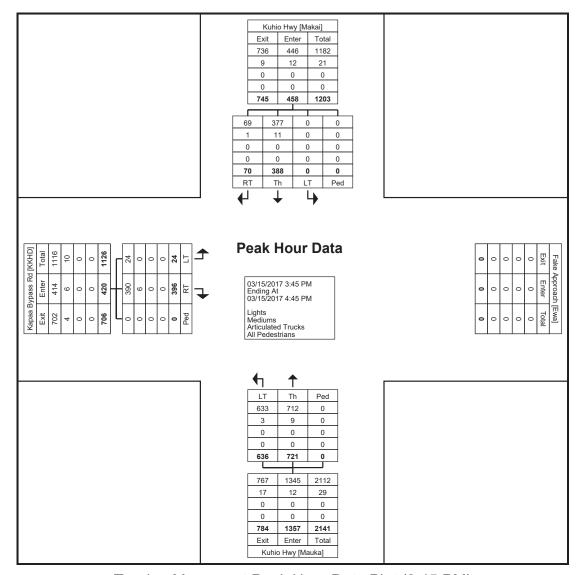
Honolulu, Hawaii, United States 96813 808-536-0223 tmchawaii@aol.com

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 3

## Turning Movement Peak Hour Data (3:45 PM)

									, \	,				1
		Kapaa By	pass Rd			Kuhid	o Hwy				Kuhio Hwy			
Start Time		Koko Hea	d Bound			Mauka	Bound				Makai Bound			
Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
3:45 PM	8	104	0	112	148	201	0	349	0	88	21	0	109	570
4:00 PM	1	108	0	109	168	161	0	329	0	91	16	0	107	545
4:15 PM	9	94	0	103	154	172	0	326	0	97	14	0	111	540
4:30 PM	6	90	0	96	166	187	0	353	0	112	19	0	131	580
Total	24	396	0	420	636	721	0	1357	0	388	70	0	458	2235
Approach %	5.7	94.3	-	-	46.9	53.1	-	-	0.0	84.7	15.3	-	-	-
Total %	1.1	17.7	-	18.8	28.5	32.3	-	60.7	0.0	17.4	3.1	-	20.5	-
PHF	0.667	0.917	-	0.938	0.946	0.897	-	0.961	0.000	0.866	0.833	-	0.874	0.963
Lights	24	390	-	414	633	712	-	1345	0	377	69	-	446	2205
% Lights	100.0	98.5	-	98.6	99.5	98.8	-	99.1	-	97.2	98.6	-	97.4	98.7
Mediums	0	6	-	6	3	9	-	12	0	11	1	-	12	30
% Mediums	0.0	1.5	-	1.4	0.5	1.2	-	0.9	-	2.8	1.4	-	2.6	1.3
Articulated Trucks	0	0	-	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	0	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 4



Turning Movement Peak Hour Data Plot (3:45 PM)

#### The Traffic Management Consultant 1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813 808-536-0223 tmchawaii@aol.com

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 5

## Turning Movement Peak Hour Data (7:00 AM)

		Kapaa By	pass Rd			Kuhid	o Hwy				Kuhio Hwy			
Start Time		Koko Hea	d Bound			Mauka	Bound				Makai Bound			
Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
7:00 AM	1	161	0	162	20	129	0	149	0	233	0	0	233	544
7:15 AM	1	184	0	185	25	155	0	180	0	200	1	0	201	566
7:30 AM	2	152	0	154	24	152	0	176	0	167	0	0	167	497
7:45 AM	1	155	1	156	33	180	0	213	0	135	0	0	135	504
Total	5	652	1	657	102	616	0	718	0	735	1	0	736	2111
Approach %	0.8	99.2	-	-	14.2	85.8	-	-	0.0	99.9	0.1	-	-	-
Total %	0.2	30.9	-	31.1	4.8	29.2	-	34.0	0.0	34.8	0.0	-	34.9	-
PHF	0.625	0.886	-	0.888	0.773	0.856	-	0.843	0.000	0.789	0.250	-	0.790	0.932
Lights	4	635	-	639	100	600	-	700	0	711	1	-	712	2051
% Lights	80.0	97.4	-	97.3	98.0	97.4	-	97.5	-	96.7	100.0	-	96.7	97.2
Mediums	1	14	-	15	2	16	-	18	0	23	0	-	23	56
% Mediums	20.0	2.1	-	2.3	2.0	2.6	-	2.5	-	3.1	0.0	-	3.1	2.7
Articulated Trucks	0	3	-	3	0	0	-	0	0	1	0	-	1	4
% Articulated Trucks	0.0	0.5	-	0.5	0.0	0.0	-	0.0	-	0.1	0.0	-	0.1	0.2
All Pedestrians	-	-	1	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	_	_	100.0	-	_	_	_	-	_	_	-	_	-	-

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 6

	Kuhio Hwy [Makai]   Exit   Enter   Total   604   712   1316   17   23   40   0   1   1   0   0   0   0   0   0	
	Peak Hour Data	Fake     Exit     Exit
Bypass Rd Enter 639 639 657 667 667 667 667 667 678 678 678 678 67	03/16/2017 7:00 AM Ending At 03/16/2017 8:00 AM	Exit Enter 0 0 0 0 0 0 0 0 0 0 0 0 0
Kapaa   Exit   101   101   2   2   0   0   0   0   0   0   0   0	Lights Mediums Articulated Trucks All Pedestrians	[Ewa]   Total   0   0   0
	LT Th Ped 100 600 0 2 16 0 0 0 0 0 0 0 102 616 0 1346 700 2046 37 18 55 4 0 4 0 0 0 1387 718 2105 Exit Enter Total Kuhio Hwy [Mauka]	

Turning Movement Peak Hour Data Plot (7:00 AM)

#### The Traffic Management Consultant 1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813 808-536-0223 tmchawaii@aol.com

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 7

## Turning Movement Peak Hour Data (4:15 PM)

									١, ١	,				1
		Kapaa By	pass Rd			Kuhid	o Hwy				Kuhio Hwy			
Start Time		Koko Hea	d Bound			Mauka	Bound				Makai Bound			
Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
4:15 PM	6	109	1	115	136	158	0	294	0	95	6	0	101	510
4:30 PM	6	96	1	102	143	174	0	317	0	78	2	0	80	499
4:45 PM	5	93	0	98	138	181	0	319	0	83	6	0	89	506
5:00 PM	2	98	0	100	146	204	0	350	0	85	3	0	88	538
Total	19	396	2	415	563	717	0	1280	0	341	17	0	358	2053
Approach %	4.6	95.4	-	-	44.0	56.0	-	-	0.0	95.3	4.7	-	-	-
Total %	0.9	19.3	-	20.2	27.4	34.9	-	62.3	0.0	16.6	0.8	-	17.4	-
PHF	0.792	0.908	-	0.902	0.964	0.879	-	0.914	0.000	0.897	0.708	-	0.886	0.954
Lights	19	385	-	404	558	710	-	1268	0	337	17	-	354	2026
% Lights	100.0	97.2	-	97.3	99.1	99.0	-	99.1	-	98.8	100.0	-	98.9	98.7
Mediums	0	11	-	11	5	7	-	12	0	4	0	-	4	27
% Mediums	0.0	2.8	-	2.7	0.9	1.0	-	0.9	-	1.2	0.0	-	1.1	1.3
Articulated Trucks	0	0	-	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	2	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 8

	Kuhio Hwy [Makai]	
Kapaa Bypass Rd [KKHD]           Exit         Enter         Total           575         404         979           5         11         16           0         0         0           0         0         0           0         0         0           0         0         0           0         11         0           0         0         0           2         396         19           Ped         RT         19           Ped         RT         10	Deak Hour Data  03/16/2017 4:15 PM Ending At 03/16/2017 5:15 PM Lights Mediums Articulated Trucks All Pedestrians	Fake Approach [Ewa]       Exit     Enter     Total       0     0     0       0     0     0       0     0     0       0     0     0       0     0     0       0     0     0
	LT Th Ped 558 710 0 5 7 0 0 0 0 0 0 0 563 717 0 722 1268 1990 15 12 27 0 0 0 0 0 0 0 737 1280 2017 Exit Enter Total Kuhio Hwy [Mauka]	

Turning Movement Peak Hour Data Plot (4:15 PM)

#### The Traffic Management Consultant 1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813 808-536-0223 tmchawaii@aol.com

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 9

## Turning Movement Peak Hour Data (7:00 AM)

	1													
		Kapaa By	pass Rd			Kuhid	o Hwy				Kuhio Hwy			
Start Time		Koko Hea	d Bound		Mauka Bound				Makai Bound					
Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
7:00 AM	1	131	0	132	17	133	0	150	0	219	1	0	220	502
7:15 AM	3	168	0	171	32	158	0	190	0	182	3	0	185	546
7:30 AM	1	125	0	126	40	146	0	186	0	166	2	0	168	480
7:45 AM	1	123	0	124	30	165	0	195	0	138	0	0	138	457
Total	6	547	0	553	119	602	0	721	0	705	6	0	711	1985
Approach %	1.1	98.9	-	-	16.5	83.5	-	-	0.0	99.2	0.8	-	-	-
Total %	0.3	27.6	-	27.9	6.0	30.3	-	36.3	0.0	35.5	0.3	-	35.8	-
PHF	0.500	0.814	-	0.808	0.744	0.912	-	0.924	0.000	0.805	0.500	-	0.808	0.909
Lights	5	535	-	540	113	569	-	682	0	688	6	-	694	1916
% Lights	83.3	97.8	-	97.6	95.0	94.5	-	94.6	-	97.6	100.0	-	97.6	96.5
Mediums	1	10	-	11	5	29	-	34	0	15	0	-	15	60
% Mediums	16.7	1.8	-	2.0	4.2	4.8	-	4.7	-	2.1	0.0	-	2.1	3.0
Articulated Trucks	0	2	-	2	1	4	-	5	0	2	0	-	2	9
% Articulated Trucks	0.0	0.4	-	0.4	0.8	0.7	-	0.7	-	0.3	0.0	-	0.3	0.5
All Pedestrians	-	-	0	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	_	_	_	-	_	_	_	_	_	_	_	_	-	_

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 10

	Kuhio Hwy [Makai]           Exit         Enter         Total           574         694         1268           30         15         45           4         2         6           0         0         0           608         711         1319           6         688         0         0           0         15         0         0           0         2         0         0           0         0         0         0           6         705         0         0           RT         Th         LT         Ped	
Kapaa Bypass Rd [KKHD]  Exit Enter Total  119 540 659  5 11 16  1 2 3  0 0 0 0  0 0 0  0 0 0  Ped RT LT	Peak Hour Data  03/17/2017 7:00 AM Ending At 03/17/2017 8:00 AM Lights Mediums Articulated Trucks All Pedestrians	Fake Approach   Ewa]     Exit   Enter   Total   0
	LT Th Ped  113 569 0 5 29 0 1 4 0 0 0 0 119 602 0 1223 682 1905 25 34 59 4 5 9 0 0 0 1252 721 1973 Exit Enter Total Kuhio Hwy [Mauka]	

Turning Movement Peak Hour Data Plot (7:00 AM)

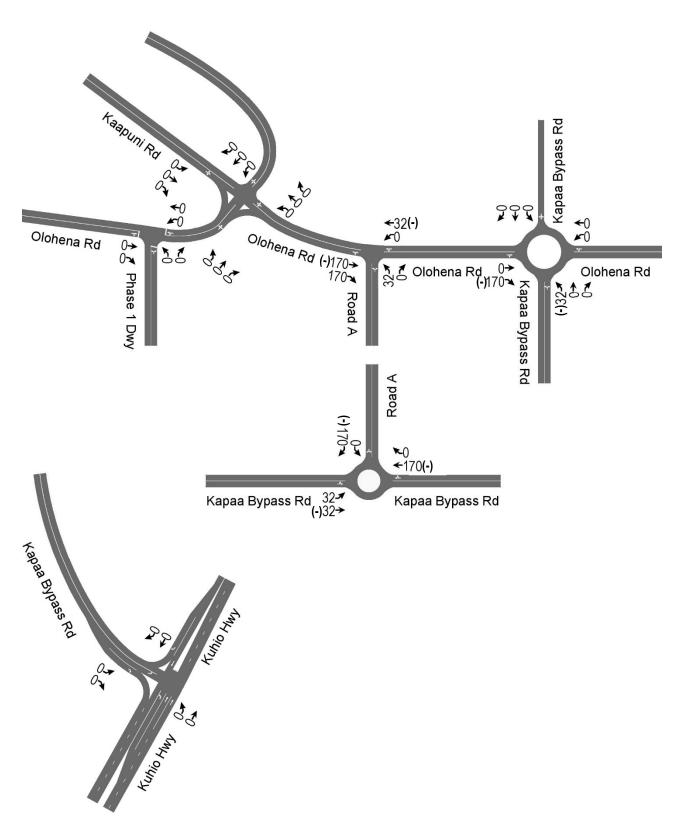


Figure 12.1 AM Peak Hour Diverted Traffic Assignment

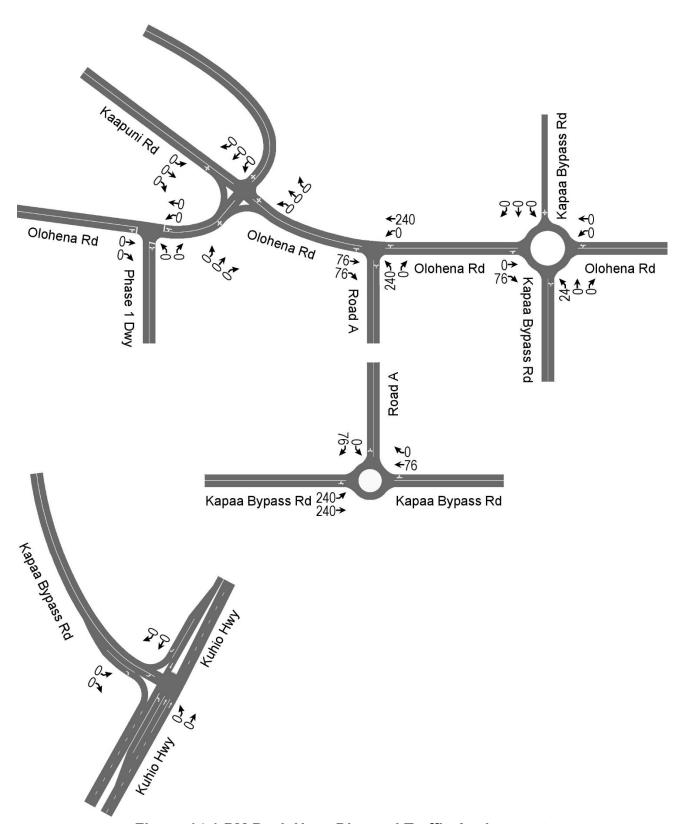


Figure 14.1 PM Peak Hour Diverted Traffic Assignment

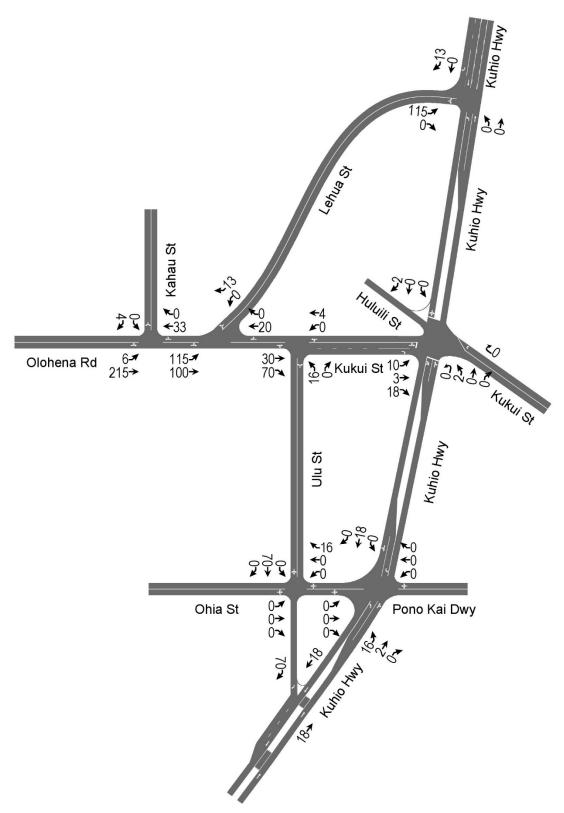


Figure 11. AM Peak Hour Site Traffic Assignment

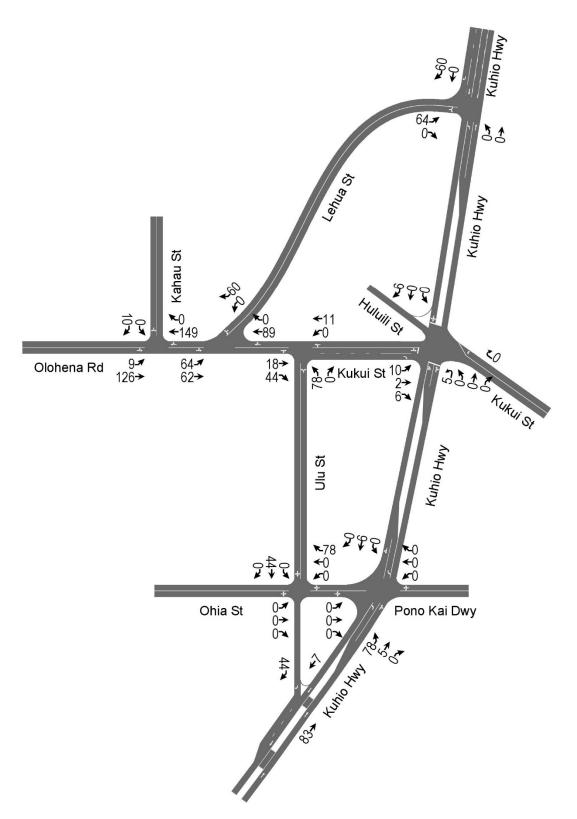


Figure 13. PM Peak Hour Site Traffic Assignment

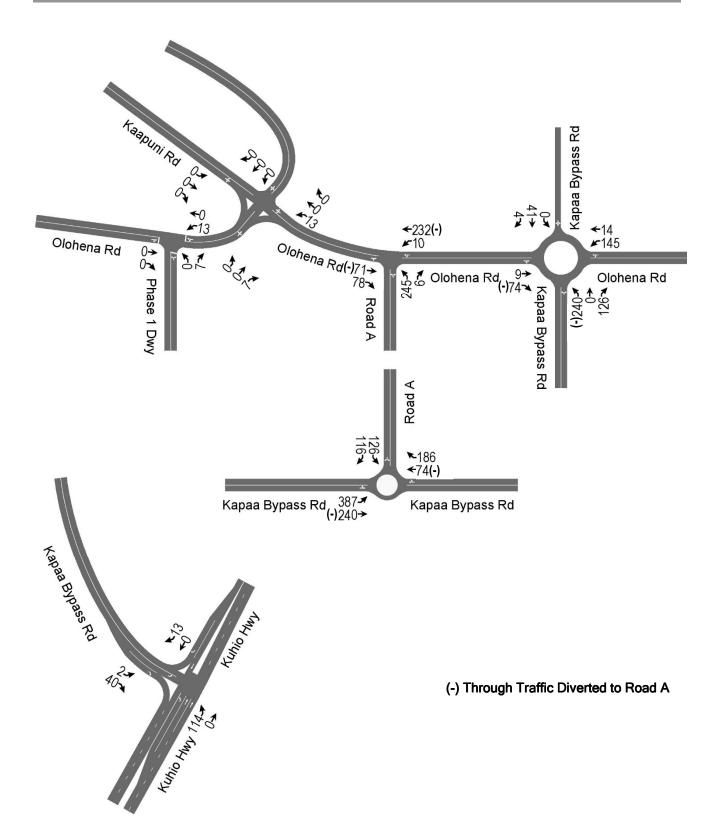


Figure 14. PM Peak Hour Site Traffic Assignment (Cont'd.)

# Bernard P. Carvalho, Jr.

OF OF

Lyle Tabata
Acting County Engineer

Wallace G. Rezentes, Jr.
Managing Director

#### DEPARTMENT OF PUBLIC WORKS

#### County of Kaua'i, State of Hawai'i

4444 Ricc Street, Suite 275, Līhu'e, Hawai'i 96766 TEL (808) 241-4992 FAX (808) 241-6604

September 1, 2017

Randall S. Okaneku, P. E. The Traffic Management Consultant 1188 Bishop Street, Suite 1907 Honolulu, Hawaii 96813

SUBJECT:

Traffic Impact Analysis Report Update

For the Proposed Hokua Place

Kapa'a, Kawaihau District, Island of Kaua'i

TMK: (4) 4-3-03: Por. 001

Dear Mr. Okaneku:

The Engineering Division of the Department of Public Works received the subject Traffic Impact Analysis Report (TIAR) Update that was transmitted via email on June 15, 2017. We appreciate the opportunity to review the TIAR and offer the following comments on the TIAR:

#### 1. Introduction, Project Description:

a. The TIAR indicates that the driveway for phase 1 is proposed to be located on Olohena Road mauka of its intersection with Kaʻapuni Road. We have concerns with a proposed intersection at this location, including the proximity to the intersection of Kaʻapuni Road as well as concerns about intersection sight distance due to nearby horizontal and vertical curves. Prior to approval of a driveway at this location, additional information will need to be provided about this driveway location, to show that appropriate sight lines can be achieved and that no safety or other problems will be created by the proximity to the intersection of Olohena Road and Kaʻapuni Road.

#### 2. Existing Conditions, Roadways:

- a. The report states that the Kapa'a Bypass Road speed limit is reduced to 25 mph south of the proposed intersection with Road A. The report should also mention that further south the speed limit is again increased to 35 mph.
- b. The report incorrectly indicates that the posted speed limit for Olohena Road is reduced to 15 mph as it approaches Kapa'a Middle School. The correct statement should be that there is a 15 mph school zone within the vicinity of Kapa'a Middle School during school hours.
- c. Kukui Street and Ulu Street should both be described as collector streets.

# 3. Existing Conditions, Existing Peak Hour Traffic Volumes and Operating Conditions:

- a. The language throughout this segment of the TIAR indicates that intersections "operated at LOS...." However, if we understand correctly, the LOS values given are based on the analysis of the traffic conditions, not actual empirical observations of delay for vehicles at these intersections. The TIAR should instead use language such as "calculated to operate at LOS ...." This is an important distinction given that observations of Kūhiō Highway during peak hours of traffic appear to show LOS along the highway worse than the LOS A for movements along Kūhiō Highway as reported in the TIAR, potentially due to other factors than the control delay at the intersections.
- b. Check the traffic volume of 1,500 shown on page 10 for Kühiö Highway south of Ulu Street in the PM Peak. The volumes shown in Figure 6 do not match.
- c. Figure 6 (Existing PM Peak Hour Traffic) has an error for the southbound through movement on Kūhiō Highway at the Kapa'a Bypass Road. The figure shows an hourly volume of 38, which is way too low for this through movement. The data shown for this intersection in figure 6 does not appear to match either of the two PM peak hour traffic count plots (or their average) in the appendix.
- d. Related to comment "a" above recommending different language for the calculated LOS values, we recommend that the TIAR include some statements comparing the observed traffic conditions with the calculated delays and level of service, ideally offering explanations for the difference in observed level of service and calculated level of service.

#### 4. Future Traffic Conditions, Kapa'a Transportation Solutions:

- a. Page 17 of the TIAR refers to removal of on-street parking on Kūhiō Highway. The Kapa'a Transportation Solutions study rejected any potential solutions that removed parking on Kūhiō Highway, since such a change would be detrimental to the economic vitality, multimodal, and safety goals of the study. Removal of parking should not be discussed in the TIAR, as HDOT is not considering removal of parking to add travel lanes or turn lanes.
- b. With respect to a new connector road in the approximate location of Road A, page 18 of the TIAR states, "The construction cost of the connector road was estimated at \$25,824,000." The costs in the Kapa'a Transportation Solutions report include right-of-way costs as well as construction cost; therefore it is misleading to state that the full cost shown in the study is the estimated construction cost.

#### 5. Traffic Impact Analysis, Trip Generation Characteristics:

- a. The project description in the TIAR's introduction states that there are 700 multifamily dwelling units, but the trip generation calculations are based on 800 multifamily dwelling units. This discrepancy must be corrected, and the accurate trip generation should be reflected in the study.
- b. The pass-by trip percentage of 81.2% is too high, especially given the relatively small amount of traffic traveling through the development on Road A. The diverted volume of 45 vehicles represents approximately 15% of the estimated through vehicles on Road A during the PM Peak Hour. The 8,000 square feet of the Hokua Place shopping center is outside of the sample size in the pass-by trip

chart for shopping centers in the ITE Trip Generation Handbook. A pass-by trip percentage of approximately 30% or 40% would be more reasonable, given the data available in the Trip Generation Handbook. It would also be reasonable for the TIAR to include a calculation of an internal capture rate for trips between the retail portion and the residential portion of the Hokua Place development. However, the combination of the traffic reduction for internal capture and pass-by trips should still be less than 81%.

#### 6. Traffic Impact Analysis, Site Access Improvements:

a. The recommendations for the stop controlled Tee-intersections of Olohena Road with Road A and the phase 1 driveway do not include any statements regarding the recommended lane assignments for these new intersections. The methodologies section of the report describes the use of AASHTO Left-Turn Lane Guidelines, but no such analyses are included in the TIAR for left turn lanes on Olohena Road at these intersections. We believe that at a minimum, a left turn lane would be necessary on Olohena Road at Road A, but analyses must be provided for both intersections. A median refuge lane should also be included on Olohena Road to facilitate the left-turn movement from Road A to Olohena Road. In addition, we believe that Road A should have two approach lanes at Olohena Road, one for right turn movements and one for left turn movements.

#### 7. Traffic Impact Analysis, Traffic Assignment:

- a. In the previous TIAR for this project, no traffic was assigned to the left turn movement from southbound Road A to eastbound Kapa'a Bypass (and likewise for the right turn from the Kapa'a Bypass to Road A). In our earlier comments, we recommended that some traffic be assigned to these movements. In almost a complete reversal, the current TIAR assigned nearly all of the traffic to these movements. In the current TIAR, only about 5% to 10% of the project traffic that goes through the existing Kapa'a Bypass roundabout is assigned to go through the intersection of Road A and Olohena Road. A more equitable distribution of traffic should be made, to accurately represent the traffic impact on Olohena Road.
- b. The TIAR assigns no traffic between the project and Olohena Road or Kaʻapuni Road north of the project (Wailua Homesteads and Upper Kapahi area). There are relatively few destinations on those roads for the residential traffic from the project, but a small amount of residential traffic is likely to travel to those areas. In addition, much of the traffic generated by the retail portion of the development would have its origin or destination in the residential areas of Wailua Homesteads and Upper Kapahi area. A reasonable (albeit small) amount of traffic must be assigned to those areas.

### 8. Figures 11 Through 14 (Traffic Assignment)

- a. For clarity, the TIAR must show the reassignment of existing traffic on separate figures from the figures for traffic assignment from this project.
- b. On Figure 11, the 989 vehicles shown for northbound Kühiō Highway at Ulu Street is incorrect. It appears that this volume should be 20.
- c. On Figure 13, the 1,274 vehicles shown for northbound Kühiō Highway at Ulu Street is incorrect. It appears that this volume should be 92.
- d. On Figure 14, the 30 vehicles shown for the Kapa'a Bypass Road left turn and the

Mr. Randall Okaneku September 1, 2017 Page 4

447 vehicles for the Kapa'a Byapss Road right turn appear to be incorrect.

#### 9. Traffic Impact Analysis, PM Peak Hour Traffic Analysis With Project:

a. We recommend that the TIAR further analyze and discuss the impact of the project on the intersection of Kūhiʻō Highway and Lehua Street and recommend measures to mitigate this impact. The TIAR states that "Makai bound Lehua Street is expected to continue at LOS F at Kūhiō Highway during the PM peak hour of traffic with the proposed project." However, Table 7 shows the PM peak hour of traffic without the project to be LOS E. Additionally, while the AM peak hour of traffic with the project continues to be LOS F, the delay increases significantly.

# 10. Recommendations and Conclusions, Recommended Traffic Improvements Without Project:

a. Item number 3 recommends restricting parking along Kūhiō Highway within Kapa'a Town in order to provide additional through lanes or left turn lanes on Kūhiō Highway. This should not be recommended in the TIAR, because HDOT is not considering removal of parking to add travel lanes. Removal of parking has been determined to be detrimental to businesses and the economic vitality of Kapa'a Town. Discussion of parking removal on Kūhiō Highway in Kapa'a Town should also be removed from other sections of the report, including the conclusions.

# 11. Recommendations and Conclusions, Recommended Traffic Improvements With Project:

a. Our comments above include several concerns about the intersection of Road A and Olohena Road, including the possibility that additional traffic should be assigned to this intersection. We are concerned that the one-way stop control Tee-intersection proposed will not be sufficient to address traffic operations and safety at intersection. The installation of a roundabout at this intersection shall be evaluated as part of the TIAR, including traffic operations analysis for a roundabout as well as a safety comparison of a roundabout and a one-way stop control intersection. The federal Manual on Uniform Traffic Control Devices (MUTCD) does not include traffic warrants for roundabouts. However, evaluation of the MUTCD's multi-way stop control warrants and/or signal warrants would be instructive with respect to evaluating whether a one-way stop control intersection would be sufficient or if a roundabout is needed instead.

Alternatively, we may also accept an evaluation of the need for a roundabout based on roundabout evaluation guidelines from another jurisdiction or research document.

Consideration should also be given to the construction of a roundabout that combines the intersections of Olohena Road with Ka'apumi Road and Road A (with Kaehulua Road designed as a T intersection with either Ka'apuni Road or Olohena Road). Traffic operations analysis of a roundabout that combines these intersections shall be included in the TIAR.

The comments in this letter should not be construed to be inclusive of all County of Kaua'i recommendations for road improvements required to be constructed as part of the Hokua Place

Mr. Randall Okaneku September 1, 2017 Page 5

project. Recommendations and requirements for road improvements will be included as part of future review phases for the project, such as zoning amendments, subdivision applications, and construction plan review. If you have any questions or need additional information, please contact me at (808) 241-4891 or Stanford Iwamoto at (808) 241-4896.

Very truly yours,

MICHAEL MOULE, P.E. Chief, Engineering Division

MM/SI

Copies to: DPW-Design & Permitting

Lyle Tabata, Acting County Engineer Larry Dill, HDOT Kaua'i District Engineer

# TRAFFIC IMPACT ANALYSIS REPORT UPDATE FOR THE PROPOSED

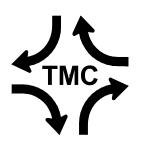
## **HOKUA PLACE**

KAPA`A, KAUAI, HAWAII TAX MAP KEY: (4) 4-3-03: 01

#### PREPARED FOR

**HG KAUAI JOINT VENTURE, LLC** 

MAY 22, 2017



#### **PREPARED BY**

# THE TRAFFIC MANAGEMENT CONSULTANT

# TRAFFIC IMPACT ANALYSIS REPORT UPDATE FOR THE PROPOSED

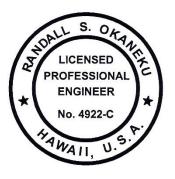
# **HOKUA PLACE**

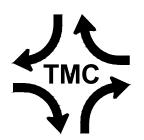
KAPA`A, KAUAI, HAWAII TAX MAP KEY: (4)4-3-03: 01

#### PREPARED FOR

## HG KAUAI JOINT VENTURE, LLC

MAY 22, 2017





**PREPARED BY** 

# THE TRAFFIC MANAGEMENT CONSULTANT RANDALL S. OKANEKU, P.E., PRINCIPAL \* 1188 BISHOP STREET, SUITE 1907 \* HONOLULU, HI 96813

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## **EXECUTIVE SUMMARY**

# TRAFFIC IMPACT ANALYSIS REPORT UPDATE FOR THE PROPOSED

## **HOKUA PLACE**

#### **Project Description**

The proposed Hokua Place will be developed into an 816-unit residential subdivision in Kapa'a, Kauai, Hawaii. The project is situated immediately to the south of Kapa'a Middle School and to the west (mauka) of Kapa'a Town. The primary access will be provided by a new connector roadway between Olohena Road, immediately mauka of Kapa'a Middle School, and the Kapa'a Bypass Road, southwest of its roundabout intersection with Olohena Road.

The <u>Draft Environmental Impact Statement for the Proposed Hokua Place</u> (DEIS) was published in May 2015. The <u>Traffic Impact Assessment Report Kapa'a Highlands Subdivision</u>, dated December 9, 2013, was attached to the DEIS. The purpose of this Traffic Impact Analysis Report Update is to update the DEIS traffic study, and to respond to comments received from the State of Hawaii Department of Transportation and the County of Kauai Department of Public Works, during their review of the DEIS traffic study.

#### **Existing Traffic Conditions**

The field investigation was conducted in March 2017, to update the existing traffic conditions from the DEIS traffic study. The study area was expanded to include Lehua Street and Ulu Street. The field investigation indicated that Lehua Street and Ulu Street were used as alternate routes between Kuhio Highway and Olohena Road/Kukui Street to avoid the delays at the intersection of Kuhio Highway and Kukui Street.

Since the preparation of the DEIS traffic study, the peak hour traffic at the roundabout intersection of the Kapa'a Bypass Road and Olohena Road increased by about 12 percent and 22 percent, during the AM and PM peak hours of traffic, respectively.

## **Trip Generation**

Hokua Place is expected to generate 487 vehicle trips per hour (vph) and 560 vph, during the AM and PM peak hours of traffic, respectively. The AM and PM peak hour trip generation characteristics for Hokua Place were increased by about 90± vph over the DEIS traffic study, primarily due to the use of the average peak hour trip rates for the multi-family dwelling units.

# **Traffic Impact Analysis**

The construction of the connector roadway through Hokua Place, between Olohena Road and the Kapa'a Bypass Road, is expected to mitigate the project's traffic impacts at the roundabout intersection of the Kapa'a Bypass Road and Olohena Road. The other intersections in the study area will require the following traffic improvements to mitigate the traffic impacts without and with the proposed project.

# **Recommendations Without Project**

- 1. Widen Kuhio Highway between the Kapa'a Bypass Road (South Junction) and Kuamoo Road to provide two through lanes in each direction.
- 2. Restripe the median on the north leg of Kuhio Highway at the Kapa`a Bypass Road (South Junction) to provide a median refuge lane.
- 3. Restripe parking and shoulder lanes on Kuhio Highway through Kapa'a Town to provide additional through and/or left-turn lanes.
- 4. Modify the traffic signal operations at the intersection of Kuhio Highway and Kukui Street to reduce queuing and delays.
- 5. Add a right-turn bypass lane from southbound Kapa`a Bypass Road to mauka bound Olohena Road at their roundabout intersection.
- 6. Realign Kaehulua Road to intersect Olohena Road and Kaapuni Road to create a four-legged, channelized intersection.
- 7. Extend the median refuge lane/two-way left-turn lane on the north leg of Kuhio Highway at Lehua Street.

#### **Recommendations With Project**

- 1. Construct Road A from Olohena Road to the Kapa'a Bypass Road.
- 2. Construct a roundabout at the intersection of Road A and the Kapa'a Bypass Road.

# **Conclusions**

The existing traffic congestion on Kuhio Highway through Kapa'a Town can be mitigated by restricting on-street parking and restriping the shoulder lanes to provide for additional through lanes/median left-turn lanes. The existing southbound traffic demand through Kapa'a Town is reduced by the Kapa'a Bypass Road. Dedication of the Kapa'a Bypass Road right-of-way along the Hokua Place frontage would assure the continued usage of the existing Kapa'a Bypass Road.

The construction of the proposed Road A will provide additional mauka-makai roadway capacity between Kapa'a Valley and the Kapa'a Bypass Road. Road A is expected to mitigate the Hokua Place traffic impacts at the roundabout intersection of the Kapa'a Bypass Road and Olohena Road. The Hokua Place access intersections on Olohena Road and on the Kapa'a Bypass Road are expected to operate at satisfactory Levels of Service, during the AM and PM peak hours of traffic.

# TRAFFIC IMPACT ANALYSIS REPORT UPDATE

# FOR THE PROPOSED

# **HOKUA PLACE**

**KAPA`A, KAUAI, HAWAII TAX MAP KEY: (4) 4-3-03: 01** 

#### I. Introduction

# A. Project Description

Hokua Place is planned as an 816-unit residential development in Kapa'a, Kauai, Hawaii. Hokua Place will consist of 116 single-family detached units, 700 multi-family condominiums, a neighborhood retail center consisting of 8,000 square feet of gross floor area (SFGFA), and a community park and recreation center. The project site is located on the southwest quadrant of the roundabout intersection of the Kapa'a Bypass Road and Olohena Road. The project is situated immediately to the south of Kapa'a Middle School and to the west (mauka) of Kapa'a Town. Figure 1 depicts the project location and vicinity map.

Phase 1 of Hokua Place will consist of 16 single-family detached units, which will be located on the mauka portion of the project site. The Phase 1 access driveway is proposed on Olohena Road, mauka of its intersection with Kaapuni Road. Phase 2 will consist of the remaining 800 dwelling units. Phase 2 access is proposed via a collector street between Olohena Road, immediately mauka of Kapa'a Middle School, and the Kapa'a Bypass Road, about 3,000 feet southwest of its intersection with Olohena Road (hereinafter referred to as Road A). The project site is depicted on Figure 2.

The construction of Hokua Place is expected to begin by the Year 2020. For the purpose of this Traffic Impact Analysis Report Update, full occupancy is assumed to occur by the Year 2030.

# **B. 2015 Draft Environmental Impact Statement**

The Draft Environmental Impact Statement for the Proposed Hokua Place (DEIS) was published in May 2015. Hokua Place was formerly known as the Kapa'a Highlands Subdivision. The <u>Traffic Impact Assessment Report Kapa'a Highlands Subdivision</u> was prepared by Phillip Rowell and Associates, dated December 9, 2013, and was attached to the DEIS as Exhibit H.

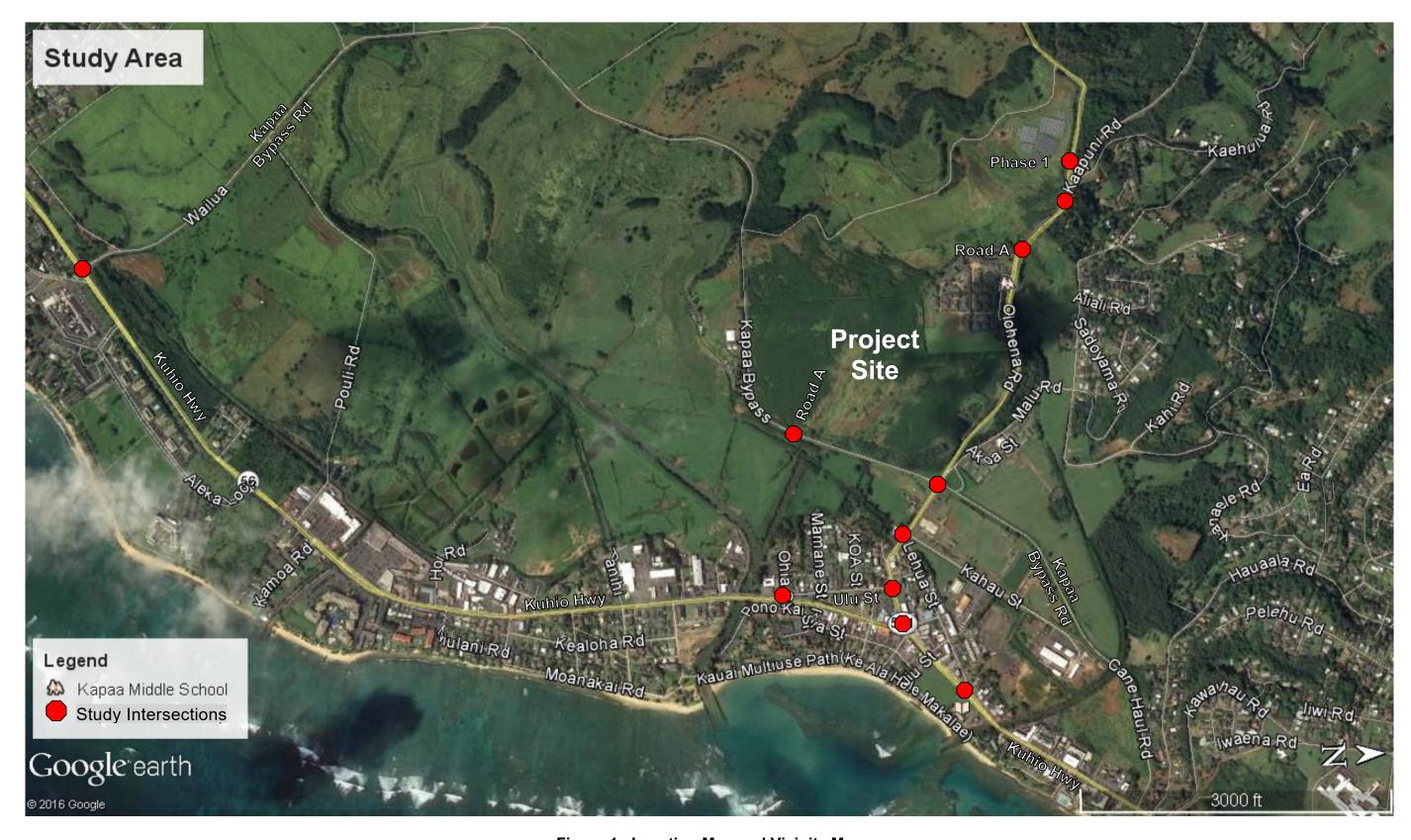


Figure 1. Location Map and Vicinity Map

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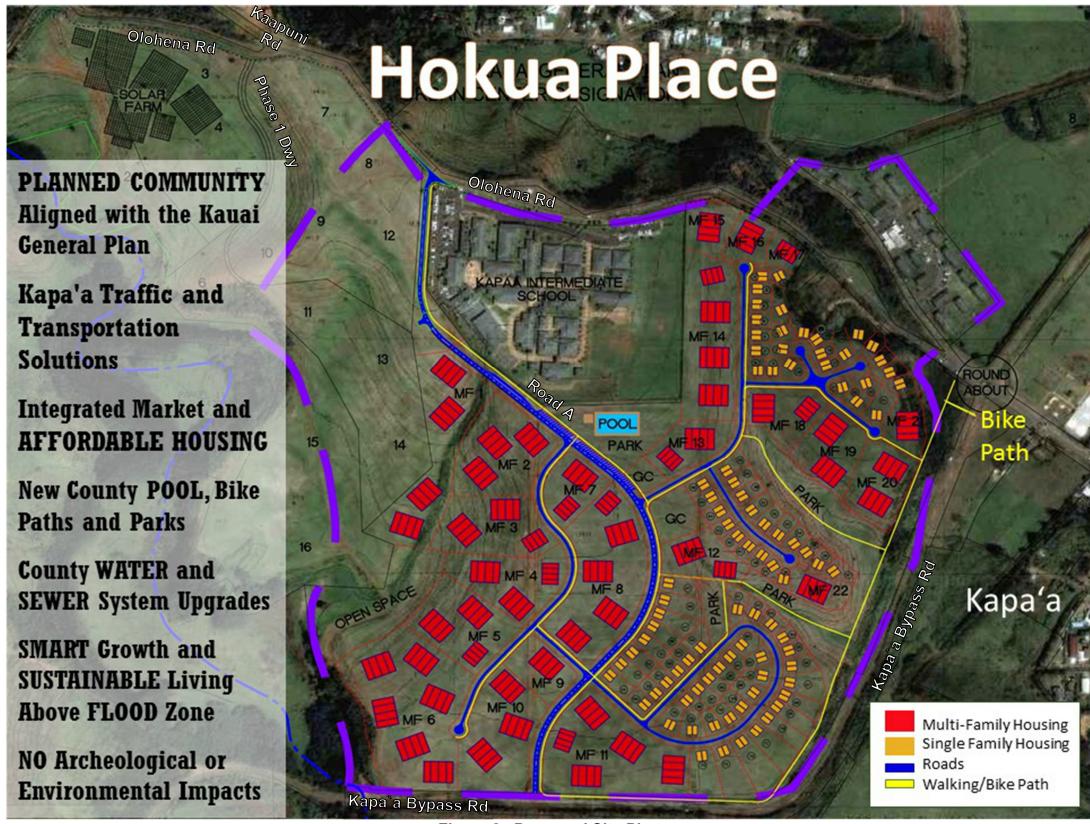


Figure 2. Proposed Site Plan

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The State of Hawaii Department of Transportation (DOT) issued comments on the Rowell study in a letter dated March 26, 2014 (HWY-PS 2.6887). Responses to DOT's comments were transmitted via email from Mr. Greg Allen on April 9, 2014. The responses were acceptable to DOT per its letter, dated June 6, 2014 (HWY-PS 2.7311).

The County of Kauai Department of Public Works (DPW) issued its comments on the DEIS in its letter dated June 22, 2015. This TIAR addresses DPW's comments on the DEIS.

## C. Purpose and Scope of the Study

The purpose of this study is to update the traffic impact analysis resulting from the development of the proposed Hokua Place. This report presents the findings and recommendations of the study, the scope of which includes:

- 1. A description of the proposed project.
- 2. An evaluation of existing roadways and traffic conditions.
- 3. The analysis of the future traffic conditions without the proposed project.
- 4. The development of trip generation characteristics of the proposed project.
- 5. The identification and analysis of the traffic impacts resulting from the development of the proposed project.
- 6. The recommendation of roadway improvements, which would mitigate the traffic impacts identified in this study.

#### D. Methodologies

#### 1. Capacity Analysis

The highway capacity analysis, performed in this study, is based upon procedures presented in the <u>Highway Capacity Manual 6<sup>th</sup> Edition</u> (HCM), published by the Transportation Research Board. HCM defines the Level of Service (LOS) as "a quantitative stratification of a performance measure or measures representing quality of service." HCM defines the six (6) Levels of Service from the traveler's perspective, ranging from the best LOS "A" to the worst LOS "F". LOS translates the complex mathematical results of highway capacity analysis into an A through F system for the purpose of simplifying the roadway performance for non-technical decision makers.

The HCM 6<sup>th</sup> Edition has updated the highway capacity analysis since the HCM 2010 methodology, utilized in the DEIS traffic study. The most significant change in the HCM 6<sup>th</sup> Edition occurred in the analysis of roundabouts. The widespread construction of roundabouts throughout the United States, since the development of the HCM 2010, resulted in changes in driver behavior, entering and exiting a roundabout.

The data collected at United States roundabouts improved the HCM 6<sup>th</sup> Edition methodology for analyzing roundabouts, where the calculated delays were reduced by about one half, when compared with the previous HCM 2010 methodology.

LOS's "A", "B", and "C" are considered satisfactory Levels of Service. LOS "D" is generally considered a "desirable minimum" operating Level of Service. LOS's "E" and "F" are undesirable conditions. Intersection LOS is primarily based upon average delay (d) in seconds per vehicle (sec/veh). The delays at unsignalized intersections, which includes stop-controlled intersections and roundabouts, are generally longer than signalized intersections, due to the drivers' expectation and acceptance of longer delays at higher-volume signalized intersections. Table 1 summarizes the HCM LOS criteria.

Table 1. Intersection Level of Service Criteria (HCM)					
LOS	Signalized Control	Unsignalized Control	Description		
	Delay d	(sec/veh)			
A	d≤10	d≤10	Control delay is minimal.		
В	10 <d td="" ≤20<=""><td>10<d≤15< td=""><td>Control delay is not significant.</td></d≤15<></td></d>	10 <d≤15< td=""><td>Control delay is not significant.</td></d≤15<>	Control delay is not significant.		
С	20 <d≤35< td=""><td>15<d≤25< td=""><td>Stable operation. Queuing begins to occur.</td></d≤25<></td></d≤35<>	15 <d≤25< td=""><td>Stable operation. Queuing begins to occur.</td></d≤25<>	Stable operation. Queuing begins to occur.		
D	35 <d≤55< td=""><td>25<d≤35< td=""><td>Less stable condition. Increase in delays, decrease in travel speeds.</td></d≤35<></td></d≤55<>	25 <d≤35< td=""><td>Less stable condition. Increase in delays, decrease in travel speeds.</td></d≤35<>	Less stable condition. Increase in delays, decrease in travel speeds.		
Е	55 <d≤80< td=""><td>35<d≤50< td=""><td>Unstable operation, significant delays.</td></d≤50<></td></d≤80<>	35 <d≤50< td=""><td>Unstable operation, significant delays.</td></d≤50<>	Unstable operation, significant delays.		
F	d>80	d>50	High delays, extensive queuing.		

HCM utilizes a peak hour factor (PHF) to convert the peak 15-minute traffic into an hourly volume. For the purpose of this study, the peak hour traffic analysis is based directly upon the peak 15-minute traffic flows entering the study intersection, which is multiplied by four (4) to convert the 15-minute peak volumes into the peak hour volumes.

Synchro is a traffic analysis software that was developed by Trafficware Corporation. Synchro is an intersection analysis program that is based upon the HCM 6<sup>th</sup> Edition methodology. Synchro was used to calculate the Levels of Service for the intersections in the study area. Worksheets for the capacity analysis, performed throughout this report, are compiled in the Appendix.

## 2. Trip Generation

The trip generation methodology is based upon generally accepted techniques developed by the Institute of Transportation Engineers (ITE) and published in <u>Trip Generation Manual</u>, 9<sup>th</sup> Edition, 2012. The ITE trip generation methodology has been updated since the <u>Trip Generation</u>, 7<sup>th</sup> Edition, utilized in the DEIS traffic study. The ITE trip rates were developed by correlating the total vehicle trip generation data with various land use activities/characteristics, such as the vehicle trips per hour (vph) per dwelling unit (DU).

A portion of the peak hour trips generated by a retail center is considered to be "pass-by" trips, i.e., traffic already on the roadway stopping by at a "secondary" destination enroute to its primary destination. The percentages of pass-by trips were compared with the gross leasable floor areas of the shopping centers, which were collected from traffic studies and compiled by ITE. The results of the analysis were published in the Trip Generation Handbook, 3rd Edition, dated August 2014. The percentage of pass-by trips is generally inversely proportional to the size of the shopping center, e.g., a regional shopping center is a primary destination with a low pass-by trip percentage, while a convenience store is a secondary destination with a high pass-by trip percentage. About 81.2 percent of the total PM peak hour trips generated by the proposed 8,000 square foot retail center are expected to be pass-by trips. The AM peak hour pass-by trip rate for a retail center was not published by ITE.

#### 3. AASHTO Left-Turn Lane Guidelines

The left-turn lane assessment on a two-lane highway is based upon <u>A Policy on Geometric Design of Highways and Streets</u>, 2011, published by the American Association of State Highway and Transportation Officials (AASHTO). The AASHTO guide analyzes the combination of the left-turn volume (minimum 5%), the advancing volume (left-turn, through and right-turn volumes), the opposing volume (left-turn, through and right-turn volumes), and the operating speed. The AASHTO guide is based upon the "Volume Warrants for Left-Turn Storage Lanes at Unsignalized Grade Intersections", <u>Highway Research Record 211</u>, Highway Research Board, 1967, by M. D. Harmelink. The Harmelink left-turn volume warrant analyzes the probability of the arrival of an advancing vehicle slowing and/or stopping behind a vehicle, which is waiting to turn left from the through lane.

## **II.** Existing Conditions

#### A. Roadways

Kuhio Highway is the primary arterial highway along the east coast of Kauai. Through Kapa'a Town, Kuhio Highway is a two-lane roadway with on-street parking on both sides of the roadway. Kuhio Highway is signalized at its intersection with Kukui Street.

Exclusive left-turn lanes are provided on Kuhio Highway at major intersections in Kapa'a Town. The posted speed limit on Kuhio Highway in Kapa'a Town is 25 miles per hour (mph).

The Kapa'a Bypass Road provides an alternative southbound route around Kapa'a Town. The Kapa'a Bypass Road is a one-lane, one-way, southbound roadway between its north junction at Kuhio Highway and Olohena Road, with a posted speed limit of 25 mph. The Kapa'a Bypass Road intersects Olohena Road at a single-lane roundabout. South of Olohena Road, the Kapa'a Bypass Road becomes a two-way, two-lane roadway, with a posted speed limit of 35 mph. A 3,700± foot section of the Kapa'a Bypass Road, south of Olohena Road, was constructed on a roadway easement, which is currently owned by the developer of Hokua Place. Hokua Place, LLC has a Memorandum of Understanding with the State of Hawaii Department of Transportation (DOT) to dedicate the roadway easement to State DOT upon the approval of the Hokua Place subdivision.

South of the proposed intersection with Road A, the posted speed limit on the Kapa'a Bypass Road is reduced to 25 mph. At its south junction, the Kapa'a Bypass Road intersects Kuhio Highway at an unsignalized Tee-intersection. The Kapa'a Bypass Road provides separate left-turn and right-turn lanes at its south junction with Kuhio Highway. Exclusive left-turn and right-turn lanes are provided on Kuhio Highway at the Kapa'a Bypass Road in the northbound and southbound directions, respectively. A median refuge lane is not delineated on the north leg of Kuhio Highway at the Kapa'a Bypass Road. However, the striped median provide sufficient refuge space for one vehicle turning left from the Kapa'a Bypass Road.

South of the Kapa'a Bypass Road, the center northbound lane of Kuhio Highway is coned to provide a southbound contra-flow lane, during the AM peak period of weekday traffic, resulting in two lanes in the southbound direction and one lane in the northbound direction. During the field investigation, the contra-flow operation occurred from 5:45 AM to 10:30 AM. The contra-flow lane provides a "free" right-turn movement from the Kapa'a Bypass Road onto southbound Kuhio Highway, during the AM peak period of weekday traffic.

Olohena Road is a two-way, two-lane collector roadway with a posted speed limit of 25 mph. The posted speed limit on Olohena Road is reduced to 15 mph as it approaches Kapa'a Middle School. Olohena Road intersects the Kapa'a Bypass Road at a single-lane roundabout. Makai of Lehua Street, Olohena Road continues as Kukui Street to Kuhio Highway.

Kaapuni Road is a two-way, two-lane, collector road which intersects Olohena Road at a stop-controlled, skewed Tee-intersection. The Kaapuni Road approach has a limited sight distance to the right, due to the vertical alignment of the mauka leg of Olohena Road. Immediately mauka of Olohena Road, the two-way, two-lane Kaehulua Road intersects Kaapuni Road at a stop-controlled, skewed Tee-intersection.

Kukui Street is a two-way, two-lane roadway between Kuhio Highway and Ulu Street with a posted speed limit of 15 mph. Kukui Street is signalized at its intersection with Kuhio Highway with a shared left-turn lane and exclusive right-turn lane.

Ulu Street is a two-way, two-lane local street between Kukui Street and Ohia Street. South of Ohia Street, Ulu Street becomes a one-lane, one-way southbound roadway to Kuhio Highway. Ohia Street is a local street, which intersects Ulu Street and Kuhio Highway at stop-controlled intersections. Exclusive left-turn lanes are provided in both directions on Kuhio Highway at Ohia Street/Pono Kai Driveway. Ulu Street provides an alternate route to the south between Kuhio Highway and Kukui Street.

Lehua Street is a two-way, two-lane local street between Olohena Road and Kuhio Highway. Lehua Street intersects Olohena Road at a stop-controlled Tee-intersection. Lehua Street intersects Kuhio Highway at a stop-controlled, channelized Tee-intersection. Lehua Street provides an alternate route to the north between Kuhio Highway and Olohena Road.

Kahau Street is a two-way, two-lane cul-de-sac street. Kahau Street intersects Olohena Road at a stop-controlled Tee-intersection, immediately mauka of Lehua Street.

#### **B.** Public Transit

The Kauai County Transportation Agency operates a public bus service in the region with a stop on Olohena Road at the Kapa'a New Town Park, between the Kapa'a Bypass Road and Kahau Street. The Kauai bus service also stops at Kapa'a Middle School. On Kuhio Highway, the Kauai Bus service stops at Lehua Street, at Ohia Street, and at the Coconut Marketplace near the Kapa'a Bypass Road (South Junction). The Kauai Bus service is provided at hourly intervals Monday through Friday from 6 AM to 9 PM and on weekends and holidays every two hours from 8 AM to 5 PM.

## C. Existing Peak Hour Traffic Volumes and Operating Conditions

#### 1. Field Investigation and Data Collection

Turning movement traffic count surveys were conducted at the following intersections in the study area, during the week of March 13, 2017:

- a. Kapa'a Bypass Road and Olohena Road
- b. Olohena Road and Kaapuni Road
- c. Kaapuni Road and Kaehulua Road
- d. Kuhio Highway and Kukui Street
- e. Kuhio Highway and Kapa'a Bypass Road (South Junction)
- f. Kuhio Highway and Lehua Street

- g. Olohena Road and Lehua Street
- h. Olohena Road and Kahau Street
- Kukui Street and Ulu Street
- j. Ulu Street and Ohia Street
- k. Kuhio Highway and Ohia Street/Pono Kai Driveway
- 1. Kuhio Highway and Ulu Street

Each intersection was surveyed during the peak periods of traffic over a two-day period. On March 14, 2017, a stalled vehicle partially blocked the circulatory roadway of the roundabout intersection of Olohena Road and the Kapa'a Bypass Road from 3:00 PM to 4:00 PM. The blockage limited traffic flows, and this data were excluded from the analysis. Otherwise, the higher peak hour volumes on the survey days at each study intersection were selected for the analysis to establish the existing conditions. The peak hours of traffic varied from intersection to intersection and from day to day.

# 2. Existing AM Peak Hour Traffic

The existing AM peak hour of traffic in the study area generally occurred from 7:15 AM to 8:15 AM. Table 2 summarizes the changes in the AM peak hour traffic between the DEIS traffic study and the existing AM peak hour traffic data.

Table 2. AM Peak Hour Traffic Comparison					
Cturdy Intongoation	Intersection Vo	Increase (+)			
Study Intersection	2012-2013	2017	Decrease (-)		
Olohena Road/Kapa'a Bypass Road	1,447	1,628	+181		
Kuhio Highway/Kukui Street	1,441	1,410	-31		
Kuhio Hwy/Kapa'a Bypass Road	1,990	2,111	+121		

In Kapa'a Town, Kuhio Highway carried about 1,400 vehicles per hour (vph), total for both directions, during the AM peak hour of traffic. South of Ulu Street, Kuhio Highway carried over 1,750 vph, total for both directions. The Kapa'a Bypass Road carried about 800 vph, total for both directions, south of Olohena Road. Mauka of the Kapa'a Bypass Road, Olohena Road carried about 1,000 vph, total for both directions. South of the Kapa'a Bypass Road (South Junction), Kuhio Highway carried about 2,100 vph.

The traffic signal timing cycle lengths at the intersection of Kuhio Highway and Kukui Street resulted in long delays on Kukui Street. Makai bound traffic on Olohena Road and Kukui Street were diverted to alternate routes to Kuhio Highway. About 54 percent of makai bound traffic on Olohena Road turned left onto Lehua Street to continue in the northbound direction. About 33 percent of makai bound traffic turned right onto Ulu Street to continue in the southbound direction. The remaining 13 percent

of the makai bound traffic on Olohena Road continued onto Kukui Street to Kuhio Highway.

During the existing AM peak hour of traffic, the overall intersection of Kuhio Highway and Kukui Street operated at LOS "A". However, the left-turn movement on makai bound Kukui Street operated at LOS "F", with a relatively low traffic demand (32 vph). All the traffic movements in both directions on Kuhio Highway operated at LOS "A" at Kukui Street, during the existing AM peak hour of traffic.

The left-turn movement on makai bound Lehua Street operated at LOS "E" at Kuhio Highway, during the existing AM peak hour of traffic. Makai bound Ohia Street also operated at LOS "E" at Kuhio Highway at a very low volume.

Makai bound Olohena Road operated at LOS "D" at the Kapa'a Bypass Road. Kaapuni Road operated at LOS "D" at Olohena Road. The other intersections in the study area operated at satisfactory Levels of Service, i.e., LOS "C" or better, during the existing AM peak hour of traffic. Figures 3 and 4 depict the existing AM peak hour traffic data.

# 3. Existing PM Peak Hour Traffic

The existing PM peak hour of traffic in the study area varied between the hours of 3:00 PM and 6:00 PM. Table 3 summarizes the changes in the PM peak hour traffic between the DEIS traffic study and the existing (2017) PM peak hour traffic data.

Table 3. PM Peak Hour Traffic Comparison					
Study Intersection	Intersection Vo	Increase (+)			
Study Intersection	2012-2013	2017	Decrease (-)		
Olohena Rd/Kapa`a Bypass Rd	1,459	1,787	+328		
Kuhio Hwy/Kukui St	1,370	1,295	-75		
Kuhio Hwy/Kapa`a Bypass Rd	2,176	2,235	+62		

During the existing PM peak hour of traffic, Kuhio Highway carried about 1,200 vph, total for both directions in Kapa'a Town. South of Ulu Street, Kuhio Highway carried over 1,500 vph, total for both directions. The Kapa'a Bypass Road carried over 1,000 vph, total for both directions, south of Olohena Road. Mauka of the Kapa'a Bypass Road, Olohena Road carried about 1,000 vph, total for both directions. Kuhio Highway carried over 2,100 vph, total for both directions, south of the Kapa'a Bypass Road.

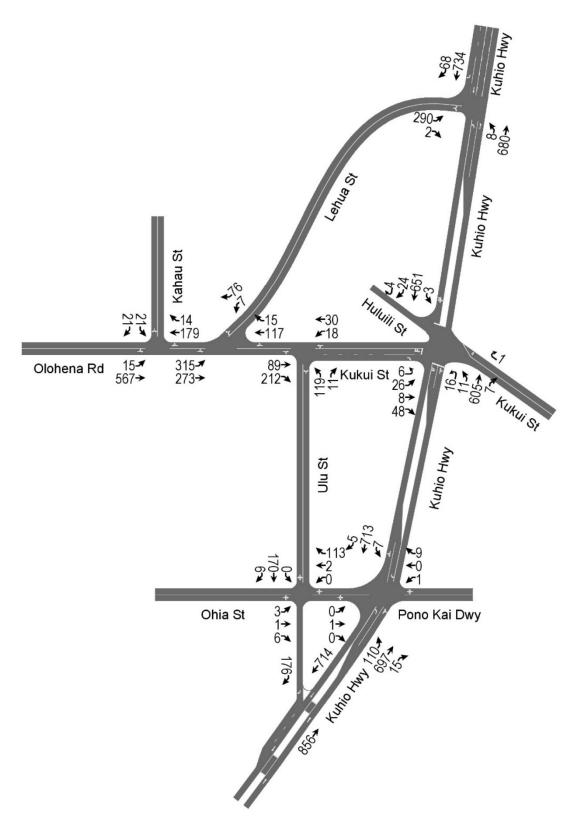
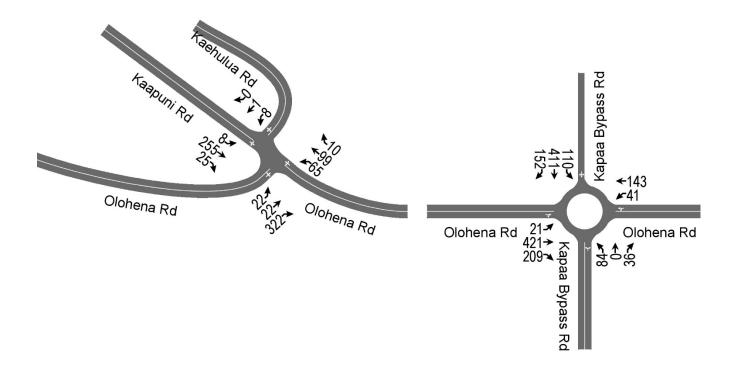


Figure 3. Existing AM Peak Hour Traffic



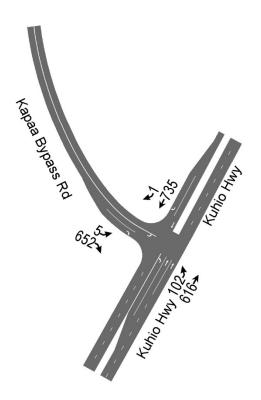


Figure 4. Existing AM Peak Hour Traffic (Cont'd.)

The northbound and southbound traffic on Kuhio Highway avoided the traffic signal delays at Kukui Street by diverting to alternate routes to Olohena Road. Less than 10 percent of the mauka bound traffic on Olohena Road at the Kapa'a Bypass Road turned from Kuhio Highway via Kukui Street. About 35 percent of the mauka bound traffic on Olohena Road turned right from Lehua Street to continue in the mauka bound direction, during the existing PM peak hour of traffic. About 55 percent of the mauka bound traffic turned left from Ulu Street onto Kukui Street to continue in the mauka bound direction on Olohena Road.

The overall intersection of Kuhio Highway and Kukui Street operated at LOS "A", during the existing PM peak hour of traffic. The left-turn movement on makai bound Kukui Street operated at LOS "E" with a relatively low traffic demand (36 vph). The other traffic movements at the intersection operated at LOS "A", during the existing PM peak hour of traffic.

The left-turn movement on makai bound Lehua Street operated at LOS "D" at Kuhio Highway, during the existing PM peak hour of traffic. Makai bound Ohia Street operated at LOS "F" at Kuhio Highway with a very low volume. The mauka bound Pono Kai Driveway operated at LOS "D", also with a very low volume.

Southbound Lehua Street operated at LOS "E" at Olohena Road, during the existing PM peak hour of traffic. Southbound Kapa'a Bypass Road operated at LOS "D" at Olohena Road. The other intersections in the study area operated at satisfactory Levels of Service, during the existing PM peak hour of traffic. The existing PM peak hour traffic data are depicted on Figures 5 and 6.

#### **III.** Future Traffic Conditions

#### A. Background Growth in Traffic

The Kauai Long-Range Land Transportation Plan (KLRLTP) was prepared by the State of Hawaii Department of Transportation (DOT), in cooperation with the Kauai County Department of Public Works and Planning Department. The KLRLTP developed long-range travel forecasts for the island of Kauai. The KLRLTP anticipated that traffic in the Kapa'a area would increase by over 30 percent between the Base Year 2007 and the Horizon Year 2035. For the purpose of this analysis, an average growth factor of 1.14 was uniformly applied to the existing (Year 2017) AM and PM peak hour traffic volumes to estimate the Year 2030 peak hour traffic without the proposed project.

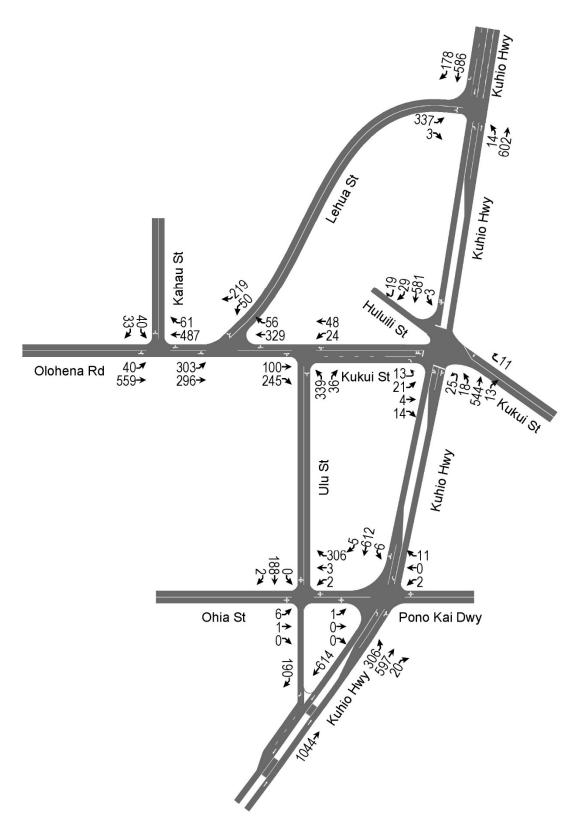
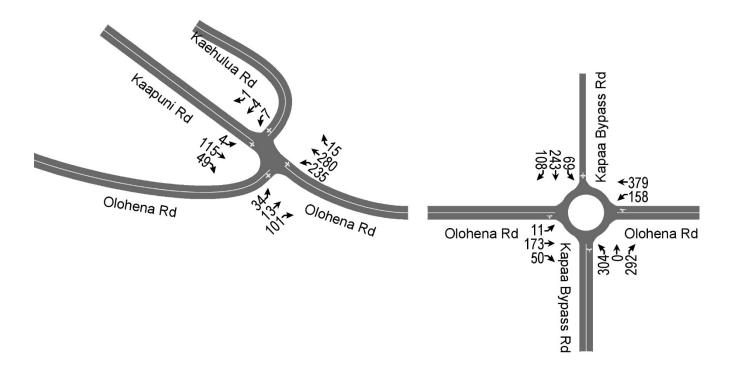


Figure 5. Existing PM Peak Hour Traffic



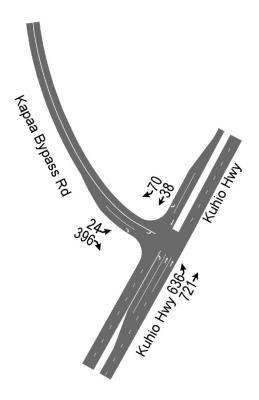


Figure 6. Existing PM Peak Hour Traffic (Cont'd.)

# **B.** Daily and Seasonal Adjustment Factors

The existing peak hour traffic data were adjusted for the daily and seasonal variation in traffic in the region. The adjustment factors were based upon the 2016 traffic count data, which were collected at DOT's continuous traffic count station at Mile Post 2.4 on Kuhio Highway (Route 56) in Hanamaulu, which is located about 6 miles south of Kapa'a Town. Table 4 summarizes the adjustment factors, which were applied to the existing AM and PM peak hour traffic data, to account for the daily and seasonal variation in traffic from the annual average weekday traffic (AAWDT).

Table 4. Day of the Week and Seasonal Adjustment Factors					
Date	Day	24-Hour Data	Adjustment Factors		
3/14/2016	Monday	15,881	1.03		
3/15/2016	Tuesday	15,824	1.03		
3/16/2016	Wednesday	16,611	0.98		
3/17/2016	Thursday	16,467	0.99		
3/18/2016	Friday	16,652	0.98		
	2016 AAWDT	16,301	1.00		

#### C. Kuhio Highway Widening

The <u>Final Environmental Assessment Kuhio Highway Short-Term Improvements Kuamoo Road to Temporary Bypass Road</u> (Kuhio Highway EA), was prepared for DOT, by Wilson Okamoto Corporation, dated September 2009. The Kuhio Highway EA recommended the widening of Kuhio Highway from three lanes to four lanes to provide a permanent second southbound lane between the Kapa'a Bypass Road and Kuamoo Road. The additional lane will provide a "free" right-turn movement from the Kapa'a Bypass Road onto southbound Kuhio Highway throughout the day.

DOT is planning to complete the widening of Kuhio Highway by the Year 2019. The widening of Kuhio Highway from the Kapa'a Bypass Road to Kuamoo Road is included in this traffic impact analysis.

# D. Kapa'a Transportation Solutions

The <u>Kapa'a Transportation Solutions</u> (KTS) was prepared for the State Department of Transportation, dated August 2015. The KTS was prepared for DOT in cooperation with the Kauai County Department of Public Works, Planning Department, and Transportation Agency, and the Federal Highways Administration. The KTS included input from the Kapa'a Citizens Advisory Committee, which is comprised of the Kapa'a Business Association, Kapa'a High School and Middle School, Wailua-Kapa'a Neighborhood Association, Kauai Visitors and Convention Bureau, and Kauai Path.

The KTS cited traffic congestion in the downtown/historic district of Kapa'a Town, which resulted from on-street parking in the curb lanes in both directions on Kuhio Highway. In addition, to the delays caused by vehicles maneuvering into and out of the parallel parking stalls along Kuhio Highway, the on-street parking occupies valuable highway space, which could otherwise provide additional through traffic lanes and/or median left-turn lanes. Table 5 summarizes the roadway improvements relevant to this traffic study, which were prioritized in the <u>Kapa'a Transportation Solutions</u>.

Table 5. Potential Traffic Solutions				
Location	Description	Priority		
Kapa`a Bypass Road	Widen the Kapa`a Bypass Road to provide one lane in the northbound direction from Olohena Road to Kuhio Highway.	<5 Years		
Kuhio Highway and Kukui Street	Modify traffic signal timings.	<5 Years		
Kuhio Hwy and Kapa`a Bypass Road	Intersection improvements.	<5 Years		
Olohena Road at Kapa`a Middle School	Improve crosswalk			
Kapa`a Bypass Road and Olohena Road Roundabout	Add a separate (bypass) right-turn lane at the roundabout from makai bound Olohena Road to southbound Kapa'a Bypass Road.	<5 Years		
Kuhio Highway	Provide an additional southbound lane on Kuhio Highway from Kapa'a Bypass Road to Kuamoo Road (scheduled for construction).	<5 Years		
Kuhio Highway and Kukui Street	Close the makai leg of Kukui Street to provide business parking. Implement vehicular and pedestrian improvements on Kukui Street (mauka leg) and Huluili Street at Kuhio Highway.	5-10 Years		
Kapa`a New Town Park	Provide direct access from the Kapa'a New Town Park to the Kapa'a Bypass Road.	5-10 Years		
Kuhio Highway and Lehua Street	Improve the left-turn movement from Lehua Street onto Kuhio Highway.	5-10 Years		
Kapa`a Bypass Rd and Kuhio Highway	Re-align the Kapa`a Bypass Road (South Junction) to intersect Kuhio Highway opposite Aleka Loop or Papaloa Road.  5-10			

Table 5. Potential Traffic Solutions (Cont'd.)					
Location	Description	Priority			
Kapa`a Bypass Road South of Olohena Road	Improve the horizontal alignment and shoulders of the Kapa'a Bypass Road, south of Olohena Road, to Kuhio Highway.	5-10 Years			
Kuhio Highway Between Kawaihau Road and Lehua Street	Provide a two-way median left-turn lane along Kuhio Highway.	5-10 Years			
Olohena Rd at Kahau St and Lehua St	Implement intersection improvements and bicycle/pedestrian improvements to Kuhio Highway.	5-10 Years			
Olohena Rd at Kaapuni Rd and Kaehulua Rd	Implement intersection improvements	5-10 Years			
Kaapuni Road	Upgrade/improve Kaapuni Road to major collector standards, including bicycle lanes.	5-10 Years			
Olohena Road Between Kuhio Highway and Kamalu Road	Improve Olohena Road to accommodate non-motorized modes.	5-10 Years			
Kapa`a Bus Hub	Relocate the Kapa'a bus hub from its existing location near the skate park to a new location on or near the Kuhio Highway mainline, with amenities.	5-10 Years			

Improving the horizontal alignment and providing shoulders on the Kapa'a Bypass Road, south of Olohena Road may impact the proposed Hokua Place frontage. Any widening and realignment should be coordinated with Hokua Place. The <u>Kapa'a Transportation Solutions</u> also identifies Road A as a new connector road between Olohena Road and the Kapa'a Bypass Road, which was prioritized beyond the 10-year time frame. The construction cost of the connector road was estimated at \$25,824,000.

## E. Peak Hour Traffic Analysis Without Project

# 1. AM Peak Hour Traffic Without Project

During the AM peak hour of traffic without the proposed project, the overall intersection of Kuhio Highway and Kukui Street is expected to continue to operate at LOS "A". The left-turn movement on makai bound Kukui Street is expected to continue to operate at LOS "F". The traffic movements in both directions on Kuhio Highway are expected to continue to operate at LOS "A" at Kukui Street, during the AM peak hour of traffic without the proposed project.

Makai bound Lehua Street is expected to operate at LOS "F" at Kuhio Highway, during the AM peak hour of traffic without the proposed project. Makai bound Ohia Street is expected to operate at LOS "E" at Kuhio Highway.

During the AM peak hour of traffic without the proposed project, makai bound Olohena Road is expected to operate at LOS "F" at the Kapa'a Bypass Road. Southbound Kapa'a Bypass Road is expected to operate at LOS "D" at Olohena Road. Kaapuni Road is expected to operate at LOS "F" at Olohena Road. The other intersections in the study area are expected to operate at satisfactory Levels of Service, during the AM peak hour of traffic without the proposed project. Figures 7 and 8 depict the AM peak hour volumes without the proposed project.

# 2. PM Peak Hour Traffic Without Project

The overall intersection of Kuhio Highway and Kukui Street is expected to operate at LOS "A", during the PM peak hour of traffic without the proposed project. The left-turn movement on makai bound Kukui Street is expected to continue to operate at LOS "E". The other traffic movements at the intersection are expected to operate at LOS "A", during the PM peak hour of traffic without the proposed project.

The left-turn movement on makai bound Lehua Street is expected to operate at LOS "E" at Kuhio Highway, during the PM peak hour of traffic without the proposed project. Makai bound Ohia Street also is expected to operate at LOS "F" at Kuhio Highway. Mauka bound Pono Kai Driveway is expected to operate at LOS "E", during the PM peak hour of traffic without the proposed project.

Southbound Lehua Street is expected to continue to operate at LOS "F" at Olohena Road, during the PM peak hour of traffic without the proposed project. Southbound Kapa'a Bypass Road is expected to operate at LOS "F" at Olohena Road. The right-turn movement from the Kapa'a Bypass Road onto Kuhio Highway is expected to operate LOS "D". The other intersections in the study area are expected to operate at satisfactory Levels of Service, during the PM peak hour of traffic without the proposed project.

The PM peak hour traffic demands at the intersection of Olohena Road and Kaapuni Road without the proposed project are expected to meet the AASHTO guideline for an exclusive left-turn lane on makai bound Olohena Road. The PM peak hour volumes without the proposed project is depicted on Figures 9 and 10.

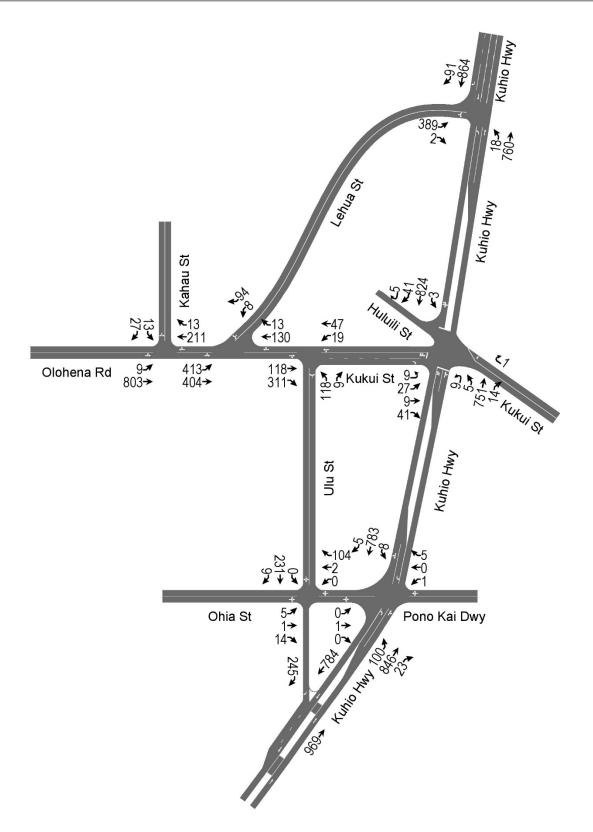
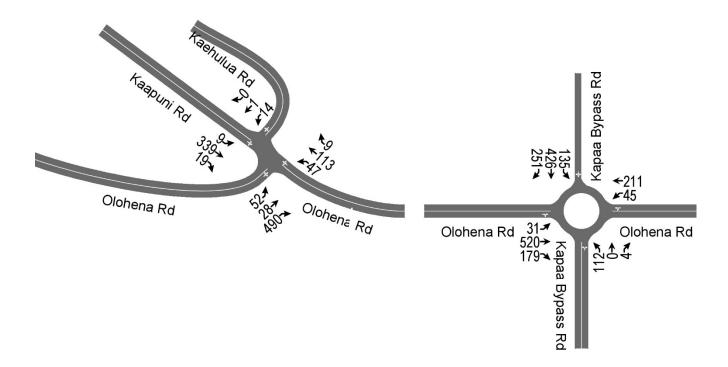


Figure 7. AM Peak Hour Volumes Without Project 20



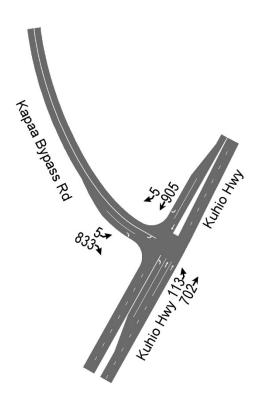


Figure 8. AM Peak Hour Volumes Without Project (Cont'd.)

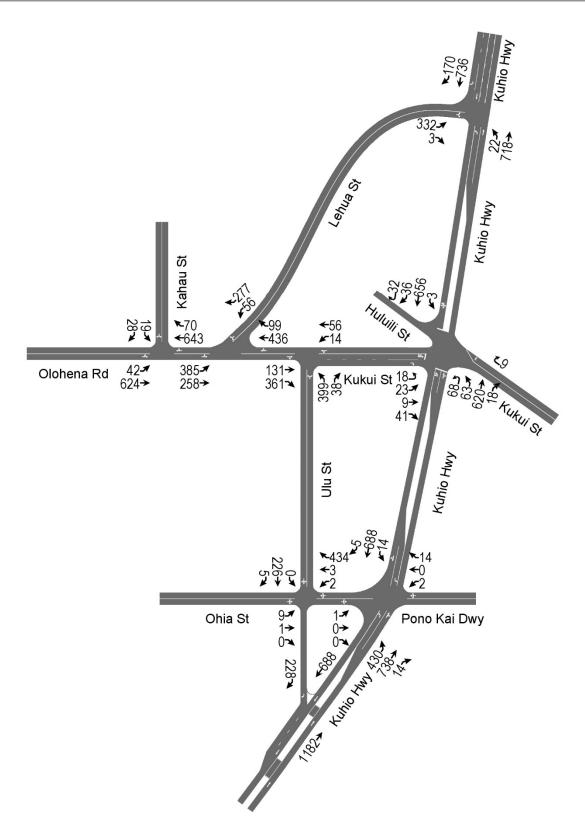
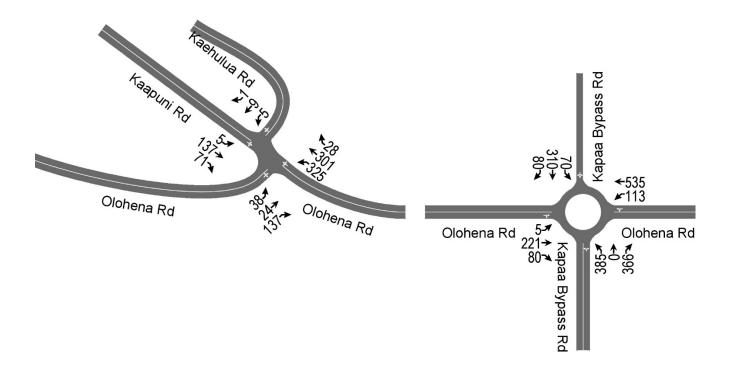


Figure 9. PM Peak Hour Volumes Without Project 22



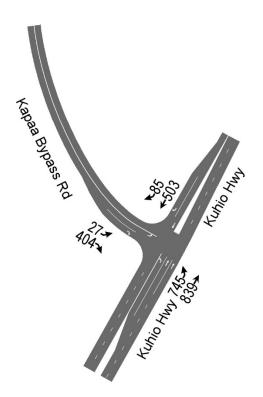


Figure 10. PM Peak Hour Volumes Without Project (Cont'd.)

# IV. Traffic Impact Analysis

# A. Trip Generation Characteristics

The trip generation characteristics were based upon the ITE trip rates for single-family detached dwelling units (DU) and residential condominium/townhouse units. The weekday ITE trip rates, during the AM peak hour and the PM peak hour of adjacent street traffic, were used for this traffic impact analysis. The ITE regression equations were used to derive the trip rates for the single-family detached dwellings in this analysis. Although ITE recommends the use of the regression equations to derive trip rates, the average peak hour trips rates for the residential condominium/townhouse were used in this analysis. The 800 DU is outside the range of the ITE trip generation data that were utilized to develop the regression equations for condominiums. Furthermore, the average condominium/townhouse rates are higher (more conservative) than the rates that are derived by the regression equations.

The ITE trip generation rates for a shopping center were developed from the regression equations to estimate the trip generation from the proposed 8,000 SFGFA retail center. The pass-by trip rate of 81.2 percent was applied to the PM peak hour trip generation. The ITE pass-by trip rate is reasonable given the size of Hokua Place and the volume of through traffic on Road A. Hokua Place is expected to generate totals of 487 vph and 560 vph, during the AM and PM peak hours of traffic, respectively. The trip generation characteristics for the proposed project are summarized in Table 6.

Table 6. Hokua Place Trip Generation Characteristics							
Land Use	Units	AM Peak Hour (vph)			PM Peak Hour (vph)		
(ITE Code)		Enter	Exit	Total	Enter	Exit	Total
Single-Family Phase 1 (265)	16 DU	5	16	21	13	7	20
Single-Family Phase 2 (265)	100 DU	20	60	80	66	38	104
Condominium/ Townhouse (230)	800 DU	60	292	352	279	137	416
Retail Center	8,000 SFGFA	21	13	34	53	57	110
(820)	Pass-By	0	0	0	(-)45	(-)45	(-)90
Total External Trips		106	381	487	366	194	560

#### **B.** Site Access Improvements

A conventional channelized, Tee-intersection was considered at the intersection of Road A and the Kapa'a Bypass, with left-turn and right-turn deceleration/storage lanes and a median refuge lane on the Kapa'a Bypass Road. Under unsignalized traffic control, the left-turn lane from Road A onto the Kapa'a Bypass Road is expected to operate at LOS "F", during the PM peak hour of traffic. As an alternative to traffic signalization, a roundabout intersection is recommended Road A and the Kapa'a Bypass Road. The following site access improvements are recommended for the proposed project:

- 1. Construct a stop-controlled Tee-intersection between Road A and Olohena Road.
- 2. Construct a stop-controlled Tee-intersection between the Phase 1 Driveway and Olohena Road.
- 3. Construct a single-lane roundabout at the intersection of Road A and the Kapa'a Bypass Road.

# C. Traffic Assignment

The traffic assignments were based upon the existing traffic patterns along Olohena Road and Kukui Street. The traffic assignments also included through traffic demands, which are expected to be diverted from makai bound Olohena Road and from northbound Kapa'a Bypass Road to the proposed Road A. Road A is expected to reduce the traffic demands at the roundabout intersection of the Kapa'a Bypass Road and Olohena Road. Figures 11 and 12 depict the AM peak hour traffic assignments. The PM peak hour traffic assignments are depicted on Figures 13 and 14.

#### D. AM Peak Hour Traffic Analysis With Project

The roundabout intersection of the Kapa'a Bypass Road and Road A is expected to operate at satisfactory Levels of Service, during the AM peak hour of traffic with the proposed project. Road A is expected to operate at LOS "C" at Olohena Road. The Phase 1 driveway on Olohena Road is expected to operate at LOS "B".

The overall intersection of Kuhio Highway and Kukui Street is expected to continue to operate at LOS "A", during the AM peak hour of traffic with the proposed project. The left-turn movement on makai bound Kukui Street is expected to continue to operate at LOS "F". The traffic movements in both directions on Kuhio Highway are expected to operate at LOS "A" at Kukui Street, during the AM peak hour of traffic with the proposed project.

Makai bound Lehua Street is expected to continue to operate at LOS "F" at Kuhio Highway, during the AM peak hour of traffic with the proposed project. Makai bound Ohia Street also is expected to operate at LOS "F" at Kuhio Highway. The Pono Kai Driveway is expected to operate at LOS "D".

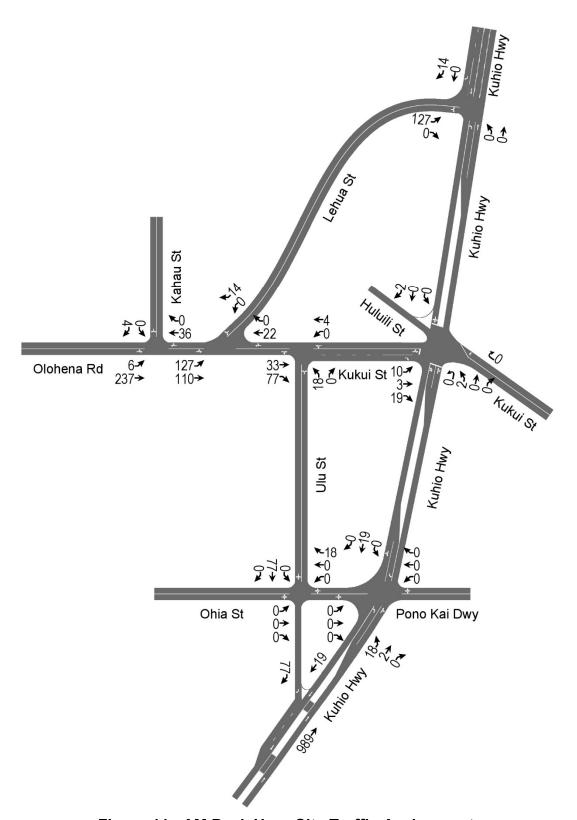


Figure 11. AM Peak Hour Site Traffic Assignment

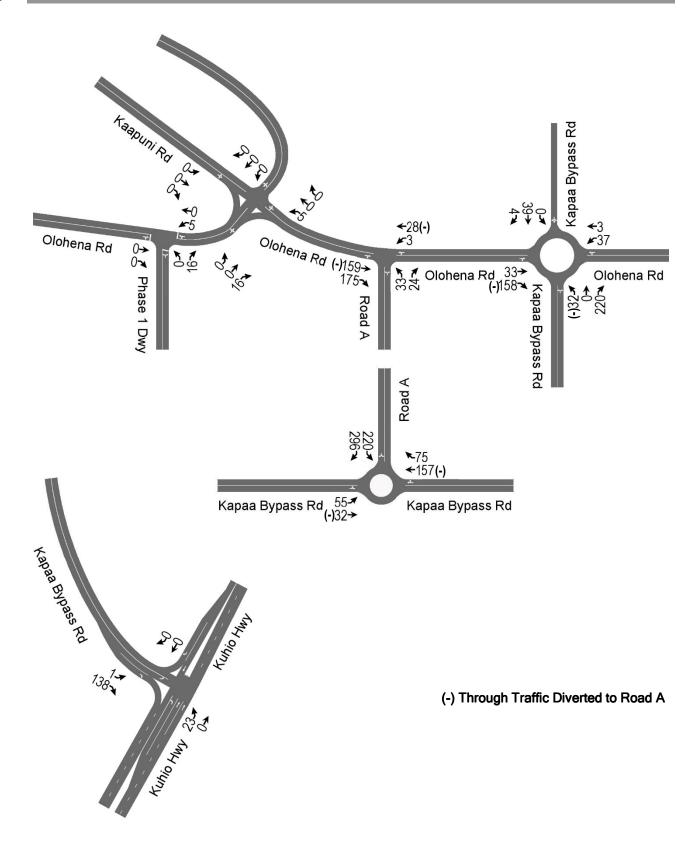


Figure 12. AM Peak Hour Site Traffic Assignment (Cont'd.)

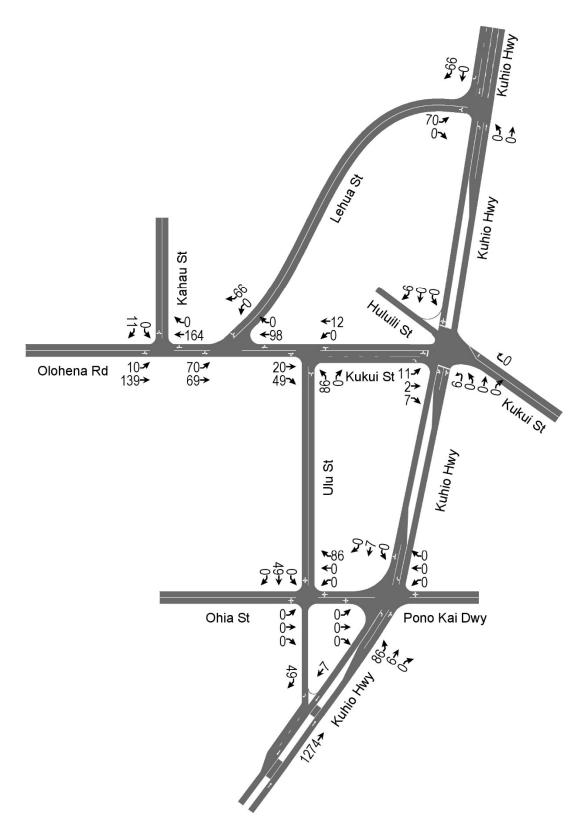


Figure 13. PM Peak Hour Site Traffic Assignment

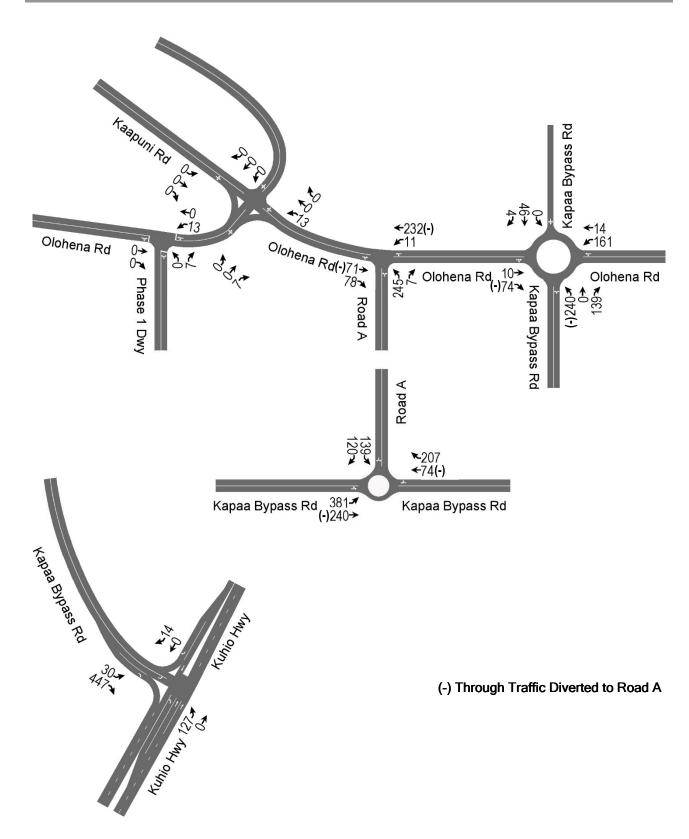


Figure 14. PM Peak Hour Site Traffic Assignment (Cont'd.)

During the AM peak hour of traffic with the proposed project, the overall roundabout intersection of the Kapa'a Bypass Road and Olohena Road is expected to improve from LOS "E" to LOS "D", during the AM peak hour of traffic with the proposed project. Makai bound Olohena Road is expected to improve from LOS "F" to LOS "E", due to the diversion of makai bound traffic to Road A. Southbound Kapa'a Bypass Road is expected to worsen from LOS "D" to LOS "E" at Olohena Road.

Kaapuni Road is expected to continue to operate at LOS "F" at Olohena Road. The left-turn movement from the Kapa'a Bypass Road onto Kuhio Highway is expected to operate at LOS "F", during the AM peak hour of traffic with the proposed project. Figures 15 and 16 depict the AM peak hour volumes with the proposed project.

#### E. PM Peak Hour Traffic Analysis With Project

During the PM peak hour of traffic with the proposed project, the roundabout intersection of the Kapa'a Bypass Road and Road A is expected to operate at satisfactory Levels of Service. Road A is expected to operate at LOS "D" at Olohena Road. The Phase 1 driveway on Olohena Road is expected to operate at LOS "A".

The overall intersection of Kuhio Highway and Kukui Street is expected to continue to operate at LOS "A", during the PM peak hour of traffic with the proposed project. The left-turn movement on makai bound Kukui Street is expected to continue to operate at LOS "F". The traffic movements in both directions on Kuhio Highway are expected to operate at LOS "A" at Kukui Street, during the PM peak hour of traffic with the proposed project.

Makai bound Lehua Street is expected to continue to operate at LOS "F" at Kuhio Highway, during the PM peak hour of traffic with the proposed project. Makai bound Ohia Street also is expected to operate at LOS "F" at Kuhio Highway. The Pono Kai Driveway is expected to operate at LOS "D" at Kuhio Highway.

During the PM peak hour of traffic with the proposed project, southbound Kapa'a Bypass Road is expected to continue to operate at LOS "F" at its roundabout intersection with Olohena Road. The left-turn and right-turn movements on the Kapa'a Bypass Road (South Junction) at Kuhio Highway are expected to operate at LOS "E" and LOS "D", respectively. The other intersections in the study area are expected to operate at satisfactory Levels of Service, during the PM peak hour of traffic with the proposed project. Figures 17 and 18 depict the PM peak hour volumes with the proposed project.

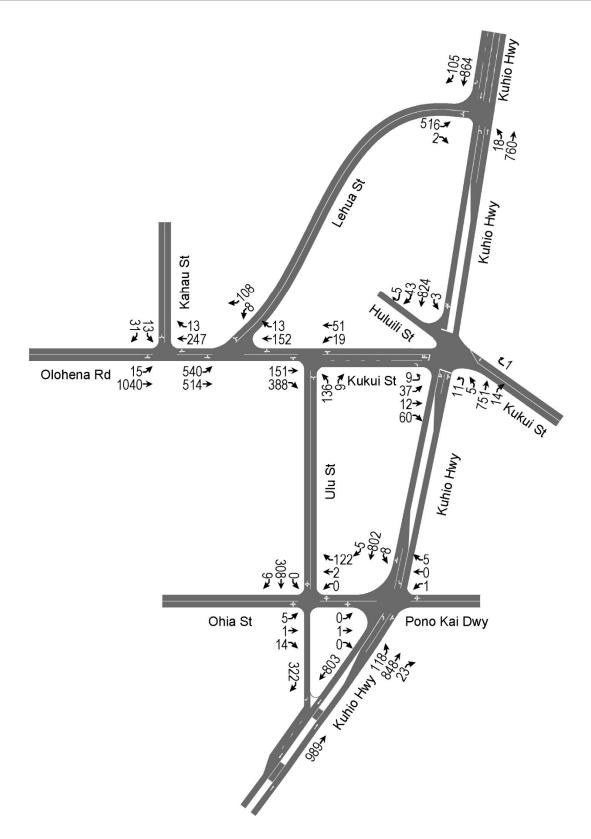


Figure 15. AM Peak Hour Volumes With Project

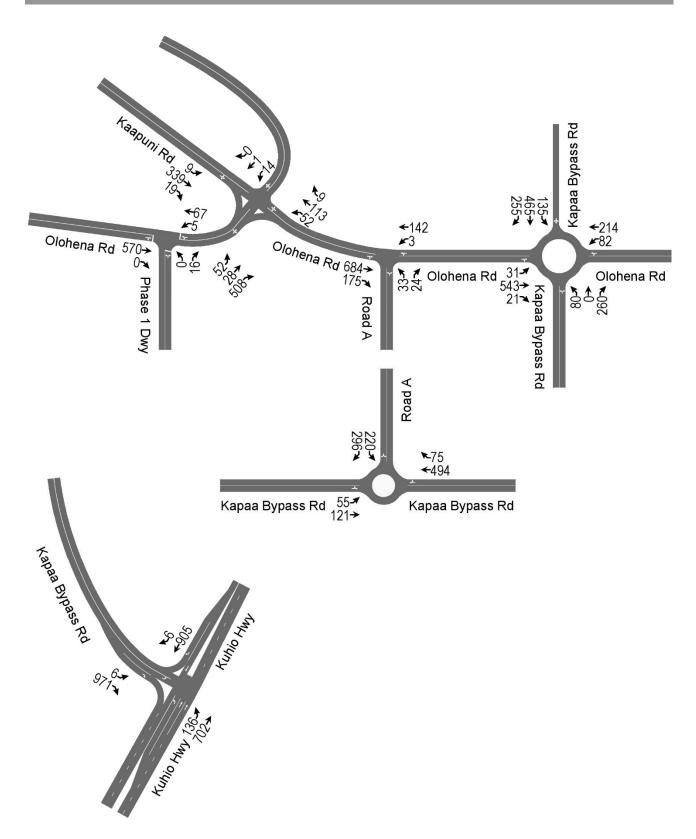


Figure 16. AM Peak Hour Volumes With Project (Cont'd.)

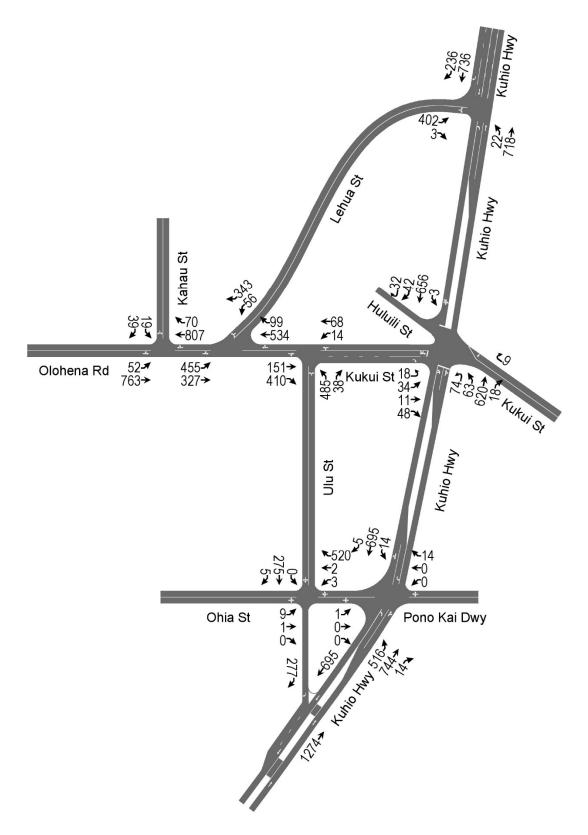


Figure 17. PM Peak Hour Volumes With Project

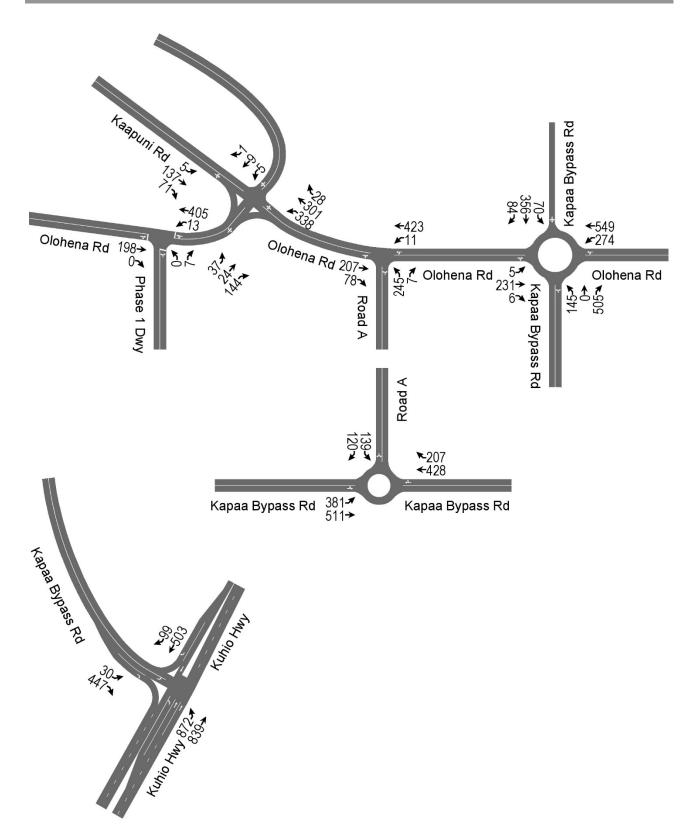


Figure 18. PM Peak Hour Volumes With Project (Cont'd.)

### V. Recommendations and Conclusions

### A. Recommended Traffic Improvements Without Project

The following traffic improvements expand upon the potential traffic solutions, which were cited in the <u>Kapa'a Transportation Solutions</u>, and are recommended to mitigate the existing and expected traffic congestion without the proposed project:

- 1. Widen Kuhio Highway between the Kapa'a Bypass Road (South Junction) and Kuamoo Road to provide two through lanes in each direction (DOT).
- 2. Restripe the median on the north leg of Kuhio Highway at the Kapa'a Bypass Road (South Junction) to provide a median refuge lane to facilitate the left-turn movement from the Kapa'a Bypass Road onto northbound Kuhio Highway.
- 3. Restrict on-street parking along Kuhio Highway within Kapa`a Town. Provide off-street business parking to replace the restricted parking along Kuhio Highway. Restripe Kuhio Highway to provide additional through and/or left-turn lanes.
- 4. Modify the traffic signal traffic operations at the intersection of Kuhio Highway and Kukui Street to reduce queuing and delays.
- 5. Add a right-turn bypass lane at the roundabout intersection from southbound Kapa'a Bypass Road to mauka bound Olohena Road.
- 6. Realign Kaehulua Road to intersect Olohena Road and Kaapuni Road opposite the mauka leg of Olohena Road to create a four-legged intersection with stop-controls on Kaehulua Road and the mauka leg of Olohena Road. Realign/channelize the mauka leg of Olohena Road to improve the intersection sight distance. Channelize the right-turn movements on the makai bound approaches of Kaapuni Road and Olohena Road.
- 7. Extend the median refuge lane/two-way left-turn lane on Kuhio Highway from Lehua Street to Kawaihau Road.

DOT is in the process of widening Kuhio Highway from the Kapa'a Bypass Road to Kuamoo Road (Item No. 1 above). The above Item Nos. 2, 3, and 7 are expected to improve the capacity of Kuhio Highway through Kapa'a Town.

Consolidating the intersections of Olohena Road, Kaapuni Road, and Kaehulua Road (Item No. 6 above) into a single four-legged intersection is expected to improve the traffic operations and safety at the intersection. A roundabout intersection was considered for Olohena Road, Kaapuni Road, and Kaehulua Road. However, the existing roadway slopes would have required extensive grading to provide adequate sight distances at a roundabout intersection.

### **B.** Recommended Traffic Improvements With Project

The following traffic improvements are recommended to mitigate traffic impacts with the proposed project:

- 1. Construct Road A from Olohena Road to the Kapa'a Bypass Road, as recommended in the Kapa'a Transportation Solutions.
- 2. Construct a single-lane roundabout at the intersection of Road A and the Kapa'a Bypass Road.

### C. Conclusions

An interim solution to the existing traffic congestion in Kapa'a Town is recommended in the <u>Kapa'a Transportation Solutions</u>. Constructing additional off-street parking areas would provide the opportunity to restripe the existing on-street parking lanes and striped shoulders along Kuhio Highway to provide for additional through traffic lanes and/or median left-turn lanes.

The existing southbound traffic demand in Kapa'a Town is reduced by the Kapa'a Bypass Road. Dedication of the Kapa'a Bypass Road right-of-way along the Hokua Place frontage would assure the continued usage of the existing Kapa'a Bypass Road. Any horizontal realignment and/or widening of the Kapa'a Bypass Road along the project frontage should be coordinated with the development of Hokua Place. Widening of the north leg of the Kapa'a Bypass Road between Olohena Road and Kuhio Highway (North Junction) to provide at a two-way, two-lane roadway would provide additional capacity in the northbound direction.

The construction of the proposed Road A is recommended in the <u>Kapa'a Transportation Solutions</u> to provide additional mauka-makai roadway capacity between Kapa'a Valley and the Kapa'a Bypass Road. By diverting through traffic between Olohena Road and the Kapa'a Bypass Road, Road A is expected to mitigate the project's traffic impacts, during the AM and PM peak hour of traffic with the proposed project at the roundabout intersection of the Kapa'a Bypass Road and Olohena Road.

The roundabout at the intersection of the Kapa'a Bypass Road and Road A will increase the intersection capacity, in anticipation of the increase in demand resulting from the future two-lane widening of the Kapa'a Bypass Road between Olohena Road and Kuhio Highway (North Junction). The proposed roundabout intersection of the Kapa'a Bypass Road and Olohena Road is expected to operate at satisfactory Levels of Service, during the AM and PM peak hours of traffic with the proposed project. Table 7 summarizes the measures of effectiveness (MOE) from the traffic analysis of the intersections in the study area.



· ·		MOE	EDY	DDE	DDD	1	ble 7. Sum		· ·		NIDD	OPT	O.P.T.	CDS	<b>T</b> ,
enario	Intersection	MOE	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection
	Kuhio Hwy &	LOS		F	C	N/A	N/A	A	A		4		<u>A</u>		A
	Kukui St &	Delay		15.8	31.5	N/A	N/A	1.3	1.3		.8		4.5		7.3
	Huluili St	v/c		.49	0.34	N/A	N/A	0.02	0.02	l	42	4	0.48		0.49 (maximum)
		LOS	N/A	N/A	N/A	A	A	N/A		В		N/A	N/A	N/A	A
	Ulu St & Kukui St	Delay	N/A	N/A	N/A	8.3	0.0	N/A		11.3		N/A	N/A	N/A	2.6
		v/c	N/A	N/A	N/A	0.01	N/A	N/A		0.16		N/A	N/A	N/A	N/A
	Olohena Rd &	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		В		A
	Lehua St	Delay	8.3	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		11.7		4.4
	Zunuu av	v/c	0.25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.15		N/A
	Olohena Rd &	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		В		A
	Kahau St	Delay	7.6	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		13.2		0.6
	Kanau St	v/c	0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.08		N/A
	17-1:- 11 0	LOS		E		N/A	N/A	N/A	A	A	N/A	N/A	A	A	A
	Kuhio Hwy & Lehua St	Delay		46.6		N/A	N/A	N/A	9.3	0.0	N/A	N/A	0.0	0.0	8.7
	Lenua St	v/c		0.85		N/A	N/A	N/A	0.02	0.40	N/A	N/A	0.45	0.04	N/A
Existing	Kuhio Hwy &	LOS		Е			С		A	N/A	N/A	A	N/A	N/A	A
M Peak	Ohia St/Pono Kai	Delay		48.9			23.7		9.60	N/A	N/A	9.4	N/A	N/A	0.7
Hour Traffic	Dwy	v/c		0.012			0.025		0.10	N/A	N/A	0.01	N/A	N/A	N/A
Traine		LOS		В			A					A			A
	Ulu St & Ohia St	Delay		10			8.8					0.0			3.1
		v/c		0.023			0.089					N/A			N/A
		LOS		D			A			A			С		С
	Kapa`a Bypass Rd	Delay		30			5.1			7.1			18.2		20.0
	& Olohena Rd	v/c		0.855			0.204			0.19			0.757		N/A
		LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		Е		В
	Olohena Rd &	Delay	7.7	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		35.1		12.3
	Kaapuni Rd	v/c	0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.751		N/A
		LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		В		A
	Kaapuni Rd &	Delay	7.6	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		11.7		0.4
	Kaehulua Rd	v/c	0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.024		N/A
		LOS	C	N/A	A	N/A	N/A	N/A	В	N/A	N/A	N/A	N/A	N/A	A
	Kuhio Hwy &	Delay	20.7	N/A	0.0	N/A	N/A	N/A	10.0	N/A	N/A	N/A	N/A	N/A	0.7
	Kapa`a Bypass Rd	v/c	0.02	N/A	N/A	N/A	N/A	N/A	0.12	N/A	N/A	N/A	N/A	N/A	N/A

EBL – Makai (East) Bound Left-Turn Movement

EBT – Makai (East) Bound Through Movement

EBR – Makai (East) Bound Right-Turn Movement

WBL - Mauka (West) Bound Left-Turn Movement

WBT – Mauka (West) Bound Through Movement WBR - Mauka (West) Bound Right-Turn Movement NBL – North Bound Left-Turn Movement

 $NBT-North\ Bound\ Through\ Movement$ NBR – North Bound Right-Turn Movement SBL – South Bound Left-Turn Movement SBT – South Bound Through Movement

SBR – South Bound Right-Turn Movement



						Table 7	. Summary	of Capacit	y Analysis (	(Cont'd.)					
Scenario	Intersection	MOE	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection
	Kuhio Hwy &	LOS	-	E	A	N/A	N/A	A	A		A		A		A
	Kukui St &	Delay	6	1.6	6.9	N/A	N/A	2.4	2.4	3	3.4		8.2		7.4
	Huluili St	v/c	0.	.39	0.22	N/A	N/A	0.18	0.18	0.	.36		0.48		0.48 (maximum)
	III C44 0	LOS	N/A	N/A	N/A	A	A	N/A		C		N/A	N/A	N/A	A
	Ulu Street & Kukui Street	Delay	N/A	N/A	N/A	8.2	0.0	N/A		17.4		N/A	N/A	N/A	7.7
	Kukui Street	v/c	N/A	N/A	N/A	0.01	N/A	N/A		0.567		N/A	N/A	N/A	N/A
	Olahana Daad (	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		Е		В
	Olohena Road & Lehua Street	Delay	9.8	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		47		12.9
	Lenua Street	v/c	0.31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.81		N/A
	Olohena Road &	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		С		A
	Kahau Street	Delay	9.1	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		19.0		0.9
	ixanau Sticet	v/c	0.04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.14		N/A
	Kuhio II 0-	LOS		D		N/A	N/A	N/A	A	A	N/A	N/A	A	A	A
'victing	Kuhio Hwy & Lehua Street	Delay		29.2		N/A	N/A	N/A	9.0	0.0	N/A	N/A	0.0	0.0	5.0
	Lenua Street	v/c		0.68		N/A	N/A	N/A	0.02	0.38	N/A	N/A	0.39	0.09	N/A
isting I Peak	Kuhio Hwy &	LOS		F			D		В	N/A	N/A	A	N/A	N/A	A
I Feak Iour	Ohia St/Pono Kai	Delay		143.4			33.1		11.3	N/A	N/A	9.0	N/A	N/A	3.0
raffic	Driveway	v/c		0.04			0.10		0.40	N/A	N/A	0.01	N/A	N/A	N/A
	Ulu Street & Ohia	LOS		С			В		N/A	N/A	N/A	A	N/A	N/A	A
	Street & Onia	Delay		15.5			10.6		N/A	N/A	N/A	0.0	N/A	N/A	7.1
	Street	v/c		0.03			0.38		N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Kapa`a Bypass Rd	LOS		A			В			В			D		В
	& Olohena Rd	Delay		7.9			11.5			11.5			26.6		14.2
	Co Oronena 1ta	v/c		0.32	1		0.57	T		0.61			0.73		N/A
	Olohena Rd &	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		C		В
	Kaapuni Rd	Delay	8.7	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		17.3		4.1
	ixaapam ixa	v/c	0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.39		N/A
	Kaanuni Dd &	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		В		A
	Kaapuni Rd & Kaehulua Rd	Delay	7.9	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		11.7		0.4
	ixuviiuiuu itu	v/c	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.02		N/A
	Kuhio Uww P.	LOS	В	N/A	С	N/A	N/A	N/A	В	N/A	N/A	N/A	N/A	N/A	A
	Kuhio Hwy & Kapa`a Bypass Rd	Delay	14.0	N/A	19.0	N/A	N/A	N/A	12.7	N/A	N/A	N/A	N/A	N/A	6.7
	rapa a Dypass Ru	v/c	0.06	N/A	N/A	N/A	N/A	N/A	0.59	N/A	N/A	N/A	N/A	N/A	N/A



						Table 7	7. Summary	of Capacit	y Analysis (	(Cont'd.)					
Scenario	Intersection	MOE	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection
	Kuhio Hwy &	LOS		F	C	N/A	N/A	A	A		A		A		A
	Kukui Street &	Delay	11	7.0	29.9	N/A	N/A	1.5	1.5	3	3.7		6.3		8.5
	Huluili Street	v/c	0.	.52	0.36	N/A	N/A	0.03	0.03	0	.49		0.57		0.57 (maximum)
	Ulu Street &	LOS	N/A	N/A	N/A	A	A	N/A		В		N/A	N/A	N/A	A
	Kukui Street	Delay	N/A	N/A	N/A	8.5	0.0	N/A		12.2		N/A	N/A	N/A	2.7
	TRUKUI Street	v/c	N/A	N/A	N/A	0.02	N/A	N/A		0.203		N/A	N/A	N/A	N/A
	Olohena Road &	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		В		A
	Lehua Street	Delay	8.5	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		13.1		4.6
	Lenua Street	v/c	0.29	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.19		N/A
	Olohena Road &	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		В		A
	Kahau Street	Delay	7.7	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		14.2		0.6
	Immu Street	v/c	0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.09		N/A
	Kuhio Hwy &	LOS		F		N/A	N/A	N/A	A	A	N/A	N/A	A	A	В
	Lehua Street	Delay		104.5		N/A	N/A	N/A	9.7	0.0	N/A	N/A	0.0	0.0	19.3
AM Pook	Lenua Street	v/c		1.33		N/A	N/A	N/A	0.02	0.45	N/A	N/A	0.51	0.06	N/A
Peak Hour	Kuhio Hwy &	LOS		F			D		В	N/A	N/A	A	N/A	N/A	A
raffic	Ohia St/Pono Kai	Delay		65			27.4		10.00	N/A	N/A	9.8	N/A	N/A	0.7
Vithout	Driveway	v/c		0.016			0.036		0.12	N/A	N/A	0.01	N/A	N/A	N/A
roject	Ulu Street & Ohia	LOS		В			A		N/A	N/A	N/A	A	N/A	N/A	A
	Street & Onia	Delay		10.3			8.8		N/A	N/A	N/A	0.0	N/A	N/A	3.1
		v/c		0.029			0.101		N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Vana'a Dynass Dd	LOS		F			A			A			D		Е
	Kapa`a Bypass Rd & Olohena Rd	Delay		64.9			5.4			7.4			30.1		38.7
	Colonella Ita	v/c		1.027	_		0.233	1		0.174	_		0.888		N/A
	Olohena Rd &	LOS	-	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A		В		A
	Kaapuni Rd	Delay	-	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A		11.4		7.8
	Pam 114	v/c	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.399		N/A
	Kaapuni Rd &	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		В		A
	Kaapulli Ku & Kaehulua Rd	Delay	7.6	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		12.6		0.4
	AMVIIWIUU ILU	v/c	0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.031		N/A
	Kuhia Uww &	LOS	С	N/A	A	N/A	N/A	N/A	В	N/A	N/A	N/A	N/A	N/A	A
	Kuhio Hwy & Kapa`a Bypass Rd	Delay	24.0	N/A	0.0	N/A	N/A	N/A	10.7	N/A	N/A	N/A	N/A	N/A	0.8
	Lapa a Dypass Nu	v/c	0.03	N/A	N/A	N/A	N/A	N/A	0.15	N/A	N/A	N/A	N/A	N/A	N/A



						Table 7	. Summary	of Capacity	Analysis (	Cont'd.)					
Scenario	Intersection	MOE	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection
	Kuhio Hwy &	LOS	]	E	A	N/A	N/A	A	A	_	A		A		A
	Kukui St &	Delay	62	2.1	8.6	N/A	N/A	2.7	2.7	3	3.9		9.6		8.3
	Huluili St	v/c	0.	.42	0.25	N/A	N/A	0.22	0.22	0.	.41		0.55		0.55 (maximum)
	III. Chung 4 0	LOS	N/A	N/A	N/A	A	A	N/A		С		N/A	N/A	N/A	В
	Ulu Street & Kukui Street	Delay	N/A	N/A	N/A	8.5	0.0	N/A		24.7		N/A	N/A	N/A	10.9
	Kukui Street	v/c	N/A	N/A	N/A	0.01	N/A	N/A		0.72		N/A	N/A	N/A	N/A
	Olahama Daad 0	LOS	В	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		F		Е
	Olohena Road & Lehua Street	Delay	10.8	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		199.9		46.8
	Lenua Street	v/c	0.38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		1.30		N/A
	Olohena Road &	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		С		A
	Kahau Street	Delay	9.5	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		24.3		1.1
	Kanau Street	v/c	0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.20		N/A
	IZ-1.:- II 0	LOS		E		N/A	N/A	N/A	A	A	N/A	N/A	A	A	В
M Peak - Hour	Kuhio Hwy & Lehua Street	Delay		48.4		N/A	N/A	N/A	9.3	0.0	N/A	N/A	0.0	0.0	19.3
	Lenua Street	v/c		0.85		N/A	N/A	N/A	0.03	0.42	N/A	N/A	0.43	0.10	N/A
	Kuhio Hwy &	LOS		F			E		В	N/A	N/A	A	N/A	N/A	A
Traffic	Ohia St/Pono Kai	Delay		261.5			47.7		12.80	N/A	N/A	9.3	N/A	N/A	3.5
Without	Driveway	v/c		0.067			0.16		0.48	N/A	N/A	0.02	N/A	N/A	N/A
Project	III. Street P Ohio	LOS		C			В		N/A	N/A	N/A	A	N/A	N/A	A
	Ulu Street & Ohia Street	Delay		17.5			11.1		N/A	N/A	N/A	0.0	N/A	N/A	7.4
	Street	v/c		0.033			0.428		N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Vana'a Dymass Dd	LOS		A			C			C			F		D
	Kapa`a Bypass Rd & Olohena Rd	Delay		9.8			16.8			16.9			72.9		27.7
	& Oloncha Ru	v/c		0.399			0.714			0.744			1.002		N/A
	Olohena Road &	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		C		A
	Kaapuni Road	Delay	9.1	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		23.5		5.4
	Ixaapuili Kvau	v/c	0.07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.538		N/A
	Vaanuni Daad 0	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		В		A
	Kaapuni Road & Kaehulua Road	Delay	8.1	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		12.6		0.4
	ixaciiuiua ixvau	v/c	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.031		N/A
	IZ-12- II 0	LOS	С	N/A	D	N/A	N/A	N/A	С	N/A	N/A	N/A	N/A	N/A	A
	Kuhio Hwy & Kapa`a Bypass Rd	Delay	22.6	N/A	25.4	N/A	N/A	N/A	15.6	N/A	N/A	N/A	N/A	N/A	8.6
	Mapa a Dypass Ku	v/c	0.12	N/A	N/A	N/A	N/A	N/A	0.70	N/A	N/A	N/A	N/A	N/A	N/A



						Table 7	. Summary	of Capacity	Analysis (	Cont'd.)					
Scenario	Intersection	MOE	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection
	Kuhio Hwy &	LOS	]	F	С	N/A	N/A	A	A		A		A		A
	Kukui Street &	Delay	11	8.9	26.1	N/A	N/A	1.8	1.8	4	<del>.</del> .1		7.0		10.0
	Huluili Street	v/c	0.	.59	0.42	N/A	N/A	0.03	0.03	0.	.49		0.57		0.59 (maximum)
	III Ci i o	LOS	N/A	N/A	N/A	A	A	N/A		В		N/A	N/A	N/A	A
	Ulu Street & Kukui Street	Delay	N/A	N/A	N/A	8.8	0.0	N/A		13.6		N/A	N/A	N/A	2.8
	Kukui Sti eet	v/c	N/A	N/A	N/A	0.02	N/A	N/A		0.257		N/A	N/A	N/A	N/A
	Olahara Daad 0	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		C		A
	Olohena Road & Lehua Street	Delay	9.2	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		19		5.4
	Lenua Street	v/c	0.39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.31		N/A
	Olohena Road &	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		C		A
	Kahau Street	Delay	7.8	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		17.3		0.6
	Ixanau Street	v/c	0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.13		N/A
	Kuhia Huu P	LOS		F		N/A	N/A	N/A	A	A	N/A	N/A	A	A	F
	Kuhio Hwy & Lehua Street	Delay		237.5		N/A	N/A	N/A	9.7	0.0	N/A	N/A	0.0	0.0	54.4
	Lenua Street	v/c		1.43		N/A	N/A	N/A	0.02	0.45	N/A	N/A	0.51	0.05	N/A
	Kuhio Hwy &	LOS		F			D		В	N/A	N/A	A	N/A	N/A	A
AM Peak	Ohia Street/Pono	Delay		71.7			29.0		10.2	N/A	N/A	9.8	N/A	N/A	0.8
Hour Traffic	Kai Driveway	v/c		0.02			0.04		0.15	N/A	N/A	0.01	N/A	N/A	N/A
With	Ulu Street & Ohia	LOS		В			A		N/A	N/A	N/A	A	N/A	N/A	A
Project	Street & Ollia	Delay		11			8.9		N/A	N/A	N/A	0.0	N/A	N/A	2.9
Ü	Street	v/c		0.03			0.12		N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Kapa`a Bypass Rd	LOS		Е			A			В			E		D
	& Olohena Rd	Delay		42.1			5.7			14.5			40.7		31.9
	W STOREM TU	v/c		0.91			0.27	1		0.53			0.95		N/A
	Road A & Olohena	LOS	N/A	N/A	N/A	A	A	N/A		С		N/A	N/A	N/A	A
	Road Road	Delay	N/A	N/A	N/A	9.6	0.0	N/A		17.9		N/A	N/A	N/A	1.0
		v/c	N/A	N/A	N/A	0.00	N/A	N/A		0.17	T	N/A	N/A	N/A	N/A
	Olohena Road &	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		F		D
	Kaapuni Road	Delay	7.8	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		106.1		35.5
		v/c	0.06	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		1.078		N/A
	Kaapuni Rd &	LOS	A	A	N/A	N/A	В	N/A	N/A	N/A	N/A		В		A
	Kaapulli Ku & Kaehulua Rd	Delay	7.6	0.0	N/A	N/A	12.6	N/A	N/A	N/A	N/A		12.6		0.4
		v/c	0.01	-	N/A	N/A	0.03	N/A	N/A	N/A	N/A		0.03		N/A
	Phase 1 Dwy &	LOS	N/A	N/A	N/A	A	A	N/A		В		N/A	N/A	N/A	A
	Olohena Rd	Delay	N/A	N/A	N/A	8.6	0.0	N/A		12.1		N/A	N/A	N/A	0.4
	O Ionena Ita	v/c	N/A	N/A	N/A	0.01	N/A	N/A		0.03		N/A	N/A	N/A	N/A



						Table 7	. Summary	of Capacity	Analysis (	Cont'd.)					
Scenario	Intersection	MOE	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection
AM Peak	IZ ' D	LOS		A			A			N/A			C		В
Hour	Kapa`a Bypass Road & Road A	Delay		4.8			7.3			N/A			15.1		10.1
Traffic	Roau & Roau A	v/c		0.16			0.45			N/A			0.64		N/A
With	Kuhio Hwy &	LOS	F	N/A	A	N/A	N/A	N/A	В	N/A	N/A	N/A	N/A	N/A	A
Project	Kapa`a Bypass	Delay	51.1	N/A	0.0	N/A	N/A	N/A	10.9	N/A	N/A	N/A	N/A	N/A	1.0
Cont'd.)	Road	v/c	0.07	N/A	N/A	N/A	N/A	N/A	0.18	N/A	N/A	N/A	N/A	N/A	N/A
	Kuhio Hwy &	LOS		С	В	N/A	N/A	A	A	,	A		A		A
	Kukui Street &	Delay	32	2.8	11.4	N/A	N/A	0.0	3.8	7	'.0		8.2		.6
	Huluili Street	v/c	0.	.31	0.27	N/A	N/A	N/A	0.03	0.	.56		0.63		0.63 (maximum)
	V 0	LOS		F		N/A	N/A	N/A	A	A	N/A	N/A	A	A	Е
	Kuhio Hwy & Lehua Street	Delay		196.5		N/A	N/A	N/A	9.7	0.0	N/A	N/A	0.0	0.0	45.0
AM Peak	Lenua Street	v/c		1.34		N/A	N/A	N/A	0.02	0.45	N/A	N/A	0.51	0.06	N/A
Hour	IZ V D D D L	LOS		С			A			В		I	В	A	В
Traffic With	Kapa`a Bypass Rd & Olohena Rd	Delay		23.9			5.4			11.1		12.1 0.61	2.1	0.0	12.9
Project -	& Olonena Ku	v/c		0.79			0.25			0.46		0.	61	0.13	N/A
mproved	Olohena Rd &	LOS	A	1	A	A		A		D			Е		В
•	Kaapuni Road &	Delay	7.5	0	.0	8.1	0	0.0		34.9			43.2		19.0
	Kaehulua Road	v/c	0.01	N	/A	0.04		=		0.87			0.14		N/A
	Kuhio Hwy &	LOS	C	N/A	A	N/A	N/A	N/A	В	A	N/A	N/A	A	A	A
	Kapa`a Bypass	Delay	21.8	N/A	0.0	N/A	N/A	N/A	10.9	0.0	N/A	N/A	0.0	0.0	0.9
	Road	v/c	0.03	N/A	N/A	N/A	N/A	N/A	0.18	N/A	N/A	N/A	N/A	N/A	N/A
	Kuhio Hwy &	LOS		Е	В	N/A	N/A	A	A	,	A		В		A
	Kukui Street &	Delay	6.	3.3	11.1	N/A	N/A	3.0	3.0	4	1.2		10.5		9.4
	Huluili Street	v/c	0.	.48	0.27	N/A	N/A	0.23	0.23	0.	.42		0.56		0.56 (maximum)
	Ulu Street &	LOS	N/A	N/A	N/A	A	A	N/A		Е		N/A	N/A	N/A	A
PM Peak	Kukui Street	Delay	N/A	N/A	N/A	8.7	0.0	N/A		49.9		N/A	N/A	N/A	22.5
Hour Traffic	IXUKUI SHICCI	v/c	N/A	N/A	N/A	0.01	N/A	N/A		0.93		N/A	N/A	N/A	N/A
With	Olahana Daad 0	LOS	В	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		F		A
Project	Olohena Road & Lehua Street	Delay	12.7	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		714.0		160.2
J	Lenua Sti CCi	v/c	0.49	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		2.45		N/A
	Olahama B. 1.0	LOS	В	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		Е		A
	Olohena Road & Kahau Street	Delay	10.4	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		36.5		1.5
	Nanau Street	v/c	0.07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.34		N/A



						Table 7.	Summary	of Capacity	Analysis (	Cont'd.)					
Scenario	Intersection	MOE	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection
	Vuhia II-ur 0	LOS		F		N/A	N/A	N/A	A	A	N/A	N/A	A	A	В
	Kuhio Hwy & Lehua Street	Delay		85.7		N/A	N/A	N/A	9.3	0.0	N/A	N/A	0.0	0.0	12.5
	Lenua Street	v/c		1.03		N/A	N/A	N/A	0.03	0.42	N/A	N/A	0.43	0.14	N/A
	Kuhio Hwy &	LOS		F			В		В	N/A	N/A	A	N/A	N/A	A
	Ohia St/Pono Kai	Delay		401.7			14.6		14.6	N/A	N/A	9.3	N/A	N/A	4.1
	Driveway	v/c		0.10			0.04		0.58	N/A	N/A	0.02	N/A	N/A	N/A
	III. Chuad ( Ohia	LOS		С			В		N/A	N/A	N/A	A	N/A	N/A	A
	Ulu Street & Ohia Street	Delay		21.7			12.1		N/A	N/A	N/A	0.0	N/A	N/A	8.1
	Street	v/c		0.04			0.51		N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Vana'a Dymass Dd	LOS		В			В			В			F		D
	Kapa`a Bypass Rd & Olohena Rd	Delay		11.3			14.2			13.3			84.7		29.8
	& Oloncha Ru	v/c		0.39			0.72			0.65			1.05		N/A
	D 14 0 OL1	LOS	N/A	N/A	N/A	A	A	N/A		D		N/A	N/A	N/A	A
PM Peak	Road A & Olohena Road	Delay	N/A	N/A	N/A	7.8	0.0	N/A		26.7		N/A	N/A	N/A	7.0
Hour Traffic	Noau	v/c	N/A	N/A	N/A	0.01	N/A	N/A		0.61		N/A	N/A	N/A	N/A
With		LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		С		D
	Olohena Road & Kaapuni Road	Delay	9.1	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A		24.5		5.5
Project Cont'd.)	Kaapuili Kuau	v/c	0.07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		0.55		N/A
	1/2 'D 10	LOS	A	A	N/A	N/A	В	N/A	N/A	N/A	N/A		В		A
	Kaapuni Road & Kaehulua Road	Delay	8.1	0.0	N/A	N/A	12.6	N/A	N/A	N/A	N/A		12.6		0.4
	Kachulua Kuau	v/c	0.00	-	N/A	N/A	0.03	N/A	N/A	N/A	N/A		0.03		N/A
	DI 1 D 0	LOS	N/A	N/A	N/A	A	A	N/A		A		N/A	N/A	N/A	A
	Phase 1 Dwy & Olohena Road	Delay	N/A	N/A	N/A	7.6	0.0	N/A		9.3		N/A	N/A	N/A	0.2
	Olulicha Kuau	v/c	N/A	N/A	N/A	0.01	N/A	N/A		0.01		N/A	N/A	N/A	N/A
	IZ V D D I	LOS		С			С			N/A			A		В
	Kapa`a Bypass Rd & Road A	Delay		16.0			16.1			N/A			7.4		14.8
	& Roau A	v/c		0.76			0.70			75			0.30		N/A
	Kuhio Hwy &	LOS	Е	N/A	A	N/A	N/A	N/A	С	N/A	N/A	N/A	N/A	N/A	В
	Kapa`a Bypass	Delay	44.7	N/A	0.0	N/A	N/A	N/A	21.1	N/A	N/A	N/A	N/A	N/A	12.0
	Road	v/c	0.25	N/A	N/A	N/A	N/A	N/A	0.81	N/A	N/A	N/A	N/A	N/A	N/A
PM Peak	Kuhio Hwy &	LOS	(	C	A	N/A	N/A	A	A	I	4		В		В
Hour	Kukui Street &	Delay	32	2.0	1.8	N/A	N/A	0.1	4.0	5	.9		16.7		11.4
Traffic	Huluili Street	v/c	0.	.32	0.18	N/A	N/A	N/A	0.24	0.	46		0.66		0.66 (maximum)
With	T/ 11 TY 0	LOS		F		N/A	N/A	N/A	A	A	N/A	N/A	A	A	В
Project -	Kuhio Hwy &	Delay		65.9		N/A	N/A	N/A	9.3	0.0	N/A	N/A	0.0	0.0	12.7
<b>Improved</b>	Lehua Street	v/c		0.96		N/A	N/A	N/A	0.03	0.42	N/A	N/A	0.43	0.14	N/A



						Table 7.	Summary	of Capacity	Analysis (	Cont'd.)					
Scenario	Intersection	MOE	EBL	EBT	<b>EBR</b>	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection
	IZ V D D I	LOS		A			В			В		I	)	A	В
PM Peak	Kapa`a Bypass Rd & Olohena Rd	Delay		9.1			12.5			11.2		25	5.1	0.0	13.7
Hour	& Olohena Ku	v/c		0.33			0.68			0.60		0.	72	0.04	N/A
Traffic	Olohena Rd &			A	1	A		C			Е		A		
With	c Otolicia ita a		0	8.2	0	.0		21.3			36.0		7.1		
Project –	Kaehulua Road	v/c	0.00	N/	'A	0.23	N	/A		0.48			0.12		N/A
Improved	Kuhio Hwy &	LOS	Е	N/A	A	N/A	N/A	N/A	C	A	N/A	N/A	A	A	A
(Cont'd.)	Kapa`a Bypass	Delay	44.9	N/A	0.0	N/A	N/A	N/A	22.4	0.0	N/A	N/A	0.0	0.0	8.9
	Road	v/c	0.25	N/A	N/A	N/A	N/A	N/A	0.81	N/A	N/A	N/A	N/A	N/A	N/A

# TRAFFIC IMPACT ANALYSIS REPORT UPDATE

FOR THE PROPOSED

### **HOKUA PLACE**

**KAPA`A, KAUAI, HAWAII TAX MAP KEY: (4) 4-3-03: 01** 

## **APPENDIX A**

TRAFFIC COUNT DATA

Study Name Kuhio Hwy Kukui ST 3-15-17 to 3-17-17 Start Date 3/15/17 Start Time 3:00 PM Site Code Hokua Place

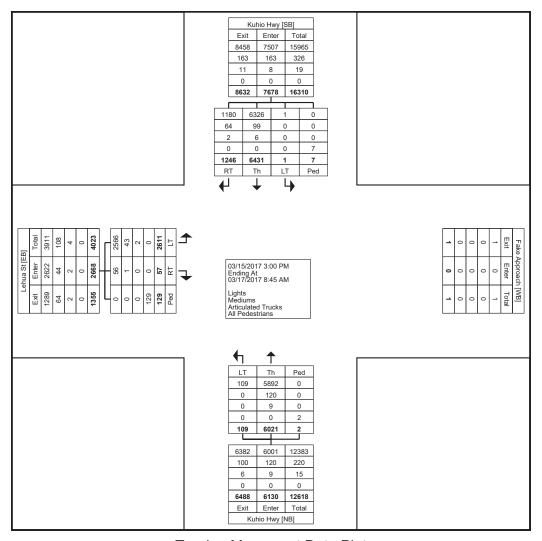
Start		Kuku Makai I				Kuk Mauka	ui St Bound				Hwy bound			Kuhio South	Hwy bound		Interse	ection
3/15/17	LT-Huluili	LT-Kuhio	Thru	Right-Turn	Left-Turn	Thru	Thru-Huluili	RT-Kuhio	LT-Kukui	LT-Huluili	Thru	Right-Turn	Left-Turn	Thru	RT-Kukui	RT-Huluili	15-Min Totals	Hourly Totals
3:00 PM	4	11	6	12	0	0	0	4	4	1	121	2	3	126	14	1	309	1160
3:15 PM	1	16	1	9	0	0	0	7	4	1	89	2	1	129	16	0	276	1136
3:30 PM	10	12	0	9	0	0	0	7	5	0	86	0	3	144	12	1	289	1142
3:45 PM	9	15	4	16	1	0	0	1	11	2	99	1	1	113	13	0	286	1125
4:00 PM	7	18	6	11	0	0	0	2	7	0	96	1	3	111	18	5	285	1136
4:15 PM	4	16	4	11	0	0	0	8	7	1	97	0	1	112	20	1	282	1123
4:30 PM	3	9	1	13	0	0	0	2	8	0	110	1	2	107	15	1	272	1153
4:45 PM	2	12	1	11	0	0	0	1	5	0	103	2	3	136	17	4	297	1177
5:00 PM	4	13	4	4	0	0	0	2	7	7	82	1	2	133	10	3	272	1144
5:15 PM	12	9	5	16	0	0	0	1	4	5	109	0	2	134	9	6	312	
5:30 PM	4	3	3	6	0	0	0	2	6	6	123	2	0	133	7	1	296	
5:45 PM	2	7	5	6	0	0	0	3	1	1	108	0	1	124	5	1	264	
3/16/17		0	2		0	0	0	2	4	4	404	4	0	404	2	2	225	1207
7:00 AM 7:15 AM	0	8	2	8	0	0	0	2	2	1	124 166	3	0	184 182	2	2	335 <b>380</b>	1397 <b>1410</b>
7:15 AM 7:30 AM	2	6	0	15	0	0	0	0	7	1 5	143	3	0	153	9	0	380	1 <b>410</b> 1367
7:30 AM 7:45 AM	2	3	2	15	0	0	0	0	/ A	ر ا	153	1	,	151	7	0	343	1399
8:00 AM	2	11	4	9	0	n	0	1	3	1	143	2	2	165	2	3	348	1399
8:15 AM	0	0	1	3	0	0	0	4	4	1	143	4	3	172	2	0	337	1001
8:30 AM	0	5	3	6	0	0	0	9	7	0	153	9	1	170	7	1	371	
8:45 AM	3	9	0	8	0	0	0	9	2	2	151	5	2	143	6	1	341	
3/16/17	1 1	-	-	-				_		_			<u> </u>		_			
3:00 PM	7	7	2	9	1	0	0	1	5	1	93	3	2	134	10	4	279	1182
3:15 PM	2	11	2	3	0	0	0	3	10	2	129	1	2	125	9	3	302	1203
3:30 PM	2	7	4	18	0	0	0	4	7	3	105	3	2	144	14	1	314	1160
3:45 PM	3	8	5	7	0	0	0	10	2	1	96	0	1	148	5	1	287	1160
4:00 PM	3	3	4	9	0	0	0	0	3	4	113	4	2	139	10	6	300	1162
4:15 PM	2	8	1	6	0	0	0	0	3	3	111	1	2	114	8	0	259	1176
4:30 PM	1	9	1	3	0	0	0	0	4	0	136	2	1	148	7	2	314	1269
4:45 PM	6	5	2	3	0	0	0	0	10	1	114	2	3	134	8	1	289	1281
5:00 PM	7	4	1	8	0	0	0	6	4	3	119	3	2	144	10	3	314	1305
5:15 PM	4	5	2	9	0	0	0	2	15	14	137	4	0	145	8	7	352	
5:30 PM	2	6	0	0	0	0	0	2	3	1	154	3	0	145	5	5	326	
5:45 PM	0	6	1	7	0	0	0	1	3	0	134	3	1	147	6	4	313	
3/17/17				_		_		_	_	_						_		
6:45 AM	0	4		6	0	0	0	2	2	0	104	1	1	167	6	0	294	1326
7:00 AM	1	3	1	8	0	0	0	3	3	0	101	2	0	179	7	0	308	1386
7:15 AM 7:30 AM	0	10	0	11 12	0	0	0	2	5 9	0	172 141	2	0	170 167	5	0	371 353	1415 1395
7:30 AM 7:45 AM	1	70	1	12	0	0	0	3	3	0	141	2	1	167	14	0	353 354	1395
8:00 AM		9	0	14	0	0	0	Z 1	ە 11	2	135	3	2	149	7	0	337	1304
8:15 AM	3	5	1	7	0	0	0	11	5	_	146	3	2	155	12	0		
8:30 AM	0	6	0	6	· ·	0	0	2	4	0		3	2	164	10	0		
3.00 / AVI	, 0	۷.			, o		, o				120		. 41	104	0		022	
AM Peak Hou	ır Traffic		3/16/17															
7:15 AM		26	8	48	0	0	0	1	16	11	605	7	3	651	24	4	1410	
PHF	0.75	1.08	N/A	1.33	N/A	N/A	N/A	N/A	2.00	2.75	0.91	0.58	N/A	0.89	0.67	N/A	0.93	
PHV	8	24	0	36	0	0	0	0	8	4	664	12	0	728	36	0	1520	
T Factor	0%	15%	0%	4%	N/A	N/A	N/A	0%	6%	9%	4%	0%	0%	1%	4%	0%		
PM Peak Hou	r Traffic		3/16/17															
5:00 PM		21	4	24	0	0	0	11	25			13	3	581	29	19		
PHF		1.05	0.50	0.67	N/A	N/A	N/A	1.38	0.42			0.81	N/A	1.00	0.91	0.68		
PHV		20	8	36		0		8	60			16	0	580	32	28	1408	
T Factor	0%	0%	0%	0%	N/A	N/A	N/A	0%	0%	0%	0%	0%	0%	1%	0%	0%		

Count Name: Kuhio Hwy Lehua St 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 1

**Turning Movement Data** 

Lehua St Kuhio Hwy Kuhio Hwy Start Time Start Time Kuhio Hwy Kuhio Hwy Southbound Southbound						Turnin	ig Mov	vemer	nt Data						
Section   Company   Comp			Lehua	a St								Kuhio Hwy			
Tell Full Full Full Full Full Full Full F	O. 1.T		Eastbo	ound			North	bound				Southbound			
3.15 PM 3.30 PM 75 2 0 77 3 2 140 0 150 0 158 0 1546 6 0 210 226 3.45 PM 77 2 1 2 73 2 148 0 150 0 154 45 0 179 402 Houty Total 208 10 25 208 10 25 208 11 145 1 146 0 150 0 574 21 1 0 785 145 PM 75 2 0 77 176 187 187 187 187 187 187 187 187 187 187	Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
33.9 PM	3:00 PM	71	3	1	74	2	142	0	144	0	140	59	0	199	417
Houry Total 286 10 25 296 10 10 563 10 150 0 134 45 0 179 402 403 415 PM	3:15 PM	68	4	14	72	4	137	0	141	0	146	51	0	197	410
Heury Total   286   10   25   296   10   563   0   573   0   574   211   0   785   1654   140   140   140   141	3:30 PM	75	2	8	77	2	136	0	138	0	154	56	0	210	425
## 4:00 PM	3:45 PM	72	1	2	73	2	148	0	150	0	134	45	0	179	402
## 4:00 PM			10		-	-		0	-	0	574	-		785	
# 415 PM			4	6	-		145	1	_	0	135		0	-	408
430 PM			-			_		1						-	
## A45 PM				5				0							
Hourly Total   290								•							
S.50 PM															
Si   FM   Si   1								-							
S30 PM			-												
Houty Total   89   2					-				_	_					
Hourly Total   332   5   22   337   10   603   0   613   0   553   165   0   718   1668						-			-					-	
****BREAK*****								-	-					-	
7:00 AM															
7:15 AM			-		-	-				-		-		-	
7:30 AM 95 1 0 96 1 163 0 164 0 170 15 0 185 445 7:45 AM 64 1 2 65 1 180 0 181 0 181 0 184 15 0 199 445 8:00 AM 45 0 4 45 2 169 0 171 1 189 18 0 208 424 8:15 AM 29 1 3 3 30 10 145 0 155 0 194 12 0 206 391 8:30 AM 41 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 1 10 42 5 161 0 166 0 150 21 0 171 379 8:45 AM 41 1 1 1 1 10 42 5 161 0 167 0 138 42 0 180 415 3:15 AM 42 0 180 415 3:15 AM 49 0 202 423 3:15 PM 67 1 7 68 5 162 0 167 0 138 42 0 180 415 415 AM 49 0 202 423 3:15 PM 67 1 7 68 5 144 0 146 0 14															
T-45 AM														-	
Hourly Total   296   2   5   298   6   651   0   657   0   758   58   0   816   1771														-	
8:00 AM															
8:15 AM         29         1         3         30         10         145         0         155         0         194         12         0         206         391           8:30 AM         34         3         3         37         2         168         0         170         0         185         16         0         201         408           8:45 AM         41         1         10         42         5         161         0         166         0         150         21         0         171         379           Hourly Total         149         5         20         1534         19         643         0         662         1         718         67         0         786         1602           ****BREAK*****         -<															
8:30 AM										_					
8.45 AM															
Hourly Total   149   5   20   154   19   643   0   662   1   718   67   0   786   1602										_				-	
**************************************						-			_					-	
3:00 PM			. 5	20	_	19		. 0		1			0		1602
3:15 PM         67         1         7         68         5         162         0         167         0         138         42         0         180         415           3:30 PM         71         4         4         75         6         145         0         151         0         155         55         0         210         436           3:45 PM         78         2         1         80         5         141         0         146         0         146         35         0         181         407           Hourly Total         301         9         15         310         19         579         0         598         0         592         181         0         773         1681           4:00 PM         71         0         0         71         4         148         0         152         0         163         51         0         214         437           4:15 PM         66         2         1         68         2         145         0         147         0         119         39         0         158         373           4:30 PM         68         3         0					-			-	-	-		-		-	
3:30 PM 71 4 4 775 6 145 0 151 0 155 55 0 210 436  3:45 PM 78 2 1 80 5 141 0 146 0 146 35 0 181 407  Hourly Total 301 9 15 310 19 579 0 598 0 592 181 0 773 1681  4:00 PM 71 0 0 71 4 148 0 152 0 163 51 0 214 437  4:15 PM 66 2 1 68 2 145 0 147 0 119 39 0 158 373  4:30 PM 81 1 1 82 1 134 0 135 0 146 25 0 171 388  Hourly Total 286 6 2 292 8 602 0 610 0 586 160 0 746 1648  5:00 PM 80 1 1 81 81 3 140 0 143 0 163 34 0 197 421  5:15 PM 74 1 6 75 2 161 0 163 0 160 27 0 187 425  5:30 PM 50 2 0 52 4 167 0 171 0 158 28 0 186 409  5:45 PM 55 1 2 56 3 133 0 136 0 151 33 0 184 376  Hourly Total 259 5 9 264 12 601 0 613 0 632 122 0 754 1631  **BREAK ***			-		-				-						
3.45 PM   78   2   1   80   5   141   0   146   0   146   35   0   181   407	3:15 PM		-		-			-	-					-	
Hourly Total   301   9   15   310   19   579   0   598   0   592   181   0   773   1681	3:30 PM	71	4	4	75	6	145	0	151	0	155	55	0	210	436
4:00 PM         71         0         0         71         4         148         0         152         0         163         51         0         214         437           4:15 PM         66         2         1         68         2         145         0         147         0         119         39         0         158         373           4:30 PM         68         3         0         71         1         175         0         176         0         158         45         0         203         450           4:45 PM         81         1         1         82         1         134         0         135         0         146         25         0         171         388           Hourly Total         286         6         2         292         8         602         0         610         0         586         160         0         746         1648           5:00 PM         80         1         1         81         3         140         0         143         0         163         34         0         197         421           5:15 PM         74         1         6	3:45 PM							-							407
4:15 PM         66         2         1         68         2         145         0         147         0         119         39         0         158         373           4:30 PM         68         3         0         71         1         175         0         176         0         158         45         0         203         450           4:45 PM         81         1         1         82         1         134         0         135         0         146         25         0         171         388           Hourly Total         286         6         2         292         8         602         0         610         0         586         160         0         746         1648           5:00 PM         80         1         1         81         3         140         0         143         0         163         34         0         197         421           5:15 PM         74         1         6         75         2         161         0         163         0         160         27         0         187         425           5:30 PM         50         2         0	Hourly Total	301	9	15	310	19	579	0	598	0	592	181	0	773	1681
4:30 PM         68         3         0         71         1         175         0         176         0         158         45         0         203         450           4:45 PM         81         1         1         82         1         134         0         135         0         146         25         0         171         388           Hourly Total         286         6         2         292         8         602         0         610         0         586         160         0         746         1648           5:00 PM         80         1         1         81         3         140         0         143         0         163         34         0         197         421           5:15 PM         74         1         6         75         2         161         0         163         0         160         27         0         187         425           5:30 PM         50         2         0         52         4         167         0         171         0         158         28         0         186         409           5:45 PM         55         1         2	4:00 PM	71	0	0	71	4	148	0	152	0	163	51	0	214	437
4:45 PM         81         1         1         82         1         134         0         135         0         146         25         0         171         388           Hourly Total         286         6         2         292         8         602         0         610         0         586         160         0         746         1648           5:00 PM         80         1         1         81         3         140         0         143         0         163         34         0         197         421           5:15 PM         74         1         6         75         2         161         0         163         0         160         27         0         187         425           5:30 PM         50         2         0         52         4         167         0         171         0         158         28         0         186         409           5:45 PM         55         1         2         56         3         133         0         136         0         151         33         0         184         376           Hourly Total         259         5         9	4:15 PM	66	2	1	68	2	145	0	147	0	119	39	0	158	373
Hourly Total         286         6         2         292         8         602         0         610         0         586         160         0         746         1648           5:00 PM         80         1         1         81         3         140         0         143         0         163         34         0         197         421           5:15 PM         74         1         6         75         2         161         0         163         0         160         27         0         187         425           5:30 PM         50         2         0         52         4         167         0         171         0         158         28         0         186         409           5:45 PM         55         1         2         56         3         133         0         136         0         151         33         0         184         376           Hourly Total         259         5         9         264         12         601         0         613         0         632         122         0         754         1631           ****BREAK ****         -         - </td <td>4:30 PM</td> <td>68</td> <td>3</td> <td>0</td> <td>71</td> <td>1</td> <td>175</td> <td>0</td> <td>176</td> <td>0</td> <td>158</td> <td>45</td> <td>0</td> <td>203</td> <td>450</td>	4:30 PM	68	3	0	71	1	175	0	176	0	158	45	0	203	450
5:00 PM         80         1         1         81         3         140         0         143         0         163         34         0         197         421           5:15 PM         74         1         6         75         2         161         0         163         0         160         27         0         187         425           5:30 PM         50         2         0         52         4         167         0         171         0         158         28         0         186         409           5:45 PM         55         1         2         56         3         133         0         136         0         151         33         0         184         376           Hourly Total         259         5         9         264         12         601         0         613         0         632         122         0         754         1631           **** BREAK *****         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -	4:45 PM	81	1	1	82	1	134	0	135	0	146	25	0	171	388
5:15 PM       74       1       6       75       2       161       0       163       0       160       27       0       187       425         5:30 PM       50       2       0       52       4       167       0       171       0       158       28       0       186       409         5:45 PM       55       1       2       56       3       133       0       136       0       151       33       0       184       376         Hourly Total       259       5       9       264       12       601       0       613       0       632       122       0       754       1631         *** BREAK ****       -	Hourly Total	286	6	2	292	8	602	0	610	0	586	160	0	746	1648
5:30 PM         50         2         0         52         4         167         0         171         0         158         28         0         186         409           5:45 PM         55         1         2         56         3         133         0         136         0         151         33         0         184         376           Hourly Total         259         5         9         264         12         601         0         613         0         632         122         0         754         1631           ***********************************	5:00 PM	80	1	1	81	3	140	0	143	0	163	34	0	197	421
5:45 PM         55         1         2         56         3         133         0         136         0         151         33         0         184         376           Hourly Total         259         5         9         264         12         601         0         613         0         632         122         0         754         1631           **** BREAK ****         - <td>5:15 PM</td> <td>74</td> <td>1</td> <td>6</td> <td>75</td> <td>2</td> <td>161</td> <td>0</td> <td>163</td> <td>0</td> <td>160</td> <td>27</td> <td>0</td> <td>187</td> <td>425</td>	5:15 PM	74	1	6	75	2	161	0	163	0	160	27	0	187	425
Hourly Total         259         5         9         264         12         601         0         613         0         632         122         0         754         1631           *** BREAK ***         -	5:30 PM	50	2	0	52	4	167	0	171	0	158	28	0	186	409
*** BREAK *** 6:45 AM 32 4 1 36 2 107 0 109 0 178 13 7 191 336 Hourly Total 32 4 1 36 2 107 0 109 0 178 13 7 191 336 7:00 AM 62 1 2 63 1 115 0 116 0 183 13 0 196 375 7:15 AM 62 0 1 62 0 1 70 0 170 0 188 12 0 200 432	5:45 PM	55	1	2	56	3	133	0	136	0	151	33	0	184	376
6:45 AM         32         4         1         36         2         107         0         109         0         178         13         7         191         336           Hourly Total         32         4         1         36         2         107         0         109         0         178         13         7         191         336           7:00 AM         62         1         2         63         1         115         0         116         0         183         13         0         196         375           7:15 AM         62         0         1         62         0         170         0         170         0         188         12         0         200         432	Hourly Total	259	5	9	264	12	601	0	613	0	632	122	0	754	1631
Hourly Total         32         4         1         36         2         107         0         109         0         178         13         7         191         336           7:00 AM         62         1         2         63         1         115         0         116         0         183         13         0         196         375           7:15 AM         62         0         1         62         0         170         0         170         0         188         12         0         200         432	*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 AM         62         1         2         63         1         115         0         116         0         183         13         0         196         375           7:15 AM         62         0         1         62         0         170         0         188         12         0         200         432	6:45 AM	32	4	1	36	2	107	0	109	0	178	13	7	191	336
7:15 AM 62 0 1 62 0 170 0 170 0 188 12 0 200 432	Hourly Total	32	4	1	36	2	107	0	109	0	178	13	7	191	336
	7:00 AM	62	1	2	63	1	115	0	116	0	183	13	0	196	375
7:30 AM 87 0 1 87 2 181 0 183 0 177 9 0 186 456	7:15 AM	62	0	1	62	0	170	0	170	0	188	12	0	200	432
	7:30 AM	87	0	1	87	2	181	0	183	0	177	9	0	186	456
7:45 AM 69 0 0 69 1 173 0 174 0 195 18 0 213 456	7:45 AM	69	0	0	69	1	173	0	174	0	195	18	0	213	456
Hourly Total 280 1 4 281 4 639 0 643 0 743 52 0 795 1719					_	-			_	0					
8:00 AM 42 1 3 43 4 144 0 148 0 168 10 0 178 369			1	3	-	4		0	_	0				_	
8:15 AM 35 1 2 36 1 156 0 157 0 189 21 0 210 403			-			-						_			
8:30 AM 23 0 4 23 0 141 0 141 0 172 12 0 184 348			-		-			-	-					-	
Grand Total 2611 57 129 2668 109 6021 2 6130 1 6431 1246 7 7678 16476					-	-			-	·					
Approach % 97.9 2.1 1.8 98.2 0.0 83.8 16.2									_						
														-	
								-							
2500 00 2022 100 0002 100 1000 1000															
% Lights 98.3 98.2 - 98.3 100.0 97.9 - 97.9 100.0 98.4 94.7 - 97.8 97.9															
Mediums 43 1 - 44 0 120 - 120 0 99 64 - 163 327															
% Mediums         1.6         1.8         -         1.6         0.0         2.0         -         2.0         0.0         1.5         5.1         -         2.1         2.0					-				_						
Articulated Trucks 2 0 - 2 0 9 - 9 0 6 2 - 8 19					_	-		-	_					-	
% Articulated Trucks 0.1 0.0 - 0.1 0.0 0.1 - 0.1 0.0 0.1 0.2 - 0.1 0.1					_										
All Pedestrians 129 2 7			-		-	-		-	-	-				-	
% All Pedestrians 100.0 100.0 100.0 100.0	% All Pedestrians	-	-	100.0	-	-	-	100.0	-	-	-	-	100.0	-	

Count Name: Kuhio Hwy Lehua St 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 2



Turning Movement Data Plot

Count Name: Kuhio Hwy Lehua St 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 3

Turning Movement Peak Hour Data (4:45 PM)

			1 011	9	2 0 0 1 1 1 0			ai Data	( 1. 10	,				
		Lehu	a St	•		Kuhic	Hwy		,	,	Kuhio Hwy			
Ctt Ti		Eastbo	ound			North	bound				Southbound			
Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
4:45 PM	74	0	5	74	5	160	0	165	0	164	38	0	202	441
5:00 PM	82	0	5	82	0	134	0	134	0	140	55	0	195	411
5:15 PM	85	1	6	86	7	145	0	152	0	145	51	0	196	434
5:30 PM	96	2	3	98	2	163	0	165	0	137	34	0	171	434
Total	337	3	19	340	14	602	0	616	0	586	178	0	764	1720
Approach %	99.1	0.9	-	-	2.3	97.7	-	-	0.0	76.7	23.3	-	-	-
Total %	19.6	0.2	-	19.8	0.8	35.0	-	35.8	0.0	34.1	10.3	-	44.4	-
PHF	0.878	0.375	-	0.867	0.500	0.923	-	0.933	0.000	0.893	0.809	-	0.946	0.975
Lights	332	3	-	335	14	598	-	612	0	581	173	-	754	1701
% Lights	98.5	100.0	-	98.5	100.0	99.3	-	99.4	-	99.1	97.2	-	98.7	98.9
Mediums	5	0	-	5	0	4	-	4	0	5	5	-	10	19
% Mediums	1.5	0.0	-	1.5	0.0	0.7	-	0.6	-	0.9	2.8	-	1.3	1.1
Articulated Trucks	0	0	-	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	19	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	100.0	-	_	_	_	_	_	-	_	-	_	_

Count Name: Kuhio Hwy Lehua St 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 4

	Kuhio Hwy [SB]	
Lehua St  EB     Exit   Enter   Total     1877   3356   522     5	Peak Hour Data  03/15/2017 4:45 PM Ending At 03/15/2017 5:45 PM Lights Mediums Articulated Trucks All Pedestrians	Fake Approach [WB]           Exit         Enter         Total           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0           0         0         0
	LT Th Ped  14 598 0 0 4 0 0 0 0 0 0 0 14 602 0  584 612 1196 5 4 9 0 0 0 0 0 0 0 0 0 0 589 616 1205  Exit Enter Total  Kuhio Hwy [NB]	

Turning Movement Peak Hour Data Plot (4:45 PM)

Count Name: Kuhio Hwy Lehua St 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 5

Turning Movement Peak Hour Data (7:15 AM)

		1 411	9 .	, , , , , ,	1111 00	AIX 1 10 X	ai Data	(1.10	,,				
	Lehua	a St			Kuhid	Hwy				Kuhio Hwy			
	Eastbo	ound			North	bound				Southbound			
Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
86	0	2	86	4	168	0	172	0	191	20	0	211	469
95	1	0	96	1	163	0	164	0	170	15	0	185	445
64	1	2	65	1	180	0	181	0	184	15	0	199	445
45	0	4	45	2	169	0	171	1	189	18	0	208	424
290	2	8	292	8	680	0	688	1	734	68	0	803	1783
99.3	0.7	-	-	1.2	98.8	-	-	0.1	91.4	8.5	-		-
16.3	0.1	-	16.4	0.4	38.1	-	38.6	0.1	41.2	3.8	-	45.0	-
0.763	0.500	-	0.760	0.500	0.944	-	0.950	0.250	0.961	0.850	-	0.951	0.950
287	2	-	289	8	658	-	666	1	720	57	-	778	1733
99.0	100.0	-	99.0	100.0	96.8	-	96.8	100.0	98.1	83.8	-	96.9	97.2
3	0	-	3	0	20	-	20	0	13	10	-	23	46
1.0	0.0	-	1.0	0.0	2.9	-	2.9	0.0	1.8	14.7	-	2.9	2.6
0	0	-	0	0	2	-	2	0	1	1	-	2	4
0.0	0.0	-	0.0	0.0	0.3	-	0.3	0.0	0.1	1.5	-	0.2	0.2
-	-	8	-	-	-	0	-		-	-	0	-	-
-	-	100.0	-	-	-	-	-	-	-	-	-	-	-
	86 95 64 45 290 99.3 16.3 0.763 287 99.0 3 1.0 0	Left-Turn         Right-Turn           86         0           95         1           64         1           45         0           290         2           99.3         0.7           16.3         0.1           0.763         0.500           287         2           99.0         100.0           3         0           1.0         0.0           0         0           0.0         0.0           -         -	Left-Turn         Right-Turn         Peds           86         0         2           95         1         0           64         1         2           45         0         4           290         2         8           99.3         0.7         -           16.3         0.1         -           0.763         0.500         -           287         2         -           99.0         100.0         -           3         0         -           1.0         0.0         -           0         0         -           0.0         0         -           0.0         -         -           0.0         -         -           0.0         -         -           0.0         -         -           0.0         -         -           0.0         -         -           0.0         -         -           0.0         -         -           0.0         -         -           0.0         -         -           0.0         -         - </td <td>Lehua St           Eastbound           Left-Turn         Right-Turn         Peds         App. Total           86         0         2         86           95         1         0         96           64         1         2         65           45         0         4         45           290         2         8         292           99.3         0.7         -         -           16.3         0.1         -         16.4           0.763         0.500         -         0.760           287         2         -         289           99.0         100.0         -         99.0           3         0         -         99.0           3         0         -         3           1.0         0.0         -         1.0           0         0         -         0           0.0         0         -         0.0           -         -         0         0</td> <td>Lehua St Eastbund           Left-Turn         Right-Turn         Peds         App. Total         Left-Turn           86         0         2         86         4           95         1         0         96         1           64         1         2         65         1           45         0         4         45         2           290         2         8         292         8           99.3         0.7         -         -         1.2           16.3         0.1         -         16.4         0.4           0.763         0.500         -         0.760         0.500           287         2         -         289         8           99.0         100.0         -         99.0         100.0           3         0         -         3         0           1.0         0.0         -         1.0         0.0           0         0         -         0         0           0.0         0         -         0         0</td> <td>Lehua St Eastbound         Kuhic North           Left-Turn         Right-Turn         Peds         App. Total         Left-Turn         Thru           86         0         2         86         4         168           95         1         0         96         1         163           64         1         2         65         1         180           45         0         4         45         2         169           290         2         8         292         8         680           99.3         0.7         -         -         1.2         98.8           16.3         0.1         -         16.4         0.4         38.1           0.763         0.500         -         0.760         0.500         0.944           287         2         -         289         8         658           99.0         100.0         -         99.0         100.0         96.8           3         0         -         3         0         20           1.0         0.0         -         1.0         0.0         2.9           0         0         -</td> <td>Lehua St Eastbount         Ruhio Hwy Northbound           Left-Turn         Right-Turn         Peds         App. Total         Left-Turn         Thru         Peds           86         0         2         86         4         168         0           95         1         0         96         1         163         0           64         1         2         65         1         180         0           45         0         4         45         2         169         0           290         2         8         292         8         680         0           99.3         0.7         -         -         1.2         98.8         -           16.3         0.1         -         16.4         0.4         38.1         -           0.763         0.500         -         0.760         0.500         0.944         -           287         2         -         289         8         658         -           99.0         100.0         9.8         -           3         0         -         99.0         100.0         96.8         -           3<td>Lehua St Eastbound         Left-Turn         Right-Turn         Peds         App. Total         Left-Turn         Thru         Peds         App. Total           86         0         2         86         4         168         0         172           95         1         0         96         1         163         0         164           64         1         2         65         1         180         0         181           45         0         4         45         2         169         0         171           290         2         8         292         8         680         0         688           99.3         0.7         -         -         1.2         98.8         -         -           16.3         0.1         -         16.4         0.4         38.1         -         38.6           0.763         0.500         -         0.760         0.500         0.944         -         0.950           287         2         -         289         8         658         -         96.8           99.0         100</td><td>Lehua St Eastbound         Left-Turn         Right-Turn         Peds         App. Total         Left-Turn         Thru         Peds         App. Total         Left-Turn           86         0         2         86         4         168         0         172         0           95         1         0         96         1         163         0         164         0           64         1         2         65         1         180         0         181         0           45         0         4         45         2         169         0         171         1           290         2         8         292         8         680         0         688         1           99.3         0.7         -         -         1.2         98.8         -         -         0.1           16.3         0.1         -         16.4         0.4         38.1         -         38.6         0.1           0.763         0.500         -         0.760         0.500         0.944         -         0.950         0.250           287<td>Eastburt         Right-Turn         Peds         App. Total         Left-Turn         Thru         190         164         0         184         0         184         0         184         45         Q         9         1         189         2         189         2         8         688         1         189</td><td>Lehua St Eastbound         Lehua St Eastbound         Kuhio Hwy Northbound         Kuhio Hwy Southbound           Left-Turn         Right-Turn         Peds         App. Total         Left-Turn         Thru         Peds         App. Total         Left-Turn         Thru         Right-Turn           86         0         2         86         4         168         0         172         0         191         20           95         1         0         96         1         163         0         164         0         170         15           64         1         2         65         1         180         0         181         0         184         15           45         0         4         45         2         169         0         171         1         189         18           290         2         8         292         8         680         0         688         1         734         68           99.3         0.7         -         -         1.2         98.8         -         -         0.1         91.4         8.5           16.3         0.1         -         16.4</td><td>Lehua St Eastbound         Kuhio Hwy Northbound         Kuhio Hwy Southbound         Register From Southbound         Register From Southbound         Register From Southbound         Left-Turn Thru Peds         App. Total Left-Turn Thru Right-Turn Peds         86         0         191         20         0         191         20         0         191         20         0         181         0         184         15         0         184         15         0         184         18         0         184         18         0         184         18         0         184         0         184         0         184         0         184         0         184         0         184</td><td>  Left-Turn   Right-Turn   Peds   App. Total   Left-Turn   Thru   Right-Turn   Peds   App. Total    </td></td></td>	Lehua St           Eastbound           Left-Turn         Right-Turn         Peds         App. Total           86         0         2         86           95         1         0         96           64         1         2         65           45         0         4         45           290         2         8         292           99.3         0.7         -         -           16.3         0.1         -         16.4           0.763         0.500         -         0.760           287         2         -         289           99.0         100.0         -         99.0           3         0         -         99.0           3         0         -         3           1.0         0.0         -         1.0           0         0         -         0           0.0         0         -         0.0           -         -         0         0	Lehua St Eastbund           Left-Turn         Right-Turn         Peds         App. Total         Left-Turn           86         0         2         86         4           95         1         0         96         1           64         1         2         65         1           45         0         4         45         2           290         2         8         292         8           99.3         0.7         -         -         1.2           16.3         0.1         -         16.4         0.4           0.763         0.500         -         0.760         0.500           287         2         -         289         8           99.0         100.0         -         99.0         100.0           3         0         -         3         0           1.0         0.0         -         1.0         0.0           0         0         -         0         0           0.0         0         -         0         0	Lehua St Eastbound         Kuhic North           Left-Turn         Right-Turn         Peds         App. Total         Left-Turn         Thru           86         0         2         86         4         168           95         1         0         96         1         163           64         1         2         65         1         180           45         0         4         45         2         169           290         2         8         292         8         680           99.3         0.7         -         -         1.2         98.8           16.3         0.1         -         16.4         0.4         38.1           0.763         0.500         -         0.760         0.500         0.944           287         2         -         289         8         658           99.0         100.0         -         99.0         100.0         96.8           3         0         -         3         0         20           1.0         0.0         -         1.0         0.0         2.9           0         0         -	Lehua St Eastbount         Ruhio Hwy Northbound           Left-Turn         Right-Turn         Peds         App. Total         Left-Turn         Thru         Peds           86         0         2         86         4         168         0           95         1         0         96         1         163         0           64         1         2         65         1         180         0           45         0         4         45         2         169         0           290         2         8         292         8         680         0           99.3         0.7         -         -         1.2         98.8         -           16.3         0.1         -         16.4         0.4         38.1         -           0.763         0.500         -         0.760         0.500         0.944         -           287         2         -         289         8         658         -           99.0         100.0         9.8         -           3         0         -         99.0         100.0         96.8         -           3 <td>Lehua St Eastbound         Left-Turn         Right-Turn         Peds         App. Total         Left-Turn         Thru         Peds         App. Total           86         0         2         86         4         168         0         172           95         1         0         96         1         163         0         164           64         1         2         65         1         180         0         181           45         0         4         45         2         169         0         171           290         2         8         292         8         680         0         688           99.3         0.7         -         -         1.2         98.8         -         -           16.3         0.1         -         16.4         0.4         38.1         -         38.6           0.763         0.500         -         0.760         0.500         0.944         -         0.950           287         2         -         289         8         658         -         96.8           99.0         100</td> <td>Lehua St Eastbound         Left-Turn         Right-Turn         Peds         App. Total         Left-Turn         Thru         Peds         App. Total         Left-Turn           86         0         2         86         4         168         0         172         0           95         1         0         96         1         163         0         164         0           64         1         2         65         1         180         0         181         0           45         0         4         45         2         169         0         171         1           290         2         8         292         8         680         0         688         1           99.3         0.7         -         -         1.2         98.8         -         -         0.1           16.3         0.1         -         16.4         0.4         38.1         -         38.6         0.1           0.763         0.500         -         0.760         0.500         0.944         -         0.950         0.250           287<td>Eastburt         Right-Turn         Peds         App. Total         Left-Turn         Thru         190         164         0         184         0         184         0         184         45         Q         9         1         189         2         189         2         8         688         1         189</td><td>Lehua St Eastbound         Lehua St Eastbound         Kuhio Hwy Northbound         Kuhio Hwy Southbound           Left-Turn         Right-Turn         Peds         App. Total         Left-Turn         Thru         Peds         App. Total         Left-Turn         Thru         Right-Turn           86         0         2         86         4         168         0         172         0         191         20           95         1         0         96         1         163         0         164         0         170         15           64         1         2         65         1         180         0         181         0         184         15           45         0         4         45         2         169         0         171         1         189         18           290         2         8         292         8         680         0         688         1         734         68           99.3         0.7         -         -         1.2         98.8         -         -         0.1         91.4         8.5           16.3         0.1         -         16.4</td><td>Lehua St Eastbound         Kuhio Hwy Northbound         Kuhio Hwy Southbound         Register From Southbound         Register From Southbound         Register From Southbound         Left-Turn Thru Peds         App. Total Left-Turn Thru Right-Turn Peds         86         0         191         20         0         191         20         0         191         20         0         181         0         184         15         0         184         15         0         184         18         0         184         18         0         184         18         0         184         0         184         0         184         0         184         0         184         0         184</td><td>  Left-Turn   Right-Turn   Peds   App. Total   Left-Turn   Thru   Right-Turn   Peds   App. Total    </td></td>	Lehua St Eastbound         Left-Turn         Right-Turn         Peds         App. Total         Left-Turn         Thru         Peds         App. Total           86         0         2         86         4         168         0         172           95         1         0         96         1         163         0         164           64         1         2         65         1         180         0         181           45         0         4         45         2         169         0         171           290         2         8         292         8         680         0         688           99.3         0.7         -         -         1.2         98.8         -         -           16.3         0.1         -         16.4         0.4         38.1         -         38.6           0.763         0.500         -         0.760         0.500         0.944         -         0.950           287         2         -         289         8         658         -         96.8           99.0         100	Lehua St Eastbound         Left-Turn         Right-Turn         Peds         App. Total         Left-Turn         Thru         Peds         App. Total         Left-Turn           86         0         2         86         4         168         0         172         0           95         1         0         96         1         163         0         164         0           64         1         2         65         1         180         0         181         0           45         0         4         45         2         169         0         171         1           290         2         8         292         8         680         0         688         1           99.3         0.7         -         -         1.2         98.8         -         -         0.1           16.3         0.1         -         16.4         0.4         38.1         -         38.6         0.1           0.763         0.500         -         0.760         0.500         0.944         -         0.950         0.250           287 <td>Eastburt         Right-Turn         Peds         App. Total         Left-Turn         Thru         190         164         0         184         0         184         0         184         45         Q         9         1         189         2         189         2         8         688         1         189</td> <td>Lehua St Eastbound         Lehua St Eastbound         Kuhio Hwy Northbound         Kuhio Hwy Southbound           Left-Turn         Right-Turn         Peds         App. Total         Left-Turn         Thru         Peds         App. Total         Left-Turn         Thru         Right-Turn           86         0         2         86         4         168         0         172         0         191         20           95         1         0         96         1         163         0         164         0         170         15           64         1         2         65         1         180         0         181         0         184         15           45         0         4         45         2         169         0         171         1         189         18           290         2         8         292         8         680         0         688         1         734         68           99.3         0.7         -         -         1.2         98.8         -         -         0.1         91.4         8.5           16.3         0.1         -         16.4</td> <td>Lehua St Eastbound         Kuhio Hwy Northbound         Kuhio Hwy Southbound         Register From Southbound         Register From Southbound         Register From Southbound         Left-Turn Thru Peds         App. Total Left-Turn Thru Right-Turn Peds         86         0         191         20         0         191         20         0         191         20         0         181         0         184         15         0         184         15         0         184         18         0         184         18         0         184         18         0         184         0         184         0         184         0         184         0         184         0         184</td> <td>  Left-Turn   Right-Turn   Peds   App. Total   Left-Turn   Thru   Right-Turn   Peds   App. Total    </td>	Eastburt         Right-Turn         Peds         App. Total         Left-Turn         Thru         190         164         0         184         0         184         0         184         45         Q         9         1         189         2         189         2         8         688         1         189	Lehua St Eastbound         Lehua St Eastbound         Kuhio Hwy Northbound         Kuhio Hwy Southbound           Left-Turn         Right-Turn         Peds         App. Total         Left-Turn         Thru         Peds         App. Total         Left-Turn         Thru         Right-Turn           86         0         2         86         4         168         0         172         0         191         20           95         1         0         96         1         163         0         164         0         170         15           64         1         2         65         1         180         0         181         0         184         15           45         0         4         45         2         169         0         171         1         189         18           290         2         8         292         8         680         0         688         1         734         68           99.3         0.7         -         -         1.2         98.8         -         -         0.1         91.4         8.5           16.3         0.1         -         16.4	Lehua St Eastbound         Kuhio Hwy Northbound         Kuhio Hwy Southbound         Register From Southbound         Register From Southbound         Register From Southbound         Left-Turn Thru Peds         App. Total Left-Turn Thru Right-Turn Peds         86         0         191         20         0         191         20         0         191         20         0         181         0         184         15         0         184         15         0         184         18         0         184         18         0         184         18         0         184         0         184         0         184         0         184         0         184         0         184	Left-Turn   Right-Turn   Peds   App. Total   Left-Turn   Thru   Right-Turn   Peds   App. Total

Count Name: Kuhio Hwy Lehua St 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 6

	Kuhio Hwy [SB]	
Lehua St   [EB]   Exit   Enber   Total   65   289   354   10   1   10   0   0   0   0   0   0	Peak Hour Data  03/16/2017 7:15 AM Ending At 03/16/2017 8:15 AM Lights Mediums Articulated Trucks All Pedestrians	Fake Approach [WB]
	LT Th Ped  8 658 0 0 20 0 0 2 0 0 0 2 0 0 0 0 8 680 0  722 666 1388 13 20 33 1 2 3 0 0 0 0 736 688 1424 Exit Enter Total Kuhio Hwy [NB]	

Turning Movement Peak Hour Data Plot (7:15 AM)

Count Name: Kuhio Hwy Lehua St 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 7

Turning Movement Peak Hour Data (3:15 PM)

									(	,				
		Lehua	a St			Kuhic	Hwy		-		Kuhio Hwy			
Start Time		Eastbo	ound			North	bound				Southbound			ĺ
Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
3:15 PM	67	. 1	7	68	5	162	0	167	0	138	42	0	180	415
3:30 PM	71	4	4	75	6	145	0	151	0	155	55	0	210	436
3:45 PM	78	2	1	80	5	141	0	146	0	146	35	0	181	407
4:00 PM	71	0	0	71	4	148	0	152	0	163	51	0	214	437
Total	287	7	12	294	20	596	0	616	0	602	183	0	785	1695
Approach %	97.6	2.4	-	-	3.2	96.8	-	-	0.0	76.7	23.3	-		-
Total %	16.9	0.4	-	17.3	1.2	35.2	-	36.3	0.0	35.5	10.8	-	46.3	-
PHF	0.920	0.438	-	0.919	0.833	0.920	-	0.922	0.000	0.923	0.832	-	0.917	0.970
Lights	285	7	-	292	20	592	-	612	0	590	177	-	767	1671
% Lights	99.3	100.0	-	99.3	100.0	99.3	-	99.4	-	98.0	96.7	-	97.7	98.6
Mediums	2	0	-	2	0	4	-	4	0	11	6	-	17	23
% Mediums	0.7	0.0	-	0.7	0.0	0.7	-	0.6	-	1.8	3.3	-	2.2	1.4
Articulated Trucks	0	0	-	0	0	0	-	0	0	1	0	-	1	1
% Articulated Trucks	0.0	0.0	-	0.0	0.0	0.0	_	0.0	-	0.2	0.0	-	0.1	0.1
All Pedestrians	-	-	12	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	_		100.0		_		_	_	_	_	_	_	_	_

Count Name: Kuhio Hwy Lehua St 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 8

											1	Exit 877 6 0 0 883 1777 5 6 1 0 0 0 1883 6 RT 1 1	hio Hwy Enter 767 17 1 0 785 11 1 0 0 2 11	[SB] To 16 2 2 1 ( ( ) 16 0 0 0 0 0 0 0 LT	3											
Lehua St [EB]	Exit Enter Total 197 292 489	2	0 0		7 2	0	0 0	42 7 207	RT		P	03/16/20 Ending A 03/16/20 Lights Mediums Articulate All Pedes	17 3:15 F t 17 4:15 F ed Trucks	PM PM	ata	l				0 0 0	0 0 0	0	0 0 0	0	Fake Approach [WB]	
												LT 20 0 0 0 20 1 1 1 0 609 Exit Ku	Th 592 4 0 0 596 612 4 0 616 Enter	Pe ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	09 5											

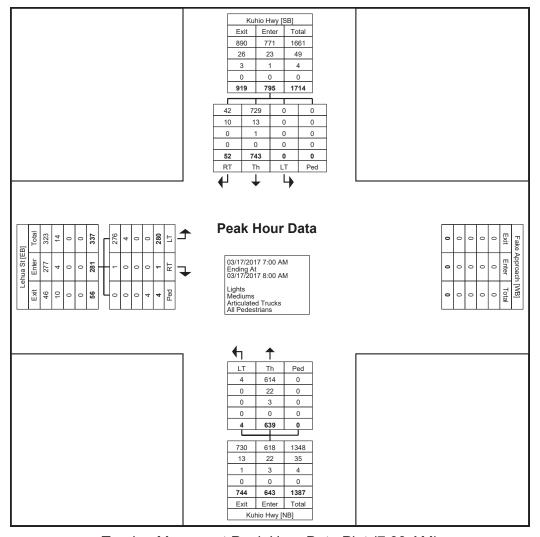
Turning Movement Peak Hour Data Plot (3:15 PM)

Count Name: Kuhio Hwy Lehua St 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 9

Turning Movement Peak Hour Data (7:00 AM)

									. (					
		Lehu	a St	_		Kuhid	Hwy			-	Kuhio Hwy			
Start Time		Eastb	ound			North	bound				Southbound			l
Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
7:00 AM	62	1	2	63	1	115	0	116	0	183	13	0	196	375
7:15 AM	62	0	1	62	0	170	0	170	0	188	12	0	200	432
7:30 AM	87	0	1	87	2	181	0	183	0	177	9	0	186	456
7:45 AM	69	0	0	69	1	173	0	174	0	195	18	0	213	456
Total	280	1	4	281	4	639	0	643	0	743	52	0	795	1719
Approach %	99.6	0.4	-	-	0.6	99.4	-		0.0	93.5	6.5	-	-	-
Total %	16.3	0.1	-	16.3	0.2	37.2	-	37.4	0.0	43.2	3.0	-	46.2	-
PHF	0.805	0.250	-	0.807	0.500	0.883	-	0.878	0.000	0.953	0.722	-	0.933	0.942
Lights	276	1	-	277	4	614	-	618	0	729	42	-	771	1666
% Lights	98.6	100.0	-	98.6	100.0	96.1	-	96.1	-	98.1	80.8	-	97.0	96.9
Mediums	4	0	-	4	0	22	-	22	0	13	10	-	23	49
% Mediums	1.4	0.0	-	1.4	0.0	3.4	-	3.4	-	1.7	19.2	-	2.9	2.9
Articulated Trucks	0	0	-	0	0	3	-	3	0	1	0	-	1	4
% Articulated Trucks	0.0	0.0	-	0.0	0.0	0.5	-	0.5	-	0.1	0.0	-	0.1	0.2
All Pedestrians	-	-	4	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	_	-	100.0	_	_	_	_	-	_	_	_	_	-	-

Count Name: Kuhio Hwy Lehua St 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 10



Turning Movement Peak Hour Data Plot (7:00 AM)

Study Name Kuhio Hwy Ulu St Ohia St 3-15-17 to 3-17-17 Start Date 3/15/17 Start Time 3:00 PM Site Code Hokua Place

Start			hia St stbound					ono Kai Dwy Vestbound				Kuhio Hwy Northbound					uhio Hwy outhbound				Sout	Ulu St theast Bound	1		Intersection	on
3/15/17	LT-Ulu	LT-Kuhio		RT-Kuhio	RT-Ulu	LT-Kuhio			RT-Ulu RT-Kuh	o UT-Ulu		LT-Ulu	Thru F	Right-Turn	Left-Turn		RT-Ulu RT-	-Ohia UT-	Ulu UT-	-Kuhio				-Ohia 1	5-Min Totals Hou	ırly Totals
3:00 PM	2	0	0	0	0	0	0	0	0	3 (	0	74	154	6	0	154	0	0	2	0	0	0	55	0	450	1699
3:15 PM	4	0	0	0	0	0	0	0	0	3	1 0	61	124	18	3	128	0	0	5	0	0	0	74	3	424	1656
3:30 PM	3	0	0	0	0	0	0	0	0	2 (	1	77	106	4	3	138	0	0	3	0	0	0	67	0	404	1632
3:45 PM	1	0	0	0	2	0	0	0	0	0 0	1	75	123	11	2	136	0	0	4	0	0	0	63	3	421	1640
4:00 PM	3	0	1	0	0	0	0	0	0	2 (	اه اه	66	118		1	139	ő	2	2	0	0	0	63	2	407	1673
4:15 PM	2	1	0	0	0	0	0	0	0	1 (	0	55	121	12	1	126	0	0	3	0	0	0	76	2	400	1674
4:30 PM	0		1	0	0	0	0	0	0	3 (		66	137	12		125	ő	0	1	0	1	0	65	1	412	1715
4:45 PM	1	0		0	0	0	0	0	0	2	ا ا	70	136	14	1	166	ő	n	1	0		0	62	0	454	1734
5:00 PM	1	0	0	0	0	1	0	0	0	1 (		91	120	10	3	132	o o	1	3	0	0	0	44	1	408	1670
5:15 PM		1	0	0	1		0	0	0	2	1 1	78	131	12	1	156	ů	1	1	0	0	0	54	1	441	1070
5:30 PM	2		0	0	2	0	0	0	0	2 (	,	68	157	9	2	152	0	3	'n	0	0	0	34	'n	431	
5:45 PM	2	0	0	0	1	0	0	0	0	3 (	1	64	131	8	1	138	0	1	1	0	0	0	35	4	390	
3/16/17	1 1	U	U	٥	'1	Ü	U	U	o o	3	1 1	04	131	٥	1	130	٩	'1	1	٥	٥	· ·	33	7	390	
7:00 AM		0	0	0	2	0	0	0	0	2 (		16	135	- 1	0	200	0	2	2	0	0	0	46	2	413	1664
7:15 AM	1	1	0	0	1	0	0	0	0	0 (		24	162	1	0	182	ő	2	2	2	0	0	39	2	420	1673
7:30 AM	5	1	0	0	2	0	0	0	0	0		23	165		2	162	ő	0	0	0	0	0	50	1	419	1683
7:45 AM	1	4	0	0	1	0	0	0	0	2		27	157	3	1	159	ő	1	2	0	0	0	57	, 'I	412	1710
8:00 AM	,	0	0	0	,	0	0	0	0	2 (		32	158	4	,	180	ő	2	2	0	0	0	38	1	422	1743
8:15 AM	0	0	1	0	2	0	0	0	0	2		27	164	2	- 1	195	ő	2	1	0	0	0	34	1	430	1743
8:30 AM	1	0	,	0	2	0	0	0	0	1 (		22	187	5	,	173	0	0	1	0	0	0	51	2	446	
8:45 AM	2	0	0	0	1	1	0	0	0	2 (		29	188	4	2	165	ő	0	1	0	0	0	47	2	445	
3/16/17	1 1	U	U	٥	'1	'	U	U	o o	3	1 "	25	100	4	-	103	٩	٩	'	٥	٥	· ·	47	-	445	
3:00 PM	1	0	0	0	1	1	0	0	0			57	124		0	152	0	0	0	0	0	0	42	2	390	1643
3:15 PM	,	0	0	0	,	,	0	0	0	,		76	145	13	0	140	ő	0	0	0	0	0	39	4	418	1705
3:15 PM 3:30 PM	2	0	0	0	0	0	0	0	0	2 (		67	145	10	0	164	0	0	0	0	0	0	38	1	418	1688
3:45 PM	1	0	0	0	2	0	0	0	0	4		81	118	10	3	155	0	0	0	0	0	0	36	,	406	
4:00 PM	1	0	0	0	0	0	0	0	0	1 1		71	147	9	4	162	0	0	0	0	0	0	57	1	452	1732 1743
	3	0	0	0	0	0	0	0	0	1 (		71		10	3		0	0	0	0	0	0	48	2	452	1743
4:15 PM 4:30 PM	1	0	0	0	0	0	0	0	0	0			137	10	0	131 152	0	0	4	0	0	0	50	4		
	2	0	0	0	0	0	0	0	0	3 (		95	163	3	3		0	0	- 1	0	0	0	39	1	473	1756
4:45 PM	0	0	0	0	0	1	0	0	0	4		76 60	153 141	5	1	139	0	0	1	0	0	0	46	0	417 423	1704 1695
5:00 PM	2	1	0	0	0	4	0	0	0	4				0		162	0	4	0	0	0	0		4		1095
5:15 PM 5:30 PM	2	0	0	0	0	1	0	0	0	2 4	1 1	71 58	140	б		159 150	0	1	2	0	0	0	53 43	1	443 421	
5:30 PM 5:45 PM	0	0	0	0	0	0	0	0	U O	0 (	1 1		163	5	1		0	0	0	0	0	0	43	0		
3/17/17	1 1	U	U	U	1	U	U	U	۷	2 (	1 1	53	139	5	1	156	٥	U	1	U	U	U	47	1	408	
7:00 AM											ا ا	19	123			185						0	48		386	1668
	2		0	0	'	0	0	0	0					0	,		0	4	0	4	0	0	45	4		
7:15 AM	1	1	0	0	0	0	0	0	0	0 (		25	182	2	3	172	0	- 1	0	1	0	0		1	434	1680
7:30 AM	5	1	0	0	1	0	0	0	U O	0 (	1 1	21	162	2	2	176	0	1	0	0	0	0	50	0	421	1676
7:45 AM	4	1	0	0	0	1	0	0	0	2		25 24	145 148	3	1	172	0	0	3	0	0	0	67	3	427 398	1655
8:00 AM	0	1	0	0	0	0	0	0	0	0		27	174	4	1	170 159	0	1	1	0	0	0	45 56	2	430	1660
8:15 AM	0	0	0	0	0	0	0	0	U O	4 (		30	174	,	0	178	0	1	0	0	0	0	52	2		
8:30 AM	0	2	0	0	0	1	0	0	0	4	1	21	166	1	3	178	0	0	1	0	0	0	46	3	400 432	
8:45 AM	U		U	U	1	U	U	U	U	4 (	) <u> </u>	21	166	4	- 1	181	0	U	2	U	U	U	46	2	432	
AM Peak Hou	r Traffic		3/16/17																							
8:00 AM		0	1	0	6	1	0	0	0	9 (	0	110	697	15	7	713	0	2	3	0	0	0	170	6	1743	
PHF		N/A	N/A	N/A	0.50	N/A	N/A	N/A	N/A 2.2		N/A	1.25	0.93	0.75	N/A	1.03				N/A	N/A	N/A	0.83	0.75	0.98	
PHV		0		0	12	0	0			4 (		88	748	20	0	692	0	0	4	0	0	0	204	8	1784	
T Factor	0%	N/A	0%	N/A	17%	0%	N/A	N/A	N/A 11	% N/A	N/A	5%	4%	0%	0%	3%	N/A	0%	0%	N/A	N/A	N/A	4%	17%		
												5	29	0		20										
													4%			3%										
PM Peak Hou			3/16/17																							
4:30 PM		1	0	0	0	2	0			1 2		302	597	20	6	612	0	1	4	0	0	0	188	2	1756	
PHF		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A 0.9		N/A	0.79	0.92	1.67	0.50	1.01		N/A		N/A	N/A	N/A	0.94	0.50	0.93	
PHV		0	0	0	0	0	0	0		2 (		380	652	12	12	608	0	0	4	0	0	0	200	4	1892	
T Factor	0%	0%	N/A	N/A	N/A	0%	N/A	N/A	N/A 0	% 0%	6 0%	1%	1%	0%	0%	0%	N/A	0%	0%	N/A	N/A	N/A	1%	0%		

Study Name Olohena Rd Lehua St Kahau St 3-13-17 to 3-15-17 Start Date 03/13/2017 Start Time 3:00 PM Site Code Hokua Place

Start		Olohena Rd Eastbound			Olohena Rd Westbound		s	Kahau St Southbound			Lehua St hwest Bou	ınd	Inters	ection
3/13/17	LT-Kahau	LT-Lehua	Thru	Thru	RT-Kahau	RT-Lehua	UT-Lehua I	LT-Olohena	Right-Turn	LT-OlohenaR	T-Olohena	UT-Kahau	15-Min Totals	Hourly Totals
3:00 PM	12	55	88	79	3	12	9	8	16	8	38	9	337	1326
3:15 PM	12	90	70	52	9	10	3	9	6	18	44	11	334	1308
3:30 PM	9	80	53	86	7	21	2	2	6	12	51	8	337	1277
3:45 PM	7	60	63	86	7	13	4	3	5	12	51	7	318	1212
4:00 PM	18	68	56	77	8	11	5	8	4	8	42	14	319	1177
4:15 PM	22	59	42	82	9	12	0	4	3	8	43	19	303	
4:30 PM	19	49	65	72	3	7	4	6	3	8	33	3	272	
4:45 PM	9	71	38	81	7	11	2	7	6	11	33	7	283	
3/14/17	1 1				•		_	-	_	1 1		•		
6:30 AM	3	23	36	15	2	0	2	0	0	2	5	4	92	573
6:45 AM	2	40	41	13	7	0	5	4	0	0	10	4	126	698
7:00 AM	4	52	46	25	2	1	1	2	4	1	8	3	149	787
7:15 AM	6	84	57	29	5	3	0	5	1	3	12	1	206	818
7:30 AM	4	81	58	35	0	3	11	3	6	2	13	1	217	762
7:45 AM	4	66	94	28	2	1	0	3	3	0	13	1	215	
8:00 AM	2	38	81	28	1	3	3	2	2	0	18	2	180	
8:15 AM	8	35	49	31	3	4	1	2	5	1 1	8	3	150	
3/14/17	i			0.	ŭ	· i		-	Ü	1 1	ŭ	ŭ	100	
3:30 PM	8	61	57	28	4	12	5	5	3	6	25	13	227	1158
3:45 PM	14	66	53	56	8	11	2	7	3	12	40	7	279	1229
4:00 PM	24	78	44	70	10	19	1	9	5	15	46	6	327	1223
4:15 PM	14	55	50	84	10	13	3	12	3	12	54	15	325	1149
4:30 PM	14	81	53	61	3	10	1	3	4	5	56	7	298	1079
4:45 PM	14	66	56	76	3	8	1	7	4	5	26	7	273	1073
5:00 PM	10	65	45	70	5	8	0	3	4	0	37	4	253	
5:15 PM	9	76	37	71	6	9	0	2	5	8	30	2	255	
3/15/17		70	31	7 1	Ü	9	U	2	J	0	30	2	233	
6:30 AM	4	18	27	9	5	0	2	2	1	2	6	6	82	602
6:45 AM	4	48	54	23	8	0	2	7	2		7	6	162	748
7:00 AM	1	53	54	23	1	1	1	3	1	0	9	1	148	829
7:15 AM	7	81	59	16	1	4	9	4	8	2	17	2	210	839
7:30 AM	2	95	59	35	5	6	0	2	5	1	18	0	210	793
7:45 AM	2	90	89	27	2	3	2	1	6	0	20	1	243	793
8:00 AM	4	36	58	29	2	2	2	1	2	4	17	1	158	
8:15 AM	1	42	62	29	3	1	0	4	7	4	17	2	164	
0.13 AW	'	42	02	21	٥	- 1	U	4		4	17	2	104	
AM Peak I	Hour Traffic		3/15/17											
7:15 AM	15	302	265	107	10	15	13	8	21	7	72	4	839	
PHF	1.88	0.84	0.74	0.99	1.25	1.25	1.63	2.00	0.88	N/A	0.90	1.00	0.86	
Peak Flow	8	360	356	108	8	12	8	4	24	7	80	4	972	
T Factor	0%	1%	4%	3%	10%	0%	8%	50%	19%	0%	7%	25%		
PM Peak I	Hour Traffic	1.0%	3/13/17					23.8%			7.2%			
3:00 PM	40	285	274	303	26	56	18	22	33	50	184	35	1326	
PHF	1.11	0.89	1.29	0.88	0.93	0.67	2.25	2.75	1.38	1.04	0.90	1.09	0.98	
Peak Flow	36	320	212	344	28	84	8	8	24	48	204	32	1348	
T Factor	13%	3%	4%	1%	0%	2%	0%	0%	6%	2%	2%	0%		

# The Traffic Management Consultant 1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813 808-536-0223 tmchawaii@aol.com

Count Name: Olohena Rd Kapaa Bypass 3-13-17 to 3-15-17 Site Code: Hokua Place Start Date: 03/13/2017 Page No: 1

Turning Movement Data

					Tur	ning N	<b>N</b> oven	nent D	ata 🏻						
		Olohe	ena Rd			Dlohena Ro		1	paa Bypass	Rd		Караа В	ypass Rd		
		East	bound		,	Vestbound			Northbound	I		South	bound		
Start Time	Left-Turn	Thru	Right- Turn	App. Total	Left-Turn	Thru	App. Total	Left-Turn	Right- Turn	App. Total	Left-Turn	Thru	Right- Turn	App. Total	Int. Total
3:00 PM	2	106	33	141	33	102	135	64	38	102	21	32	10	63	441
3:15 PM	4	65	17	86	29	73	102	67	65	132	33	63	28	124	444
3:30 PM	4	50	18	72	42	98	140	57	72	129	14	69	19	102	443
3:45 PM	1	49	11	61	32	118	150	77	57	134	19	46	29	94	439
Hourly Total	11	270	79	360	136	391	527	265	232	497	87	210	86	383	1767
4:00 PM	1	47	17	65	24	114	138	82	78	160	15	66	17	98	461
4:15 PM	2	48	17	67	10	126	136	83	64	147	16	61	10	87	437
4:30 PM	2	35	11	48	16	105	121	89	76	165	13	57	19	89	423
4:45 PM	3	40	12	55	17	109	126	80	64	144	11	41	19	71	396
Hourly Total	8	170	57	235	67	454	521	334	282	616	55	225	65	345	1717
*** BREAK ***	-	-	-	-	-	-	-	-	<del>-</del>	-	-	-		-	-
6:30 AM	0	46	37	83	7	16	23	5	4	9	10	40	4	54	169
6:45 AM	3	61	45	109	7	17	24	3	5	8	20	66	9	95	236
Hourly Total	3	107	82	192	14	33	47	8	9 2	17	30	106	13	149	405
7:00 AM	3	86	76	165	11	28	39	10	-	12	14	96	24	134	350
7:15 AM	7	107	59 40	169	10	33 47	43	23	12 9	35	30	119 95	31	180	427
7:30 AM 7:45 AM	8	116 112	34	163 154	10	35	57 45	25 26	13	34 39	30 36	101	56 41	181 178	416
	21	421	209	651	41	143	184	84	36	120	110	411	152	673	1628
Hourly Total 8:00 AM	2	77	209	106	13	32	45	10	11	21	24	91	22	137	309
8:15 AM	1	65	21	87	12	32	44	12	5	17	20	68	14	102	250
*** BREAK ***	-	-	-	-	-	-		-	-	- ''	-	-	- '-	-	230
Hourly Total	3	142	48	193	25	64	89	22	16	38	44	159	36	239	559
3:30 PM	2	42	19	63	18	37	55	41	61	102	14	48	19	81	301
3:45 PM	3	46	6	55	37	86	123	93	84	177	14	46	20	80	435
Hourly Total	5	88	25	118	55	123	178	134	145	279	28	94	39	161	736
4:00 PM	2	38	17	57	36	104	140	66	74	140	22	70	44	136	473
4:15 PM	2	51	15	68	42	104	146	68	58	126	11	62	23	96	436
4:30 PM	4	38	12	54	43	85	128	77	76	153	22	65	21	108	443
4:45 PM	4	47	15	66	31	84	115	98	77	175	11	42	20	73	429
Hourly Total	12	174	59	245	152	377	529	309	285	594	66	239	108	413	1781
5:00 PM	5	41	18	64	21	106	127	98	69	167	15	55	28	98	456
5:15 PM	2	36	12	50	29	92	121	96	82	178	10	43	24	77	426
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	7	77	30	114	50	198	248	194	151	345	25	98	52	175	882
6:30 AM	0	38	43	81	8	9	17	3	11	4	9	51	6	66	168
6:45 AM	2	79	56	137	9	26	35	10	7	17	18	58	10	86	275
Hourly Total	2	117	99	218	17	35	52	13	8	21	27	109	16	152	443
7:00 AM	2	90	59	151	10	26	36	10	2	12	13	98	16	127	326
7:15 AM	1	108	62	171	17	24	41	26	6	32	24	107	45	176	420
7:30 AM	4	116	34	154	16	47	63	27	8	35	32	111	50	193	445
7:45 AM	10	126	45	181	13	45	58	25	12	37	39	83	47	169	445
Hourly Total	17	440	200	657	56	142	198	88	28	116	108	399	158	665	1636
8:00 AM	3	73	34	110	13	39	52	16	8	24	16	99	16	131	317
8:15 AM	4	86	21	111	15	30	45	9	8	17	15	72	10	97	270
Grand Total	96	2165	943	3204	641	2029	2670	1476	1208	2684	611	2221	751	3583	12141
Approach %	3.0	67.6	29.4	-	24.0	76.0	-	55.0	45.0	-	17.1	62.0	21.0	-	-
Total %	0.8	17.8	7.8	26.4	5.3	16.7	22.0	12.2	9.9	22.1	5.0	18.3	6.2	29.5	-
Lights	93	2104	922	3119	574	1982	2556	1459	1182	2641	598	2175	735	3508	11824
% Lights	96.9	97.2	97.8	97.3	89.5	97.7	95.7	98.8	97.8	98.4	97.9	97.9	97.9	97.9	97.4
Mediums	3	60	19	82	61	47	108	15	23	38	12	41	16	69	297
% Mediums	3.1	2.8	2.0	2.6	9.5	2.3	4.0	1.0	1.9	1.4	2.0	1.8	2.1	1.9	2.4
Articulated Trucks	0	1	2	3	6	0	6	2	3	5	1	5	0	6	20
% Articulated Trucks	0.0	0.0	0.2	0.1	0.9	0.0	0.2	0.1	0.2	0.2	0.2	0.2	0.0	0.2	0.2

Count Name: Olohena Rd Kapaa Bypass 3-13-17 to 3-15-17 Site Code: Hokua Place Start Date: 03/13/2017 Page No: 2

													Exit 93 0 96 735 16 0 751 RT	Er 35 6 35 21 4 4 22 7 1	bass Finter 508 69 6 583 1175 221 Th	Total 3601 72 6 3679 598 12 1 611 LT												
EBI	Total	7295	160	2	7460	] ]	93	က	0	96	LT	<u></u>					4	<b>-</b> Th	2029	> ±	1982	L	3984	5	95	3884	Exit	Oloh
Olohena Rd [EB]	Enter	3119	82	က	3204	$\parallel$	2104	09	-	2165	Th	<b>→</b>	03/13/20 Ending / 03/15/20	017 3: At 017 8:	:00 PN	M	`	_	H	n -	+	<u> </u>  -	2670	6	108	2556	Enter	Olohena Rd [WB]
Jö	Exit	4176	78	2	4256		922	19	2	943	RT	<b></b>	Lights Medium: Articulat	s ed Tru	ucks		<b>+</b>			Ţ	4		6654	11	203	6440	Total	VB]
													3671 121 13 3805 Exit	26 Er	R 113 3 3 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1	82 3 3												

**Turning Movement Data Plot** 

The Traffic Management Consultant 1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813 808-536-0223 tmchawaii@aol.com

Count Name: Olohena Rd Kapaa Bypass 3-13-17 to 3-15-17 Site Code: Hokua Place Start Date: 03/13/2017 Page No: 3

### Turning Movement Peak Hour Data (3:15 PM)

				_											
		Olohe	ena Rd			Olohena Ro	I	Kap	aa Bypass	Rd		Kapaa B	ypass Rd		
		East	bound		,	Westbound		1	Northbound	i		South	bound		
Start Time	Left-Turn	Thru	Right- Turn	App. Total	Left-Turn	Thru	App. Total	Left-Turn	Right- Turn	App. Total	Left-Turn	Thru	Right- Turn	App. Total	Int. Total
3:15 PM	4	65	17	86	29	73	102	67	65	132	33	63	28	124	444
3:30 PM	4	50	18	72	42	98	140	57	72	129	14	69	19	102	443
3:45 PM	1	49	11	61	32	118	150	77	57	134	19	46	29	94	439
4:00 PM	1	47	17	65	24	114	138	82	78	160	15	66	17	98	461
Total	10	211	63	284	127	403	530	283	272	555	81	244	93	418	1787
Approach %	3.5	74.3	22.2	-	24.0	76.0	-	51.0	49.0	-	19.4	58.4	22.2	-	-
Total %	0.6	11.8	3.5	15.9	7.1	22.6	29.7	15.8	15.2	31.1	4.5	13.7	5.2	23.4	-
PHF	0.625	0.812	0.875	0.826	0.756	0.854	0.883	0.863	0.872	0.867	0.614	0.884	0.802	0.843	0.969
Lights	10	201	59	270	118	399	517	280	270	550	79	232	92	403	1740
% Lights	100.0	95.3	93.7	95.1	92.9	99.0	97.5	98.9	99.3	99.1	97.5	95.1	98.9	96.4	97.4
Mediums	0	10	2	12	7	4	11	3	2	5	2	10	1	13	41
% Mediums	0.0	4.7	3.2	4.2	5.5	1.0	2.1	1.1	0.7	0.9	2.5	4.1	1.1	3.1	2.3
Articulated Trucks	0	0	2	2	2	0	2	0	0	0	0	2	0	2	6
% Articulated Trucks	0.0	0.0	3.2	0.7	1.6	0.0	0.4	0.0	0.0	0.0	0.0	0.8	0.0	0.5	0.3

Count Name: Olohena Rd Kapaa Bypass 3-13-17 to 3-15-17 Site Code: Hokua Place Start Date: 03/13/2017 Page No: 4

															Exit  10  0  10  92  1  0  93  RT		ypass Enter 403 13 2 418 2332 10 2 2444 Th		SSB   Fotal   413   13   2   428   79   2   0   81   LT   LT   LT   Total   13   13   13   13   13   13   13   1													
EBJ	Total	1041	20	2	1063	Г	10	0	0	10	5	<u></u>	ı	Pe	ak	Н	oui	r E	Data	a	4		403	0	4	399	001	6	14	550	Exit	Oloi
Olohena Rd [EB]	Enter	270	12	2	284	+	201	10	0	211	Th	<b>→</b>		03 Er 03	3/13/20 nding <i>P</i> 3/13/20	)17 : At )17 :	3:15 P 4:15 P	PM PM			т •	-   Th	+	2	+	99 118	3	200	) 11	517	Enter	Olohena Rd [WB]
Ĭ	Exit	771	80	0	779	L	29	2	2	63	R	<b></b>		M	ghts lediums rticulate	s ed T	Frucks				*	Ľ					9	2	25	1067	Total	/B]
															409 19 6 434 Exit	280 3 0 283	F 2		959 24 6 989													

Turning Movement Peak Hour Data Plot (3:15 PM)

The Traffic Management Consultant 1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813 808-536-0223 tmchawaii@aol.com

Count Name: Olohena Rd Kapaa Bypass 3-13-17 to 3-15-17 Site Code: Hokua Place Start Date: 03/13/2017 Page No: 5

### Turning Movement Peak Hour Data (7:00 AM)

		Olohe	ena Rd	5		Olohena Ro	ı	Kap	aa Bypass	Rd	′	Kapaa B	ypass Rd		
		Eastl	oound			Westbound		1	Northbound	l		South	bound		
Start Time	Left-Turn	Thru	Right- Turn	App. Total	Left-Turn	Thru	App. Total	Left-Turn	Right- Turn	App. Total	Left-Turn	Thru	Right- Turn	App. Total	Int. Total
7:00 AM	3	86	76	165	11	28	39	10	2	12	14	96	24	134	350
7:15 AM	3	107	59	169	10	33	43	23	12	35	30	119	31	180	427
7:30 AM	7	116	40	163	10	47	57	25	9	34	30	95	56	181	435
7:45 AM	8	112	34	154	10	35	45	26	13	39	36	101	41	178	416
Total	21	421	209	651	41	143	184	84	36	120	110	411	152	673	1628
Approach %	3.2	64.7	32.1	-	22.3	77.7	-	70.0	30.0	-	16.3	61.1	22.6	-	-
Total %	1.3	25.9	12.8	40.0	2.5	8.8	11.3	5.2	2.2	7.4	6.8	25.2	9.3	41.3	-
PHF	0.656	0.907	0.688	0.963	0.932	0.761	0.807	0.808	0.692	0.769	0.764	0.863	0.679	0.930	0.936
Lights	21	410	205	636	31	136	167	83	35	118	108	406	150	664	1585
% Lights	100.0	97.4	98.1	97.7	75.6	95.1	90.8	98.8	97.2	98.3	98.2	98.8	98.7	98.7	97.4
Mediums	0	10	4	14	9	7	16	1	0	1	2	4	2	. 8	39
% Mediums	0.0	2.4	1.9	2.2	22.0	4.9	8.7	1.2	0.0	0.8	1.8	1.0	1.3	1.2	2.4
Articulated Trucks	0	1	0	1	1	0	1	0	1	1	0	1	0	1	4
% Articulated Trucks	0.0	0.2	0.0	0.2	2.4	0.0	0.5	0.0	2.8	0.8	0.0	0.2	0.0	0.1	0.2

Count Name: Olohena Rd Kapaa Bypass 3-13-17 to 3-15-17 Site Code: Hokua Place Start Date: 03/13/2017 Page No: 6

													Kapaa Exit 21 0 0 21 150 2 0 152 RT	Bypass   Enter   664   8   1   673     406   411   Th	Rd [SB] Total 685 8 1 694 108 2 0 110 LT													
EBJ	Total	cnor.	24	1030	]	21	0	0	21	5	<u>_</u>	P	eak l	Hour	Data	a	4		<u> </u>	Τ.	<u>.</u>	3	567	2 5	3 8	553	Exit	20
Olohena Rd [EB]	Enter	959	4 -	651	+	410	10	1	421	<u>.</u>	<b>→</b>		03/14/20 Ending A 03/14/20	17 7:00 A t 17 8:00 A	M M		_	Н	143 41		6		184	` -	16	167	Enter	Olohena Rd IV
Jö	Exit	308	9 0	379		205	4	0	209	r	7		Lights Mediums Articulate	ed Trucks			Ţ	Ц					751	2 6	32.7	720	Total	IWB1
													642 17 2 661 Exit	T F 33 3 1 0	760 18 35 0 1 18 36 781 Total													

Turning Movement Peak Hour Data Plot (7:00 AM)

The Traffic Management Consultant 1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813 808-536-0223 tmchawaii@aol.com

Count Name: Olohena Rd Kapaa Bypass 3-13-17 to 3-15-17 Site Code: Hokua Place Start Date: 03/13/2017 Page No: 7

### Turning Movement Peak Hour Data (3:45 PM)

ranning movement can read bata (error in)															
		Olohe	ena Rd			Olohena Ro	t	Kap	aa Bypass	Rd	,	Kapaa B	ypass Rd		
		East	bound		,	Westbound	I		Northbound	I		South	bound		
Start Time	Left-Turn	Thru	Right- Turn	App. Total	Left-Turn	Thru	App. Total	Left-Turn	Right- Turn	App. Total	Left-Turn	Thru	Right- Turn	App. Total	Int. Total
3:45 PM	3	46	6	55	37	86	123	93	84	177	14	46	20	80	435
4:00 PM	2	38	17	57	36	104	140	66	74	140	22	70	44	136	473
4:15 PM	2	51	15	68	42	104	146	68	58	126	11	62	23	96	436
4:30 PM	4	38	12	54	43	85	128	77	76	153	22	65	21	108	443
Total	11	173	50	234	158	379	537	304	292	596	69	243	108	420	1787
Approach %	4.7	73.9	21.4	-	29.4	70.6	-	51.0	49.0	-	16.4	57.9	25.7	-	-
Total %	0.6	9.7	2.8	13.1	8.8	21.2	30.1	17.0	16.3	33.4	3.9	13.6	6.0	23.5	-
PHF	0.688	0.848	0.735	0.860	0.919	0.911	0.920	0.817	0.869	0.842	0.784	0.868	0.614	0.772	0.945
Lights	11	168	47	226	149	374	523	301	285	586	69	234	107	410	1745
% Lights	100.0	97.1	94.0	96.6	94.3	98.7	97.4	99.0	97.6	98.3	100.0	96.3	99.1	97.6	97.6
Mediums	0	5	3	8	9	5	14	2	7	9	0	8	1	9	40
% Mediums	0.0	2.9	6.0	3.4	5.7	1.3	2.6	0.7	2.4	1.5	0.0	3.3	0.9	2.1	2.2
Articulated Trucks	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
% Articulated Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.2	0.0	0.4	0.0	0.2	0.1

Count Name: Olohena Rd Kapaa Bypass 3-13-17 to 3-15-17 Site Code: Hokua Place Start Date: 03/13/2017 Page No: 8

														Exit 11 0 0 11 107 1 0 108 RT	Bypass Enter 410 9 1 420 234 8 1 243 Th	$\neg$	td [SB] Total 421 9 1 431 69 0 69 LT													
[EB]	Total	16	-	1025	Г	11	0	0	11	5	<u>_</u>		Pe	ak I	Hou	r	Data	a	4	<b>-</b> [=	379	0	5	374	534	0	12	522	Exit	Olol
Olohena Rd [EB]	Enter	027	0	234	+	168	5	0	173	Th	<b>→</b>		03. En 03.	3/14/201 nding At 3/14/201	17 3:45 t 17 4:45	PN PN	И		1	_ -	$\mathbb{H}$		+	140	537	0	14	523	Enter	Olohena Rd [V
ŏ	Exit	8 8	-	791	L	47	3	0	20	RT L	<b></b>		Me	ghts ediums ticulate	d Truck	s			•	Ľ					1071	0	26	1045	Total	[wB]
															T	R' 28 7 0 <b>29</b>	1016 29 2 1047													

Turning Movement Peak Hour Data Plot (3:45 PM)

The Traffic Management Consultant 1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813 808-536-0223 tmchawaii@aol.com

Count Name: Olohena Rd Kapaa Bypass 3-13-17 to 3-15-17 Site Code: Hokua Place Start Date: 03/13/2017 Page No: 9

### Turning Movement Peak Hour Data (7:00 AM)

dd d		Olohena Rd		Kap	aa Bypass	Rd		Kapaa By	vpass Rd		
d	l ,								, ,		l .
	'	Westbound		١ ١	Northbound			Southl	bound		
ight- App. Turn Total	Left-Turn	Thru	App. Total	Left-Turn	Right- Turn	App. Total	Left-Turn	Thru	Right- Turn	App. Total	Int. Total
59 151	10	26	36	10	2	12	13	98	16	127	326
62 171	17	24	41	26	6	32	24	107	45	176	420
34 154	16	47	63	27	8	35	32	111	50	193	445
45 181	13	45	58	25	12	37	39	83	47	169	445
200 657	56	142	198	88	28	116	108	399	158	665	1636
30.4 -	28.3	71.7	-	75.9	24.1	-	16.2	60.0	23.8	-	
12.2 40.2	3.4	8.7	12.1	5.4	1.7	7.1	6.6	24.4	9.7	40.6	
.806 0.907	0.824	0.755	0.786	0.815	0.583	0.784	0.692	0.899	0.790	0.861	0.919
195 641	45	135	180	87	28	115	105	395	153	653	1589
97.5 97.6	80.4	95.1	90.9	98.9	100.0	99.1	97.2	99.0	96.8	98.2	97.1
5 16	9	7	16	1	0	1	2	4	5	11	44
2.5 2.4	16.1	4.9	8.1	1.1	0.0	0.9	1.9	1.0	3.2	1.7	2.7
0 0	2	0	2	0	0	0	1	0	0	1	3
0.0 0.0	3.6	0.0	1.0	0.0	0.0	0.0	0.9	0.0	0.0	0.2	0.2
	Total 59 151 62 171 34 154 45 181 200 657 10.0.4 - 2.2.2 40.2 1806 0.907 195 641 17.5 97.6 5 16 2.5 2.4 0 0	Total 59 151 10 62 171 17 17 18 16 16 16 16 16 17 18 18 18 18 18 18 18 18 18 18 18 18 18	Total         Left-full         Hill           59         151         10         26           62         171         17         24           34         154         16         47           45         181         13         45           200         657         56         142           10.4         -         28.3         71.7           2.2         40.2         3.4         8.7           806         0.907         0.824         0.755           195         641         45         135           17.5         97.6         80.4         95.1           5         16         9         7           2.5         2.4         16.1         4.9           0         0         2         0	Total         Celeration         Title         Total           59         151         10         26         36           62         171         17         24         41           34         154         16         47         63           45         181         13         45         58           200         657         56         142         198           10.4         -         28.3         71.7         -           2.2         40.2         3.4         8.7         12.1           806         0.907         0.824         0.755         0.786           195         641         45         135         180           197.5         97.6         80.4         95.1         90.9           5         16         9         7         16           2.5         2.4         16.1         4.9         8.1           0         0         2         0         2	furn         Total         Left full         Total         Total         Left full           59         151         10         26         36         10           62         171         17         24         41         26           34         154         16         47         63         27           45         181         13         45         58         25           200         657         56         142         198         88           80.4         -         28.3         71.7         -         75.9           2.2         40.2         3.4         8.7         12.1         5.4           806         0.907         0.824         0.755         0.786         0.815           195         641         45         135         180         87           17.5         97.6         80.4         95.1         90.9         98.9           5         16         9         7         16         1           2.5         2.4         16.1         4.9         8.1         1.1           0         0         2         0         2         0	Total         Left-10th         Titul         Total         Left-10th         Turn           59         151         10         26         36         10         2           62         171         17         24         41         26         6           34         154         16         47         63         27         8           45         181         13         45         58         25         12           200         657         56         142         198         88         28           10.4         -         28.3         71.7         -         75.9         24.1           2.2         40.2         3.4         8.7         12.1         5.4         1.7           806         0.907         0.824         0.755         0.786         0.815         0.583           195         641         45         135         180         87         28           17.5         97.6         80.4         95.1         90.9         98.9         100.0           5         16         9         7         16         1         0           2.5         2.4         16.1	fun         Total         Lene fun         Title         Total         Lene fun         Turn         Total           59         151         10         26         36         10         2         12           62         171         17         24         41         26         6         32           34         154         16         47         63         27         8         35           45         181         13         45         58         25         12         37           200         657         56         142         198         88         28         116           10.4         -         28.3         71.7         -         75.9         24.1         -           2.2         40.2         3.4         8.7         12.1         5.4         1.7         7.1           806         0.907         0.824         0.755         0.786         0.815         0.583         0.784           195         641         45         135         180         87         28         115           17.5         97.6         80.4         95.1         90.9         98.9         100.0         9	fun         Total         Cenerum         Turn         Total         Cenerum         Cenerum         Cene	fun         Total         Celerium         Time         Total         Celerium         Turn         Total         Celerium         Time         Total         Celerium         Turn         Total         Celerium         Time         Time </td <td>Total         Celerian         Titul         Total         Celerian         Turn         Total         Celerian         Titul         Titul</td> <td>fun         Total         Cenerium         Total         Enterium         Turn         Total         Cenerium         Turn         Total         Enterium         Turn         Total         Total         Enterium         Turn         Total</td>	Total         Celerian         Titul         Total         Celerian         Turn         Total         Celerian         Titul         Titul	fun         Total         Cenerium         Total         Enterium         Turn         Total         Cenerium         Turn         Total         Enterium         Turn         Total         Total         Enterium         Turn         Total

Count Name: Olohena Rd Kapaa Bypass 3-13-17 to 3-15-17 Site Code: Hokua Place Start Date: 03/13/2017 Page No: 10

														Exit 16 1 0 17 153 5 0 158 RT	Bypass Enter 653 11 1 665 395 4 0 399 Th	Rd [SB] Total 669 12 1 682 105 2 1 108 LT												
[EB]	Н	1016	29	0	1045		16	-	0	17	占	<b>_</b>	F	Peak	Houi	r Data	a	<b>←</b>	- Th	142	7	135 7	576	_	12		Exit	Olohe
Olohena Rd [EB]	Enter	641	16	0	657	$\dagger$	430	10	0	440	부	<b>→</b>		03/15/20 Ending A 03/15/20	17 7:00 A .t 17 8:00 A	AM AM				+	9	$\dashv$	198	2	16	180	Enter	Olohena Rd [W
ō	Exit	375	13	0	388	L	195	2	0	200	R	<b>→</b>		Lights Mediums Articulate	d Trucks	;		•	Ш				774	ω	28	743	Total	[WB]
														635 18 2 655 Exit	T F S S S S S S S S S S S S S S S S S S	RT 28 0 0 0 28 19 2 770 Total Rd [NB]												

Turning Movement Peak Hour Data Plot (7:00 AM)

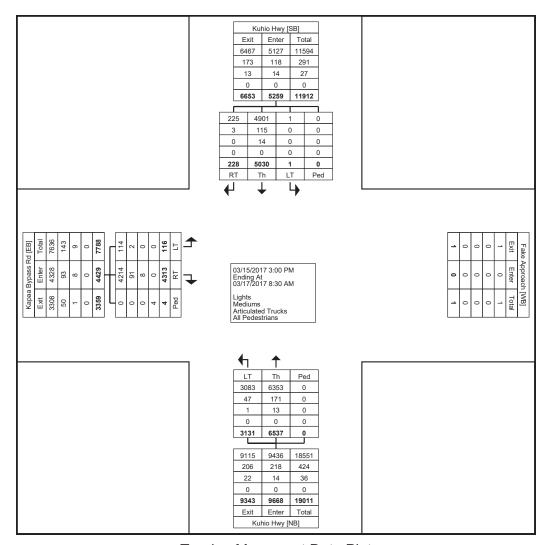
#### Study Name Olohena Rd Kaapuni Rd Kaehulu Rd 3-13-17 to 3-15-17 Start Date 03/13/2017 Start Time 3:30 PM Site Code Hokua Place

		Olohena Rd			Olohena Rd			Kaehulua Ro			Kaapuni Rd		Intere	ection
Start		Eastbound			Westbound			Southbound			outheast Bou			
3/13/17	LT-Kaapuni	LT-Kaehulu	Thru	Thru	RT-Kaapuni		LT-Olohena	RT-Olohena		LT-Kaehulua	<del> </del>	<del> </del>	15-Min Totals	
3:30 PM	4	5	33	38	70	3	0	0	0	0	28		186	811
3:45 PM	1	0	28	51	80	6	2	0	0	0			204	802
4:00 PM	7	0	37 24	54	84	3	2	0	0	0	21		210	797 775
4:15 PM 4:30 PM	6	2	2 <del>4</del> 18	50 49	77 64	9 5	0	0	0	0	36 25		211 177	775 744
4:45 PM	8	4	23	49 51	72	4	0	0	1	0	25		177	744
5:00 PM	4	2	36	44	62	1	0	1	0	0	30		188	
5:15 PM	5	2	20	53	65	6	2	0	1	0	19		180	
3/14/17	Ĭ	_	20	00	00	Ü	_						100	
6:30 AM	4	1	36	10	6	0	2	2	0	0	52	5	118	702
6:45 AM	4	1	61	7	7	0	0	0	0	1	65		148	789
7:00 AM	3	1	79	14	15	2	2	0	0	1	78		198	835
7:15 AM	11	6	104	10	24	2	3	0	0	2	72	4	238	782
7:30 AM	3	9	86	17	28	4	1	1	0	5	45		205	674
7:45 AM	5	6	53	24	32	2	2	0	0	0	60	10	194	
8:00 AM	5	4	37	30	13	2	4	1	0	1	45	3	145	
8:15 AM	5	2	45	16	17	1	1	0	0	0	40	3	130	
3/14/17														
3:30 PM	6	2	30	33	35	2	0	3	1	2	42	4	160	800
3:45 PM	9	2	22	51	60	3	0	3	2	0	26	11	189	833
4:00 PM	8	5	29	69	64	6	1	2	0	1	29	15	229	858
4:15 PM	5	4	26	68	68	2	4	0	0	0	31	14	222	855
4:30 PM	10	0	19	60	63	3	0	2	1	2	24		193	834
4:45 PM	11	4	27	38	85	4	2	0	0	1	31		214	
5:00 PM	9	0	32	58	81	6	5	1	1	0	30		226	
5:15 PM	5	4	17	58	73	4	3	3	3	0	26	5	201	
3/15/17														
6:30 AM	2	1	33	9	l I	0	2	3	0	0			103	658
6:45 AM	2	0	64	8		0	1	1	0	0			153	763
7:00 AM	2	2	83	11	9	2	2	0	0	0			193	824
7:15 AM	8	7	97	9	· ·	1	2	0	0	0	61	4	209	761
7:30 AM	10	7	82	21	23	4	1	0	0	0	54		208	699
7:45 AM	11 3	3 1	65 44	22	33	5 5	3	0	0	0	60		214	
8:00 AM	7	0	44	20 19	14 13	5 1	1	1	0	0	-		130 147	
8:15 AM	/	U	48	19	13	1	1	1	0		1 51	1 0	147	
AM Peak	Hour Traffic		3/14/17											
7:00 AM	22	22		65	99	10	8	1	0	8	255	23	835	
PHF	0.50	0.92		1.63		1.25	0.67	N/A	N/A	1.00			0.88	
PHV	44	24	416	40		8	12	1	0	8			952	
T Factor	9%	0%	1%	0%		0%	0%	0%	N/A	0%			302	
PM Peak			3/14/17											
4:00 PM	34	13	101	235	280	15	7	4	1	4	115	49	858	
PHF	1.06	0.65	0.87	0.85	1.09	0.63	1.75	0.50	N/A	1.00	0.99	0.82	0.94	
PHV	32	20	116	276		24	4	8	1	4			916	
T Factor	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%	2%	0%		

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 1

**Turning Movement Data** 

					Turnin	ıg Μον	/emer	nt Data						
		Караа Ву	pass Rd				Hwy				Kuhio Hwy			
		Eastbo				North	bound				Southbound			
Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
3:00 PM	1	105	0	106	99	191	0	290	0	106	5	0	111	507
3:15 PM	3	100	0	103	122	210	0	332	0	88	7	0	95	530
3:30 PM	8	93	0	101	120	207	0	327	0	73	8	0	81	509
3:45 PM	8	104	0	112	148	201	0	349	0	88	21	0	109	570
Hourly Total	20	402	0	422	489	809	0	1298	0	355	41	0	396	2116
4:00 PM	1	108	0	109	168	161	0	329	0	91	16	0	107	545
4:15 PM	9	94	0	103	154	172	0	329	0	97	14	0	111	540
	-				-									
4:30 PM	6	90	0	96	166	187	0	353	0	112	19	0	131	580
4:45 PM	2	95	0	97	146	176	0	322	0	112	15	0	127	546
Hourly Total	18	387	0	405	634	696	0	1330	0	412	64	0	476	2211
5:00 PM	5	88	0	93	149	232	0	381	0	138	27	0	165	639
5:15 PM	2	91	0	93	149	192	0	341	0	152	25	0	177	611
*** BREAK ***	-	<u> </u>	-	-	-	-		-	-	-	-	-	-	-
Hourly Total	7	179	0	186	298	424	0	722	0	290	52	0	342	1250
6:30 AM	0	78	0	78	14	124	0	138	0	203	0	0	203	419
6:45 AM	2	116	0	118	8	124	0	132	0	190	1	0	191	441
Hourly Total	2	194	0	196	22	248	0	270	0	393	1	0	394	860
7:00 AM	1	161	0	162	20	129	0	149	0	233	0	0	233	544
7:15 AM	1	184	0	185	25	155	0	180	0	200	1	0	201	566
7:30 AM	2	152	0	154	24	152	0	176	0	167	0	0	167	497
7:45 AM	1	155	1	156	33	180	0	213	0	135	0	0	135	504
	5	652	1			616	0	718	0	735	1	0	736	
Hourly Total				657	102				0					2111
8:00 AM	0	150	0	150	24	187	0	211		132	1	0	133	494
8:15 AM	3	131	0	134	21	177	0	198	0	165	0	0	165	497
8:30 AM	3	130	0	133	33	191	0	224	0	161	1	0	162	519
8:45 AM	1	108	0	109	25	209	0	234	0	189	0	0	189	532
Hourly Total	7	519	0	526	103	764	. 0	867	0	647	2	0	649	2042
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	5	103	0	108	97	217	0	314	0	96	6	0	102	524
3:15 PM	8	117	0	125	131	156	0	287	0	84	9	0	93	505
3:30 PM	6	83	0	89	138	227	0	365	1	76	8	0	85	539
3:45 PM	2	87	1	89	119	182	0	301	0	76	7	0	83	473
Hourly Total	21	390	1	411	485	782	0	1267	1	332	30	0	363	2041
4:00 PM	2	122	0	124	126	152	0	278	0	96	7	0	103	505
4:15 PM	6	109	1	115	136	158	0	294	0	95	6	0	101	510
4:30 PM	6	96	1	102	143	174	0	317	0	78	2	0	80	499
4:45 PM	5	93	0	98	138	181	0	319	0	83	6	0	89	506
			2				0		0					
Hourly Total	19	420		439	543	665		1208		352	21	0	373	2020
5:00 PM	2	98	0	100	146	204	0	350	0	85	3	0	88	538
5:15 PM	4	113	0	117	121	159	0	280	0	92	2	0	94	491
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	6	211	0	217	267	363	0	630	0	177	5	0	182	1029
6:30 AM	0	82	0	82	11	115	0	126	0	185	0	0	185	393
6:45 AM	0	89	0	89	10	126	0	136	0	164	3	0	167	392
Hourly Total	0	171	0	171	21	241	0	262	0	349	3	0	352	785
7:00 AM	1	131	0	132	17	133	0	150	0	219	1	0	220	502
7:15 AM	3	168	0	171	32	158	0	190	0	182	3	0	185	546
7:30 AM	1	125	0	126	40	146	0	186	0	166	2	0	168	480
7:45 AM	1	123	0	124	30	165	0	195	0	138	0	0	138	457
Hourly Total	6	547	0	553	119	602	0	721	0	705	6	0	711	1985
8:00 AM	4	116	0	120	20	169	0	189	0	150	0	0	150	459
8:15 AM	1	125	0	126	28	158	0	186	0	133	2	0	135	447
		-		-	-		-	-					_	
Grand Total	116	4313	4	4429	3131	6537	0	9668	1	5030	228	0	5259	19356
Approach %	2.6	97.4	-	-	32.4	67.6	-		0.0	95.6	4.3	-	-	-
Total %	0.6	22.3	-	22.9	16.2	33.8	-	49.9	0.0	26.0	1.2	-	27.2	-
Lights	114	4214	-	4328	3083	6353	-	9436	1	4901	225	-	5127	18891
% Lights	98.3	97.7	-	97.7	98.5	97.2	-	97.6	100.0	97.4	98.7	-	97.5	97.6
Mediums	2	91	-	93	47	171	-	218	0	115	3	-	118	429
% Mediums	1.7	2.1	-	2.1	1.5	2.6	-	2.3	0.0	2.3	1.3	-	2.2	2.2
Articulated Trucks	0	8	-	8	1	13	-	14	0	14	0	-	14	36
% Articulated Trucks	0.0	0.2	-	0.2	0.0	0.2	-	0.1	0.0	0.3	0.0	-	0.3	0.2
All Pedestrians	-	-	4	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-
							-	_						

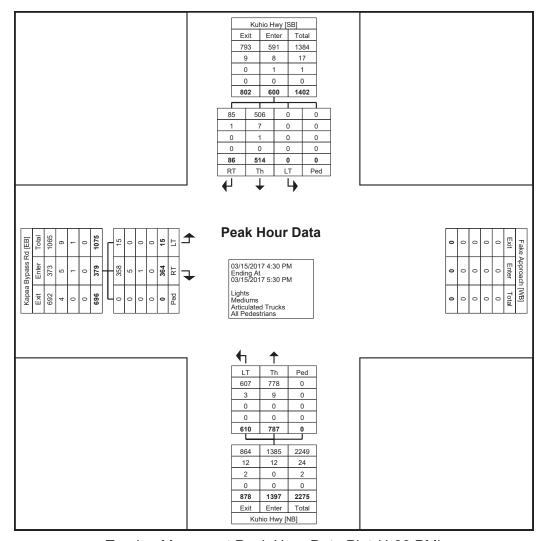


Turning Movement Data Plot

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 3

# Turning Movement Peak Hour Data (4:30 PM)

	1			0					. `	,				
		Kapaa By	pass Rd			Kuhic	Hwy				Kuhio Hwy			
Start Time		Eastbo	ound			North	bound				Southbound			
Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
4:30 PM	6	90	0	96	166	187	0	353	0	112	19	0	131	580
4:45 PM	2	95	0	97	146	176	0	322	0	112	15	0	127	546
5:00 PM	5	88	0	93	149	232	0	381	0	138	27	0	165	639
5:15 PM	2	91	0	93	149	192	0	341	0	152	25	0	177	611
Total	15	364	0	379	610	787	0	1397	0	514	86	0	600	2376
Approach %	4.0	96.0	-	-	43.7	56.3	-	-	0.0	85.7	14.3	-	-	-
Total %	0.6	15.3	-	16.0	25.7	33.1	-	58.8	0.0	21.6	3.6	-	25.3	-
PHF	0.625	0.958	-	0.977	0.919	0.848	-	0.917	0.000	0.845	0.796	-	0.847	0.930
Lights	15	358	-	373	607	778	-	1385	0	506	85	-	591	2349
% Lights	100.0	98.4	-	98.4	99.5	98.9	-	99.1	-	98.4	98.8	-	98.5	98.9
Mediums	0	5	-	5	3	9	-	12	0	7	1	-	8	25
% Mediums	0.0	1.4	-	1.3	0.5	1.1	-	0.9	-	1.4	1.2	-	1.3	1.1
Articulated Trucks	0	1	-	1	0	0	-	0	0	1	0	-	1	2
% Articulated Trucks	0.0	0.3	-	0.3	0.0	0.0	_	0.0		0.2	0.0	-	0.2	0.1
All Pedestrians	-	-	0	-		-	0	-		-	-	0	-	-
% All Padastrians	_				_	_			_					_



Turning Movement Peak Hour Data Plot (4:30 PM)

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 5

## Turning Movement Peak Hour Data (7:00 AM)

									(	,				
		Kapaa By	pass Rd			Kuhic	Hwy				Kuhio Hwy			
Start Time		Eastbo	ound			North	bound				Southbound			
Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
7:00 AM	1	161	0	162	20	129	0	149	0	233	0	0	233	544
7:15 AM	1	184	0	185	25	155	0	180	0	200	1	0	201	566
7:30 AM	2	152	0	154	24	152	0	176	0	167	0	0	167	497
7:45 AM	1	155	1	156	33	180	0	213	0	135	0	0	135	504
Total	5	652	1	657	102	616	0	718	0	735	1	0	736	2111
Approach %	0.8	99.2	-	-	14.2	85.8	-	-	0.0	99.9	0.1	-	-	-
Total %	0.2	30.9	-	31.1	4.8	29.2	-	34.0	0.0	34.8	0.0	-	34.9	-
PHF	0.625	0.886	-	0.888	0.773	0.856	-	0.843	0.000	0.789	0.250	-	0.790	0.932
Lights	4	635	-	639	100	600	-	700	0	711	1	-	712	2051
% Lights	80.0	97.4	-	97.3	98.0	97.4	-	97.5	-	96.7	100.0	-	96.7	97.2
Mediums	1	14	-	15	2	16	-	18	0	23	0	-	23	56
% Mediums	20.0	2.1	-	2.3	2.0	2.6	-	2.5	-	3.1	0.0	-	3.1	2.7
Articulated Trucks	0	3	-	3	0	0	-	0	0	1	0	-	1	4
% Articulated Trucks	0.0	0.5	-	0.5	0.0	0.0	-	0.0	-	0.1	0.0	-	0.1	0.2
All Pedestrians	-	-	1	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	_	_	100.0	_	_		_	_	_	_	_	_	_	_

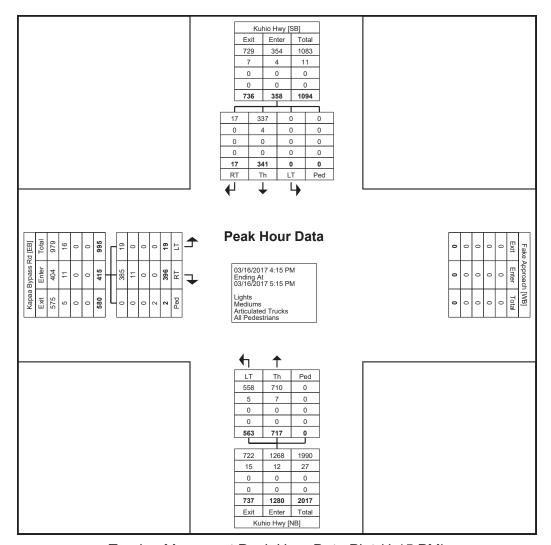
	Kuhio Hwy [SB]	
1   1   1   1   1   1   1   1   1   1	Peak Hour Data	Fake Exit 0 0 0
Kepea Bypass Rd [EB] Exit Eher Total 2 15 1740 0 3 3 3 0 0 0 0 103 657 766 0 144 14 1 0 3 0 0 1 685 5 1 662 5	03/16/2017 7:00 AM Ending At 03/16/2017 8:00 AM	Fake Approach [WB]  Exit Enter Toto 0
Exit (Apparent (	Lights Mediums Articulated Trucks All Pedestrians	[WB] Total 0 0 0
	LT Th Ped  100 600 0 2 16 0 0 0 0 0 0 0 102 616 0 1346 700 2046 37 18 55 4 0 4 0 0 4 0 0 0 1387 718 2105 Exit Enter Total Kuhio Hwy [NB]	

Turning Movement Peak Hour Data Plot (7:00 AM)

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 7

## Turning Movement Peak Hour Data (4:15 PM)

										,				
		Kapaa By	pass Rd	_		Kuhic	Hwy			-	Kuhio Hwy			
Start Time		Eastbo	ound			North	bound				Southbound			
Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
4:15 PM	6	109	1	115	136	158	0	294	0	95	6	0	101	510
4:30 PM	6	96	1	102	143	174	0	317	0	78	2	0	80	499
4:45 PM	5	93	0	98	138	181	0	319	0	83	6	0	89	506
5:00 PM	2	98	0	100	146	204	0	350	0	85	3	0	88	538
Total	19	396	2	415	563	717	0	1280	0	341	17	0	358	2053
Approach %	4.6	95.4	-	-	44.0	56.0	-	-	0.0	95.3	4.7	-	-	-
Total %	0.9	19.3	-	20.2	27.4	34.9	-	62.3	0.0	16.6	0.8	-	17.4	-
PHF	0.792	0.908	-	0.902	0.964	0.879	-	0.914	0.000	0.897	0.708	-	0.886	0.954
Lights	19	385	-	404	558	710	-	1268	0	337	17	-	354	2026
% Lights	100.0	97.2	-	97.3	99.1	99.0	-	99.1	-	98.8	100.0	-	98.9	98.7
Mediums	0	11	-	11	5	7	-	12	0	4	0	-	4	27
% Mediums	0.0	2.8	-	2.7	0.9	1.0	-	0.9	-	1.2	0.0	-	1.1	1.3
Articulated Trucks	0	0	-	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	2	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	_	_	100.0	-	_			-	_		-		-	_



Turning Movement Peak Hour Data Plot (4:15 PM)

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 9

## Turning Movement Peak Hour Data (7:00 AM)

									(	,				
		Kapaa By	pass Rd			Kuhic	Hwy				Kuhio Hwy			
Start Time		Eastbo	ound			North	bound				Southbound			
Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
7:00 AM	1	131	0	132	17	133	0	150	0	219	. 1	0	220	502
7:15 AM	3	168	0	171	32	158	0	190	0	182	3	0	185	546
7:30 AM	1	125	0	126	40	146	0	186	0	166	2	0	168	480
7:45 AM	1	123	0	124	30	165	0	195	0	138	0	0	138	457
Total	6	547	0	553	119	602	0	721	0	705	6	0	711	1985
Approach %	1.1	98.9	-	-	16.5	83.5	-	-	0.0	99.2	0.8	-	-	-
Total %	0.3	27.6	-	27.9	6.0	30.3	-	36.3	0.0	35.5	0.3	-	35.8	-
PHF	0.500	0.814	-	0.808	0.744	0.912	-	0.924	0.000	0.805	0.500	-	0.808	0.909
Lights	5	535	-	540	113	569	-	682	0	688	6	-	694	1916
% Lights	83.3	97.8	-	97.6	95.0	94.5	-	94.6	-	97.6	100.0	-	97.6	96.5
Mediums	1	10	-	11	5	29	-	34	0	15	0	-	15	60
% Mediums	16.7	1.8	-	2.0	4.2	4.8	-	4.7	-	2.1	0.0	-	2.1	3.0
Articulated Trucks	0	2	-	2	1	4	-	5	0	2	0	-	2	9
% Articulated Trucks	0.0	0.4	-	0.4	0.8	0.7	-	0.7	-	0.3	0.0	-	0.3	0.5
All Pedestrians	-	-	0	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	_	_	_	_	_		_	_	_	_		_	_	_

	Kuhio Hwy [SB]	
Kapaa Bypass Rd [EB]   Exit Enter Total   119   540   659   5   11   16   1   2   3   0   0   0   0   0   0   0   0   0	Peak Hour Data  03/17/2017 7:00 AM Ending At 03/17/2017 8:00 AM Lights Mediums Articulated Trucks All Pedestrians	Fake Approach [MB]
	LT Th Ped 113 569 0 5 29 0 1 4 0 0 0 0 119 602 0 1223 682 1905 25 34 59 4 5 9 0 0 0 0 1252 721 1973 Exit Enter Total Kuhio Hwy [NB]	

Turning Movement Peak Hour Data Plot (7:00 AM)

# TRAFFIC IMPACT ANALYSIS REPORT UPDATE

FOR THE PROPOSED

# **HOKUA PLACE**

**KAPA`A, KAUAI, HAWAII TAX MAP KEY: (4) 4-3-03: 01** 

# **APPENDIX B**

CAPACITY ANALYSIS WORKSHEETS
EXISTING TRAFFIC CONDITIONS

	>	ၨ	-	•	•	4	ሻ	<b>†</b>	~	<b>/</b>	Į.	4
Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			र्स	7	7		7	₽.			4	
Traffic Volume (vph)	8	24	8	36	1	8	4	664	12	3	728	36
Future Volume (vph)	8	24	8	36	1	8	4	664	12	3	728	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0			60		0	0		0
Storage Lanes		0		1			1		0	0		0
Taper Length (ft)	•	100	1001	4504	4500	0	100	4700	•	100	4700	0
Satd. Flow (prot)	0	0	1621	1501	1589	0	1631	1760	0	0	1799	0
Flt Permitted	٥	0	0.962	1400	1506	0	0.367	1760	0	0	0.998	0
Satd. Flow (perm)	0	0	1582	1420 Yes	1526 Yes	0	630	1760	0 No	0	1795	0
Right Turn on Red Satd. Flow (RTOR)				36	374				INO			
Link Speed (mph)			30	30	3/4			30			30	
Link Distance (ft)			417					1113			697	
Travel Time (s)			9.5					25.3			15.8	
Confl. Peds. (#/hr)	2	4	0.0	7	4	4	4	20.0	7	4	10.0	4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	15%	0%	4%	0%	6%	9%	4%	0%	0%	1%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	40	36	1	0	12	676	0	0	771	0
Turn Type	Perm	Perm	NA	Perm	Perm	custom	custom	NA		Perm	NA	
Protected Phases			4				5				6	
Permitted Phases	4	4		4	8	5	2	2		6		
Detector Phase	4	4	4	4	8	5	5	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	3.0	3.0	7.0		7.0	7.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	7.0	7.0	26.0		34.0	34.0	
Total Split (s)	32.0	32.0	32.0	32.0	32.0	8.0	8.0	178.0		170.0	170.0	
Total Split (%)	15.2% 4.0	15.2%	15.2% 4.0	15.2%	15.2% 4.0	3.8%	3.8%	84.8%		81.0%	81.0%	
Yellow Time (s) All-Red Time (s)	2.0	4.0 2.0	2.0	4.0	2.0	1.0	1.0	4.0 2.0		4.0	4.0 2.0	
Lost Time Adjust (s)	2.0	2.0	0.0	0.0	0.0	1.0	0.0	0.0		2.0	0.0	
Total Lost Time (s)			6.0	6.0	6.0		4.0	6.0			6.0	
Lead/Lag			0.0	0.0	0.0	Lead	Lead	0.0		Lag	Lag	
Lead-Lag Optimize?						Yes	Yes			Lug	Lug	
Recall Mode	None	None	None	None	None	None	None	C-Max		C-Max	C-Max	
Act Effct Green (s)			10.9	10.9	10.9		191.7	190.9			187.0	
Actuated g/C Ratio			0.05	0.05	0.05		0.91	0.91			0.89	
v/c Ratio			0.49	0.34	0.00		0.02	0.42			0.48	
Control Delay			115.8	31.5	0.0		1.3	2.8			4.5	
Queue Delay			0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay			115.8	31.5	0.0		1.3	2.8			4.5	
LOS			F	С	Α		Α	Α			Α	
Approach Delay			75.8					2.8			4.5	



Lane Group Lane Configurations Traffic Volume (vph) Future Volume (vph) Ideal Flow (vphpl) Storage Length (ft) Storage Length (ft) Satd. Flow (prot) Flt Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Confl. Peds. (#/hr) Peak Hour Factor Heavy Vehicles (%) Shared Lane Traffic (%) Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (%) Yellow Time (s) Lost Time (s) Lost Time (s) Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio V/c Ratio Control Delay Queue Delay Total Delay		0000
Traffic Volume (vph) 4 Future Volume (vph) 4 Ideal Flow (vphpl) 1900 Storage Length (ft) Storage Lanes Taper Length (ft) Satd. Flow (prot) 0 Flt Permitted Satd. Flow (perm) 0 Right Turn on Red No Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Confl. Peds. (#/hr) 4 Peak Hour Factor 1.00 Heavy Vehicles (%) 0% Shared Lane Traffic (%) Lane Group Flow (vph) 0 Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (%) Yellow Time (s) Lost Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS	Lane Group	SBR2
Future Volume (vph) 1 Ideal Flow (vphpl) 1900 Storage Length (ft) Storage Lanes Taper Length (ft) Satd. Flow (prot) 0 Flt Permitted Satd. Flow (perm) 0 Right Turn on Red No Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Confl. Peds. (#/hr) 4 Peak Hour Factor 1.00 Heavy Vehicles (%) 0% Shared Lane Traffic (%) Lane Group Flow (vph) 0 Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (%) Yellow Time (s) Lost Time (s) Lost Time (s) Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Ideal Flow (vphpl) Storage Length (ft) Storage Lanes Taper Length (ft) Satd. Flow (prot) Flt Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Confl. Peds. (#/hr) Peak Hour Factor Heavy Vehicles (%) Shared Lane Traffic (%) Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (%) Yellow Time (s) Lost Time (s) Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Storage Length (ft) Storage Lanes Taper Length (ft) Satd. Flow (prot) 0 Flt Permitted Satd. Flow (perm) 0 Right Turn on Red No Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Confl. Peds. (#/hr) 4 Peak Hour Factor 1.00 Heavy Vehicles (%) 0% Shared Lane Traffic (%) Lane Group Flow (vph) 0 Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (%) Yellow Time (s) Lost Time (s) Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Storage Lanes Taper Length (ft) Satd. Flow (prot) OFIt Permitted Satd. Flow (perm) ORight Turn on Red No Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Confl. Peds. (#/hr) Peak Hour Factor Heavy Vehicles (%) Shared Lane Traffic (%) Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (%) Yellow Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		1900
Storage Lanes Taper Length (ft) Satd. Flow (prot) Flt Permitted Satd. Flow (perm) Right Turn on Red No Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Confl. Peds. (#/hr) Peak Hour Factor Heavy Vehicles (%) Shared Lane Traffic (%) Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (%) Yellow Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS	Storage Length (ft)	
Taper Length (ft) Satd. Flow (prot) Flt Permitted Satd. Flow (perm) Right Turn on Red No Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Confl. Peds. (#/hr) Peak Hour Factor Heavy Vehicles (%) Shared Lane Traffic (%) Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (%) Yellow Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Satd. Flow (prot) Flt Permitted Satd. Flow (perm) Right Turn on Red No Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Confl. Peds. (#/hr) Peak Hour Factor Heavy Vehicles (%) Shared Lane Traffic (%) Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (%) Yellow Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Flt Permitted Satd. Flow (perm) 0 Right Turn on Red No Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Confl. Peds. (#/hr) 4 Peak Hour Factor 1.00 Heavy Vehicles (%) 0% Shared Lane Traffic (%) Lane Group Flow (vph) 0 Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		0
Satd. Flow (perm) Right Turn on Red No Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Confl. Peds. (#/hr) Peak Hour Factor Heavy Vehicles (%) Shared Lane Traffic (%) Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS	(: /	
Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Confl. Peds. (#/hr) Peak Hour Factor Heavy Vehicles (%) Shared Lane Traffic (%) Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		0
Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Confl. Peds. (#/hr) 4 Peak Hour Factor 1.00 Heavy Vehicles (%) 0% Shared Lane Traffic (%) Lane Group Flow (vph) 0 Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS	<b>\:</b> ,	
Link Speed (mph) Link Distance (ft) Travel Time (s) Confl. Peds. (#/hr) 4 Peak Hour Factor 1.00 Heavy Vehicles (%) 0% Shared Lane Traffic (%) Lane Group Flow (vph) 0 Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Link Distance (ft) Travel Time (s) Confl. Peds. (#/hr) 4 Peak Hour Factor 1.00 Heavy Vehicles (%) 0% Shared Lane Traffic (%) Lane Group Flow (vph) 0 Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Travel Time (s) Confl. Peds. (#/hr) 4 Peak Hour Factor 1.00 Heavy Vehicles (%) 0% Shared Lane Traffic (%) Lane Group Flow (vph) 0 Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Confl. Peds. (#/hr) 4 Peak Hour Factor 1.00 Heavy Vehicles (%) 0% Shared Lane Traffic (%) Lane Group Flow (vph) 0 Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Peak Hour Factor Heavy Vehicles (%) Shared Lane Traffic (%) Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS	. ,	1
Heavy Vehicles (%) Shared Lane Traffic (%) Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) Lost Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead-Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Shared Lane Traffic (%) Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Lane Group Flow (vph) Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		0%
Turn Type Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS	. ,	^
Protected Phases Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS	,	0
Permitted Phases Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Detector Phase Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Switch Phase Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Minimum Initial (s) Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Minimum Split (s) Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS	Minimum Initial (s)	
Total Split (s) Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS	Minimum Split (s)	
Total Split (%) Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Yellow Time (s) All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Total Lost Time (s) Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS	, ,	
Lead/Lag Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Lead-Lag Optimize? Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Recall Mode Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Act Effct Green (s) Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
Actuated g/C Ratio v/c Ratio Control Delay Queue Delay Total Delay LOS		
v/c Ratio Control Delay Queue Delay Total Delay LOS		
Control Delay Queue Delay Total Delay LOS		
Queue Delay Total Delay LOS		
Total Delay LOS	•	
LOS		
Approach Delay		
	Approach Delay	

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Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS			Е					Α			Α	
Queue Length 50th (ft)			55	0	0		1	127			157	
Queue Length 95th (ft)			103	44	0		4	201			360	
Internal Link Dist (ft)			337					1033			617	
Turn Bay Length (ft)							60					
Base Capacity (vph)			195	207	516		602	1600			1598	
Starvation Cap Reductn			0	0	0		0	0			0	
Spillback Cap Reductn			0	0	0		0	0			0	
Storage Cap Reductn			0	0	0		0	0			0	
Reduced v/c Ratio			0.21	0.17	0.00		0.02	0.42			0.48	

### Intersection Summary

Area Type: Other

Cycle Length: 210

Actuated Cycle Length: 210

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 75

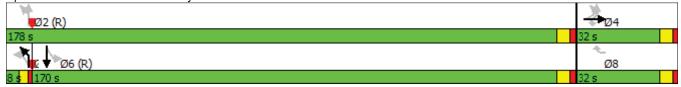
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.49

Intersection Signal Delay: 7.3 Intersection LOS: A Intersection Capacity Utilization 66.2% ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Kuhio Hwy & Kukui St & Huluili St





Lane Group	SBR2
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Intersection								
Int Delay, s/veh	2.6							
		EDT	EDD		MD	MET	NE	NDD
Movement		EBT	EBR		WBL	WBT	NBL	NBR
Lane Configurations		<b>₽</b>				4	W	
Traffic Vol, veh/h		100	264		16	40	100	8
Future Vol, veh/h		100	264		16	40	100	8
Conflicting Peds, #/hr		_ 0	0		0	0	1	0
Sign Control		Free	Free		Free	Free	Stop	Stop
RT Channelized		-	None		-	None	-	None
Storage Length		-	-		-	-	0	-
Veh in Median Storage, #		0	-		-	0	0	-
Grade, %		0	-		-	0	0	-
Peak Hour Factor		100	100		100	100	100	100
Heavy Vehicles, %		3	6		17	0	6	9
Mvmt Flow		100	264		16	40	100	8
Major/Minor		/lajor1		M	ajor2		Minor1	
Conflicting Flow All		0	0		364	0	305	232
Stage 1		-	-		-	-	232	-
Stage 2		_	-		-	-	73	-
Critical Hdwy		-	_		4.27	-	6.46	6.29
Critical Hdwy Stg 1		-	-		-	-	5.46	-
Critical Hdwy Stg 2		-	-		-	-	5.46	-
Follow-up Hdwy		-	-	2	2.353	-	3.554	3.381
Pot Cap-1 Maneuver		-	-		1116	-	679	790
Stage 1		-	-		-	-	797	-
Stage 2		-	-		-	-	940	-
Platoon blocked, %		-	-			-		
Mov Cap-1 Maneuver		-	-		1116	-	668	790
Mov Cap-2 Maneuver		-	-		-	-	668	-
Stage 1		-	-		-	-	785	-
Stage 2		-	-		-	-	939	-
Approach		EB			WB		NB	
		0			2.4		11.3	
HCM Control Delay, s HCM LOS		U			2.4		11.3 B	
I IOIVI LOS							Б	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR		WBT			
Capacity (veh/h)	676	-		1116	-			
HCM Lane V/C Ratio	0.16	-	-	0.014	-			
HCM Control Delay (s)	11.3	-	-	8.3	0			
HCM Lane LOS	В	-	-	Α	Α			
HCM 95th %tile Q(veh)	0.6	-	-	0	-			

Intersection									
Int Delay, s/veh	4.4								
Movement	EBL	EBT			WBT	WBR	SWL	SWR	
Lane Configurations		4			ĵ.		W		
Traffic Vol, veh/h	368	360			116	12	7	84	
Future Vol, veh/h	368	360			116	12	7	84	
Conflicting Peds, #/hr	7	0			0	7	0	0	
Sign Control	Free	Free			Free	Free	Stop	Stop	
RT Channelized	_	None			-	None	-	None	
Storage Length	_	-			_	-	0	-	
Veh in Median Storage, #	‡ -	0			0	-	0	-	
Grade, %	_	0			0	-	0	-	
Peak Hour Factor	100	100			100	100	100	100	
Heavy Vehicles, %	1	5			20	0	0	8	
Mvmt Flow	368	360			116	12	7	84	
Major/Minor	Major1				Major2		Minor2		
Conflicting Flow All	135	0			-	0	1225	129	
Stage 1	-	-			_	_	129	125	
Stage 2	_	_			_	_	1096	_	
Critical Hdwy	4.11	_			_	_	6.4	6.28	
Critical Hdwy Stg 1	-	_			_	_	5.4	-	
Critical Hdwy Stg 2	_	_			_	_	5.4	-	
Follow-up Hdwy	2.209	_			-	_	3.5	3.372	
Pot Cap-1 Maneuver	1456	_			_	_	199	905	
Stage 1	-	_			-	_	902	-	
Stage 2	_	_			_	_	323	_	
Platoon blocked, %		_			-	-			
Mov Cap-1 Maneuver	1447	-			_	-	134	899	
Mov Cap-2 Maneuver	-	_			-	-	134	-	
Stage 1	-	-			_	-	612	_	
Stage 2	-	-			-	-	321	-	
J									
Approach	EB				WB		SW		
HCM Control Delay, s	4.2				0		11.7		
HCM LOS	7.2				U		В		
TIOW EOO									
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBRSWLr	1				
	1447	ED1	VVDT	- 62					
Capacity (veh/h) HCM Lane V/C Ratio	0.254	-	-	- 0.14					
HCM Control Delay (s)	8.3	0	-	- 0.14					
HCM Lane LOS					. <i>т</i> В				
HCM 95th %tile Q(veh)	A 1	A	-	- 0					
How som whe Q(ven)		-	-	- 0	.0				

Intersection								
Int Delay, s/veh	0.6							
Movement	EBL	EBT			WBT	WBR	SBL	SBR
Lane Configurations		4			ĵ.		W	32.1
Traffic Vol, veh/h	8	716			188	12	12	24
Future Vol, veh/h	8	716			188		12	24
Conflicting Peds, #/hr	6	0			0		0	0
Sign Control	Free	Free			Free		Stop	Stop
RT Channelized	-	None			-	None	-	None
Storage Length	_	-			_	-	0	-
Veh in Median Storage, #	‡ -	0			0	_	0	-
Grade, %	_	0			0		0	_
Peak Hour Factor	100	100			100		100	100
Heavy Vehicles, %	0	2			4		24	19
Mvmt Flow	8	716			188		12	24
Major/Minor	Major1				Major2		Minor2	
Conflicting Flow All	206	0			-	0	932	200
Stage 1	-	-			_	-	200	-
Stage 2	-	_			-	-	732	-
Critical Hdwy	4.1	-			_	-	6.64	6.39
Critical Hdwy Stg 1	-	-			-	_	5.64	- 5.30
Critical Hdwy Stg 2	-	-			_	_	5.64	-
Follow-up Hdwy	2.2	-			-	-	3.716	3.471
Pot Cap-1 Maneuver	1377	-			_	_	270	800
Stage 1	-	-			-	-	784	-
Stage 2	-	-			_	-	438	-
Platoon blocked, %		-			-	-		
Mov Cap-1 Maneuver	1370	-			-	-	265	796
Mov Cap-2 Maneuver	-	-			-	-	265	-
Stage 1	-	-			-	-	772	-
Stage 2	-	-			-	-	436	-
Ü								
Approach	EB				WB		SB	
HCM Control Delay, s	0.1				0		13.2	
HCM LOS							В	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR SBLn	1			
Capacity (veh/h)	1370	-	-	- 47				
HCM Lane V/C Ratio	0.006	-	_	- 0.07				
HCM Control Delay (s)	7.6	0	-	- 13.				
HCM Lane LOS	A	A	-		В			
HCM 95th %tile Q(veh)	0	-	-	- 0.				
2 ( 2 ( 2 ( 2 ( 2 ( 2 ( 2 ( 2 ( 2 ( 2 (								

TT. Ranio Tiwy & Londa Ot							Existing Air Call Hour Hamo
	*	*	4	<b>†</b>	Į.	4	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	W		, j	<b></b>	<b></b>	7	
Traffic Volume (veh/h)	344	2	16	672	764	68	
Future Volume (Veh/h)	344	2	16	672	764	68	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly flow rate (vph)	344	2	16	672	764	68	
Pedestrians	8						
Lane Width (ft)	11.0						
Walking Speed (ft/s)	3.5						
Percent Blockage	1						
Right turn flare (veh)							
Median type				None	TWLTL		
Median storage veh)					2		
Upstream signal (ft)				697	_		
pX, platoon unblocked	0.93						
vC, conflicting volume	1476	772	772				
vC1, stage 1 conf vol	772						
vC2, stage 2 conf vol	704						
vCu, unblocked vol	1474	772	772				
tC, single (s)	6.4	6.2	4.1				
tC, 2 stage (s)	5.4	0.2					
tF (s)	3.5	3.3	2.2				
p0 queue free %	16	99	98				
cM capacity (veh/h)	409	400	846				
				CD 4	CD 0		
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2		
Volume Total	346	16	672	764	68		
Volume Left	344	16	0	0	0		
Volume Right	2	0	0	0	68		
cSH	409	846	1700	1700	1700		
Volume to Capacity	0.85	0.02	0.40	0.45	0.04		
Queue Length 95th (ft)	203	1	0	0	0		
Control Delay (s)	46.6	9.3	0.0	0.0	0.0		
Lane LOS	Е	Α					
Approach Delay (s)	46.6	0.2		0.0			
Approach LOS	Е						
Intersection Summary							
Average Delay			8.7				
Intersection Capacity Utilizat	ion		66.1%	I	CU Level c	f Service	С
Analysis Period (min)			15				

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4		7	ĵ.		ሻ	_ ĵ₃	
Traffic Vol, veh/h	0	1	0	1	0	4	88	748	20	7	713	4
Future Vol, veh/h	0	1	0	1	0	4	88	748	20	7	713	4
Conflicting Peds, #/hr	3	0	0	0	0	3	0	0	16	16	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	11	5	4	0	2	2	2
Mvmt Flow	0	1	0	1	0	4	88	748	20	7	713	4
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1668	1689	715	1680	1681	777	717	0	0	784	0	0
Stage 1	729	729	-	950	950	-	-	-	-	-	-	-
Stage 2	939	960	-	730	731	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.31	4.15	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.399	2.245	-	-	2.218	-	-
Pot Cap-1 Maneuver	77	94	434	76	96	383	870	-	-	834	-	-
Stage 1	417	431	-	315	341	-	-	-	-	-	-	-
Stage 2	320	338	-	417	430	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	70	83	434	68	84	377	870	-	-	822	-	-
Mov Cap-2 Maneuver	70	83	-	68	84	-	-	-	-	-	-	-
Stage 1	375	427	-	279	302	-	-	-	-	-	-	-
Stage 2	284	299	-	412	426	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	48.9			23.7			1			0.1		
HCM LOS	Е			С								
Minor Long/Maior M.	NDI	NDT	NDD		CDI	CDT	CDD					
Minor Lane/Major Mvmt	NBL	NBT		EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	870	-	-	83 198	822	-	-					
HCM Lane V/C Ratio	0.101	-	-	0.012 0.025		-	-					
HCM Control Delay (s)	9.6	-	-	48.9 23.7	9.4	-	-					
HCM Lane LOS	Α	-	-	E C	Α	-	-					
HCM 95th %tile Q(veh)	0.3	-	-	0 0.1	0	-	-					

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations		4			4						4	
Traffic Vol, veh/h	4	1	12	0	2	92	0	0	0	0	204	3
Future Vol, veh/h	4	1	12	0	2	92	0	0	0	0	204	3
Conflicting Peds, #/hr	4	0	0	0	0	4	0	0	0	0	0	7
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	17	0	0	5	0	0	0	0	4	17
Mvmt Flow	4	1	12	0	2	92	0	0	0	0	204	8
Major/Minor	Minor2			Minor1						Major2		
Conflicting Flow All	266	215	215	215	219	4				0	0	C
Stage 1	215	215	-	0	0	-				-	-	-
Stage 2	51	0	-	215	219	-				-	-	
Critical Hdwy	7.1	6.5	6.37	7.1	6.5	6.25				4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	-	-	-				-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-				-	-	-
Follow-up Hdwy	3.5	4	3.453	3.5	4					2.2	-	
Pot Cap-1 Maneuver	691	686	789	746	683	1071				-	-	
Stage 1	792	729	-	-	-	-				-	-	
Stage 2	-	-	-	792	726	-				-	-	
Platoon blocked, %											-	
Mov Cap-1 Maneuver	624	682	784	734	679	1067				-	-	
Mov Cap-2 Maneuver	624	682	-	734	679	-				-	-	-
Stage 1	792	725	-			-				-	-	-
Stage 2	-	-	-	779	722	-				-	-	-
Approach	EB			WB						SB		
HCM Control Delay, s	10			8.8						0		
HCM LOS	B									U		
TIGIVI LOS	Б			A								
Minor Lane/Major Mvmt	EBLn1\	WBLn1	SBL	SBT SBR								
Capacity (veh/h)		1054	-									
HCM Lane V/C Ratio		0.089	_									
HCM Control Delay (s)	10	8.8	0									
HCM Lane LOS	В	Α	A									
HCM 95th %tile Q(veh)	0.1	0.3	-									
1.5.11 0011 /0110 ((1011)	0.1	0.0										

Intersection					
Intersection Delay, s/veh	20.0				
Intersection LOS	С				
Approach		EB	WB	NB	SB
Entry Lanes		1	1	1	1
Conflicting Circle Lanes		1	1	1	1
Adj Approach Flow, veh/h		652	228	136	724
Demand Flow Rate, veh/h		669	247	138	732
Vehicles Circulating, veh/h		556	129	628	348
Vehicles Exiting, veh/h		524	637	597	28
Ped Vol Crossing Leg, #/h		0	0	0	0
Ped Cap Adj	1.	.000	1.000	1.000	1.000
Approach Delay, s/veh	3	30.0	5.1	7.1	18.2
Approach LOS		D	Α	Α	С
Lana	1 . 6	1 6			
Lane	Left	Left		_eft	Left
Designated Moves	Lett LTR	Left LT		<u>-eft</u> .TR	Left LTR
			L		
Designated Moves	LTR	LT	L	.TR	LTR
Designated Moves Assumed Moves	LTR	LT	L L	TR TR	LTR
Designated Moves Assumed Moves RT Channelized	LTR LTR	LT LT	L L 1.(	TR TR 000	LTR LTR
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s	LTR LTR 1.000 2.609 4.976	LT LT 1.000 2.609 4.976	1.0 2.6 4.9	TR .TR 	LTR LTR 1.000 2.609 4.976
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s	LTR LTR 1.000 2.609 4.976 669	LT LT 1.000 2.609 4.976 247	1.0 2.6 4.9	TR TR 000 609 976 138	LTR LTR 1.000 2.609 4.976 732
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s	LTR LTR 1.000 2.609 4.976	LT LT 1.000 2.609 4.976	1.0 2.6 4.9	TR .TR 	LTR LTR 1.000 2.609 4.976
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h	LTR LTR 1.000 2.609 4.976 669 783 0.975	LT LT 1.000 2.609 4.976 247 1210 0.922	1.0 2.6 4.9 7	TR .TR .000 .609 .976 .138 .727	LTR LTR 1.000 2.609 4.976 732
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h	LTR LTR 1.000 2.609 4.976 669 783 0.975 652	LT LT 1.000 2.609 4.976 247 1210 0.922 228	1.0 2.6 4.9 7	TR .TR .000 .609 .976 .138 .727 .986 .136	LTR LTR 1.000 2.609 4.976 732 968
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h	LTR LTR 1.000 2.609 4.976 669 783 0.975 652 763	LT LT 1.000 2.609 4.976 247 1210 0.922 228 1115	1.0 2.6 4.9 0.9	TR .TR .000 .609 .976 .138 .727 .986 .136 .717	LTR LTR 1.000 2.609 4.976 732 968 0.989 724 957
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio	LTR LTR 1.000 2.609 4.976 669 783 0.975 652 763 0.855	LT LT 1.000 2.609 4.976 247 1210 0.922 228 1115 0.204	1.0 2.6 4.9 0.9	TR .TR .000 .609 .976 .138 .727 .986 .136 .717	LTR LTR 1.000 2.609 4.976 732 968 0.989 724 957 0.757
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h Cap Entry, veh/h Cap Entry, veh/h Cop Entry, veh/h V/C Ratio Control Delay, s/veh	LTR LTR 1.000 2.609 4.976 669 783 0.975 652 763 0.855 30.0	LT LT 1.000 2.609 4.976 247 1210 0.922 228 1115 0.204 5.1	1.0 2.6 4.9 0.9	TR .TR .000 .609 .976 .138 .727 .986 .136 .717 .190	LTR LTR 1.000 2.609 4.976 732 968 0.989 724 957 0.757
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio	LTR LTR 1.000 2.609 4.976 669 783 0.975 652 763 0.855	LT LT 1.000 2.609 4.976 247 1210 0.922 228 1115 0.204	1.0 2.6 4.9 0.9	TR .TR .000 .609 .976 .138 .727 .986 .136 .717	LTR LTR 1.000 2.609 4.976 732 968 0.989 724 957 0.757

Int Delay, s/veh   12.3
Movement   EBL   EBT   WBT   WBR   SEL   SER
Traffic Vol, veh/h
Traffic Vol, veh/h         68         416         40         104         300         17           Future Vol, veh/h         68         416         40         104         300         17           Conflicting Peds, #/hr         0         0         0         0         0         0           Sign Control         Free         Free         Free         Free         Free         Stop         Stop           RT Channelized         -         None         -         0         -         0         -         0         -         0         -         0         -         0         -         0         -         0         -         0         -         0         -         0         -         0         -         0         0         -         0         0         -         0         0         0 <td< td=""></td<>
Future Vol, veh/h         68         416         40         104         300         17           Conflicting Peds, #/hr         0         0         0         0         0         0           Sign Control         Free         Free         Free         Free         Free         Stop         Stop           RT Channelized         - None         - None <t< td=""></t<>
Conflicting Peds, #/hr         0         0         0         0         0         0           Sign Control         Free         Free         Free         Free         Stop         Stop           RT Channelized         - None         - None         - None         - None         - None           Storage Length         0         0         0         0         0           Veh in Median Storage, # - 0         0 0         0 0         0         0         0           Grade, % - 0         - 0 0 100         100 100         100 100         100 100         100
Sign Control         Free Free         Free Free         Free Free Free         Stop Stop Stop None           RT Channelized         - None         - None         - None           Storage Length         0
RT Channelized         - None         - None         - None           Storage Length         0 0 - 0 - 0 - 0 - 0 -
Storage Length         -         -         -         0         -         O         -         O         -         O         -         Grade, W         -         O         O         -         O         -         O         -         O         -         O         -         O         -         O         -         Peak Hour Factor         100         100         100         100         100         100         Hour Dead Plant         Dead Plant         O         2         2         0         Dead Plant         Dead Pl
Veh in Median Storage, #         -         0         0         -         0         -           Grade, %         -         0         0         -         0         -           Peak Hour Factor         100         100         100         100         100           Heavy Vehicles, %         9         1         0         2         2         0           Mvmt Flow         68         416         40         104         300         17           Major/Minor         Major/Minor         Major/Minor         Major/Minor         Minor2           Conflicting Flow All         144         0         -         0         644         92           Stage 1         -         -         0         644         92           Stage 2         -         -         -         92         -           Critical Hdwy         4.19         -         -         6.42         6.2           Critical Hdwy Stg 1         -         -         -         5.42         -           Critical Hdwy Stg 2         -         -         -         5.42         -           Follow-up Hdwy         2.281
Grade, %         -         0         0         -         0         -           Peak Hour Factor         100         100         100         100         100           Heavy Vehicles, %         9         1         0         2         2         0           Mvmt Flow         68         416         40         104         300         17           Major/Minor         Major1         Major2         Minor2         Minor2           Conflicting Flow All         144         0         -         0         644         92           Stage 1         -         -         -         92         -         -           Stage 2         -         -         -         92         -         -           Critical Hdwy         4.19         -         -         -         6.42         6.2         -           Critical Hdwy Stg 1         -         -         -         -         5.42         -
Peak Hour Factor         100         100         100         100         100           Heavy Vehicles, %         9         1         0         2         2         0           Mvmt Flow         68         416         40         104         300         17           Major/Minor         Major1         Major2         Minor2           Conflicting Flow All         144         0         -         0         644         92           Stage 1         -         -         -         92         -           Stage 2         -         -         -         92         -           Critical Hdwy         4.19         -         -         -         6.42         6.2           Critical Hdwy Stg 1         -         -         -         5.42         -           Critical Hdwy Stg 2         -         -         -         5.42         -           Follow-up Hdwy         2.281         -         -         -         3.518         3.3           Pot Cap-1 Maneuver         1397         -         -         -         437         971           Stage 1         -         -         -         -         -         9
Heavy Vehicles, %         9         1         0         2         2         0           Mvmt Flow         68         416         40         104         300         17           Major/Minor         Major1         Major2         Minor2           Conflicting Flow All         144         0         -         0         644         92           Stage 1         -         -         0         644         92           Stage 2         -         -         -         92         -           Critical Hdwy         4.19         -         -         -         6.42         6.2           Critical Hdwy Stg 1         -         -         -         5.42         -           Critical Hdwy Stg 2         -         -         -         5.42         -           Follow-up Hdwy         2.281         -         -         3.518         3.3           Pot Cap-1 Maneuver         1397         -         -         437         971           Stage 1         -         -         -         577         -           Platoon blocked, %         -         -         -         577         -
Mvmt Flow         68         416         40         104         300         17           Major/Minor         Major1         Major2         Minor2           Conflicting Flow All         144         0         -         0         644         92           Stage 1         -         -         -         92         -           Stage 2         -         -         -         552         -           Critical Hdwy         4.19         -         -         6.42         6.2           Critical Hdwy Stg 1         -         -         -         5.42         -           Critical Hdwy Stg 2         -         -         -         5.42         -           Follow-up Hdwy         2.281         -         -         3.518         3.3           Pot Cap-1 Maneuver         1397         -         -         437         971           Stage 1         -         -         -         577         -           Platoon blocked, %         -         -         -         -         -
Major/Minor         Major1         Major2         Minor2           Conflicting Flow All         144         0         -         0         644         92           Stage 1         -         -         -         92         -           Stage 2         -         -         -         552         -           Critical Hdwy         4.19         -         -         6.42         6.2           Critical Hdwy Stg 1         -         -         -         5.42         -           Critical Hdwy Stg 2         -         -         -         5.42         -           Follow-up Hdwy         2.281         -         -         3.518         3.3           Pot Cap-1 Maneuver         1397         -         -         437         971           Stage 1         -         -         -         577         -           Platoon blocked, %         -         -         -         577         -
Conflicting Flow All         144         0         -         0         644         92           Stage 1         -         -         -         92         -           Stage 2         -         -         -         552         -           Critical Hdwy         4.19         -         -         6.42         6.2           Critical Hdwy Stg 1         -         -         -         5.42         -           Critical Hdwy Stg 2         -         -         -         5.42         -           Follow-up Hdwy         2.281         -         -         3.518         3.3           Pot Cap-1 Maneuver         1397         -         -         437         971           Stage 1         -         -         -         932         -           Stage 2         -         -         -         577         -           Platoon blocked, %         -         -         -         -         -
Conflicting Flow All         144         0         -         0         644         92           Stage 1         -         -         -         92         -           Stage 2         -         -         -         552         -           Critical Hdwy         4.19         -         -         6.42         6.2           Critical Hdwy Stg 1         -         -         -         5.42         -           Critical Hdwy Stg 2         -         -         -         5.42         -           Follow-up Hdwy         2.281         -         -         3.518         3.3           Pot Cap-1 Maneuver         1397         -         -         437         971           Stage 1         -         -         -         577         -           Platoon blocked, %         -         -         -         577         -
Conflicting Flow All         144         0         -         0         644         92           Stage 1         -         -         -         92         -           Stage 2         -         -         -         552         -           Critical Hdwy         4.19         -         -         6.42         6.2           Critical Hdwy Stg 1         -         -         -         5.42         -           Critical Hdwy Stg 2         -         -         -         5.42         -           Follow-up Hdwy         2.281         -         -         3.518         3.3           Pot Cap-1 Maneuver         1397         -         -         437         971           Stage 1         -         -         -         577         -           Platoon blocked, %         -         -         -         577         -
Stage 1       -       -       92       -         Stage 2       -       -       -       552       -         Critical Hdwy       4.19       -       -       6.42       6.2         Critical Hdwy Stg 1       -       -       -       5.42       -         Critical Hdwy Stg 2       -       -       -       5.42       -         Follow-up Hdwy       2.281       -       -       3.518       3.3         Pot Cap-1 Maneuver       1397       -       -       437       971         Stage 1       -       -       -       932       -         Stage 2       -       -       -       577       -         Platoon blocked, %       -       -       -       -       -
Stage 2       -       -       -       552       -         Critical Hdwy       4.19       -       -       -       6.42       6.2         Critical Hdwy Stg 1       -       -       -       5.42       -         Critical Hdwy Stg 2       -       -       -       5.42       -         Follow-up Hdwy       2.281       -       -       -       3.518       3.3         Pot Cap-1 Maneuver       1397       -       -       437       971         Stage 1       -       -       -       932       -         Stage 2       -       -       -       577       -         Platoon blocked, %       -       -       -       -       -
Critical Hdwy       4.19       -       -       6.42       6.2         Critical Hdwy Stg 1       -       -       -       5.42       -         Critical Hdwy Stg 2       -       -       -       5.42       -         Follow-up Hdwy       2.281       -       -       -       3.518       3.3         Pot Cap-1 Maneuver       1397       -       -       -       437       971         Stage 1       -       -       -       932       -         Stage 2       -       -       -       577       -         Platoon blocked, %       -       -       -       -       -
Critical Hdwy Stg 1       -       -       -       5.42       -         Critical Hdwy Stg 2       -       -       -       5.42       -         Follow-up Hdwy       2.281       -       -       -       3.518       3.3         Pot Cap-1 Maneuver       1397       -       -       -       437       971         Stage 1       -       -       -       932       -         Stage 2       -       -       -       577       -         Platoon blocked, %       -       -       -       -       -
Critical Hdwy Stg 2       -       -       -       5.42       -         Follow-up Hdwy       2.281       -       -       -       3.518       3.3         Pot Cap-1 Maneuver       1397       -       -       -       437       971         Stage 1       -       -       -       932       -         Stage 2       -       -       -       577       -         Platoon blocked, %       -       -       -       -       -
Follow-up Hdwy 2.281 3.518 3.3  Pot Cap-1 Maneuver 1397 437 971  Stage 1 932 -  Stage 2 577 -  Platoon blocked, %
Pot Cap-1 Maneuver       1397       -       -       -       437       971         Stage 1       -       -       -       932       -         Stage 2       -       -       -       577       -         Platoon blocked, %       -       -       -       -       -
Stage 1       -       -       -       932       -         Stage 2       -       -       -       577       -         Platoon blocked, %       -       -       -       -       -
Stage 2       -       -       -       577       -         Platoon blocked, %       -       -       -       -
Platoon blocked, %
Mov Cap-1 Maneuver 1007 400 571
Mov Cap-2 Maneuver 409 -
Stage 1 873 -
Stage 2 577 -
Approach EB WB SE
HCM Control Delay, s 1.1 0 35.1
HCM LOS E
Minor Lane/Major Mvmt EBL EBT WBT WBR SELn1
Capacity (veh/h) 1397 422
HCM Control Delay (s) 7.7 0 - 35.1
HCM Lane LOS A A E
HCM 95th %tile Q(veh) 0.2 6.2

Intersection								
Int Delay, s/veh	0.4							
		EDT			WDT	WDD	CDI	CDD
Movement	EBL	EBT			WBT	WBR	SBL	SBR
Lane Configurations	•	्री			<b>f</b>		¥	•
Traffic Vol, veh/h	8	304			140	32	13	0
Future Vol, veh/h	8	304			140	32	13	0
Conflicting Peds, #/hr	0	0			_ 0	0	0	0
Sign Control	Free	Free			Free		Stop	Stop
RT Channelized	-	None			-	None	-	None
Storage Length	-	-			-	-	0	-
Veh in Median Storage, #	<del>+</del> -	0			0	-	0	-
Grade, %	-	0			0	-	0	-
Peak Hour Factor	100	100			100	100	100	100
Heavy Vehicles, %	0	2			11	0	0	0
Mvmt Flow	8	304			140	32	13	0
Major/Minor	Major1				Major2		Minor2	
Conflicting Flow All	172	0			-	0	476	156
Stage 1	-	-			_		156	-
Stage 2	_	_			_	_	320	_
Critical Hdwy	4.1	_			_	_	6.4	6.2
Critical Hdwy Stg 1	7.1	_			_	_	5.4	0.2
Critical Hdwy Stg 2		_					5.4	
Follow-up Hdwy	2.2	_			_		3.5	3.3
Pot Cap-1 Maneuver	1417	-			-		551	895
Stage 1	1417	-			_	_	877	090
Stage 2	-	-			-		741	-
Platoon blocked, %	-	-			-	-	141	_
Mov Cap-1 Maneuver	1417	-			-	-	547	895
Mov Cap-1 Maneuver	1417	-			-	_	547	090
					-	-	871	
Stage 1	-	-			-	-	741	-
Stage 2	-	-			-	-	741	-
Approach	EB				WB		SB	
HCM Control Delay, s	0.2				0		11.7	
HCM LOS							В	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR SB	Ln1			
Capacity (veh/h)	1417		_		<u></u> 547			
HCM Lane V/C Ratio	0.006	_	_	- 0.				
HCM Control Delay (s)	7.6	0	_		11.7			
HCM Lane LOS	7.0 A	A	-	-	В			
LION LAND LUG	A	Α.	-	-	ט			
HCM 95th %tile Q(veh)	0	_	_	_	0.1			

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	7	7	Ť	<b>^</b>	<u></u>	7
Traffic Vol, veh/h	4	736	100	620	800	4
Future Vol, veh/h	4	736	100	620	800	4
Conflicting Peds, #/hr	1	0	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	140	0	170	-	-	150
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	20	3	2	3	3	0
Mvmt Flow	4	736	100	620	800	4
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1312	_	801	0	-	0
Stage 1	801	-	-	-		-
Stage 2	511		_	_	_	_
Critical Hdwy	6.9	_	4.13	_	_	_
Critical Hdwy Stg 1	5.7	_	٠.١٥	_	_	_
Critical Hdwy Stg 2	6.1	_	-	_	_	_
Follow-up Hdwy	3.69	_	2.219	_	_	_
Pot Cap-1 Maneuver	144	0	820	_	_	_
Stage 1	402	0	-	_	_	_
Stage 2	527	0	-	_	_	_
Platoon blocked, %	UL!			_	_	_
Mov Cap-1 Maneuver	126	_	819	_	_	-
Mov Cap-2 Maneuver	233	-	-	_	_	_
Stage 1	353	_	-	-	_	-
Stage 2	526	-	-	_	-	_
	020					
Approach	EB		NB		SB	
HCM Control Delay, s	20.7		1.4		0	
HCM LOS	20.7 C		1.4		U	
TIOW LOO	U					
Minor Lane/Major Mvmt	NBL	NBT EBLn1 I	EBLn2 SBT	SBR		
Capacity (veh/h)	819	- 233	- CDI	ODIN		
HCM Lane V/C Ratio	0.122	- 233	-	-		
	10	20 =	 0	-		
HCM Control Delay (s) HCM Lane LOS	10 B	- 20.7 - C	0 - A -	-		
	0.4	0.4		-		
HCM 95th %tile Q(veh)	0.4	- 0.1		-		

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Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			ર્ની	7	7		7	f)			4	
Traffic Volume (vph)	16	20	8	36	8	60	56	548	16	3	580	32
Future Volume (vph)	16	20	8	36	8	60	56	548	16	3	580	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0			60		0	0		0
Storage Lanes		0		1			1		0	0		0
Taper Length (ft)		100					100			100		
Satd. Flow (prot)	0	0	1765	1561	1589	0	1745	1821	0	0	1770	0
Flt Permitted		_	0.961				0.397		_		0.998	
Satd. Flow (perm)	0	0	1489	1324	1423	0	679	1821	0	0	1766	0
Right Turn on Red				Yes	Yes				No			
Satd. Flow (RTOR)				64	340							
Link Speed (mph)			30					30			30	
Link Distance (ft)			417					1123			607	
Travel Time (s)			9.5					25.5	10		13.8	
Confl. Peds. (#/hr)	37	30		47	30	30	75	4.00	49	49		30
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)	0	0	4.4	0.0	•	0	440	504	•	0	0.40	0
Lane Group Flow (vph)	0	0	44	36	8	0	116	564	0	0	643	0
Turn Type	Perm	Perm	NA	Perm	Perm	custom		NA		Perm	NA	
Protected Phases	1	1	4	1	0	F	5	2		c	6	
Permitted Phases Detector Phase	4	4	4	4	8	5 5	2 5	2		6	6	
Switch Phase	4	4	4	4	0	5	5	2		U	Ü	
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	4.0	4.0	7.0		7.0	7.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	8.0	8.0	26.0		34.0	34.0	
Total Split (s)	28.0	28.0	28.0	28.0	28.0	8.0	8.0	92.0		84.0	84.0	
Total Split (%)	23.3%	23.3%	23.3%	23.3%	23.3%	6.7%	6.7%	76.7%		70.0%	70.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.5	3.5	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	0.5	2.0		2.0	2.0	
Lost Time Adjust (s)	2.0	2.0	0.0	0.0	0.0	0.5	0.0	0.0		2.0	0.0	
Total Lost Time (s)			6.0	6.0	6.0		4.0	6.0			6.0	
Lead/Lag			0.0	0.0	0.0	Lead	Lead	0.0		Lag	Lag	
Lead-Lag Optimize?						Yes	Yes			Lug	Lug	
Recall Mode	None	None	None	None	None	None	None	C-Max		C-Max	C-Max	
Act Effct Green (s)	110110	110110	9.3	9.3	9.3	110110	103.3	102.5		o max	90.5	
Actuated g/C Ratio			0.08	0.08	0.08		0.86	0.85			0.75	
v/c Ratio			0.39	0.22	0.02		0.18	0.36			0.48	
Control Delay			61.6	6.9	0.1		2.4	3.4			8.2	
Queue Delay			0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay			61.6	6.9	0.1		2.4	3.4			8.2	
LOS			E	A	A		A	Α			A	
Approach Delay			37.0					3.2			8.2	
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Lane Group	SBR2
Lane Configurations	ODIAL
Traffic Volume (vph)	28
Future Volume (vph)	28
Ideal Flow (vphpl)	1900
Storage Length (ft)	1900
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	0
Flt Permitted	U
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	INO
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	35
Peak Hour Factor	1.00
Heavy Vehicles (%)	0%
Shared Lane Traffic (%)	0 /0
Lane Group Flow (vph)	0
Turn Type	U
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

	_5	•	-	*	•		ገ	T		-	¥	*
Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS			D					Α			Α	
Queue Length 50th (ft)			33	0	0		11	85			181	
Queue Length 95th (ft)			71	12	0		25	147			302	
Internal Link Dist (ft)			337					1043			527	
Turn Bay Length (ft)							60					
Base Capacity (vph)			272	295	538		645	1556			1332	
Starvation Cap Reductn			0	0	0		0	0			0	
Spillback Cap Reductn			0	0	0		0	0			0	
Storage Cap Reductn			0	0	0		0	0			0	
Reduced v/c Ratio			0.16	0.12	0.01		0.18	0.36			0.48	
Intersection Summary												

#### Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

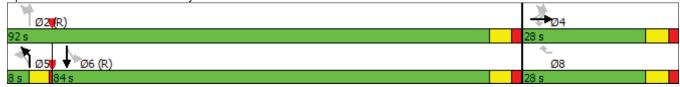
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.48

Intersection Signal Delay: 7.4 Intersection LOS: A Intersection Capacity Utilization 95.3% ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 1: Kuhio Hwy & Kukui St & Huluili St





Lane Group	SBR2
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Intersection									
Int Delay, s/veh	7.7								
						MOT	ND	NDD	
Movement		EBT	EBR		WBL	WBT	NBL	NBR	
Lane Configurations		<b>†</b>			4.0	ની	W		
Traffic Vol, veh/h		112	308		12	48	340	32	
Future Vol, veh/h		112	308		12	48	340	32	
Conflicting Peds, #/hr		0	4		4	0	0	3	
Sign Control		Free	Free		Free	Free	Stop	Stop	
RT Channelized		-	None		-	None	-	None	
Storage Length		-	-		-	-	0	-	
Veh in Median Storage, #		0	-		-	0	0	-	
Grade, %		0	-		-	0	0	-	
Peak Hour Factor		100	100		100	100	100	100	
Heavy Vehicles, %		2	4		4	6	1	0	
Mvmt Flow		112	308		12	48	340	32	
Major/Minor	N	/lajor1		Ma	ajor2		Minor1		
Conflicting Flow All		0	0		424	0	342	273	
Stage 1		-	-		-	-	270	-	
Stage 2		_	_		_	_	72	_	
Critical Hdwy		_	_		4.14	_	6.41	6.2	
Critical Hdwy Stg 1		_	_			_	5.41	0.2	
Critical Hdwy Stg 2			_		_	_	5.41	_	
Follow-up Hdwy			_	2	.236	_	3.509	3.3	
Pot Cap-1 Maneuver			_		1125	_	656	771	
Stage 1		_	_		-	_	778		
Stage 2		_	_		_	_	953	_	
Platoon blocked, %			_			_	300		
Mov Cap-1 Maneuver		_	_		1121	_	647	766	
Mov Cap-2 Maneuver		_	_		-	_	647	-	
Stage 1		_	_		_	_	767	_	
Stage 2		_	_		_	_	953	_	
							300		
Approach		EB			WB		NB		
HCM Control Delay, s		0			1.6		17.4		
HCM LOS							С		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL \	WBT				
	656			1121	-				
Capacity (yeh/h)	000			0.011	_				
Capacity (veh/h)	0.567	_	_						
HCM Lane V/C Ratio	0.567 17.4	-							
HCM Lane V/C Ratio HCM Control Delay (s)	17.4	-	-	8.2	0				
HCM Lane V/C Ratio									

Intersection									
Int Delay, s/veh	12.9								
Movement	EBL	EBT			WBT	WBR	SWL	SWR	{
Lane Configurations		4			4		W		
Traffic Vol, veh/h	328	220			372	84	48	236	j
Future Vol, veh/h	328	220			372	84	48	236	
Conflicting Peds, #/hr	15	0			0	15	0	0	
Sign Control	Free	Free			Free	Free	Stop	Stop	
RT Channelized	-	None			-		-	None	
Storage Length	-	-			-	-	0	-	
Veh in Median Storage,	# -	0			0	-	0	-	
Grade, %	-	0			0	-	0	-	
Peak Hour Factor	100	100			100	100	100	100	)
Heavy Vehicles, %	3	3			1	2	2	1	
Mvmt Flow	328	220			372	84	48	236	j
Major/Minor	Major1				Major2		Minor2		
Conflicting Flow All	471	0			-	0	1305	429	,
Stage 1	-	-			_	-	429	-	
Stage 2	-	-			-	-	876	-	
Critical Hdwy	4.13	-			-	-	6.42	6.21	
Critical Hdwy Stg 1	-	-			-	-	5.42	-	
Critical Hdwy Stg 2	-	-			_	-	5.42	_	
Follow-up Hdwy	2.227	-			-	-	3.518	3.309	)
Pot Cap-1 Maneuver	1086	-			_	-	177	628	
Stage 1	-	-			-	-	657	-	
Stage 2	-	-			_	-	407	-	
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1072	-			-	-	112	620	)
Mov Cap-2 Maneuver	-	-			-	-	112	-	
Stage 1	-	-			-	-	422	-	-
Stage 2	-	-			-	-	402	-	
Approach	EB				WB		SW		
HCM Control Delay, s	5.9				0		47		
HCM LOS							E		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBRSW	Ln1				
Capacity (veh/h)	1072	-	-		351				
HCM Lane V/C Ratio	0.306	-	-	- 0.					
HCM Control Delay (s)	9.8	0	-	-	47				
HCM Lane LOS	A	A	-	-	E				
HCM 95th %tile Q(veh)	1.3	-	-	-	7				

Intersection								
Int Delay, s/veh	0.9							
		EDT			WDT	WDD	CDI	CDD
Movement	EBL	EBT			WBT	WBR	SBL	SBR
Lane Configurations	00	<b>4</b>			<b>}</b>		<b>Y</b>	0.4
Traffic Vol, veh/h	36	532			548		16	24
Future Vol, veh/h	36	532			548		16	24
Conflicting Peds, #/hr	2	0			0		0	58
Sign Control	Free	Free			Free		Stop	Stop
RT Channelized	-	None			-	None	-	None
Storage Length	-	-			-	-	0	-
Veh in Median Storage, #	-	0			0	-	0	-
Grade, %	400	0			0		0	-
Peak Hour Factor	100	100			100		100	100
Heavy Vehicles, %	13	3			1	0	0	6
Mvmt Flow	36	532			548	60	16	24
Major/Minor	Major1				Major2		Minor2	
Conflicting Flow All	610	0			-	0	1184	638
Stage 1	-	-			-	-	580	-
Stage 2	-	-			-	-	604	-
Critical Hdwy	4.23	-				-	6.4	6.26
Critical Hdwy Stg 1	-	-			-	-	5.4	-
Critical Hdwy Stg 2	-	-			-	-	5.4	-
Follow-up Hdwy	2.317	-			-	-	3.5	3.354
Pot Cap-1 Maneuver	917	-			-	-	211	469
Stage 1	-	-			-	-	564	-
Stage 2	-	-			-	-	550	-
Platoon blocked, %		-			-	-		
Mov Cap-1 Maneuver	915	-			-	-	198	444
Mov Cap-2 Maneuver	-	-			-	-	198	-
Stage 1	-	-			-	-	531	-
Stage 2	-	-			-	-	549	-
Approach	EB				WB		SB	
	0.6				0		19	
HCM Control Delay, s HCM LOS	0.0				0		C	
I IOWI LOS							C	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR S				
Capacity (veh/h)	915	-	-	-	297			
HCM Lane V/C Ratio	0.039	-	-	-	0.135			
HCM Control Delay (s)	9.1	0	-	-	19			
HCM Lane LOS	Α	Α	-	-	С			
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5			

	•	$\overline{}$	•	<b>+</b>	T	1	
		*	7		*	_	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	W		7			7	
Traffic Volume (veh/h)	296	3	20	640	656	152	
Future Volume (Veh/h)	296	3	20	640	656	152	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly flow rate (vph)	296	3	20	640	656	152	
Pedestrians	19						
Lane Width (ft)	11.0						
Walking Speed (ft/s)	3.5						
Percent Blockage	2						
Right turn flare (veh)							
Median type				None	TWLTL		
Median storage veh)					2		
Upstream signal (ft)				607			
pX, platoon unblocked	0.93						
vC, conflicting volume	1355	675	675				
vC1, stage 1 conf vol	675						
vC2, stage 2 conf vol	680						
vCu, unblocked vol	1344	675	675				
tC, single (s)	6.4	6.2	4.1				
tC, 2 stage (s)	5.4						
tF(s)	3.5	3.3	2.2				
p0 queue free %	32	99	98				
cM capacity (veh/h)	437	450	910				
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2		
Volume Total	299	20	640	656	152		
Volume Left	296	20	040	0	0		
Volume Right	3	0	0	0	152		
cSH	437	910	1700	1700	1700		
Volume to Capacity	0.68	0.02	0.38	0.39	0.09		
Queue Length 95th (ft)	126	2	0.50	0.59	0.09		
	29.2	9.0	0.0	0.0	0.0		
Control Delay (s)	29.2 D		0.0	0.0	0.0		
Lane LOS	29.2	A 0.3		0.0			
Approach LOS		0.3		0.0			
Approach LOS	D						
Intersection Summary							
Average Delay			5.0				
Intersection Capacity Utiliza	ation		57.8%	IC	CU Level o	f Service	
Analysis Period (min)			15				

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations		4			4		7	ĵ.		75	- 1≽	
Traffic Vol, veh/h	1	0	0	2	0	12	380	652	12	12	608	5
Future Vol, veh/h	1	0	0	2	0	12	380	652	12	12	608	5
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	7	7	0	C
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	11	5	4	0	2	2	2
Mvmt Flow	1	0	0	2	0	12	380	652	12	12	608	5
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2060	2066	611	2060	2062	666	613	0	0	671	0	0
Stage 1	635	635	-	1425	1425	-	-	-	-	-	-	
Stage 2	1425	1431	_	635	637	_	_	_	_	_	_	
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.31	4.15	_	_	4.12	_	_
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	_	_	-	_	_
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	_	_	_	_	_	_	_
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.399	2.245	_	_	2.218	_	_
Pot Cap-1 Maneuver	41	55	497	41	55	444	952	_	_	919	_	
Stage 1	470	476	-	170	203		-	_	_	-	_	
Stage 2	170	202	-	470	475	_	-	-	_	_	_	
Platoon blocked, %		v_						-	-		-	_
Mov Cap-1 Maneuver	27	32	497	28	32	441	952	_	_	913	_	
Mov Cap-2 Maneuver	27	32	-	28	32	-	-	-	_	-	-	
Stage 1	282	470	-	101	121	_	_	-	_	-	_	-
Stage 2	99	121	-	464	469	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	143.4			33.1			4.1			0.2		
HCM LOS	143.4 F			55.1 D			4.1			0.2		
TIGIVI LOS	Г			U								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	952	-	-	27 142	913	-	-					
HCM Lane V/C Ratio	0.399	-		0.037 0.099	0.013	-	-					
HCM Control Delay (s)	11.3	-	-	143.4 33.1	9	-	-					
HCM Lane LOS	В	-	-	F D	Α	-	-					
HCM 95th %tile Q(veh)	1.9	-	-	0.1 0.3	0	-	-					

Intersection												
Int Delay, s/veh	7.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	LDL	4	LDIX	VVDL	4	WDIX	NDL	וטו	NON	ODL	4	JUIN
Traffic Vol, veh/h	8	1	0	3	2	384	0	0	0	0	200	4
Future Vol, veh/h	8	1	0	3	2	384	0	0	0	0	200	4
Conflicting Peds, #/hr	13	0	0	0	0	13	0	0	0	7	0	16
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	- -	- Otop	None	- Otop	- Olop		-	-	None	-	-	None
Storage Length	_	_	-	_	_	-	_	_	-	_	_	-
Veh in Median Storage, #	-	0	-	_	0	_	_	16974	_	-	0	_
Grade, %	_	0	_	_	0	_	_	0	_	_	0	_
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	17	0	0	5	0	0	0	0	4	17
Mvmt Flow	8	1	0	3	2	384	0	0	0	0	200	4
WWW.CTIOW	· ·	•		Ū	_	001	V	· ·			200	•
Major/Minor	Minor2			Minor1						Major2		
Conflicting Flow All	424	225	218	210	227	20				7	0	0
Stage 1	218	218	-	7	7	-				-	-	-
Stage 2	206	7	_	203	220	_				_		
Critical Hdwy	7.1	6.5	6.37	7.1	6.5	6.25				4.1	_	_
Critical Hdwy Stg 1	6.1	5.5	-	-	-	0.20				-	_	_
Critical Hdwy Stg 2	-	-	_	6.1	5.5	_				_	_	_
Follow-up Hdwy	3.5	4	3.453	3.5		3.345				2.2	_	_
Pot Cap-1 Maneuver	544	678	786	752	676	1049				1627	_	_
Stage 1	789	726	-	-	-	-				-	_	_
Stage 2	-	-	_	804	725	_				_	-	_
Platoon blocked, %				001	120						_	_
Mov Cap-1 Maneuver	332	664	775	747	662	1031				1617	-	-
Mov Cap-2 Maneuver	332	664	-	747	662	-				-	-	-
Stage 1	789	716	_	-	-	-				-	-	-
Stage 2	-	-	_	803	715	-				_	-	_
g												
Approach	EB			WB						SB		
HCM Control Delay, s	15.5			10.6						0		
HCM LOS	C			В						•		
110111 200												
Minor Lane/Major Mvmt	EBLn1V	VBLn1	SBL	SBT SBR								
Capacity (veh/h)	352		1617									
HCM Lane V/C Ratio	0.026	0.38	-									
HCM Control Delay (s)	15.5	10.6	0									
HCM Lane LOS	C	В	A									
HCM 95th %tile Q(veh)	0.1	1.8	0									
/541/ /5410 ((1511)	0.1	1.0	v									

Intersection					
Intersection Delay, s/veh	14.2				
Intersection LOS	В				
Approach	Е	3	WB	NB	SB
Entry Lanes		1	1	1	1
Conflicting Circle Lanes		1	1	1	1
Adj Approach Flow, veh/h	26	0	552	640	392
Demand Flow Rate, veh/h	27	8	564	640	407
Vehicles Circulating, veh/h	43	9	333	262	892
Vehicles Exiting, veh/h	86	0	569	455	5
Ped Vol Crossing Leg, #/h		0	0	0	0
Ped Cap Adj	1.00	0	1.000	1.000	1.000
Approach Delay, s/veh	7.	9	11.5	11.5	26.6
Approach LOS		4	В	В	D
Lana	1 -4	1 6	1 60		
Lane	Left	Left	Left	<u>Left</u>	
Designated Moves	LETT LTR	Left LT	Lett LTR		
				LTR	
Designated Moves	LTR	LT	LTR	LTR	
Designated Moves Assumed Moves	LTR	LT	LTR	LTR LTR	
Designated Moves Assumed Moves RT Channelized	LTR LTR	LT LT	LTR LTR	LTR LTR	
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s	LTR LTR 1.000 2.609 4.976	LT LT 1.000 2.609 4.976	LTR LTR 1.000 2.609 4.976	LTR LTR 1.000 2.609 4.976	
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s	LTR LTR 1.000 2.609 4.976 278	1.000 2.609 4.976 564	LTR LTR 1.000 2.609 4.976 640	LTR LTR 1.000 2.609 4.976 407	
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s	LTR LTR 1.000 2.609 4.976	LT LT 1.000 2.609 4.976	LTR LTR 1.000 2.609 4.976	LTR LTR 1.000 2.609 4.976 407	
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h	LTR LTR 1.000 2.609 4.976 278 882 0.937	1.000 2.609 4.976 564	LTR LTR 1.000 2.609 4.976 640	LTR LTR 1.000 2.609 4.976 407 556 0.964	
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h	LTR LTR 1.000 2.609 4.976 278 882 0.937 260	1.000 2.609 4.976 564 983 0.979 552	LTR LTR 1.000 2.609 4.976 640 1056 1.000 640	LTR LTR 1.000 2.609 4.976 407 556 0.964 392	
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h	LTR LTR 1.000 2.609 4.976 278 882 0.937 260 826	1.000 2.609 4.976 564 983 0.979 552 962	LTR LTR 1.000 2.609 4.976 640 1056 1.000 640 1056	LTR LTR 1.000 2.609 4.976 407 556 0.964 392 536	
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio	LTR LTR 1.000 2.609 4.976 278 882 0.937 260 826 0.315	1.000 2.609 4.976 564 983 0.979 552 962 0.574	LTR LTR 1.000 2.609 4.976 640 1056 1.000 640 1056 0.606	LTR LTR 1.000 2.609 4.976 407 556 0.964 392 536 0.733	
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio Control Delay, s/veh	LTR LTR 1.000 2.609 4.976 278 882 0.937 260 826	1.000 2.609 4.976 564 983 0.979 552 962	LTR LTR 1.000 2.609 4.976 640 1056 1.000 640 1056	LTR LTR 1.000 2.609 4.976 407 556 0.964 392 536 0.733	
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio	LTR LTR 1.000 2.609 4.976 278 882 0.937 260 826 0.315	1.000 2.609 4.976 564 983 0.979 552 962 0.574	LTR LTR 1.000 2.609 4.976 640 1056 1.000 640 1056 0.606	LTR LTR 1.000 2.609 4.976 407 556 0.964 392 536 0.733 6 26.6	

Intersection								
Int Delay, s/veh	4.1							
Movement	EBL	EBT			WBT	WBR	SEL	SER
Lane Configurations		4			ĵ.		W	
Traffic Vol, veh/h	52	116			276	280	120	68
Future Vol, veh/h	52	116			276	280	120	68
Conflicting Peds, #/hr	0	0			0	0	0	0
Sign Control	Free	Free			Free	Free	Stop	Stop
RT Channelized	-	None			-	None	-	None
Storage Length	-	-			-	-	0	-
Veh in Median Storage, #	-	0			0	-	0	-
Grade, %	-	0			0	-	0	-
Peak Hour Factor	100	100			100	100	100	100
Heavy Vehicles, %	0	2			0	1	2	0
Mvmt Flow	52	116			276	280	120	68
Major/Minor	Major1				Major2		Minor2	
Conflicting Flow All	556	0			-	0	636	416
Stage 1	-	-			-	-	416	-
Stage 2	-	-			-	-	220	-
Critical Hdwy	4.1	-			-	-	6.42	6.2
Critical Hdwy Stg 1	-	-			-	-	5.42	-
Critical Hdwy Stg 2	-	-			-	-	5.42	-
Follow-up Hdwy	2.2	-			-	-	3.518	3.3
Pot Cap-1 Maneuver	1025	-			-	-	442	641
Stage 1	-	-			-	-	666	-
Stage 2	-	-			-	-	817	-
Platoon blocked, %		-			-	-		
Mov Cap-1 Maneuver	1025	-			-	-	418	641
Mov Cap-2 Maneuver	-	-			-	-	418	-
Stage 1	-	-			-	-	630	-
Stage 2	-	-			-	-	817	-
Approach	EB				WB		SE	
HCM Control Delay, s	2.7				0		17.3	
HCM LOS							С	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR SE	Ln1			
Capacity (veh/h)	1025	-	-		478			
HCM Lane V/C Ratio	0.051	_	-	- 0.				
HCM Control Delay (s)	8.7	0	_		17.3			
HCM Lane LOS	A	A	-	-	C			
HCM 95th %tile Q(veh)	0.2	-	-	-	1.9			
	V.E							

Intersection								
Int Delay, s/veh	0.4							
Movement	EBL	EBT			WBT	WBR	SBL	SBR
Lane Configurations		4			<b>1</b>	1.01	¥	ODIT
Traffic Vol, veh/h	4	176			288	44	12	1
Future Vol, veh/h	4	176			288	44	12	1
Conflicting Peds, #/hr	0	0			0	0	0	0
Sign Control	Free	Free			Free	Free	Stop	Stop
RT Channelized	-	None			-	None	-	None
Storage Length	_	-			-	-	0	-
Veh in Median Storage, #	<u> </u>	0			0	-	0	-
Grade, %	-	0			0	-	0	-
Peak Hour Factor	100	100			100	100	100	100
Heavy Vehicles, %	0	1			1	0	0	0
Mvmt Flow	4	176			288	44	12	1
Major/Minor	Major1				Major2		Minor2	
Conflicting Flow All	332	0			-	0	494	310
Stage 1	-	-			-	-	310	-
Stage 2	-	-			-	-	184	-
Critical Hdwy	4.1	-			-	-	6.4	6.2
Critical Hdwy Stg 1	-	-			-	-	5.4	-
Critical Hdwy Stg 2	-	-			_	-	5.4	-
Follow-up Hdwy	2.2	-			-	-	3.5	3.3
Pot Cap-1 Maneuver	1239	-			_	-	538	735
Stage 1	-	-			-	-	748	-
Stage 2	-	-			-	-	852	-
Platoon blocked, %		-			-	-		
Mov Cap-1 Maneuver	1239	-			-	-	536	735
Mov Cap-2 Maneuver	-	-			-	-	536	-
Stage 1	-	-			-	-	745	-
Stage 2	-	-			-	-	852	-
Approach	EB				WB		SB	
HCM Control Delay, s	0.2				0		11.7	
HCM LOS							В	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR SBL	n1			
Capacity (veh/h)	1239	-	_		47			
HCM Lane V/C Ratio	0.003	_	-	- 0.0				
HCM Control Delay (s)	7.9	0	_	- 1 <sup>2</sup>				
HCM Lane LOS	A	A	_	-	В			
HCM 95th %tile Q(veh)	0	-	_	- (	0.1			

Intersection								
	6.7							
<b>3</b> ,	EBL	EBR	NBL	NDT		SBT	SBR	
Movement				NBT				
ane Configurations	<b>^</b>	7	<b>7</b>	<b>^</b>		140	70	
raffic Vol, veh/h	24	360	664	748		446	78	
uture Vol, veh/h	24	360	664	748		446	78	
Conflicting Peds, #/hr	0	0	0	0		0	0	
Sign Control	Stop	Stop	Free	Free		Free	Free	
RT Channelized	-	Yield	-	None		-	Yield	
Storage Length	140	0	170	-		-	150	
/eh in Median Storage, #		-	-	0		0	-	
Grade, %	0	-	-	0		0	-	
Peak Hour Factor	100	100	100	100		100	100	
leavy Vehicles, %	0	2	0	1		3	1	
/Ivmt Flow	24	360	664	748		446	78	
/lajor/Minor	Minor2		Major1			Major2		
Conflicting Flow All	2148	446	446	0		-	0	
Stage 1	446	-	-	-		-	-	
Stage 2	1702	-	-	-		-	-	
ritical Hdwy	6.6	6.23	4.1	-		-	-	
Critical Hdwy Stg 1	5.4	-	-	-		-	-	
ritical Hdwy Stg 2	5.8	-	-	-		-	-	
ollow-up Hdwy	3.5	3.319	2.2	-		-	-	
ot Cap-1 Maneuver	48	611	1125	-		-	-	
Stage 1	649	-	-	-		-	-	
Stage 2	136	-	-	-		-	-	
Platoon blocked, %				-		-	-	
Nov Cap-1 Maneuver	~ 20	611	1125	-		-	-	
Mov Cap-2 Maneuver	426	-	-	-		-	-	
Stage 1	266	-	-	-		_	-	
Stage 2	136	-	-	-		-	-	
pproach	EB		NB			SB		
HCM Control Delay, s	18.7		6			0		
ICM LOS	C		- 0			U		
IOW LOO	U							
Minor Lane/Major Mvmt	NBL	NDT EDI 51 F	BLn2 SBT	SBR				
		NBT EBLn1 E						
Capacity (veh/h)	1125	- 426	611 -	-				
ICM Lane V/C Ratio	0.59	- 0.056 (		-				
ICM Control Delay (s)	12.7	- 14	19 -	-				
CM Lane LOS	В	- B	C -	-				
HCM 95th %tile Q(veh)	4	- 0.2	3.8 -	-				
lotes								
: Volume exceeds capac	city \$: Dela	ay exceeds 300	Os +: Comp	outation	Not Defined	*: All major vo	olume in pl	atoon
						-		

# TRAFFIC IMPACT ANALYSIS REPORT UPDATE

FOR THE PROPOSED

### **HOKUA PLACE**

**KAPA`A, KAUAI, HAWAII TAX MAP KEY: (4) 4-3-03: 01** 

## **APPENDIX C**

CAPACITY ANALYSIS WORKSHEETS
PEAK HOUR TRAFFIC WITHOUT PROJECT

T. Rullo Flwy & Rukul Ot & T	>	•		$\overline{\ }$	•	•	ች	<u>†</u>	<i>&gt;</i>	<u> </u>	1	4
Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	LDLZ	LDL	4	7	7	NDLZ	NDL N	<b>1</b>	NDIX	ODL	4	ODIN
Traffic Volume (vph)	9	27	9	41	<u>r</u> 1	9	5	751	14	3	824	41
Future Volume (vph)	9	27	9	41	1	9	5	751	14	3	824	41
( , ,	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	60	1900	1900	1900	1900	1900
Storage Length (ft)		0		1			1		0	0		0
Storage Lanes		100		ı			100		U	100		U
Taper Length (ft)	0	0	1621	1501	1589	0	1630	1761	0	0	1800	0
Satd. Flow (prot) Flt Permitted	U	U	0.962	1501	1309	U	0.320	1701	U	U	0.998	U
	0	0	1602	1447	1542	0	547	1761	0	0	1797	0
Satd. Flow (perm)	U	U	1002			U	547	1701	0	U	1797	U
Right Turn on Red				Yes	Yes				No			
Satd. Flow (RTOR)			20	76	246			20			20	
Link Speed (mph)			30					30			30	
Link Distance (ft)			417					1113			697	
Travel Time (s)	0	4	9.5	7	4	4	4	25.3	7	4	15.8	4
Confl. Peds. (#/hr)	2	4	4.00	7	4	4	4	4.00	7	4	4.00	4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	15%	0%	4%	0%	6%	9%	4%	0%	0%	1%	4%
Shared Lane Traffic (%)	•	•	4.5	4.4	4	•	4.4	705	•	0	070	0
Lane Group Flow (vph)	0	0	45	41	1	0	14	765	0	0	873	0
Turn Type	Perm	Perm	NA	Perm	Perm	custom		NA		Perm	NA	
Protected Phases		4	4	4	0	_	5	_		•	6	
Permitted Phases	4	4	4	4	8	5	2	2		6	0	
Detector Phase	4	4	4	4	8	5	5	2		6	6	
Switch Phase	7.0	7.0	7.0	7.0	7.0	4.0	4.0	7.0		7.0	7.0	
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	1.0	1.0	7.0		7.0	7.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	5.0	5.0	26.0		34.0	34.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	5.0	5.0	73.0		68.0	68.0	
Total Split (%)	27.0%	27.0%	27.0%	27.0%	27.0%	5.0%	5.0%	73.0%		68.0%	68.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	1.0	2.0		2.0	2.0	
Lost Time Adjust (s)			0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)			6.0	6.0	6.0		4.0	6.0			6.0	
Lead/Lag						Lead	Lead			Lag	Lag	
Lead-Lag Optimize?	N				N	Yes	Yes	0.14		0.14	0.14	
Recall Mode	None	None	None	None	None	None	None	C-Max		C-Max		
Act Effct Green (s)			8.6	8.6	8.6		84.0	83.2			81.2	
Actuated g/C Ratio			0.09	0.09	0.09		0.84	0.83			0.81	
v/c Ratio			0.33	0.21	0.00		0.03	0.52			0.60	
Control Delay			48.8	5.1	0.0		2.1	5.1			7.9	
Queue Delay			0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay			48.8	5.1	0.0		2.1	5.1			7.9	
LOS			D	Α	Α		Α	A			A	
Approach Delay			27.9					5.1			7.9	
Approach LOS			С					A			A	
Queue Length 50th (ft)			28	0	0		1	134			168	
Queue Length 95th (ft)			61	10	0		5	241			480	
Internal Link Dist (ft)			337					1033			617	
Turn Bay Length (ft)							60					



Lane Group	SBR2
Lane Configurations	
Traffic Volume (vph)	5
Future Volume (vph)	5
Ideal Flow (vphpl)	1900
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	110
Link Speed (mph)	
Link Opeca (mph) Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	4
Peak Hour Factor	1.00
Heavy Vehicles (%)	0%
Shared Lane Traffic (%)	U /0
` ,	0
Lane Group Flow (vph)	U
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Tuill Day Leligill (II)	

	_7		-	*			ገ	T		-	¥	*
Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)			336	363	518		520	1464			1458	
Starvation Cap Reductn			0	0	0		0	0			0	
Spillback Cap Reductn			0	0	0		0	0			0	
Storage Cap Reductn			0	0	0		0	0			0	
Reduced v/c Ratio			0.13	0.11	0.00		0.03	0.52			0.60	

#### Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 80

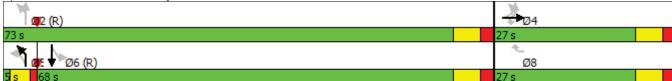
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 7.6 Intersection LOS: A Intersection Capacity Utilization 70.9% ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Kuhio Hwy & Kukui St & Huluili St





Lane Group	SBR2
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Int Delay, s/veh   2.7
Movement
Lane Configurations         Image: Configuration of the proof o
Traffic Vol, veh/h         118         311         19         47         118         9           Future Vol, veh/h         118         311         19         47         118         9           Conflicting Peds, #/hr         0         0         0         0         1         0           Sign Control         Free         Free         Free         Free         Free         Stop         Stop           RT Channelized         -         None         -         0         0         0         <
Future Vol, veh/h         118         311         19         47         118         9           Conflicting Peds, #/hr         0         0         0         0         1         0           Sign Control         Free         Free         Free         Free         Free         Stop         Stop           RT Channelized         -         None         -         None         -         None           Storage Length         -         -         -         0         0         -           Veh in Median Storage, #         0         -         -         0         0         -           Grade, %         0         -         -         0         0         -           Peak Hour Factor         100         100         100         100         100         100           Heavy Vehicles, %         3         6         17         0         6         9           Mvmt Flow         118         311         19         47         118         9           Mvmt Flow         118         311         19         47         118         9           Mvmt Flow         118         311         19         47         118 </td
Conflicting Peds, #/hr         0         0         0         0         1         0           Sign Control         Free         Free         Free         Free         Free         Stop         Stop           RT Channelized         - None         - None         - None         - None         - None           Storage Length         0         0         0         0         0           Veh in Median Storage, #         0 0         0         0         0         0         0           Grade, %         0 0         100         1
Sign Control         Free         Free         Free         Free         Free         Free         Stop         Stop           RT Channelized         - None
RT Channelized         - None         - None         - None           Storage Length         0         0         -           Veh in Median Storage, #         0 0         0         -           Grade, %         0 0         0         -           Peak Hour Factor         100 100         100 100         100         100           Heavy Vehicles, %         3 6 17 0 6 9         6 9         9           Mvmt Flow         118 311 19 47 118 9         9           Major/Minor         Major1         Major2         Minor1           Conflicting Flow All         0 0 429 0 360 274         2           Stage 1         2 274 - 2         2         2           Stage 2         2 274 - 2         86 2         2           Critical Hdwy Stg 1         - 2 277 - 2         6.46 6.29         6.29           Critical Hdwy Stg 2         - 2 2.353 - 3.554 3.381         3.381           Pollow-up Hdwy         - 2 2.353 - 3.554 3.381         3.381           Pot Cap-1 Maneuver         - 1055 - 631 748           Stage 1         - 2 2.0 - 2 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2
Storage Length         -         -         -         -         0         -           Veh in Median Storage, #         0         -         -         0         0         -           Grade, %         0         -         -         0         0         -           Peak Hour Factor         100         100         100         100         100         100           Heavy Vehicles, %         3         6         17         0         6         9           Mvmt Flow         118         311         19         47         118         9           Major/Minor         Major1         Major2         Minor1         Minor1         118         9           Major/Minor         Major1         Major2         Minor1         Minor1         118         9           Major/Minor         Major1         Major2         Minor1         Minor1         118         9           Morth         Major2         Minor1         Minor1         118         9         9         360         274         274         -         -         274         -         274         -         274         -         274         -         274         -         3
Veh in Median Storage, #         0         -         -         0         0         -           Grade, %         0         -         -         0         0         -           Peak Hour Factor         100         100         100         100         100           Heavy Vehicles, %         3         6         17         0         6         9           Mvmt Flow         118         311         19         47         118         9           Major/Minor         Major/Minor         Major/Minor         Major/Minor         Minor1         Minor1           Conflicting Flow All         0         0         429         0         360         274           Stage 1         -         -         -         -         274         -           Stage 2         -         -         -         -         86         -           Critical Hdwy Stg 1         -         -         -         -         5.46         -           Critical Hdwy Stg 2         -         -         -         -         5.46         -           Follow-up Hdwy         -         -         2.353         -         3.554 <t< td=""></t<>
Grade, %         0         -         -         0         0         -           Peak Hour Factor         100         100         100         100         100         100           Heavy Vehicles, %         3         6         17         0         6         9           Mvmt Flow         118         311         19         47         118         9           Major/Minor         Major/Minor         Major/Minor         Minor1         Major           Conflicting Flow All         0         0         429         0         360         274           Stage 1         -         -         -         274         -         274         -           Stage 2         -         -         -         274         -         360         274           Stage 1         -         -         -         274         -         -         274         -         -         274         -         -         -         360         274         -         -         -         -         266         -         -         -         -         -         -         -         -         -         -         -         -
Peak Hour Factor         100         100         100         100         100         100           Heavy Vehicles, %         3         6         17         0         6         9           Mvmt Flow         118         311         19         47         118         9           Major/Minor         Major1         Major2         Minor1
Heavy Vehicles, %         3         6         17         0         6         9           Mvmt Flow         118         311         19         47         118         9           Major/Minor         Major1         Major2         Minor1           Conflicting Flow All         0         0         429         0         360         274           Stage 1         -         -         -         -         274         -           Stage 2         -         -         -         274         -           Stage 2         -         -         -         6.46         6.29           Critical Hdwy         Stg 1         -         -         -         5.46         -           Critical Hdwy Stg 2         -         -         -         5.46         -           Follow-up Hdwy         -         -         2.353         -         3.554         3.381           Pot Cap-1 Maneuver         -         -         -         -         631         748           Stage 1         -         -         -         -         927         -           Pot Cap-1 Maneuver         -         -         -         -
Mymt Flow         118         311         19         47         118         9           Major/Minor         Major1         Major2         Minor1           Conflicting Flow All         0         0         429         0         360         274           Stage 1         -         -         -         -         274         -           Stage 2         -         -         -         -         86         -           Critical Hdwy         -         -         4.27         -         6.46         6.29           Critical Hdwy Stg 1         -         -         -         -         5.46         -           Critical Hdwy Stg 2         -         -         -         5.46         -           Follow-up Hdwy         -         -         2.353         -         3.554         3.381           Pot Cap-1 Maneuver         -         -         -         -         631         748           Stage 1         -         -         -         -         927         -           Pot Cap-1 Maneuver         -         -         -         -         -         927         -           Mov Cap-2 Maneuver         - </td
Major/Minor         Major1         Major2         Minor1           Conflicting Flow All         0         0         429         0         360         274           Stage 1         -         -         -         -         274         -           Stage 2         -         -         -         -         86         -           Critical Hdwy         -         -         4.27         -         6.46         6.29           Critical Hdwy Stg 1         -         -         -         -         5.46         -           Critical Hdwy Stg 2         -         -         -         5.46         -           Follow-up Hdwy         -         -         2.353         -         3.554         3.381           Pot Cap-1 Maneuver         -         -         1055         -         631         748           Stage 2         -         -         -         -         927         -           Platoon blocked, %         -         -         -         -         -           Mov Cap-1 Maneuver         -         -         1055         -         619         748           Mov Cap-2 Maneuver         -         -
Conflicting Flow All         0         0         429         0         360         274           Stage 1         -         -         -         -         274         -           Stage 2         -         -         -         -         86         -           Critical Hdwy         -         -         4.27         -         6.46         6.29           Critical Hdwy Stg 1         -         -         -         -         5.46         -           Critical Hdwy Stg 2         -         -         -         -         5.46         -           Follow-up Hdwy         -         -         2.353         -         3.554         3.381           Pot Cap-1 Maneuver         -         -         -         -         631         748           Stage 1         -         -         -         -         927         -           Platoon blocked, %         -         -         -         -         927         -           Mov Cap-2 Maneuver         -         -         -         -         619         748           Mov Cap-2 Maneuver         -         -         -         -         -         -         -
Conflicting Flow All         0         0         429         0         360         274           Stage 1         -         -         -         -         274         -           Stage 2         -         -         -         -         86         -           Critical Hdwy         -         -         4.27         -         6.46         6.29           Critical Hdwy Stg 1         -         -         -         -         5.46         -           Critical Hdwy Stg 2         -         -         -         -         5.46         -           Follow-up Hdwy         -         -         2.353         -         3.554         3.381           Pot Cap-1 Maneuver         -         -         -         -         631         748           Stage 2         -         -         -         -         927         -           Platoon blocked, %         -         -         -         -         619         748           Mov Cap-2 Maneuver         -         -         -         -         -         619         -           Stage 1         -         -         -         -         -         -
Conflicting Flow All         0         0         429         0         360         274           Stage 1         -         -         -         -         274         -           Stage 2         -         -         -         -         86         -           Critical Hdwy         -         -         4.27         -         6.46         6.29           Critical Hdwy Stg 1         -         -         -         -         5.46         -           Critical Hdwy Stg 2         -         -         -         -         5.46         -           Follow-up Hdwy         -         -         2.353         -         3.554         3.381           Pot Cap-1 Maneuver         -         -         -         -         631         748           Stage 2         -         -         -         -         927         -           Platoon blocked, %         -         -         -         -         619         748           Mov Cap-2 Maneuver         -         -         -         -         -         619         -           Stage 1         -         -         -         -         -         -
Stage 1       -       -       -       -       274       -         Stage 2       -       -       -       -       -       86       -         Critical Hdwy       -       -       -       -       -       6.46       6.29         Critical Hdwy       Stg 1       -       -       -       -       5.46       -         Critical Hdwy       Stg 2       -       -       -       5.46       -         Follow-up Hdwy       -       -       2.353       -       3.554       3.381         Pot Cap-1 Maneuver       -       -       1055       -       631       748         Stage 1       -       -       -       -       927       -         Platoon blocked, %       -       -       -       -       927       -         Mov Cap-1 Maneuver       -       -       1055       -       619       748         Mov Cap-2 Maneuver       -       -       -       -       -       619       -         Stage 1       -       -       -       -       -       -       -       619       -         -       -       -
Stage 2         - </td
Critical Hdwy         -         -         4.27         -         6.46         6.29           Critical Hdwy Stg 1         -         -         -         -         5.46         -           Critical Hdwy Stg 2         -         -         -         -         5.46         -           Follow-up Hdwy         -         -         2.353         -         3.554         3.381           Pot Cap-1 Maneuver         -         -         1055         -         631         748           Stage 1         -         -         -         -         927         -           Stage 2         -         -         -         -         927         -           Platoon blocked, %         -         -         -         -         619         748           Mov Cap-1 Maneuver         -         -         -         -         619         -           Mov Cap-2 Maneuver         -         -         -         -         -         619         -           Stage 1         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -
Critical Hdwy Stg 1       -       -       -       -       5.46       -         Critical Hdwy Stg 2       -       -       -       5.46       -         Follow-up Hdwy       -       -       2.353       -       3.554       3.381         Pot Cap-1 Maneuver       -       -       1055       -       631       748         Stage 1       -       -       -       -       927       -         Platoon blocked, %       -       -       -       -       -         Mov Cap-1 Maneuver       -       -       1055       -       619       748         Mov Cap-2 Maneuver       -       -       -       -       619       -         Stage 1       -       -       -       -       -       749       -
Critical Hdwy Stg 2       -       -       -       5.46       -         Follow-up Hdwy       -       -       2.353       -       3.554       3.381         Pot Cap-1 Maneuver       -       -       1055       -       631       748         Stage 1       -       -       -       -       763       -         Stage 2       -       -       -       927       -         Platoon blocked, %       -       -       -       -         Mov Cap-1 Maneuver       -       -       1055       -       619       748         Mov Cap-2 Maneuver       -       -       -       -       619       -         Stage 1       -       -       -       -       749       -
Follow-up Hdwy       -       -       2.353       -       3.554       3.381         Pot Cap-1 Maneuver       -       -       1055       -       631       748         Stage 1       -       -       -       -       763       -         Stage 2       -       -       -       -       927       -         Platoon blocked, %       -       -       -       -       -         Mov Cap-1 Maneuver       -       -       1055       -       619       748         Mov Cap-2 Maneuver       -       -       -       -       619       -         Stage 1       -       -       -       -       749       -
Pot Cap-1 Maneuver       -       -       1055       -       631       748         Stage 1       -       -       -       -       763       -         Stage 2       -       -       -       927       -         Platoon blocked, %       -       -       -       -         Mov Cap-1 Maneuver       -       -       1055       -       619       748         Mov Cap-2 Maneuver       -       -       -       -       619       -         Stage 1       -       -       -       -       749       -
Stage 1       -       -       -       -       763       -         Stage 2       -       -       -       -       927       -         Platoon blocked, %       -       -       -       -       -         Mov Cap-1 Maneuver       -       -       1055       -       619       748         Mov Cap-2 Maneuver       -       -       -       -       619       -         Stage 1       -       -       -       -       749       -
Stage 2       -       -       -       -       927       -         Platoon blocked, %       -       -       -       -       -         Mov Cap-1 Maneuver       -       -       1055       -       619       748         Mov Cap-2 Maneuver       -       -       -       -       619       -         Stage 1       -       -       -       -       749       -
Platoon blocked, %       -       -       -       -         Mov Cap-1 Maneuver       -       -       1055       -       619       748         Mov Cap-2 Maneuver       -       -       -       -       619       -         Stage 1       -       -       -       -       749       -
Mov Cap-1 Maneuver       -       -       1055       -       619       748         Mov Cap-2 Maneuver       -       -       -       -       619       -         Stage 1       -       -       -       -       749       -
Mov Cap-2 Maneuver       -       -       -       -       619       -         Stage 1       -       -       -       -       749       -
Stage 1 749 -
Staye 2 320 -
320
Approach ED M/D MD
Approach EB WB NB
HCM Control Delay, s 0 2.4 12.2
HCM LOS B
Minor Lane/Major Mvmt NBLn1 EBT EBR WBL WBT
Capacity (veh/h) 627 1055 -
HCM Lane V/C Ratio 0.203 0.018 -
HCM Control Delay (s) 12.2 8.5 0
HCM Lane LOS B A A
HCM 95th %tile Q(veh) 0.8 0.1 -

Intersection										
Int Delay, s/veh	4.6									
Movement	EBL	EBT			W	ВТ	WBR	SW	L	SWR
Lane Configurations		सी				ħ		*	#	
Traffic Vol, veh/h	413	404			1	30	13		8	94
Future Vol, veh/h	413	404			1	30	13		8	94
Conflicting Peds, #/hr	7	0				0	7		0	0
Sign Control	Free	Free			Fr	ee	Free	Sto	р	Stop
RT Channelized	-	None				-	None		-	None
Storage Length	-	-				-	-		0	-
Veh in Median Storage, #	‡ -	0				0	-		0	-
Grade, %	-	0				0	-		0	-
Peak Hour Factor	100	100			1	00	100	10	0	100
Heavy Vehicles, %	1	5				20	0		0	8
Mvmt Flow	413	404			1	30	13		8	94
Major/Minor	Major1				Majo	or2		Minor	2	
Conflicting Flow All	150	0				-	0	137		144
Stage 1	-	-				-	-	14		-
Stage 2	-	-				-	-	123		-
Critical Hdwy	4.11	-				-	-	6.		6.28
Critical Hdwy Stg 1	-	-				-	-	5.		-
Critical Hdwy Stg 2	-	-				-	-	5.		-
Follow-up Hdwy	2.209	-				-	-	3.		3.372
Pot Cap-1 Maneuver	1437	-				-	-	16		888
Stage 1	-	-				-	-	88		-
Stage 2	-	-				-	-	27		-
Platoon blocked, %		-				-	-			
Mov Cap-1 Maneuver	1428	-				-	-	10	0	883
Mov Cap-2 Maneuver	-	-				-	-	10		-
Stage 1	-	-				-	-	55		-
Stage 2	-	-				-	-	27		-
ŭ										
Approach	EB				V	VB		SV	V	
HCM Control Delay, s	4.3					0		13.		
HCM LOS									B	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBRSW	/Ln1					
Capacity (veh/h)	1428	-	-	-	547					
HCM Lane V/C Ratio	0.289	_	_	- 0	.186					
HCM Control Delay (s)	8.5	0	-		13.1					
HCM Lane LOS	A	A	_	-	В					
HCM 95th %tile Q(veh)	1.2	-	-	-	0.7					

Intersection								
Int Delay, s/veh	0.6							
					14/5-	14/05	07:	055
Movement	EBL	EBT			WBT	WBR	SBL	SBR
Lane Configurations		4			f)		, A	
Traffic Vol, veh/h	9	803			211	13	13	27
Future Vol, veh/h	9	803			211	13	13	27
Conflicting Peds, #/hr	6	0			0	6	0	0
Sign Control	Free	Free			Free	Free	Stop	Stop
RT Channelized	-	None			-	None	-	None
Storage Length	-	-			-	-	0	-
Veh in Median Storage, #	-	0			0	-	0	-
Grade, %	-	0			0	-	0	-
Peak Hour Factor	100	100			100	100	100	100
Heavy Vehicles, %	0	2			4	14	24	19
Mvmt Flow	9	803			211	13	13	27
Major/Minor	Major1				Major2		Minor2	
Conflicting Flow All	230	0			-	0	1045	224
Stage 1	-	-			_	-	224	-
Stage 2	_	_			-	_	821	-
Critical Hdwy	4.1	-			_	_	6.64	6.39
Critical Hdwy Stg 1	-				-	_	5.64	-
Critical Hdwy Stg 2	_	-			_	_	5.64	-
Follow-up Hdwy	2.2				-	_	3.716	3.471
Pot Cap-1 Maneuver	1350	-			_	_	230	775
Stage 1	-	_			-	_	764	-
Stage 2	-	-			_	_	397	-
Platoon blocked, %		_			-	-		
Mov Cap-1 Maneuver	1343	-			_	-	225	771
Mov Cap-2 Maneuver	-	_			-	_	225	-
Stage 1	-	-			_	_	751	-
Stage 2	-	_			-	-	395	-
<b>y</b>								
A					ME		0.0	
Approach	EB				WB		SB	
HCM Control Delay, s	0.1				0		14.2	
HCM LOS							В	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR SBL	n1			
Capacity (veh/h)	1343	_	-	- 4;	31			
HCM Lane V/C Ratio	0.007	-	-	- 0.0	93			
HCM Control Delay (s)	7.7	0	-	- 14	1.2			
HCM Lane LOS	А	Α	-	-	В			
HCM 95th %tile Q(veh)	0	-	-	- 0	).3			

TT. Runio Tiwy & Londa Ot							AWIT CAR Float Traffic Without Floject
	<b>*</b>	*	4	<b>†</b>	ļ	4	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	W		7	<b>*</b>	<u></u>	7	
Traffic Volume (veh/h)	389	2	18	760	864	91	
Future Volume (Veh/h)	389	2	18	760	864	91	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly flow rate (vph)	389	2	18	760	864	91	
Pedestrians	8						
Lane Width (ft)	11.0						
Walking Speed (ft/s)	3.5						
Percent Blockage	1						
Right turn flare (veh)							
Median type				None	TWLTL		
Median storage veh)					2		
Upstream signal (ft)				697			
pX, platoon unblocked	0.84						
vC, conflicting volume	1668	872	872				
vC1, stage 1 conf vol	872						
vC2, stage 2 conf vol	796						
vCu, unblocked vol	1700	872	872				
tC, single (s)	6.4	6.2	4.1				
tC, 2 stage (s)	5.4						
tF (s)	3.5	3.3	2.2				
p0 queue free %	0	99	98				
cM capacity (veh/h)	359	350	776				
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2		
Volume Total	391	18	760	864	91		
Volume Left	389	18	0	004	0		
Volume Right	2	0	0	0	91		
cSH	359	776	1700	1700	1700		
Volume to Capacity	1.09	0.02	0.45	0.51	0.05		
Queue Length 95th (ft)	356	2	0.43	0.51	0.03		
	107.8	9.7	0.0	0.0	0.0		
Control Delay (s) Lane LOS	107.8 F	9.7 A	0.0	0.0	0.0		
Approach Delay (s)	107.8	0.2		0.0			
Approach LOS	107.8 F	0.2		0.0			
Intersection Summary							
Average Delay			19.9				
Intersection Capacity Utilizat	tion		73.8%	ı	CU Level o	of Service	D
Analysis Period (min)			15		23 20.01	5011105	<u> </u>

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4		7	ĵ.		7	- ∱	
Traffic Vol, veh/h	0	1	0	1		5	100	846	23	8	783	5
Future Vol, veh/h	0	1	0	1	0	5	100	846	23	8	783	5
Conflicting Peds, #/hr	3	0	0	0	0	3	0	0	16	16	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None		-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	C	0	11	5	4	0	2	2	2
Mvmt Flow	0	1	0	1	0	5	100	846	23	8	783	5
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1865	1887	786	1876	1878	877	788	0	0	885	0	0
Stage 1	802	802	-	1074	1074	-	-	-	-	-	-	-
Stage 2	1063	1085	-	802	804	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.31	4.15	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.399	2.245	-	-	2.218	-	-
Pot Cap-1 Maneuver	56	71	395	55	72	335	818	-	-	765	-	-
Stage 1	381	399	-	269	299	-	-	-	-	-	-	-
Stage 2	272	295	-	381	398	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	49	61	395	48	62	329	818	-	-	754	-	-
Mov Cap-2 Maneuver	49	61	-	48	62	-	-	-	-	-	-	-
Stage 1	335	395	-	233	259	-	-	-	-	-	-	-
Stage 2	235	255	-	376	394	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	65			27.4			1			0.1		
HCM LOS	F			D								
Minor Lane/Major Mvmt	NBL	NBT	NBR I	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	818	-	-	61 167	754	-	-					
HCM Lane V/C Ratio	0.122	-	-	0.016 0.036	0.011	-	-					
HCM Control Delay (s)	10	-	-	65 27.4		-	-					
HCM Lane LOS	В	-	-	F D		-	-					
HCM 95th %tile Q(veh)	0.4	-	-	0.1 0.1		-	-					

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBI	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		44			4						44	
Traffic Vol, veh/h	5	1	14	(		104	0	0	0	0	231	9
Future Vol, veh/h	5	1	14	(	) 2	104	0	0	0	0	231	9
Conflicting Peds, #/hr	4	0	0	(	0 (	4	0	0	0	0	0	7
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None			None	-	-	None	-	-	None
Storage Length	-	-	-			-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-		- 0	-	-	16974	-	-	0	-
Grade, %	-	0	-		- 0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	17	(		5	0	0	0	0	4	17
Mvmt Flow	5	1	14	(	) 2	104	0	0	0	0	231	9
Major/Minor	Minor2			Minor*						Major2		
Conflicting Flow All	300	243	243	243		4				0	0	0
Stage 1	243	243	-		0					-	-	-
Stage 2	57	0	-	243	3 247	-				-	-	-
Critical Hdwy	7.1	6.5	6.37	7.	6.5	6.25				4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-			-				-	-	-
Critical Hdwy Stg 2	-	-	-	6.	5.5	-				-	-	-
Follow-up Hdwy	3.5	4	3.453	3.5	5 4	3.345				2.2	-	-
Pot Cap-1 Maneuver	656	662	760	71	659	1071				-	-	-
Stage 1	765	708	-			-				-	-	-
Stage 2	-	-	-	76	706	-				-	-	-
Platoon blocked, %											-	-
Mov Cap-1 Maneuver	585	658	755	70		1067				-	-	-
Mov Cap-2 Maneuver	585	658	-	70	655	-				-	-	-
Stage 1	765	704	-			-				-	-	-
Stage 2	-	-	-	750	702	-				-	-	-
Approach	EB			WE	}					SB		
HCM Control Delay, s	10.3			8.8	3					0		
HCM LOS	В			-								
Minor Lane/Major Mvmt	EBLn1\	NBLn1	SBL	SBT SBF	}							
Capacity (veh/h)		1054	-									
HCM Lane V/C Ratio		0.101	_	-	-							
HCM Control Delay (s)	10.3	8.8	0	-	-							
HCM Lane LOS	В	A	A		-							
HCM 95th %tile Q(veh)	0.1	0.3	-		-							
	0.1	0.0										

Intersection				
Intersection Delay, s/veh	38.7			
Intersection LOS	Е			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	730	256	116	812
Demand Flow Rate, veh/h	750	278	117	822
Vehicles Circulating, veh/h	624	144	705	391
Vehicles Exiting, veh/h	589	678	669	31
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	64.9	5.4	7.4	30.1
Approach LOS	F	A	А	D
Lane	Left	Left	Left	1 -4
Luito	LEIL	Leit	Leit	Left
Designated Moves	LTR	Leit LT	LTR	Leπ LTR
Designated Moves	LTR LTR	LT	LTR	LTR
Designated Moves Assumed Moves	LTR	LT	LTR	LTR
Designated Moves Assumed Moves RT Channelized	LTR LTR	LT LT	LTR LTR	LTR LTR
Designated Moves Assumed Moves RT Channelized Lane Util	LTR LTR 1.000 2.609 4.976	LT LT 1.000 2.609 4.976	LTR LTR 1.000 2.609 4.976	LTR LTR 1.000 2.609 4.976
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h	LTR LTR 1.000 2.609 4.976 750	LT LT 1.000 2.609 4.976 278	LTR LTR 1.000 2.609 4.976 117	LTR LTR 1.000 2.609 4.976 822
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h	LTR LTR 1.000 2.609 4.976 750 730	LT LT 1.000 2.609 4.976 278 1191	LTR LTR 1.000 2.609 4.976 117 672	LTR LTR 1.000 2.609 4.976 822 926
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h	LTR LTR 1.000 2.609 4.976 750	LT LT 1.000 2.609 4.976 278	LTR LTR 1.000 2.609 4.976 117	LTR LTR 1.000 2.609 4.976 822 926 0.988
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h	LTR LTR 1.000 2.609 4.976 750 730 0.974 730	LT LT 1.000 2.609 4.976 278 1191 0.922 256	LTR LTR 1.000 2.609 4.976 117 672 0.991	LTR LTR 1.000 2.609 4.976 822 926 0.988 812
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h	LTR LTR 1.000 2.609 4.976 750 730 0.974 730 711	LT LT 1.000 2.609 4.976 278 1191 0.922 256 1099	LTR LTR 1.000 2.609 4.976 117 672 0.991 116 667	LTR LTR 1.000 2.609 4.976 822 926 0.988 812 915
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h	LTR LTR 1.000 2.609 4.976 750 730 0.974 730	LT LT 1.000 2.609 4.976 278 1191 0.922 256	LTR LTR 1.000 2.609 4.976 117 672 0.991	LTR LTR 1.000 2.609 4.976 822 926 0.988 812
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio Control Delay, s/veh	LTR LTR 1.000 2.609 4.976 750 730 0.974 730 711	LT LT 1.000 2.609 4.976 278 1191 0.922 256 1099	LTR LTR 1.000 2.609 4.976 117 672 0.991 116 667	LTR LTR 1.000 2.609 4.976 822 926 0.988 812 915
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio	LTR LTR 1.000 2.609 4.976 750 730 0.974 730 711 1.027	LT LT 1.000 2.609 4.976 278 1191 0.922 256 1099 0.233	LTR LTR 1.000 2.609 4.976 117 672 0.991 116 667 0.174	LTR LTR 1.000 2.609 4.976 822 926 0.988 812 915 0.888

Intersection						
Int Delay, s/veh	7.8					
Movement	EBL	EBR	SET	SER	NWL	NWT
Lane Configurations	N/		f)			ની
Traffic Vol, veh/h	80	490	353	20	47	122
Future Vol, veh/h	80	490	353	20	47	122
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, a	<b>#</b> 2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	9	1	2	0	0	2
Mvmt Flow	80	490	353	20	47	122
Major/Minor			Minor2		Major2	
Conflicting Flow All			216	122	0	0
Stage 1			216	122	-	-
Stage 1 Stage 2			0		-	-
			6.52	6.2	4.1	
Critical Hdwy Critical Hdwy Stg 1			5.52	0.2	4.1	-
						-
Critical Hdwy Stg 2			4.040	- 2.2	2.2	-
Follow-up Hdwy			4.018	3.3		-
Pot Cap-1 Maneuver			682	935	-	-
Stage 1			724	-	-	-
Stage 2			-	-	-	-
Platoon blocked, %			^	005		-
Mov Cap-1 Maneuver			0	935	-	-
Mov Cap-2 Maneuver			0	-	-	-
Stage 1			0	-	-	-
Stage 2			0	-	-	-
Approach			SE		NW	
HCM Control Delay, s			11.4			
HCM LOS			В			
1.0111 200			Б			
Minor Lane/Major Mvmt	NWL	NWT SELn1				
	INVVL	- 935				
Capacity (veh/h) HCM Lane V/C Ratio	-	- 0.399				
	-					
HCM Control Delay (s)	-	- 11.4				
HCM CEth (/tile O/yeh)	-	- B				
HCM 95th %tile Q(veh)	-	- 1.9				

Intersection									
Int Delay, s/veh	0.4								
Movement	EBL	EBT			WBT	WBR	SBL	SBR	
Lane Configurations		4			<b>1</b> >		W		
Traffic Vol, veh/h	8	358			165	38	15	0	
Future Vol, veh/h	8	358			165		15	0	
Conflicting Peds, #/hr	0	0			0		0	0	
Sign Control	Free	Free			Free		Stop	Stop	
RT Channelized	-	None			-	None	-	None	
Storage Length	-	-			-	-	0	-	
Veh in Median Storage, #	‡ -	0			0	-	0	-	
Grade, %	-	0			0		0	-	
Peak Hour Factor	100	100			100		100	100	
Heavy Vehicles, %	0	2			11	0	0	0	
Mvmt Flow	8	358			165	38	15	0	
Major/Minor	Major1				Major2		Minor2		
Conflicting Flow All	203	0			-	0	558	184	
Stage 1	-	-			-	_	184	-	
Stage 2	-	-			-	-	374	-	
Critical Hdwy	4.1	-			_	-	6.4	6.2	
Critical Hdwy Stg 1	-	-			-	-	5.4	-	
Critical Hdwy Stg 2	-	-			-	-	5.4	-	
Follow-up Hdwy	2.2	-			-	-	3.5	3.3	
Pot Cap-1 Maneuver	1381	-			-	-	494	864	
Stage 1	-	-			-	-	852	-	
Stage 2	-	-			-	-	700	-	
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1381	-			-	-	491	864	
Mov Cap-2 Maneuver	-	-			-	-	491	-	
Stage 1	-	-			-	-	846	-	
Stage 2	-	-			-	-	700	-	
Approach	EB				WB		SB		
HCM Control Delay, s	0.2				0		12.6		
HCM LOS							В		
							_		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR SE	BLn1				
Capacity (veh/h)	1381	-	-	-	491				
HCM Lane V/C Ratio	0.006	-	-	- 0	.031				
HCM Control Delay (s)	7.6	0	-		12.6				
HCM Lane LOS	A	A	-	-	В				
HCM 95th %tile Q(veh)	0	-	-	-	0.1				
., ,									

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	7	7	ሻ	<b>^</b>	<b>†</b>	7
Traffic Vol, veh/h	5	833	113	702	905	5
Future Vol, veh/h	5	833	113	702	905	5
Conflicting Peds, #/hr	1	0	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	Yield
Storage Length	140	0	170	-	-	150
Veh in Median Storage, #	<del>†</del> 1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	20	3	2	3	3	0
Mvmt Flow	5	833	113	702	905	5
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1484		906	0	-	0
Stage 1	906		-	-		-
Stage 2	578		-	_	-	
Critical Hdwy	6.9	-	4.13	_		_
Critical Hdwy Stg 1	5.7		4.13	_	-	_
Critical Hdwy Stg 2	6.1		- -	_		_
Follow-up Hdwy	3.69		2.219	_	-	_
Pot Cap-1 Maneuver	110	0	749	_	-	-
Stage 1	357	0	-	_	-	_
Stage 1	486	0	-	-	<u> </u>	
Platoon blocked, %	400	0	-	-		-
Mov Cap-1 Maneuver	93	_	748		<u> </u>	-
Mov Cap-1 Maneuver	194	_	740	-		-
Stage 1	303	-	-	-	-	-
Stage 2	486	-	-	-		-
Olaye Z	400	<u>-</u>	-	<u>-</u>	- -	_
Approach	EB		NB		SB	
HCM Control Delay, s	24		1.5		0	
HCM LOS	С					
Minor Lane/Major Mvmt	NBL	NBT EBLn1 E	EBLn2 SBT	SBR		
Capacity (veh/h)	748	- 194		_		
HCM Lane V/C Ratio	0.151	- 0.026		-		
HCM Control Delay (s)	10.7	- 24	0 -	-		
HCM Lane LOS	В	- C	A -	-		
HCM 95th %tile Q(veh)	0.5	- 0.1		-		
	0.0	0.1				

	<b>*</b>	ၨ	<b>→</b>	•	4	•	ሻ	†	<i>&gt;</i>	<u> </u>	<u> </u>	4
Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			4	1	7		*	7.			4	
Traffic Volume (vph)	18	23	9	41	9	68	63	620	18	3	656	36
Future Volume (vph)	18	23	9	41	9	68	63	620	18	3	656	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	1300	0	1000	0	1000	1300	60	1000	0	0	1000	0
Storage Lanes		0		1			1		0	0		0
Taper Length (ft)		100					100		U	100		U
Satd. Flow (prot)	0	0	1765	1561	1589	0	1745	1821	0	0	1770	0
Flt Permitted	· ·		0.961	1001	1000		0.362	1021			0.998	
Satd. Flow (perm)	0	0	1488	1324	1423	0	626	1821	0	0	1766	0
Right Turn on Red				Yes	Yes		0_0		No			
Satd. Flow (RTOR)				64	301							
Link Speed (mph)			30					30			30	
Link Distance (ft)			417					1123			607	
Travel Time (s)			9.5					25.5			13.8	
Confl. Peds. (#/hr)	37	30	0.0	47	30	30	75		49	49		30
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)		- 7		- 7	7,7							0,70
Lane Group Flow (vph)	0	0	50	41	9	0	131	638	0	0	727	0
Turn Type	Perm	Perm	NA	Perm	Perm	custom		NA		Perm	NA	
Protected Phases			4				5				6	
Permitted Phases	4	4		4	8	5	2	2		6		
Detector Phase	4	4	4	4	8	5	5	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	4.0	4.0	7.0		7.0	7.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	8.0	8.0	26.0		34.0	34.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	8.0	8.0	93.0		85.0	85.0	
Total Split (%)	22.5%	22.5%	22.5%	22.5%	22.5%	6.7%	6.7%	77.5%		70.8%	70.8%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.5	3.5	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	0.5	2.0		2.0	2.0	
Lost Time Adjust (s)			0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)			6.0	6.0	6.0		4.0	6.0			6.0	
Lead/Lag						Lead	Lead			Lag	Lag	
Lead-Lag Optimize?						Yes	Yes			_	_	
Recall Mode	None	None	None	None	None	None	None	C-Max		C-Max	C-Max	
Act Effct Green (s)			9.7	9.7	9.7		102.9	102.1			89.8	
Actuated g/C Ratio			0.08	0.08	0.08		0.86	0.85			0.75	
v/c Ratio			0.42	0.25	0.02		0.22	0.41			0.55	
Control Delay			62.1	8.6	0.1		2.7	3.9			9.6	
Queue Delay			0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay			62.1	8.6	0.1		2.7	3.9			9.6	
LOS			Е	Α	Α		Α	Α			Α	
Approach Delay			38.0					3.7			9.6	
Approach LOS			D					Α			Α	
Queue Length 50th (ft)			38	0	0		13	105			226	
Queue Length 95th (ft)			77	18	0		29	184			385	
Internal Link Dist (ft)			337					1043			527	
Turn Bay Length (ft)							60					



Lane Group	SBR2
Lane Configurations	
Traffic Volume (vph)	32
Future Volume (vph)	32
Ideal Flow (vphpl)	1900
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	35
Peak Hour Factor	1.00
Heavy Vehicles (%)	0%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Tulli Day Lellylli (IL)	

	_5		-	*	_		٦	T		-	¥	*
Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)			260	284	497		602	1549			1321	
Starvation Cap Reductn			0	0	0		0	0			0	
Spillback Cap Reductn			0	0	0		0	0			0	
Storage Cap Reductn			0	0	0		0	0			0	
Reduced v/c Ratio			0.19	0.14	0.02		0.22	0.41			0.55	

#### Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 8.3 Intersection LOS: A Intersection Capacity Utilization 103.7% ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 1: Kuhio Hwy & Kukui St & Huluili St





Lane Group	SBR2
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Intersection								
Int Delay, s/veh	10.9							
		EDZ	EDD		MPI	MOT	NBI	NDD
Movement		EBT	EBR		WBL	WBT	NBL	NBR
Lane Configurations		<b>(</b>	004		4.4	4	<b>Y</b>	00
Traffic Vol, veh/h		131	361		14	56	399	38
Future Vol, veh/h		131	361		14	56	399	38
Conflicting Peds, #/hr		_ 0	_ 4		_ 4	_ 0	0	3
Sign Control		Free	Free		Free	Free	Stop	Stop
RT Channelized		-	None		-	None	-	None
Storage Length	.,	-	-		-	-	0	-
Veh in Median Storage,	#	0	-		-	0	0	-
Grade, %		0	-		-	0	0	-
Peak Hour Factor		100	100		100	100	100	100
Heavy Vehicles, %		2	4		4	6	1	0
Mvmt Flow		131	361		14	56	399	38
Major/Minor		Major1		N	lajor2		Minor1	
Conflicting Flow All		0	0		496	0	400	319
Stage 1		-	-		-	-	316	-
Stage 2		-	_		-	-	84	-
Critical Hdwy		-	_		4.14	-	6.41	6.2
Critical Hdwy Stg 1		-	-		_	-	5.41	-
Critical Hdwy Stg 2		-	_		_	-	5.41	_
Follow-up Hdwy		-	-		2.236	-	3.509	3.3
Pot Cap-1 Maneuver		-	-		1058	-	608	726
Stage 1		-	-		-	-	741	-
Stage 2		-	-		-	-	942	-
Platoon blocked, %		-	-			-		
Mov Cap-1 Maneuver		-	-		1054	-	598	722
Mov Cap-2 Maneuver		-	-		-	-	598	-
Stage 1		-	-		-	-	728	-
Stage 2		-	-		-	-	942	-
Approach		EB			WB		NB	
- 1		0			1.7		24.7	
HCM Control Delay, s HCM LOS		U			1.7		24.7 C	
HCW LOS							C	
Minor Lane/Major Mvmt	NBLn1		EBR	WBL	WBT			
Capacity (veh/h)	607			1054	-			
HCM Lane V/C Ratio	0.72		-	0.013	-			
HCM Control Delay (s)	24.7		-	8.5	0			
HCM Lane LOS	С		-	Α	Α			
HCM 95th %tile Q(veh)	6	-	-	0	-			

Intersection								
Int Delay, s/veh	46.8							
Movement	EBL	EBT			WBT	WBR	SWL	SWR
Lane Configurations		ન			₽.		W	
Traffic Vol, veh/h	385	258			436		56	277
Future Vol, veh/h	385	258			436	99	56	277
Conflicting Peds, #/hr	15	0			0	15	0	0
Sign Control	Free	Free			Free	Free	Stop	Stop
RT Channelized	-	None			-	None	-	None
Storage Length	-	-			-	-	0	-
Veh in Median Storage,	# -	0			0	-	0	-
Grade, %	-	0			0	-	0	-
Peak Hour Factor	100	100			100	100	100	100
Heavy Vehicles, %	3	3			1	2	2	1
Mvmt Flow	385	258			436	99	56	277
Major/Minor	Major1				Major2		Minor2	
Conflicting Flow All	550	0			- Wajorz	0	1529	501
Stage 1	-	-			-		501	-
Stage 2	_				-	_	1028	
Critical Hdwy	4.13	_				_	6.42	6.21
Critical Hdwy Stg 1	4.10				_	_	5.42	0.21
Critical Hdwy Stg 2	_	-			_	-	5.42	-
Follow-up Hdwy	2.227				-	-	3.518	3.309
Pot Cap-1 Maneuver	1015	-			_	-	129	572
Stage 1	1015				-	-	609	312
Stage 1	-	-			_	-	345	-
Platoon blocked, %	-	-			-	-	J <del>4</del> 3	-
Mov Cap-1 Maneuver	1002	-			-	-	69	565
Mov Cap-1 Maneuver	1002	-			-		69	505
Stage 1	-	-			-	-	331	-
Stage 1	-	-			-	-	341	-
Slaye 2	<u>-</u>	-			<u>-</u>	<u>-</u>	J4 I	-
Approach	EB				WB		SW	
HCM Control Delay, s	6.5				0		199.9	
HCM LOS							F	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBRSW	/Ln1			
Capacity (veh/h)	1002	_	_	-	256			
HCM Lane V/C Ratio	0.384	-	-	- 1	.301			
HCM Control Delay (s)	10.8	0	-		99.9			
HCM Lane LOS	В	A	-	-	F			
HCM 95th %tile Q(veh)	1.8	-	-	-	17			
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2								

Intersection								
Int Delay, s/veh	1.1							
					10.50	10/5	25	
Movement	EBL	EBT			WBT	WBR	SBL	SBR
Lane Configurations		- 4			f)		W	
Traffic Vol, veh/h	42	624			643	70	19	28
Future Vol, veh/h	42	624			643	70	19	28
Conflicting Peds, #/hr	2	0			0	2	0	58
Sign Control	Free	Free			Free	Free	Stop	Stop
RT Channelized	-	None			-	None	-	None
Storage Length	-	-				-	0	
Veh in Median Storage, #	_	0			0	-	0	-
Grade, %	-	0			0	-	0	-
Peak Hour Factor	100	100			100	100	100	100
Heavy Vehicles, %	13	3			1	0	0	6
Mvmt Flow	42	624			643	70	19	28
Major/Minor	Major1				Major2		Minor2	
Conflicting Flow All	715	0			-	0	1388	738
Stage 1	713	-				-	680	730
Stage 2	_	_			_		708	
Critical Hdwy	4.23	_					6.4	6.26
Critical Hdwy Stg 1	4.25	_			_		5.4	0.20
Critical Hdwy Stg 2		-			_	-	5.4	-
Follow-up Hdwy	2.317	-			_	_	3.5	3.354
Pot Cap-1 Maneuver	837	-			-	-	159	411
Stage 1	037	-			_	-	507	411
Stage 1	-	-			-	-	492	-
Platoon blocked, %	-				-	-	432	-
Mov Cap-1 Maneuver	836	-			-	-	146	390
Mov Cap-1 Maneuver	030	-			-	-	146	390
Stage 1	-	-			-	-	467	
· ·	-	-			-	-	491	-
Stage 2	-	-			-	-	491	-
Approach	EB				WB		SB	
HCM Control Delay, s	0.6				0		24.3	
HCM LOS							С	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR SBLn	1			
Capacity (veh/h)	836	-		- 23				
HCM Lane V/C Ratio	0.05	_	_	- 0.20				
HCM Control Delay (s)	9.5	0	_	- 24.3				
HCM Lane LOS	3.5 A	A	_		о С			
HCM 95th %tile Q(veh)	0.2	-	_	- 0.				
HOW JOHN /OHIE W(VEII)	0.2	-	-	- 0.				

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	*	*	4	<b>†</b>	ļ	4	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	W		7	<b></b>	<b>1</b>	7	
Traffic Volume (veh/h)	332	3	22	718	736	170	
Future Volume (Veh/h)	332	3	22	718	736	170	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly flow rate (vph)	332	3	22	718	736	170	
Pedestrians	19						
Lane Width (ft)	11.0						
Walking Speed (ft/s)	3.5						
Percent Blockage	2						
Right turn flare (veh)							
Median type				None	TWLTL		
Median storage veh)					2		
Upstream signal (ft)				607			
pX, platoon unblocked	0.91						
vC, conflicting volume	1517	755	755				
vC1, stage 1 conf vol	755						
vC2, stage 2 conf vol	762						
vCu, unblocked vol	1519	755	755				
tC, single (s)	6.4	6.2	4.1				
tC, 2 stage (s)	5.4						
tF (s)	3.5	3.3	2.2				
p0 queue free %	16	99	97				
cM capacity (veh/h)	394	405	850				
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2		
Volume Total	335	22	718	736	170		
Volume Left	332	22	0	0	0		
	3	0	0	0	170		
Volume Right cSH	394	850	1700	1700	1700		
	0.85		0.42	0.43	0.10		
Volume to Capacity	202	0.03					
Queue Length 95th (ft)		2	0	0	0		
Control Delay (s)	48.4	9.3	0.0	0.0	0.0		
Lane LOS	E	Α		0.0			
Approach LOS	48.4	0.3		0.0			
Approach LOS	Е						
Intersection Summary			2.2				
Average Delay			8.3		0111		5
Intersection Capacity Utilizat	ion		64.0%	l	CU Level o	of Service	В
Analysis Period (min)			15				

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4		*	ĵ.		*	<b>1</b> >	
Traffic Vol, veh/h	1	0	0	2	0	14	430	738	14	14	688	5
Future Vol, veh/h	1	0	0	2	0	14	430	738	14	14	688	5
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	7	7	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	_	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	11	5	4	0	2	2	2
Mvmt Flow	1	0	0	2	0	14	430	738	14	14	688	5
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2332	2338	691	2331	2333	753	693	0	0	759	0	0
Stage 1	719	719	_	1612	1612	_	-	-	-	-	-	-
Stage 2	1613	1619	-	719	721	_	-	-	-	-	-	_
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.31	4.15	-	-	4.12	-	_
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	_
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.399	2.245	-	-	2.218	-	-
Pot Cap-1 Maneuver	26	37	448	26	37	395	888	-	-	852	-	-
Stage 1	423	436	-	133	165	-	-	-	-	-	-	-
Stage 2	132	164	-	423	435	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	15	19	448	16	19	392	888	-	-	847	-	-
Mov Cap-2 Maneuver	15	19	-	16	19	-	-	-	-	-	-	-
Stage 1	218	429	-	68	85	-	-	-	-	-	-	-
Stage 2	66	84	-	416	428	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	261.5			47.7			4.7			0.2		
HCM LOS	F			E						0.2		
110111 200												
Minor Lane/Major Mvmt	NBL	NBT	NBR E	BLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	888		_	15 100	847	_	-					
HCM Lane V/C Ratio	0.484	_	- (		0.017	_	-					
HCM Control Delay (s)	12.8	_		261.5 47.7	9.3	_	-					
HCM Lane LOS	В	_		F E	Α.	_	-					
HCM 95th %tile Q(veh)	2.7	_	_	0.2 0.5	0.1	_	-					
110.111 00011 /00110 ((1011)	2.1			0.2	0.1							

Intersection												
Int Delay, s/veh	7.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4						4	
Traffic Vol, veh/h	9	1	0	2		434	0	0	0	0	226	5
Future Vol, veh/h	9	1	0	2	3	434	0	0	0	0	226	5
Conflicting Peds, #/hr	13	0	0	0	0	13	0	0	0	7	0	16
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	17	0	0	5	0	0	0	0	4	17
Mvmt Flow	9	1	0	2	3	434	0	0	0	0	226	5
Major/Minor	Minor2			Minor1						Major2		
Conflicting Flow All	477	252	245	236	254	20				7	0	0
Stage 1	245	245	-	7	7	-				-	-	-
Stage 2	232	7	-	229	247	-				-	-	-
Critical Hdwy	7.1	6.5	6.37	7.1	6.5	6.25				4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	-	-	-				-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-				-	-	-
Follow-up Hdwy	3.5	4	3.453	3.5	4	3.345				2.2	-	-
Pot Cap-1 Maneuver	502	655	758	723	653	1049				1627	-	-
Stage 1	763	707	-	-	-	-				-	-	-
Stage 2	-	-	-	778	706	-				-	-	-
Platoon blocked, %											-	-
Mov Cap-1 Maneuver	282	642	747	718	640	1031				1617	-	-
Mov Cap-2 Maneuver	282	642	-	718	640	-				-	-	-
Stage 1	763	697	-	-	-	-				-	-	-
Stage 2	-	-	-	777	696	-				-	-	-
Approach	EB			WB						SB		
HCM Control Delay, s	17.5			11.1						0		
HCM LOS	С			В								
			0.71	0.0.7								
Minor Lane/Major Mvmt	EBLn1\		SBL	SBT SBR								
Capacity (veh/h)		1025	1617									
HCM Lane V/C Ratio	0.033		-									
HCM Control Delay (s)	17.5	11.1	0									
HCM Lane LOS	С	В	Α									
HCM 95th %tile Q(veh)	0.1	2.2	0									

Intersection				
Intersection Delay, s/veh	27.7			
Intersection LOS	D			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	306	648	751	460
Demand Flow Rate, veh/h	326	661	751	476
Vehicles Circulating, veh/h	514	391	307	1046
Vehicles Exiting, veh/h	1008	667	533	6
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.8	16.8	16.9	72.9
Approach LOS	Α	С	С	F
Lane	Left	Left	Left	Left
Designated Moves	LTR	LT	LTR	LTR
Assumed Moves	LTR	LT	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	326	661	751	476
Cap Entry Lane, veh/h	817	926	1009	475
Entry HV Adj Factor	0.939	0.980	1.000	0.966
Flow Entry, veh/h	306	648	751	460
Cap Entry, veh/h	767	907	1009	458
V/C Ratio	0.399	0.714	0.744	1.002
Control Delay, s/veh	9.8	16.8	16.9	72.9
LOS	A	С	С	F
95th %tile Queue, veh	2	6	7	13

Intersection								
Int Delay, s/veh	5.4							
Movement	EBL	EBT			WBT	WBR	SEL	SER
Lane Configurations		4			<u> </u>		¥	- OLIV
Traffic Vol, veh/h	61	137			325	330	141	80
Future Vol, veh/h	61	137			325	330	141	80
Conflicting Peds, #/hr	0	0			0	0	0	0
Sign Control	Free	Free			Free	Free	Stop	Stop
RT Channelized	-	None			-	None	-	None
Storage Length	_	-			_	-	0	-
Veh in Median Storage, #	<u> </u>	0			0	_	0	-
Grade, %	_	0			0	_	0	-
Peak Hour Factor	100	100			100	100	100	100
Heavy Vehicles, %	0	2			0	1	2	0
Mvmt Flow	61	137			325	330	141	80
Major/Minor	Major1				Major2		Minor2	
Conflicting Flow All	655	0			-	0	749	490
Stage 1	-	-			_	-	490	-
Stage 2	-	_			_	_	259	-
Critical Hdwy	4.1	_			_	-	6.42	6.2
Critical Hdwy Stg 1	-	-			-	-	5.42	-
Critical Hdwy Stg 2	-	-			_	-	5.42	_
Follow-up Hdwy	2.2	_			-	-	3.518	3.3
Pot Cap-1 Maneuver	942	_			_	-	379	582
Stage 1		-			-	-	616	-
Stage 2	-	_			_	-	784	_
Platoon blocked, %		_			_	-		
Mov Cap-1 Maneuver	942	-			_	-	352	582
Mov Cap-2 Maneuver	-	-			-	-	352	-
Stage 1	-	-			_	-	573	_
Stage 2	-	-			-	-	784	-
J								
Approach	EB				WB		SE	
HCM Control Delay, s	2.8				0		23.5	
HCM LOS							С	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR SELn1	1			
Capacity (veh/h)	942	-	-	- 411				
HCM Lane V/C Ratio	0.065	_	_	- 0.538				
HCM Control Delay (s)	9.1	0	-	- 23.5				
HCM Lane LOS	A	A	-	- (				
HCM 95th %tile Q(veh)	0.2	-	-	- 3.1				
	J.2			3.1				

Intersection								
Int Delay, s/veh	0.4							
Movement	EBL	EBT			WBT	WBR	SBL	SBR
Lane Configurations		4			î,		W	
Traffic Vol, veh/h	5	207			339	52	14	1
Future Vol, veh/h	5	207			339	52	14	1
Conflicting Peds, #/hr	0	0			0	0	0	0
Sign Control	Free	Free			Free	Free	Stop	Stop
RT Channelized	-	None			-		<u>.</u>	None
Storage Length	-	-			-	-	0	-
Veh in Median Storage, #	‡ -	0			0	-	0	-
Grade, %	-	0			0	-	0	-
Peak Hour Factor	100	100			100	100	100	100
Heavy Vehicles, %	0	1			1	0	0	0
Mvmt Flow	5	207			339	52	14	1
Major/Minor	Major1				Major2		Minor2	
Conflicting Flow All	391	0			-	0	582	365
Stage 1	-	-			_	-	365	-
Stage 2	-	_			-	_	217	_
Critical Hdwy	4.1	_				-	6.4	6.2
Critical Hdwy Stg 1	-	_			-	_	5.4	- 0.2
Critical Hdwy Stg 2	_	_				-	5.4	_
Follow-up Hdwy	2.2	_			-	_	3.5	3.3
Pot Cap-1 Maneuver	1179	-			_	-	479	685
Stage 1	-	_			-	_	707	-
Stage 2	_	-			_	-	824	_
Platoon blocked, %		-			-	-		
Mov Cap-1 Maneuver	1179	-			-	-	477	685
Mov Cap-2 Maneuver	-	-			-	-	477	-
Stage 1	-	-			_	-	703	-
Stage 2	-	-			-	-	824	-
Approach	EB				WB		SB	
HCM Control Delay, s	0.2				0		12.6	
HCM LOS	0.2						В	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR SE	BLn1			
Capacity (veh/h)	1179	-	-	-	487			
HCM Lane V/C Ratio	0.004	-	-	- n	.031			
HCM Control Delay (s)	8.1	0	-		12.6			
HCM Lane LOS	Α	A	-	-	B			
HCM 95th %tile Q(veh)	0	- A			0.1			
	U	-	-	-	0.1			

Intersection	8.6							
<b>,</b>								
Movement	EBL	EBR	NBL	NBT		SBT	SBR	
ane Configurations	7	7	7	ተተ			7	
affic Vol, veh/h	27	404	745	839		503	85	
uture Vol, veh/h	27	404	745	839		503	85	
onflicting Peds, #/hr	0	0	0	0		0	0	
ign Control	Stop	Stop	Free	Free		Free	Free	
T Channelized	-	Yield		None		-	11010	
torage Length	140	0	170	-		-	150	
eh in Median Storage, #		-	-	0		0	-	
Grade, %	0	-	-	0		0	-	
eak Hour Factor	100	100	100	100		100	100	
eavy Vehicles, %	0	2	0	1		3	1	
Ivmt Flow	27	404	745	839		503	85	
ajor/Minor	Minor2		Major1			Major2		
onflicting Flow All	2413	503	503	0		-	0	
Stage 1	503	-	-	-		-	-	
Stage 2	1910	-	-	-		-	-	
ritical Hdwy	6.6	6.23	4.1	-		-	-	
itical Hdwy Stg 1	5.4	-	-	-		-	-	
itical Hdwy Stg 2	5.8	-	-	-		-	-	
ollow-up Hdwy	3.5	3.319	2.2	-		-	-	
ot Cap-1 Maneuver	32	568	1072	-		-	-	
Stage 1	612	-	-	-		-	-	
Stage 2	104	-	-	-		-	-	
latoon blocked, %				-		-	-	
lov Cap-1 Maneuver	~ 10	568	1072	-		-	-	
lov Cap-2 Maneuver	231	-	-	-		-	-	
Stage 1	187	-	-	-		-	-	
Stage 2	104	-	-	-		-	-	
proach	EB		NB			SB		
CM Control Delay, s	25.2		7.3			0		
CM LOS	D							
nor Lane/Major Mvmt	NBL	NBT EBLn1 EBLn	2 SBT	SBR				
apacity (veh/h)	1072	- 231 56		-				
CM Lane V/C Ratio	0.695	- 0.117 0.71		_				
CM Control Delay (s)	15.6	- 22.6 25.		_				
CM Lane LOS	C		D -	_				
CM 95th %tile Q(veh)	6	- 0.4 5.		-				
` '								
otes	'' A D :				L ( D C )	* A11		1.1
Volume exceeds capac	city \$: Dela	ay exceeds 300s	+: Com	outation N	lot Defined	*: All major vo	olume in p	olatoon

# TRAFFIC IMPACT ANALYSIS REPORT UPDATE

FOR THE PROPOSED

### **HOKUA PLACE**

**KAPA`A, KAUAI, HAWAII TAX MAP KEY: (4) 4-3-03: 01** 

## **APPENDIX D**

CAPACITY ANALYSIS WORKSHEETS
PEAK HOUR TRAFFIC WITH PROJECT

	>	ၨ	<b>→</b>	•	•	1	ሻ	†	<i>&gt;</i>	<b>/</b>	ļ	4
Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			ની	7	7		7	ĵ.			4	
Traffic Volume (vph)	9	37	12	60	1	11	5	751	14	3	824	43
Future Volume (vph)	9	37	12	60	1	11	5	751	14	3	824	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0			60		0	0		0
Storage Lanes		0		1			1		0	0		0
Taper Length (ft)		100					100			100		
Satd. Flow (prot)	0	0	1613	1501	1589	0	1632	1760	0	0	1798	0
Flt Permitted			0.962				0.328				0.998	
Satd. Flow (perm)	0	0	1574	1420	1526	0	560	1760	0	0	1795	0
Right Turn on Red				Yes	Yes				No			
Satd. Flow (RTOR)				60	330							
Link Speed (mph)			30					30			30	
Link Distance (ft)			417					1113			697	
Travel Time (s)			9.5					25.3			15.8	
Confl. Peds. (#/hr)	2	4		7	4	4	4		7	4		4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	15%	0%	4%	0%	6%	9%	4%	0%	0%	1%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	58	60	1	0	16	765	0	0	875	0
Turn Type	Perm	Perm	NA	Perm	Perm	custom	custom	NA		Perm	NA	
Protected Phases			4				5				6	
Permitted Phases	4	4		4	8	5	2	2		6		
Detector Phase	4	4	4	4	8	5	5	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	1.0	1.0	7.0		7.0	7.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	5.0	5.0	26.0		34.0	34.0	
Total Split (s)	30.0	30.0	30.0	30.0	30.0	6.0	6.0	180.0		174.0	174.0	
Total Split (%)	14.3%	14.3%	14.3%	14.3%	14.3%	2.9%	2.9%	85.7%		82.9%	82.9%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	1.0	1.0	2.0		2.0	2.0	
Lost Time Adjust (s)			0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)			6.0	6.0	6.0		4.0	6.0			6.0	
Lead/Lag						Lead	Lead			Lag	Lag	
Lead-Lag Optimize?						Yes	Yes					
Recall Mode	None	None	None	None	None	None	None	C-Max		C-Max	C-Max	
Act Effct Green (s)			13.1	13.1	13.1		186.9	184.9			179.0	
Actuated g/C Ratio			0.06	0.06	0.06		0.89	0.88			0.85	
v/c Ratio			0.59	0.42	0.00		0.03	0.49			0.57	
Control Delay			118.9	26.1	0.0		1.8	4.1			7.0	
Queue Delay			0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay			118.9	26.1	0.0		1.8	4.1			7.0	
LOS			F	С	Α		Α	Α			Α	
Approach Delay			71.7					4.0			7.0	
Approach LOS			Е					Α			Α	
Queue Length 50th (ft)			80	0	0		2	180			342	
Queue Length 95th (ft)			136	56	0		6	284			505	
Internal Link Dist (ft)			337					1033			617	
Turn Bay Length (ft)							60					



Lane Group	SBR2
Lane Configurations	
Traffic Volume (vph)	5
Future Volume (vph)	5
Ideal Flow (vphpl)	1900
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	4
Peak Hour Factor	1.00
Heavy Vehicles (%)	0%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
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Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)			179	215	466		527	1549			1529	
Starvation Cap Reductn			0	0	0		0	0			0	
Spillback Cap Reductn			0	0	0		0	0			0	
Storage Cap Reductn			0	0	0		0	0			0	
Reduced v/c Ratio			0.32	0.28	0.00		0.03	0.49			0.57	

#### Intersection Summary

Area Type: Other

Cycle Length: 210

Actuated Cycle Length: 210

Offset: 202 (96%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 10.0 Intersection LOS: A Intersection Capacity Utilization 70.9% ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Kuhio Hwy & Kukui St & Huluili St





Lane Group	SBR2
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Intersection								
Int Delay, s/veh	2.8							
Movement	E	ЕВТ	EBR	\	<b>VBL</b>	WBT	NBL	NBR
Lane Configurations		ħ				4	N/	
Traffic Vol, veh/h		151	388		19	51	136	9
Future Vol, veh/h		151	388		19	51	136	9
Conflicting Peds, #/hr		0	0		0	0	1	0
Sign Control	F	ree	Free	F	ree	Free	Stop	Stop
RT Channelized		-	None		-	None	-	None
Storage Length		-	-		-	-	0	-
Veh in Median Storage, #		0	-		-	0	0	-
Grade, %		0	-		-	0	0	-
Peak Hour Factor		100	100		100	100	100	100
Heavy Vehicles, %		3	6		17	0	6	9
Mvmt Flow		151	388		19	51	136	9
Major/Minor	Ma	jor1		Ma	jor2		Minor1	
Conflicting Flow All		0	0		539	0	435	345
Stage 1		-	-		-	-	345	-
Stage 2		-	-		-	-	90	-
Critical Hdwy		-	-		4.27	-	6.46	6.29
Critical Hdwy Stg 1		-	-		-	-	5.46	-
Critical Hdwy Stg 2		-	-		-	-	5.46	-
Follow-up Hdwy		-	-		.353	-	3.554	3.381
Pot Cap-1 Maneuver		-	-		958	-	571	682
Stage 1		-	-		-	-	708	-
Stage 2		-	-		-	-	924	-
Platoon blocked, %		-	-			-		
Mov Cap-1 Maneuver		-	-		958	-	559	682
Mov Cap-2 Maneuver		-	-		-	-	559	-
Stage 1		-	-		-	-	694	-
Stage 2		-	-		-	-	923	-
Approach		EB			WB		NB	
HCM Control Delay, s		0			2.4		13.6	
HCM LOS							В	
Minor Lane/Major Mvmt	NBLn1 E	EBT	EBR	WBL V	VBT			
Capacity (veh/h)	565	-	-	958	-			
HCM Lane V/C Ratio	0.257	-	-	0.02	-			
HCM Control Delay (s)	13.6	-	-	8.8	0			
HCM Lane LOS	В	-	-	А	A			
HCM 95th %tile Q(veh)	1	-	-	0.1	-			
2000								

Intersection								
Int Delay, s/veh	5.4							
Movement	EBL	EBT			WBT	WBR	SWL	SWR
Lane Configurations		- 4			f)		¥	
Traffic Vol, veh/h	540	514			152	13	8	108
Future Vol, veh/h	540	514			152	13	8	108
Conflicting Peds, #/hr	7	0			0	7	0	0
Sign Control	Free	Free			Free	Free	Stop	Stop
RT Channelized	-	None			-	None	-	None
Storage Length	-	-			-	-	0	-
Veh in Median Storage, #	‡ -	0			0	-	0	-
Grade, %	-	0			0	-	0	-
Peak Hour Factor	100	100			100	100	100	100
Heavy Vehicles, %	1	5			20	0	0	8
Mvmt Flow	540	514			152	13	8	108
Major/Minor	Major1				Major2		Minor2	
Conflicting Flow All	172	0			-	0	1760	166
Stage 1	-	-			_	_	166	-
Stage 2	_	_			_	_	1594	_
Critical Hdwy	4.11	_				_	6.4	6.28
Critical Hdwy Stg 1	7.11	_			_	_	5.4	0.20
Critical Hdwy Stg 2	_	_					5.4	
Follow-up Hdwy	2.209						3.5	3.372
Pot Cap-1 Maneuver	1411	_				-	94	863
Stage 1	1411				-	-	868	003
Stage 2	-	-			-	-	185	-
Platoon blocked, %	-	_			-	-	100	-
Mov Cap-1 Maneuver	1402	_			-	-	43	858
Mov Cap-1 Maneuver	1402	-			-	-	43	000
Stage 1	-	-			-	-	398	-
	-	-			-	-	184	-
Stage 2	-	-			-	-	104	-
							2111	
Approach	EB				WB		SW	
HCM Control Delay, s	4.7				0		19	
HCM LOS							С	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBRSW	Ln1			
Capacity (veh/h)	1402	-	-	-	372			
HCM Lane V/C Ratio	0.385	-	-	- 0.	312			
HCM Control Delay (s)	9.2	0	-	-	19			
HCM Lane LOS	Α	Α	-	-	С			
HCM 95th %tile Q(veh)	1.8	-	-	-	1.3			

Intersection								
Int Delay, s/veh	0.6							
		EST			MAR	14/00	0.00	0.00
Movement	EBL	EBT			WBT	WBR	SBL	SBR
Lane Configurations		4			f)		N/	
Traffic Vol, veh/h	15	1040			247	13	13	31
Future Vol, veh/h	15	1040			247	13	13	31
Conflicting Peds, #/hr	6	0			0	6	0	0
Sign Control	Free	Free			Free	Free	Stop	Stop
RT Channelized	-	None			-	None	-	None
Storage Length	-	-			-	-	0	-
Veh in Median Storage, #	-	0			0	-	0	-
Grade, %	-	0			0	-	0	-
Peak Hour Factor	100	100			100	100	100	100
Heavy Vehicles, %	0	2			4	14	24	19
Mvmt Flow	15	1040			247	13	13	31
Major/Minor	Major1				Major2		Minor2	
Conflicting Flow All	266	0			-	0	1330	260
Stage 1	-	-			-	-	260	-
Stage 2	_				_	_	1070	-
Critical Hdwy	4.1	-			-	_	6.64	6.39
Critical Hdwy Stg 1	-	_			-	_	5.64	-
Critical Hdwy Stg 2	-	-			-	_	5.64	-
Follow-up Hdwy	2.2	_			-	_	3.716	3.471
Pot Cap-1 Maneuver	1310	-			-	_	153	739
Stage 1	-	_			-	_	735	-
Stage 2	-	-			-	_	299	-
Platoon blocked, %		_			-	-		
Mov Cap-1 Maneuver	1303	-			-	-	147	735
Mov Cap-2 Maneuver	-	_			-	_	147	-
Stage 1	-	-			_	_	711	-
Stage 2	-	_			-	-	298	-
A no reach	ED				MP		0.0	
Approach	EB				WB		SB	
HCM Control Delay, s	0.1				0		17.3	
HCM LOS							С	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR SBLn	1			
Capacity (veh/h)	1303	-	-	- 33	7			
HCM Lane V/C Ratio	0.012	-	-	- 0.13	1			
HCM Control Delay (s)	7.8	0	-	- 17.3	3			
HCM Lane LOS	А	Α	-	- (	0			
HCM 95th %tile Q(veh)	0	-	-	- 0.4	4			
· ,								

TT. Ranio Tiwy & Londa Ot							AWIT Call Hour Hame With Frojet
	۶	$\rightarrow$	4	<b>†</b>	ļ	4	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	W		7	<b></b>	<b>†</b>	7	
Traffic Volume (veh/h)	516	2	18	760	864	105	
Future Volume (Veh/h)	516	2	18	760	864	105	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly flow rate (vph)	516	2	18	760	864	105	
Pedestrians	8						
Lane Width (ft)	11.0						
Walking Speed (ft/s)	3.5						
Percent Blockage	1						
Right turn flare (veh)							
Median type				None	TWLTL		
Median storage veh)					2		
Upstream signal (ft)				697			
pX, platoon unblocked	0.90						
vC, conflicting volume	1668	872	872				
vC1, stage 1 conf vol	872						
vC2, stage 2 conf vol	796						
vCu, unblocked vol	1686	872	872				
tC, single (s)	6.4	6.2	4.1				
tC, 2 stage (s)	5.4	V. <u> </u>					
tF (s)	3.5	3.3	2.2				
p0 queue free %	0	99	98				
cM capacity (veh/h)	362	350	776				
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2		
Volume Total	518	18	760	864	105		
Volume Left	516	18	0	0	0		
Volume Right	2	0	0	0	105		
cSH	362	776	1700	1700	1700		
Volume to Capacity	1.43	0.02	0.45	0.51	0.06		
Queue Length 95th (ft)	669	2	0.40	0.01	0.00		
Control Delay (s)	237.5	9.7	0.0	0.0	0.0		
Lane LOS	207.5 F	Α	0.0	0.0	0.0		
Approach Delay (s)	237.5	0.2		0.0			
Approach LOS	F	0.2		0.0			
Intersection Summary							
Average Delay			54.4				
Intersection Capacity Utilizat	ion		80.8%		CU Level of	of Service	D
Analysis Period (min)			15				

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4		7	ĵ.		7	ĵ.	
Traffic Vol, veh/h	0	1	0	1	0	5	118	848	23	8	802	5
Future Vol, veh/h	0	1	0	1	0	5	118	848	23	8	802	5
Conflicting Peds, #/hr	3	0	0	0	0	3	0	0	16	16	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	11	5	4	0	2	2	2
Mvmt Flow	0	1	0	1	0	5	118	848	23	8	802	5
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1922	1944	805	1933	1935	879	807	0	0	887	0	0
Stage 1	821	821	-	1112	1112	-	-	-	-	-	-	_
Stage 2	1101	1123	-	821	823	_	_	_	_	_	_	_
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.31	4.15	_	_	4.12	-	
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	_	_	-	_	_
Critical Hdwy Stg 2	6.1	5.5	_	6.1	5.5	_	-	_	_	_	-	_
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.399	2.245	-	-	2.218	-	_
Pot Cap-1 Maneuver	51	66	386	50	67	334	805	-	-	763	-	
Stage 1	371	391	-	256	287	-	-	-	-	-	-	_
Stage 2	259	283	-	371	391	_	-	-	-	-	-	_
Platoon blocked, %								-	-		-	_
Mov Cap-1 Maneuver	44	55	386	43	56	328	805	-	-	752	-	-
Mov Cap-2 Maneuver	44	55	-	43	56	-	-	-	-	-	-	-
Stage 1	316	387	-	215	241	-	-	-	-	-	-	-
Stage 2	217	238	-	366	387	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	71.7			29			1.2			0.1		
HCM LOS	7 1.7 F			D			1.2			0.1		
HOW EOS	'			U								
Minor Lane/Major Mvmt	NBL	NBT	NBR E	BLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	805	-	-	55 156	752	-	-					
HCM Lane V/C Ratio	0.147	-	-	0.018 0.038	0.011	-	-					
HCM Control Delay (s)	10.2	-	-	71.7 29	9.8	-	-					
HCM Lane LOS	В	-	-	F D	Α	-	-					
HCM 95th %tile Q(veh)	0.5	-	-	0.1 0.1	0	-	-					

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations		4			4						4	
Traffic Vol, veh/h	5	1	14	0	2	122	0	0	0	0	308	ç
Future Vol, veh/h	5	1	14	0	2	122	0	0	0	0	308	Ç
Conflicting Peds, #/hr	4	0	0	0	0	4	0	0	0	0	0	7
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	17	0	0	5	0	0	0	0	4	17
Mvmt Flow	5	1	14	0	2	122	0	0	0	0	308	g
NA : (NA:	M' 0			<b>.</b>						M : 0		
Major/Minor	Minor2			Minor1						Major2		
Conflicting Flow All	386	320	320	320	324	4				0	0	C
Stage 1	320	320	-	0	0	-				-	-	-
Stage 2	66	0	-	320	324	-				-	-	
Critical Hdwy	7.1	6.5	6.37	7.1	6.5	6.25				4.1	-	
Critical Hdwy Stg 1	6.1	5.5	-	-	-	-				-	-	
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-				-	-	
Follow-up Hdwy	3.5	4	3.453	3.5	4					2.2	-	
Pot Cap-1 Maneuver	576	600	687	637	597	1071				-	-	
Stage 1	696	656	-	-	-	-				-	-	
Stage 2	-	-	-	696	653	-				-	-	•
Platoon blocked, %	504	500	000	000	500	4007					-	
Mov Cap-1 Maneuver	504	596	683	623	593	1067				-	-	•
Mov Cap-2 Maneuver	504	596	-	623	593	-				-	-	
Stage 1	696	652	-	-	- 040	-				-	-	•
Stage 2	-	-	-	681	649	-				-	-	-
Approach	EB			WB						SB		
HCM Control Delay, s	11			8.9						0		
HCM LOS	В			A								
TIOW EGG	J			,,								
Minor Lane/Major Mvmt	EBLn1\	WBLn1	SBL	SBT SBR								
Capacity (veh/h)	623	1053	-									
HCM Lane V/C Ratio		0.118	-									
HCM Control Delay (s)	11	8.9	0									
HCM Lane LOS	В	Α	Α									
HCM 95th %tile Q(veh)	0.1	0.4	-									

Intersection				
Intersection Delay, s/veh	31.9			
Intersection LOS	D			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	595	296	340	855
Demand Flow Rate, veh/h	611	327	349	866
Vehicles Circulating, veh/h	710	112	728	408
Vehicles Exiting, veh/h	564	965	593	31
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	42.1	5.7	14.5	40.7
Approach LOS	Е	A	В	Е
lone	1 . 60	1 6	1 6	
Lane	Left	Left	Left	Left
Designated Moves	Lett LTR	Left LT	Left LTR	Lett LTR
Designated Moves	LTR	LT	LTR	LTR
Designated Moves Assumed Moves	LTR	LT	LTR	LTR
Designated Moves Assumed Moves RT Channelized	LTR LTR	LT LT	LTR LTR	LTR LTR
Designated Moves Assumed Moves RT Channelized Lane Util	LTR LTR 1.000	LT LT 1.000	LTR LTR 1.000	LTR LTR 1.000
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s	LTR LTR 1.000 2.609 4.976 611	LT LT 1.000 2.609 4.976 327	LTR LTR 1.000 2.609	LTR LTR 1.000 2.609
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s	LTR LTR 1.000 2.609 4.976	LT LT 1.000 2.609 4.976	LTR LTR 1.000 2.609 4.976	LTR LTR 1.000 2.609 4.976
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h	LTR LTR 1.000 2.609 4.976 611	LT LT 1.000 2.609 4.976 327	LTR LTR 1.000 2.609 4.976 349	LTR LTR 1.000 2.609 4.976 866
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h	LTR LTR 1.000 2.609 4.976 611 669	LT LT 1.000 2.609 4.976 327 1231	LTR LTR 1.000 2.609 4.976 349 657	LTR LTR 1.000 2.609 4.976 866 910
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h	LTR LTR 1.000 2.609 4.976 611 669 0.973 595 651	LT LT 1.000 2.609 4.976 327 1231 0.906 296	LTR LTR 1.000 2.609 4.976 349 657 0.974 340 640	LTR LTR 1.000 2.609 4.976 866 910 0.988 855 899
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h	LTR LTR 1.000 2.609 4.976 611 669 0.973 595	LT LT 1.000 2.609 4.976 327 1231 0.906 296	LTR LTR 1.000 2.609 4.976 349 657 0.974 340	LTR LTR 1.000 2.609 4.976 866 910 0.988 855
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio Control Delay, s/veh	LTR LTR 1.000 2.609 4.976 611 669 0.973 595 651	LT LT 1.000 2.609 4.976 327 1231 0.906 296	LTR LTR 1.000 2.609 4.976 349 657 0.974 340 640	LTR LTR 1.000 2.609 4.976 866 910 0.988 855 899
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio	LTR LTR 1.000 2.609 4.976 611 669 0.973 595 651 0.913	LT LT 1.000 2.609 4.976 327 1231 0.906 296 1115 0.266	LTR LTR 1.000 2.609 4.976 349 657 0.974 340 640 0.531	LTR LTR 1.000 2.609 4.976 866 910 0.988 855 899

Intersection				
Intersection Delay, s/veh	10.1		<u> </u>	
Intersection LOS	В			
Approach	EB	WB	SB	
Entry Lanes	1	1	1	
Conflicting Circle Lanes	1	1	1	
Adj Approach Flow, veh/h	176	569	516	
Demand Flow Rate, veh/h	179	580	526	
Vehicles Circulating, veh/h	224	56	504	
Vehicles Exiting, veh/h	806	347	132	
Ped Vol Crossing Leg, #/h	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	
Approach Delay, s/veh	4.8	7.3	15.1	
Approach LOS	А	А	С	
Lane	Left	Left	Left	
Designated Moves	LT	TR	LR	
Assumed Moves	LT	TR	LR	
RT Channelized				
Lane Util	1.000	1.000	1.000	
Follow Un Hondway a			1.000	
Follow-Up Headway, s	2.609	2.609	2.609	
Critical Headway, s	2.609 4.976			
Critical Headway, s Entry Flow, veh/h	4.976 179	2.609 4.976 580	2.609 4.976 526	
Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h	4.976 179 1098	2.609 4.976 580 1303	2.609 4.976 526 825	
Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor	4.976 179 1098 0.981	2.609 4.976 580 1303 0.981	2.609 4.976 526 825 0.981	
Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h	4.976 179 1098 0.981 176	2.609 4.976 580 1303 0.981 569	2.609 4.976 526 825 0.981 516	
Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h	4.976 179 1098 0.981 176 1077	2.609 4.976 580 1303 0.981 569 1279	2.609 4.976 526 825 0.981 516 810	
Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio	4.976 179 1098 0.981 176 1077 0.163	2.609 4.976 580 1303 0.981 569 1279 0.445	2.609 4.976 526 825 0.981 516 810 0.637	
Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio Control Delay, s/veh	4.976 179 1098 0.981 176 1077 0.163 4.8	2.609 4.976 580 1303 0.981 569 1279 0.445 7.3	2.609 4.976 526 825 0.981 516 810 0.637	
Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio Control Delay, s/veh LOS	4.976 179 1098 0.981 176 1077 0.163 4.8	2.609 4.976 580 1303 0.981 569 1279 0.445 7.3	2.609 4.976 526 825 0.981 516 810 0.637 15.1	
Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio Control Delay, s/veh	4.976 179 1098 0.981 176 1077 0.163 4.8	2.609 4.976 580 1303 0.981 569 1279 0.445 7.3	2.609 4.976 526 825 0.981 516 810 0.637	

Intersection							
Int Delay, s/veh	1						
		T EDD		WDI	WDT	NDI	NDD
Movement	EB			WBL	WBT	NBL	NBR
Lane Configurations		<b>)</b>		•	4	¥	0.4
Traffic Vol, veh/h	68			3	142	33	24
Future Vol, veh/h	68			3	142	33	24
Conflicting Peds, #/hr		0 0		0	0	0	0
Sign Control	Fre			Free	Free	Stop	Stop
RT Channelized		- None		-	None	-	None
Storage Length				-	-	0	-
Veh in Median Storage, #		0 -		-	0	0	-
Grade, %		0 -		-	0	0	-
Peak Hour Factor	10			100	100	100	100
Heavy Vehicles, %		2 2		2	2	2	2
Mvmt Flow	68	4 175		3	142	33	24
Major/Minor	Major	1	N	/lajor2		Minor1	
Conflicting Flow All		0 0		859	0	920	772
Stage 1				-	-	772	-
Stage 2				_	_	148	-
Critical Hdwy				4.12	_	6.42	6.22
Critical Hdwy Stg 1				7.12	_	5.42	0.22
Critical Hdwy Stg 2				_	_	5.42	
Follow-up Hdwy				2.218	_	3.518	3.318
Pot Cap-1 Maneuver				782	-	3.310	400
Stage 1				102	-	456	400
Stage 2				-		880	-
· ·		-		-	-	000	-
Platoon blocked, %				700	-	200	400
Mov Cap-1 Maneuver				782	-	300	400
Mov Cap-2 Maneuver				-	-	300	-
Stage 1				-	-	454	-
Stage 2				-	-	880	-
Approach	E	В		WB		NB	
HCM Control Delay, s		0		0.2		17.9	
HCM LOS						С	
Minor Lane/Major Mvmt	NBLn1 EB	T EBR	WBL	WBT			
Capacity (veh/h)	335			-			
HCM Lane V/C Ratio	0.17		0.004	_			
HCM Control Delay (s)	17.9			0			
HCM Lane LOS	C C			A			
HCM 95th %tile Q(veh)	0.6			- -			
HOW SOUT /OUIE Q(VEII)	0.0		U	-			

Intersection									
	5.5								
Movement	EBL	EBT		WB <sup>-</sup>	Τ \Λ	/BR	SEL	SER	
Lane Configurations		4		1		IDIT	W	OLIT	
Traffic Vol, veh/h	80	506		52		122	353	20	
Future Vol, veh/h	80	506		5/		122	353	20	
*	0	0			2	0	0	0	
Conflicting Peds, #/hr									
Sign Control	Free	Free		Free		ree	Stop	Stop	
RT Channelized	-	None			- N	one	-	None	
Storage Length	-	-			-	-	0	-	
Veh in Median Storage, #	-	0			0	-	0	-	
Grade, %	-	0			0	-	0	-	
Peak Hour Factor	100	100		100	0	100	100	100	
Heavy Vehicles, %	9	1			0	2	2	0	
Mvmt Flow	80	506		5	2	122	353	20	
Main = 1/N Aim = 1	NA. 1			NA .	1		Min		
Major/Minor	Major1			Major			Minor2		
Conflicting Flow All	174	0			-	0	779	113	
Stage 1	-	-			-	-	113	-	
Stage 2	-	-			-	-	666	-	
Critical Hdwy	4.19	-			-	-	6.42	6.2	
Critical Hdwy Stg 1	-	-			-	-	5.42	-	
Critical Hdwy Stg 2	-	-			-	-	5.42	-	
Follow-up Hdwy	2.281	_			_	_	3.518	3.3	
Pot Cap-1 Maneuver	1361	_			_	_	364	945	
Stage 1	-	_			_	_	912	-	
Stage 2	_				_	_	511	_	
Platoon blocked, %	_	_			_	_	311		
	1001	-			-		224	045	
Mov Cap-1 Maneuver	1361	-			-	-	~ 334	945	
Mov Cap-2 Maneuver	-	-			-	-	~ 334	-	
Stage 1	-	-			-	-	837	-	
Stage 2	-	-			-	-	511	-	
Approach	EB			WE	3		SE		
	1.1				0		106.1		
HCM Control Delay, s	1.1				J				
HCM LOS							F		
Minor Lane/Major Mvmt	EBL	EBT	WBT W	BR SELn1					
Capacity (veh/h)	1361	_	_	- 346					
HCM Lane V/C Ratio	0.059	_	-	- 1.078					
HCM Control Delay (s)	7.8	0		- 106.1					
HCM Lane LOS	7.0 A	A		_					
	0.2		-						
HCM 95th %tile Q(veh)	0.2	-	-	- 13.6					
Notes									
~: Volume exceeds capaci	tv \$: De	lav exc	eeds 300s	+: Computation	on No	ot Define	ed * All ma	ajor volume in pla	toon
siamo exocodo capaci	-, ψ. υ	07.01	2340 0000	. Oomputatio	140	. Dom		.jo. Tolalilo ili pia	

Intersection								
Int Delay, s/veh	0.4							
Movement	EBL	EBT			WBT	WBR	SBL	SBR
Lane Configurations		4			10W	TIDIC	₩.	OBIT
Traffic Vol, veh/h	8	358			165	38	15	0
Future Vol, veh/h	8	358			165	38	15	0
Conflicting Peds, #/hr	0	0			0	0	0	0
Sign Control	Free	Free			Free	Free	Stop	Stop
RT Channelized	-	None			-	None	-	None
Storage Length	_	-			-	-	0	-
Veh in Median Storage, #	‡ -	0			0	-	0	-
Grade, %	-	0			0	-	0	-
Peak Hour Factor	100	100			100	100	100	100
Heavy Vehicles, %	0	2			11	0	0	0
Mvmt Flow	8	358			165	38	15	0
Major/Minor	Major1				Major2		Minor2	
Conflicting Flow All	203	0			-	0	558	184
Stage 1	-	-			_	-	184	-
Stage 2	_	-			-	-	374	-
Critical Hdwy	4.1	_			-	-	6.4	6.2
Critical Hdwy Stg 1	-	-			-	-	5.4	-
Critical Hdwy Stg 2	-	_			-	-	5.4	-
Follow-up Hdwy	2.2	-			-	-	3.5	3.3
Pot Cap-1 Maneuver	1381	-			_	-	494	864
Stage 1	-	-			-	-	852	-
Stage 2	-	-			_	-	700	-
Platoon blocked, %		-			-	-		
Mov Cap-1 Maneuver	1381	-			_	-	491	864
Mov Cap-2 Maneuver	-	-			-	-	491	-
Stage 1	-	-			-	-	846	-
Stage 2	-	-			-	-	700	-
Approach	EB				WB		SB	
HCM Control Delay, s	0.2				0		12.6	
HCM LOS							В	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR SBL	n1			
Capacity (veh/h)	1381	-	-		91			
HCM Lane V/C Ratio	0.006	_	_	- 0.0				
HCM Control Delay (s)	7.6	0	_	- 12				
HCM Lane LOS	A	A	-	-	В			
HCM 95th %tile Q(veh)	0	-	_	- (	).1			

Intersection							
Int Delay, s/veh	0.4						
iiii Deiay, S/Veii	0.4						
Movement	EB	T EBR		WBL	WBT	NBL	NBR
Lane Configurations	1	<b>à</b>			4	₩.	
Traffic Vol, veh/h	57			5	67	0	16
Future Vol, veh/h	57	0 0		5	67	0	16
Conflicting Peds, #/hr		0 0		0	0	0	0
Sign Control	Fre			Free	Free	Stop	Stop
RT Channelized		- None		-	None	-	None
Storage Length				-	-	0	-
Veh in Median Storage, #		0 -		-	0	0	-
Grade, %		0 -		-	0	0	-
Peak Hour Factor	10			100	100	100	100
Heavy Vehicles, %		2 2		2	2	2	2
Mvmt Flow	57			5	67	0	16
Major/Minor	Major	1		ajor2		Minor1	
				_	0		E70
Conflicting Flow All		0 0		570	0	647	570
Stage 1				-	-	570	-
Stage 2				1 10	-	77	- 6.00
Critical House Sta 1				4.12	-	6.42	6.22
Critical House Stg 1				-	-	5.42	-
Critical Hdwy Stg 2			,	-	-	5.42	2 240
Follow-up Hdwy				2.218	-	3.518	3.318
Pot Cap-1 Maneuver				1002	-	436	521
Stage 1				-	-	566	-
Stage 2				-	-	946	-
Platoon blocked, %				1000	-	10.4	F04
Mov Cap-1 Maneuver				1002	-	434	521
Mov Cap-2 Maneuver				-	-	434	-
Stage 1				-	-	563	-
Stage 2				-	-	946	-
Approach	Е	В		WB		NB	
HCM Control Delay, s		0		0.6		12.1	
HCM LOS						В	
Minor Lane/Major Mvmt	NBLn1 EB	T EBR	WBL	WBT			
Capacity (veh/h)	521		1002				
HCM Lane V/C Ratio	0.031		0.005	-			
HCM Control Delay (s)	12.1		0.0	0			
HCM Lane LOS	12.1 B			A			
HCM 95th %tile Q(veh)	0.1		•	-			
HOW SOUL WILL (VEII)	0.1		U	-			

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	*	7	7	<b>^</b>	<u> </u>	7
Traffic Vol, veh/h	6	971	136	702	905	6
Future Vol, veh/h	6	971	136	702	905	6
Conflicting Peds, #/hr	1	0	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	- -	Free	-	None	-	Yield
Storage Length	140	0	170	-	_	150
Veh in Median Storage, #		-	-	0	0	-
Grade, %	0	_	_	0	0	_
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	20	3	2	3	3	0
Mvmt Flow	6	971	136	702	905	6
WWW.CT IOW		07.1	100	102	000	Ū
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1530	_	906	0	- Wajoiz	0
Stage 1	906	<u>-</u>	900		<u>-</u>	U
Stage 1 Stage 2	624	-	-	-	-	-
Critical Hdwy	6.9	<u>-</u>	4.13	-	<u>-</u>	-
Critical Hdwy Stg 1	5.7	-	4.13	-	-	-
Critical Hdwy Stg 2	6.1	<u>-</u>	-	-	<u>-</u>	-
Follow-up Hdwy	3.69	-	2.219	-	-	-
Pot Cap-1 Maneuver	103	0	749	-	<u>-</u>	-
Stage 1	357	0	149	-	-	-
Stage 2	459	0	-	-	<u>-</u>	-
Platoon blocked, %	400	U	-	-	-	_
Mov Cap-1 Maneuver	84		748	-	<u>-</u>	-
Mov Cap-1 Maneuver	178	-	140	-	-	-
Stage 1	292	-	-	_		<u>-</u>
Stage 2	459	-	-	-	•	
Glage Z	400	-	-			_
Approach	EB		NB		SB	
HCM Control Delay, s	25.9		1.8		0	
HCM LOS	25.9 D		1.0		U	
I IOIVI LOS	U					
Minor Lane/Major Mvmt	NBL	NBT EBLn1 E	BLn2 SBT	SBR		
Capacity (veh/h)	748	- 178				
HCM Lane V/C Ratio	0.182	- 0.034		-		
	10.9	- 25.9	0 -			
HCM Lang LOS				-		
HCM 05th % tile O(yeh)	B	- D - 0.1	Α -	-		
HCM 95th %tile Q(veh)	0.7	- 0.1		-		

	<b>*</b>		<b>→</b>	_	4	•	ሻ	<u>†</u>	<i>&gt;</i>	<u> </u>	1	4
Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	LDLZ	LDL	4	7	7	NDLZ	NDL N	<b>1</b>	NDIX	ODL	4	ODIN
Traffic Volume (vph)	18	34	<b>역</b> 11	48	9	74	63	620	18	3	656	42
Future Volume (vph)	18	34	11	48	9	74	63	620	18	3	656	42
( , ,	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	60	1900	1900	1900	1900	1900
Storage Length (ft)		0		1			1		0	0		0
Storage Lanes		100		ı			100		U	100		U
Taper Length (ft)	0	0	1763	1561	1589	0		1821	0	0	1767	0
Satd. Flow (prot) Flt Permitted	U	U	0.960	1001	1309	U	1745 0.358	1021	U	U	0.998	U
	0	0	1485	1324	1423	0	619	1821	٥	0	1763	0
Satd. Flow (perm)	U	U	1400			U	019	1021	0	U	1703	U
Right Turn on Red				Yes 64	Yes				No			
Satd. Flow (RTOR)			20	04	301			20			20	
Link Speed (mph)			30					30			30	
Link Distance (ft)			417					1123			607	
Travel Time (s)	07	20	9.5	47	20	20	7.5	25.5	40	40	13.8	20
Confl. Peds. (#/hr)	37	30	4.00	47	30	30	75	4.00	49	49	4.00	30
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)	^	•	00	40	^	•	407	000	0	•	700	0
Lane Group Flow (vph)	0	0	63	48	9	0	137	638	0	0	733	0
Turn Type	Perm	Perm	NA	Perm	Perm	custom		NA		Perm	NA	
Protected Phases	4	4	4	4	0	_	5	0		•	6	
Permitted Phases	4	4	4	4	8	5	2	2		6	0	
Detector Phase	4	4	4	4	8	5	5	2		6	6	
Switch Phase	7.0	7.0	7.0	7.0	7.0	4.0	4.0	7.0		7.0	7.0	
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	4.0	4.0	7.0		7.0	7.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	8.0	8.0	26.0		34.0	34.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	8.0	8.0	93.0		85.0	85.0	
Total Split (%)	22.5%	22.5%	22.5%	22.5%	22.5%	6.7%	6.7%	77.5%		70.8%	70.8%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.5	3.5	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	0.5	2.0		2.0	2.0	
Lost Time Adjust (s)			0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)			6.0	6.0	6.0		4.0	6.0			6.0	
Lead/Lag						Lead	Lead			Lag	Lag	
Lead-Lag Optimize?						Yes	Yes					
Recall Mode	None	None	None	None	None	None	None	C-Max		C-Max		
Act Effct Green (s)			10.6	10.6	10.6		102.0	101.2			88.7	
Actuated g/C Ratio			0.09	0.09	0.09		0.85	0.84			0.74	
v/c Ratio			0.48	0.27	0.02		0.23	0.42			0.56	
Control Delay			63.3	11.1	0.1		3.0	4.2			10.5	
Queue Delay			0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay			63.3	11.1	0.1		3.0	4.2			10.5	
LOS			Е	В	Α		Α	Α			В	
Approach Delay			40.7					4.0			10.5	
Approach LOS			D					Α			В	
Queue Length 50th (ft)			47	0	0		15	112			241	
Queue Length 95th (ft)			92	25	0		33	198			413	
Internal Link Dist (ft)			337					1043			527	
Turn Bay Length (ft)							60					



Lane Group	SBR2
Lane Configurations	
Traffic Volume (vph)	32
Future Volume (vph)	32
Ideal Flow (vphpl)	1900
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	35
Peak Hour Factor	1.00
Heavy Vehicles (%)	0%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
7 - 3 - (-)	

	_5	•	-	*	•	1	٦	T		-	¥	4
Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)			259	284	497		593	1535			1303	
Starvation Cap Reductn			0	0	0		0	0			0	
Spillback Cap Reductn			0	0	0		0	0			0	
Storage Cap Reductn			0	0	0		0	0			0	
Reduced v/c Ratio			0.24	0.17	0.02		0.23	0.42			0.56	

## Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 9.4 Intersection LOS: A Intersection Capacity Utilization 104.3% ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 1: Kuhio Hwy & Kukui St & Huluili St





Lane Group	SBR2
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Intersection								
Int Delay, s/veh	22.5							
	<i>LL</i> .0							
Movement		EBT	EBR		WBL	WBT	NBL	NBR
Lane Configurations		Þ				4	¥	
Traffic Vol, veh/h		151	410		14	68	485	38
Future Vol, veh/h		151	410		14	68	485	38
Conflicting Peds, #/hr		0	4		4	0	0	3
Sign Control		Free	Free		Free	Free	Stop	Stop
RT Channelized		-	None		-	None	-	None
Storage Length		-	-		-	-	0	-
Veh in Median Storage,	#	0	-		-	0	0	-
Grade, %		0	-		-	0	0	-
Peak Hour Factor		100	100		100	100	100	100
Heavy Vehicles, %		2	4		4	6	1	0
Mvmt Flow		151	410		14	68	485	38
Major/Minor		Major1		M	lajor2		Minor1	
Conflicting Flow All		0	0	141	565	0	456	363
Stage 1		-	-		-	-	360	-
Stage 2		_	_		_	_	96	_
Critical Hdwy		_	_		4.14	_	6.41	6.2
Critical Hdwy Stg 1		_	_		-	_	5.41	-
Critical Hdwy Stg 2		_	_		-	_	5.41	_
Follow-up Hdwy		_	_		2.236	_	3.509	3.3
Pot Cap-1 Maneuver		-	_		997	-	564	686
Stage 1		_	_		-	_	708	-
Stage 2		-	_		-	-	930	_
Platoon blocked, %		_	_			-		
Mov Cap-1 Maneuver		-	_		994	-	554	682
Mov Cap-2 Maneuver		_	_		-	-	554	-
Stage 1		-	_		-	-	695	-
Stage 2		-	_		-	-	930	-
0								
A		ED			MD		ND	
Approach		EB			WB		NB 10.0	
HCM Control Delay, s		0			1.5		49.9	
HCM LOS							E	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT			
Capacity (veh/h)	562	-	-	994	-			
HCM Lane V/C Ratio	0.931	-	-	0.014	-			
HCM Control Delay (s)	49.9	-	-	8.7	0			
HCM Lane LOS	Е	-	-	Α	Α			
HCM 95th %tile Q(veh)	11.8	-	-	0	-			
, ,								

Intersection									
	60.2								
Movement	EBL	EBT		WBT	WBR	SI	WL	SWR	
Lane Configurations		4					¥	OWIT	
Traffic Vol, veh/h	455	327		534			56	343	
Future Vol, veh/h	455	327		534			56	343	
Conflicting Peds, #/hr	15	0		0			0	0	
Sign Control	Free	Free		Free			top	Stop	
RT Channelized	-	None		-			- -	None	
Storage Length	-	NOHE		•	INOHE		0	None	
Storage Length Veh in Median Storage, #	<u>-</u>	0		0	_		0	-	
•	•	0		0			0	-	
Grade, %	100	100					100	100	
Peak Hour Factor	100			100				100	
Heavy Vehicles, %	3	3		1			2	1	
Mvmt Flow	455	327		534	99		56	343	
Major/Minor	Major1			Major2		Min	or2		
Conflicting Flow All	648	0		-			336	599	
Stage 1	-	-		_			599	_	
Stage 2	_	_		_			237	_	
Critical Hdwy	4.13	_		_	_		.42	6.21	
Critical Hdwy Stg 1	7.10				_		.42	0.21	
Critical Hdwy Stg 2	_	_			_		.42	<u> </u>	
Follow-up Hdwy	2.227	-			_		. <del>4</del> 2 518	3.309	
Pot Cap-1 Maneuver	933			<u> </u>	_		83	503	
Stage 1	333	-		•	_		549	505	
Stage 2		-		-	_		274	-	
	-	-		•	-	2	2/4	-	
Platoon blocked, %	921	-		-	_		32	496	
Mov Cap-1 Maneuver		-		-	-				
Mov Cap-2 Maneuver	-	-		-	-		32	-	
Stage 1	-	-		-	-		215	-	
Stage 2	-	-		-	-	Ž	270	-	
Approach	EB			WB			SW		
HCM Control Delay, s	7.4			C			714		
HCM LOS						Ψ,	F		
							•		
Minor Lane/Major Mvmt	EBL	EBT	WBT W	BRSWLn1					
Capacity (veh/h)	921	-	-	- 163					
HCM Lane V/C Ratio	0.494	-	-	- 2.448					
HCM Control Delay (s)	12.7	0	-	- \$714					
HCM Lane LOS	В	Α	-	- F					
HCM 95th %tile Q(veh)	2.8	-	-	- 33.9					
`									
Notes	'' A F		1 000	0 1 ::	NI CE	<b>c</b>	AU		
-: Volume exceeds capac	city \$: De	lay exc	eeds 300s	+: Computatio	n Not D	etined *:	All m	ajor volume in pla	itoon

Intersection									
Int Delay, s/veh	1.5								
Movement	EBL	EBT			WBT	WBR	SBL	SBR	
Lane Configurations		स			1,		W		
Traffic Vol, veh/h	52	763			807	70	19	39	
Future Vol, veh/h	52	763			807	70	19	39	
Conflicting Peds, #/hr	2	0			0		0	58	
Sign Control	Free	Free			Free		Stop	Stop	
RT Channelized	-	None			-	None	-	None	
Storage Length	-	-			-	-	0	-	
Veh in Median Storage, #	-	0			0	-	0	-	
Grade, %	-	0			0	-	0	-	
Peak Hour Factor	100	100			100	100	100	100	
Heavy Vehicles, %	13	3			1	0	0	6	
Mvmt Flow	52	763			807	70	19	39	
Major/Minor	Major1				Major2		Minor2		
Conflicting Flow All	879	0			-	0	1711	902	
Stage 1	-	-			-	-	844	-	
Stage 2	_	-			_	-	867	-	
Critical Hdwy	4.23	_			-	-	6.4	6.26	
Critical Hdwy Stg 1	-	-			-	-	5.4	-	
Critical Hdwy Stg 2	-	-			-	-	5.4	-	
Follow-up Hdwy	2.317	-			-	-	3.5	3.354	
Pot Cap-1 Maneuver	724	-			-	-	101	331	
Stage 1	-	-			-	-	425	-	
Stage 2	-	-			-	-	415	-	
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	723	-			-	-	88	314	
Mov Cap-2 Maneuver	-	-			-	-	88	-	
Stage 1	-	-			-	-	371	-	
Stage 2	-	-			-	-	414	-	
Approach	EB				WB		SB		
HCM Control Delay, s	0.7				0		36.5		
HCM LOS	•						E		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR SE	BLn1				
Capacity (veh/h)	723	-	-	-	171				
HCM Lane V/C Ratio	0.072	_	_		.339				
HCM Control Delay (s)	10.4	0	-		36.5				
HCM Lane LOS	В	A	_	_	E				
HCM 95th %tile Q(veh)	0.2	-	-	_	1.4				
riom oour rune a(veri)	0.2				1.7				

TT. Runio Tiwy & Londa Ot							T WIT CAR FROM TRAING WILLIT TOJCCL
	*	*	4	<b>†</b>	ļ	4	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	W		7	<b></b>	<b></b>	7	
Traffic Volume (veh/h)	402	3	22	718	736	236	
Future Volume (Veh/h)	402	3	22	718	736	236	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly flow rate (vph)	402	3	22	718	736	236	
Pedestrians	19						
Lane Width (ft)	11.0						
Walking Speed (ft/s)	3.5						
Percent Blockage	2						
Right turn flare (veh)	_						
Median type				None	TWLTL		
Median storage veh)				110110	2		
Upstream signal (ft)				607	_		
pX, platoon unblocked	0.90			001			
vC, conflicting volume	1517	755	755				
vC1, stage 1 conf vol	755	700	700				
vC2, stage 2 conf vol	762						
vCu, unblocked vol	1519	755	755				
tC, single (s)	6.4	6.2	4.1				
tC, 2 stage (s)	5.4	0.2	7.1				
tF (s)	3.5	3.3	2.2				
p0 queue free %	0	99	97				
cM capacity (veh/h)	394	405	850				
				05.4	05.0		
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2		
Volume Total	405	22	718	736	236		
Volume Left	402	22	0	0	0		
Volume Right	3	0	0	0	236		
cSH	394	850	1700	1700	1700		
Volume to Capacity	1.03	0.03	0.42	0.43	0.14		
Queue Length 95th (ft)	326	2	0	0	0		
Control Delay (s)	85.7	9.3	0.0	0.0	0.0		
Lane LOS	F	Α					
Approach Delay (s)	85.7	0.3		0.0			
Approach LOS	F						
Intersection Summary							
Average Delay			16.5				
Intersection Capacity Utilizat	ion		67.9%	I	CU Level c	f Service	С
Analysis Period (min)			15				

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4		7	ĵ.		7	ĵ.	
Traffic Vol, veh/h	1	0	0	0	0	14	516	744	14	14	695	5
Future Vol, veh/h	1	0	0	0	0	14	516	744	14	14	695	5
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	7	7	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	<u> </u>	-	None	_	-	None	-	_	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	_
Veh in Median Storage, #	-	0	-	-	0	_	_	0	-	-	0	_
Grade, %	-	0	_	-	0	_	-	0	-	-	0	_
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	11	5	4	0	2	2	2
Mvmt Flow	1	0	0	0	0	14	516	744	14	14	695	5
Willer IOW				Ū			010	, , ,			000	
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2517	2523	698	2516	2518	759	700	0	0	765	0	0
Stage 1	726	726	-	1790	1790	-	-	-	-	-	-	_
Stage 2	1791	1797	-	726	728	-	-	-	-	-	_	_
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.31	4.15	-	_	4.12	-	_
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	_
Critical Hdwy Stg 2	6.1	5.5	_	6.1	5.5	_	-	-	-	-	-	_
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.399	2.245	-	_	2.218	_	_
Pot Cap-1 Maneuver	19	28	444	19	28	392	883	-	_	848	-	_
Stage 1	419	433	-	105	135	-	-	-	_	-	_	_
Stage 2	104	134	_	419	432	_	_	_	_	_	_	_
Platoon blocked, %	101	101		110	.02			_	_		_	_
Mov Cap-1 Maneuver	10	11	444	10	11	389	883	_	_	843	_	_
Mov Cap-2 Maneuver	10	11		10	11	-	-	_	_	-	_	_
Stage 1	174	426	_	43	56	_	-	_	_	-	_	
Stage 2	42	55	_	412	425	_	_		_	_	_	
Stage 2	72	33		712	720							
Approach	EB			WB			NB			SB		
HCM Control Delay, s	\$ 401.7			14.6			5.9			0.2		
HCM LOS	φ 401.7 F			В			0.0			0.2		
TIOM EGG												
Minor Lane/Major Mvmt	NBL	NBT	NBR E	BLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	883	_	_	10 389	843	-	-					
HCM Lane V/C Ratio	0.584	_	_	0.1 0.036		_	-					
HCM Control Delay (s)	14.6	-		401.7 14.6	9.3	_	-					
HCM Lane LOS	В	_		F B	A	_	-					
HCM 95th %tile Q(veh)	3.9	-	-	0.3 0.1	0.1	-	-					
Notes												
~: Volume exceeds capac	city \$ Do	alay aya	eeds 300	Os +: Comp	outation	Not Do	fined *· All	majory	oluma ir	n platoon		
. Volume exceeds capac	Jity . De	nay ext	eeus JU	7. CUIII	Julalion	I NOL DE	anneu . All	major v	Juille II	ριαισστι		

Intersection												
Int Delay, s/veh	8.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations		4			4						4	
Traffic Vol, veh/h	9	1	0	3	2	520	0	0	0	0	275	5
Future Vol, veh/h	9	1	0	3	2	520	0	0	0	0	275	5
Conflicting Peds, #/hr	13	0	0	0	0	13	0	0	0	7	0	16
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	17	0	0	5	0	0	0	0	4	17
Mvmt Flow	9	1	0	3	2	520	0	0	0	0	275	5
Major/Minor	Minor			Minor1						Major		
Major/Minor	Minor2	004	00.4	Minor1	000					Major2		
Conflicting Flow All	568	301	294	285	303	20				7	0	C
Stage 1	294	294	-	7	7	-				-	-	•
Stage 2	274	7	-	278	296	-				-	-	-
Critical Hdwy	7.1	6.5	6.37	7.1	6.5	6.25				4.1	-	•
Critical Hdwy Stg 1	6.1	5.5	-	- 0.4	-	-				-	-	
Critical Hdwy Stg 2	-	-	- 450	6.1	5.5	-				-	-	•
Follow-up Hdwy	3.5	4	3.453	3.5	4					2.2	-	-
Pot Cap-1 Maneuver	437	615	711	671	613	1049				1627	-	
Stage 1	719	673	-	700	- 070	-				-	-	-
Stage 2	-	-	-	733	672	-				-	-	•
Platoon blocked, %	044	000	704	000	004	4004				4047	-	
Mov Cap-1 Maneuver	211	603	701	666	601	1031				1617	-	•
Mov Cap-2 Maneuver	211	603	-	666	601	-				-	-	
Stage 1	719	664	-	700	-	-				-	-	•
Stage 2	-	-	-	732	663	-				-	-	-
Approach	EB			WB						SB		
HCM Control Delay, s	21.7			12.1						0		
HCM LOS	C			В								
				_								
Minor Lane/Major Mvmt	EBLn1\		SBL	SBT SBR								
Capacity (veh/h)	226	1025	1617									
HCM Lane V/C Ratio	0.044	0.512	-									
HCM Control Delay (s)	21.7	12.1	0									
HCM Lane LOS	С	В	Α									
HCM 95th %tile Q(veh)	0.1	3	0									

Intersection				
Intersection Delay, s/veh	29.8			
Intersection LOS	D			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	242	823	650	510
Demand Flow Rate, veh/h	253	847	650	528
Vehicles Circulating, veh/h	734	151	317	992
Vehicles Exiting, veh/h	786	816	670	6
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	11.3	14.2	13.3	84.7
Approach LOS	В	В	В	F
Lane	Left	Left	Left	Left
Designated Moves	LTR	LT	LTR	LTR
Designated Moves Assumed Moves	LTR LTR	LT LT	LTR LTR	
		LT		LTR
Assumed Moves	LTR 1.000	LT 1.000	LTR 1.000	LTR
Assumed Moves RT Channelized	LTR	LT	LTR	LTR LTR
Assumed Moves RT Channelized Lane Util	LTR 1.000 2.609 4.976	LT 1.000 2.609 4.976	LTR 1.000	LTR LTR 1.000 2.609 4.976
Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h	1.000 2.609 4.976 253	1.000 2.609 4.976 847	1.000 2.609 4.976 650	LTR LTR 1.000 2.609 4.976 528
Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s	LTR 1.000 2.609 4.976	LT 1.000 2.609 4.976	LTR 1.000 2.609 4.976	LTR LTR 1.000 2.609 4.976
Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h	1.000 2.609 4.976 253 653 0.956	1.000 2.609 4.976 847 1183 0.971	1.000 2.609 4.976 650	LTR LTR 1.000 2.609 4.976 528 502 0.965
Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h	1.000 2.609 4.976 253 653 0.956 242	1.000 2.609 4.976 847 1183 0.971	1.000 2.609 4.976 650 999 1.000 650	LTR LTR 1.000 2.609 4.976 528 502 0.965 510
Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h	1.000 2.609 4.976 253 653 0.956	1.000 2.609 4.976 847 1183 0.971	1.000 2.609 4.976 650 999 1.000	LTR LTR 1.000 2.609 4.976 528 502 0.965 510 484
Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h	1.000 2.609 4.976 253 653 0.956 242	1.000 2.609 4.976 847 1183 0.971	1.000 2.609 4.976 650 999 1.000 650	LTR LTR 1.000 2.609 4.976 528 502 0.965 510
Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio Control Delay, s/veh	1.000 2.609 4.976 253 653 0.956 242 624	1.000 2.609 4.976 847 1183 0.971 823 1149	1.000 2.609 4.976 650 999 1.000 650 999	LTR LTR 1.000 2.609 4.976 528 502 0.965 510 484
Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio	1.000 2.609 4.976 253 653 0.956 242 624 0.388	1.000 2.609 4.976 847 1183 0.971 823 1149	1.000 2.609 4.976 650 999 1.000 650 999 0.651	LTR LTR 1.000 2.609 4.976 528 502 0.965 510 484 1.052

Intersection				
Intersection Delay, s/veh	14.8			
Intersection LOS	В			
Approach	EB	WB	SB	
Entry Lanes	1	1	1	
Conflicting Circle Lanes	1	1	1	
Adj Approach Flow, veh/h	892	635	259	
Demand Flow Rate, veh/h	910	648	264	
Vehicles Circulating, veh/h	142	389	437	
Vehicles Exiting, veh/h	559	663	600	
Ped Vol Crossing Leg, #/h	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	
Approach Delay, s/veh	16.0	16.1	7.4	
Approach LOS	С	С	А	
Lane	1 -4	1 61	1 6	
Lane	Left	Left	Left	
Designated Moves	Lett LT	Left TR	Left LR	
Designated Moves	LT	TR	LR	
Designated Moves Assumed Moves RT Channelized Lane Util	LT LT 1.000	TR TR 1.000	LR LR 1.000	
Designated Moves Assumed Moves RT Channelized	LT LT	TR TR	LR LR	
Designated Moves Assumed Moves RT Channelized Lane Util	LT LT 1.000 2.609 4.976	TR TR 1.000 2.609 4.976	LR LR 1.000 2.609 4.976	
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h	LT LT 1.000 2.609 4.976 910	TR TR 1.000 2.609 4.976 648	LR LR 1.000 2.609 4.976 264	
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s	LT LT 1.000 2.609 4.976	TR TR 1.000 2.609 4.976	LR LR 1.000 2.609 4.976 264 884	
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h	LT LT 1.000 2.609 4.976 910 1194 0.980	TR TR 1.000 2.609 4.976 648 928 0.981	LR LR 1.000 2.609 4.976 264	
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h	LT LT 1.000 2.609 4.976 910 1194	TR TR 1.000 2.609 4.976 648 928 0.981 635	LR LR 1.000 2.609 4.976 264 884 0.981 259	
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor	LT LT 1.000 2.609 4.976 910 1194 0.980	TR TR 1.000 2.609 4.976 648 928 0.981	LR LR 1.000 2.609 4.976 264 884 0.981	
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h	LT LT 1.000 2.609 4.976 910 1194 0.980 892	TR TR 1.000 2.609 4.976 648 928 0.981 635	LR LR 1.000 2.609 4.976 264 884 0.981 259	
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio Control Delay, s/veh	LT LT 1.000 2.609 4.976 910 1194 0.980 892 1170	TR TR 1.000 2.609 4.976 648 928 0.981 635 910	LR LR 1.000 2.609 4.976 264 884 0.981 259 867	
Designated Moves Assumed Moves RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio	LT LT 1.000 2.609 4.976 910 1194 0.980 892 1170 0.762	TR TR 1.000 2.609 4.976 648 928 0.981 635 910 0.698	LR LR 1.000 2.609 4.976 264 884 0.981 259 867 0.299	

Intersection								
Int Delay, s/veh	7							
	ı							
Movement		EBT	EBR		WBL	WBT	NBL	NBR
Lane Configurations		₽				- 4	**	
Traffic Vol, veh/h		207	78		11	423	245	7
Future Vol, veh/h		207	78		11	423	245	7
Conflicting Peds, #/hr		0	0		0	0	0	0
Sign Control		Free	Free		Free	Free	Stop	Stop
RT Channelized		-	None		-	None	-	None
Storage Length		-	-		-	-	0	-
Veh in Median Storage, #		0	-		-	0	0	-
Grade, %		0	-		-	0	0	-
Peak Hour Factor		100	100		100	100	100	100
Heavy Vehicles, %		2	2		2	2	2	2
Mvmt Flow		207	78		11	423	245	7
Major/Minor		1ajor1			/lajor2		Minor1	
Conflicting Flow All	IV	0	0	- IV	285	0	691	246
Stage 1		-	-		205	-	246	240
Stage 2			-		-	-	445	-
Critical Hdwy		-	-		4.12	-	6.42	6.22
Critical Hdwy Stg 1			_		4.12	-	5.42	0.22
Critical Hdwy Stg 2					-	_	5.42	
Follow-up Hdwy			_		2.218	_	3.518	3.318
Pot Cap-1 Maneuver			_		1277	_	410	793
Stage 1			-		1211	-	795	195
Stage 2		-			-	-	646	-
Platoon blocked, %		_	_			-	040	
Mov Cap-1 Maneuver			_		1277	_	405	793
Mov Cap-1 Maneuver			_		1211	-	405	195
Stage 1							786	
Stage 2		_	_		_	_	646	_
Olago Z							040	
A I					ME		MB	
Approach		EB			WB		NB	
HCM Control Delay, s		0			0.2		26.7	
HCM LOS							D	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT			
Capacity (veh/h)	411	-	-	1277	-			
HCM Lane V/C Ratio	0.613	-	-	0.009	-			
HCM Control Delay (s)	26.7	-	-	7.8	0			
HCM Lane LOS	D	-	-	Α	Α			
HCM 95th %tile Q(veh)	4	-	-	0	-			

Intersection									
Int Delay, s/veh	5.5								
Movement	EBL	EBT			WBT	WBR	SEL	SER	
Lane Configurations		स			13		W		
Traffic Vol, veh/h	61	144			338	330	141	80	
Future Vol, veh/h	61	144			338		141	80	
Conflicting Peds, #/hr	0	0			0		0	0	
Sign Control	Free	Free			Free		Stop	Stop	
RT Channelized	-	None			-	None	-	None	
Storage Length	-	_			-	-	0	-	
Veh in Median Storage, #	‡ -	0			0	-	0	-	
Grade, %	-	0			0	-	0	-	
Peak Hour Factor	100	100			100	100	100	100	
Heavy Vehicles, %	0	2			0	1	2	0	
Mvmt Flow	61	144			338	330	141	80	
Major/Minor	Major1				Major2		Minor2		
Conflicting Flow All	668	0			-	0	769	503	
Stage 1	-	_			-	-	503	-	
Stage 2	-	_			-	-	266	-	
Critical Hdwy	4.1	-			-	-	6.42	6.2	
Critical Hdwy Stg 1	-	-			-	-	5.42	-	
Critical Hdwy Stg 2	-	-			-	-	5.42	-	
Follow-up Hdwy	2.2	-			-	-	3.518	3.3	
Pot Cap-1 Maneuver	931	-			-	-	369	573	
Stage 1	-	-			-	-	607	-	
Stage 2	-	-			-	-	779	_	
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	931	-			-	-	343	573	
Mov Cap-2 Maneuver	-	-			-	-	343	-	
Stage 1	-	-			-	-	564	-	
Stage 2	-	-			-	-	779	-	
Approach	EB				WB		SE		
HCM Control Delay, s	2.7				0		24.5		
HCM LOS							С		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR SE	ELn1				
Capacity (veh/h)	931	-	-	-	401				
HCM Lane V/C Ratio	0.066	_	-		.551				
HCM Control Delay (s)	9.1	0	-		24.5				
HCM Lane LOS	A	A	-	-	C				
HCM 95th %tile Q(veh)	0.2	-	-	-	3.2				

Intersection								
Int Delay, s/veh	0.4							
Movement	EBL	EBT			WBT	WBR	SBL	SBR
Lane Configurations		ની			<b>1</b> 2		N/F	
Traffic Vol, veh/h	5	207			339	52	14	1
Future Vol, veh/h	5	207			339	52	14	1
Conflicting Peds, #/hr	0	0			0	0	0	0
Sign Control	Free	Free			Free	Free	Stop	Stop
RT Channelized	-	None			-	None	·-	None
Storage Length	-	-			-	-	0	-
Veh in Median Storage, #	<u> -</u>	0			0	-	0	-
Grade, %	-	0			0	-	0	-
Peak Hour Factor	100	100			100	100	100	100
Heavy Vehicles, %	0	1			1	0	0	0
Mvmt Flow	5	207			339	52	14	1
Major/Minor	Major1				Major2		Minor2	
Conflicting Flow All	391	0			-	0	582	365
Stage 1	-	_			_	-	365	-
Stage 2	_	_			_	_	217	-
Critical Hdwy	4.1	-			-	-	6.4	6.2
Critical Hdwy Stg 1	-	_			-	-	5.4	-
Critical Hdwy Stg 2	-	_			-	-	5.4	-
Follow-up Hdwy	2.2	-			-	-	3.5	3.3
Pot Cap-1 Maneuver	1179	-			-	-	479	685
Stage 1	-	-			-	-	707	-
Stage 2	-	-			-	-	824	-
Platoon blocked, %		-			-	-		
Mov Cap-1 Maneuver	1179	-			-	-	477	685
Mov Cap-2 Maneuver	-	-			-	-	477	-
Stage 1	-	-			-	-	703	-
Stage 2	-	-			-	-	824	-
Approach	EB				WB		SB	
HCM Control Delay, s	0.2				0		12.6	
HCM LOS	V. <u> </u>				· ·		В	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR SE	3Ln1			
Capacity (veh/h)	1179	-	-	-	487			
HCM Lane V/C Ratio	0.004	_	_	_ ∩	.031			
HCM Control Delay (s)	8.1	0			12.6			
HCM Lane LOS	Α	A	_	_	B			
HCM 95th %tile Q(veh)	0	-	_	_	0.1			
HOW JOHN JULIE Q(VOII)	0				J. 1			

Intersection							
Int Delay, s/veh	0.2						
Movement	EB			WBL	WBT	NBL	NBR
Lane Configurations		<b>&gt;</b>			4	W	
Traffic Vol, veh/h	19			13	405	0	7
Future Vol, veh/h	19			13	405	0	7
Conflicting Peds, #/hr		0 0		0	0	0	0
Sign Control	Fre			Free	Free	Stop	Stop
RT Channelized		- None		-	None	-	None
Storage Length				-	-	0	-
Veh in Median Storage, #		0 -		-	0	0	-
Grade, %		0 -		-	0	0	-
Peak Hour Factor	10	0 100		100	100	100	100
Heavy Vehicles, %		2 2		2	2	2	2
Mvmt Flow	19	8 0		13	405	0	7
Major/Minor	Major	1	Λ	/lajor2		Minor1	
Conflicting Flow All		0 0		198	0	629	198
Stage 1				190	-	198	190
Stage 2		_			-	431	-
Critical Hdwy				4.12	-	6.42	6.22
Critical Hdwy Stg 1				7.12	_	5.42	0.22
Critical Hdwy Stg 2				-	-	5.42	-
Follow-up Hdwy				2.218	_	3.518	3.318
Pot Cap-1 Maneuver				1375	_	3.516	843
				13/3	-	835	043
Stage 1				-		655	-
Stage 2				-	-	000	-
Platoon blocked, %				1275	-	111	0.40
Mov Cap-1 Maneuver				1375	-	441	843
Mov Cap-2 Maneuver				-	-	441	-
Stage 1				-	-	825	-
Stage 2				-	-	655	-
Approach	E	В		WB		NB	
HCM Control Delay, s		0		0.2		9.3	
HCM LOS						А	
Minor Lane/Major Mvmt	NBLn1 EB	T EBR	WBL	WBT			
Capacity (veh/h)	843		1375	-			
HCM Lane V/C Ratio	0.008		0.009	_			
HCM Control Delay (s)	9.3			0			
HCM Lane LOS	A.		Α.	A			
HCM 95th %tile Q(veh)	0		_	-			
HOW SOUL WILLE COVERN)	U	-	U	_			

nt Delay, s/veh 12	)							
	•							
Movement	EBL	EBR	N	IBL	NBT	SBT	SBR	
Lane Configurations	7	7		ħ	<b>^</b>	<b>1</b>	7	
Traffic Vol, veh/h	30	447	8	372	839	503	99	
Future Vol, veh/h	30	447		372	839	503	99	
Conflicting Peds, #/hr	0	0	•	0	0	0	0	
Sign Control	Stop	Stop	Fı	ree	Free	Free	Free	
RT Channelized	-	Yield			None	-		
Storage Length	140	0	1	170	-	_	150	
Veh in Median Storage, #	1	_	'	-	0	0	-	
Grade, %	0	_		_	0	0	_	
Peak Hour Factor	100	100	1	100	100	100	100	
Heavy Vehicles, %	0	2		0	100	3	1	
Mvmt Flow	30	447	c	372	839	503	99	
WWIII FIOW	30	447	C	012	039	503	99	
Major/Minor	Minor2		Majo	or1		Major2		
Conflicting Flow All	2667	503		503	0	-	0	
Stage 1	503	505		-	-	<u>-</u>	-	
Stage 2	2164	-		-	-	_	-	
Critical Hdwy	6.6	6.23		4.1		-	-	
Critical Hdwy Stg 1	5.4	0.23		4. I	-	-	-	
	5.8	-		-		-	-	
Critical Hdwy Stg 2		2 240		-	-	-	-	
Follow-up Hdwy	3.5	3.319		2.2	-	-	-	
Pot Cap-1 Maneuver	~ 22	568	10	)72	-	-	-	
Stage 1	612	-		-	-	-	-	
Stage 2	75	-		-	-	-	-	
Platoon blocked, %					-	-	-	
Mov Cap-1 Maneuver	~ 4	568	10	)72	-	-	-	
Mov Cap-2 Maneuver	120	-		-	-	-	-	
Stage 1	114	-		-	-	-	-	
Stage 2	75	-		-	-	-	-	
				NE		0.5		
Approach	EB			NB		SB		
HCM Control Delay, s	31.7		1	0.7		0		
HCM LOS	D							
Minor Lane/Major Mvmt	NBL	NBT EBLn1 I		ВТ	SBR			
Capacity (veh/h)	1072	- 120	568	-	-			
HCM Lane V/C Ratio	0.813		0.787	-	-			
HCM Control Delay (s)	21.1	- 44.7	30.8	-	-			
HCM Lane LOS	С	- E	D	-	-			
HCM 95th %tile Q(veh)	9.5	- 0.9	7.4	-	-			
Notes								
110103								

## TRAFFIC IMPACT ANALYSIS REPORT UPDATE FOR THE PROPOSED

## **HOKUA PLACE**

**KAPA`A, KAUAI, HAWAII TAX MAP KEY: (4) 4-3-03: 01** 

## **APPENDIX E**

CAPACITY ANALYSIS WORKSHEETS
PEAK HOUR TRAFFIC WITH PROJECT
WITH IMPROVEMENTS

	<b>*</b>	۶	<b>→</b>	•	•	4	ሻ	†	~	<b>\</b>	<b>+</b>	1
Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			4	7	7		7	1₃			4	
Traffic Volume (vph)	9	37	12	60	1	11	5	751	14	3	824	43
Future Volume (vph)	9	37	12	60	1	11	5	751	14	3	824	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	1000	0	1000	0	1000	1000	60	1000	0	0	1000	0
Storage Lanes		0		1			1		0	0		0
Taper Length (ft)		100		•			100		v	100		J
Satd. Flow (prot)	0	0	1613	1501	1589	0	1632	1761	0	0	1800	0
Flt Permitted		v	0.962	1001	1000	•	0.347	1701	v	·	0.998	Ü
Satd. Flow (perm)	0	0	1598	1451	1545	0	594	1761	0	0	1797	0
Right Turn on Red	U	U	1000	Yes	Yes	U	004	1701	No	U	1131	U
Satd. Flow (RTOR)				60	198				INO			
Link Speed (mph)			30	00	130			30			30	
Link Distance (ft)			417					1113			697	
			9.5					25.3			15.8	
Travel Time (s)	2	1	9.5	7	1	1	1	25.3	7	1	13.0	1
Confl. Peds. (#/hr)		4	4.00	7	4 00	4	4	4.00	7	4	4.00	4 00
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	15%	0%	4%	0%	6%	9%	4%	0%	0%	1%	4%
Shared Lane Traffic (%)	•	•	=0	00		•	40	705	•	•	075	0
Lane Group Flow (vph)	0	0	58	60	_ 1	0	16	765	0	0	875	0
Turn Type	Perm	Perm	NA	Perm	Perm	custom	custom	NA		Perm	NA	
Protected Phases			4		_	_					6	
Permitted Phases	4	4		4	8	2	2	2		6		
Detector Phase	4	4	4	4	8	2	2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	26.0	26.0	26.0		34.0	34.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	53.0	53.0	53.0		53.0	53.0	
Total Split (%)	33.8%	33.8%	33.8%	33.8%	33.8%	66.3%	66.3%	66.3%		66.3%	66.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)			0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)			6.0	6.0	6.0		6.0	6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	Max	Max	Max		Max	Max	
Act Effct Green (s)			8.4	8.4	8.4		55.6	55.6			55.6	
Actuated g/C Ratio			0.12	0.12	0.12		0.77	0.77			0.77	
v/c Ratio			0.31	0.27	0.00		0.03	0.56			0.63	
Control Delay			32.8	11.4	0.0		3.8	7.0			8.2	
Queue Delay			0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay			32.8	11.4	0.0		3.8	7.0			8.2	
LOS			C	В	A		A	A			A	
Approach Delay			21.9		, (		, ,	7.0			8.2	
Approach LOS			C C					Α			Α	
Queue Length 50th (ft)			25	0	0		2	132			166	
Queue Length 95th (ft)			53	30	0		7	257			330	
Internal Link Dist (ft)			337	30	U		ı	1033			617	
			331				60	1033			017	
Turn Bay Length (ft)							υo					



Lane Group	SBR2
Lane Configurations	
Traffic Volume (vph)	5
Future Volume (vph)	5
Ideal Flow (vphpl)	1900
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	110
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	4
Peak Hour Factor	1.00
Heavy Vehicles (%)	0%
Shared Lane Traffic (%)	U 70
	0
Lane Group Flow (vph)	U
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Tulli Day Lellylli (II)	

1. Kurilo Hwy & Kukui St &	t Tululli St							IVI Peak r	ioui Italii	CVVIIII FI	Oject - IIII	proveu
	>	۶	-	$\searrow$	*	1	ሽ	<b>†</b>	<b>/</b>	-	ļ	1
Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)			468	467	592		458	1359			1387	
Starvation Cap Reductn			0	0	0		0	0			0	
Spillback Cap Reductn			0	0	0		0	0			0	
Storage Cap Reductn			0	0	0		0	0			0	
Reduced v/c Ratio			0.12	0.13	0.00		0.03	0.56			0.63	
Intersection Summary												
Area Type:	Other											
Cycle Length: 80												
Actuated Cycle Length: 72												
Natural Cycle: 70												
Control Type: Semi Act-Ur	ncoord											
Maximum v/c Ratio: 0.63												
Intersection Signal Delay:	8.6			Ir	ntersection	n LOS: A						
Intersection Capacity Utiliz	ation 70.9%			10	CU Level	of Service	С					
Analysis Period (min) 15												
Splits and Phases: 1: Ku	uhio Hwy & Kı	ukui St &	Huluili St					s.i.				
Ø2							-	<b>Ø</b> 4				
53 s							27	7 s				
<b>₽</b> 06								<b>€_</b> Ø8				



Lane Group	SBR2
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Movement								
Lane Configurations       Traffic Volume (veh/h)       516       2       18       760       864       105         Future Volume (Veh/h)       516       2       18       760       864       105         Sign Control       Stop       Free       Free       Free         Grade       0%       0%       0%       0%         Peak Hour Factor       1.00       1.00       1.00       1.00       1.00         Hourly flow rate (vph)       516       2       18       760       864       105         Pedestrians       8       8       8       8       1.05       8       1.05       864       105         Pedestrians       8       8       8       8       1.05       864       105       105       100       1.00 <th></th> <th>1</th> <th><b>↓</b></th> <th><b>†</b></th> <th>1</th> <th>*</th> <th><b>→</b></th> <th></th>		1	<b>↓</b>	<b>†</b>	1	*	<b>→</b>	
Traffic Volume (veh/h) 516 2 18 760 864 105 Future Volume (Veh/h) 516 2 18 760 864 105 Sign Control Stop Free Free Grade 0% 0% 0% 0% Peak Hour Factor 1.00 1.00 1.00 1.00 1.00 1.00 Hourly flow rate (vph) 516 2 18 760 864 105 Pedestrians 8 Lane Width (ft) 11.0 Walking Speed (ft/s) 3.5 Percent Blockage 1 Right turn flare (veh) Median type None TWLTL Median storage veh) 2 Upstream signal (ft) 697 pX, platoon unblocked 0.79 vC, conflicting volume 1668 872 872 vC1, stage 1 conf vol 872 vC2, stage 2 conf vol 796 vCu, unblocked vol 1713 872 872 tC, single (s) 6.4 6.2 4.1 tC, 2 stage (s) 5.4		SBR	SBT	NBT	NBL	EBR	EBL	Movement
Traffic Volume (veh/h) 516 2 18 760 864 105 Future Volume (Veh/h) 516 2 18 760 864 105 Sign Control Stop Free Free Grade 0% 0% 0% Peak Hour Factor 1.00 1.00 1.00 1.00 1.00 1.00 Hourly flow rate (vph) 516 2 18 760 864 105 Pedestrians 8 Lane Width (ft) 11.0 Walking Speed (ft/s) 3.5 Percent Blockage 1 Right turn flare (veh) Median type None TWLTL Median storage veh) 2 Upstream signal (ft) 697 pX, platoon unblocked 0.79 vC, conflicting volume 1668 872 872 vC1, stage 1 conf vol 872 vC2, stage 2 conf vol 796 vCu, unblocked vol 1713 872 872 tC, Single (s) 6.4 6.2 4.1 tC, 2 stage (s)		7	<b></b>	<b></b>	7		N/F	Lane Configurations
Sign Control         Stop         Free         Free           Grade         0%         0%         0%           Peak Hour Factor         1.00         1.00         1.00         1.00           Hourly flow rate (vph)         516         2         18         760         864         105           Pedestrians         8         8         4         105           Pedestrians         8         4         4         4         4           Walking Speed (ft/s)         3.5         4		105		760	18	2	516	Traffic Volume (veh/h)
Sign Control         Stop         Free         Free           Grade         0%         0%         0%           Peak Hour Factor         1.00         1.00         1.00         1.00           Hourly flow rate (vph)         516         2         18         760         864         105           Pedestrians         8         2         18         760         864         105           Pedestrians         8         2         10         100         100         100           Walking Speed (ft/s)         3.5		105	864	760	18	2	516	
Grade     0%     0%     0%       Peak Hour Factor     1.00     1.00     1.00     1.00     1.00       Hourly flow rate (vph)     516     2     18     760     864     105       Pedestrians     8       Lane Width (ft)     11.0       Walking Speed (ft/s)     3.5       Percent Blockage     1       Right turn flare (veh)       Median type     None TWLTL       Median storage veh)     2       Upstream signal (ft)     697       DX, platoon unblocked     0.79       VC, conflicting volume     1668     872       VC1, stage 1 conf vol     872       VC2, stage 2 conf vol     796       VC2, unblocked vol     1713     872     872       C, single (s)     6.4     6.2     4.1       C, 2 stage (s)     5.4			Free	Free			Stop	
Peak Hour Factor 1.00 1.00 1.00 1.00 1.00 1.00 1.00 Hourly flow rate (vph) 516 2 18 760 864 105 Pedestrians 8 Lane Width (ft) 11.0  Walking Speed (ft/s) 3.5 Percent Blockage 1 Right turn flare (veh) Median type None TWLTL Median storage veh) 2  Upstream signal (ft) 697  DX, platoon unblocked 0.79  VC, conflicting volume 1668 872 872  VC2, stage 1 conf vol 872  VC2, stage 2 conf vol 796  VCu, unblocked vol 1713 872 872  C, single (s) 6.4 6.2 4.1  C, 2 stage (s) 5.4			0%	0%				
Hourly flow rate (vph) 516 2 18 760 864 105 Pedestrians 8 Lane Width (ft) 11.0  Walking Speed (ft/s) 3.5 Percent Blockage 1  Right turn flare (veh)  Median type None TWLTL  Median storage veh) 2  Upstream signal (ft) 697  DX, platoon unblocked 0.79  /C, conflicting volume 1668 872 872  /C1, stage 1 conf vol 872  /C2, stage 2 conf vol 796  /Cu, unblocked vol 1713 872 872  C, single (s) 6.4 6.2 4.1  C, 2 stage (s) 5.4		1.00			1.00	1.00		
Pedestrians 8 Lane Width (ft) 11.0  Walking Speed (ft/s) 3.5  Percent Blockage 1  Right turn flare (veh)  Median type None TWLTL  Median storage veh) 2  Upstream signal (ft) 697  DX, platoon unblocked 0.79  VC, conflicting volume 1668 872 872  VC1, stage 1 conf vol 872  VC2, stage 2 conf vol 796  VCu, unblocked vol 1713 872 872  CC, single (s) 6.4 6.2 4.1  CC, 2 stage (s) 5.4								
Alking Speed (ft/s) 3.5 Percent Blockage 1 Right turn flare (veh) Median type None TWLTL Median storage veh) 2 Jpstream signal (ft) 697  OX, platoon unblocked 0.79  VC, conflicting volume 1668 872 872  VC1, stage 1 conf vol 872  VC2, stage 2 conf vol 796  VC4, unblocked vol 1713 872 872  CC, single (s) 6.4 6.2 4.1  CC, 2 stage (s) 5.4								
Walking Speed (ft/s)       3.5         Percent Blockage       1         Right turn flare (veh)       None TWLTL         Median storage veh)       2         Upstream signal (ft)       697         bX, platoon unblocked       0.79         vC, conflicting volume       1668       872         vC1, stage 1 conf vol       872         vC2, stage 2 conf vol       796         vCu, unblocked vol       1713       872         C, single (s)       6.4       6.2       4.1         C, 2 stage (s)       5.4								
Percent Blockage 1 Right turn flare (veh) Median type None TWLTL Median storage veh) 2 Upstream signal (ft) 697  OX, platoon unblocked 0.79  VC, conflicting volume 1668 872 872  VC1, stage 1 conf vol 872  VC2, stage 2 conf vol 796  VCu, unblocked vol 1713 872 872  C, single (s) 6.4 6.2 4.1  C, 2 stage (s) 5.4								` '
Right turn flare (veh)  Median type  Median storage veh)  Upstream signal (ft)  X, platoon unblocked  C, conflicting volume  CC1, stage 1 conf vol  CC2, stage 2 conf vol  CC4, unblocked vol  1713  1								
Median type         None         TWLTL           Median storage veh)         2           Upstream signal (ft)         697           bX, platoon unblocked         0.79           yC, conflicting volume         1668         872           yC1, stage 1 conf vol         872           yC2, stage 2 conf vol         796           yCu, unblocked vol         1713         872           C, single (s)         6.4         6.2         4.1           C, 2 stage (s)         5.4							•	
Median storage veh)       2         Upstream signal (ft)       697         bX, platoon unblocked       0.79         yC, conflicting volume       1668       872         yC1, stage 1 conf vol       872         yC2, stage 2 conf vol       796         yCu, unblocked vol       1713       872         C, single (s)       6.4       6.2         C, 2 stage (s)       5.4			TWI TI	None				
Upstream signal (ft)       697         bX, platoon unblocked       0.79         yC, conflicting volume       1668       872         yC1, stage 1 conf vol       872         yC2, stage 2 conf vol       796         yCu, unblocked vol       1713       872         C, single (s)       6.4       6.2       4.1         C, 2 stage (s)       5.4				140110				
bX, platoon unblocked       0.79         yC, conflicting volume       1668       872         yC1, stage 1 conf vol       872         yC2, stage 2 conf vol       796         yCu, unblocked vol       1713       872       872         C, single (s)       6.4       6.2       4.1         C, 2 stage (s)       5.4			2	697				σ ,
/C, conflicting volume 1668 872 872 /C1, stage 1 conf vol 872 /C2, stage 2 conf vol 796 /Cu, unblocked vol 1713 872 872 C, single (s) 6.4 6.2 4.1 C, 2 stage (s) 5.4				001			0.70	
C1, stage 1 conf vol 872 C2, stage 2 conf vol 796 C4, unblocked vol 1713 872 872 C5, single (s) 6.4 6.2 4.1 C6, 2 stage (s) 5.4					872	872		
vC2, stage 2 conf vol     796       vCu, unblocked vol     1713     872     872       C, single (s)     6.4     6.2     4.1       C, 2 stage (s)     5.4					012	012		
Cu, unblocked vol 1713 872 872 C, single (s) 6.4 6.2 4.1 C, 2 stage (s) 5.4								
C, single (s) 6.4 6.2 4.1 C, 2 stage (s) 5.4					972	972		
C, 2 stage (s) 5.4								
, 0 ()					4.1	0.2		
					2.2	2.2		
V /								
								•
M capacity (veh/h) 388 350 776								,
Direction, Lane # EB 1 NB 1 NB 2 SB 1 SB 2								·
/olume Total 518 18 760 864 105								
/olume Left 516 18 0 0 0								
/olume Right 2 0 0 0 105								
SH 387 776 1700 1700								
/olume to Capacity 1.34 0.02 0.45 0.51 0.06								
Queue Length 95th (ft) 608 2 0 0								
Control Delay (s) 196.5 9.7 0.0 0.0 0.0			0.0	0.0	0.0		196.5	
ane LOS F A								
Approach Delay (s) 196.5 0.2 0.0				0.0		0.2	196.5	
Approach LOS F							F	Approach LOS
ntersection Summary	 							ntersection Summary
Average Delay 45.0					45.0			Average Delay
ntersection Capacity Utilization 80.8% ICU Level of Service D	D	of Service	U Level o	10	80.8%		ation	
Analysis Period (min) 15					4.5			

Intersection					
Intersection Delay, s/veh	12.9				
Intersection LOS	В				
Approach	EB	WB	NB		SB
Entry Lanes	1	1	1		1
Conflicting Circle Lanes	2	2	2		2
Adj Approach Flow, veh/h	595	296	340	8	55
Demand Flow Rate, veh/h	611	327	349	8	66
Vehicles Circulating, veh/h	710	112	728	4	08
Vehicles Exiting, veh/h	306	965	593		31
Ped Vol Crossing Leg, #/h	0	0	0		0
Ped Cap Adj	1.000	1.000	1.000	1.0	
Approach Delay, s/veh	23.9	5.4	11.1	8	3.5
Approach LOS	С	Α	В		Α
Lane	Left	Left	Left	Left	Bypass
Designated Moves	LTR	LT	LTR	LT	R
Assumed Moves					
Assumed Moves	LTR	LT	LTR	LT	R
RT Channelized				LT	
	LTR 1.000	LT 1.000	LTR 1.000		R
RT Channelized Lane Util Follow-Up Headway, s	1.000 2.535	1.000 2.535	1.000 2.535	LT 1.000 2.535	R Free
RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s	1.000 2.535 4.328	1.000 2.535 4.328	1.000 2.535 4.328	LT 1.000 2.535 4.328	R Free 258
RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h	1.000 2.535 4.328 611	1.000 2.535 4.328 327	1.000 2.535 4.328 349	1.000 2.535 4.328 608	258 1919
RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h	1.000 2.535 4.328 611 777	1.000 2.535 4.328 327 1291	1.000 2.535 4.328 349 765	1.000 2.535 4.328 608 1004	258 1919 0.990
RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor	1.000 2.535 4.328 611 777 0.973	1.000 2.535 4.328 327 1291 0.906	1.000 2.535 4.328 349 765 0.974	1.000 2.535 4.328 608 1004 0.987	258 1919 0.990 255
RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h	1.000 2.535 4.328 611 777 0.973 595	1.000 2.535 4.328 327 1291 0.906 296	1.000 2.535 4.328 349 765 0.974 340	1.000 2.535 4.328 608 1004 0.987 600	258 1919 0.990 255 1900
RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h	1.000 2.535 4.328 611 777 0.973 595 756	1.000 2.535 4.328 327 1291 0.906 296 1170	1.000 2.535 4.328 349 765 0.974 340 745	1.000 2.535 4.328 608 1004 0.987 600 991	258 1919 0.990 255 1900 0.134
RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio	1.000 2.535 4.328 611 777 0.973 595 756 0.787	1.000 2.535 4.328 327 1291 0.906 296 1170 0.253	1.000 2.535 4.328 349 765 0.974 340 745	1.000 2.535 4.328 608 1004 0.987 600 991 0.606	258 1919 0.990 255 1900
RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio Control Delay, s/veh	1.000 2.535 4.328 611 777 0.973 595 756 0.787 23.9	1.000 2.535 4.328 327 1291 0.906 296 1170 0.253 5.4	1.000 2.535 4.328 349 765 0.974 340 745 0.456	1.000 2.535 4.328 608 1004 0.987 600 991 0.606 12.1	258 1919 0.990 255 1900 0.134 0.0 A
RT Channelized Lane Util Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio	1.000 2.535 4.328 611 777 0.973 595 756 0.787	1.000 2.535 4.328 327 1291 0.906 296 1170 0.253	1.000 2.535 4.328 349 765 0.974 340 745	1.000 2.535 4.328 608 1004 0.987 600 991 0.606	258 1919 0.990 255 1900 0.134 0.0

Intersection														
Int Delay, s/veh	19													
Movement	EBL	EBT	EBR	\	NBL	WBT	WBR		NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4				4				4			4	
Traffic Vol, veh/h	9	339	16		52	113	9		52	28	506	14	1	0
Future Vol, veh/h	9	339	16		52	113	9		52	28	506	14	1	0
Conflicting Peds, #/hr	0	0	0		0	0	0		0	0	0	0	0	0
Sign Control	Free	Free	Free	I	Free	Free	Free		Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield		-	-	None		-	-	Yield	-	-	None
Storage Length	-	-	-		-	-	-		-	-	-	-	-	-
Veh in Median Storage, #	-	0	-		-	0	-		-	0	-	-	0	-
Grade, %	-	0	-		-	0	-		-	0	-	-	0	-
Peak Hour Factor	100	100	100		100	100	100		100	100	100	100	100	100
Heavy Vehicles, %	2	2	0		0	2	2		9	2	1	2	2	2
Mvmt Flow	9	339	16		52	113	9		52	28	506	14	1	0
Major/Minor	Major1			Ma	ajor2				Minor1			Minor2		
Conflicting Flow All	122	0	0		339	0	0		587	591	347	593	579	118
Stage 1	-	-	-		-	-	-		365	365	-	222	222	-
Stage 2	-	-	-		-	-	-		222	226	-	371	357	-
Critical Hdwy	4.12	-	-		4.1	-	-		7.19	6.52	6.21	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-		-	-	-		6.19	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-		-	-	-		6.19	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-		2.2	-	-		3.581	4.018	3.309	3.518	4.018	3.318
Pot Cap-1 Maneuver	1465	-	-	1	1231	-	-		411	420	698	417	426	934
Stage 1	-	-	-		-	-	-		640	623	-	780	720	-
Stage 2	-	-	-		-	-	-		765	717	-	649	628	-
Platoon blocked, %		-	-			-	-							
Mov Cap-1 Maneuver	1465	-	-	1	1231	-	-		394	398	698	104	403	934
Mov Cap-2 Maneuver	-	-	-		-	-	-		394	398	-	104	403	-
Stage 1	-	-	-		-	-	-		635	618	-	774	688	-
Stage 2	-	-	-		-	-	-		730	685	-	169	623	-
Approach	EB				WB				NB			SB		
HCM Control Delay, s	0.2				2.4				34.9			43.2		
HCM LOS									D			Е		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR \	NBL	WBT	WBR	SBLn1						
Capacity (veh/h)	676	1465	-	- 1	1231	-	-	109						
HCM Lane V/C Ratio	0.867	0.006	-		.042	-	-	0.138						
HCM Control Delay (s)	34.9	7.5	0	-	8.1	0	-							
HCM Lane LOS	D	Α	A	_	Α	A	_	E						
HCM 95th %tile Q(veh)	10.2	0	-	-	0.1	-	-	0.5						

Intersection						
	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	7	7	*	<b>^</b>	<b>†</b>	7
Traffic Vol, veh/h	6	971	136	702	905	6
Future Vol, veh/h	6	971	136	702	905	6
Conflicting Peds, #/hr	1	0	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	<u> </u>	Free	-	None	-	Yield
Storage Length	140	0	170	-	-	150
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	20	3	2	3	3	0
Mvmt Flow	6	971	136	702	905	6
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1530	-	906	0	-	0
Stage 1	906	-	-	-	-	-
Stage 2	624	-	-	-	-	-
Critical Hdwy	6.9	-	4.13	-	-	-
Critical Hdwy Stg 1	5.7	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.69	-	2.219	-	-	-
Pot Cap-1 Maneuver	103	0	749	-	-	-
Stage 1	357	0	-	-	-	-
Stage 2	459	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	84	-	748	-	-	-
Mov Cap-2 Maneuver	220	-	-	-	-	-
Stage 1	292	-	-	-	-	-
Stage 2	459	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	21.8		1.8		0	
HCM LOS	С					
Minor Lane/Major Mvmt	NBL	NBT EBLn1 El	BLn2 SBT	SBR		
Capacity (veh/h)	748	- 220		-		
HCM Lane V/C Ratio	0.182	- 0.027		-		
HCM Control Delay (s)	10.9	- 21.8	0 -	-		
HCM Lane LOS	В	- C	Α -	-		
HCM 95th %tile Q(veh)	0.7	- 0.1		-		
,						

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Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			4	7	7		7	1•			4	
Traffic Volume (vph)	18	34	11	48	9	74	63	620	18	3	656	42
Future Volume (vph)	18	34	11	48	9	74	63	620	18	3	656	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0			60		0	0		0
Storage Lanes		0		1			1		0	0		0
Taper Length (ft)		100					100			100		
Satd. Flow (prot)	0	0	1763	1561	1589	0	1745	1824	0	0	1777	0
Flt Permitted			0.960				0.322				0.998	
Satd. Flow (perm)	0	0	1601	1410	1479	0	573	1824	0	0	1773	0
Right Turn on Red				Yes	Yes				No			
Satd. Flow (RTOR)				109	184							
Link Speed (mph)			30					30			30	
Link Distance (ft)			417					1123			607	
Travel Time (s)			9.5					25.5			13.8	
Confl. Peds. (#/hr)	37	30		47	30	30	75		49	49		30
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)	0,0	0,10	0,70	• 70	0,0	0,0	0,0	• 70	0,0	0,0	.,,	0,0
Lane Group Flow (vph)	0	0	63	48	9	0	137	638	0	0	733	0
Turn Type	Perm	Perm	NA	Perm		custom		NA		Perm	NA	Ū
Protected Phases	. 0	. 0	4		. 0	odotom	5			. 0	6	
Permitted Phases	4	4	•	4	8	5	2	2		6		
Detector Phase	4	4	4	4	8	5	5	2		6	6	
Switch Phase	•	•	•	•	Ū			_				
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	4.0	4.0	7.0		7.0	7.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	8.0	8.0	26.0		34.0	34.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	8.0	8.0	43.0		35.0	35.0	
Total Split (%)	38.6%	38.6%	38.6%	38.6%	38.6%	11.4%	11.4%	61.4%		50.0%	50.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.5	3.5	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.5	0.5	2.0		2.0	2.0	
Lost Time Adjust (s)			0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Total Lost Time (s)			6.0	6.0	6.0		4.0	6.0			6.0	
Lead/Lag			0.0	0.0	0.0	Lead	Lead	0.0		Lag	Lag	
Lead-Lag Optimize?						Yes	Yes			Lug	Lag	
Recall Mode	None	None	None	None	None	None	None	C-Max		C-Max	C-Max	
Act Effct Green (s)	110110	110110	8.5	8.5	8.5	110110	54.1	53.3		O Max	44.1	
Actuated g/C Ratio			0.12	0.12	0.12		0.77	0.76			0.63	
v/c Ratio			0.32	0.12	0.03		0.24	0.46			0.66	
Control Delay			32.0	1.8	0.1		4.0	5.9			16.7	
Queue Delay			0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay			32.0	1.8	0.1		4.0	5.9			16.7	
LOS			02.0 C	Α	Α		4.0 A	Α			В	
Approach Delay			18.9					5.5			16.7	
Approach LOS			10.3 B					3.5 A			В	
Queue Length 50th (ft)			26	0	0		13	96			218	
Queue Length 95th (ft)			57	3	0		31	187			#475	
Internal Link Dist (ft)			337	3	U		31	1043			#475 527	
			331				60	1043			521	
Turn Bay Length (ft)							00					



Lane Group	SBR2
Lane Configurations	
Traffic Volume (vph)	32
Future Volume (vph)	32
Ideal Flow (vphpl)	1900
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Opeca (mph) Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	35
Peak Hour Factor	1.00
Heavy Vehicles (%)	0%
Shared Lane Traffic (%)	0 /0
Lane Group Flow (vph)	0
Turn Type	U
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	

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Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)			480	499	572		561	1387			1116	
Starvation Cap Reductn			0	0	0		0	0			0	
Spillback Cap Reductn			0	0	0		0	0			0	
Storage Cap Reductn			0	0	0		0	0			0	
Reduced v/c Ratio			0.13	0.10	0.02		0.24	0.46			0.66	

#### Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

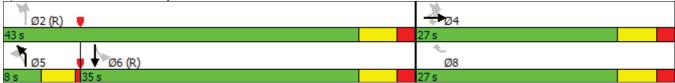
Intersection Signal Delay: 11.4 Intersection LOS: B
Intersection Capacity Utilization 104.3% ICU Level of Service G

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Kuhio Hwy & Kukui St & Huluili St





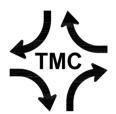
Lane Group	SBR2
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
1.1	
Intersection Summary	

11. Rullio Hwy & Lollad Ot							T WT Cak Hour Traine With Troject - improved
	•	•	1	<b>†</b>	<b>↓</b>	4	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	W		7	<b>•</b>	<b>*</b>	7	
Traffic Volume (veh/h)	402	3	22	718	736	236	
Future Volume (Veh/h)	402	3	22	718	736	236	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly flow rate (vph)	402	3	22	718	736	236	
Pedestrians	19						
Lane Width (ft)	11.0						
Walking Speed (ft/s)	3.5						
Percent Blockage	2						
Right turn flare (veh)							
Median type				None	TWLTL		
Median storage veh)					2		
Upstream signal (ft)				607			
pX, platoon unblocked	0.85						
vC, conflicting volume	1517	755	755				
vC1, stage 1 conf vol	755						
vC2, stage 2 conf vol	762						
vCu, unblocked vol	1520	755	755				
tC, single (s)	6.4	6.2	4.1				
tC, 2 stage (s)	5.4	V. <u> </u>					
tF (s)	3.5	3.3	2.2				
p0 queue free %	5	99	97				
cM capacity (veh/h)	422	405	850				
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2		
Volume Total	405	22	718	736	236		
Volume Left	402	22	0	0	0		
Volume Right	3	0	0	0	236		
cSH	422	850	1700	1700	1700		
Volume to Capacity	0.96	0.03	0.42	0.43	0.14		
Queue Length 95th (ft)	283	2	0	0	0		
Control Delay (s)	65.9	9.3	0.0	0.0	0.0		
Lane LOS	F	Α					
Approach Delay (s)	65.9	0.3		0.0			
Approach LOS	F						
Intersection Summary							
Average Delay			12.7				
Intersection Capacity Utilizat	ion		67.9%	I	CU Level c	of Service	С
Analysis Period (min)			15				

-					
Intersection					
Intersection Delay, s/veh	13.7				
Intersection LOS	В				
Approach	EB	WB	NB	,	SB
Entry Lanes	1	1	1		1
Conflicting Circle Lanes	2	2	2		2
Adj Approach Flow, veh/h	242	823	650	5	10
Demand Flow Rate, veh/h	253	847	650	5	28
Vehicles Circulating, veh/h	734	151	317	9	92
Vehicles Exiting, veh/h	699	816	670		6
Ped Vol Crossing Leg, #/h	0	0	0		0
Ped Cap Adj	1.000	1.000	1.000	1.0	
Approach Delay, s/veh	9.1	12.5	11.2	20	0.9
Approach LOS	Α	В	В		С
Lane	Left	Left	Left	Left	Bypass
Designated Moves	LTR	LT	LTR	LT	R
Assumed Moves	LTR	LT	LTR	LT	R
RT Channelized					_
Lane Util					Free
	1.000	1.000	1.000	1.000	Free
Follow-Up Headway, s	2.535	2.535	2.535	2.535	
Follow-Up Headway, s Critical Headway, s	2.535 4.328	2.535 4.328	2.535 4.328	2.535 4.328	87
Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h	2.535 4.328 253	2.535 4.328 847	2.535 4.328 650	2.535 4.328 441	87 1976
Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h	2.535 4.328 253 761	2.535 4.328 847 1249	2.535 4.328 650 1085	2.535 4.328 441 611	87 1976 0.962
Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor	2.535 4.328 253 761 0.956	2.535 4.328 847 1249 0.971	2.535 4.328 650 1085 1.000	2.535 4.328 441 611 0.965	87 1976 0.962 84
Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h	2.535 4.328 253 761 0.956 242	2.535 4.328 847 1249 0.971 823	2.535 4.328 650 1085 1.000 650	2.535 4.328 441 611 0.965 426	87 1976 0.962 84 1900
Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h	2.535 4.328 253 761 0.956 242 727	2.535 4.328 847 1249 0.971 823 1213	2.535 4.328 650 1085 1.000 650 1085	2.535 4.328 441 611 0.965 426 590	87 1976 0.962 84 1900 0.044
Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio	2.535 4.328 253 761 0.956 242 727 0.333	2.535 4.328 847 1249 0.971 823 1213 0.678	2.535 4.328 650 1085 1.000 650 1085 0.599	2.535 4.328 441 611 0.965 426 590 0.722	87 1976 0.962 84 1900
Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio Control Delay, s/veh	2.535 4.328 253 761 0.956 242 727 0.333 9.1	2.535 4.328 847 1249 0.971 823 1213 0.678 12.5	2.535 4.328 650 1085 1.000 650 1085 0.599 11.2	2.535 4.328 441 611 0.965 426 590 0.722 25.1	87 1976 0.962 84 1900 0.044 0.0
Follow-Up Headway, s Critical Headway, s Entry Flow, veh/h Cap Entry Lane, veh/h Entry HV Adj Factor Flow Entry, veh/h Cap Entry, veh/h V/C Ratio	2.535 4.328 253 761 0.956 242 727 0.333	2.535 4.328 847 1249 0.971 823 1213 0.678	2.535 4.328 650 1085 1.000 650 1085 0.599	2.535 4.328 441 611 0.965 426 590 0.722	87 1976 0.962 84 1900 0.044 0.0

Intersection														
Int Delay, s/veh	7.1													
Movement	EBL	EBT	EBR	,	WBL	WBT	WBR		NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4				4				4			4	
Traffic Vol, veh/h	5	137	71		338	301	28		38	24	144	5	9	1
Future Vol, veh/h	5	137	71		338	301	28		38	24	144	5	9	1
Conflicting Peds, #/hr	0	0	0		0	0	0		0	0	0	0	0	0
Sign Control	Free	Free	Free		Free	Free	Free		Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield		-	-	None		-	-	Yield	-	-	None
Storage Length	-	-	-		-	-	-		-	-	-	-	-	-
Veh in Median Storage, #	-	0	-		-	0	-		-	0	-	-	0	-
Grade, %	-	0	-		-	0	-		-	0	-	-	0	-
Peak Hour Factor	100	100	100		100	100	100		100	100	100	100	100	100
Heavy Vehicles, %	2	2	0		0	1	2		0	2	2	2	2	2
Mvmt Flow	5	137	71		338	301	28		38	24	144	5	9	1
Major/Minor	Major1			Ma	ajor2			ı	Minor1			Minor2		
Conflicting Flow All	329	0	0		137	0	0		1179	1188	173	1150	1138	315
Stage 1	-	_	-		-	-	-		183	183	-	991	991	-
Stage 2	-	_	-		-	-	-		996	1005	-	159	147	_
Critical Hdwy	4.12	_	-		4.1	-	-		7.1	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-		-	-	-		6.1	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	_	-		-	-	-		6.1	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-		2.2	-	-		3.5	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1231	-	-		1459	-	-		169	188	871	175	201	725
Stage 1	-	-	-		-	-	-		823	748	-	296	324	-
Stage 2	-	-	-		-	-	-		297	319	-	843	775	-
Platoon blocked, %		-	-			-	-							
Mov Cap-1 Maneuver	1231	-	-		1459	-	-		125	134	871	99	143	725
Mov Cap-2 Maneuver	-	-	-		-	-	-		125	134	-	99	143	-
Stage 1	-	-	-		-	-	-		819	744	-	295	232	-
Stage 2	-	-	-		-	-	-		204	228	-	678	771	-
Approach	EB				WB				NB			SB		
HCM Control Delay, s	0.2				4.2				21.3			36		
HCM LOS	V.L								C			E		
												_		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1						
Capacity (veh/h)	426	1231	-		1459	-	-	131						
HCM Lane V/C Ratio	0.484	0.004	-		).232	-		0.115						
HCM Control Delay (s)	21.3	7.9	0	- 0	8.2	0		36						
HCM Lane LOS	21.3 C	7.9 A	A	_	Α	A		E						
HCM 95th %tile Q(veh)	2.7	0	-	-	0.9	-		0.4						
	2.1	U		_	0.0		-	0.4						

Intersection								
	8.9							
Movement	EBL	EBR	NBL	NBT		SBT	SBR	
		EDK 7						
Lane Configurations	<b>ነ</b>		070	<b>^</b>		<b>†</b>	7	
Traffic Vol, veh/h	30	447	872	839		503	99	
Future Vol, veh/h	30	447	872	839		503	99	
Conflicting Peds, #/hr	0	0	0	_ 0		0	0	
Sign Control	Stop	Stop	Free	Free		Free	Free	
RT Channelized	-	Free	-	None		-	Yield	
Storage Length	140	0	170	-		-	150	
Veh in Median Storage, #	1	-	-	0		0	-	
Grade, %	0	-	-	0		0	-	
Peak Hour Factor	100	100	100	100		100	100	
Heavy Vehicles, %	0	2	0	1		3	1	
Mvmt Flow	30	447	872	839		503	99	
Major/Minor	Minor2		Major1			Major2		
Conflicting Flow All	2667	-	503	0		-	0	
Stage 1	503	-	-	-		-	-	
Stage 2	2164	_	_	_		_	_	
Critical Hdwy	6.6	_	4.1	_		_	_	
Critical Hdwy Stg 1	5.4	_	7.1	_		_	_	
Critical Hdwy Stg 2	5.8	-	_	_		_	_	
Follow-up Hdwy	3.5	<u>-</u>	2.2	_		-	-	
Pot Cap-1 Maneuver	~ 22	0	1072			-		
	612	0	1072			-	-	
Stage 1	75	0				-		
Stage 2	15	U	-	-		-	-	
Platoon blocked, %	4		4070	-		-	-	
Mov Cap-1 Maneuver	~ 4	-	1072	-		-	-	
Mov Cap-2 Maneuver	120	-	-	-		-	-	
Stage 1	114	-	-	-		-	-	
Stage 2	75	-	-	-		-	-	
Approach	EB		NB			SB		
HCM Control Delay, s	44.9		11.4			0		
HCM LOS	E							
Minor Lane/Major Mvmt	NBL	NBT EBLn1 EBLn	2 SBT	SBR				
Capacity (veh/h)	1072	- 120		-				
HCM Carrier Dalay (a)	0.813	- 0.25		-				
HCM Control Delay (s)	22.4		0 -	-				
HCM Lane LOS	C		A -	-				
HCM 95th %tile Q(veh)	11.7	- 1		-				
Notes								
~: Volume exceeds capac	ity \$: Del	ay exceeds 300s	+: Comr	outation	Not Defined	*: All major v	olume in i	olatoon
	, , ,	,					. •	



#### THE TRAFFIC MANAGEMENT CONSULTANT

Randall S. Okaneku, P.E., Principal \* 1188 Bishop Street, Suite 1907 \* Honolulu, Hawaii 96813 Telephone: (808) 536-0223 \* Facsimile: (808) 537-2985 \* Email: TMCHawaii@aol.com

TMC Job No. 201708 October 3, 2017

State of Hawaii Department of Transportation Highways Division-Kauai District 1720 Haleukana Street Lihu'e, Kauai, Hawai'i 96766

Attn.: Mr. Larry Dill, P.E., District Engineer

Dear Mr. Dill:

# Subject: Traffic Impact Analysis Report Update For the Proposed Hokua Place Tax Map Key: (4) 4-3-003: Portion of 001 Kapa`a, Kauai, Hawaii

Thank you for the review comments in your letter, dated September 29, 2017, on the subject traffic study. Our responses follow:

#### Comment No. 1

Noted.

#### Comment No. 2

Noted.

#### Comment No. 3

The AM and PM Peak Hour Traffic Without Project rows of Table 6 summarize the capacity analysis under existing roadway conditions. The AM and PM Peak Hour Traffic With Project rows of Table 6 summarize the capacity analysis with the recommended site access improvements under Section V.B. of the TIAR Update. The AM and PM Peak Hour Traffic With Project – Improved rows in Table 6 summarize the capacity analysis of the recommended traffic improvements under Section V.A. of the TIAR Update.

#### Comment No. 4

Noted.

#### Comment No. 5

Noted.

If you require clarification on any of the above material or have any other questions, please do not hesitate to call me.

Very truly yours,

**The Traffic Management Consultant** 

By

Randall S. Okaneku, P. E. Principal



# STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION

KAUAI DISTRICT 1720 HALEUKANA STREET LIHUE, HAWAII 96766

September 29, 2017

FORD N. FUCHIGAMI DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:

HWAY-K 4.170445

Randall S. Okaneku, P.E. The Traffic Management Consultant 1188 Bishop Street, Suite 1907 Honolulu, Hawaii 96813

Dear Mr. Okaneku:

Subject:

Traffic Impact Analysis Report Update

Hokua Place

Kapa'a, Kawaihau District, Island of Kaua'i

TMK: (4) 4-3-03: Por. 001

Thank you for submitting the updated Traffic Impact Analysis Report(TIAR) update that was transmitted via email on June 15, 2017. We have circulated the TIAR for comment through the Highways Division Planning Branch as well as the Traffic Branch. We have also reviewed the comments provided by the County of Kauai Department of Public Works Engineering Division on September 1, 2017.

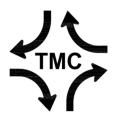
The combined comments for the Hawaii Department of Transportation Highways Division are as follows:

- 1. The report discussed the projects that are proposed in the Kapaa Transportation Solutions Report dated August 2015. It should be noted that these projects may not be completed on schedule. Therefore, they should not be considered in this report.
- 2. It is understood that the proposed Road A will be funded and constructed by the developer.
- 3. Please clarify the scenarios in Table 7, Summary of Capacity Analysis. What assumed improvements are completed for AM/PM peak hour traffic without project, with project, and with project-improved.
- 4. Section V of the TIAR recommends traffic improvements without the project. Although these recommendations are appreciated, they are not a consideration for this development.
- 5. We concur with the comments provided by the County of Kauai Department of Engineering Division.

Please contact Raymond McCormick at 808-241-3015 by telephone or by email at <a href="mailto:Raymond.j.mccormick@hawaii.gov">Raymond.j.mccormick@hawaii.gov</a> if you have comments or questions regarding this letter.

Sincerely,

Larry Dill, P.E. District Engineer



#### THE TRAFFIC MANAGEMENT CONSULTANT

Randall S. Okaneku, P.E., Principal \* 1188 Bishop Street, Suite 1907 \* Honolulu, Hawaii 96813 Telephone: (808) 536-0223 \* Facsimile: (808) 537-2985 \* Email: TMCHawaii@aol.com

TMC Job No. 201708 October 3, 2017

Department of Public Works County of Kauai

4444 Rice Street, Suite 275 Lihu'e, Kauai, Hawai'i 96766

Attn.: Mr. Michael Moule, P.E., Chief, Engineering Division

Dear Mr. Moule:

Subject: Traffic Impact Analysis Report Update
For the Proposed Hokua Place
Tax Map Key: (4) 4-3-003: Portion of 001
Kapa'a, Kauai, Hawaii

Thank you for the thorough review comments in your letter, dated September 1, 2017, on the subject traffic study. Our responses follow:

#### **Comment No. 1 – Introduction, Project Description**

a. Concur. The design of the intersection between the Phase 1 access road and Olohena Road, mauka of its intersection with Ka'apuni Road, will include the appropriate vertical and horizontal sight distances in accordance with the AASHTO A Policy on Geometric Design of Highways and Streets and the Hawaii Statewide Uniform Design Manual for Streets and Highways.

#### **Comment No. 2 – Existing Roadways**

- a. Concur. The stated speed limits are intended to provide guidance to the design of the intersection of Road A and the Kapa'a Bypass Road.
- b. Concur.
- c. Concur.

#### Comment No. 3 – Existing Peak Hour Traffic Volumes and Operation Conditions

a. Noted. The traffic impact analysis is based upon the methodology presented in the <u>Highway Capacity Manual</u> (HCM). The HCM methodology consists of a series of mathematical calculations to determine roadway capacity, vehicle delay, vehicle queuing, etc. The LOS concept was defined in the HCM to translate the results of the complex calculations into a simplified "A" through "F" grading system.

- b. Corrected. The second sentence in the last paragraph on Page 10 should read "South of Ulu Street, Kuhio Highway carried over 1,700 vph...".
- c. Corrected. The revised Figure 6 is attached. The PM peak hour of traffic from 3:45 PM to 4:45 PM on March 15, 2015 was selected for the intersection of Kuhio Highway and the Kapa'a Bypass Road because it corresponded with of the commuter PM peak hour traffic at the intersections in Kapa'a Town. The revised traffic data sheets for the intersection of Kuhio Highway and Kapa'a Bypass Road also are attached.
- d. LOS, by definition, is the result of a series of mathematical calculations. For the purpose of the traffic impact analysis, the HCM methodology provides a common basis for comparing future traffic conditions without the proposed project and future traffic conditions with the proposed project.

#### Comment No. 4 – Kapa'a Transportation Solutions

- a. Noted. The <u>Kapa'a Transportation Solutions</u>, cited in the TIAR Update, is dated August 2015. Please transmit the latest version of the Kapa'a traffic study.
- b. Noted.

#### **Comment No. 5 – Trip Generation Characteristics**

a. Noted. The revised Table 6 is shown below:

Table 1.	Table 1. Hokua Place Trip Generation Characteristics												
Land Use	WT *4	AM Pe	eak Hour	r (vph)	PM Pe	eak Hour	· (vph)						
(ITE Code)	Units	Enter	Exit	Total	Enter	Exit	Total						
Single-Family Phase 1 (265)	16 DU	5	16	21	13	7	20						
Single-Family Phase 2 (265)	100 DU	20	60	80	66	38	104						
Condominium/ Townhouse (230)	700 DU	52	256	308	244	120	364						
Retail Center	8,000 SFGFA	21	13	34	53	57	110						
(820)	Pass-By	0	0	0	(-)45	(-)45	(-)90						
Total External T	rips	98	345	443	331	177	509						

b. The ITE <u>Trip Generation Handbook</u> cites a 9,000-square foot retail center, where 20 percent of the trip generation were primary trips. Comparing the retail center to smaller convenience markets, the <u>Trip Generation Handbook</u> listed sites where the primary trip percentages ranged from 8 percent to 28 percent of the PM peak period trip generation. The retail center is described in the DEIS as a neighborhood-oriented commercial center. Therefore, it is reasonable to assume that a significant portion of the retail trips will be generated from within the proposed project, which can be defined as "internal capture" or "diverted trips".

#### **Comment No. 6 – Site Access Improvements**

a. Noted. The AM and PM peak hour traffic demands at the Olohena Road intersections at the Phase 1 Driveway and at Road A do <u>not</u> meet the AASHTO left-turn lane guidelines. During the AM peak hour of traffic, the advancing (mauka bound) volumes on Olohena Road do not meet the AASHTO minimum requirements. The left-turn demands at Road A and at the Phase 1 Driveway do <u>not</u> meet the AASHTO minimum left-turn volumes, during the PM peak hour of traffic. The Olohena Road intersections at Road A and the Phase 1 Driveway are expected to operate at satisfactory LOS during the AM peak hour of traffic. The Phase 1 Driveway also is expected to operate at satisfactory LOS at Olohena Road, during the PM peak hour of traffic. Road A is expected to operate at LOS "D", during the PM peak hour of traffic. However, the average delay of 26.7 seconds/vehicle on Road A is in the upper range of LOS "D". Therefore, a median refuge lane at Road A was <u>not</u> recommended at this time. Furthermore, separate left-turn and right-turn lanes on Road A would not improve the LOS.

#### Comment No. 7 – Traffic Assignment

- a. The traffic assignment for the proposed project was primarily based upon the direction of peak hour traffic at the roundabout intersection of the Kapa'a Bypass Road and Olohena Road, where only about one third of Olohena Road traffic turns to/from the south leg of the Kapa'a Bypass Road. The Phase 2 development is concentrated on the makai half of the project site. Only the trips generated from the mauka-most portion of the site and the estimated AM peak hour school trips are expected to use the mauka access of Road A at Olohena Road.
- b. The peak hour trip destinations, mauka of the Ka`apuni Road/Olohena Road intersection, are virtually nil, as observed in mauka bound/makai bound directional splits on Olohena Road. The retail trips generated from the mauka neighboring communities are represented in the "pass-by" trips using Road A.

#### Comment No. 8 – Figures 11 through 14 (Traffic Assignment)

- a. The diverted peak hour trips on Road A are depicted on the attached Figures 12.1 and 14.1.
- b. The revised Figure 11 is attached.
- c. The revised Figure 13 is attached.
- d. The revised Figure 14 is attached.

#### Comment No. 9 – PM Peak Hour Traffic Analysis With Project

a. The recommendation of extending the median refuge lane/two-way left-turn lane in Section V.A.7. of the TIAR Update is expected to mitigate the "bottle-neck" on Kuhio Highway, north of Lehua Street. Ultimately, the improvement of the north leg of the Kapa'a Bypass Road from a one-way roadway to a two-way bypass road is expected to improve traffic operations in Kapa'a Town.

#### Comment No. 10 - Recommendation of Traffic Improvements Without Project

a. Noted.

#### Comment No. 11 – Recommendation of Traffic Improvements With Project

a. Noted. While the MUTCD does not provide warrants for roundabout intersections, it does advise that a roundabout intersection can be considered as an alternative to traffic signal control. Based upon the TIAR Update, the intersection of Olohena Road and Road A is not expected to warrant all-way stop controls or traffic signals. Therefore, a roundabout intersection was not considered. However, a reassessment of the traffic operations at the Road A intersection at Olohena Road may be considered after the project is fully built out and occupied. A roundabout intersection was considered at the intersection of Olohena Road, Ka'apuni Road, and Kaehulua Road. However, based upon a preliminary assessment of the horizontal and vertical alignments of the intersecting roadways, it was determined that a roundabout intersection would not be feasible. The realignment of Kaehulua Road to form a four-legged intersection with the Olohena Road and Ka'apuni Road was recommended in Section V.A.6.

If you require clarification on any of the above material or have any other questions, please do not hesitate to call me.

Very truly yours,

The Traffic Management Consultant

By Randet

Randall S. Okaneku, P. E. Principal

#### Attachments:

Figure 6-Revised

Kuhio Hwy Kapa'a Bypass Rd Traffic Count Data-Revised

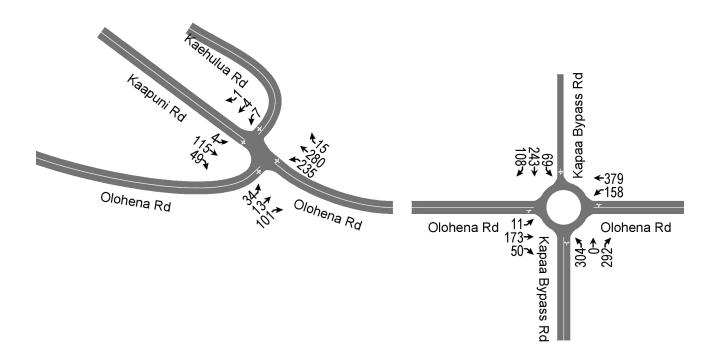
Figure 12.1

Figure 14.1

Figure 11-Revised

Figure 13-Revised

Figure 14-Revised



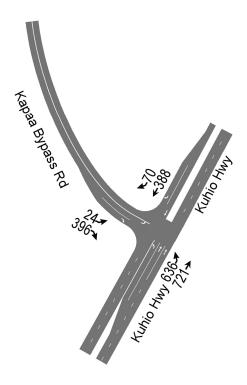
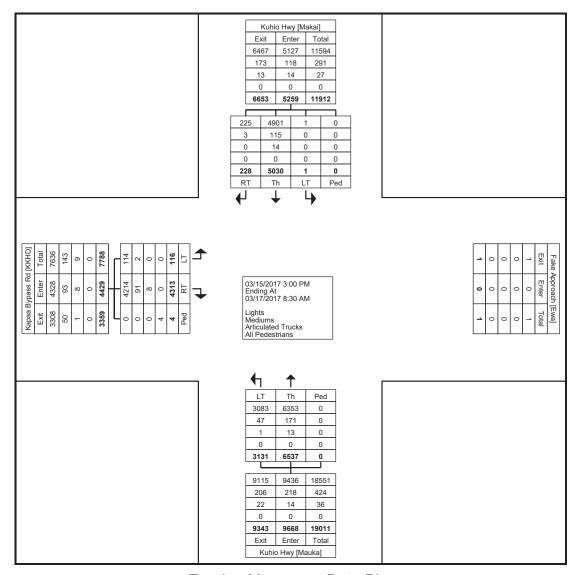


Figure 6. Existing PM Peak Hour Traffic (Cont'd.)

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 1

**Turning Movement Data** 

					Turnin	g Mo۱	/emen	t Data						
		Kapaa By	/pass Rd				o Hwy				Kuhio Hwy			
		Koko Hea	ad Bound			Mauka	Bound				Makai Bound			
Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
3:00 PM	1	105	0	106	99	191	0	290	0	106	5	0	111	507
3:15 PM	3	100	0	103	122	210	0	332	0	88	7	0	95	530
3:30 PM	8	93	0	101	120	207	0	327	0	73	8	0	81	509
3:45 PM	8	104	0	112	148	201	0	349	0	88	21	0	109	570
Hourly Total	20	402	0	422	489	809	0	1298	0	355	41	0	396	2116
4:00 PM	1	108	0	109	168	161	0	329	0	91	16	0	107	545
4:15 PM	9	94	0	103	154	172	0	326	0	97	14	0	111	540
4:30 PM	6	90	0	96	166	187	0	353	0	112	19	0	131	580
4:45 PM	2	95	0	97	146	176	0	322	0	112	15	0	127	546
Hourly Total	18	387	0	405	634	696	0	1330	0	412	64	0	476	2211
5:00 PM	5	88	0	93	149	232	0	381	0	138	27	0	165	639
5:15 PM	2	91	0	93	149	192	0	341	0	152	25	0	177	611
*** BREAK ***	-				-	-		-	-		-		-	
Hourly Total	7	179	0	186	298	424	0	722	0	290	52	0	342	1250
6:30 AM	0	78	0	78	14	124	0	138	0	203	0	0	203	419
6:45 AM	2	116	0	118	8	124	0	132	0	190	1	0	191	441
Hourly Total	2	194	0	196	22	248	0	270	0	393	1	0	394	860
7:00 AM	1	161	0	162	20	129	0	149	0	233	0	0	233	544
7:15 AM	1	184	0	185	25	155	0	180	0	200	1	0	201	566
7:30 AM	2	152	0	154	24	152	0	176	0	167	0	0	167	497
7:45 AM	1	155	1	156	33	180	0	213	0	135	0	0	135	504
Hourly Total	5	652	1	657	102	616	0	718	0	735	1	0	736	2111
8:00 AM	0	150	0	150	24	187	0	211	0	132	1	0	133	494
8:15 AM	3	131	0	134	21	177	0	198	0	165	0	0	165	497
8:30 AM	3	130	0	133	33	191	0	224	0	161	1	0	162	519
8:45 AM	1	108	0	109	25	209	0	234	0	189	0	0	189	532
Hourly Total	7	519	0	526	103	764	0	867	0	647	2	0	649	2042
*** BREAK ***	-	-	-	-	-	-	_	-	-	-		-	-	2042
3:00 PM	5	103	0	108	97	217	0	314	0	96	6	0	102	524
3:15 PM	8	117	0	125	131	156	0	287	0	84	9	0	93	505
3:30 PM	6	83	0	89	138	227	0	365	1	76	8	0	85	539
3:45 PM	2	87	1	89	119	182	0	301	0	76	7	0	83	473
	21	390	1	411	485	782	0		1	332	30	0	363	2041
Hourly Total 4:00 PM	2	122	0	124	126	152	0	1267 278	0	96	7	0	103	505
4:15 PM	6	109	1	115	136	158	0	294	0	95	6	0	103	510
4:15 PM 4:30 PM	6	96	1	102	143	174	0	317	0	78	2	0	80	499
	5	93	0	98	138	181	0	317	0	83	6	0	89	506
4:45 PM			2				0		0			0	-	
Hourly Total	19 2	420		439	543	665	0	1208	0	352	21 3	0	373	2020
5:00 PM		98	0	100	146	204		350	-	85 92			88	538
5:15 PM	4	113	0	117	121	159	. 0	280	0	92	2	0	94	491
*** BREAK ***	-		-	- 047	- 007	-	-		-	477	-	-	400	4000
Hourly Total	6	211	0	217	267	363	0	630	0	177	5	0	182	1029
6:30 AM	0	82	0	82	11	115	0	126	0	185	0	0	185	393
6:45 AM	0	89	0	89	10	126	0	136	0	164	3	0	167	392
Hourly Total	0	171	0	171	21	241	. 0	262	0	349	3	0	352	785
7:00 AM	1	131	0	132	17	133	0	150	0	219	1	0	220	502
7:15 AM	3	168	0	171	32	158	0	190	0	182	3	0	185	546
7:30 AM	1	125	0	126	40	146	. 0	186	0	166	2	0	168	480
7:45 AM	1	123	0	124	30	165	0	195	0	138	0	0	138	457
Hourly Total	6	547	0	553	119	602	0	721	0	705	6	0	711	1985
8:00 AM	4	116	0	120	20	169	. 0	189	0	150	0	0	150	459
8:15 AM	1	125	0	126	28	158	0	186	0	133	2	0	135	447
Grand Total	116	4313	4	4429	3131	6537	0	9668	1	5030	228	0	5259	19356
Approach %	2.6	97.4	-	-	32.4	67.6	-	-	0.0	95.6	4.3	-	-	-
Total %	0.6	22.3	-	22.9	16.2	33.8	-	49.9	0.0	26.0	1.2	-	27.2	
Lights	114	4214	-	4328	3083	6353	-	9436	1	4901	225	-	5127	18891
% Lights	98.3	97.7	-	97.7	98.5	97.2	-	97.6	100.0	97.4	98.7	-	97.5	97.6
Mediums	2	91	-	93	47	171	-	218	0	115	3	-	118	429
% Mediums	1.7	2.1	-	2.1	1.5	2.6	-	2.3	0.0	2.3	1.3	-	2.2	2.2
Articulated Trucks	0	. 8	-	. 8	1	13	-	14	0	14	0	-	14	36
% Articulated Trucks	0.0	0.2	-	0.2	0.0	0.2	-	0.1	0.0	0.3	0.0	-	0.3	0.2
All Pedestrians	-		4		-	-	. 0		-	-		0	-	-
% All Pedestrians	-		100.0	-	-	-	-	-	-	-	-	-	-	



**Turning Movement Data Plot** 

#### The Traffic Management Consultant 1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813 808-536-0223 tmchawaii@aol.com

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 3

Turning Movement Peak Hour Data (3:45 PM)

ranning movement real bala (error m)														
		Kapaa By	oass Rd		Kuhio Hwy				Kuhio Hwy					
Start Time		Koko Head		Mauka Bound				Makai Bound						
Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
3:45 PM	8	104	0	112	148	201	0	349	0	88	21	0	109	570
4:00 PM	1	108	0	109	168	161	0	329	0	91	16	0	107	545
4:15 PM	9	94	0	103	154	172	0	326	0	97	14	0	111	540
4:30 PM	6	90	0	96	166	187	0	353	0	112	19	0	131	580
Total	24	396	0	420	636	721	0	1357	0	388	70	0	458	2235
Approach %	5.7	94.3	-	-	46.9	53.1	-	-	0.0	84.7	15.3	-	-	-
Total %	1.1	17.7	-	18.8	28.5	32.3	-	60.7	0.0	17.4	3.1	-	20.5	-
PHF	0.667	0.917	-	0.938	0.946	0.897	-	0.961	0.000	0.866	0.833	-	0.874	0.963
Lights	24	390	-	414	633	712	-	1345	0	377	69	-	446	2205
% Lights	100.0	98.5	-	98.6	99.5	98.8	-	99.1	-	97.2	98.6	-	97.4	98.7
Mediums	0	6	-	6	3	9	-	12	0	11	1	-	12	30
% Mediums	0.0	1.5	-	1.4	0.5	1.2	-	0.9	-	2.8	1.4	-	2.6	1.3
Articulated Trucks	0	0	-	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0
All Pedestrians	-	-	0	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	Kuhio Hwy [Makai]	
	Peak Hour Data	Fake Down the Fake Down to the Fake Down
Bypass Rd Enter 414 6 0 0 0 0 0 420 0 0 0 0 0 0 0 0 0 0 0 0 0	03/15/2017 3:45 PM Ending At 03/15/2017 4:45 PM	Exit Enter 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Kapaa B   Exit   Exit   702   702   706	Lights Mediums Articulated Trucks All Pedestrians	Total 0 0 0 0
	Th Ped 633 712 0 3 9 0 0 0 0 0 0 0 636 721 0 767 1345 2112 17 12 29 0 0 0 0 0 0 0 784 1357 2141 Exit Enter Total Kuhio Hwy [Mauka]	

Turning Movement Peak Hour Data Plot (3:45 PM)

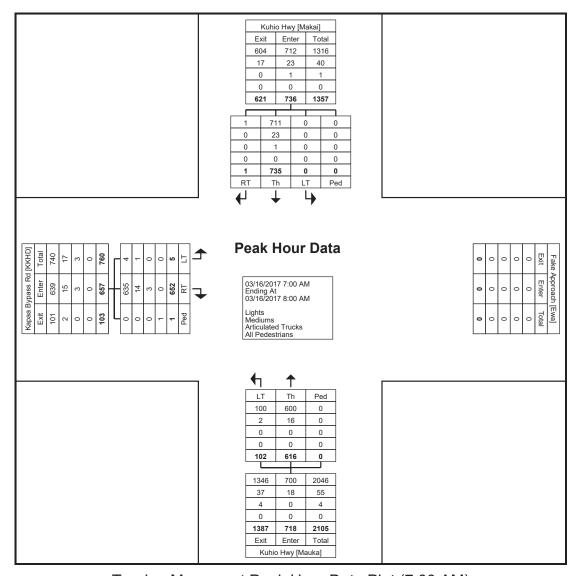
#### The Traffic Management Consultant 1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813 808-536-0223 tmchawaii@aol.com

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 5

Turning Movement Peak Hour Data (7:00 AM)

		Караа Ву	pass Rd		Kuhio Hwy				Kuhio Hwy					
Start Time		Koko Hea	d Bound		Mauka Bound				Makai Bound					
Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
7:00 AM	1	161	0	162	20	129	. 0	149	0	233	0	0	233	544
7:15 AM	1	184	0	185	25	155	0	180	0	200	1	0	201	566
7:30 AM	2	152	0	154	24	152	0	176	0	167	0	0	167	497
7:45 AM	1	155	1	156	33	180	0	213	0	135	0	0	135	504
Total	5	652	1	657	102	616	0	718	0	735	1	0	736	2111
Approach %	0.8	99.2	-	-	14.2	85.8	-	-	0.0	99.9	0.1	-	-	-
Total %	0.2	30.9	-	31.1	4.8	29.2	-	34.0	0.0	34.8	0.0	-	34.9	-
PHF	0.625	0.886	-	0.888	0.773	0.856	-	0.843	0.000	0.789	0.250	-	0.790	0.932
Lights	4	635	-	639	100	600	-	700	0	711	1	-	712	2051
% Lights	80.0	97.4	-	97.3	98.0	97.4	-	97.5	-	96.7	100.0	-	96.7	97.2
Mediums	1	14	-	15	2	16	-	18	0	23	0	-	23	56
% Mediums	20.0	2.1	-	2.3	2.0	2.6	-	2.5	-	3.1	0.0	-	3.1	2.7
Articulated Trucks	0	3	-	3	0	0	-	0	0	1	0	-	1	4
% Articulated Trucks	0.0	0.5	-	0.5	0.0	0.0	-	0.0	-	0.1	0.0	-	0.1	0.2
All Pedestrians	-	-	1	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	_	_	100.0	_	_	_	_	_	_	_	_	_	-	_



Turning Movement Peak Hour Data Plot (7:00 AM)

#### The Traffic Management Consultant 1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813 808-536-0223 tmchawaii@aol.com

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 7

#### Turning Movement Peak Hour Data (4:15 PM)

	, , , , , , , , , , , , , , , , , , , ,									, ,					
		Kapaa By	pass Rd		Kuhio Hwy				Kuhio Hwy						
Start Time		Koko Hea			Mauka Bound				Makai Bound						
Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total	
4:15 PM	6	109	1	115	136	158	. 0	294	0	95	6	0	101	510	
4:30 PM	6	96	1	102	143	174	0	317	0	78	2	0	80	499	
4:45 PM	5	93	0	98	138	181	0	319	0	83	6	0	89	506	
5:00 PM	2	98	0	100	146	204	0	350	0	85	3	0	88	538	
Total	19	396	2	415	563	717	0	1280	0	341	17	0	358	2053	
Approach %	4.6	95.4	-	-	44.0	56.0	-	-	0.0	95.3	4.7	-	-	-	
Total %	0.9	19.3	-	20.2	27.4	34.9	-	62.3	0.0	16.6	0.8	-	17.4	-	
PHF	0.792	0.908	-	0.902	0.964	0.879	-	0.914	0.000	0.897	0.708	-	0.886	0.954	
Lights	19	385	-	404	558	710	-	1268	0	337	17	-	354	2026	
% Lights	100.0	97.2	-	97.3	99.1	99.0	-	99.1	-	98.8	100.0	-	98.9	98.7	
Mediums	0	11	-	11	5	7	-	12	0	4	0	-	4	27	
% Mediums	0.0	2.8	-	2.7	0.9	1.0	-	0.9	-	1.2	0.0	-	1.1	1.3	
Articulated Trucks	0	0	-	0	0	0	-	0	0	0	0	-	0	0	
% Articulated Trucks	0.0	0.0	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0	
All Pedestrians	-	-	2	-	-	-	0	-	-	-	-	0	-	-	
% All Pedestrians	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	

	Kuhio Hwy [Makai]	
Kapaa Bypass Rd [KKHD]           Exit         Enter         Total           575         404         979           5         11         16           0         0         0           0         0         0           6         415         995           11         0         0           0         11         0           0         0         0           2         385         19           0         0         0           2         396         19           Ped         RT         LT	Peak Hour Data  03/16/2017 4:15 PM Ending At 03/16/2017 5:15 PM Lights Mediums Articulated Trucks All Pedestrians	Fake Approach [Ewa]     Exit   Enter   Total     0
	Th Ped  558 710 0  5 7 0  0 0 0  0 0 0  563 717 0  722 1268 1990  15 12 27  0 0 0 0  0 0 0  737 1280 2017  Exit Enter Total  Kuhio Hwy [Mauka]	

Turning Movement Peak Hour Data Plot (4:15 PM)

#### The Traffic Management Consultant 1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813 808-536-0223 tmchawaii@aol.com

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17 Site Code: Hokua Place Start Date: 03/15/2017 Page No: 9

Turning Movement Peak Hour Data (7:00 AM)

									١, ١	,				1
		Kapaa By	pass Rd		Kuhio Hwy				Kuhio Hwy					
Start Time		Koko Hea			Mauka Bound				Makai Bound					
Start Time	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
7:00 AM	1	131	0	132	17	133	0	150	0	219	1	0	220	502
7:15 AM	3	168	0	171	32	158	0	190	0	182	3	0	185	546
7:30 AM	1	125	0	126	40	146	0	186	0	166	2	0	168	480
7:45 AM	1	123	0	124	30	165	0	195	0	138	0	0	138	457
Total	6	547	0	553	119	602	0	721	0	705	6	0	711	1985
Approach %	1.1	98.9	-	-	16.5	83.5	-	-	0.0	99.2	0.8	-	-	-
Total %	0.3	27.6	-	27.9	6.0	30.3	-	36.3	0.0	35.5	0.3	-	35.8	-
PHF	0.500	0.814	-	0.808	0.744	0.912	-	0.924	0.000	0.805	0.500	-	0.808	0.909
Lights	5	535	-	540	113	569	-	682	0	688	6	-	694	1916
% Lights	83.3	97.8	-	97.6	95.0	94.5	-	94.6	-	97.6	100.0	-	97.6	96.5
Mediums	1	10	-	11	5	29	-	34	0	15	0	-	15	60
% Mediums	16.7	1.8	-	2.0	4.2	4.8	-	4.7	-	2.1	0.0	-	2.1	3.0
Articulated Trucks	0	2	-	2	1	4	-	5	0	2	0	-	2	9
% Articulated Trucks	0.0	0.4	-	0.4	0.8	0.7	-	0.7	-	0.3	0.0	-	0.3	0.5
All Pedestrians	-	-	0	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	Kuhio Hwy [Makai]         Exit         Enter         Total           574         694         1268           30         15         45           4         2         6           0         0         0           608         711         1319           6         688         0         0           0         15         0         0           0         2         0         0           0         0         0         0           6         705         0         0           0         0         0         0           0         0         0         0	
Kapaa Bypass Rd [KKHD]       Exit     Enter     Total       119     540     659       5     11     16       0     0     0       125     553     678       0     10     1       0     0     0       0     0     0       0     0     0       0     0     0       0     0     0       Ped     RT     LT	Peak Hour Data  03/17/2017 7:00 AM Ending At 03/17/2017 8:00 AM Lights Mediums Articulated Trucks All Pedestrians	Fake Approach   Ewa]   Exit   Enter   Total   0
	LT Th Ped  113 569 0  5 29 0  1 4 0  0 0 0  119 602 0  1223 682 1905  25 34 59  4 5 9  0 0 0  1252 721 1973  Exit Enter Total  Kuhio Hwy [Mauka]	

Turning Movement Peak Hour Data Plot (7:00 AM)

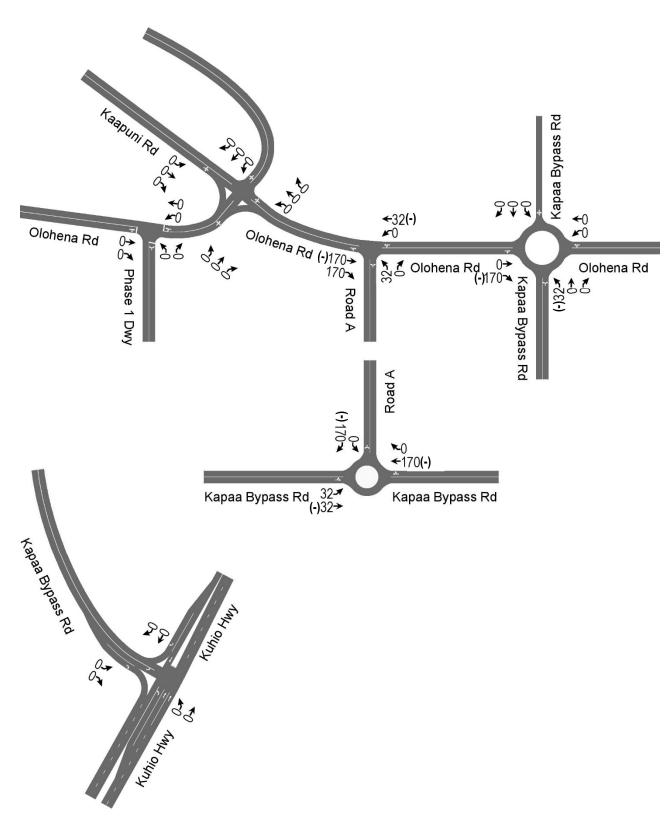


Figure 12.1 AM Peak Hour Diverted Traffic Assignment

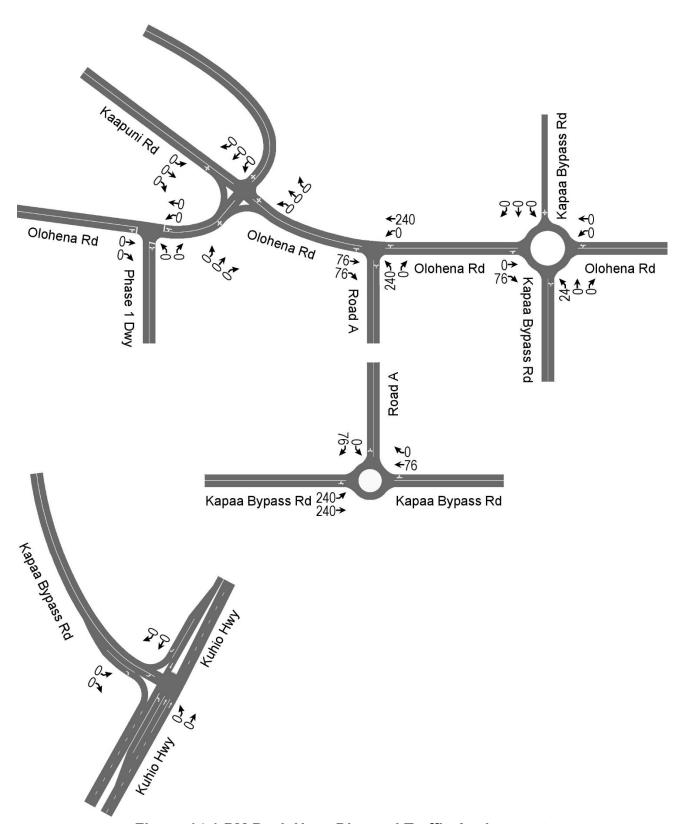


Figure 14.1 PM Peak Hour Diverted Traffic Assignment

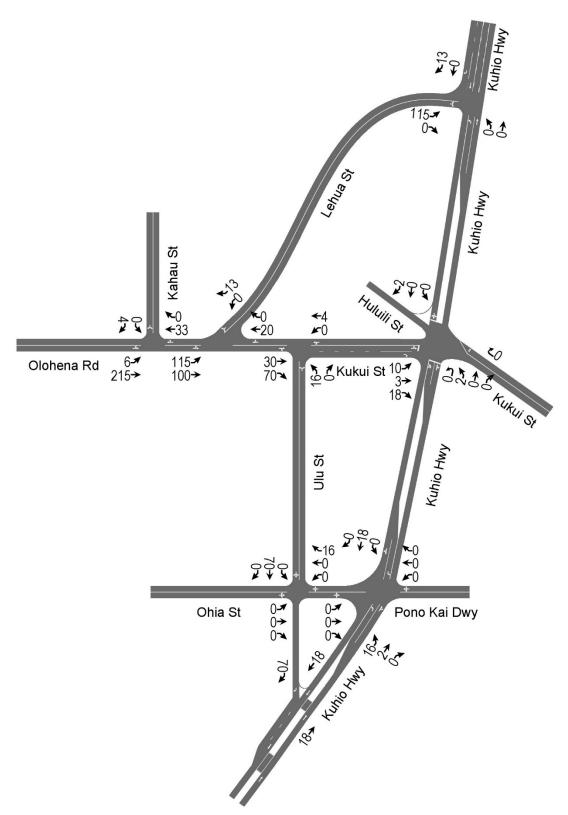


Figure 11. AM Peak Hour Site Traffic Assignment

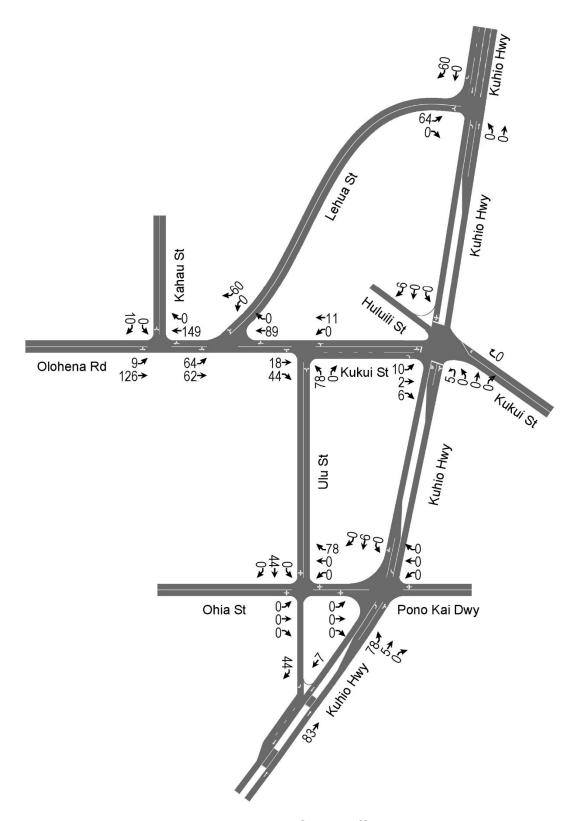


Figure 13. PM Peak Hour Site Traffic Assignment

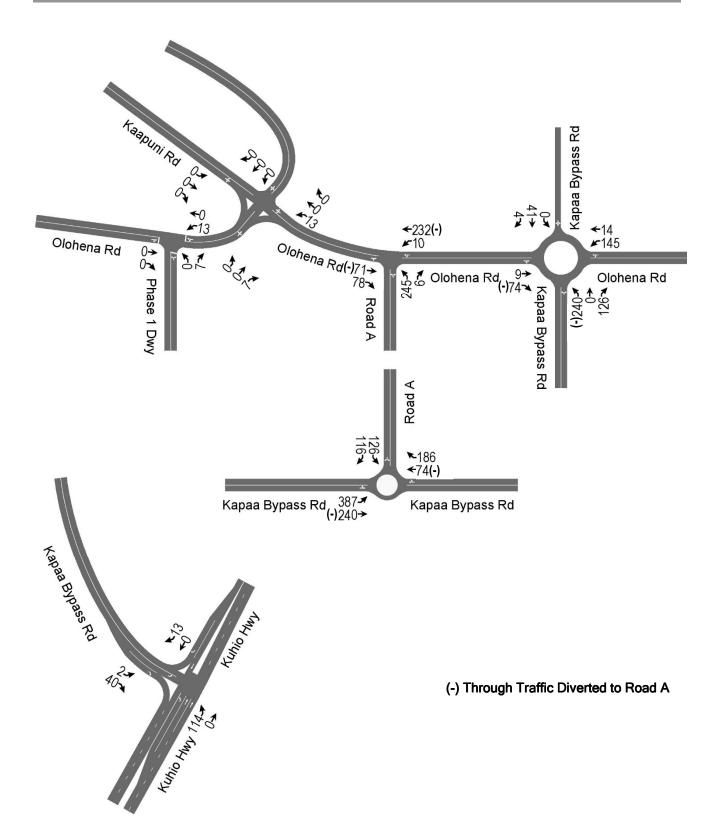


Figure 14. PM Peak Hour Site Traffic Assignment (Cont'd.)

### Bernard P. Carvalho, Jr.

TOP OF THE PERSON OF THE PERSO

Lyle Tabata
Acting County Engineer

Wallace G. Rezentes, Jr.
Managing Director

#### DEPARTMENT OF PUBLIC WORKS

#### County of Kaua'i, State of Hawai'i

4444 Ricc Street, Suite 275, Līhu'e, Hawai'i 96766 TEL (808) 241-4992 FAX (808) 241-6604

September 1, 2017

Randall S. Okaneku, P. E. The Traffic Management Consultant 1188 Bishop Street, Suite 1907 Honolulu, Hawaii 96813

SUBJECT:

Traffic Impact Analysis Report Update

For the Proposed Hokua Place

Kapa'a, Kawaihau District, Island of Kaua'i

TMK: (4) 4-3-03: Por. 001

Dear Mr. Okaneku:

The Engineering Division of the Department of Public Works received the subject Traffic Impact Analysis Report (TIAR) Update that was transmitted via email on June 15, 2017. We appreciate the opportunity to review the TIAR and offer the following comments on the TIAR:

#### 1. Introduction, Project Description:

a. The TIAR indicates that the driveway for phase 1 is proposed to be located on Olohena Road mauka of its intersection with Ka'apuni Road. We have concerns with a proposed intersection at this location, including the proximity to the intersection of Ka'apuni Road as well as concerns about intersection sight distance due to nearby horizontal and vertical curves. Prior to approval of a driveway at this location, additional information will need to be provided about this driveway location, to show that appropriate sight lines can be achieved and that no safety or other problems will be created by the proximity to the intersection of Olohena Road and Ka'apuni Road.

#### 2. Existing Conditions, Roadways:

- a. The report states that the Kapa'a Bypass Road speed limit is reduced to 25 mph south of the proposed intersection with Road A. The report should also mention that further south the speed limit is again increased to 35 mph.
- b. The report incorrectly indicates that the posted speed limit for Olohena Road is reduced to 15 mph as it approaches Kapa'a Middle School. The correct statement should be that there is a 15 mph school zone within the vicinity of Kapa'a Middle School during school hours.
- c. Kukui Street and Ulu Street should both be described as collector streets.

# 3. Existing Conditions, Existing Peak Hour Traffic Volumes and Operating Conditions:

- a. The language throughout this segment of the TIAR indicates that intersections "operated at LOS...." However, if we understand correctly, the LOS values given are based on the analysis of the traffic conditions, not actual empirical observations of delay for vehicles at these intersections. The TIAR should instead use language such as "calculated to operate at LOS ...." This is an important distinction given that observations of Kūhiō Highway during peak hours of traffic appear to show LOS along the highway worse than the LOS A for movements along Kūhiō Highway as reported in the TIAR, potentially due to other factors than the control delay at the intersections.
- b. Check the traffic volume of 1,500 shown on page 10 for Kühiö Highway south of Ulu Street in the PM Peak. The volumes shown in Figure 6 do not match.
- c. Figure 6 (Existing PM Peak Hour Traffic) has an error for the southbound through movement on Kühiö Highway at the Kapa'a Bypass Road. The figure shows an hourly volume of 38, which is way too low for this through movement. The data shown for this intersection in figure 6 does not appear to match either of the two PM peak hour traffic count plots (or their average) in the appendix.
- d. Related to comment "a" above recommending different language for the calculated LOS values, we recommend that the TIAR include some statements comparing the observed traffic conditions with the calculated delays and level of service, ideally offering explanations for the difference in observed level of service and calculated level of service.

#### 4. Future Traffic Conditions, Kapa'a Transportation Solutions:

- a. Page 17 of the TIAR refers to removal of on-street parking on Kūhiō Highway. The Kapa'a Transportation Solutions study rejected any potential solutions that removed parking on Kūhiō Highway, since such a change would be detrimental to the economic vitality, multimodal, and safety goals of the study. Removal of parking should not be discussed in the TIAR, as HDOT is not considering removal of parking to add travel lanes or turn lanes.
- b. With respect to a new connector road in the approximate location of Road A, page 18 of the TIAR states, "The construction cost of the connector road was estimated at \$25,824,000." The costs in the Kapa'a Transportation Solutions report include right-of-way costs as well as construction cost; therefore it is misleading to state that the full cost shown in the study is the estimated construction cost.

#### 5. Traffic Impact Analysis, Trip Generation Characteristics:

- a. The project description in the TIAR's introduction states that there are 700 multifamily dwelling units, but the trip generation calculations are based on 800 multifamily dwelling units. This discrepancy must be corrected, and the accurate trip generation should be reflected in the study.
- b. The pass-by trip percentage of \$1.2% is too high, especially given the relatively small amount of traffic traveling through the development on Road A. The diverted volume of 45 vehicles represents approximately 15% of the estimated through vehicles on Road A during the PM Peak Hour. The \$,000 square feet of the Hokua Place shopping center is outside of the sample size in the pass-by trip

chart for shopping centers in the ITE Trip Generation Handbook. A pass-by trip percentage of approximately 30% or 40% would be more reasonable, given the data available in the Trip Generation Handbook. It would also be reasonable for the TIAR to include a calculation of an internal capture rate for trips between the retail portion and the residential portion of the Hokua Place development. However, the combination of the traffic reduction for internal capture and pass-by trips should still be less than 81%.

#### 6. Traffic Impact Analysis, Site Access Improvements:

a. The recommendations for the stop controlled Tee-intersections of Olohena Road with Road A and the phase 1 driveway do not include any statements regarding the recommended lane assignments for these new intersections. The methodologies section of the report describes the use of AASHTO Left-Turn Lane Guidelines, but no such analyses are included in the TIAR for left turn lanes on Olohena Road at these intersections. We believe that at a minimum, a left turn lane would be necessary on Olohena Road at Road A, but analyses must be provided for both intersections. A median refuge lane should also be included on Olohena Road to facilitate the left-turn movement from Road A to Olohena Road. In addition, we believe that Road A should have two approach lanes at Olohena Road, one for right turn movements and one for left turn movements.

#### 7. Traffic Impact Analysis, Traffic Assignment:

- a. In the previous TIAR for this project, no traffic was assigned to the left turn movement from southbound Road A to eastbound Kapa'a Bypass (and likewise for the right turn from the Kapa'a Bypass to Road A). In our earlier comments, we recommended that some traffic be assigned to these movements. In almost a complete reversal, the current TIAR assigned nearly all of the traffic to these movements. In the current TIAR, only about 5% to 10% of the project traffic that goes through the existing Kapa'a Bypass roundabout is assigned to go through the intersection of Road A and Olohena Road. A more equitable distribution of traffic should be made, to accurately represent the traffic impact on Olohena Road.
- b. The TIAR assigns no traffic between the project and Olohena Road or Kaʻapuni Road north of the project (Wailua Homesteads and Upper Kapahi area). There are relatively few destinations on those roads for the residential traffic from the project, but a small amount of residential traffic is likely to travel to those areas. In addition, much of the traffic generated by the retail portion of the development would have its origin or destination in the residential areas of Wailua Homesteads and Upper Kapahi area. A reasonable (albeit small) amount of traffic must be assigned to those areas.

#### 8. Figures 11 Through 14 (Traffic Assignment)

- a. For clarity, the TIAR must show the reassignment of existing traffic on separate figures from the figures for traffic assignment from this project.
- b. On Figure 11, the 989 vehicles shown for northbound Kühiō Highway at Ulu Street is incorrect. It appears that this volume should be 20.
- c. On Figure 13, the 1,274 vehicles shown for northbound Kühiō Highway at Ulu Street is incorrect. It appears that this volume should be 92.
- d. On Figure 14, the 30 vehicles shown for the Kapa'a Bypass Road left turn and the

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447 vehicles for the Kapa'a Byapss Road right turn appear to be incorrect.

#### 9. Traffic Impact Analysis, PM Peak Hour Traffic Analysis With Project:

a. We recommend that the TIAR further analyze and discuss the impact of the project on the intersection of Kūhiʻō Highway and Lehua Street and recommend measures to mitigate this impact. The TIAR states that "Makai bound Lehua Street is expected to continue at LOS F at Kūhiō Highway during the PM peak hour of traffic with the proposed project." However, Table 7 shows the PM peak hour of traffic without the project to be LOS E. Additionally, while the AM peak hour of traffic with the project continues to be LOS F, the delay increases significantly.

# 10. Recommendations and Conclusions, Recommended Traffic Improvements Without Project:

a. Item number 3 recommends restricting parking along Kūhiō Highway within Kapa'a Town in order to provide additional through lanes or left turn lanes on Kūhiō Highway. This should not be recommended in the TIAR, because HDOT is not considering removal of parking to add travel lanes. Removal of parking has been determined to be detrimental to businesses and the economic vitality of Kapa'a Town. Discussion of parking removal on Kūhiō Highway in Kapa'a Town should also be removed from other sections of the report, including the conclusions.

# 11. Recommendations and Conclusions, Recommended Traffic Improvements With Project:

a. Our comments above include several concerns about the intersection of Road A and Olohena Road, including the possibility that additional traffic should be assigned to this intersection. We are concerned that the one-way stop control Tee-intersection proposed will not be sufficient to address traffic operations and safety at intersection. The installation of a roundabout at this intersection shall be evaluated as part of the TIAR, including traffic operations analysis for a roundabout as well as a safety comparison of a roundabout and a one-way stop control intersection. The federal Manual on Uniform Traffic Control Devices (MUTCD) does not include traffic warrants for roundabouts. However, evaluation of the MUTCD's multi-way stop control warrants and/or signal warrants would be instructive with respect to evaluating whether a one-way stop control intersection would be sufficient or if a roundabout is needed instead. Alternatively, we may also accept an evaluation of the need for a roundabout based on roundabout evaluation guidelines from another jurisdiction or research document.

Consideration should also be given to the construction of a roundabout that combines the intersections of Olohena Road with Ka'apumi Road and Road A (with Kaehulua Road designed as a T intersection with either Ka'apuni Road or Olohena Road). Traffic operations analysis of a roundabout that combines these intersections shall be included in the TIAR.

The comments in this letter should not be construed to be inclusive of all County of Kaua'i recommendations for road improvements required to be constructed as part of the Hokua Place

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project. Recommendations and requirements for road improvements will be included as part of future review phases for the project, such as zoning amendments, subdivision applications, and construction plan review. If you have any questions or need additional information, please contact me at (808) 241-4891 or Stanford Iwamoto at (808) 241-4896.

Very truly yours,

MICHAEL MOULE, P.E. Chief, Engineering Division

MM/SI

Copies to: DPW-Design & Permitting

Lyle Tabata, Acting County Engineer Larry Dill, HDOT Kaua'i District Engineer