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 

Randall S. Okaneku, P. E.
Principal

DAVID Y. IGE
GOVERNOR

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

September 29, 2017

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 Raymond.j.mccormick@hawaii.gov if you have comments or questions regarding this letter.

Sincerely,

Larry Dill, P.E.
District Engineer
for

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 Highway Capacity Manual (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 Kapa`a Transportation Solutions, 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 (ITE Code)	Units	AM Peak Hour (vph)			PM Peak Hour (vph)		
		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 (820)	8,000 SFGFA	21	13	34	53	57	110
	Pass-By	0	0	0	(-)45	(-)45	(-)90
Total External Trips		**98**	**345**	**443**	**331**	**177**	**509**

b. The ITE Trip Generation Handbook 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 Trip Generation Handbook 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 not 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 not 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 not 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.

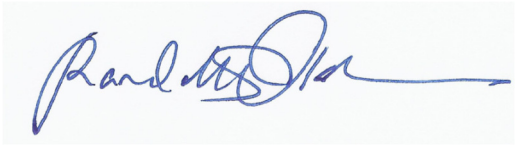
Comment No. 11 – Recommendation of Traffic Improvements With Project

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 

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

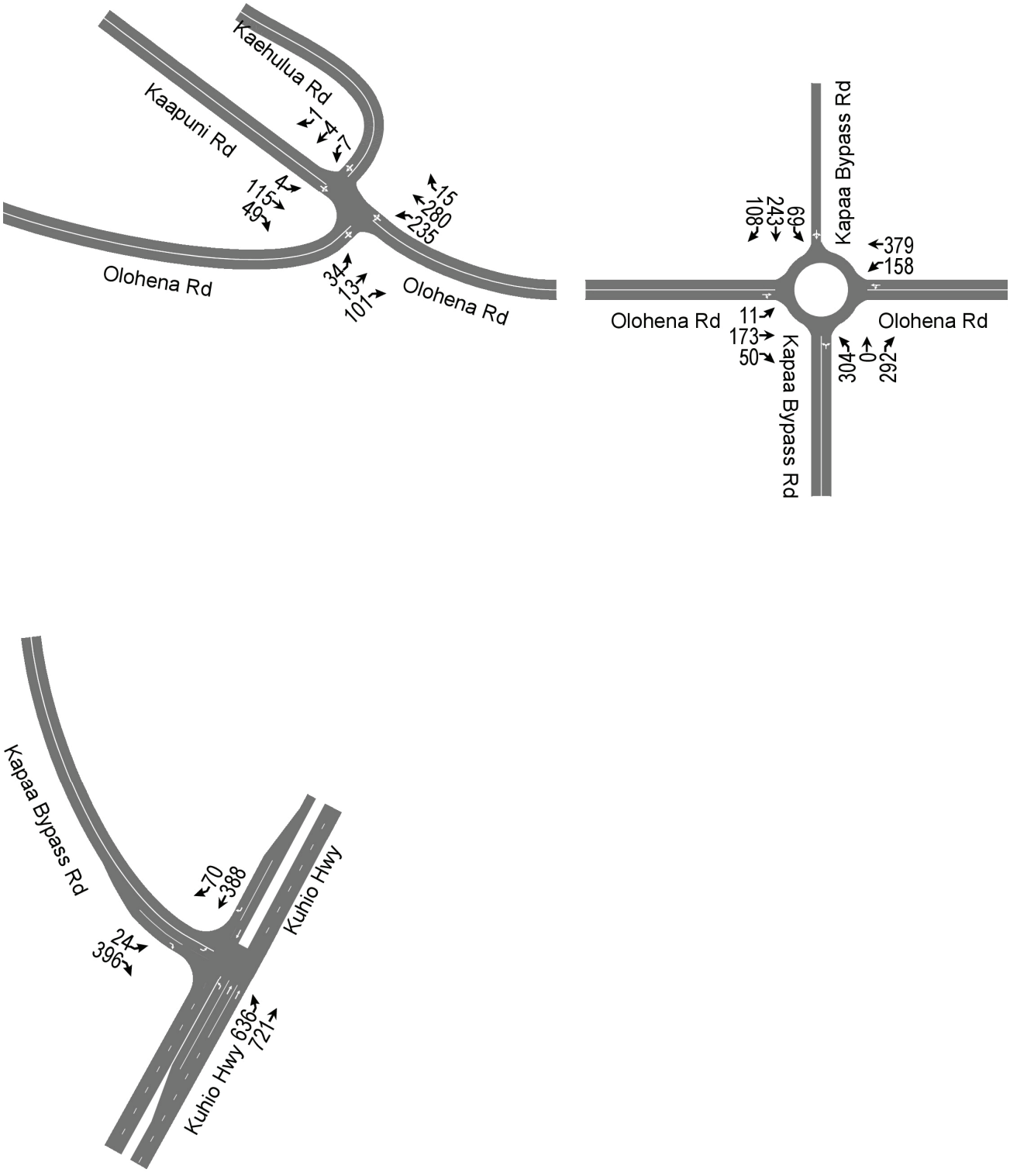


Figure 6. Existing PM Peak Hour Traffic (Cont'd.)

The Traffic Management Consultant
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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

Turning Movement Data

Start Time	Kapaa Bypass Rd Koko Head Bound				Kuhio Hwy Mauka Bound				Kuhio Hwy Makai Bound					
	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 ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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
Hourly Total	19	420	2	439	543	665	0	1208	0	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	-	-	-	-	-	-	-	-	-	-	-

The Traffic Management Consultant
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Honolulu, Hawaii, United States 96813
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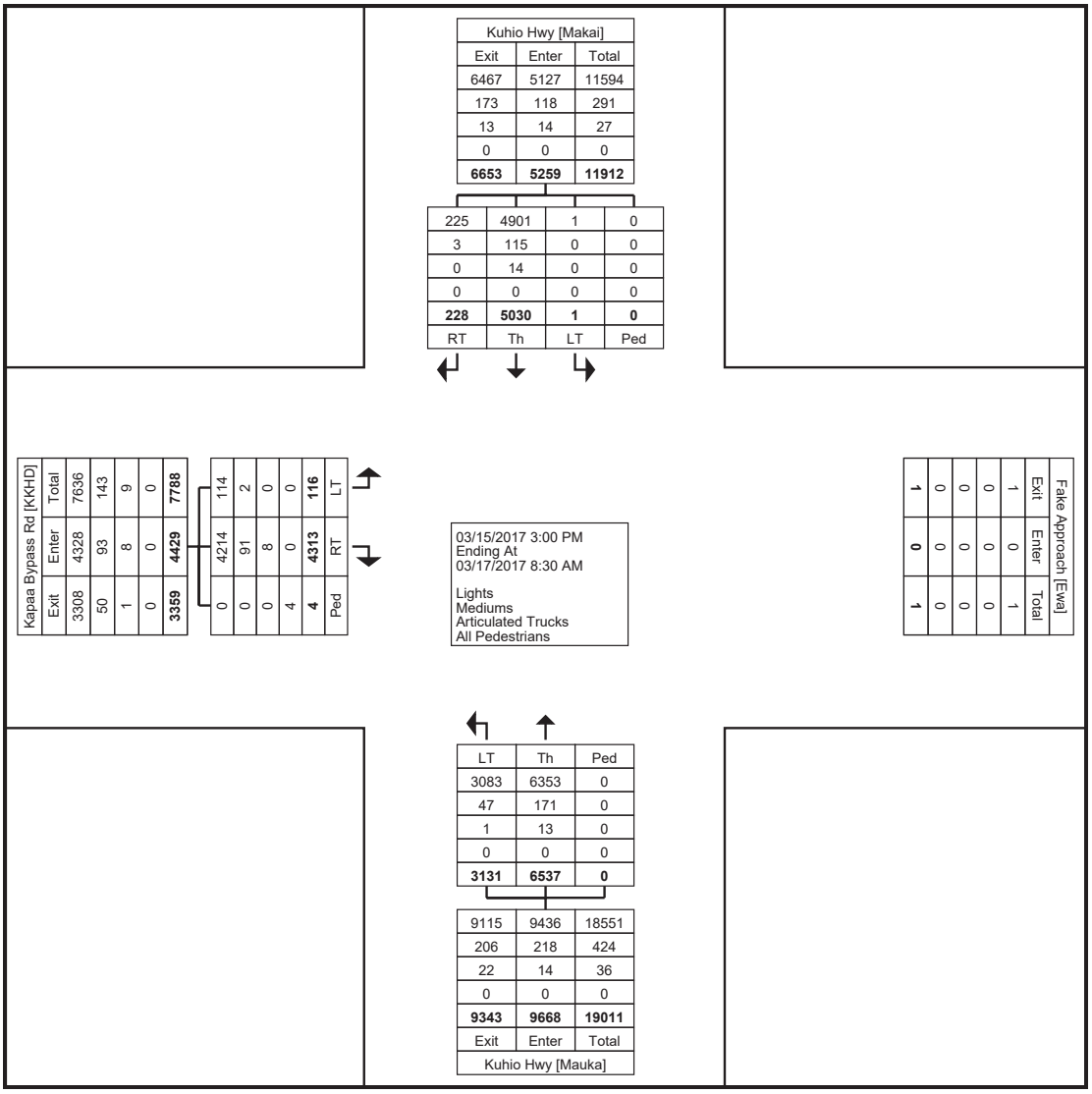
Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017



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

Turning Movement Peak Hour Data (3:45 PM)

Start Time	Kapaa Bypass Rd Koko Head Bound				Kuhio Hwy Mauka Bound				Kuhio Hwy Makai Bound					
	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-

The Traffic Management Consultant
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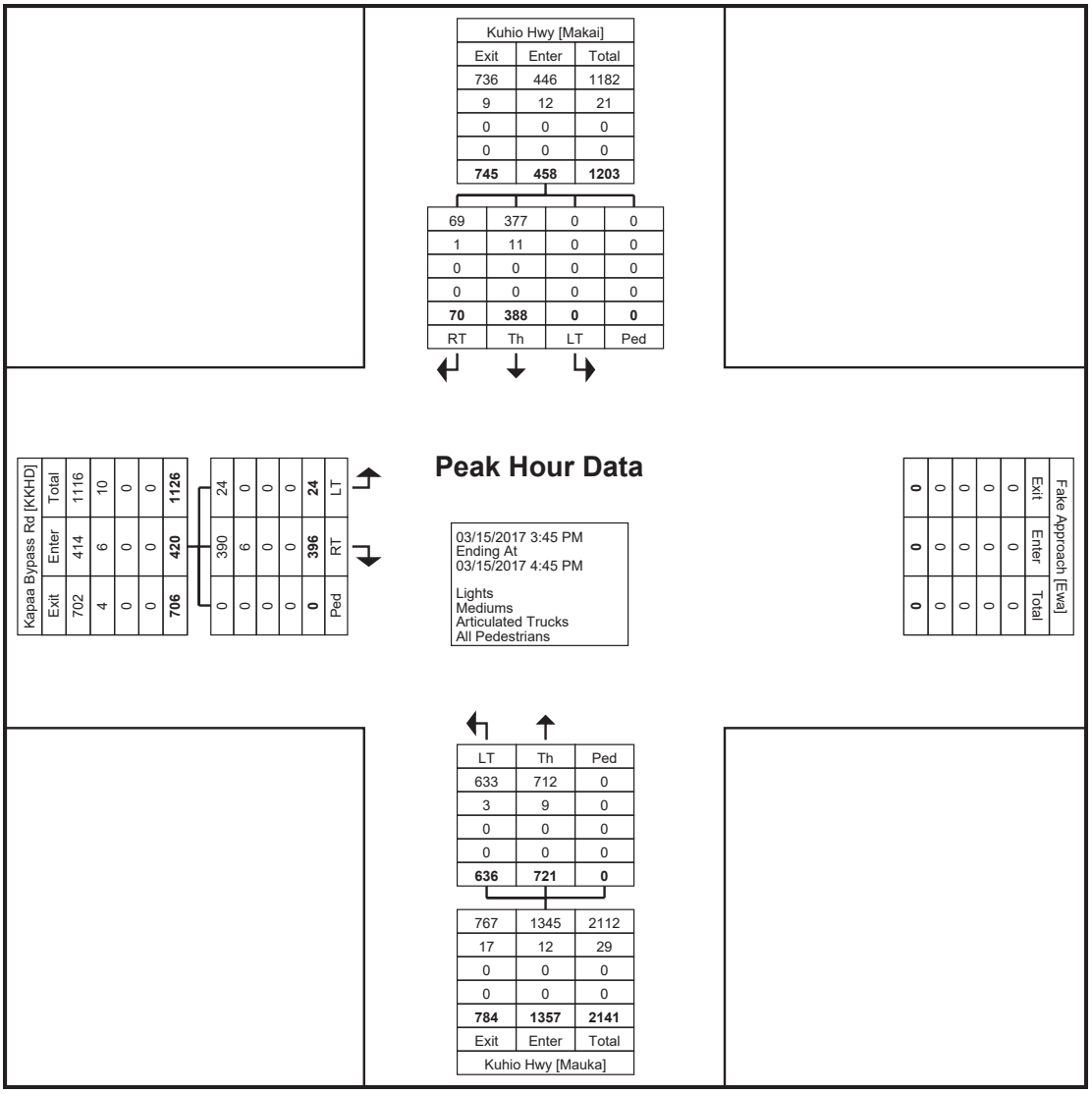
Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017



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

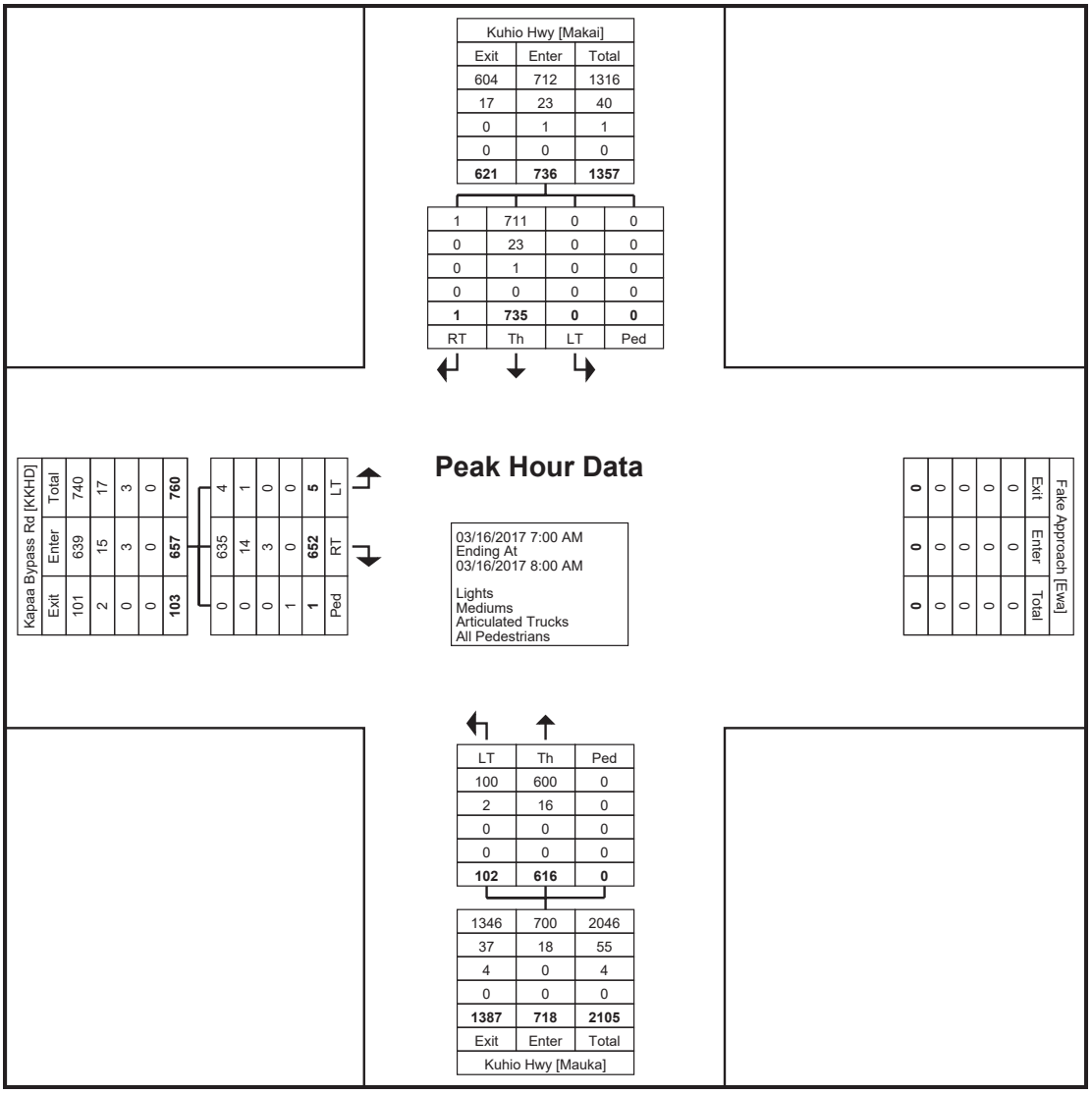
Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Kapaa Bypass Rd Koko Head Bound				Kuhio Hwy Mauka Bound				Kuhio Hwy Makai Bound					
	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	-	-	-	-	-	-	-	-	-	-	-

The Traffic Management Consultant
1188 Bishop Street, Suite 1907

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



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

The Traffic Management Consultant
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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

Turning Movement Peak Hour Data (4:15 PM)

Start Time	Kapaa Bypass Rd Koko Head Bound				Kuhio Hwy Mauka Bound				Kuhio Hwy Makai Bound					
	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	-	-	-	-	-	-	-	-	-	-	-

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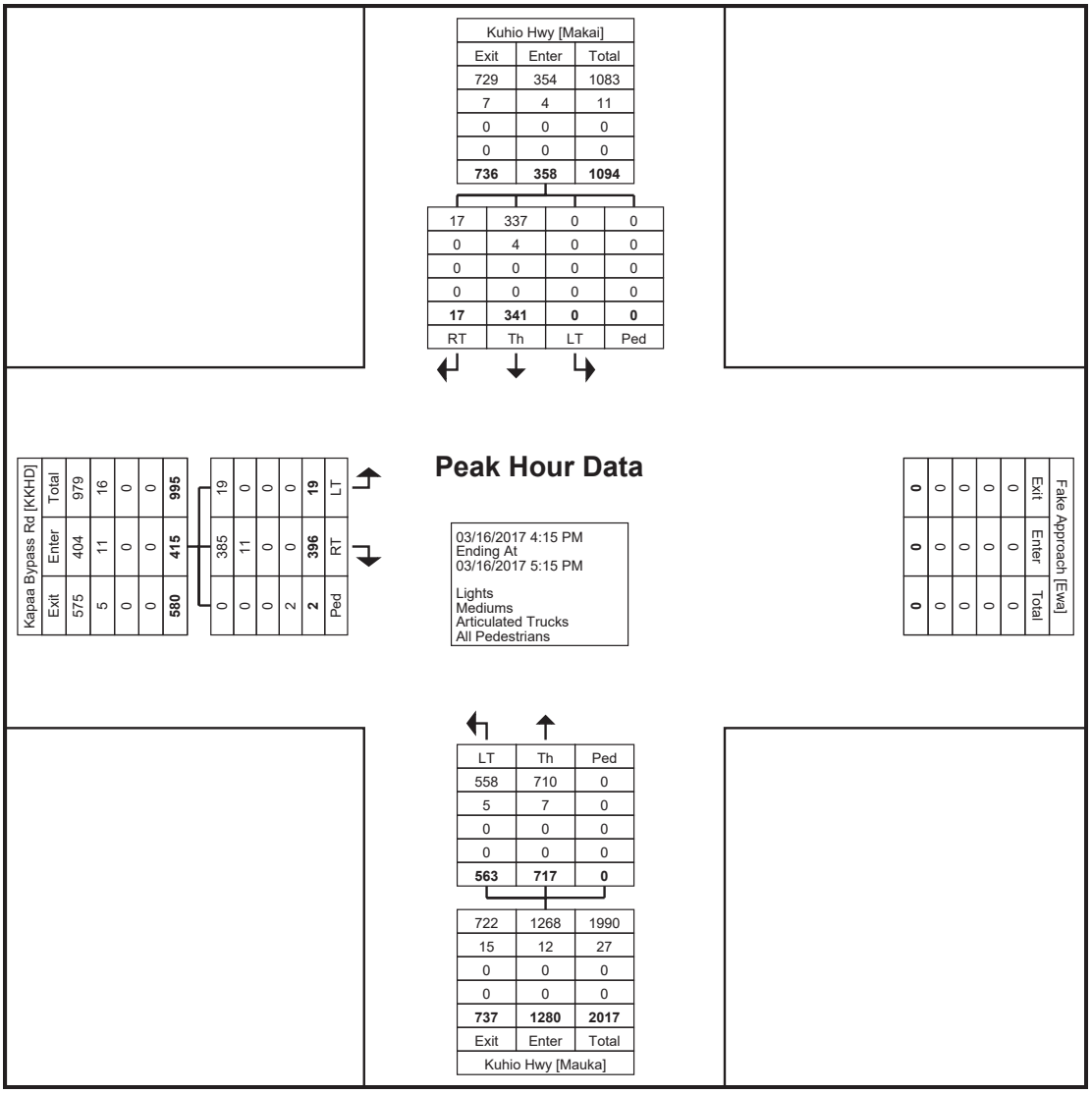

Turning Movement Peak Hour Data Plot (4:15 PM)

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Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Kapaa Bypass Rd Koko Head Bound				Kuhio Hwy Mauka Bound				Kuhio Hwy Makai Bound					
	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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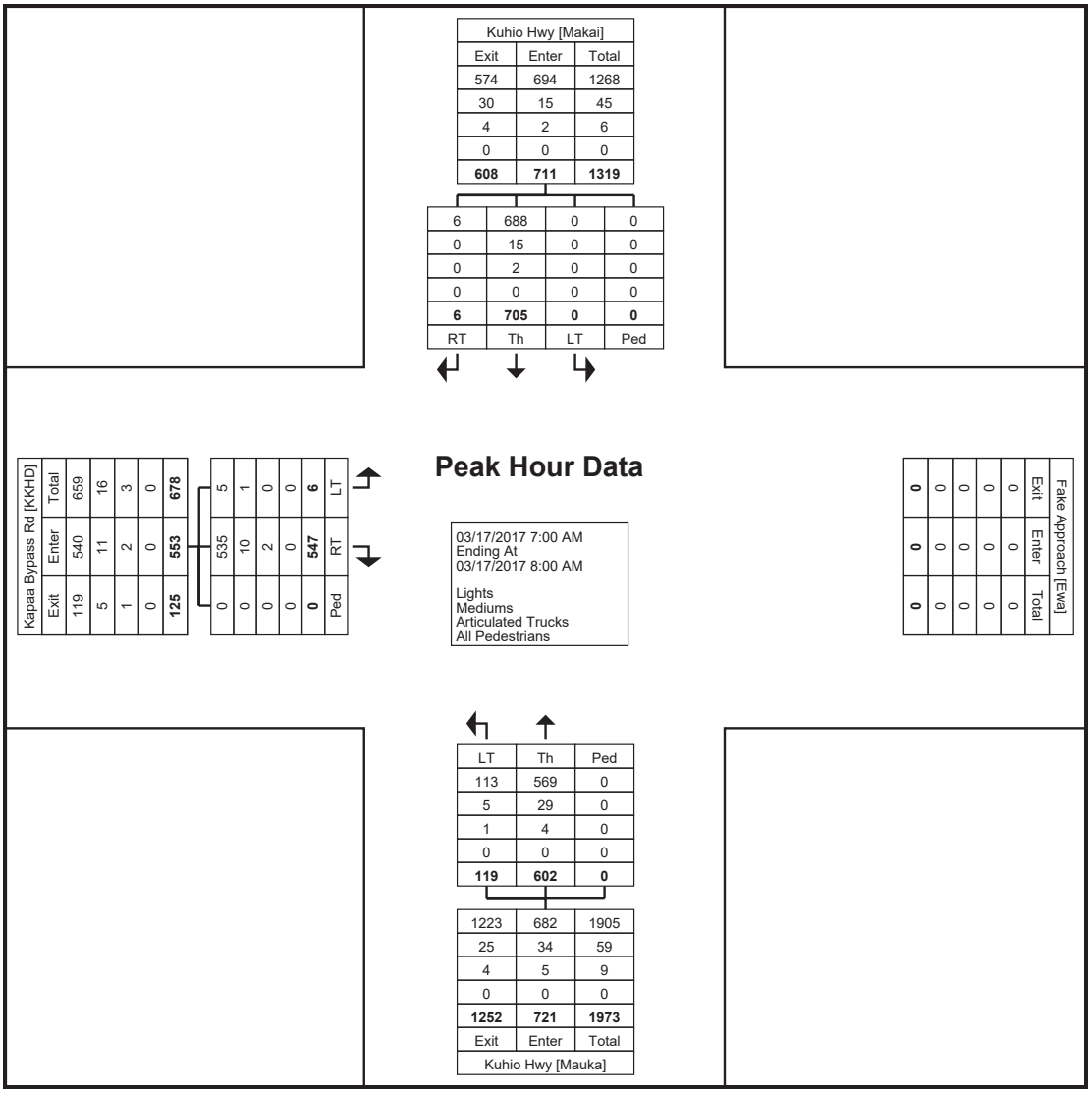

Turning Movement Peak Hour Data Plot (7:00 AM)

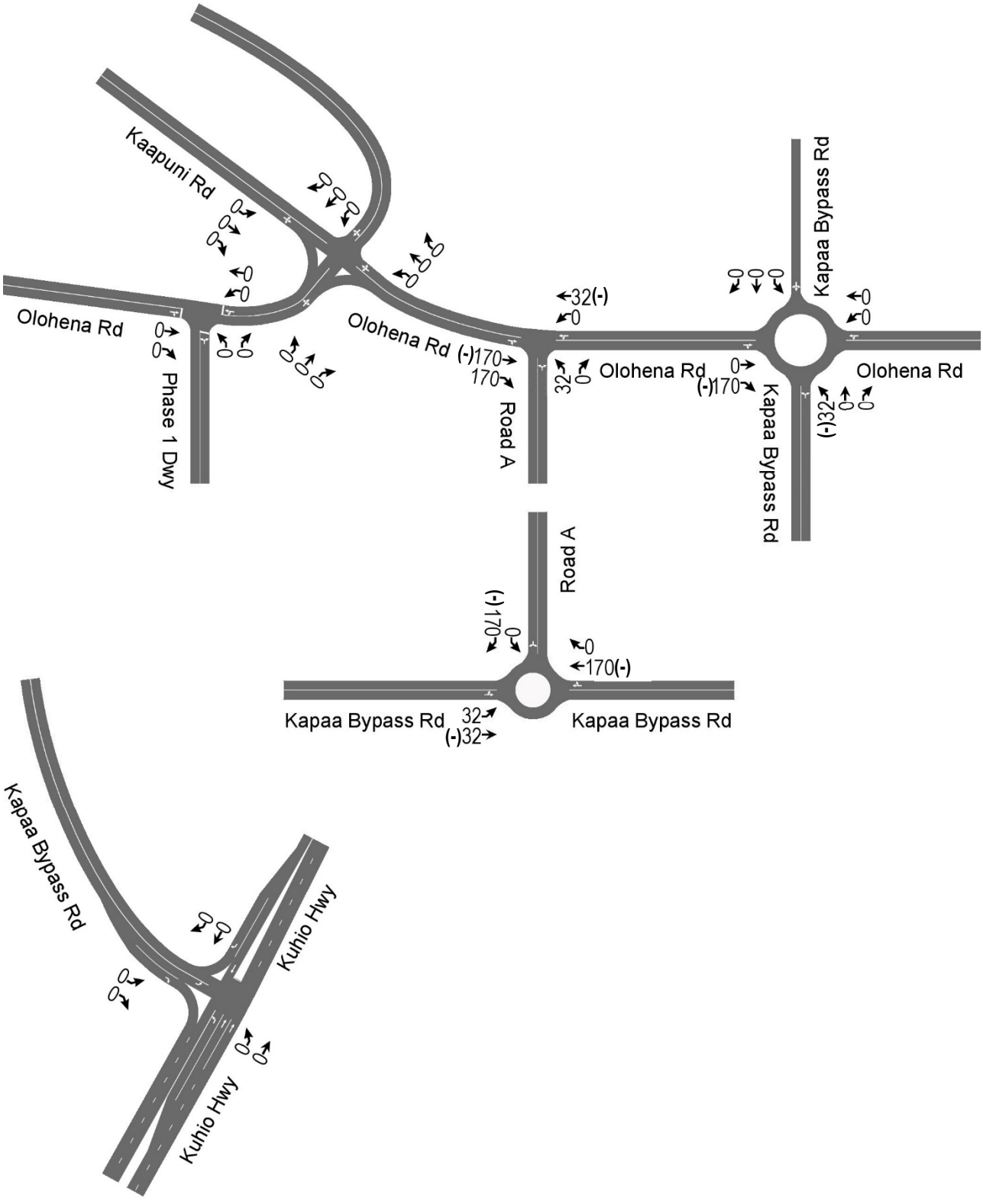

Figure 12.1 AM Peak Hour Diverted Traffic Assignment

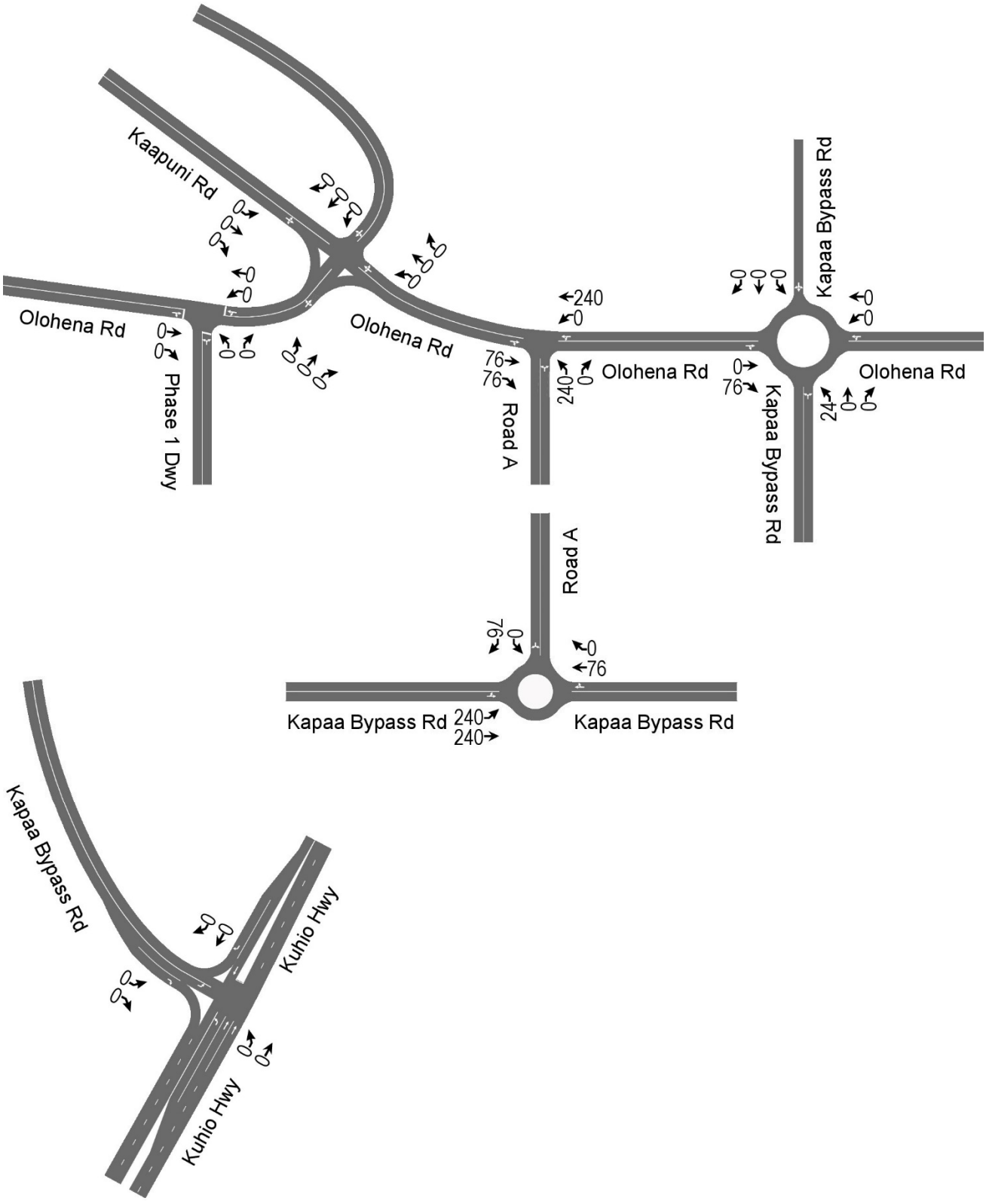

Figure 14.1 PM Peak Hour Diverted Traffic Assignment

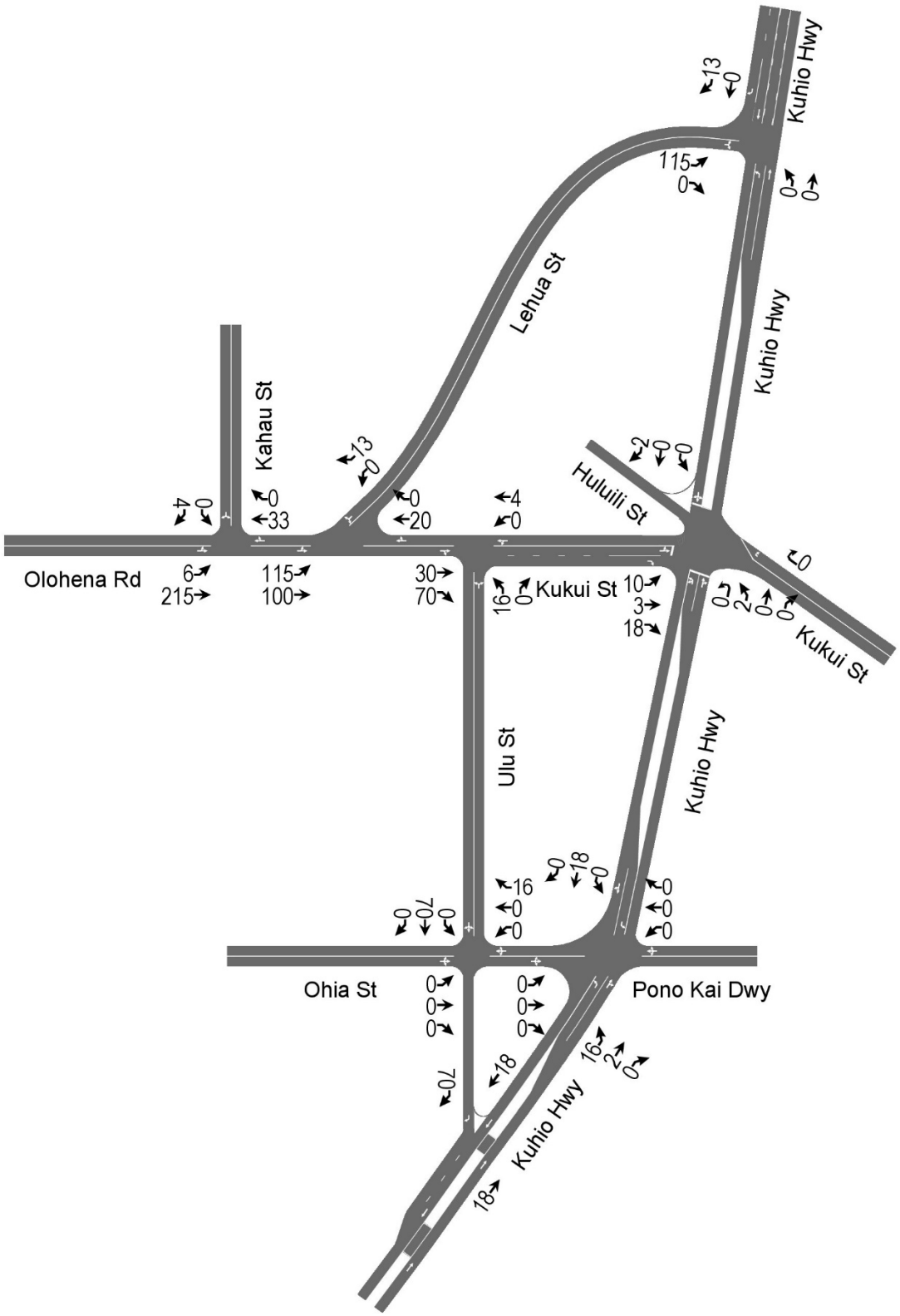

Figure 11. AM Peak Hour Site Traffic Assignment

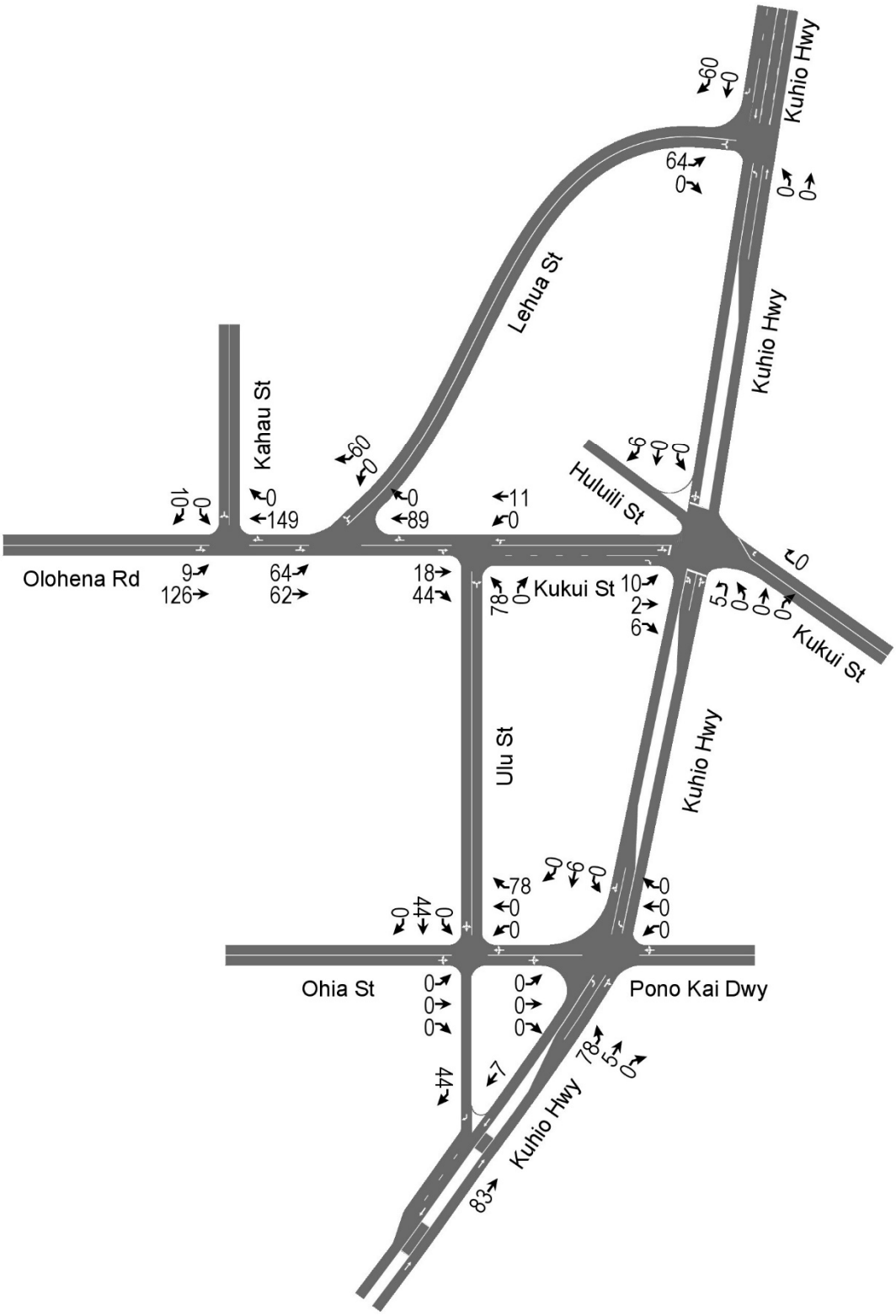

Figure 13. PM Peak Hour Site Traffic Assignment

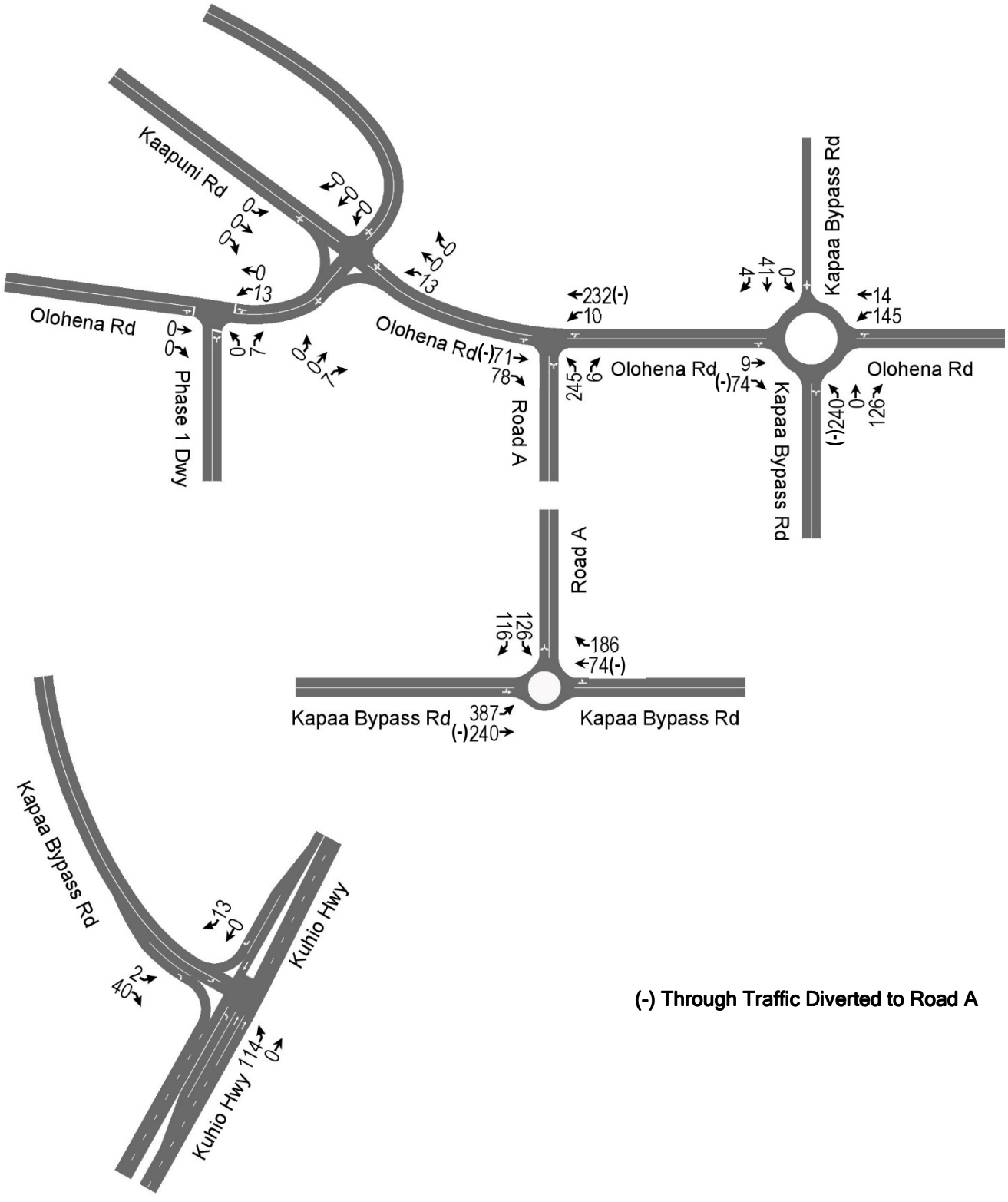

Figure 14. PM Peak Hour Site Traffic Assignment (Cont'd.)

Bernard P. Carvalho, Jr.
Mayor

Wallace G. Rezentes, Jr.
Managing Director

Lyle Tabata
Acting County Engineer

DEPARTMENT OF PUBLIC WORKS
County of Kaua'i, State of Hawai'i
4444 Rice 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 Kūhiō 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 multi-family dwelling units, but the trip generation calculations are based on 800 multi-family 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 Ka'apuni 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 Kūhiō 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 Kūhiō 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

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 Kūhi'ō 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'apuni 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

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

TMC

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

TMC

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

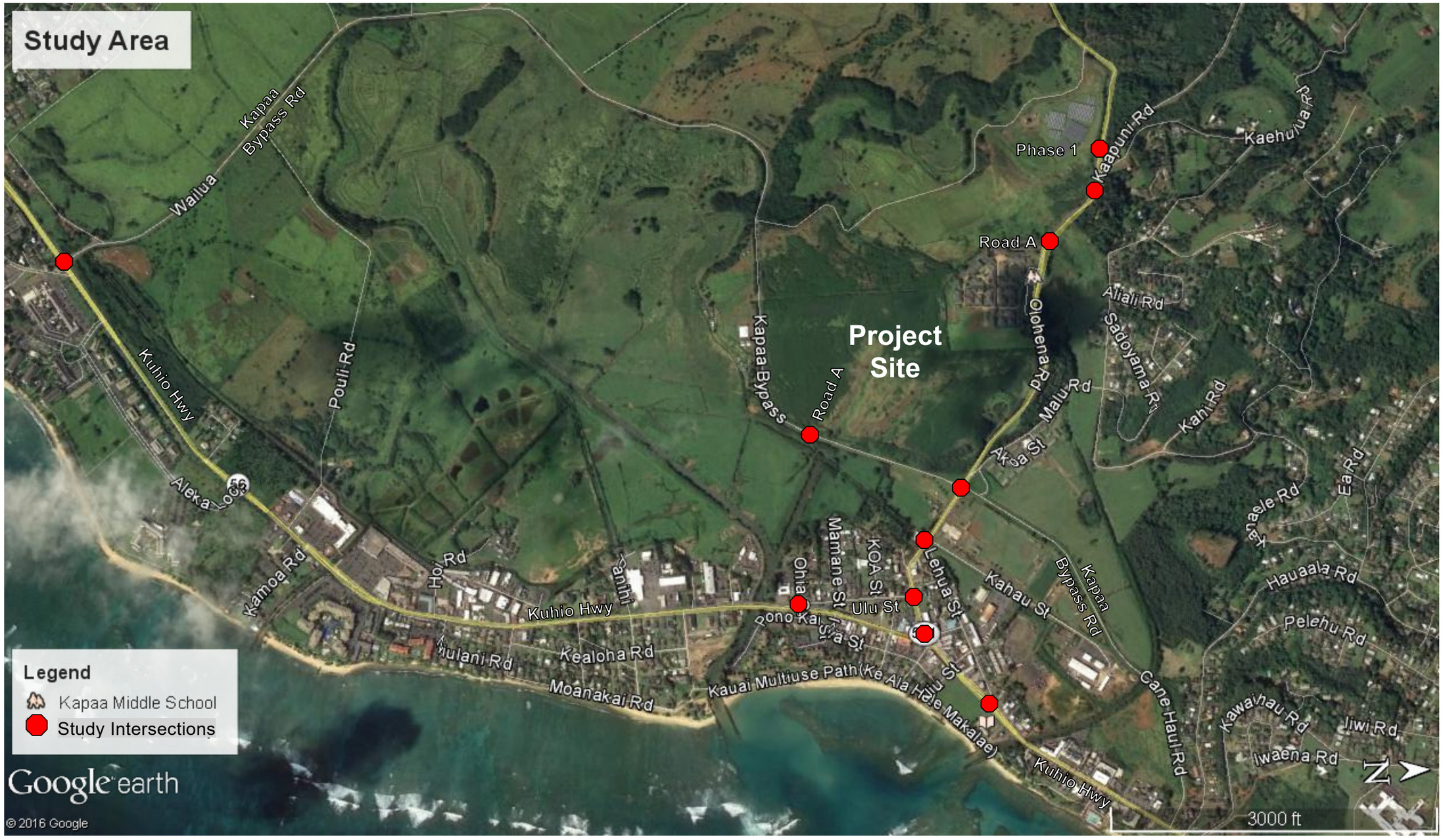

Figure 1. Location Map and Vicinity Map

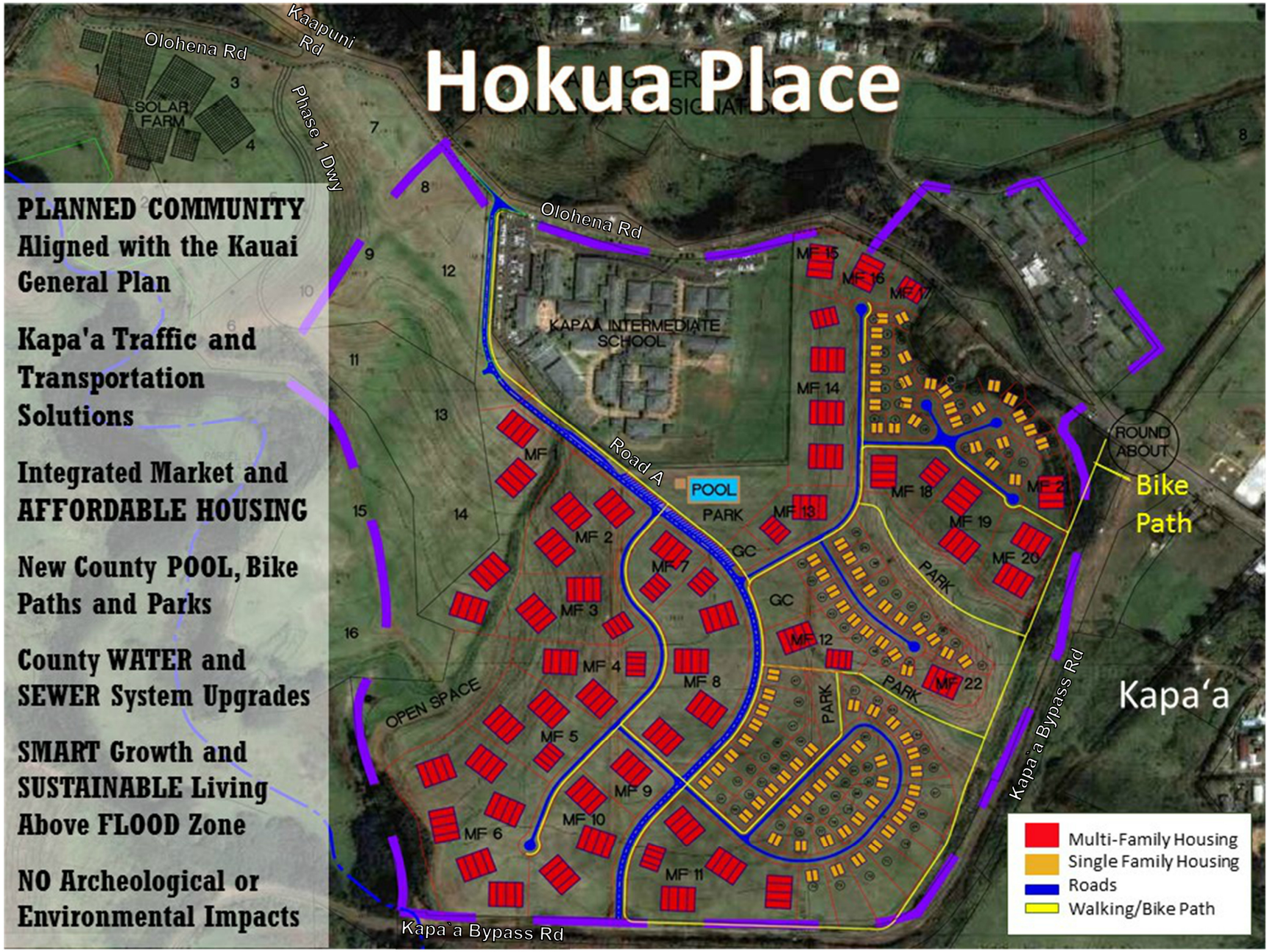

Figure 2. Proposed Site Plan

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 Highway Capacity Manual 6th Edition (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 6th 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 6th 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 6th 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.
B	10<d ≤20	10<d≤15	Control delay is not significant.
C	20<d≤35	15<d≤25	Stable operation. Queuing begins to occur.
D	35<d≤55	25<d≤35	Less stable condition. Increase in delays, decrease in travel speeds.
E	55<d≤80	35<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 6th 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 Trip Generation Manual, 9th Edition, 2012. The ITE trip generation methodology has been updated since the Trip Generation, 7th 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 A Policy on Geometric Design of Highways and Streets, 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", Highway Research Record 211, 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

i. Kukui Street and Ulu Street

j. Ulu Street and Ohia Street

k. Kuhio Highway and Ohia Street/Pono Kai Driveway

l. 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

Study Intersection	Intersection Volumes (vph)		Increase (+) Decrease (-)
	2012-2013	2017	
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 Volumes (vph)		Increase (+) Decrease (-)
	2012-2013	2017	
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.

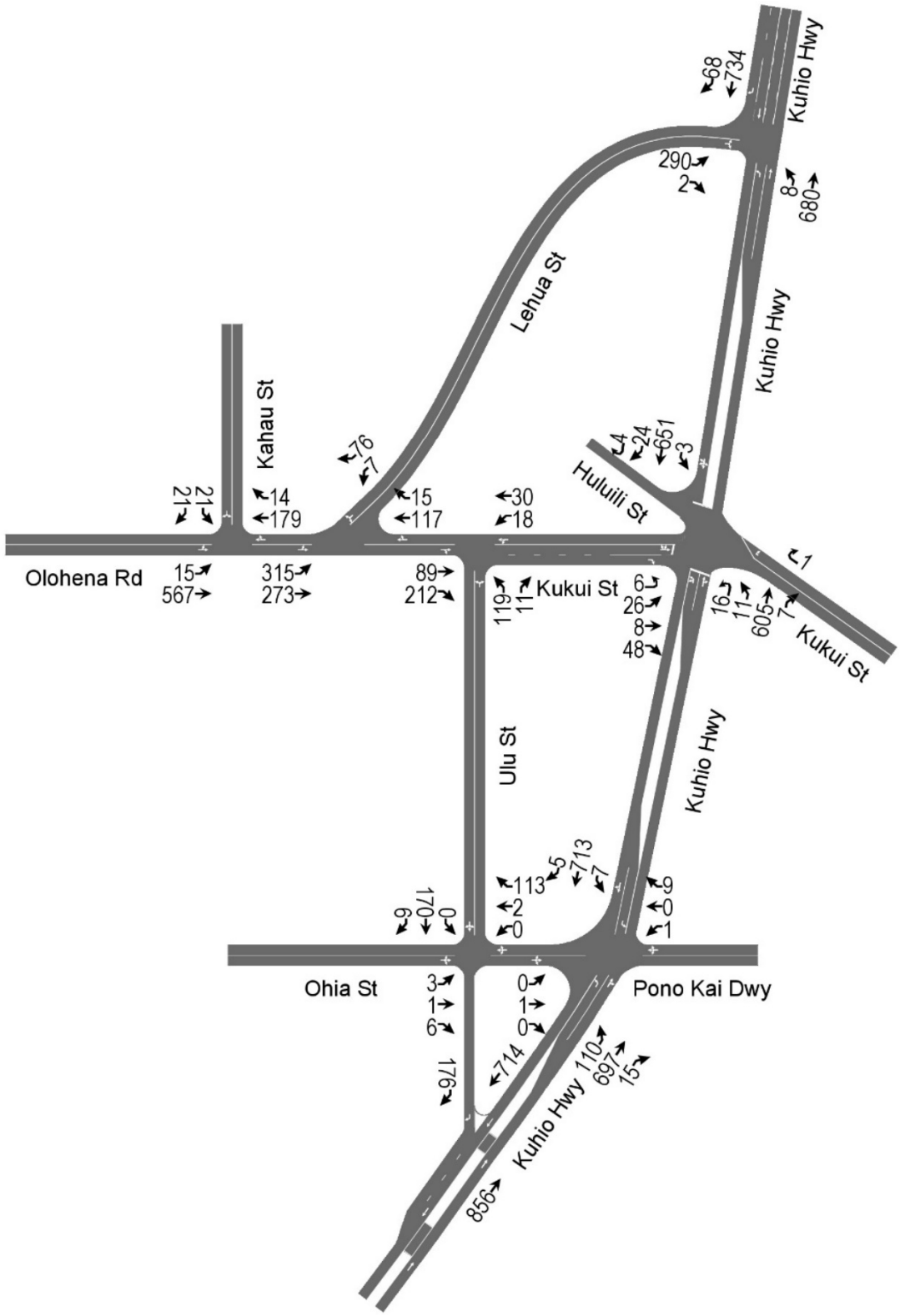

Figure 3. Existing AM Peak Hour Traffic

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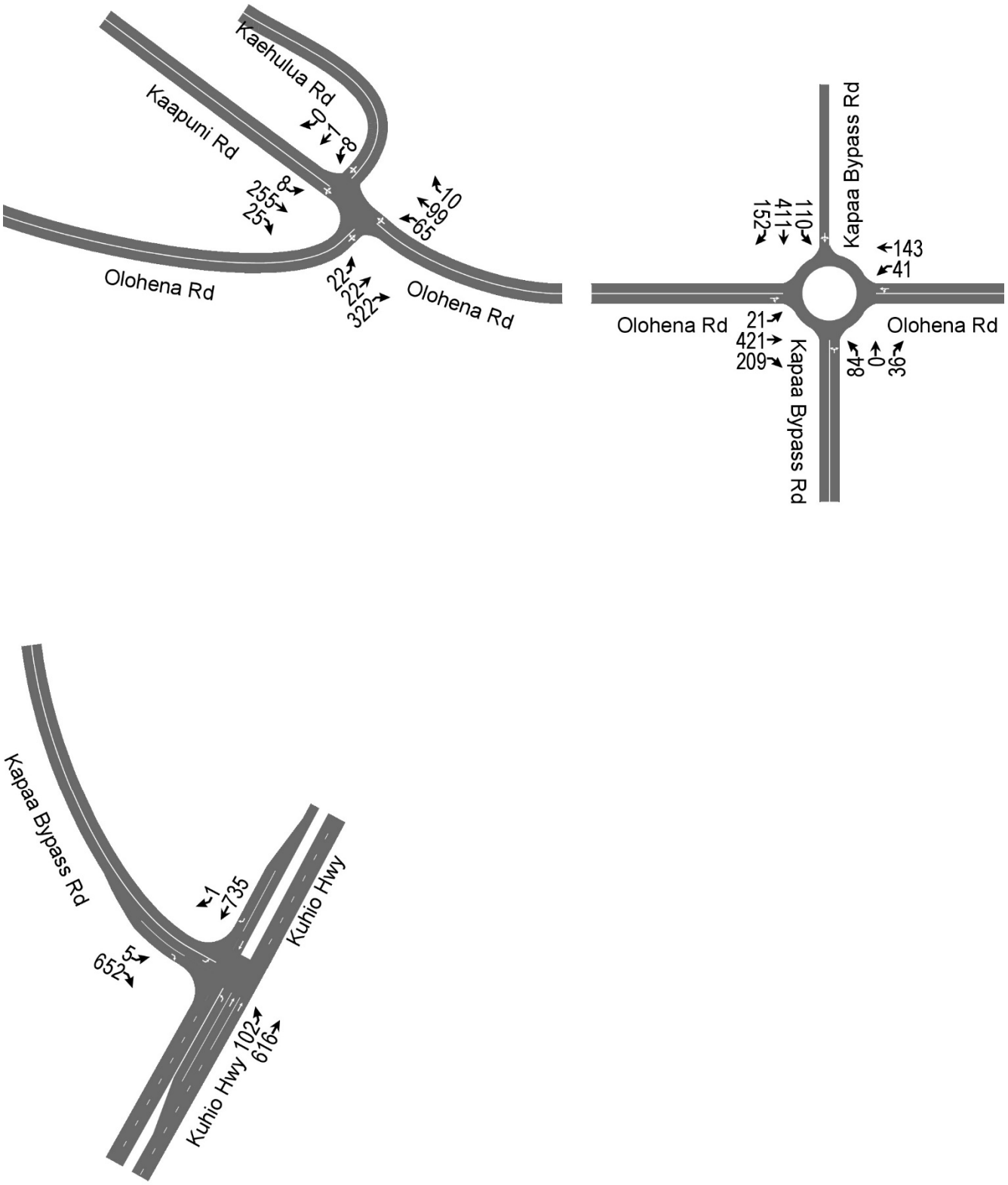

Figure 4. Existing AM Peak Hour Traffic (Cont'd.)

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.

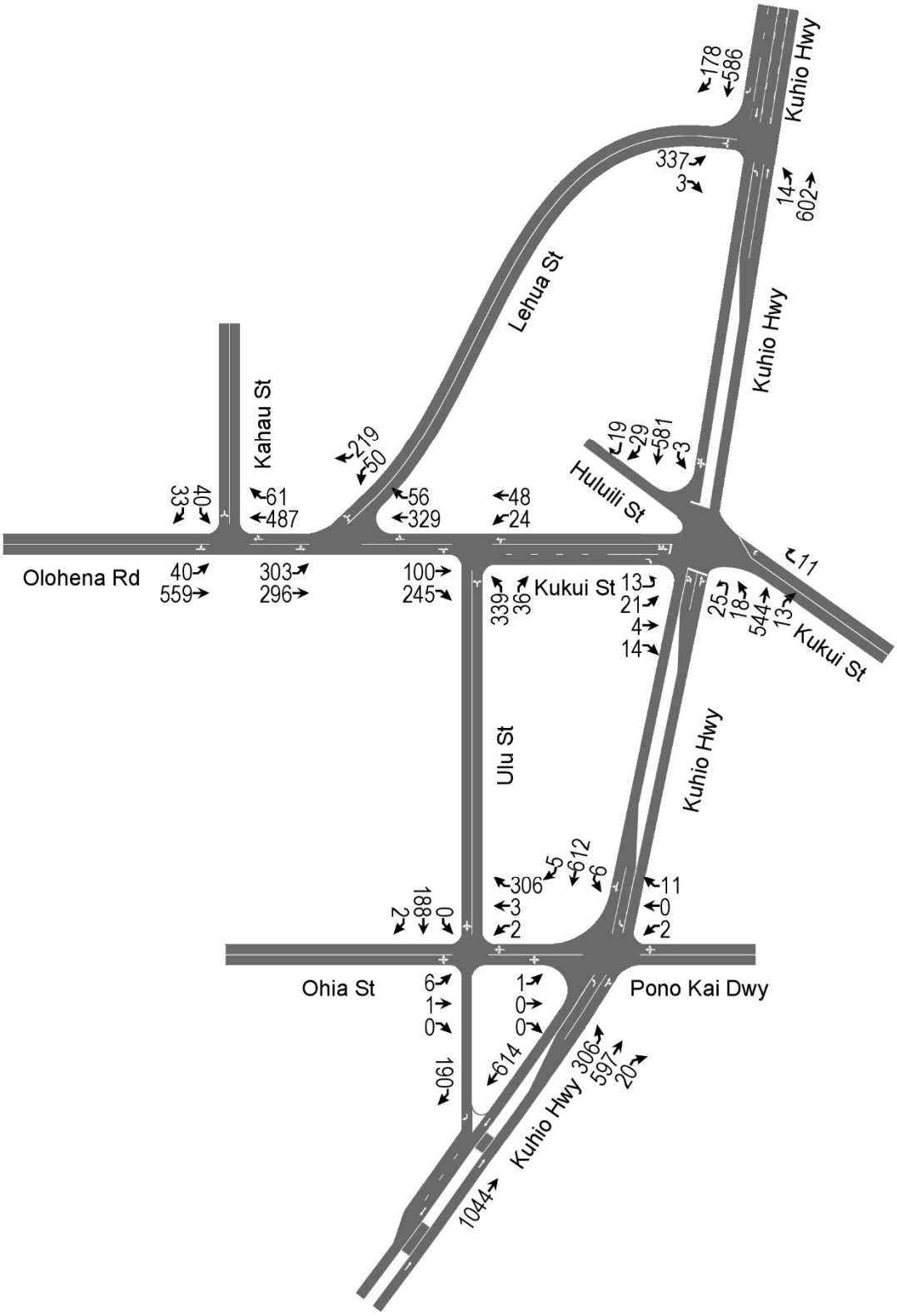

Figure 5. Existing PM Peak Hour Traffic

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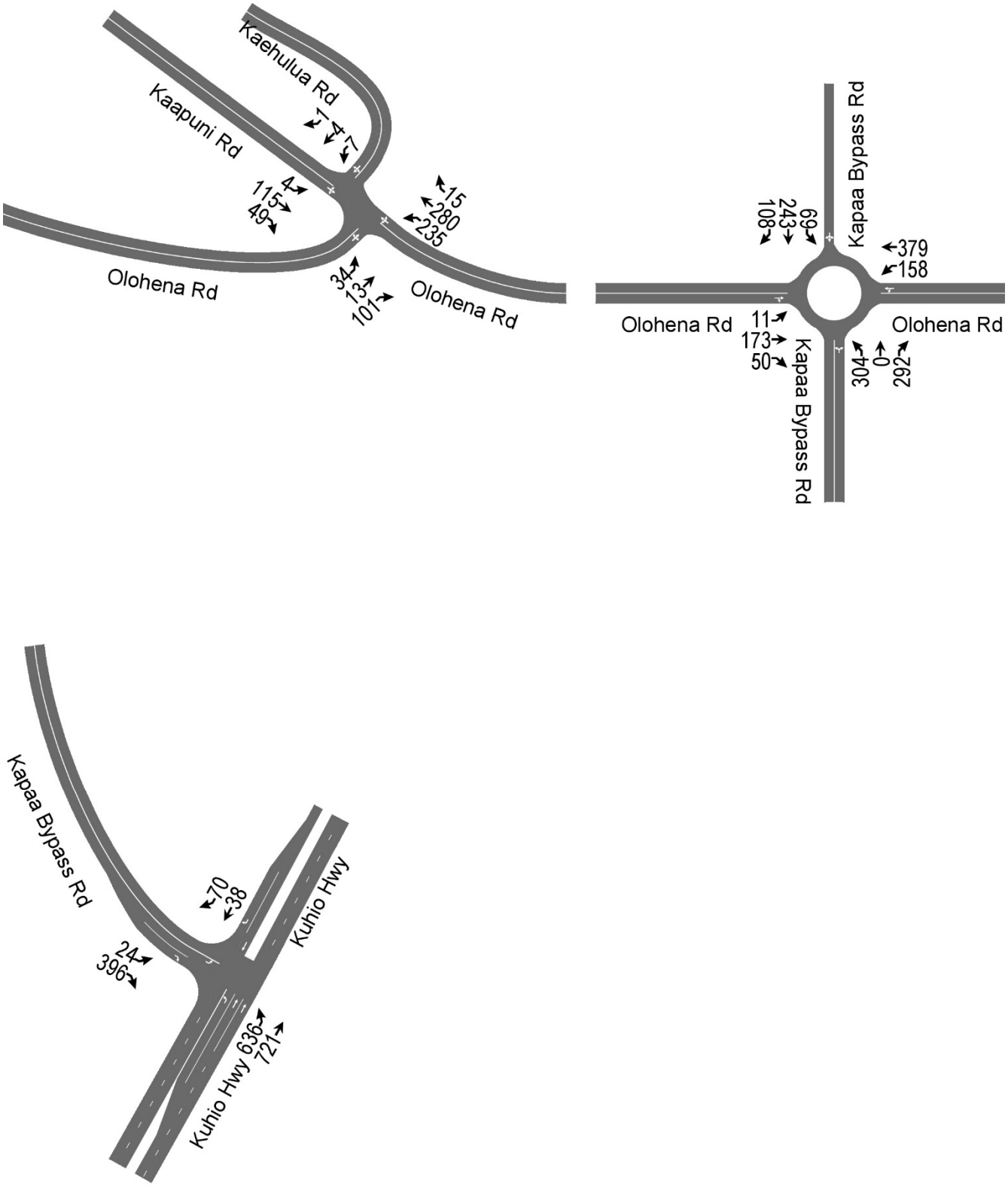

Figure 6. Existing PM Peak Hour Traffic (Cont'd.)

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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 Final Environmental Assessment Kuhio Highway Short-Term Improvements Kuamoo Road to Temporary Bypass Road (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 Kapa`a Transportation Solutions (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 Kapa`a Transportation Solutions.

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.	<5 Years
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 Years

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 Kapa`a Transportation Solutions 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.

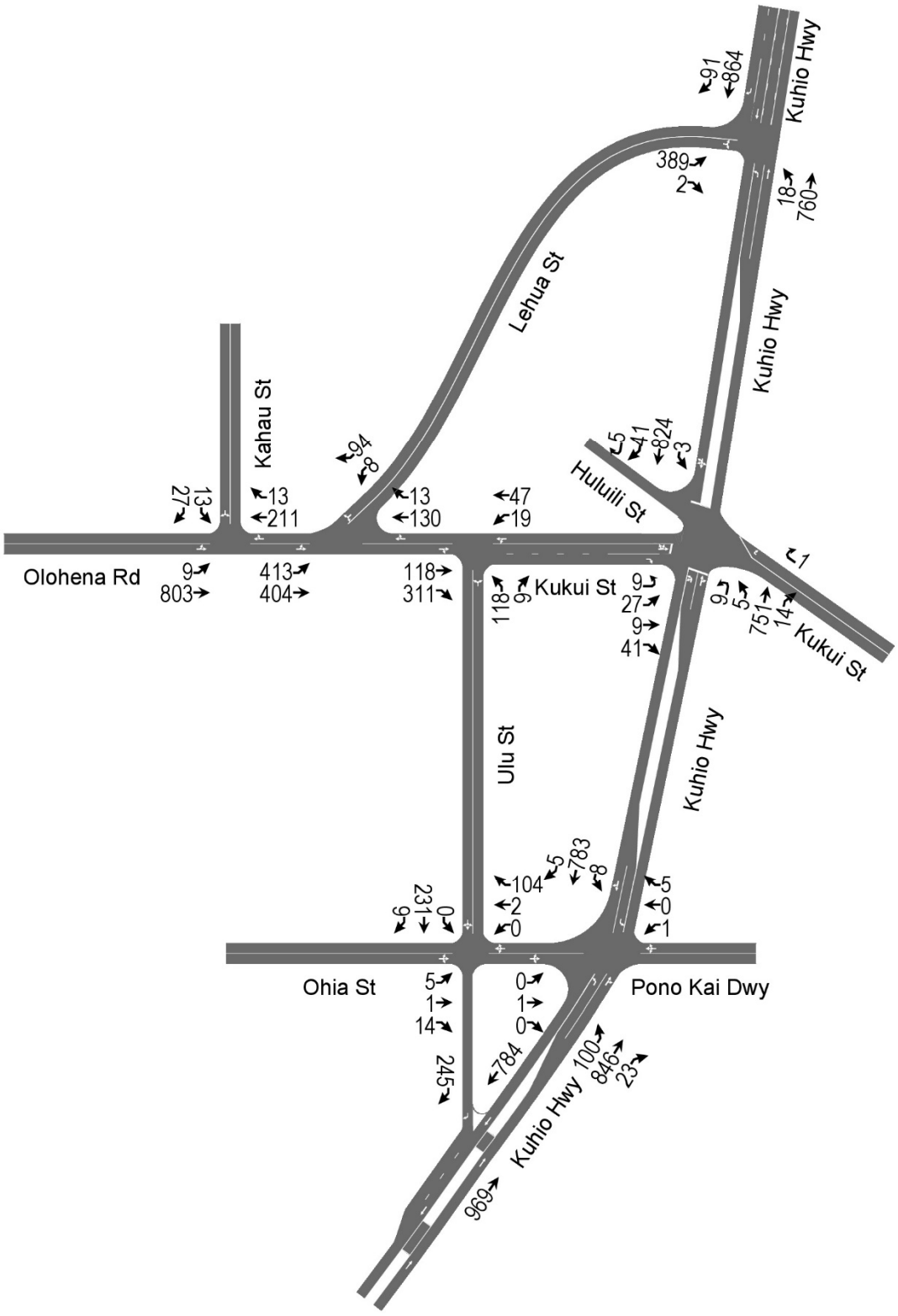

Figure 7. AM Peak Hour Volumes Without Project

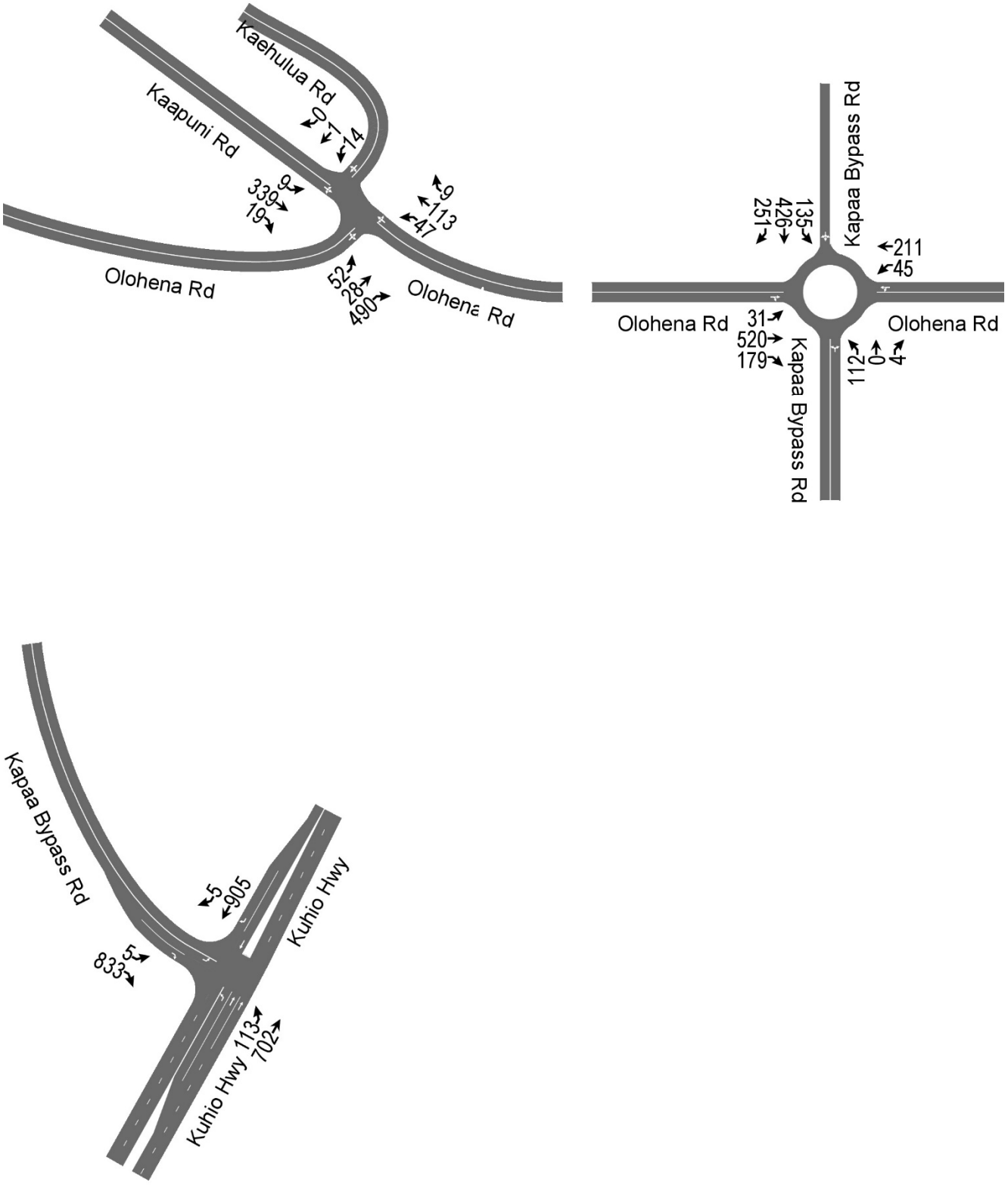

Figure 8. AM Peak Hour Volumes Without Project (Cont'd.)

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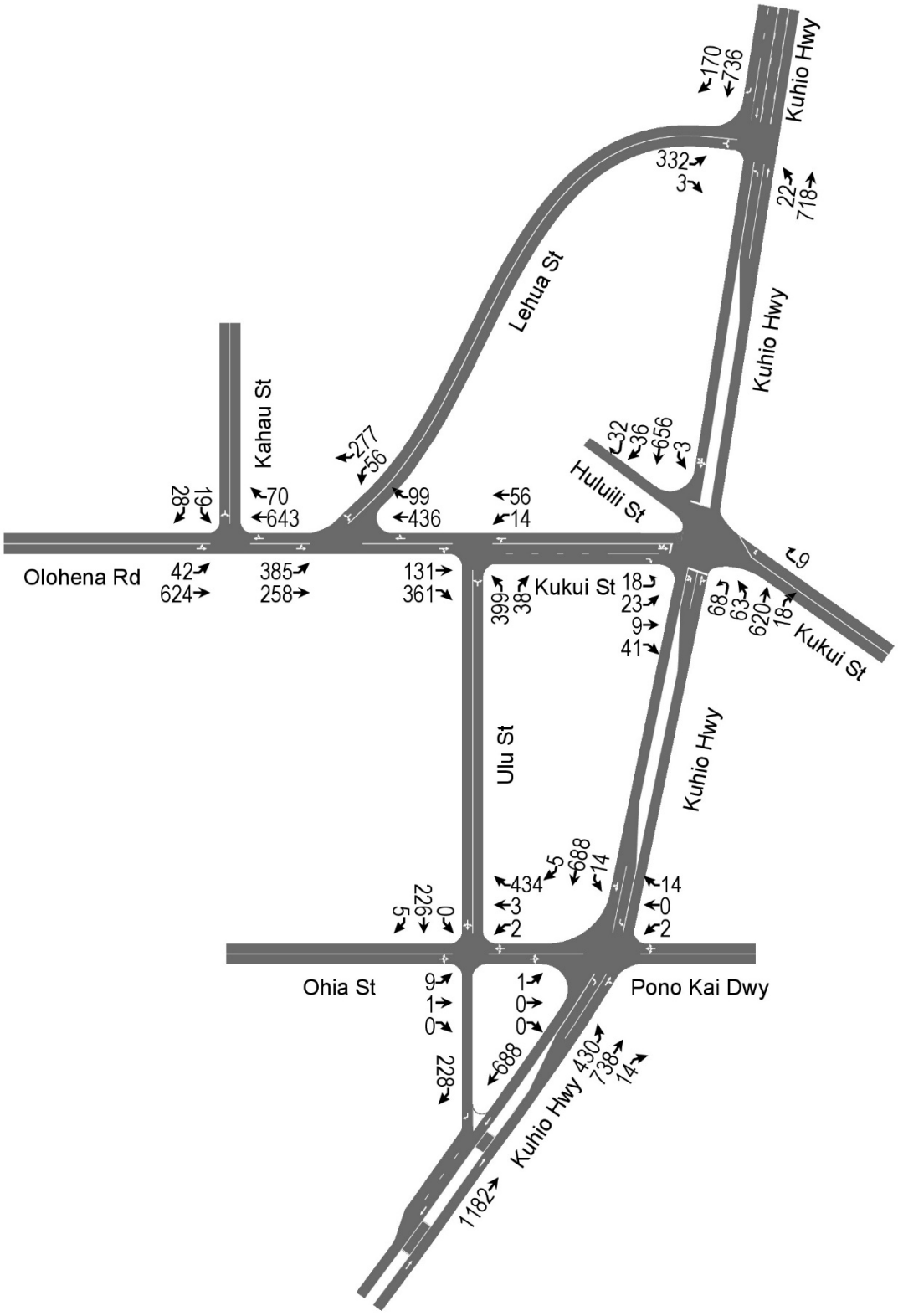

Figure 9. PM Peak Hour Volumes Without Project

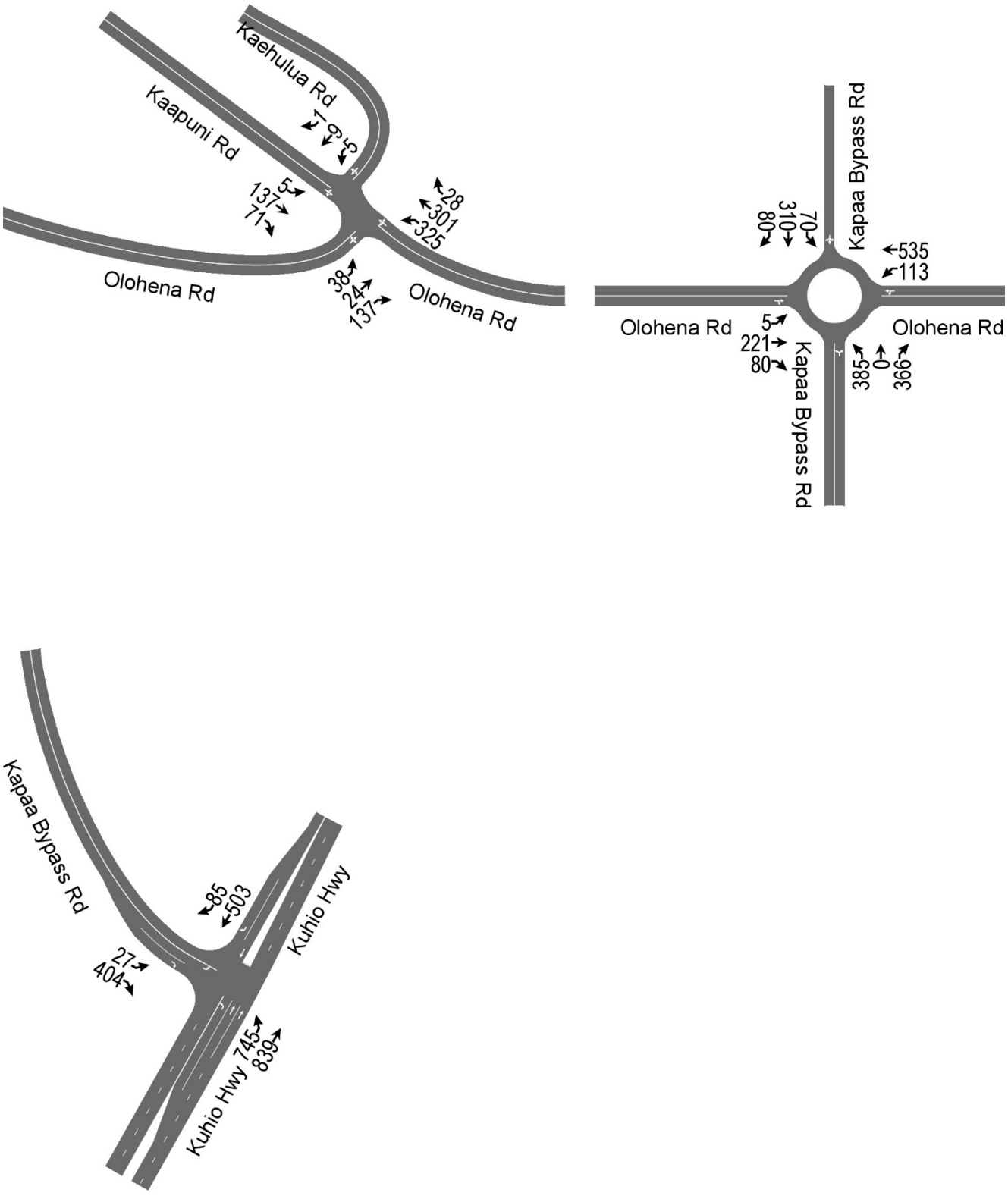

Figure 10. PM Peak Hour Volumes Without Project (Cont'd.)

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 (ITE Code)	Units	AM Peak Hour (vph)			PM Peak Hour (vph)		
		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 (820)	8,000 SFGFA	21	13	34	53	57	110
	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".

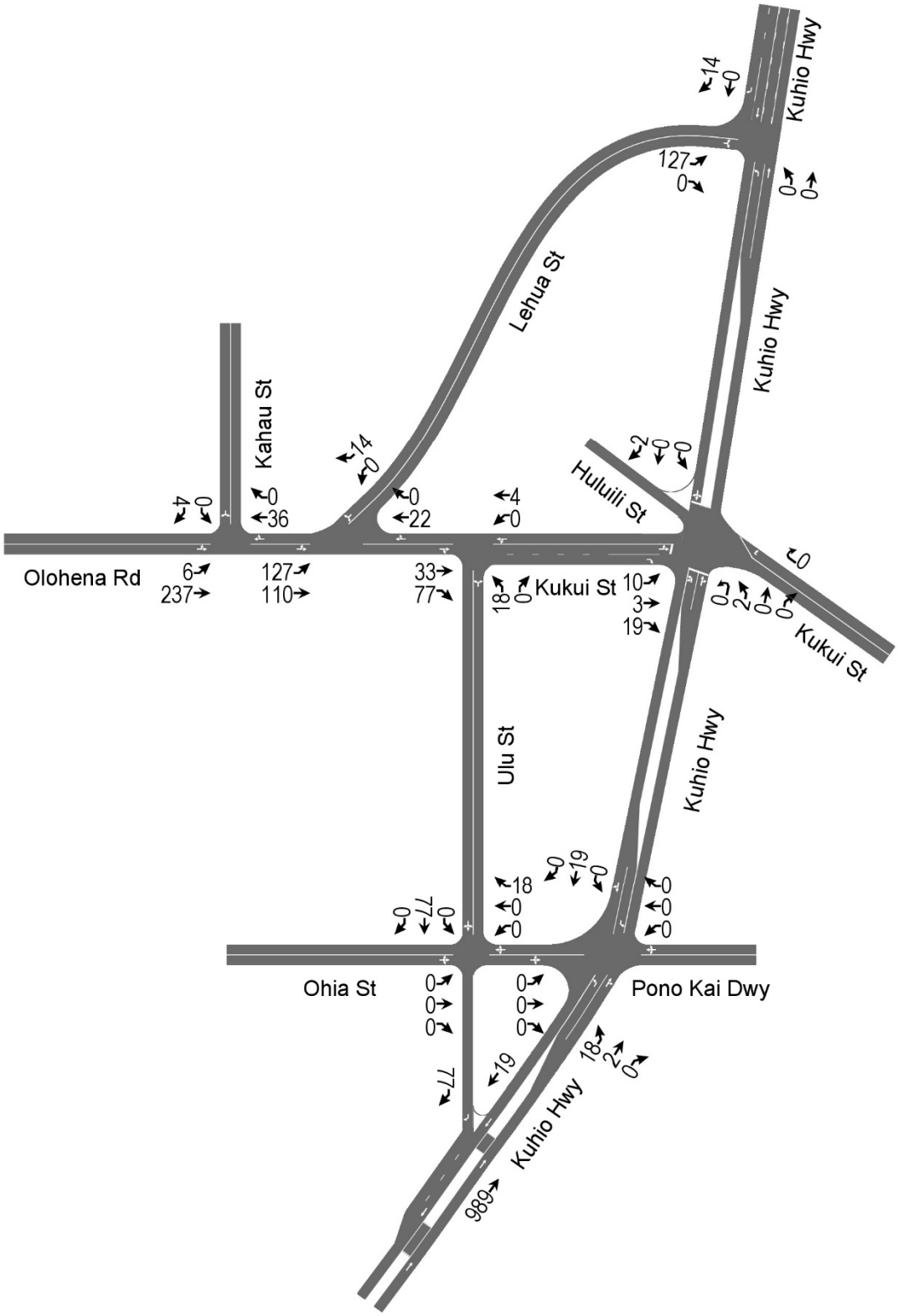

Figure 11. AM Peak Hour Site Traffic Assignment

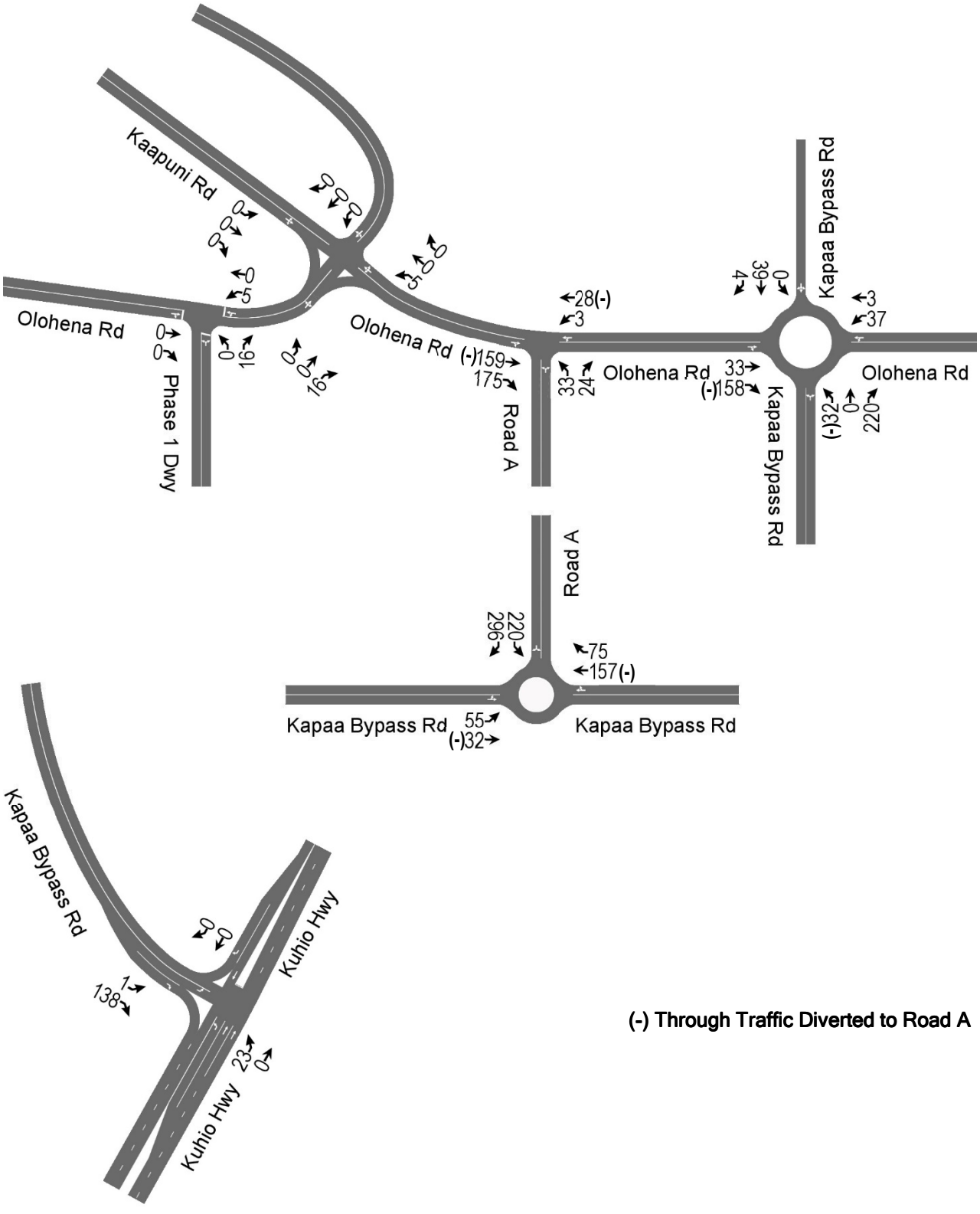

Figure 12. AM Peak Hour Site Traffic Assignment (Cont'd.)

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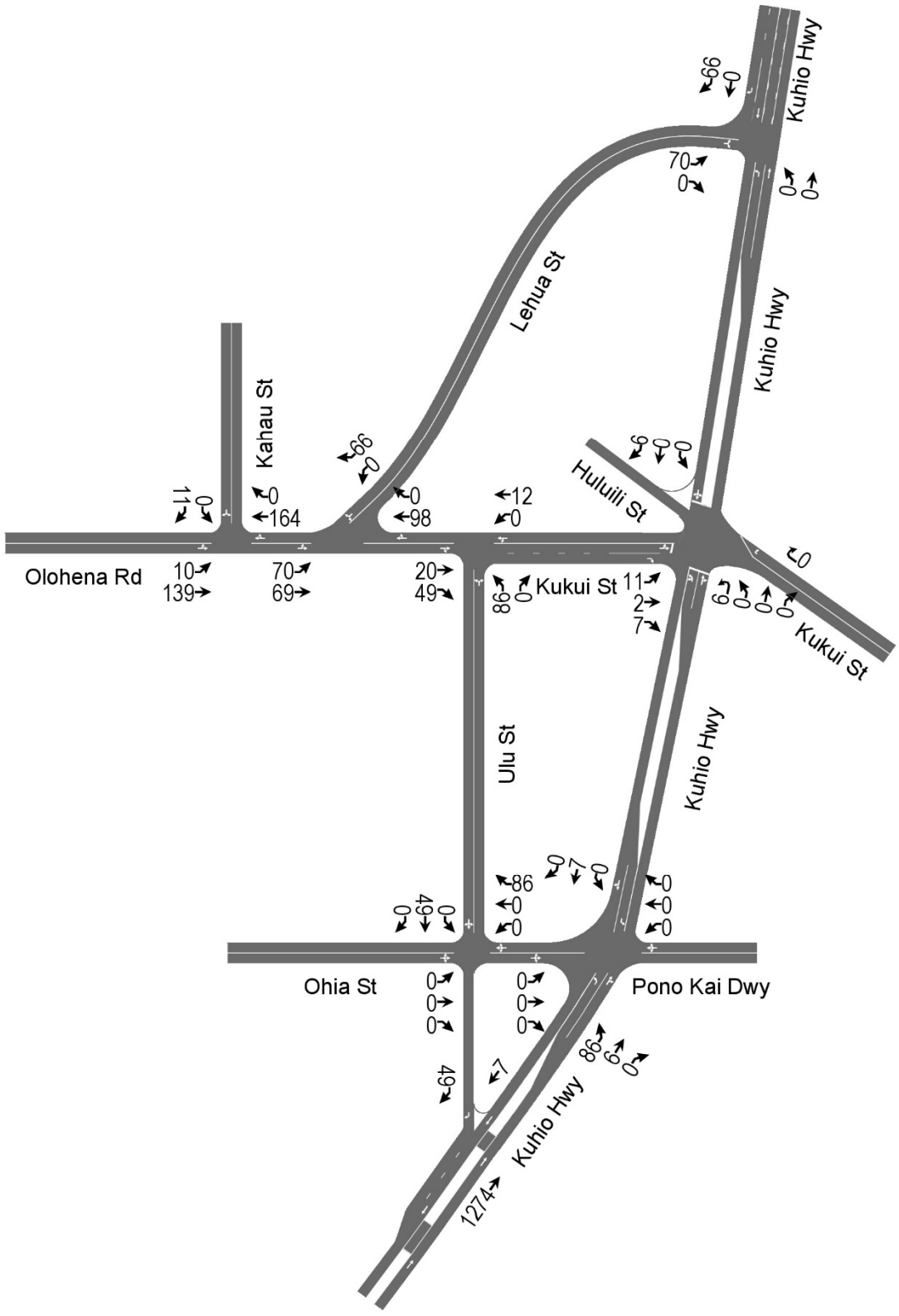

Figure 13. PM Peak Hour Site Traffic Assignment

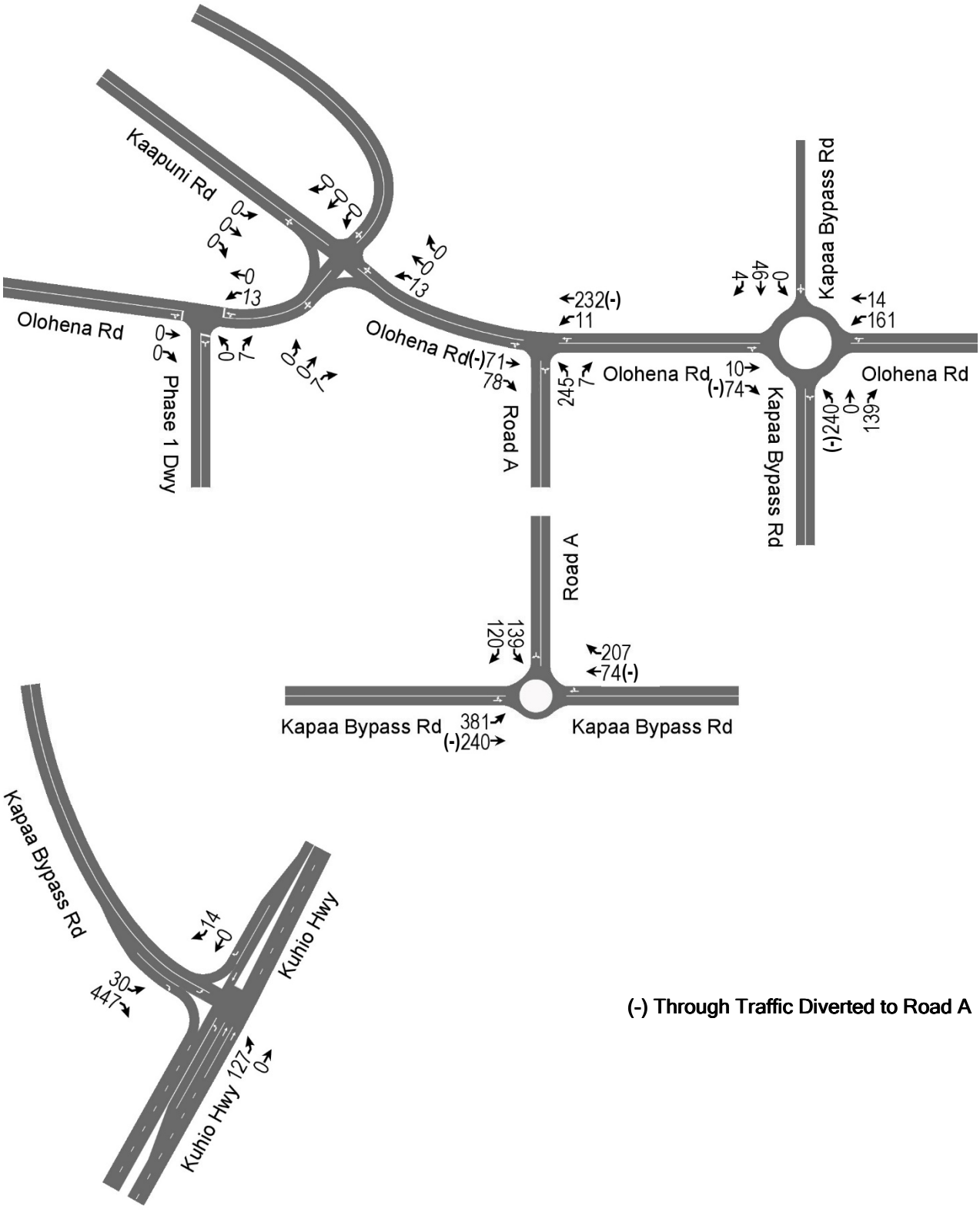

Figure 14. PM Peak Hour Site Traffic Assignment (Cont'd.)

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.

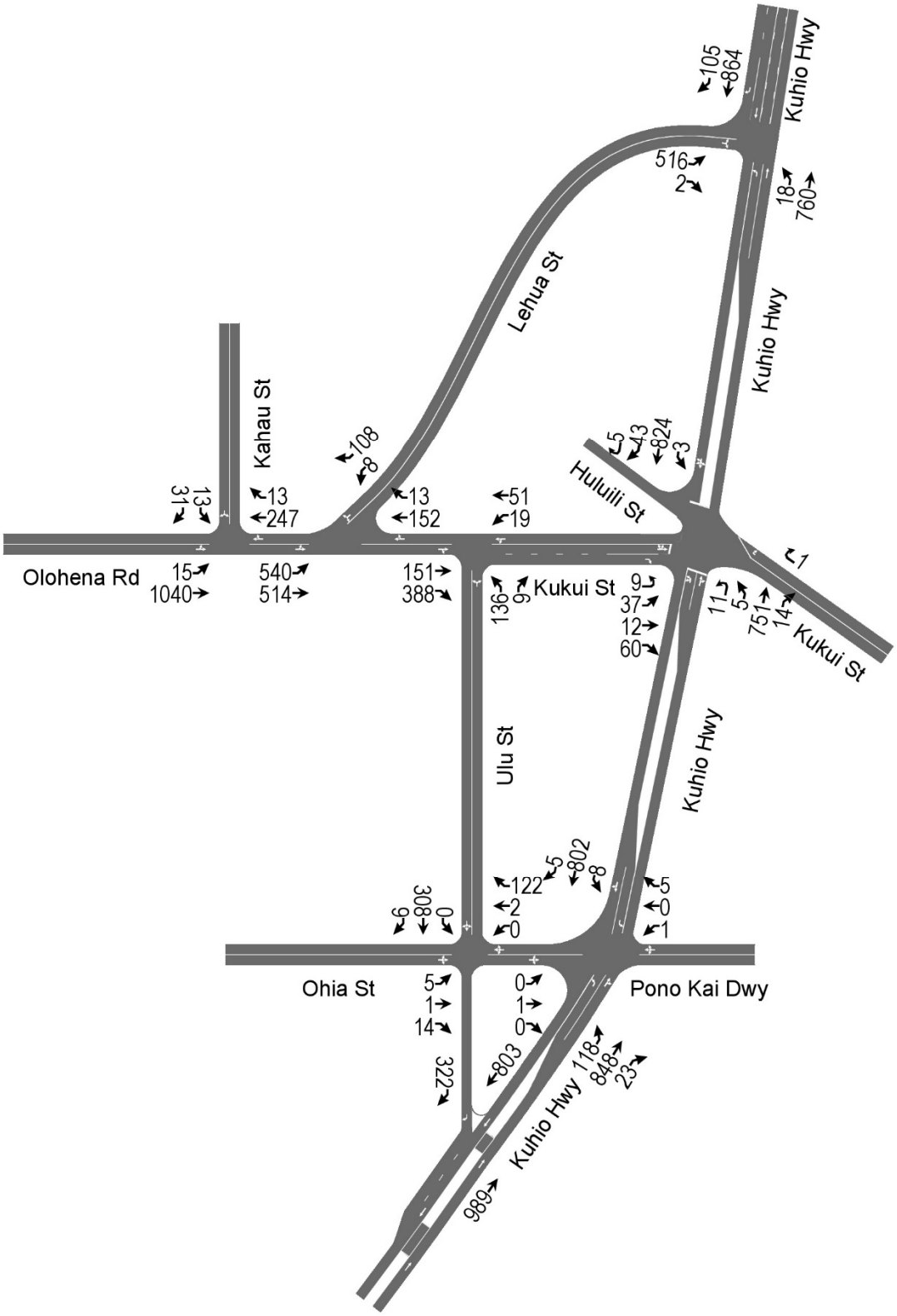

Figure 15. AM Peak Hour Volumes With Project

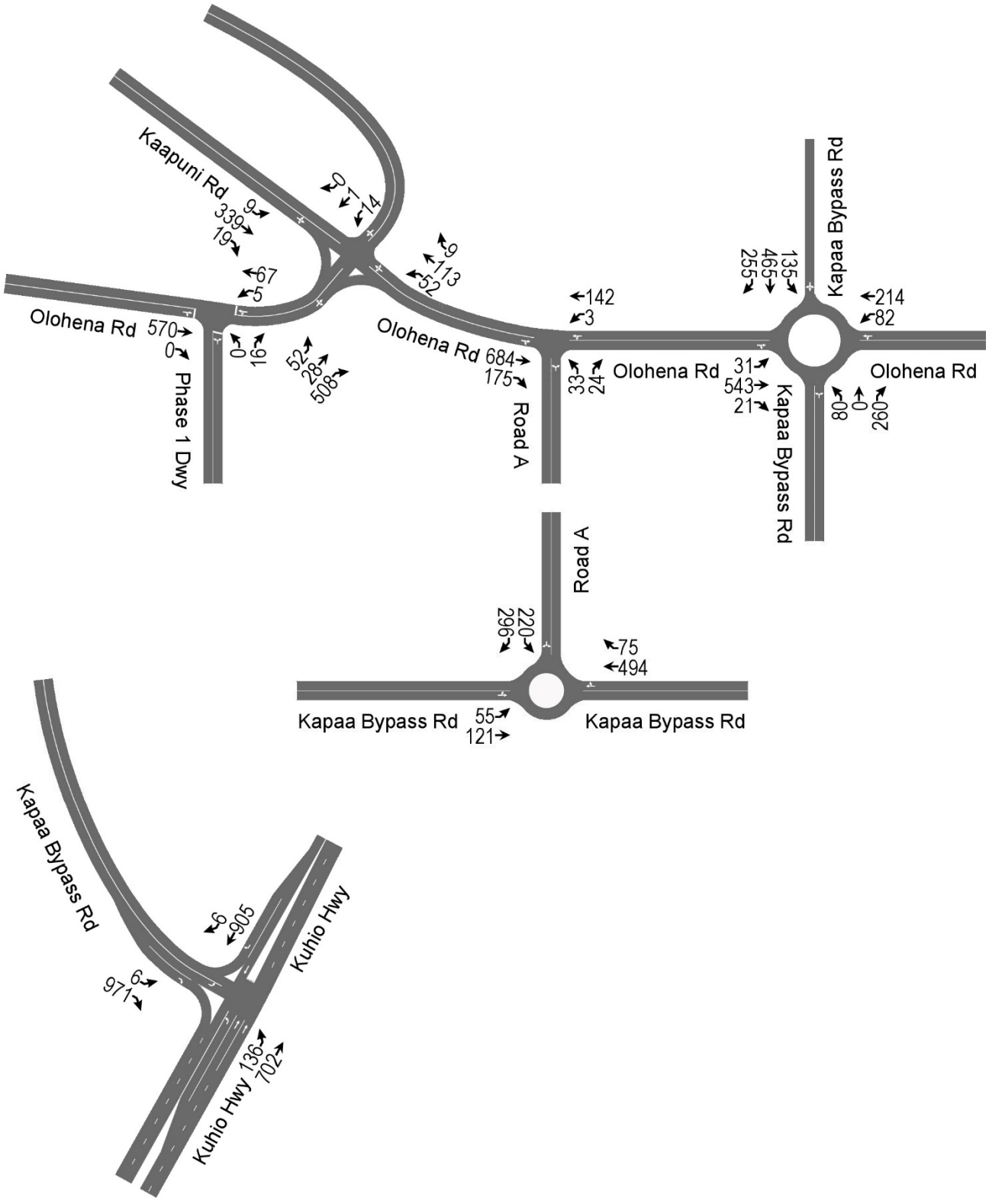

Figure 16. AM Peak Hour Volumes With Project (Cont'd.)

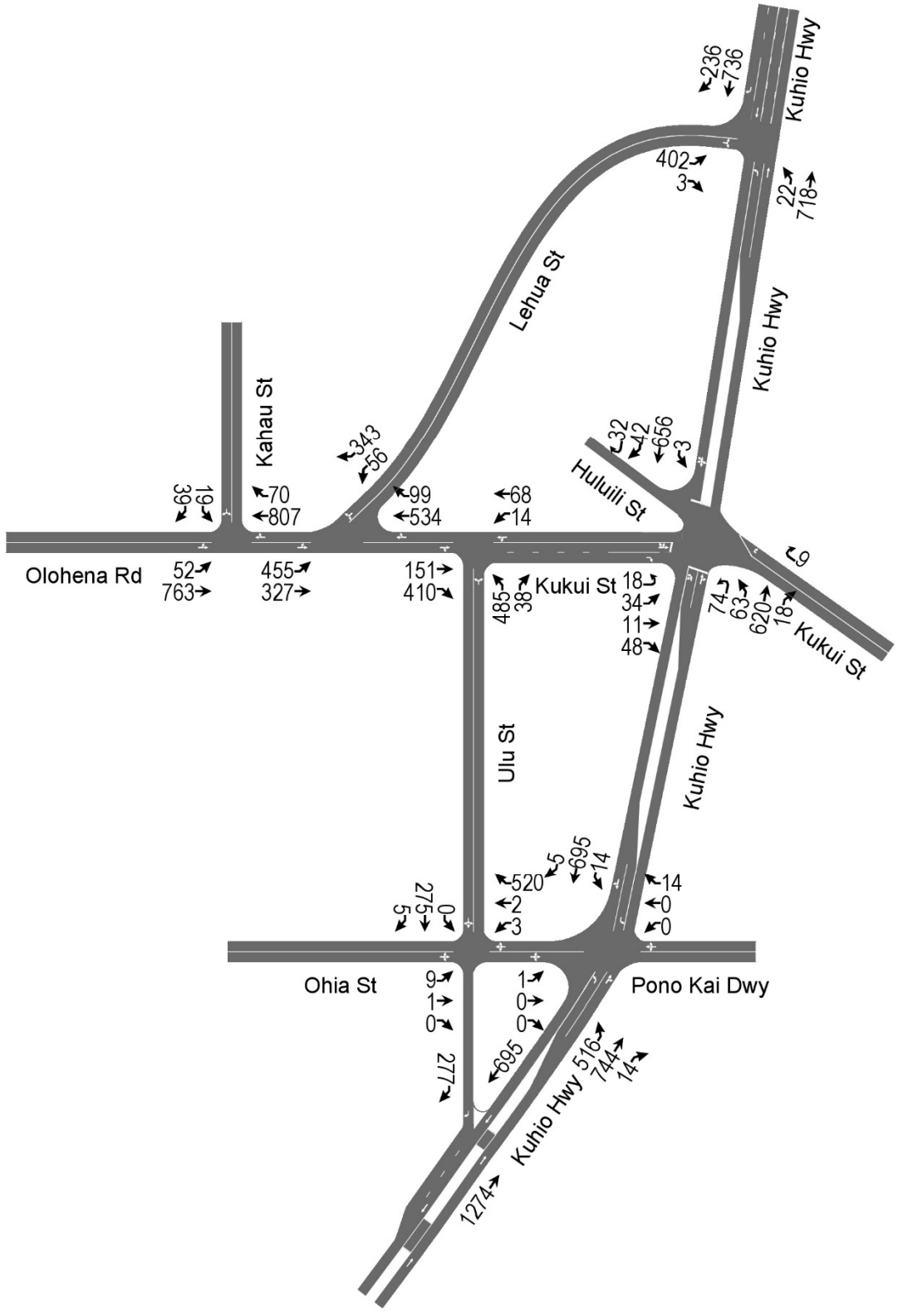

Figure 17. PM Peak Hour Volumes With Project

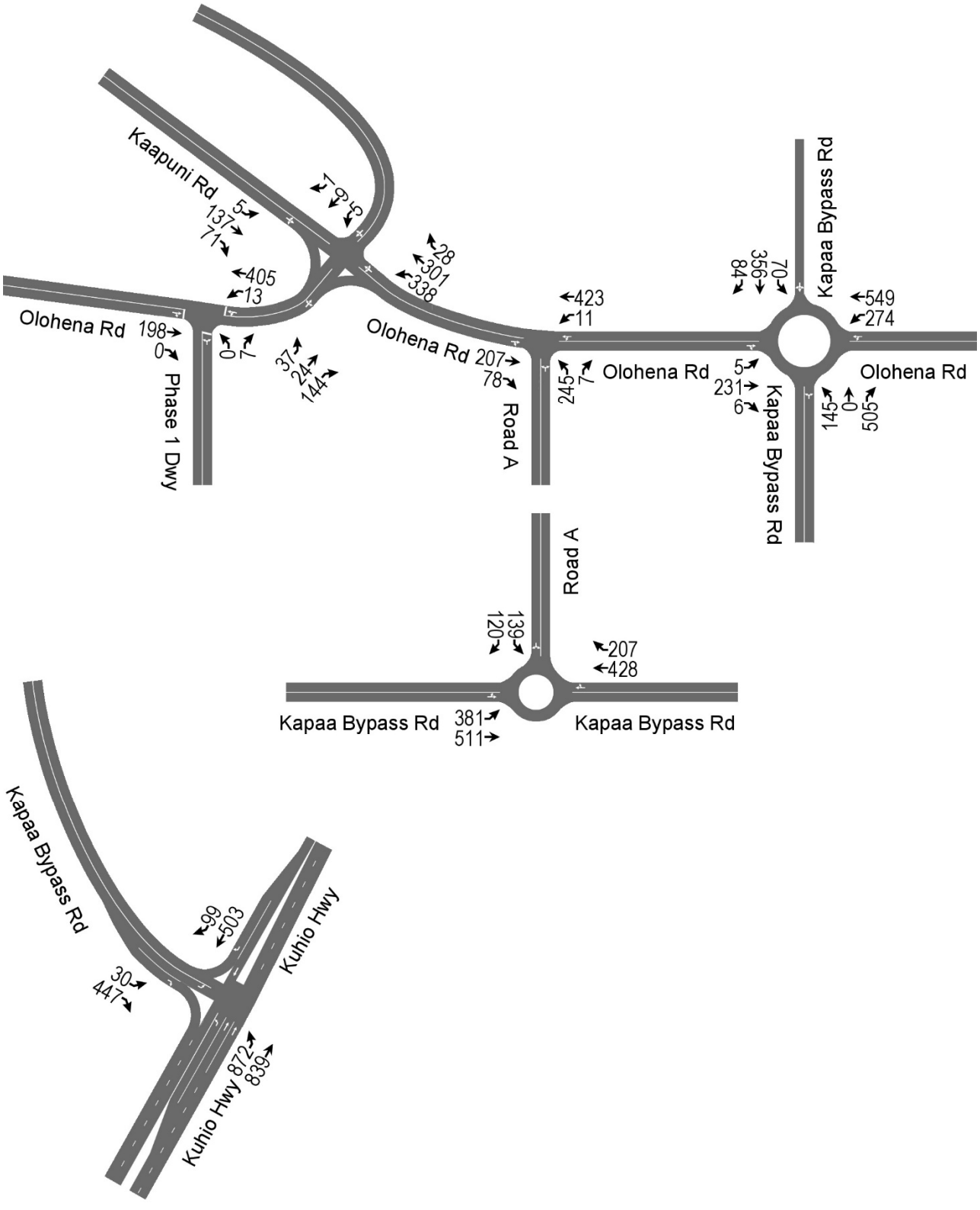

Figure 18. PM Peak Hour Volumes With Project (Cont'd.)

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 Kapa`a Transportation Solutions, 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 intersect Kaapuni Road and the makai 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 Kapa`a Transportation Solutions. 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 Kapa`a Transportation Solutions 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.

Table 7. Summary of Capacity Analysis

Scenario	Intersection	MOE	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection
Existing AM Peak Hour Traffic	Kuhio Hwy & Kukui St & Huluili St	LOS	F		C	N/A	N/A	A	A	A		A			A
		Delay	115.8		31.5	N/A	N/A	1.3	1.3	2.8		4.5			7.3
		v/c	0.49		0.34	N/A	N/A	0.02	0.02	0.42		0.48			0.49 (maximum)
	Ulu St & Kukui St	LOS	N/A	N/A	N/A	A	A	N/A	B			N/A	N/A	N/A	A
		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 & Lehua St	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B			A
		Delay	8.3	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11.7			4.4
		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 & Kahau St	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B			A
		Delay	7.6	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13.2			0.6
		v/c	0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.08			N/A
	Kuhio Hwy & Lehua St	LOS	E			N/A	N/A	N/A	A	A	N/A	N/A	A	A	A
		Delay	46.6			N/A	N/A	N/A	9.3	0.0	N/A	N/A	0.0	0.0	8.7
		v/c	0.85			N/A	N/A	N/A	0.02	0.40	N/A	N/A	0.45	0.04	N/A
	Kuhio Hwy & Ohia St/Pono Kai Dwy	LOS	E			C			A	N/A	N/A	A	N/A	N/A	A
		Delay	48.9			23.7			9.60	N/A	N/A	9.4	N/A	N/A	0.7
		v/c	0.012			0.025			0.10	N/A	N/A	0.01	N/A	N/A	N/A
	Ulu St & Ohia St	LOS	B			A						A			A
		Delay	10			8.8						0.0			3.1
		v/c	0.023			0.089						N/A			N/A
	Kapa`a Bypass Rd & Olohena Rd	LOS	D			A			A			C			C
		Delay	30			5.1			7.1			18.2			20.0
		v/c	0.855			0.204			0.19			0.757			N/A
	Olohena Rd & Kaapuni Rd	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	E			B
		Delay	7.7	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	35.1			12.3
		v/c	0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.751			N/A
	Kaapuni Rd & Kaehulua Rd	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B			A
		Delay	7.6	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11.7			0.4
		v/c	0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.024			N/A
	Kuhio Hwy & Kapa`a Bypass Rd	LOS	C	N/A	A	N/A	N/A	N/A	B	N/A	N/A	N/A	N/A	N/A	A
		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
		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

Legend

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 Capacity Analysis (Cont'd.)

Scenario	Intersection	MOE	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection
Existing PM Peak Hour Traffic	Kuhio Hwy & Kukui St & Huluili St	LOS	E		A	N/A	N/A	A	A	A		A			A
		Delay	61.6		6.9	N/A	N/A	2.4	2.4	3.4		8.2			7.4
		v/c	0.39		0.22	N/A	N/A	0.18	0.18	0.36		0.48			0.48 (maximum)
	Ulu Street & Kukui Street	LOS	N/A	N/A	N/A	A	A	N/A	C			N/A	N/A	N/A	A
		Delay	N/A	N/A	N/A	8.2	0.0	N/A	17.4			N/A	N/A	N/A	7.7
		v/c	N/A	N/A	N/A	0.01	N/A	N/A	0.567			N/A	N/A	N/A	N/A
	Olohena Road & Lehua Street	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	E			B
		Delay	9.8	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	47			12.9
		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 & Kahau Street	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	C			A
		Delay	9.1	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	19.0			0.9
		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 Hwy & Lehua Street	LOS	D			N/A	N/A	N/A	A	A	N/A	N/A	A	A	A
		Delay	29.2			N/A	N/A	N/A	9.0	0.0	N/A	N/A	0.0	0.0	5.0
		v/c	0.68			N/A	N/A	N/A	0.02	0.38	N/A	N/A	0.39	0.09	N/A
	Kuhio Hwy & Ohia St/Pono Kai Driveway	LOS	F			D			B	N/A	N/A	A	N/A	N/A	A
		Delay	143.4			33.1			11.3	N/A	N/A	9.0	N/A	N/A	3.0
		v/c	0.04			0.10			0.40	N/A	N/A	0.01	N/A	N/A	N/A
	Ulu Street & Ohia Street	LOS	C			B			N/A	N/A	N/A	A	N/A	N/A	A
		Delay	15.5			10.6			N/A	N/A	N/A	0.0	N/A	N/A	7.1
		v/c	0.03			0.38			N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Kapa`a Bypass Rd & Olohena Rd	LOS	A			B			B			D			B
		Delay	7.9			11.5			11.5			26.6			14.2
		v/c	0.32			0.57			0.61			0.73			N/A
	Olohena Rd & Kaapuni Rd	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	C			B
		Delay	8.7	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17.3			4.1
		v/c	0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.39			N/A
	Kaapuni Rd & Kaehulua Rd	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B			A
		Delay	7.9	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11.7			0.4
		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 Hwy & Kapa`a Bypass Rd	LOS	B	N/A	C	N/A	N/A	N/A	B	N/A	N/A	N/A	N/A	N/A	A
		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
		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. Summary of Capacity Analysis (Cont'd.)

Scenario	Intersection	MOE	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection
AM Peak Hour Traffic Without Project	Kuhio Hwy & Kukui Street & Huluili Street	LOS	F		C	N/A	N/A	A	A	A		A			A
		Delay	117.0		29.9	N/A	N/A	1.5	1.5	3.7		6.3			8.5
		v/c	0.52		0.36	N/A	N/A	0.03	0.03	0.49		0.57			0.57 (maximum)
	Ulu Street & Kukui Street	LOS	N/A	N/A	N/A	A	A	N/A	B			N/A	N/A	N/A	A
		Delay	N/A	N/A	N/A	8.5	0.0	N/A	12.2			N/A	N/A	N/A	2.7
		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 & Lehua Street	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B			A
		Delay	8.5	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13.1			4.6
		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 & Kahau Street	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B			A
		Delay	7.7	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14.2			0.6
		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 & Lehua Street	LOS	F			N/A	N/A	N/A	A	A	N/A	N/A	A	A	B
		Delay	104.5			N/A	N/A	N/A	9.7	0.0	N/A	N/A	0.0	0.0	19.3
		v/c	1.33			N/A	N/A	N/A	0.02	0.45	N/A	N/A	0.51	0.06	N/A
	Kuhio Hwy & Ohia St/Pono Kai Driveway	LOS	F			D			B	N/A	N/A	A	N/A	N/A	A
		Delay	65			27.4			10.00	N/A	N/A	9.8	N/A	N/A	0.7
		v/c	0.016			0.036			0.12	N/A	N/A	0.01	N/A	N/A	N/A
	Ulu Street & Ohia Street	LOS	B			A			N/A	N/A	N/A	A	N/A	N/A	A
		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
	Kapa`a Bypass Rd & Olohena Rd	LOS	F			A			A			D			E
		Delay	64.9			5.4			7.4			30.1			38.7
		v/c	1.027			0.233			0.174			0.888			N/A
	Olohena Rd & Kaapuni Rd	LOS	-	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B			A
		Delay	-	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11.4			7.8
		v/c	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.399			N/A
	Kaapuni Rd & Kaehulua Rd	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B			A
		Delay	7.6	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12.6			0.4
		v/c	0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.031			N/A
	Kuhio Hwy & Kapa`a Bypass Rd	LOS	C	N/A	A	N/A	N/A	N/A	B	N/A	N/A	N/A	N/A	N/A	A
		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
		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
PM Peak Hour Traffic Without Project	Kuhio Hwy & Kukui St & Huluili St	LOS	E		A	N/A	N/A	A	A	A		A			A
		Delay	62.1		8.6	N/A	N/A	2.7	2.7	3.9		9.6			8.3
		v/c	0.42		0.25	N/A	N/A	0.22	0.22	0.41		0.55			0.55 (maximum)
	Ulu Street & Kukui Street	LOS	N/A	N/A	N/A	A	A	N/A	C			N/A	N/A	N/A	B
		Delay	N/A	N/A	N/A	8.5	0.0	N/A	24.7			N/A	N/A	N/A	10.9
		v/c	N/A	N/A	N/A	0.01	N/A	N/A	0.72			N/A	N/A	N/A	N/A
	Olohena Road & Lehua Street	LOS	B	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F			E
		Delay	10.8	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	199.9			46.8
		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 & Kahau Street	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	C			A
		Delay	9.5	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	24.3			1.1
		v/c	0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.20			N/A
	Kuhio Hwy & Lehua Street	LOS	E			N/A	N/A	N/A	A	A	N/A	N/A	A	A	B
		Delay	48.4			N/A	N/A	N/A	9.3	0.0	N/A	N/A	0.0	0.0	19.3
		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 & Ohia St/Pono Kai Driveway	LOS	F			E			B	N/A	N/A	A	N/A	N/A	A
		Delay	261.5			47.7			12.80	N/A	N/A	9.3	N/A	N/A	3.5
		v/c	0.067			0.16			0.48	N/A	N/A	0.02	N/A	N/A	N/A
	Ulu Street & Ohia Street	LOS	C			B			N/A	N/A	N/A	A	N/A	N/A	A
		Delay	17.5			11.1			N/A	N/A	N/A	0.0	N/A	N/A	7.4
		v/c	0.033			0.428			N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Kapa`a Bypass Rd & Olohena Rd	LOS	A			C			C			F			D
		Delay	9.8			16.8			16.9			72.9			27.7
		v/c	0.399			0.714			0.744			1.002			N/A
	Olohena Road & Kaapuni Road	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	C			A
		Delay	9.1	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	23.5			5.4
		v/c	0.07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.538			N/A
	Kaapuni Road & Kaehulua Road	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B			A
		Delay	8.1	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12.6			0.4
		v/c	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.031			N/A
	Kuhio Hwy & Kapa`a Bypass Rd	LOS	C	N/A	D	N/A	N/A	N/A	C	N/A	N/A	N/A	N/A	N/A	A
		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
		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
AM Peak Hour Traffic With Project	Kuhio Hwy & Kukui Street & Huluili Street	LOS	F		C	N/A	N/A	A	A	A		A			A
		Delay	118.9		26.1	N/A	N/A	1.8	1.8	4.1		7.0			10.0
		v/c	0.59		0.42	N/A	N/A	0.03	0.03	0.49		0.57			0.59 (maximum)
	Ulu Street & Kukui Street	LOS	N/A	N/A	N/A	A	A	N/A	B			N/A	N/A	N/A	A
		Delay	N/A	N/A	N/A	8.8	0.0	N/A	13.6			N/A	N/A	N/A	2.8
		v/c	N/A	N/A	N/A	0.02	N/A	N/A	0.257			N/A	N/A	N/A	N/A
	Olohena Road & Lehua Street	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	C			A
		Delay	9.2	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	19			5.4
		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 & Kahau Street	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	C			A
		Delay	7.8	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17.3			0.6
		v/c	0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.13			N/A
	Kuhio Hwy & Lehua Street	LOS	F			N/A	N/A	N/A	A	A	N/A	N/A	A	A	F
		Delay	237.5			N/A	N/A	N/A	9.7	0.0	N/A	N/A	0.0	0.0	54.4
		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 & Ohia Street/Pono Kai Driveway	LOS	F			D			B	N/A	N/A	A	N/A	N/A	A
		Delay	71.7			29.0			10.2	N/A	N/A	9.8	N/A	N/A	0.8
		v/c	0.02			0.04			0.15	N/A	N/A	0.01	N/A	N/A	N/A
	Ulu Street & Ohia Street	LOS	B			A			N/A	N/A	N/A	A	N/A	N/A	A
		Delay	11			8.9			N/A	N/A	N/A	0.0	N/A	N/A	2.9
		v/c	0.03			0.12			N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Kapa`a Bypass Rd & Olohena Rd	LOS	E			A			B			E			D
		Delay	42.1			5.7			14.5			40.7			31.9
		v/c	0.91			0.27			0.53			0.95			N/A
	Road A & Olohena Road	LOS	N/A	N/A	N/A	A	A	N/A	C			N/A	N/A	N/A	A
		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			N/A	N/A	N/A	N/A
	Olohena Road & Kaapuni Road	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F			D
		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 & Kaehulua Rd	LOS	A	A	N/A	N/A	B	N/A	N/A	N/A	N/A	B			A
		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 & Olohena Rd	LOS	N/A	N/A	N/A	A	A	N/A	B			N/A	N/A	N/A	A
		Delay	N/A	N/A	N/A	8.6	0.0	N/A	12.1			N/A	N/A	N/A	0.4
		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 Hour Traffic With Project (Cont'd.)	Kapa`a Bypass Road & Road A	LOS	A			A			N/A			C			B
		Delay	4.8			7.3			N/A			15.1			10.1
		v/c	0.16			0.45			N/A			0.64			N/A
	Kuhio Hwy & Kapa`a Bypass Road	LOS	F	N/A	A	N/A	N/A	N/A	B	N/A	N/A	N/A	N/A	N/A	A
		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
		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
AM Peak Hour Traffic With Project - Improved	Kuhio Hwy & Kukui Street & Huluili Street	LOS	C		B	N/A	N/A	A	A	A		A			A
		Delay	32.8		11.4	N/A	N/A	0.0	3.8	7.0		8.2			.6
		v/c	0.31		0.27	N/A	N/A	N/A	0.03	0.56		0.63			0.63 (maximum)
	Kuhio Hwy & Lehua Street	LOS	F			N/A	N/A	N/A	A	A	N/A	N/A	A	A	E
		Delay	196.5			N/A	N/A	N/A	9.7	0.0	N/A	N/A	0.0	0.0	45.0
		v/c	1.34			N/A	N/A	N/A	0.02	0.45	N/A	N/A	0.51	0.06	N/A
	Kapa`a Bypass Rd & Olohena Rd	LOS	C			A			B			B		A	B
		Delay	23.9			5.4			11.1			12.1		0.0	12.9
		v/c	0.79			0.25			0.46			0.61		0.13	N/A
	Olohena Rd & Kaapuni Road & Kaehulua Road	LOS	A	A		A	A		D			E			B
		Delay	7.5	0.0		8.1	0.0		34.9			43.2			19.0
		v/c	0.01	N/A		0.04	-		0.87			0.14			N/A
	Kuhio Hwy & Kapa`a Bypass Road	LOS	C	N/A	A	N/A	N/A	N/A	B	A	N/A	N/A	A	A	A
		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
		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
PM Peak Hour Traffic With Project	Kuhio Hwy & Kukui Street & Huluili Street	LOS	E		B	N/A	N/A	A	A	A		B			A
		Delay	63.3		11.1	N/A	N/A	3.0	3.0	4.2		10.5			9.4
		v/c	0.48		0.27	N/A	N/A	0.23	0.23	0.42		0.56			0.56 (maximum)
	Ulu Street & Kukui Street	LOS	N/A	N/A	N/A	A	A	N/A	E			N/A	N/A	N/A	A
		Delay	N/A	N/A	N/A	8.7	0.0	N/A	49.9			N/A	N/A	N/A	22.5
		v/c	N/A	N/A	N/A	0.01	N/A	N/A	0.93			N/A	N/A	N/A	N/A
	Olohena Road & Lehua Street	LOS	B	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F			A
		Delay	12.7	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	714.0			160.2
		v/c	0.49	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.45			N/A
	Olohena Road & Kahau Street	LOS	B	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	E			A
		Delay	10.4	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36.5			1.5
		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
PM Peak Hour Traffic With Project (Cont'd.)	Kuhio Hwy & Lehua Street	LOS	F			N/A	N/A	N/A	A	A	N/A	N/A	A	A	B
		Delay	85.7			N/A	N/A	N/A	9.3	0.0	N/A	N/A	0.0	0.0	12.5
		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 & Ohia St/Pono Kai Driveway	LOS	F			B			B	N/A	N/A	A	N/A	N/A	A
		Delay	401.7			14.6			14.6	N/A	N/A	9.3	N/A	N/A	4.1
		v/c	0.10			0.04			0.58	N/A	N/A	0.02	N/A	N/A	N/A
	Ulu Street & Ohia Street	LOS	C			B			N/A	N/A	N/A	A	N/A	N/A	A
		Delay	21.7			12.1			N/A	N/A	N/A	0.0	N/A	N/A	8.1
		v/c	0.04			0.51			N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Kapa`a Bypass Rd & Olohena Rd	LOS	B			B			B			F			D
		Delay	11.3			14.2			13.3			84.7			29.8
		v/c	0.39			0.72			0.65			1.05			N/A
	Road A & Olohena Road	LOS	N/A	N/A	N/A	A	A	N/A	D			N/A	N/A	N/A	A
		Delay	N/A	N/A	N/A	7.8	0.0	N/A	26.7			N/A	N/A	N/A	7.0
		v/c	N/A	N/A	N/A	0.01	N/A	N/A	0.61			N/A	N/A	N/A	N/A
	Olohena Road & Kaapuni Road	LOS	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	C			D
		Delay	9.1	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	24.5			5.5
		v/c	0.07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.55			N/A
	Kaapuni Road & Kaehulua Road	LOS	A	A	N/A	N/A	B	N/A	N/A	N/A	N/A	B			A
		Delay	8.1	0.0	N/A	N/A	12.6	N/A	N/A	N/A	N/A	12.6			0.4
		v/c	0.00	-	N/A	N/A	0.03	N/A	N/A	N/A	N/A	0.03			N/A
	Phase 1 Dwy & Olohena Road	LOS	N/A	N/A	N/A	A	A	N/A	A			N/A	N/A	N/A	A
		Delay	N/A	N/A	N/A	7.6	0.0	N/A	9.3			N/A	N/A	N/A	0.2
		v/c	N/A	N/A	N/A	0.01	N/A	N/A	0.01			N/A	N/A	N/A	N/A
	Kapa`a Bypass Rd & Road A	LOS	C			C			N/A			A			B
		Delay	16.0			16.1			N/A			7.4			14.8
		v/c	0.76			0.70			75			0.30			N/A
	Kuhio Hwy & Kapa`a Bypass Road	LOS	E	N/A	A	N/A	N/A	N/A	C	N/A	N/A	N/A	N/A	N/A	B
		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
		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 Hour Traffic With Project - Improved	Kuhio Hwy & Kukui Street & Huluili Street	LOS	C		A	N/A	N/A	A	A	A		B			B
		Delay	32.0		1.8	N/A	N/A	0.1	4.0	5.9		16.7			11.4
		v/c	0.32		0.18	N/A	N/A	N/A	0.24	0.46		0.66			0.66 (maximum)
	Kuhio Hwy & Lehua Street	LOS	F			N/A	N/A	N/A	A	A	N/A	N/A	A	A	B
		Delay	65.9			N/A	N/A	N/A	9.3	0.0	N/A	N/A	0.0	0.0	12.7
		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**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**Intersection**
PM Peak Hour Traffic With Project – Improved (Cont'd.)	**Kapa`a Bypass Rd & Olohena Rd**	**LOS**	A			B			B			D		A	B
		Delay	9.1			12.5			11.2			25.1		0.0	13.7
		v/c	0.33			0.68			0.60			0.72		0.04	N/A
	Olohena Rd & Kaapuni Road & Kaehulua Road	**LOS**	A	A		A	A		C			E			A
		Delay	7.9	0.0		8.2	0.0		21.3			36.0			7.1
		v/c	0.00	N/A		0.23	N/A		0.48			0.12			N/A
	Kuhio Hwy & Kapa`a Bypass Road	**LOS**	E	N/A	A	N/A	N/A	N/A	C	A	N/A	N/A	A	A	A
		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
		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	Kukui St Makai Bound				Kukui St Mauka Bound				Kuhio Hwy Northbound				Kuhio Hwy Southbound				Intersection	
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																		
7:00 AM	0	8	2	8	0	0	0	2	1	1	124	1	0	184	2	2	335	1397
7:15 AM	2	6	0	9	0	0	0	0	2	1	166	3	0	182	9	0	**380**	**1410**
7:30 AM	0	6	1	15	0	0	0	0	7	5	143	1	1	153	6	1	339	1367
7:45 AM	2	3	3	15	0	0	0	0	4	4	153	1	0	151	7	0	343	1399
8:00 AM	2	11	4	9	0	0	0	1	3	1	143	2	2	165	2	3	348	1397
8:15 AM	0	0	1	3	0	0	0	4	4	1	143	4	3	172	2	0	337	
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																		
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	1	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	0	4	0	11	0	0	0	2	5	0	172	2	0	170	5	0	371	1415
7:30 AM	1	10	1	12	0	0	0	3	9	1	141	2	1	167	5	0	353	1395
7:45 AM	1	7	2	12	0	0	0	2	3	0	145	2	2	164	14	0	354	1364
8:00 AM	1	9	0	14	0	0	0	4	11	2	135	3	2	149	7	0	337	
8:15 AM	3	5	1	7	0	0	0	11	5	0	146	4	2	155	12	0	351	
8:30 AM	0	6	0	6	0	0	0	2	4	0	125	3	2	164	10	0	322	

AM Peak Hour Traffic			3/16/17															
7:15 AM	6	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 Hour Traffic			3/16/17															
5:00 PM	13	21	4	24	0	0	0	11	25	18	544	13	3	581	29	19	1305	
PHF	0.81	1.05	0.50	0.67	N/A	N/A	N/A	1.38	0.42	0.32	0.99	0.81	N/A	1.00	0.91	0.68	0.93	
PHV	16	20	8	36	0	0	0	8	60	56	548	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%		

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Count Name: Kuhio Hwy Lehua St 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017

Turning Movement Data

Start Time	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	Peds	App. Total	Int. Total
3:00 PM	71	3	1	74	2	142	0	144	0	140	59	0	199	417
3:15 PM	68	4	14	72	4	137	0	141	0	146	51	0	197	410
3:30 PM	75	2	8	77	2	136	0	138	0	154	56	0	210	425
3:45 PM	72	1	2	73	2	148	0	150	0	134	45	0	179	402
Hourly Total	286	10	25	296	10	563	0	573	0	574	211	0	785	1654
4:00 PM	69	4	6	73	1	145	1	146	0	135	54	0	189	408
4:15 PM	72	2	1	74	5	144	1	149	0	139	37	0	176	399
4:30 PM	75	2	5	77	3	143	0	146	0	130	45	0	175	398
4:45 PM	74	0	5	74	5	160	0	165	0	164	38	0	202	441
Hourly Total	290	8	17	298	14	592	2	606	0	568	174	0	742	1646
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
5:45 PM	69	2	8	71	1	161	0	162	0	131	25	0	156	389
Hourly Total	332	5	22	337	10	603	0	613	0	553	165	0	718	1668
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 AM	51	0	1	51	0	140	0	140	0	213	8	0	221	412
7:15 AM	86	0	2	86	4	168	0	172	0	191	20	0	211	469
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	184	15	0	199	445
Hourly Total	296	2	5	298	6	651	0	657	0	758	58	0	816	1771
8:00 AM	45	0	4	45	2	169	0	171	1	189	18	0	208	424
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	154	19	643	0	662	1	718	67	0	786	1602
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	85	2	3	87	3	131	0	134	0	153	49	0	202	423
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	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	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 ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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
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
Hourly Total	280	1	4	281	4	639	0	643	0	743	52	0	795	1719
8:00 AM	42	1	3	43	4	144	0	148	0	168	10	0	178	369
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	-	-	-
Total %	15.8	0.3	-	16.2	0.7	36.5	-	37.2	0.0	39.0	7.6	-	46.6	-
Lights	2566	56	-	2622	109	5892	-	6001	1	6326	1180	-	7507	16130
% 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	-	-

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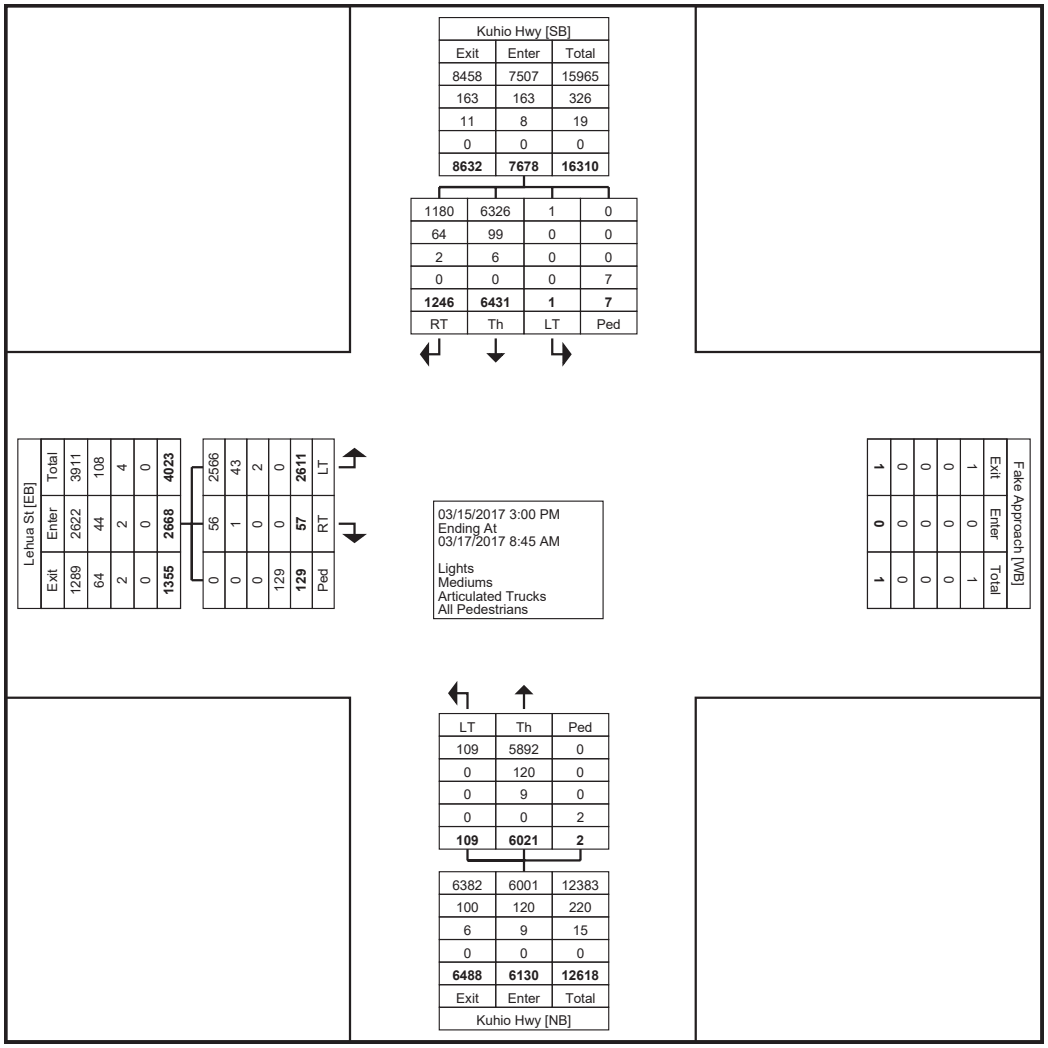
Count Name: Kuhio Hwy Lehua St 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017
Page No: 2



Turning Movement Data Plot

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Count Name: Kuhio Hwy Lehua St 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017

Turning Movement Peak Hour Data (4:45 PM)

Start Time	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	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	-	-	-	-	-	-	-	-	-	-	-

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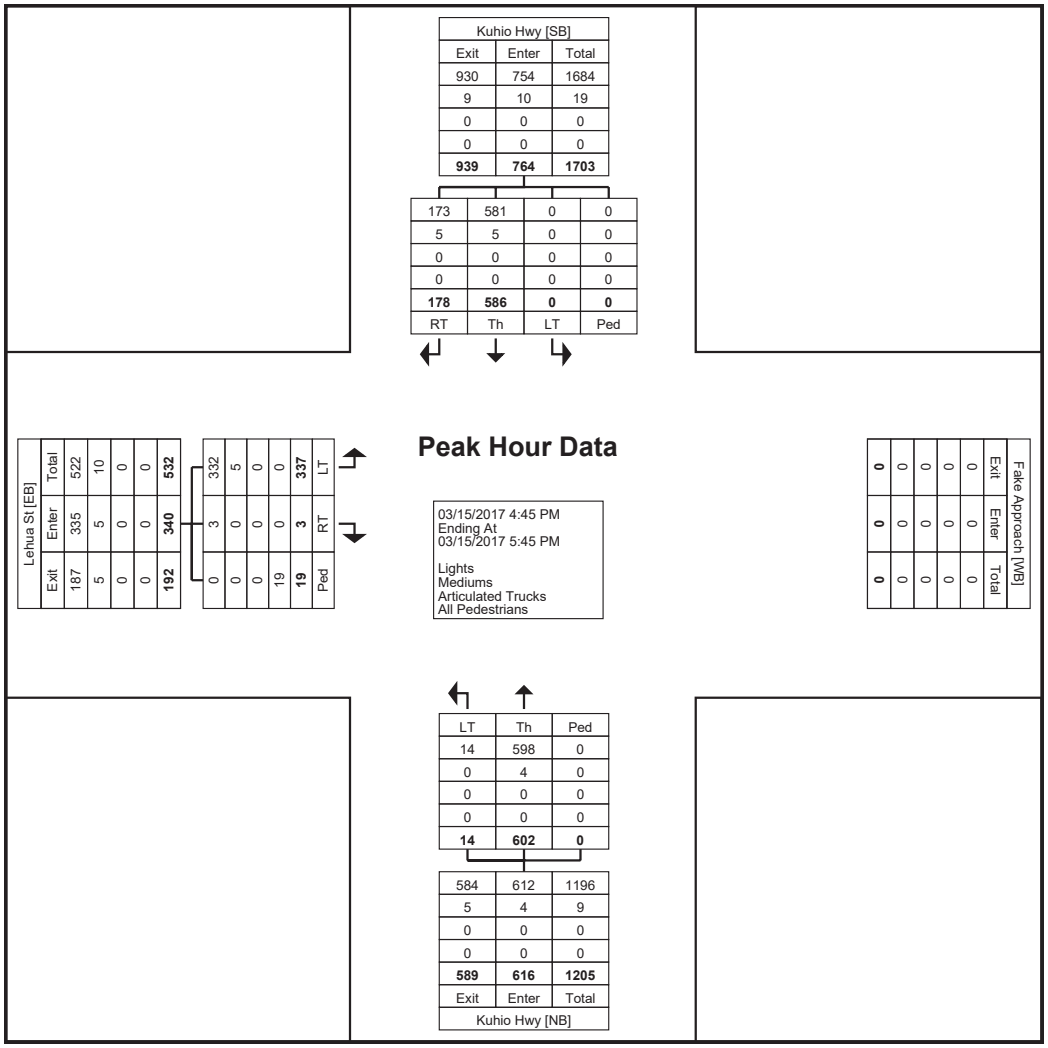
Site Code: Hokua Place
Start Date: 03/15/2017
Page No: 4



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

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Count Name: Kuhio Hwy Lehua St 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017

Turning Movement Peak Hour Data (7:15 AM)

Start Time	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	Peds	App. Total	Int. Total
7:15 AM	86	0	2	86	4	168	0	172	0	191	20	0	211	469
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	184	15	0	199	445
8:00 AM	45	0	4	45	2	169	0	171	1	189	18	0	208	424
Total	290	2	8	292	8	680	0	688	1	734	68	0	803	1783
Approach %	99.3	0.7	-	-	1.2	98.8	-	-	0.1	91.4	8.5	-	-	-
Total %	16.3	0.1	-	16.4	0.4	38.1	-	38.6	0.1	41.2	3.8	-	45.0	-
PHF	0.763	0.500	-	0.760	0.500	0.944	-	0.950	0.250	0.961	0.850	-	0.951	0.950
Lights	287	2	-	289	8	658	-	666	1	720	57	-	778	1733
% Lights	99.0	100.0	-	99.0	100.0	96.8	-	96.8	100.0	98.1	83.8	-	96.9	97.2
Mediums	3	0	-	3	0	20	-	20	0	13	10	-	23	46
% Mediums	1.0	0.0	-	1.0	0.0	2.9	-	2.9	0.0	1.8	14.7	-	2.9	2.6
Articulated Trucks	0	0	-	0	0	2	-	2	0	1	1	-	2	4
% Articulated Trucks	0.0	0.0	-	0.0	0.0	0.3	-	0.3	0.0	0.1	1.5	-	0.2	0.2
All Pedestrians	-	-	8	-	-	-	0	-	-	-	-	0	-	-
% All Pedestrians	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-

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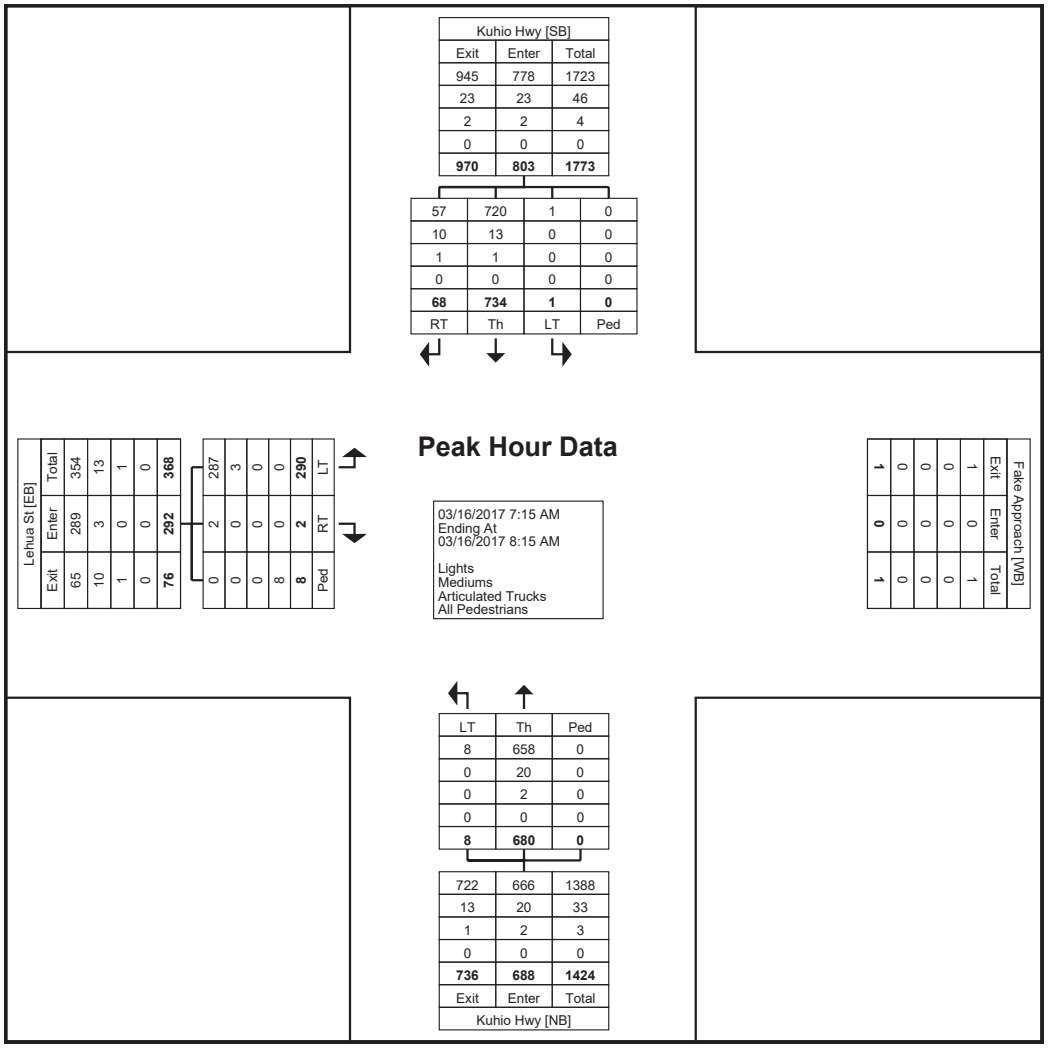
Count Name: Kuhio Hwy Lehua St 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017
Page No: 6



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

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Count Name: Kuhio Hwy Lehua St 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017

Turning Movement Peak Hour Data (3:15 PM)

Start Time	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	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	-	-	-	-	-	-	-	-	-	-	-

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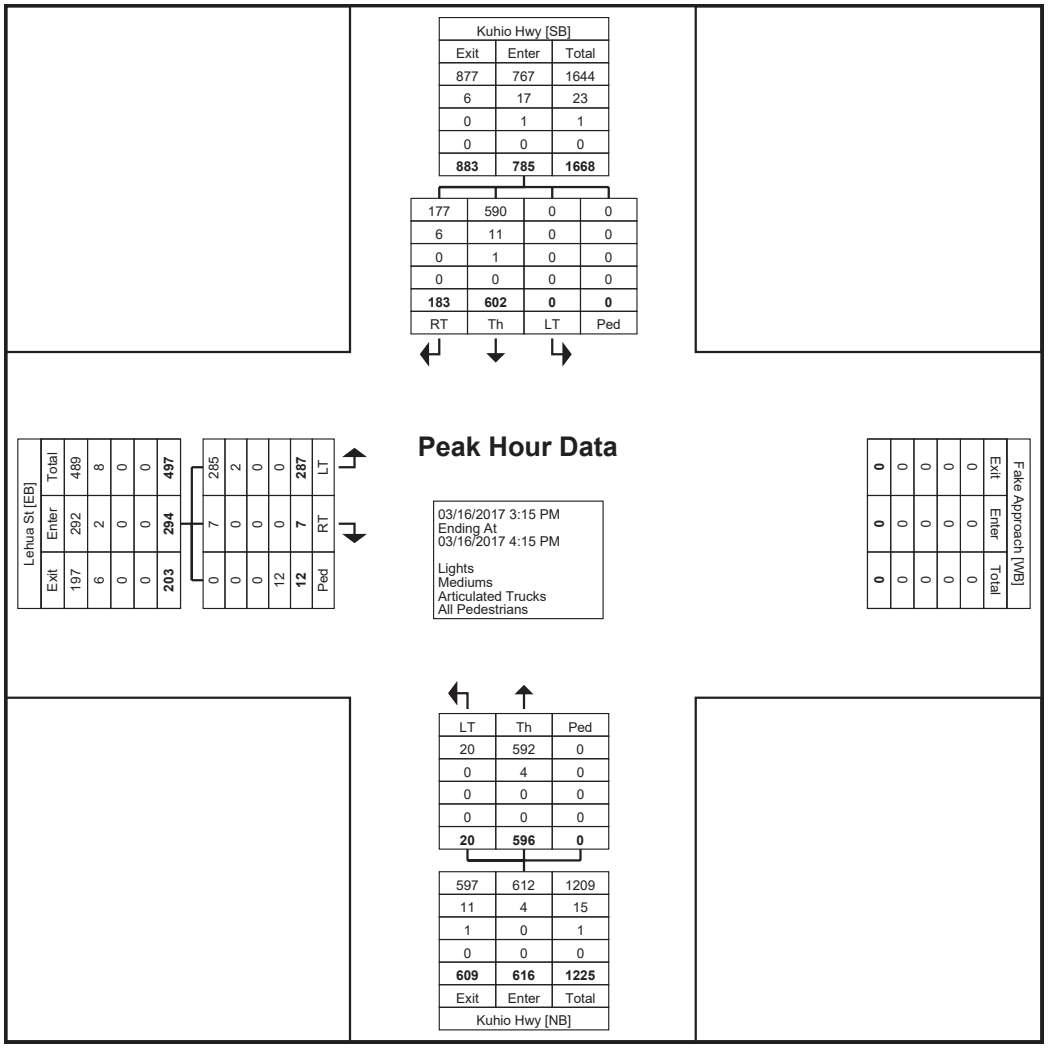
Count Name: Kuhio Hwy Lehua St 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017
Page No: 8



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

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Count Name: Kuhio Hwy Lehua St 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017

Turning Movement Peak Hour Data (7:00 AM)

Start Time	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	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	-	-	-	-	-	-	-	-	-	-	-

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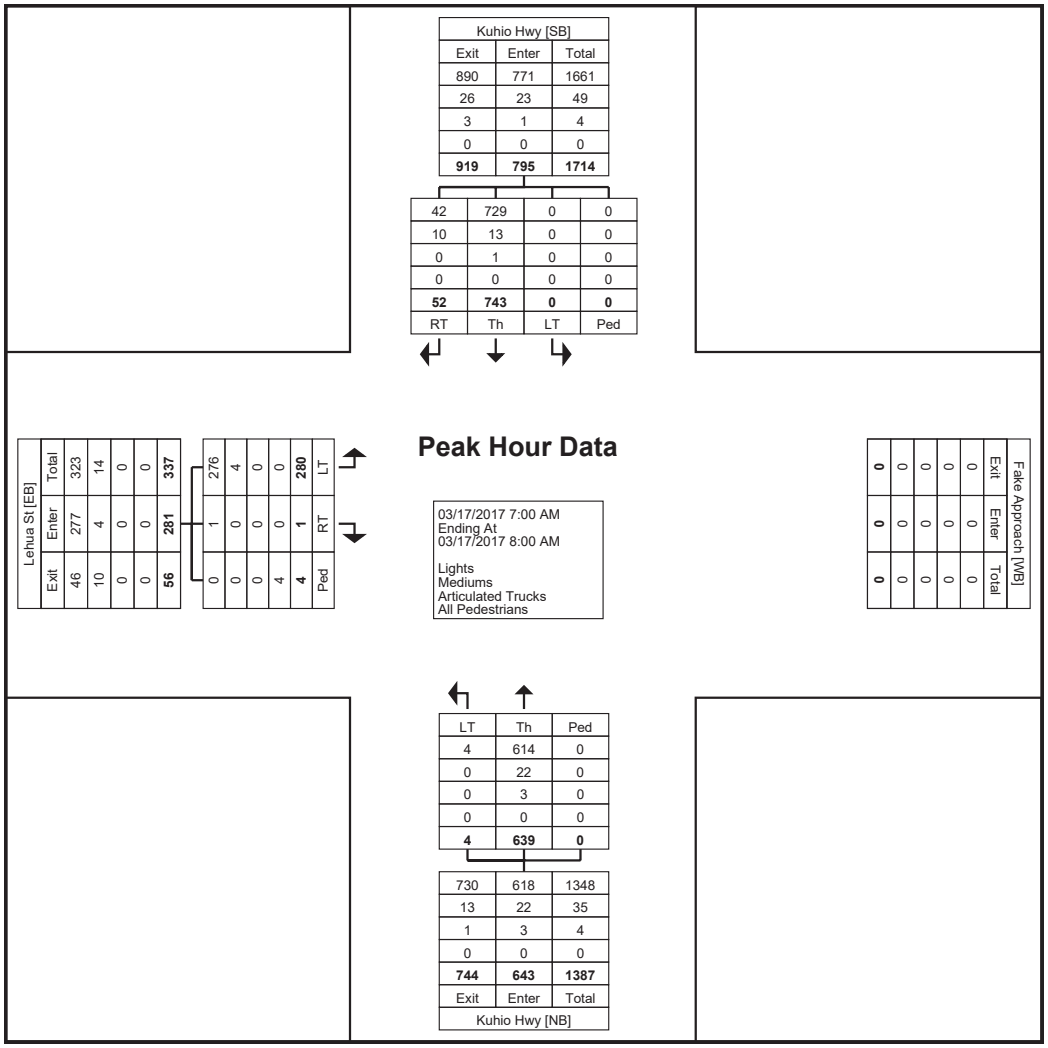

Turning Movement Peak Hour Data Plot (7:00 AM)

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	Ohia St Eastbound					Pono Kai Dwy Westbound					Kuhio Hwy Northbound					Kuhio Hwy Southbound					Ulu St Southeast Bound					Intersection	
3/15/17	LT-Ulu	LT-Kuhio	Thru	RT-Kuhio	RT-Ulu	LT-Kuhio	LT-Ulu	Thru	RT-Ulu	RT-Kuhio	UT-Ulu	LT-Ohia	LT-Ulu	Thru	Right-Turn	Left-Turn	Thru	RT-Ulu	RT-Ohia	UT-Ulu	UT-Kuhio	LT-Dwy	RT-Kuhio	Thru	RT-Ohia	15-Min Totals	Hourly Totals
3:00 PM	2	0	0	0	0	0	0	0	0	3	0	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	0	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	0	0	66	118	8	1	139	0	2	2	0	0	0	63	2	407	1673
4:15 PM	2	1	0	0	0	0	0	0	0	1	0	0	55	121	12	1	126	0	0	3	0	0	0	76	2	400	1674
4:30 PM	0	0	1	0	0	0	0	0	0	3	0	0	66	137	12	0	125	0	0	1	0	1	0	65	1	412	1715
4:45 PM	1	0	0	0	0	0	0	0	0	2	1	0	70	136	14	1	166	0	0	1	0	0	0	62	0	454	1734
5:00 PM	1	0	0	0	0	1	0	0	0	1	0	0	91	120	10	3	132	0	1	3	0	0	0	44	1	408	1670
5:15 PM	0	1	0	0	1	0	0	0	0	2	1	1	78	131	12	1	156	0	1	1	0	0	0	54	1	441	
5:30 PM	2	0	0	0	2	0	0	0	0	2	0	0	68	157	9	2	152	0	3	0	0	0	0	34	0	431	
5:45 PM	2	0	0	0	1	0	0	0	0	3	0	1	64	131	8	1	138	0	1	1	0	0	0	35	4	390	
3/16/17																											
7:00 AM	2	0	0	0	2	0	0	0	0	3	0	0	16	135	1	0	200	0	3	2	0	0	0	46	3	413	1664
7:15 AM	1	1	0	0	1	0	0	0	0	0	0	3	24	162	1	0	182	0	2	0	2	0	0	39	2	420	1673
7:30 AM	5	4	0	0	2	0	0	0	0	0	0	0	23	165	5	2	162	0	0	0	0	0	0	50	1	419	1683
7:45 AM	1	0	0	0	1	0	0	0	0	2	0	0	27	157	3	1	159	0	1	2	0	0	0	57	1	412	1710
8:00 AM	0	0	0	0	0	0	0	0	0	3	0	0	32	158	4	4	180	0	2	0	0	0	0	38	1	422	**1743**
8:15 AM	0	0	1	0	2	0	0	0	0	2	0	0	27	164	2	1	195	0	0	1	0	0	0	34	1	430	
8:30 AM	1	0	0	0	3	0	0	0	0	1	0	0	22	187	5	0	173	0	0	1	0	0	0	51	2	**446**	
8:45 AM	2	0	0	0	1	1	0	0	0	3	0	0	29	188	4	2	165	0	0	1	0	0	0	47	2	445	
3/16/17																											
3:00 PM	1	0	0	0	1	1	0	0	0	1	1	0	57	124	8	0	152	0	0	0	0	0	0	42	2	390	1643
3:15 PM	2	0	0	0	0	0	0	0	0	2	0	0	76	145	13	0	140	0	0	0	0	0	0	39	1	418	1705
3:30 PM	0	0	0	0	2	0	0	0	0	2	0	0	67	142	10	3	164	0	0	0	0	0	0	38	1	429	1688
3:45 PM	1	0	0	0	0	0	0	0	0	1	0	0	81	118	9	4	155	0	0	0	0	0	0	36	1	406	1732
4:00 PM	3	0	0	0	0	0	0	0	0	1	0	0	71	147	6	3	162	0	0	0	0	0	0	57	2	452	1743
4:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	72	137	10	0	131	0	0	2	0	0	0	48	0	401	1714
4:30 PM	2	0	0	0	0	0	0	0	0	3	0	0	95	163	3	3	152	0	0	1	0	0	0	50	1	**473**	**1756**
4:45 PM	0	0	0	0	0	1	0	0	0	2	0	0	76	153	5	1	139	0	0	1	0	0	0	39	0	417	1704
5:00 PM	2	1	0	0	0	0	0	0	0	4	0	0	60	141	6	1	162	0	0	0	0	0	0	46	0	423	1695
5:15 PM	2	0	0	0	0	1	0	0	0	2	2	2	71	140	6	1	159	0	1	2	0	0	0	53	1	443	
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	58	163	5	1	150	0	0	0	0	0	0	43	0	421	
5:45 PM	1	0	0	0	1	0	0	0	0	2	0	1	53	139	5	1	156	0	0	1	0	0	0	47	1	408	
3/17/17																											
7:00 AM	2	1	0	0	1	0	0	0	0	1	0	1	19	123	0	1	185	0	2	0	0	0	0	48	2	386	1668
7:15 AM	1	1	0	0	0	0	0	0	0	0	0	0	25	182	2	3	172	0	1	0	1	0	0	45	1	434	1680
7:30 AM	5	1	0	0	1	0	0	0	0	0	0	0	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	0	0	25	145	3	1	172	0	0	3	0	0	0	67	3	427	1655
8:00 AM	0	1	0	0	0	0	0	0	0	0	1	0	24	148	4	1	170	0	1	1	0	0	0	45	2	398	1660
8:15 AM	0	0	0	0	0	0	0	0	0	4	0	0	27	174	7	0	159	0	1	0	0	0	0	56	2	430	
8:30 AM	0	2	0	0	0	1	0	0	0	2	0	1	30	126	1	3	178	0	0	1	0	0	0	52	3	400	
8:45 AM	0	2	0	0	1	0	0	0	0	4	0	2	21	166	4	1	181	0	0	2	0	0	0	46	2	432	

AM Peak Hour Traffic			3/16/17																								
8:00 AM	3	0	1	0	6	1	0	0	0	9	0	0	110	697	15	7	713	0	2	3	0	0	0	170	6	1743	
PHF	0.75	N/A	N/A	N/A	0.50	N/A	N/A	N/A	N/A	2.25	N/A	N/A	1.25	0.93	0.75	N/A	1.03	N/A	N/A	0.75	N/A	N/A	N/A	0.83	0.75	0.98	
PHV	4	0	0	0	12	0	0	0	0	4	0	0	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 Hour Traffic			3/16/17																								
4:30 PM	6	1	0	0	0	2	0	0	0	11	2	2	302	597	20	6	612	0	1	4	0	0	0	188	2	1756	
PHF	0.75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.92	N/A	N/A	0.79	0.92	1.67	0.50	1.01	N/A	N/A	1.00	N/A	N/A	N/A	0.94	0.50	0.93	
PHV	8	0	0	0	0	0	0	0	0	12	0	0	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%	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			Kahau St Southbound			Lehua St Southwest Bound			Intersection	
3/13/17	LT-Kahau	LT-Lehua	Thru	Thru	RT-Kahau	RT-Lehua	UT-Lehua	LT-Olohena	Right-Turn	LT-Olohena	RT-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														
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	8	3	150	
3/14/17														
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	
5:00 PM	10	65	45	72	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														
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	1	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	228	793
7:45 AM	2	90	89	27	2	3	2	1	6	0	20	1	**243**	
8:00 AM	4	36	58	29	2	2	2	1	2	4	17	1	158	
8:15 AM	1	42	62	21	3	1	0	4	7	4	17	2	164	
AM Peak 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 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%		

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Count Name: Olohena Rd Kapaa Bypass 3-13-17 to 3-15-17
Site Code: Hokua Place
Start Date: 03/13/2017

Turning Movement Data

Start Time	Olohena Rd Eastbound				Olohena Rd Westbound			Kapaa Bypass Rd Northbound			Kapaa Bypass Rd Southbound				Int. Total
	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	
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 ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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	17	30	106	13	149	405
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
Hourly Total	21	421	209	651	41	143	184	84	36	120	110	411	152	673	1628
8:00 AM	2	77	27	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 ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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	1	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

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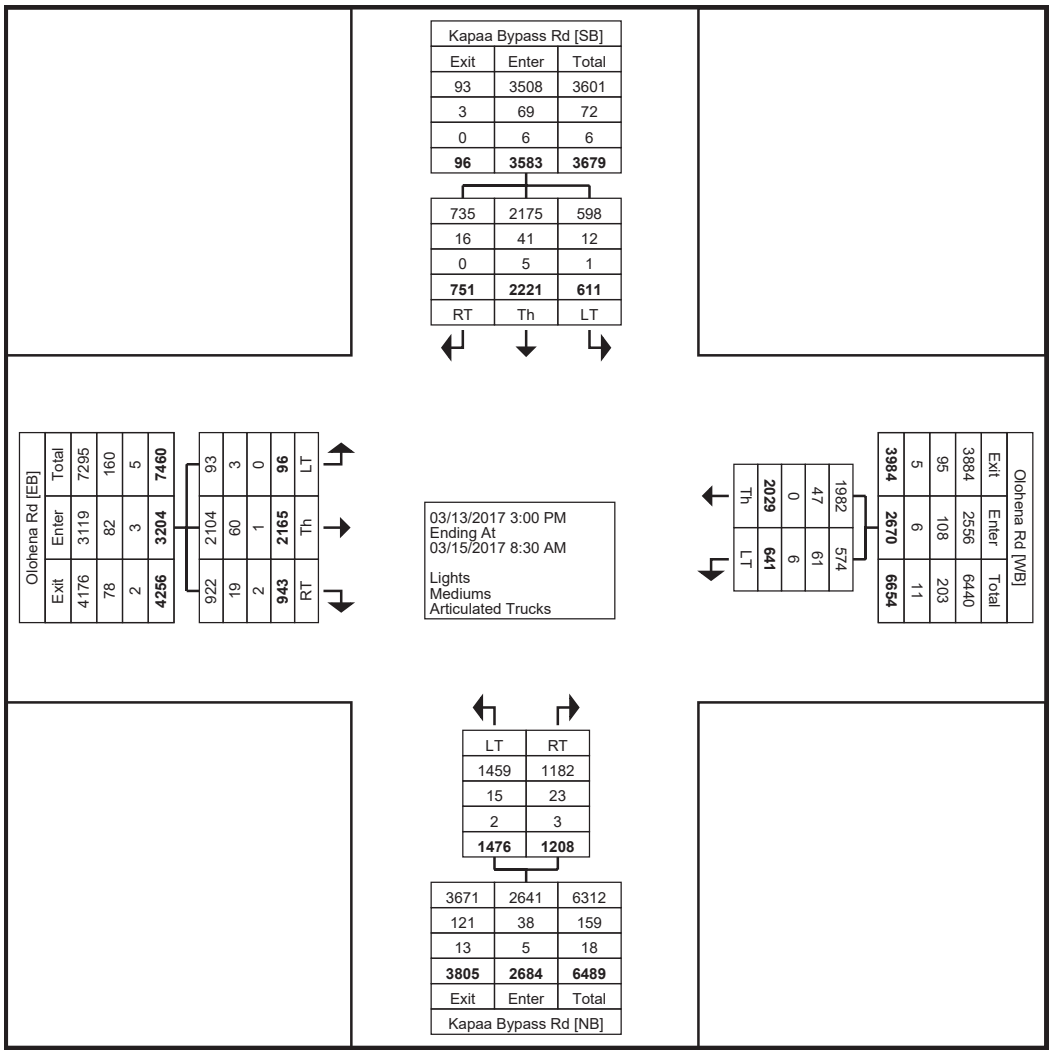
Count Name: Olohena Rd
Kapaa Bypass 3-13-17 to 3-15-17
Site Code: Hokua Place
Start Date: 03/13/2017
Page No: 2



Turning Movement Data Plot

The Traffic Management Consultant
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Count Name: Olohena Rd
Kapaa Bypass 3-13-17 to 3-15-17
Site Code: Hokua Place
Start Date: 03/13/2017

Turning Movement Peak Hour Data (3:15 PM)

Start Time	Olohena Rd Eastbound				Olohena Rd Westbound			Kapaa Bypass Rd Northbound			Kapaa Bypass Rd Southbound				Int. Total
	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	
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

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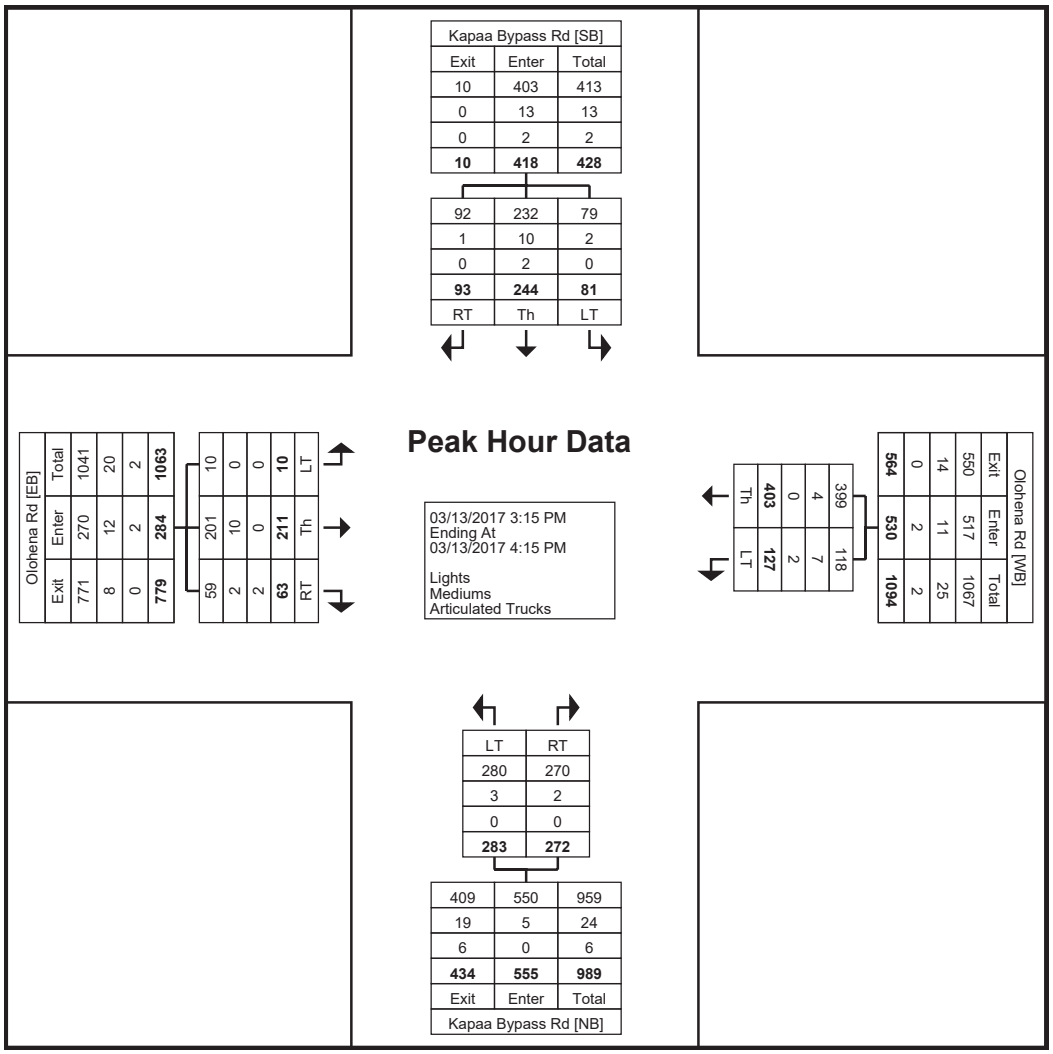

Turning Movement Peak Hour Data Plot (3:15 PM)

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Count Name: Olohena Rd
Kapaa Bypass 3-13-17 to 3-15-17
Site Code: Hokua Place
Start Date: 03/13/2017

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Olohena Rd Eastbound				Olohena Rd Westbound			Kapaa Bypass Rd Northbound			Kapaa Bypass Rd Southbound				Int. Total
	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	
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

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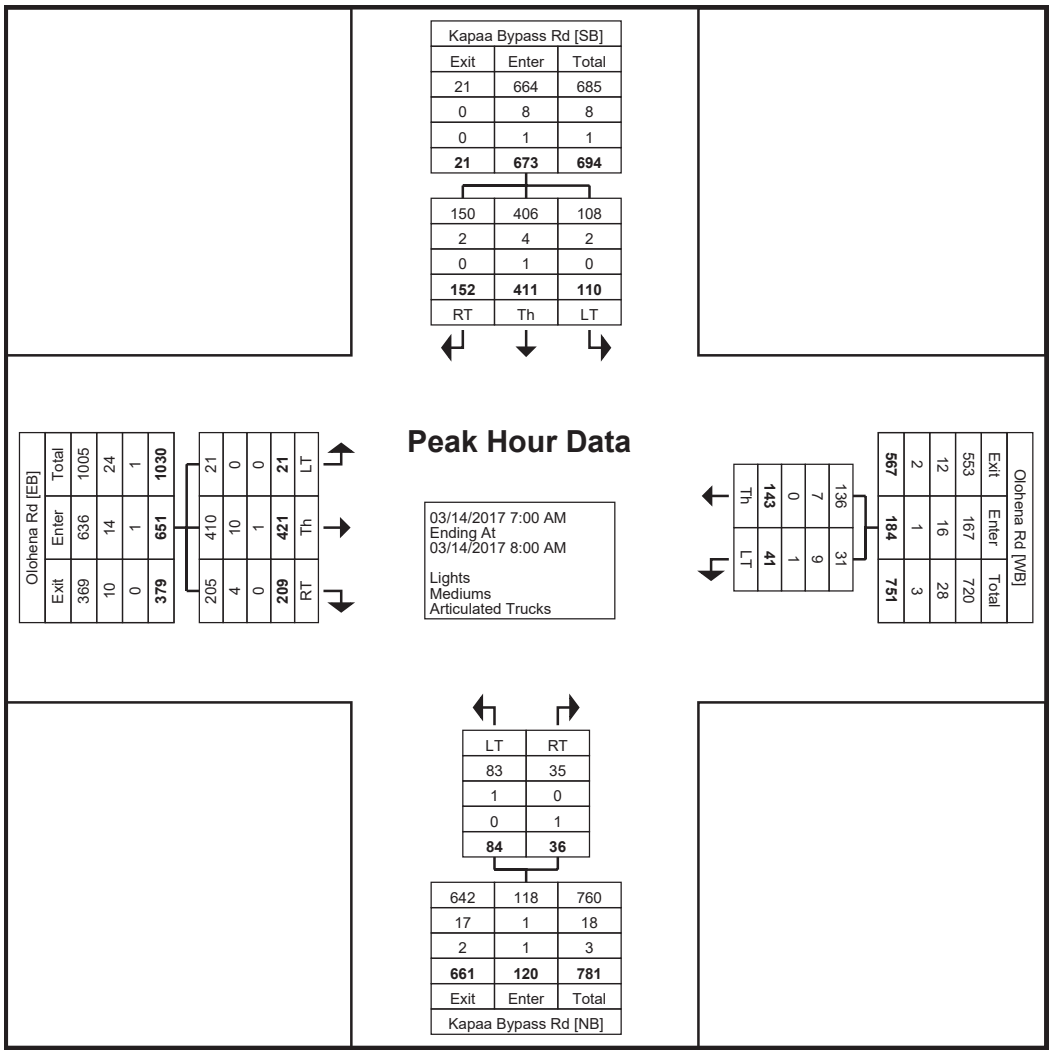
Count Name: Olohena Rd
Kapaa Bypass 3-13-17 to 3-15-17
Site Code: Hokua Place
Start Date: 03/13/2017
Page No: 6



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

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Turning Movement Peak Hour Data (3:45 PM)

Start Time	Olohena Rd Eastbound				Olohena Rd Westbound			Kapaa Bypass Rd Northbound			Kapaa Bypass Rd Southbound				Int. Total
	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	
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

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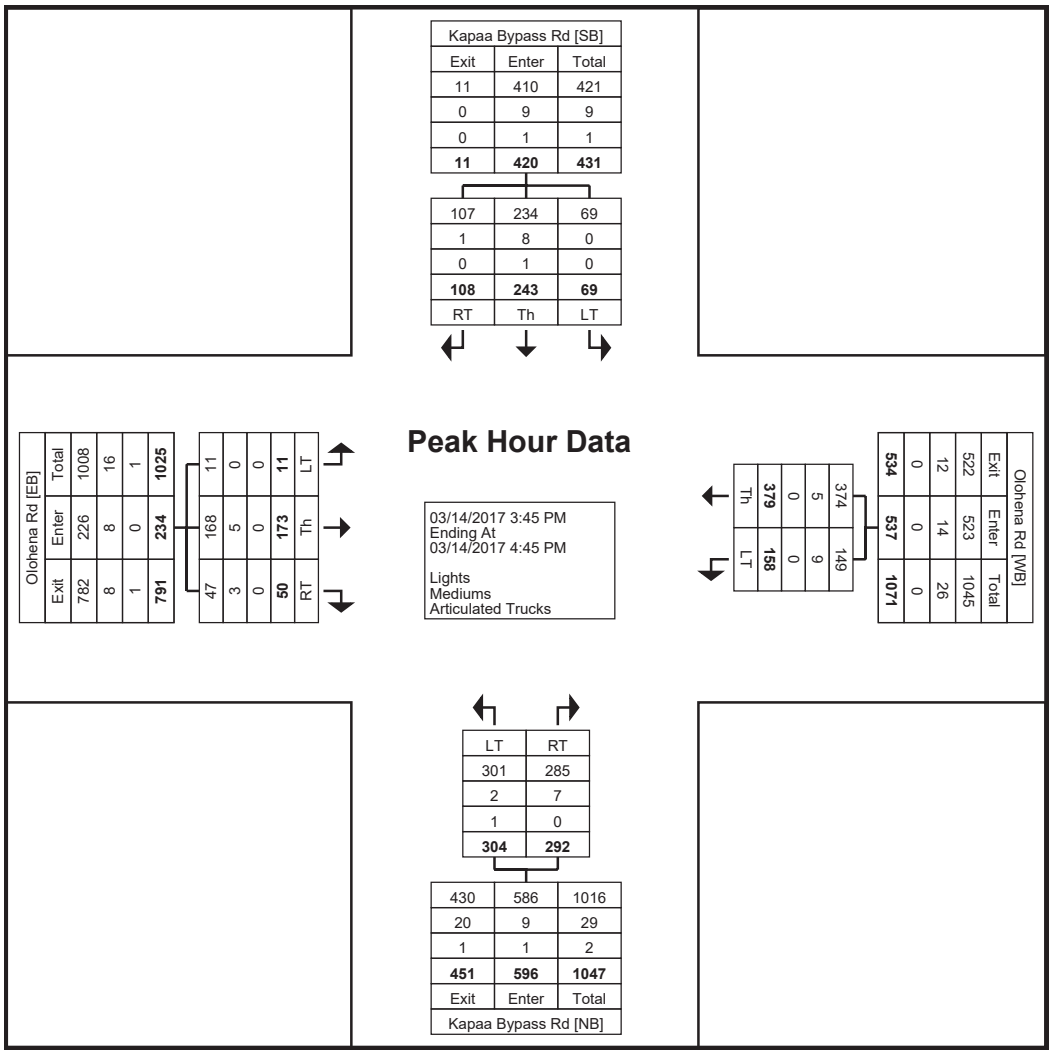
Count Name: Olohena Rd
Kapaa Bypass 3-13-17 to 3-15-17
Site Code: Hokua Place
Start Date: 03/13/2017
Page No: 8



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

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Count Name: Olohena Rd
Kapaa Bypass 3-13-17 to 3-15-17
Site Code: Hokua Place
Start Date: 03/13/2017

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Olohena Rd Eastbound				Olohena Rd Westbound			Kapaa Bypass Rd Northbound			Kapaa Bypass Rd Southbound				Int. Total
	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	
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
Total	17	440	200	657	56	142	198	88	28	116	108	399	158	665	1636
Approach %	2.6	67.0	30.4	-	28.3	71.7	-	75.9	24.1	-	16.2	60.0	23.8	-	-
Total %	1.0	26.9	12.2	40.2	3.4	8.7	12.1	5.4	1.7	7.1	6.6	24.4	9.7	40.6	-
PHF	0.425	0.873	0.806	0.907	0.824	0.755	0.786	0.815	0.583	0.784	0.692	0.899	0.790	0.861	0.919
Lights	16	430	195	641	45	135	180	87	28	115	105	395	153	653	1589
% Lights	94.1	97.7	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
Mediums	1	10	5	16	9	7	16	1	0	1	2	4	5	11	44
% Mediums	5.9	2.3	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
Articulated Trucks	0	0	0	0	2	0	2	0	0	0	1	0	0	1	3
% Articulated Trucks	0.0	0.0	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

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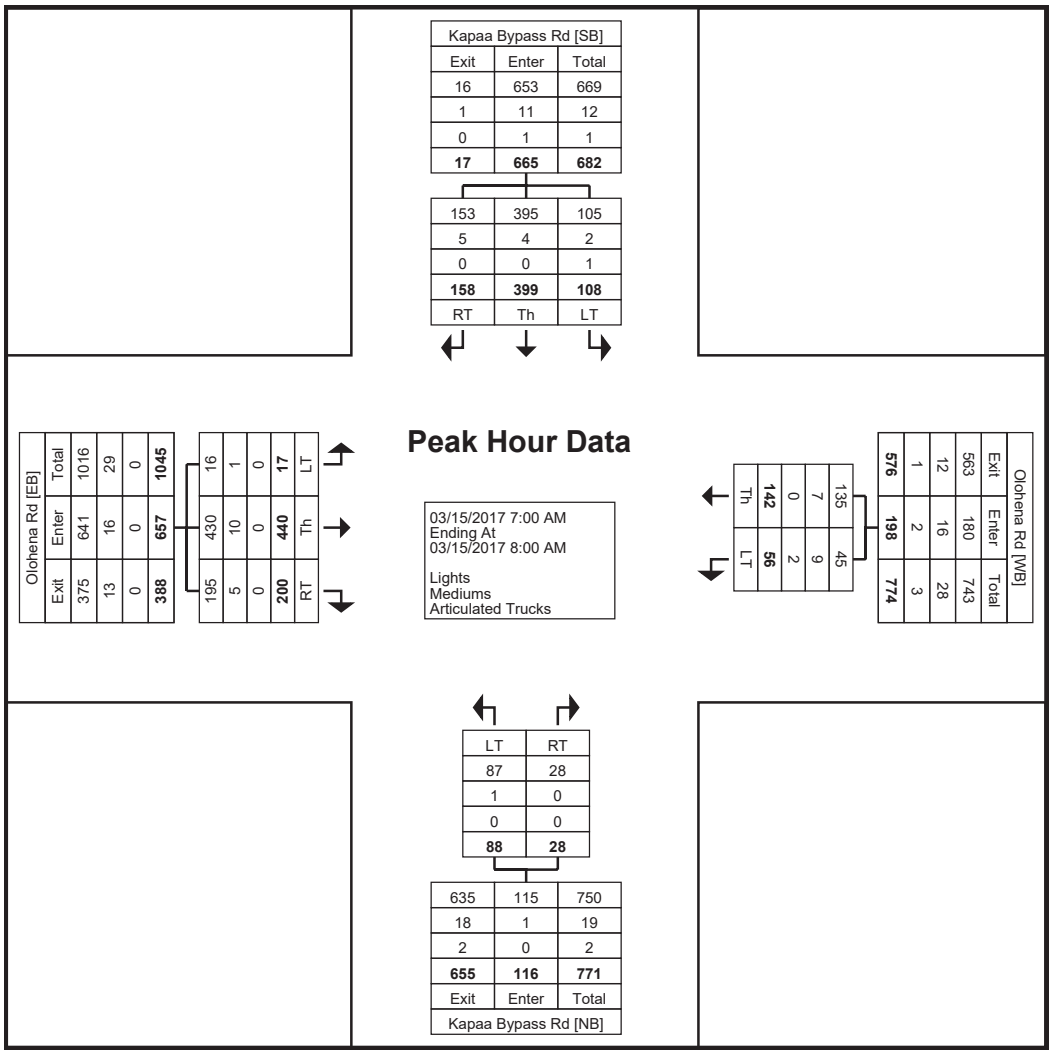

Turning Movement Peak Hour Data Plot (7:00 AM)

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

Start	Olohena Rd Eastbound			Olohena Rd Westbound			Kaehulua Rd Southbound			Kaapuni Rd Southeast Bound			Intersection	
3/13/17	LT-Kaapuni	LT-Kaehulu	Thru	Thru	RT-Kaapuni	RT-Kaehulua	LT-Olohena	RT-Olohena	RT-Kaapuni	LT-Kaehulua	LT-Olohena	RT-Olohena	15-Min Totals	Hourly Totals
3:30 PM	4	5	33	38	70	3	0	0	0	0	28	5	186	811
3:45 PM	1	0	28	51	80	6	2	0	0	0	28	8	204	802
4:00 PM	4	0	37	54	84	3	2	0	0	0	21	5	210	797
4:15 PM	7	2	24	50	77	9	1	0	0	0	36	5	211	775
4:30 PM	6	0	18	49	64	5	0	0	1	0	25	9	177	744
4:45 PM	8	4	23	51	72	4	0	4	0	0	26	7	199	
5:00 PM	4	2	36	44	62	1	0	1	0	0	30	8	188	
5:15 PM	5	2	20	53	65	6	2	0	1	0	19	7	180	
3/14/17														
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	2	148	789
7:00 AM	3	1	79	14	15	2	2	0	0	1	78	3	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	6	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	9	193	834
4:45 PM	11	4	27	38	85	4	2	0	0	1	31	11	214	
5:00 PM	9	0	32	58	81	6	5	1	1	0	30	3	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	2	0	2	3	0	0	49	2	103	658
6:45 AM	2	0	64	8	12	0	1	1	0	0	64	1	153	763
7:00 AM	2	2	83	11	9	2	2	0	0	0	73	9	193	824
7:15 AM	8	7	97	9	20	1	2	0	0	0	61	4	209	761
7:30 AM	10	7	82	21	23	4	1	0	0	0	54	6	208	699
7:45 AM	11	3	65	22	33	5	3	0	0	0	60	12	214	
8:00 AM	3	1	44	20	14	5	0	1	0	0	40	2	130	
8:15 AM	7	0	48	19	13	1	1	1	0	0	51	6	147	

AM Peak Hour Traffic			3/14/17										
7:00 AM	22	22	322	65	99	10	8	1	0	8	255	23	835
PHF	0.50	0.92	0.77	1.63	1.03	1.25	0.67	N/A	N/A	1.00	0.89	1.44	0.88
PHV	44	24	416	40	96	8	12	1	0	8	288	16	952
T Factor	9%	0%	1%	0%	2%	0%	0%	0%	N/A	0%	2%	0%	

PM Peak Hour Traffic			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	256	24	4	8	1	4	116	60	916
T Factor	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%	2%	0%	

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Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017

Turning Movement Data

Start Time	Kapaa Bypass Rd 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	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 ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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
Hourly Total	19	420	2	439	543	665	0	1208	0	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	-	-	-	-	-	-	-	-	-	-	-

The Traffic Management Consultant
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Honolulu, Hawaii, United States 96813
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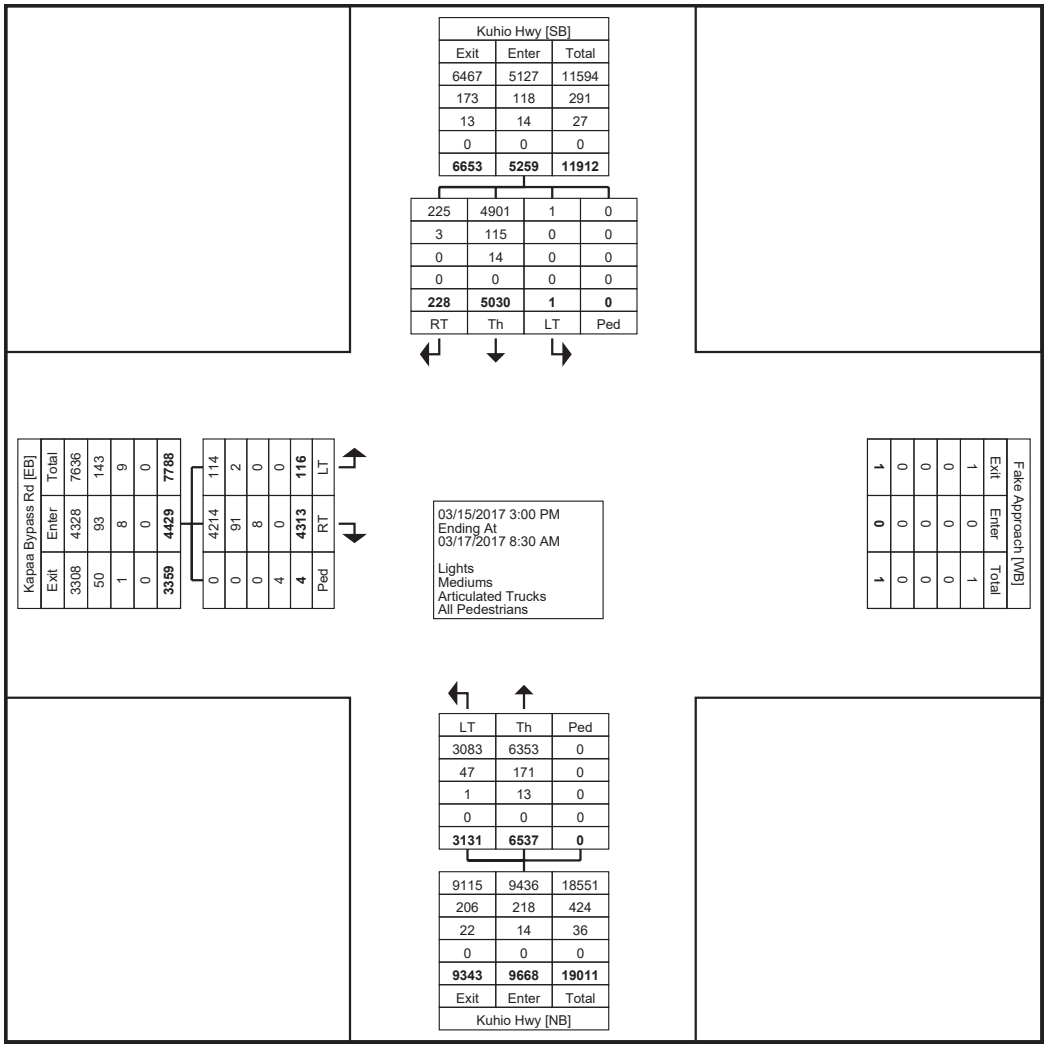
Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017



Turning Movement Data Plot

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Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017

Turning Movement Peak Hour Data (4:30 PM)

Start Time	Kapaa Bypass Rd 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	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 Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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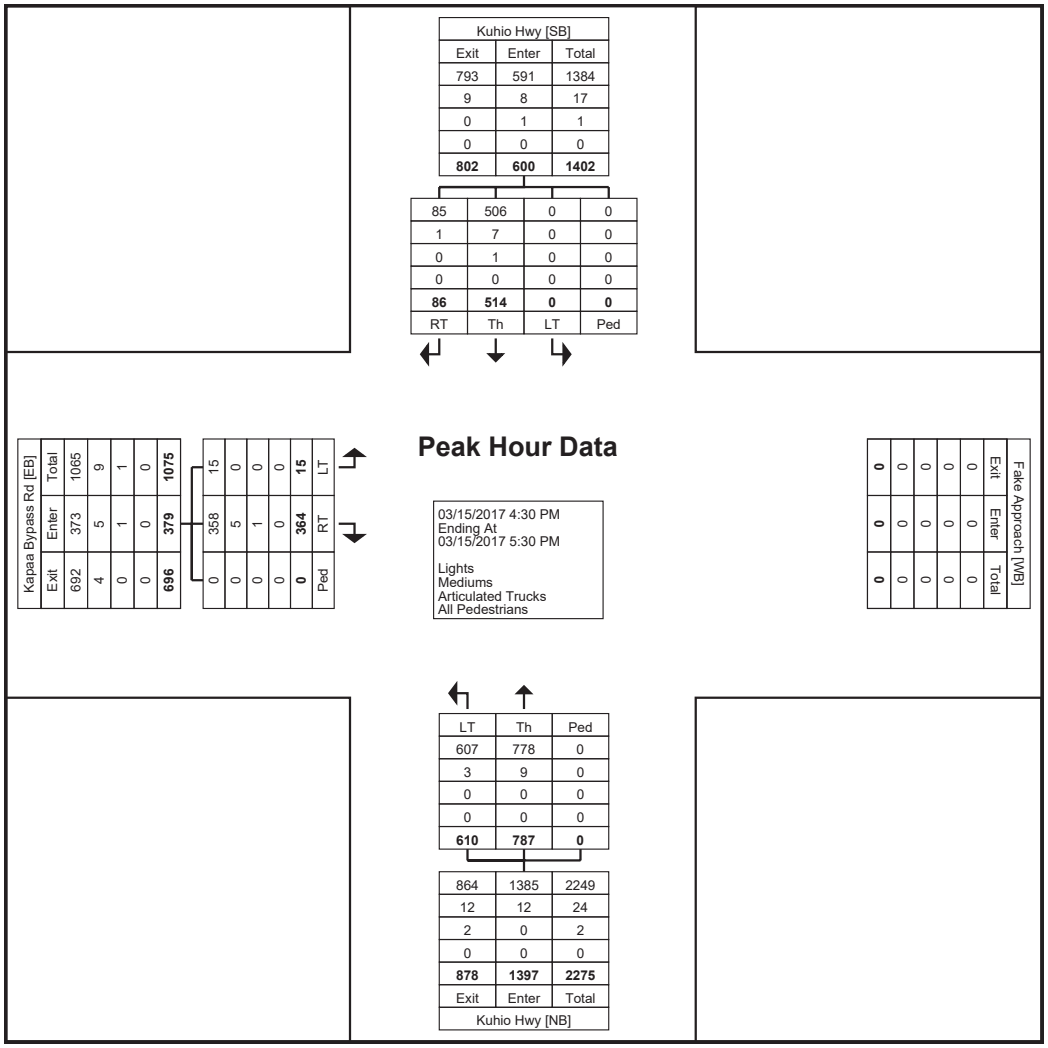
Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017
Page No: 4



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

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Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Kapaa Bypass Rd 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	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	-	-	-	-	-	-	-	-	-	-	-

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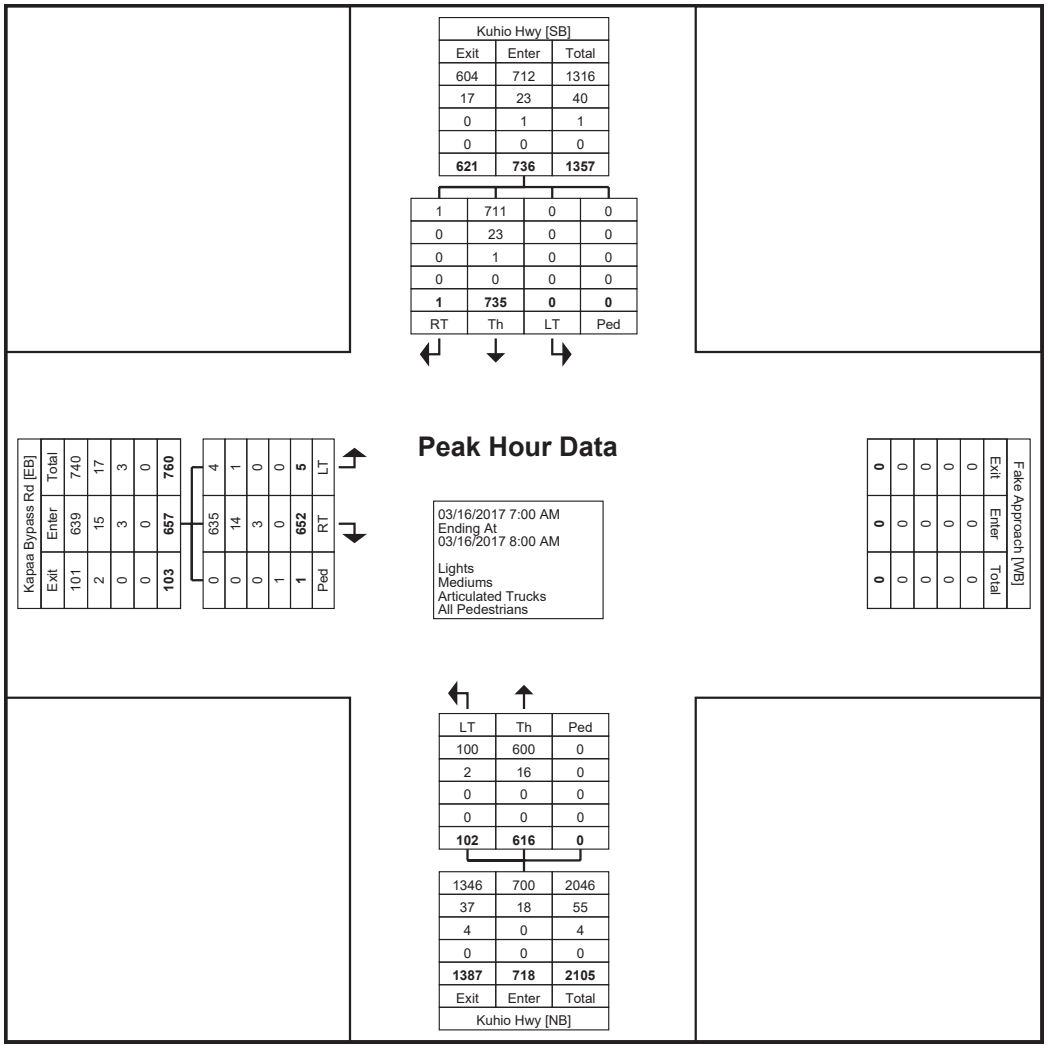

Turning Movement Peak Hour Data Plot (7:00 AM)

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Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017

Turning Movement Peak Hour Data (4:15 PM)

Start Time	Kapaa Bypass Rd 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	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	-	-	-	-	-	-	-	-	-	-	-

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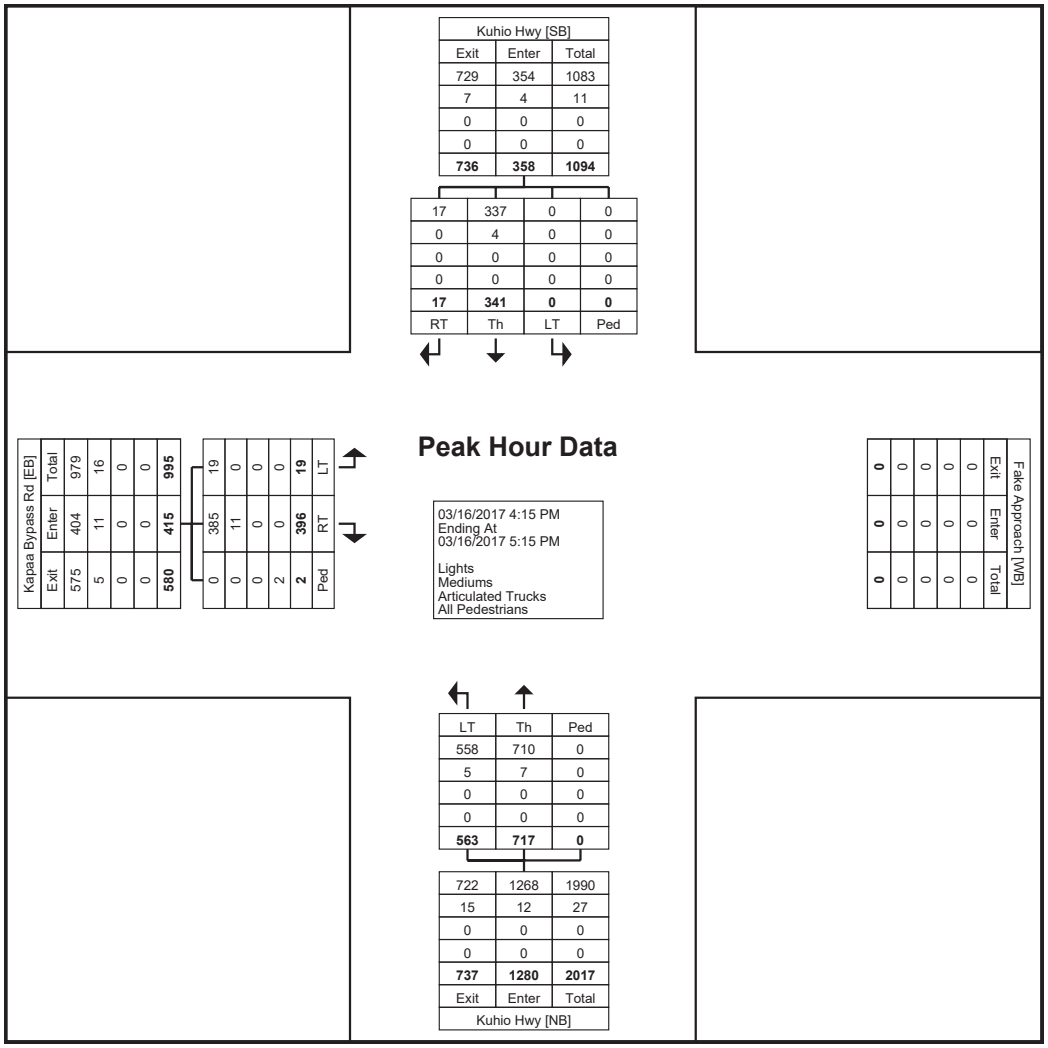

Turning Movement Peak Hour Data Plot (4:15 PM)

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Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Kapaa Bypass Rd 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	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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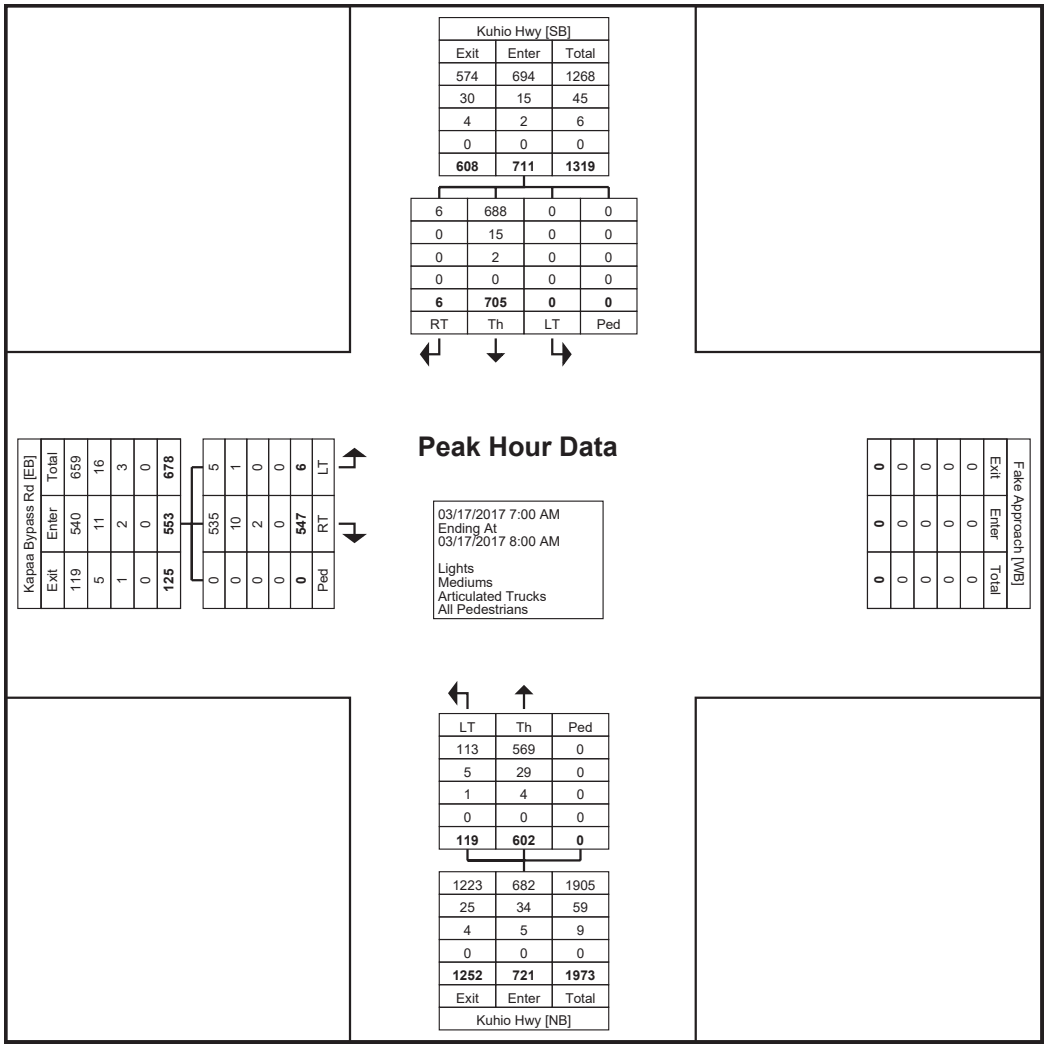
Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017



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

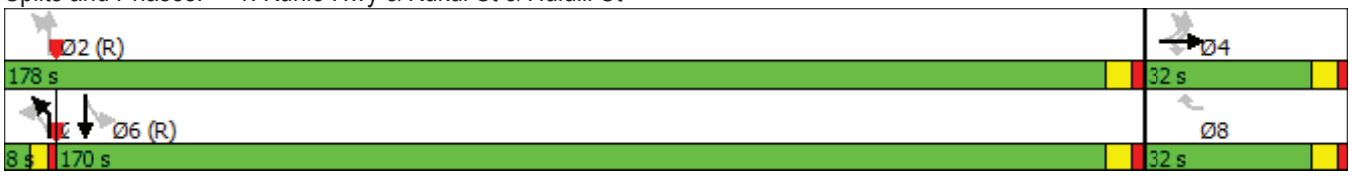
Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	24	8	36	1	8	4	664	12	3	728	36
Future Volume (vph)	8	24	8	36	1	8	4	664	12	3	728	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0			60		0	0		0
Storage Lanes		0		1			1		0	0		0
Taper Length (ft)		100					100			100		
Satd. Flow (prot)	0	0	1621	1501	1589	0	1631	1760	0	0	1799	0
Flt Permitted			0.962				0.367				0.998	
Satd. Flow (perm)	0	0	1582	1420	1526	0	630	1760	0	0	1795	0
Right Turn on Red				Yes	Yes				No			
Satd. Flow (RTOR)				36	374							
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	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%	15.2%	15.2%	15.2%	15.2%	3.8%	3.8%	84.8%		81.0%	81.0%	
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?						Yes	Yes					
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	C	A		A	A			A	
Approach Delay			75.8					2.8			4.5	

Lane Group	SBR2
Lane Configurations	
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 (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	

Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS			E					A			A	
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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
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	Major1		Major2		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	-	-	2.353	-	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
HCM Control Delay, s	0	2.4	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	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	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
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	-
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	-

Approach	EB	WB	SW
HCM Control Delay, s	4.2	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SWLn1
Capacity (veh/h)	1447	-	-	-	625
HCM Lane V/C Ratio	0.254	-	-	-	0.146
HCM Control Delay (s)	8.3	0	-	-	11.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	1	-	-	-	0.5

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	716	188	12	12	24
Future Vol, veh/h	8	716	188	12	12	24
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	8	716	188	12	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	-
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	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1370	-	-	-	477
HCM Lane V/C Ratio	0.006	-	-	-	0.075
HCM Control Delay (s)	7.6	0	-	-	13.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
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					
tF (s)	3.5	3.3	2.2			
p0 queue free %	16	99	98			
cM capacity (veh/h)	409	400	846			

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	E	A			
Approach Delay (s)	46.6	0.2		0.0	
Approach LOS	E				

Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
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												
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	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	870	-	-	83	198	822	-	-
HCM Lane V/C Ratio	0.101	-	-	0.012	0.025	0.009	-	-
HCM Control Delay (s)	9.6	-	-	48.9	23.7	9.4	-	-
HCM Lane LOS	A	-	-	E	C	A	-	-
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	SBR
Lane Configurations		↕			↕						↕	
Traffic Vol, veh/h	4	1	12	0	2	92	0	0	0	0	204	8
Future Vol, veh/h	4	1	12	0	2	92	0	0	0	0	204	8
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	0
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	3.345				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	A	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	733	1054	-	-	-
HCM Lane V/C Ratio	0.023	0.089	-	-	-
HCM Control Delay (s)	10	8.8	0	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	0.1	0.3	-	-	-

Intersection	
Intersection Delay, s/veh	20.0
Intersection LOS	C

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	30.0	5.1	7.1	18.2
Approach LOS	D	A	A	C

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	669	247	138	732
Cap Entry Lane, veh/h	783	1210	727	968
Entry HV Adj Factor	0.975	0.922	0.986	0.989
Flow Entry, veh/h	652	228	136	724
Cap Entry, veh/h	763	1115	717	957
V/C Ratio	0.855	0.204	0.190	0.757
Control Delay, s/veh	30.0	5.1	7.1	18.2
LOS	D	A	A	C
95th %tile Queue, veh	10	1	1	7

Intersection	
Int Delay, s/veh	12.3

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
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	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, %	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	-	-	-	-	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, %		-	-	-		
Mov Cap-1 Maneuver	1397	-	-	-	409	971
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 Lane V/C Ratio	0.049	-	-	-	0.751
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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
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	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	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	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1417	-	-	-	551	895
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	741	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1417	-	-	-	547	895
Mov Cap-2 Maneuver	-	-	-	-	547	-
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	741	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1417	-	-	-	547
HCM Lane V/C Ratio	0.006	-	-	-	0.024
HCM Control Delay (s)	7.6	0	-	-	11.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
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	-	-	-	-	-
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, %				-	-	-
Mov Cap-1 Maneuver	126	-	819	-	-	-
Mov Cap-2 Maneuver	233	-	-	-	-	-
Stage 1	353	-	-	-	-	-
Stage 2	526	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.7	1.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	819	-	233	-	-	-
HCM Lane V/C Ratio	0.122	-	0.017	-	-	-
HCM Control Delay (s)	10	-	20.7	0	-	-
HCM Lane LOS	B	-	C	A	-	-
HCM 95th %tile Q(veh)	0.4	-	0.1	-	-	-

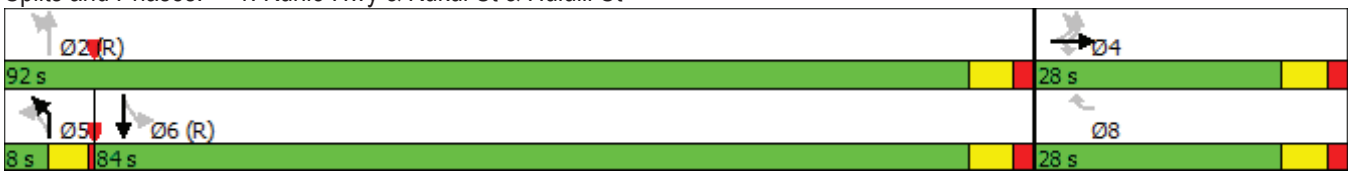
Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	20	8	36	8	60	56	548	16	3	580	32
Future Volume (vph)	16	20	8	36	8	60	56	548	16	3	580	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		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			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 (%)												
Lane Group Flow (vph)	0	0	44	36	8	0	116	564	0	0	643	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	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)			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)			9.3	9.3	9.3		103.3	102.5			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	A			A	
Approach Delay			37.0					3.2			8.2	

Lane Group	SBR2
Lane Configurations	
Traffic Volume (vph)	28
Future Volume (vph)	28
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	

Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS			D					A			A	
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			
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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
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	Major1		Major2		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	-
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, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1121	-	647	766
Mov Cap-2 Maneuver	-	-	-	-	647	-
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	953	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	17.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	656	-	-	1121	-
HCM Lane V/C Ratio	0.567	-	-	0.011	-
HCM Control Delay (s)	17.4	-	-	8.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	3.6	-	-	0	-

Intersection	
Int Delay, s/veh	12.9

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	328	220	372	84	48	236
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	-	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

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	WBR	SWLn1
Capacity (veh/h)	1072	-	-	-	351
HCM Lane V/C Ratio	0.306	-	-	-	0.809
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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	36	532	548	60	16	24
Future Vol, veh/h	36	532	548	60	16	24
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	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
HCM Control Delay, s	0.6	0	19
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
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	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
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	0	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	0	0
Control Delay (s)	29.2	9.0	0.0	0.0	0.0
Lane LOS	D	A			
Approach Delay (s)	29.2	0.3		0.0	
Approach LOS	D				

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	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	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, %								-	-		-	-
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	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	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	B	-	-	F	D	A	-	-
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		↕			↕						↕	
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	-	-	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	8	1	0	3	2	384	0	0	0	0	200	4

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	-	-	-	-				-	-	-
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	544	678	786	752	676	1049				1627	-	-
Stage 1	789	726	-	-	-	-				-	-	-
Stage 2	-	-	-	804	725	-				-	-	-
Platoon blocked, %											-	-
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	-				-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	15.5	10.6	0
HCM LOS	C	B	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	352	1025	1617	-	-
HCM Lane V/C Ratio	0.026	0.38	-	-	-
HCM Control Delay (s)	15.5	10.6	0	-	-
HCM Lane LOS	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	1.8	0	-	-

Intersection	
Intersection Delay, s/veh	14.2
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	260	552	640	392
Demand Flow Rate, veh/h	278	564	640	407
Vehicles Circulating, veh/h	439	333	262	892
Vehicles Exiting, veh/h	860	569	455	5
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.9	11.5	11.5	26.6
Approach LOS	A	B	B	D

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	278	564	640	407
Cap Entry Lane, veh/h	882	983	1056	556
Entry HV Adj Factor	0.937	0.979	1.000	0.964
Flow Entry, veh/h	260	552	640	392
Cap Entry, veh/h	826	962	1056	536
V/C Ratio	0.315	0.574	0.606	0.733
Control Delay, s/veh	7.9	11.5	11.5	26.6
LOS	A	B	B	D
95th %tile Queue, veh	1	4	4	6

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
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			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SELn1
Capacity (veh/h)	1025	-	-	-	478
HCM Lane V/C Ratio	0.051	-	-	-	0.393
HCM Control Delay (s)	8.7	0	-	-	17.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	1.9

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
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, #	-	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			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1239	-	-	-	547
HCM Lane V/C Ratio	0.003	-	-	-	0.024
HCM Control Delay (s)	7.9	0	-	-	11.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	24	360	664	748	446	78
Future 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
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	3	1
Mvmt Flow	24	360	664	748	446	78

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2148	446	446	0	-	0
Stage 1	446	-	-	-	-	-
Stage 2	1702	-	-	-	-	-
Critical Hdwy	6.6	6.23	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.319	2.2	-	-	-
Pot Cap-1 Maneuver	48	611	1125	-	-	-
Stage 1	649	-	-	-	-	-
Stage 2	136	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 20	611	1125	-	-	-
Mov Cap-2 Maneuver	426	-	-	-	-	-
Stage 1	266	-	-	-	-	-
Stage 2	136	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.7	6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1125	-	426	611	-	-
HCM Lane V/C Ratio	0.59	-	0.056	0.589	-	-
HCM Control Delay (s)	12.7	-	14	19	-	-
HCM Lane LOS	B	-	B	C	-	-
HCM 95th %tile Q(veh)	4	-	0.2	3.8	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

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

Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	27	9	41	1	9	5	751	14	3	824	41
Future Volume (vph)	9	27	9	41	1	9	5	751	14	3	824	41
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	1621	1501	1589	0	1630	1761	0	0	1800	0
Flt Permitted			0.962				0.320				0.998	
Satd. Flow (perm)	0	0	1602	1447	1542	0	547	1761	0	0	1797	0
Right Turn on Red				Yes	Yes				No			
Satd. Flow (RTOR)				76	246							
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	45	41	1	0	14	765	0	0	873	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)	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?						Yes	Yes					
Recall Mode	None	None	None	None	None	None	None	C-Max		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	A	A		A	A			A	
Approach Delay			27.9					5.1			7.9	
Approach LOS			C					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)	
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)	

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

Intersection	
Int Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
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	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	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	-	-	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 2	-	-	-	-	926	-

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	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	413	404	130	13	8	94
Future Vol, veh/h	413	404	130	13	8	94
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	413	404	130	13	8	94

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	150	0	-	0	1374	144
Stage 1	-	-	-	-	144	-
Stage 2	-	-	-	-	1230	-
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	1437	-	-	-	162	888
Stage 1	-	-	-	-	888	-
Stage 2	-	-	-	-	279	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1428	-	-	-	100	883
Mov Cap-2 Maneuver	-	-	-	-	100	-
Stage 1	-	-	-	-	553	-
Stage 2	-	-	-	-	277	-

Approach	EB	WB	SW
HCM Control Delay, s	4.3	0	13.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SWLn1
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	-	-	B
HCM 95th %tile Q(veh)	1.2	-	-	-	0.7

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
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	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	14.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1343	-	-	-	431
HCM Lane V/C Ratio	0.007	-	-	-	0.093
HCM Control Delay (s)	7.7	0	-	-	14.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
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	0	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	0	0
Control Delay (s)	107.8	9.7	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	107.8	0.2		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	19.9		
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
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												
Traffic Vol, veh/h	0	1	0	1	0	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	0	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	EBLn1	WBLn1	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	9.8	-	-
HCM Lane LOS	B	-	-	F	D	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕						↕	
Traffic Vol, veh/h	5	1	14	0	2	104	0	0	0	0	231	9
Future Vol, veh/h	5	1	14	0	2	104	0	0	0	0	231	9
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	104	0	0	0	0	231	9

Major/Minor	Minor2			Minor1						Major2		
Conflicting Flow All	300	243	243	243	247	4				0	0	0
Stage 1	243	243	-	0	0	-				-	-	-
Stage 2	57	0	-	243	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	656	662	760	715	659	1071				-	-	-
Stage 1	765	708	-	-	-	-				-	-	-
Stage 2	-	-	-	765	706	-				-	-	-
Platoon blocked, %											-	-
Mov Cap-1 Maneuver	585	658	755	701	655	1067				-	-	-
Mov Cap-2 Maneuver	585	658	-	701	655	-				-	-	-
Stage 1	765	704	-	-	-	-				-	-	-
Stage 2	-	-	-	750	702	-				-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	10.3	8.8	0
HCM LOS	B	A	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	699	1054	-	-	-
HCM Lane V/C Ratio	0.029	0.101	-	-	-
HCM Control Delay (s)	10.3	8.8	0	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	0.1	0.3	-	-	-

Intersection	
Intersection Delay, s/veh	38.7
Intersection LOS	E

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	A	D

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	750	278	117	822
Cap Entry Lane, veh/h	730	1191	672	926
Entry HV Adj Factor	0.974	0.922	0.991	0.988
Flow Entry, veh/h	730	256	116	812
Cap Entry, veh/h	711	1099	667	915
V/C Ratio	1.027	0.233	0.174	0.888
Control Delay, s/veh	64.9	5.4	7.4	30.1
LOS	F	A	A	D
95th %tile Queue, veh	18	1	1	12

Intersection	
Int Delay, s/veh	7.8

Movement	EBL	EBR	SET	SER	NWL	NWT
Lane Configurations						
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, #	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	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.52	6.2	4.1	-
Critical Hdwy Stg 1	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	4.018	3.3	2.2	-
Pot Cap-1 Maneuver	682	935	-	-
Stage 1	724	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %				-
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	B	

Minor Lane/Major Mvmt	NWL	NWT	SELn1
Capacity (veh/h)	-	-	935
HCM Lane V/C Ratio	-	-	0.399
HCM Control Delay (s)	-	-	11.4
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	1.9

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
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			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
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	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
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, #	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	-	-	-	-	-
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 2	486	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	93	-	748	-	-	-
Mov Cap-2 Maneuver	194	-	-	-	-	-
Stage 1	303	-	-	-	-	-
Stage 2	486	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24	1.5	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	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	B	-	C	A	-	-
HCM 95th %tile Q(veh)	0.5	-	0.1	-	-	-

Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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)		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				0.362				0.998	
Satd. Flow (perm)	0	0	1488	1324	1423	0	626	1821	0	0	1766	0
Right Turn on Red				Yes	Yes				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		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 (%)												
Lane Group Flow (vph)	0	0	50	41	9	0	131	638	0	0	727	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	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			E	A	A		A	A			A	
Approach Delay			38.0					3.7			9.6	
Approach LOS			D					A			A	
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)	

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
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		Major2		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
HCM Control Delay, s	0	1.7	24.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	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	C	-	-	A	A
HCM 95th %tile Q(veh)	6	-	-	0	-

Intersection	
Int Delay, s/veh	46.8

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	385	258	436	99	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	-	0	1529	501
Stage 1	-	-	-	-	501	-
Stage 2	-	-	-	-	1028	-
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	1015	-	-	-	129	572
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	345	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1002	-	-	-	69	565
Mov Cap-2 Maneuver	-	-	-	-	69	-
Stage 1	-	-	-	-	331	-
Stage 2	-	-	-	-	341	-

Approach	EB	WB	SW
HCM Control Delay, s	6.5	0	199.9
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SWLn1
Capacity (veh/h)	1002	-	-	-	256
HCM Lane V/C Ratio	0.384	-	-	-	1.301
HCM Control Delay (s)	10.8	0	-	-	199.9
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	1.8	-	-	-	17

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
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	-	-	-	-	680	-
Stage 2	-	-	-	-	708	-
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	837	-	-	-	159	411
Stage 1	-	-	-	-	507	-
Stage 2	-	-	-	-	492	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	836	-	-	-	146	390
Mov Cap-2 Maneuver	-	-	-	-	146	-
Stage 1	-	-	-	-	467	-
Stage 2	-	-	-	-	491	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	24.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	836	-	-	-	233
HCM Lane V/C Ratio	0.05	-	-	-	0.202
HCM Control Delay (s)	9.5	0	-	-	24.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
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
Volume Right	3	0	0	0	170
cSH	394	850	1700	1700	1700
Volume to Capacity	0.85	0.03	0.42	0.43	0.10
Queue Length 95th (ft)	202	2	0	0	0
Control Delay (s)	48.4	9.3	0.0	0.0	0.0
Lane LOS	E	A			
Approach Delay (s)	48.4	0.3		0.0	
Approach LOS	E				

Intersection Summary			
Average Delay	8.3		
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
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												
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		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	888	-	-	15	100	847	-	-
HCM Lane V/C Ratio	0.484	-	-	0.067	0.16	0.017	-	-
HCM Control Delay (s)	12.8	-	-	261.5	47.7	9.3	-	-
HCM Lane LOS	B	-	-	F	E	A	-	-
HCM 95th %tile Q(veh)	2.7	-	-	0.2	0.5	0.1	-	-

Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕						↕	
Traffic Vol, veh/h	9	1	0	2	3	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	C	B	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	299	1025	1617	-	-
HCM Lane V/C Ratio	0.033	0.428	-	-	-
HCM Control Delay (s)	17.5	11.1	0	-	-
HCM Lane LOS	C	B	A	-	-
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	A	C	C	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	C	C	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						
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, #	-	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	-

Approach	EB	WB	SE
HCM Control Delay, s	2.8	0	23.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SELn1
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	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	3.1

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
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, #	-	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			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1179	-	-	-	487
HCM Lane V/C Ratio	0.004	-	-	-	0.031
HCM Control Delay (s)	8.1	0	-	-	12.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	8.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	27	404	745	839	503	85
Future Vol, veh/h	27	404	745	839	503	85
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
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	27	404	745	839	503	85

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2413	503	503	0	-	0
Stage 1	503	-	-	-	-	-
Stage 2	1910	-	-	-	-	-
Critical Hdwy	6.6	6.23	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.319	2.2	-	-	-
Pot Cap-1 Maneuver	32	568	1072	-	-	-
Stage 1	612	-	-	-	-	-
Stage 2	104	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 10	568	1072	-	-	-
Mov Cap-2 Maneuver	231	-	-	-	-	-
Stage 1	187	-	-	-	-	-
Stage 2	104	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.2	7.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1072	-	231	568	-	-
HCM Lane V/C Ratio	0.695	-	0.117	0.711	-	-
HCM Control Delay (s)	15.6	-	22.6	25.4	-	-
HCM Lane LOS	C	-	C	D	-	-
HCM 95th %tile Q(veh)	6	-	0.4	5.8	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

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

Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	C	A		A	A			A	
Approach Delay			71.7					4.0			7.0	
Approach LOS			E					A			A	
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)	

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	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
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	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	151	388	19	51	136	9

Major/Minor	Major1		Major2		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	-	-	2.353	-	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			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
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	B	-	-	A	A
HCM 95th %tile Q(veh)	1	-	-	0.1	-

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
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	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.372
Pot Cap-1 Maneuver	1411	-	-	-	94	863
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	185	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1402	-	-	-	43	858
Mov Cap-2 Maneuver	-	-	-	-	43	-
Stage 1	-	-	-	-	398	-
Stage 2	-	-	-	-	184	-

Approach	EB	WB	SW
HCM Control Delay, s	4.7	0	19
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SWLn1
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	A	A	-	-	C
HCM 95th %tile Q(veh)	1.8	-	-	-	1.3

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
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	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	17.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1303	-	-	-	337
HCM Lane V/C Ratio	0.012	-	-	-	0.131
HCM Control Delay (s)	7.8	0	-	-	17.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
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	
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					
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	0	0
Control Delay (s)	237.5	9.7	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	237.5	0.2		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	54.4		
Intersection Capacity Utilization	80.8%	ICU Level 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												
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	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	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	B	-	-	F	D	A	-	-
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	SBR
Lane Configurations		↕			↕						↕	
Traffic Vol, veh/h	5	1	14	0	2	122	0	0	0	0	308	9
Future Vol, veh/h	5	1	14	0	2	122	0	0	0	0	308	9
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	9

Major/Minor	Minor2			Minor1						Major2		
Conflicting Flow All	386	320	320	320	324	4				0	0	0
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	3.345				2.2	-	-
Pot Cap-1 Maneuver	576	600	687	637	597	1071				-	-	-
Stage 1	696	656	-	-	-	-				-	-	-
Stage 2	-	-	-	696	653	-				-	-	-
Platoon blocked, %											-	-
Mov Cap-1 Maneuver	504	596	683	623	593	1067				-	-	-
Mov Cap-2 Maneuver	504	596	-	623	593	-				-	-	-
Stage 1	696	652	-	-	-	-				-	-	-
Stage 2	-	-	-	681	649	-				-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	11	8.9	0
HCM LOS	B	A	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	623	1053	-	-	-
HCM Lane V/C Ratio	0.032	0.118	-	-	-
HCM Control Delay (s)	11	8.9	0	-	-
HCM Lane LOS	B	A	A	-	-
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	E	A	B	E

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	611	327	349	866
Cap Entry Lane, veh/h	669	1231	657	910
Entry HV Adj Factor	0.973	0.906	0.974	0.988
Flow Entry, veh/h	595	296	340	855
Cap Entry, veh/h	651	1115	640	899
V/C Ratio	0.913	0.266	0.531	0.951
Control Delay, s/veh	42.1	5.7	14.5	40.7
LOS	E	A	B	E
95th %tile Queue, veh	12	1	3	15

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

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	A	A	C

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-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	179	580	526
Cap Entry Lane, veh/h	1098	1303	825
Entry HV Adj Factor	0.981	0.981	0.981
Flow Entry, veh/h	176	569	516
Cap Entry, veh/h	1077	1279	810
V/C Ratio	0.163	0.445	0.637
Control Delay, s/veh	4.8	7.3	15.1
LOS	A	A	C
95th %tile Queue, veh	1	2	5

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	684	175	3	142	33	24
Future Vol, veh/h	684	175	3	142	33	24
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	684	175	3	142	33	24

Major/Minor	Major1		Major2		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	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	782	-	301	400
Stage 1	-	-	-	-	456	-
Stage 2	-	-	-	-	880	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	782	-	300	400
Mov Cap-2 Maneuver	-	-	-	-	300	-
Stage 1	-	-	-	-	454	-
Stage 2	-	-	-	-	880	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	17.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	335	-	-	782	-
HCM Lane V/C Ratio	0.17	-	-	0.004	-
HCM Control Delay (s)	17.9	-	-	9.6	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Intersection	
Int Delay, s/veh	35.5

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	80	506	52	122	353	20
Future Vol, veh/h	80	506	52	122	353	20
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, %	9	1	0	2	2	0
Mvmt Flow	80	506	52	122	353	20

Major/Minor	Major1		Major2		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, %		-	-	-		
Mov Cap-1 Maneuver	1361	-	-	-	~ 334	945
Mov Cap-2 Maneuver	-	-	-	-	~ 334	-
Stage 1	-	-	-	-	837	-
Stage 2	-	-	-	-	511	-

Approach	EB	WB	SE
HCM Control Delay, s	1.1	0	106.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	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	A	A	-	-	F
HCM 95th %tile Q(veh)	0.2	-	-	-	13.6

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
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			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
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	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	570	0	5	67	0	16
Future Vol, veh/h	570	0	5	67	0	16
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	570	0	5	67	0	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	570	0	647	570
Stage 1	-	-	-	-	570	-
Stage 2	-	-	-	-	77	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1002	-	436	521
Stage 1	-	-	-	-	566	-
Stage 2	-	-	-	-	946	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1002	-	434	521
Mov Cap-2 Maneuver	-	-	-	-	434	-
Stage 1	-	-	-	-	563	-
Stage 2	-	-	-	-	946	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	12.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	521	-	-	1002	-
HCM Lane V/C Ratio	0.031	-	-	0.005	-
HCM Control Delay (s)	12.1	-	-	8.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
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, #	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	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	178	-	-	-	-	-
Stage 1	292	-	-	-	-	-
Stage 2	459	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.9	1.8	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	748	-	178	-	-	-
HCM Lane V/C Ratio	0.182	-	0.034	-	-	-
HCM Control Delay (s)	10.9	-	25.9	0	-	-
HCM Lane LOS	B	-	D	A	-	-
HCM 95th %tile Q(veh)	0.7	-	0.1	-	-	-

Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	1821	0	0	1767	0
Flt Permitted			0.960				0.358				0.998	
Satd. Flow (perm)	0	0	1485	1324	1423	0	619	1821	0	0	1763	0
Right Turn on Red				Yes	Yes				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		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 (%)												
Lane Group Flow (vph)	0	0	63	48	9	0	137	638	0	0	733	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	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)			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			E	B	A		A	A			B	
Approach Delay			40.7					4.0			10.5	
Approach LOS			D					A			B	
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)	

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
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		Major2		Minor1	
Conflicting Flow All	0	0	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	-

Approach	EB	WB	NB
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	E	-	-	A	A
HCM 95th %tile Q(veh)	11.8	-	-	0	-

Intersection	
Int Delay, s/veh	160.2

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	455	327	534	99	56	343
Future Vol, veh/h	455	327	534	99	56	343
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	455	327	534	99	56	343

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	648	0	-	0	1836	599
Stage 1	-	-	-	-	599	-
Stage 2	-	-	-	-	1237	-
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	933	-	-	-	83	503
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	274	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	921	-	-	-	~ 32	496
Mov Cap-2 Maneuver	-	-	-	-	~ 32	-
Stage 1	-	-	-	-	215	-
Stage 2	-	-	-	-	270	-

Approach	EB	WB	SW
HCM Control Delay, s	7.4	0	$ 714
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SWLn1
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	B	A	-	-	F
HCM 95th %tile Q(veh)	2.8	-	-	-	33.9

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
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	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	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	SBLn1
Capacity (veh/h)	723	-	-	-	171
HCM Lane V/C Ratio	0.072	-	-	-	0.339
HCM Control Delay (s)	10.4	0	-	-	36.5
HCM Lane LOS	B	A	-	-	E
HCM 95th %tile Q(veh)	0.2	-	-	-	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
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	0.90					
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 %	0	99	97			
cM capacity (veh/h)	394	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	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	A			
Approach Delay (s)	85.7	0.3		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	16.5		
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
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												
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	-	-	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

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, %								-	-		-	-
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	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 401.7	14.6	5.9	0.2
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	883	-	-	10	389	843	-	-
HCM Lane V/C Ratio	0.584	-	-	0.1	0.036	0.017	-	-
HCM Control Delay (s)	14.6	-	-	$ 401.7	14.6	9.3	-	-
HCM Lane LOS	B	-	-	F	B	A	-	-
HCM 95th %tile Q(veh)	3.9	-	-	0.3	0.1	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕						↕	
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	Minor2			Minor1						Major2		
Conflicting Flow All	568	301	294	285	303	20				7	0	0
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	-	-	-	-				-	-	-
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	437	615	711	671	613	1049				1627	-	-
Stage 1	719	673	-	-	-	-				-	-	-
Stage 2	-	-	-	733	672	-				-	-	-
Platoon blocked, %											-	-
Mov Cap-1 Maneuver	211	603	701	666	601	1031				1617	-	-
Mov Cap-2 Maneuver	211	603	-	666	601	-				-	-	-
Stage 1	719	664	-	-	-	-				-	-	-
Stage 2	-	-	-	732	663	-				-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	21.7	12.1	0
HCM LOS	C	B	

Minor Lane/Major Mvmt	EBLn1	WBLn1	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	C	B	A	-	-
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	B	B	B	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	253	847	650	528
Cap Entry Lane, veh/h	653	1183	999	502
Entry HV Adj Factor	0.956	0.971	1.000	0.965
Flow Entry, veh/h	242	823	650	510
Cap Entry, veh/h	624	1149	999	484
V/C Ratio	0.388	0.716	0.651	1.052
Control Delay, s/veh	11.3	14.2	13.3	84.7
LOS	B	B	B	F
95th %tile Queue, veh	2	7	5	16

Intersection	
Intersection Delay, s/veh	14.8
Intersection LOS	B

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	C	C	A

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-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	910	648	264
Cap Entry Lane, veh/h	1194	928	884
Entry HV Adj Factor	0.980	0.981	0.981
Flow Entry, veh/h	892	635	259
Cap Entry, veh/h	1170	910	867
V/C Ratio	0.762	0.698	0.299
Control Delay, s/veh	16.0	16.1	7.4
LOS	C	C	A
95th %tile Queue, veh	8	6	1

Intersection	
Int Delay, s/veh	7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
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	Major1		Major2		Minor1	
Conflicting Flow All	0	0	285	0	691	246
Stage 1	-	-	-	-	246	-
Stage 2	-	-	-	-	445	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1277	-	410	793
Stage 1	-	-	-	-	795	-
Stage 2	-	-	-	-	646	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1277	-	405	793
Mov Cap-2 Maneuver	-	-	-	-	405	-
Stage 1	-	-	-	-	786	-
Stage 2	-	-	-	-	646	-

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	-	-	A	A
HCM 95th %tile Q(veh)	4	-	-	0	-

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	61	144	338	330	141	80
Future Vol, veh/h	61	144	338	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, #	-	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			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SELn1
Capacity (veh/h)	931	-	-	-	401
HCM Lane V/C Ratio	0.066	-	-	-	0.551
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						
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, #	-	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			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1179	-	-	-	487
HCM Lane V/C Ratio	0.004	-	-	-	0.031
HCM Control Delay (s)	8.1	0	-	-	12.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	198	0	13	405	0	7
Future Vol, veh/h	198	0	13	405	0	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	198	0	13	405	0	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	198	0	629	198
Stage 1	-	-	-	-	198	-
Stage 2	-	-	-	-	431	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1375	-	446	843
Stage 1	-	-	-	-	835	-
Stage 2	-	-	-	-	655	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1375	-	441	843
Mov Cap-2 Maneuver	-	-	-	-	441	-
Stage 1	-	-	-	-	825	-
Stage 2	-	-	-	-	655	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	9.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	843	-	-	1375	-
HCM Lane V/C Ratio	0.008	-	-	0.009	-
HCM Control Delay (s)	9.3	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	12

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
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	-	Yield	-	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	503	0	-	0
Stage 1	503	-	-	-	-	-
Stage 2	2164	-	-	-	-	-
Critical Hdwy	6.6	6.23	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.319	2.2	-	-	-
Pot Cap-1 Maneuver	~ 22	568	1072	-	-	-
Stage 1	612	-	-	-	-	-
Stage 2	75	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 4	568	1072	-	-	-
Mov Cap-2 Maneuver	120	-	-	-	-	-
Stage 1	114	-	-	-	-	-
Stage 2	75	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	31.7	10.7	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1072	-	120	568	-	-
HCM Lane V/C Ratio	0.813	-	0.25	0.787	-	-
HCM Control Delay (s)	21.1	-	44.7	30.8	-	-
HCM Lane LOS	C	-	E	D	-	-
HCM 95th %tile Q(veh)	9.5	-	0.9	7.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

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

Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	1761	0	0	1800	0
Flt Permitted			0.962				0.347				0.998	
Satd. Flow (perm)	0	0	1598	1451	1545	0	594	1761	0	0	1797	0
Right Turn on Red				Yes	Yes				No			
Satd. Flow (RTOR)				60	198							
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								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	B	A		A	A			A	
Approach Delay			21.9					7.0			8.2	
Approach LOS			C					A			A	
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					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)	

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-Uncoord			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 8.6		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

Movement	EBL	EBR	NBL	NBT	SBT	SBR
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	
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)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	99	98			
cM capacity (veh/h)	388	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	387	776	1700	1700	1700
Volume to Capacity	1.34	0.02	0.45	0.51	0.06
Queue Length 95th (ft)	608	2	0	0	0
Control Delay (s)	196.5	9.7	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	196.5	0.2		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	45.0		
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	12.9
Intersection LOS	B

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	855
Demand Flow Rate, veh/h	611	327	349	866
Vehicles Circulating, veh/h	710	112	728	408
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	1.000
Approach Delay, s/veh	23.9	5.4	11.1	8.5
Approach LOS	C	A	B	A

Lane	Left	Left	Left	Left	Bypass
Designated Moves	LTR	LT	LTR	LT	R
Assumed Moves	LTR	LT	LTR	LT	R
RT Channelized					Free
Lane Util	1.000	1.000	1.000	1.000	
Follow-Up Headway, s	2.535	2.535	2.535	2.535	
Critical Headway, s	4.328	4.328	4.328	4.328	258
Entry Flow, veh/h	611	327	349	608	1919
Cap Entry Lane, veh/h	777	1291	765	1004	0.990
Entry HV Adj Factor	0.973	0.906	0.974	0.987	255
Flow Entry, veh/h	595	296	340	600	1900
Cap Entry, veh/h	756	1170	745	991	0.134
V/C Ratio	0.787	0.253	0.456	0.606	0.0
Control Delay, s/veh	23.9	5.4	11.1	12.1	A
LOS	C	A	B	B	0
95th %tile Queue, veh	8	1	2	4	

Intersection	
Int Delay, s/veh	19

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
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	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			Major2			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	-	-	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	-	-	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	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	676	1465	-	-	1231	-	-	109
HCM Lane V/C Ratio	0.867	0.006	-	-	0.042	-	-	0.138
HCM Control Delay (s)	34.9	7.5	0	-	8.1	0	-	43.2
HCM Lane LOS	D	A	A	-	A	A	-	E
HCM 95th %tile Q(veh)	10.2	0	-	-	0.1	-	-	0.5

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
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, #	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	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	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	B	-	C	A	-	-
HCM 95th %tile Q(veh)	0.7	-	0.1	-	-	-

Lane Group	EBL2	EBL	EBT	EBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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 (%)												
Lane Group Flow (vph)	0	0	63	48	9	0	137	638	0	0	733	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	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	
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)			8.5	8.5	8.5		54.1	53.3			44.1	
Actuated g/C Ratio			0.12	0.12	0.12		0.77	0.76			0.63	
v/c Ratio			0.32	0.18	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			C	A	A		A	A			B	
Approach Delay			18.9					5.5			16.7	
Approach LOS			B					A			B	
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					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)	

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	

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
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					
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	A			
Approach Delay (s)	65.9	0.3		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	12.7		
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	13.7
Intersection LOS	B

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	510
Demand Flow Rate, veh/h	253	847	650	528
Vehicles Circulating, veh/h	734	151	317	992
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	1.000
Approach Delay, s/veh	9.1	12.5	11.2	20.9
Approach LOS	A	B	B	C

Lane	Left	Left	Left	Left	Bypass
Designated Moves	LTR	LT	LTR	LT	R
Assumed Moves	LTR	LT	LTR	LT	R
RT Channelized					Free
Lane Util	1.000	1.000	1.000	1.000	
Follow-Up Headway, s	2.535	2.535	2.535	2.535	
Critical Headway, s	4.328	4.328	4.328	4.328	87
Entry Flow, veh/h	253	847	650	441	1976
Cap Entry Lane, veh/h	761	1249	1085	611	0.962
Entry HV Adj Factor	0.956	0.971	1.000	0.965	84
Flow Entry, veh/h	242	823	650	426	1900
Cap Entry, veh/h	727	1213	1085	590	0.044
V/C Ratio	0.333	0.678	0.599	0.722	0.0
Control Delay, s/veh	9.1	12.5	11.2	25.1	A
LOS	A	B	B	D	0
95th %tile Queue, veh	1	6	4	7	

Intersection	
Int Delay, s/veh	7.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
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			Major2			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			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	-	-	0.232	-	-	0.115
HCM Control Delay (s)	21.3	7.9	0	-	8.2	0	-	36
HCM Lane LOS	C	A	A	-	A	A	-	E
HCM 95th %tile Q(veh)	2.7	0	-	-	0.9	-	-	0.4

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
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	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	-	2.2	-	-	-
Pot Cap-1 Maneuver	~ 22	0	1072	-	-	-
Stage 1	612	0	-	-	-	-
Stage 2	75	0	-	-	-	-
Platoon blocked, %				-	-	-
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	EBLn2	SBT	SBR
Capacity (veh/h)	1072	-	120	-	-	-
HCM Lane V/C Ratio	0.813	-	0.25	-	-	-
HCM Control Delay (s)	22.4	-	44.9	0	-	-
HCM Lane LOS	C	-	E	A	-	-
HCM 95th %tile Q(veh)	11.7	-	1	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

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

DAVID Y. IGE
GOVERNOR

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

September 29, 2017

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 Raymond.j.mccormick@hawaii.gov if you have comments or questions regarding this letter.

Sincerely,

Larry Dill, P.E.
District Engineer
for

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 Highway Capacity Manual (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 Kapa`a Transportation Solutions, 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 (ITE Code)	Units	AM Peak Hour (vph)			PM Peak Hour (vph)		
		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 (820)	8,000 SFGFA	21	13	34	53	57	110
	Pass-By	0	0	0	(-)45	(-)45	(-)90
Total External Trips		**98**	**345**	**443**	**331**	**177**	**509**

b. The ITE Trip Generation Handbook 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 Trip Generation Handbook 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 not 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 not 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 not 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.

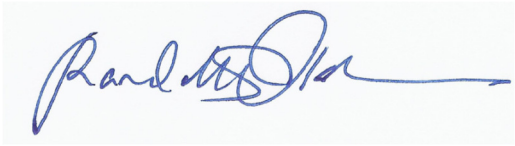
Comment No. 11 – Recommendation of Traffic Improvements With Project

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 

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

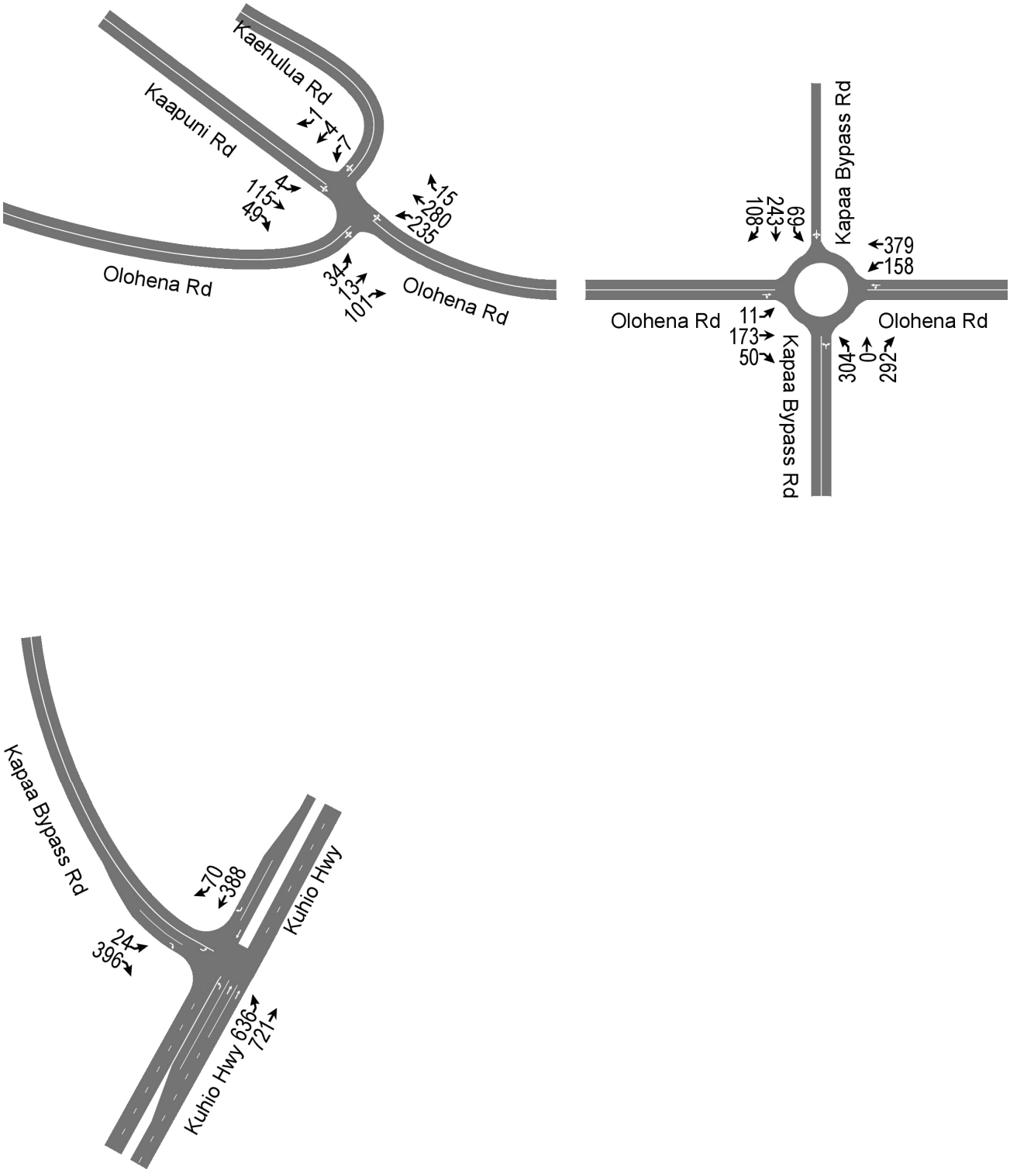


Figure 6. Existing PM Peak Hour Traffic (Cont'd.)

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

Turning Movement Data

Start Time	Kapaa Bypass Rd Koko Head Bound				Kuhio Hwy Mauka Bound				Kuhio Hwy Makai Bound					
	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 ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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
Hourly Total	19	420	2	439	543	665	0	1208	0	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	-	-	-	-	-	-	-	-	-	-	-

The Traffic Management Consultant
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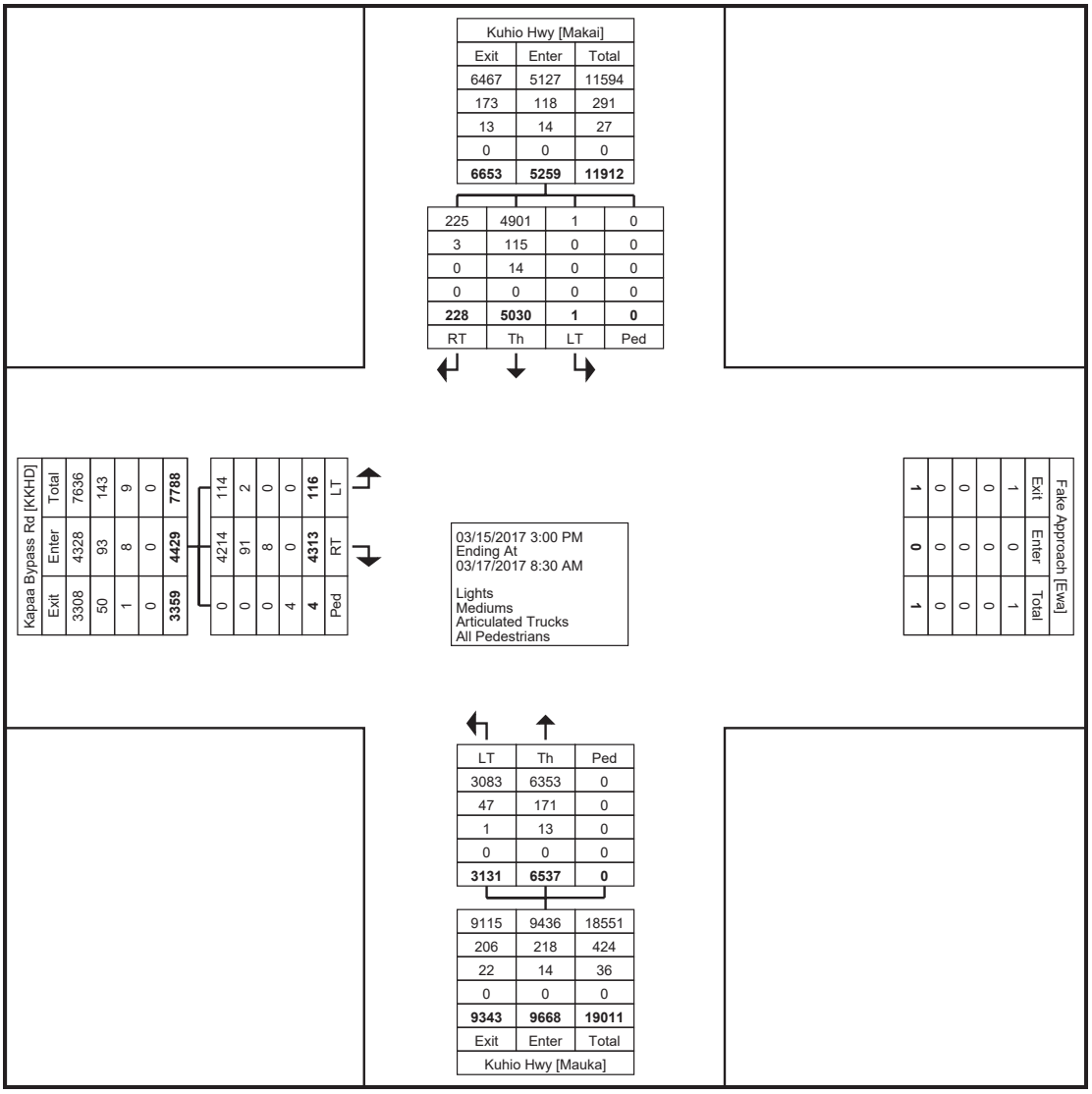
Honolulu, Hawaii, United States 96813
808-536-0223 tmchawaii@aol.com

Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017



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

Turning Movement Peak Hour Data (3:45 PM)

Start Time	Kapaa Bypass Rd Koko Head Bound				Kuhio Hwy Mauka Bound				Kuhio Hwy Makai Bound					
	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-

The Traffic Management Consultant
1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813
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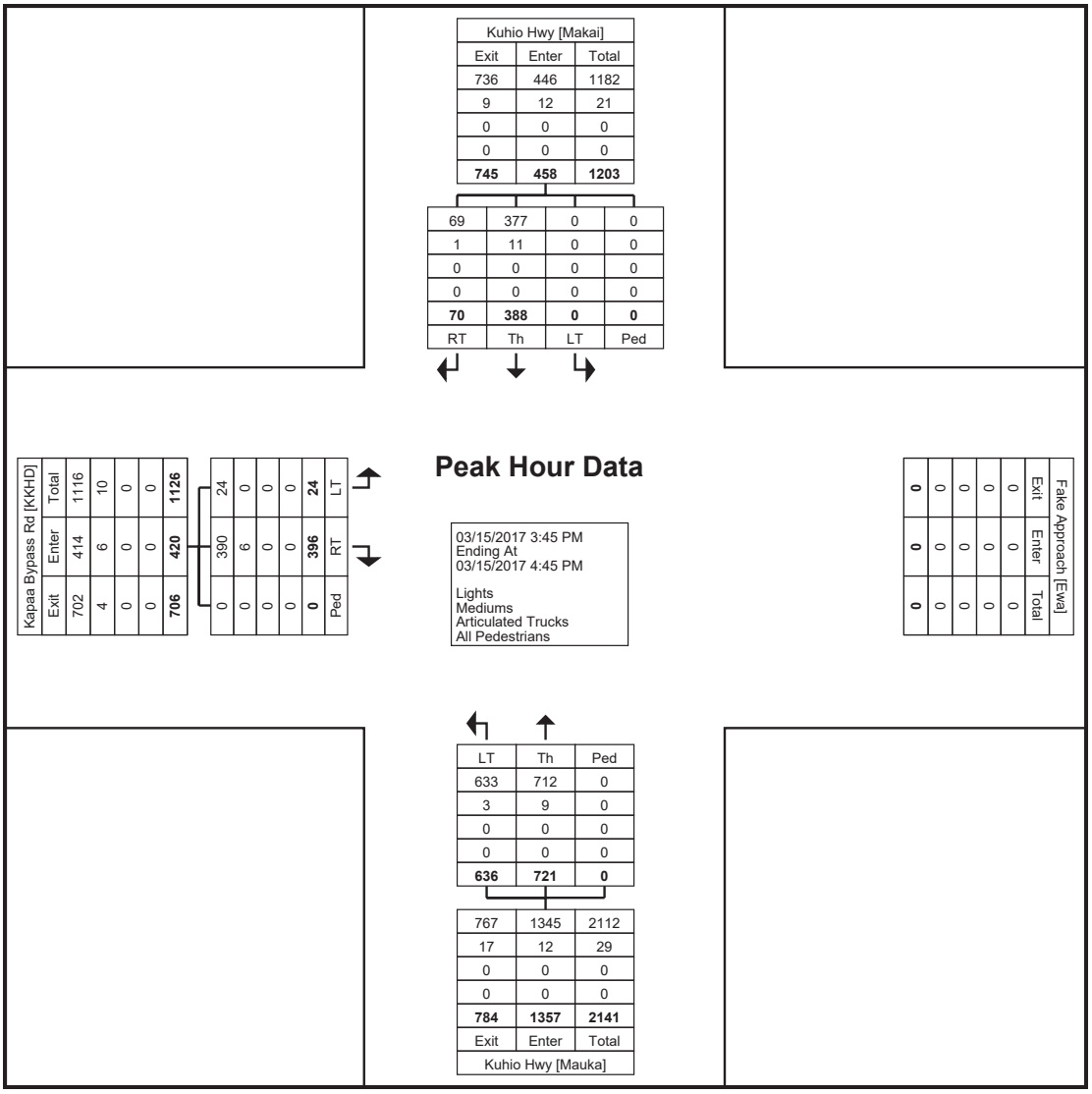

Turning Movement Peak Hour Data Plot (3:45 PM)

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

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Kapaa Bypass Rd Koko Head Bound				Kuhio Hwy Mauka Bound				Kuhio Hwy Makai Bound					
	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	-	-	-	-	-	-	-	-	-	-	-

The Traffic Management Consultant
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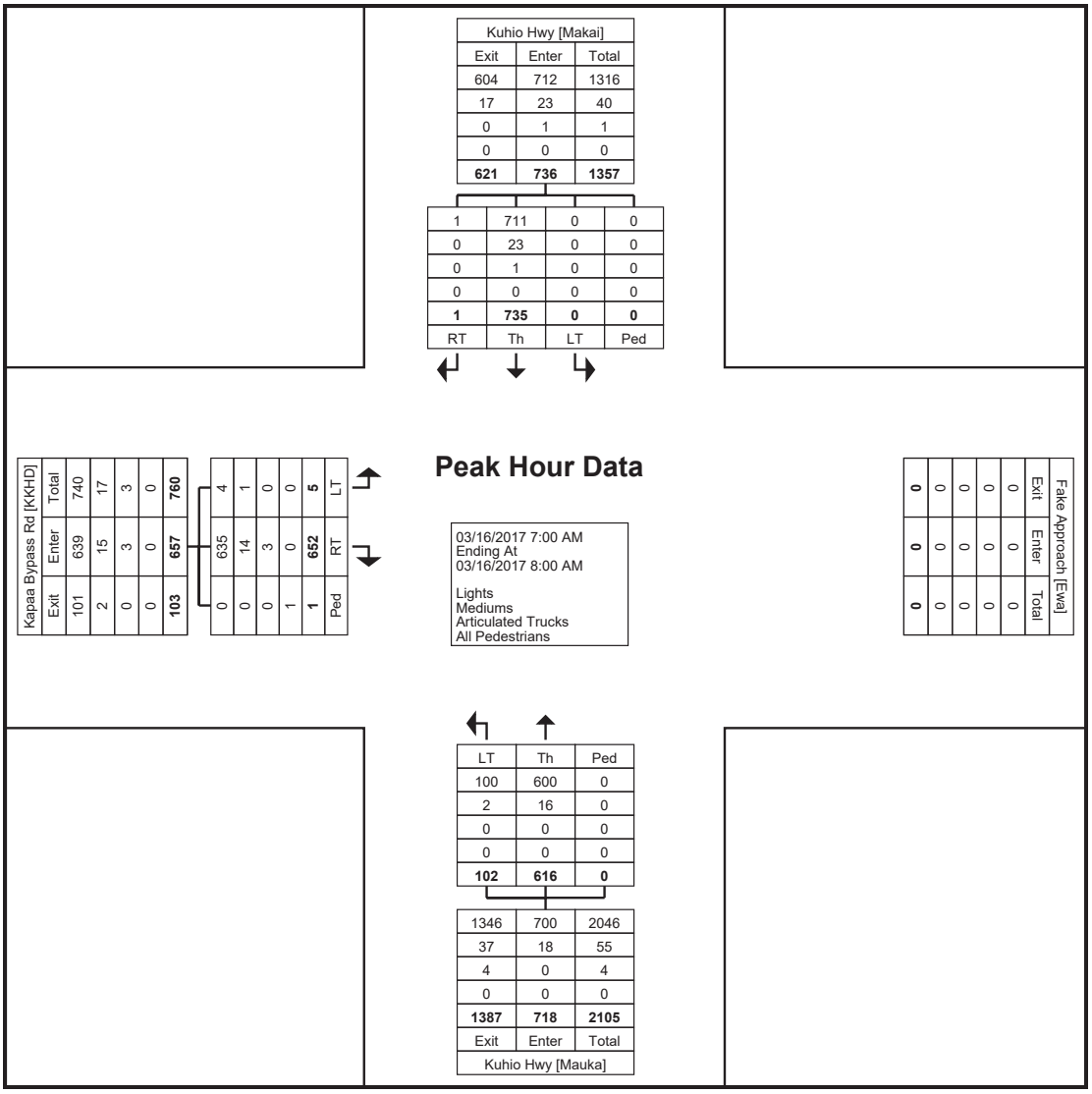
808-536-0223 tmchawaii@aol.com



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

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Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017

Turning Movement Peak Hour Data (4:15 PM)

Start Time	Kapaa Bypass Rd Koko Head Bound				Kuhio Hwy Mauka Bound				Kuhio Hwy Makai Bound					
	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	-	-	-	-	-	-	-	-	-	-	-

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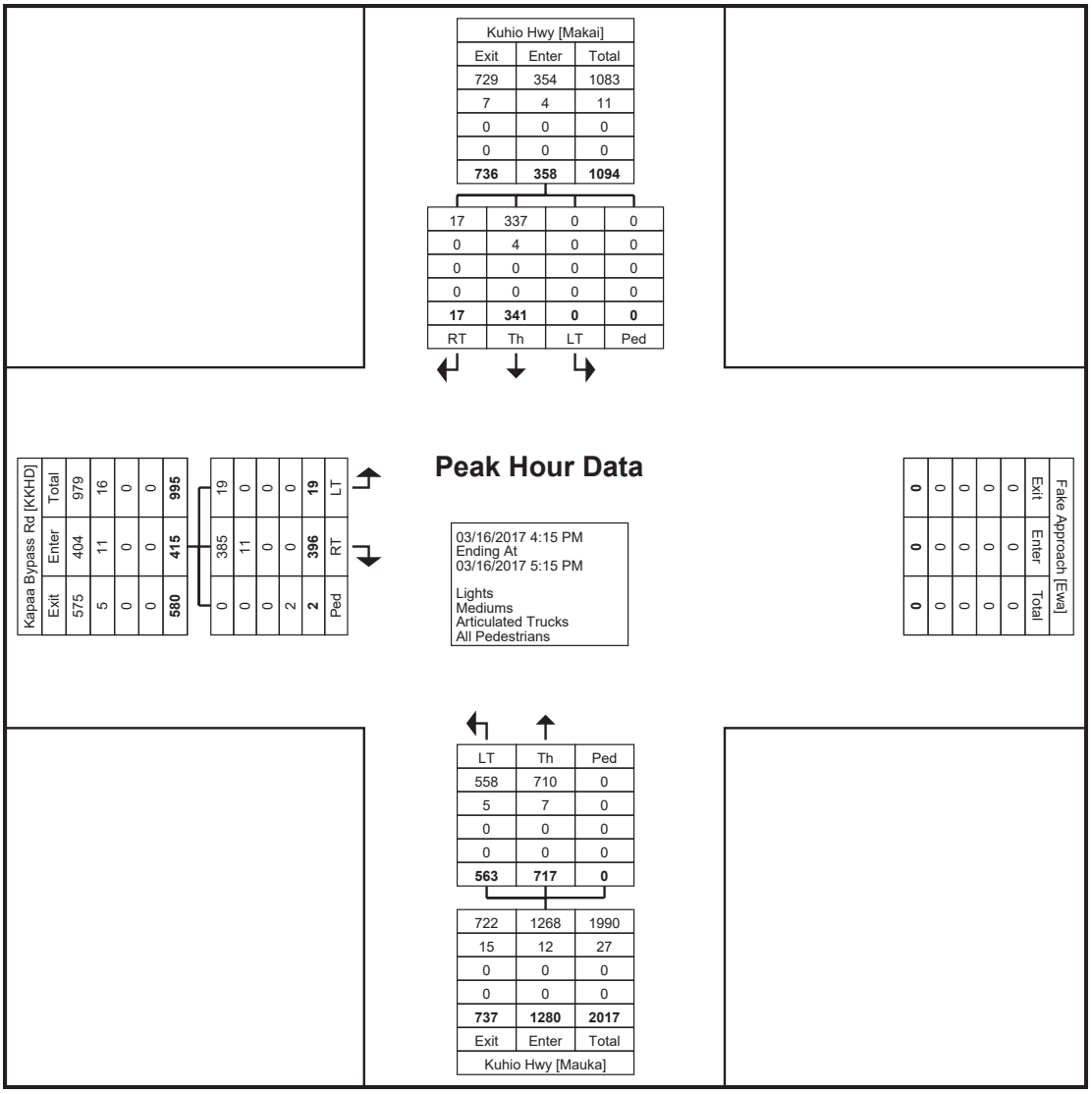

Turning Movement Peak Hour Data Plot (4:15 PM)

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Count Name: Kuhio Hwy Kapaa Bypass 3-15-17 to 3-17-17
Site Code: Hokua Place
Start Date: 03/15/2017

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Kapaa Bypass Rd Koko Head Bound				Kuhio Hwy Mauka Bound				Kuhio Hwy Makai Bound					
	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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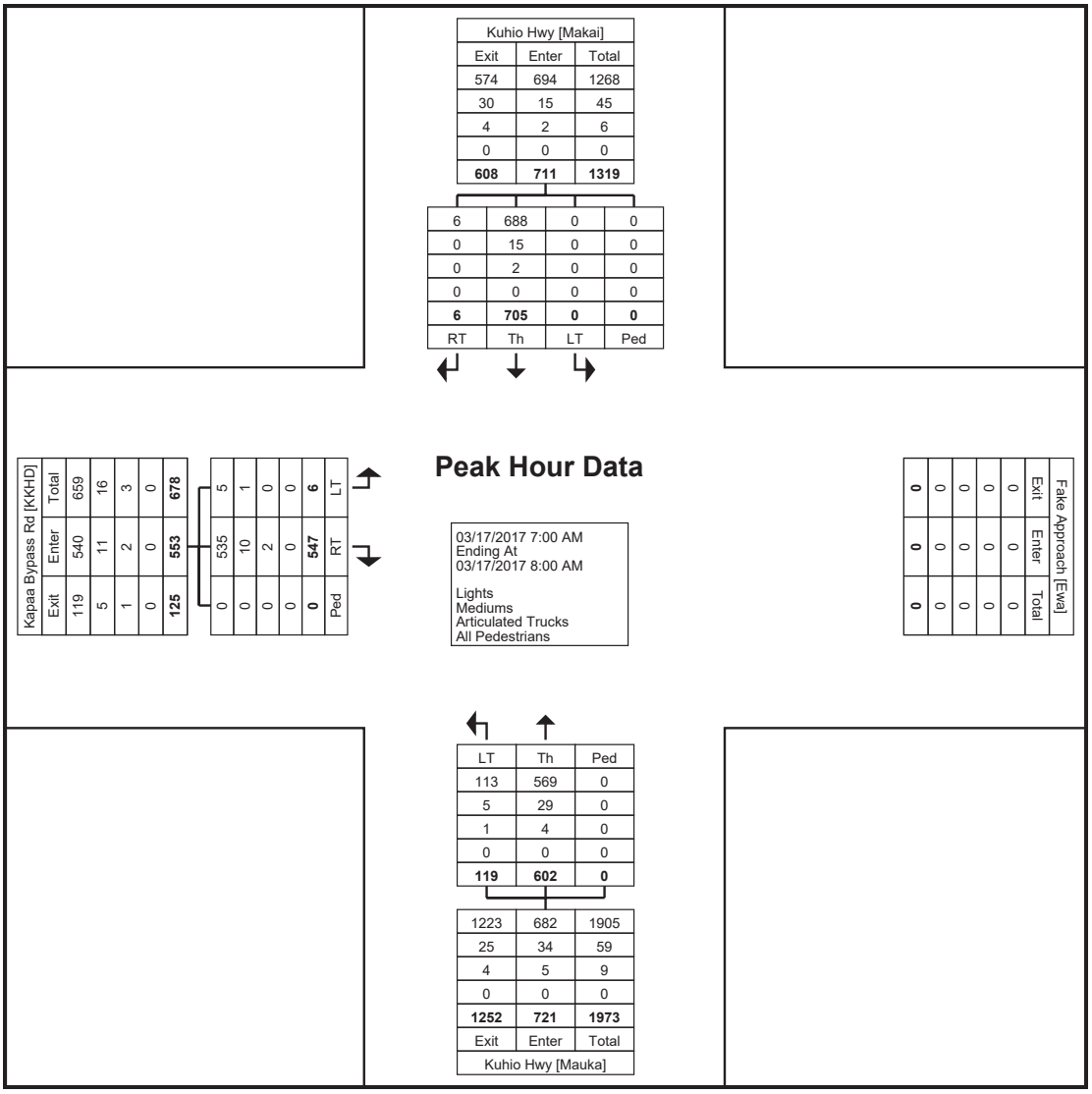

Turning Movement Peak Hour Data Plot (7:00 AM)

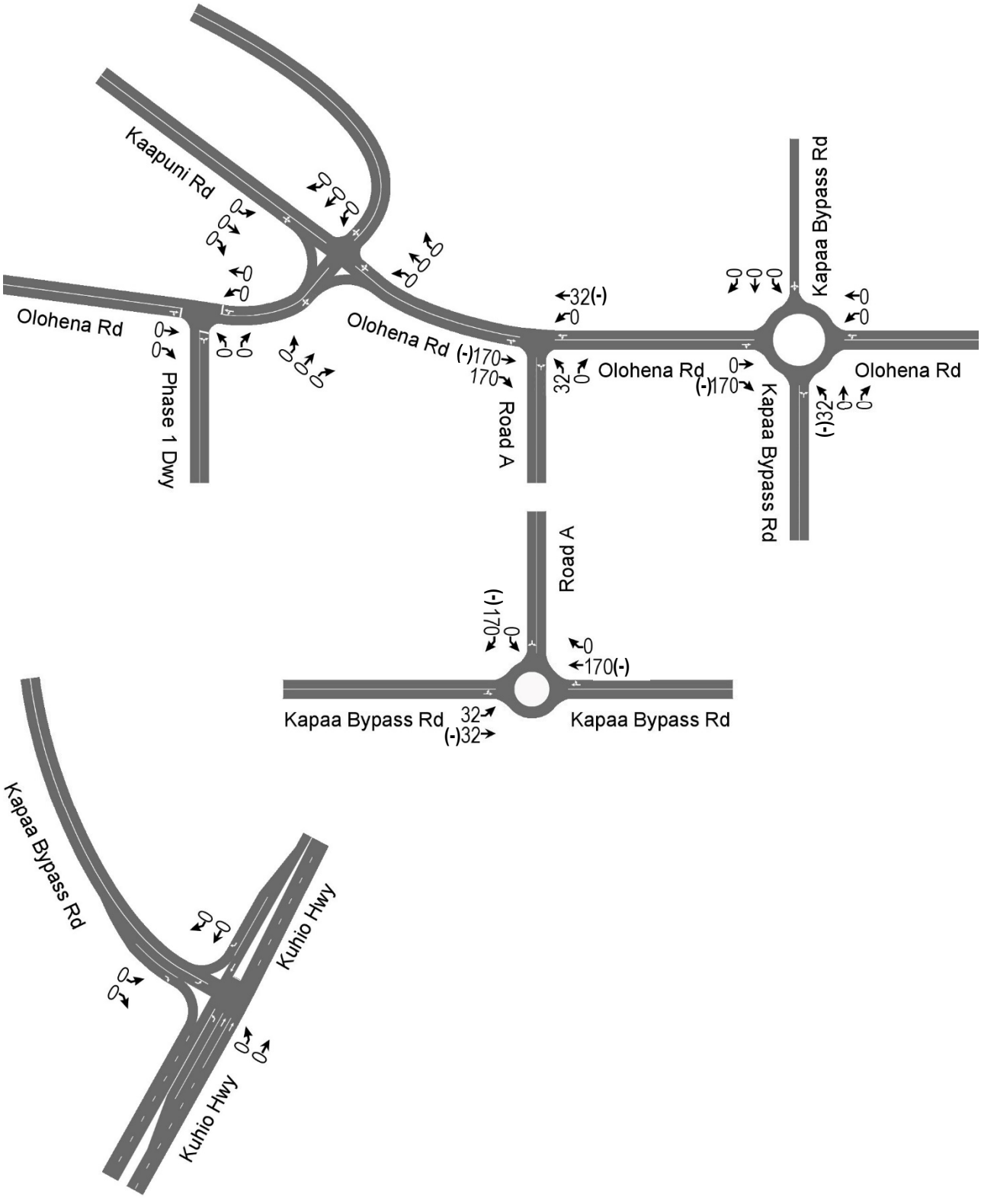

Figure 12.1 AM Peak Hour Diverted Traffic Assignment

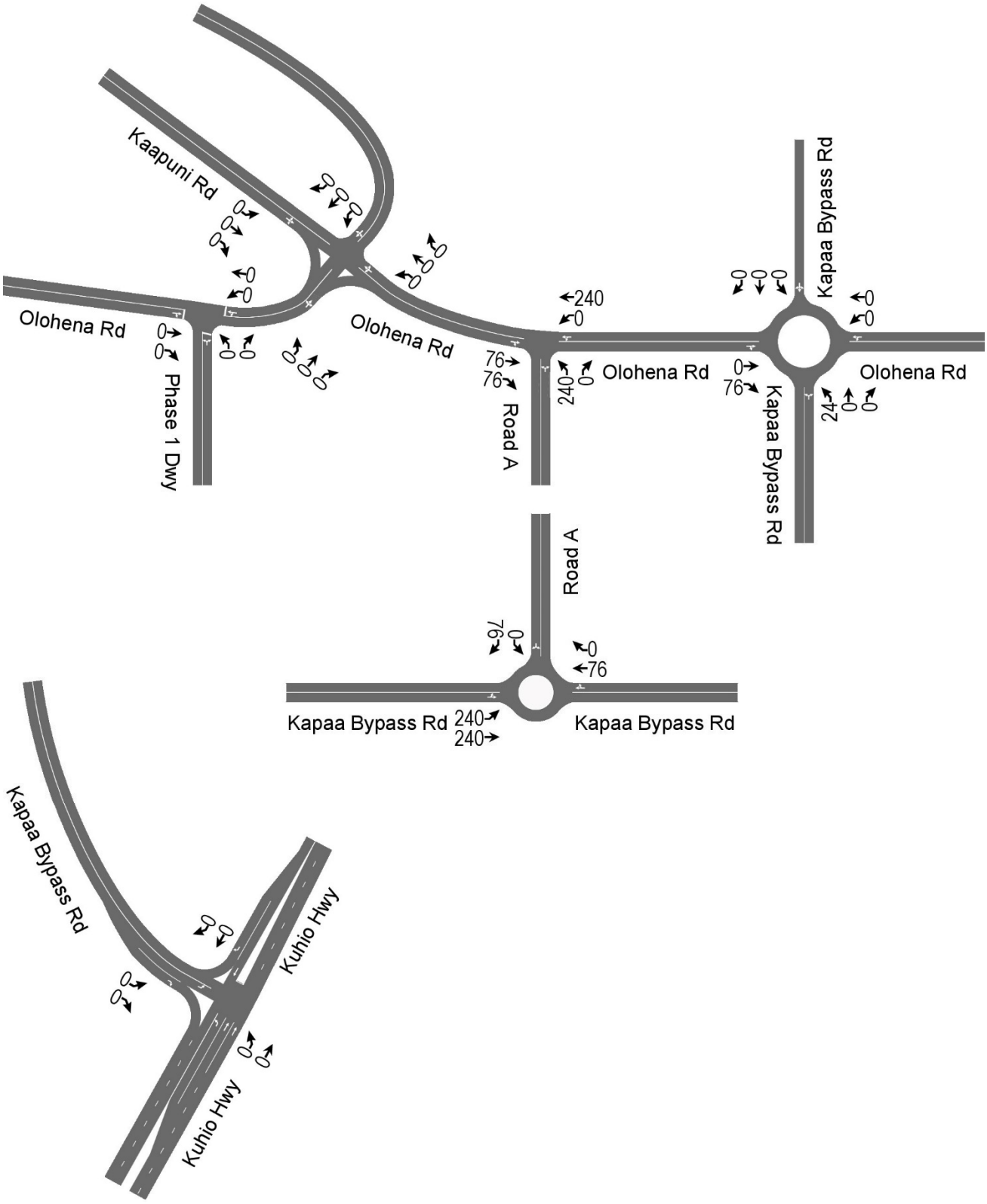

Figure 14.1 PM Peak Hour Diverted Traffic Assignment

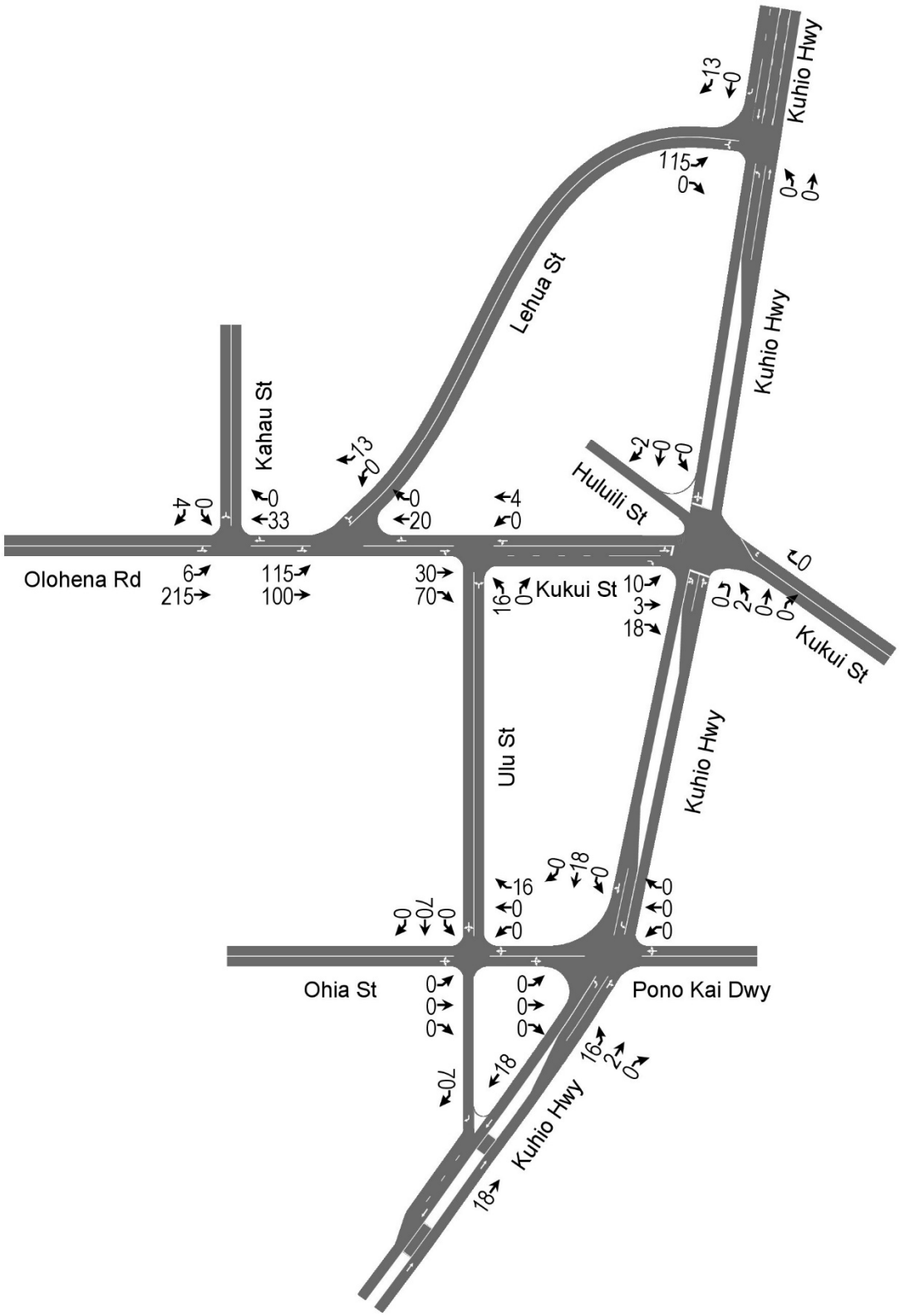

Figure 11. AM Peak Hour Site Traffic Assignment

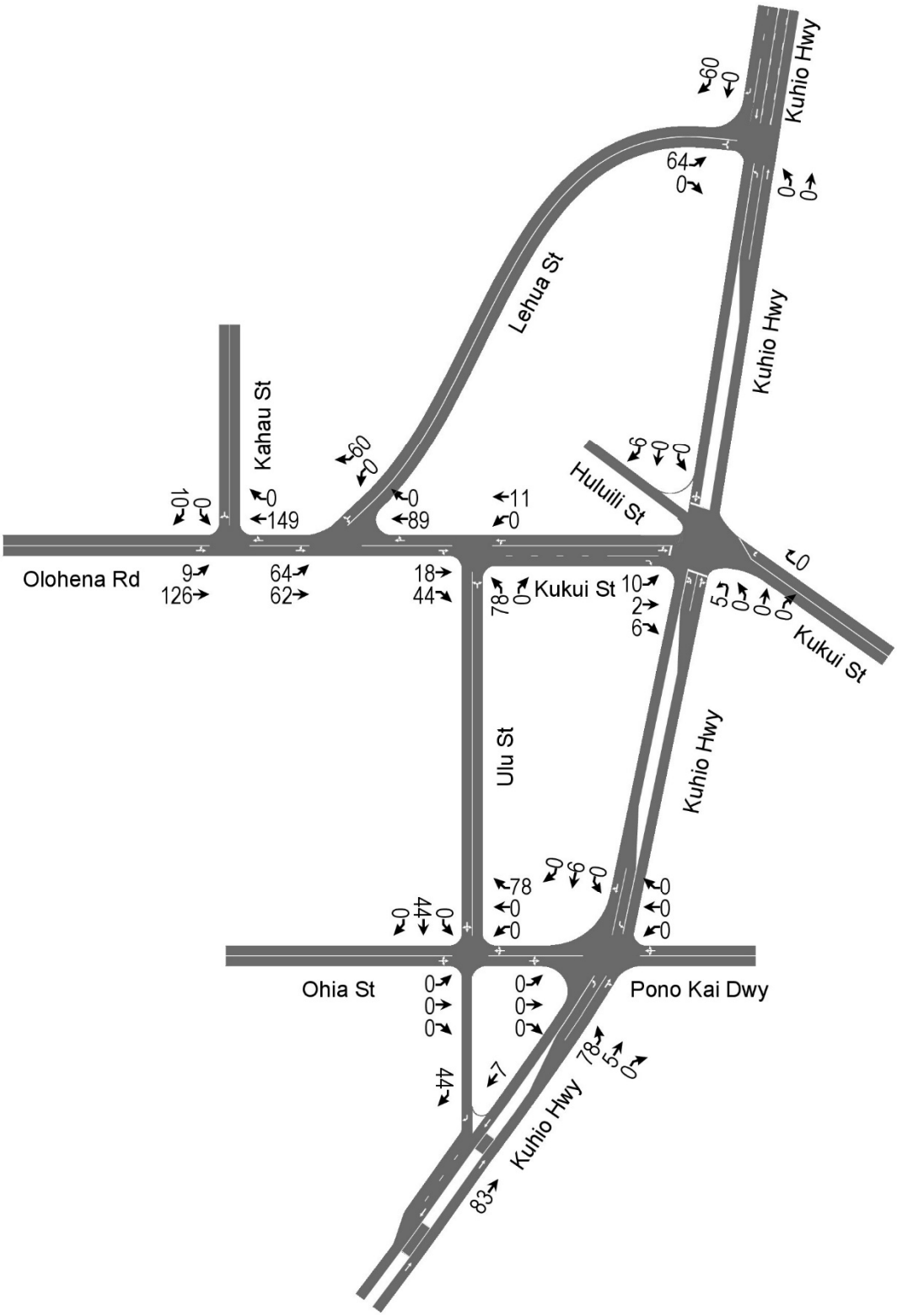

Figure 13. PM Peak Hour Site Traffic Assignment

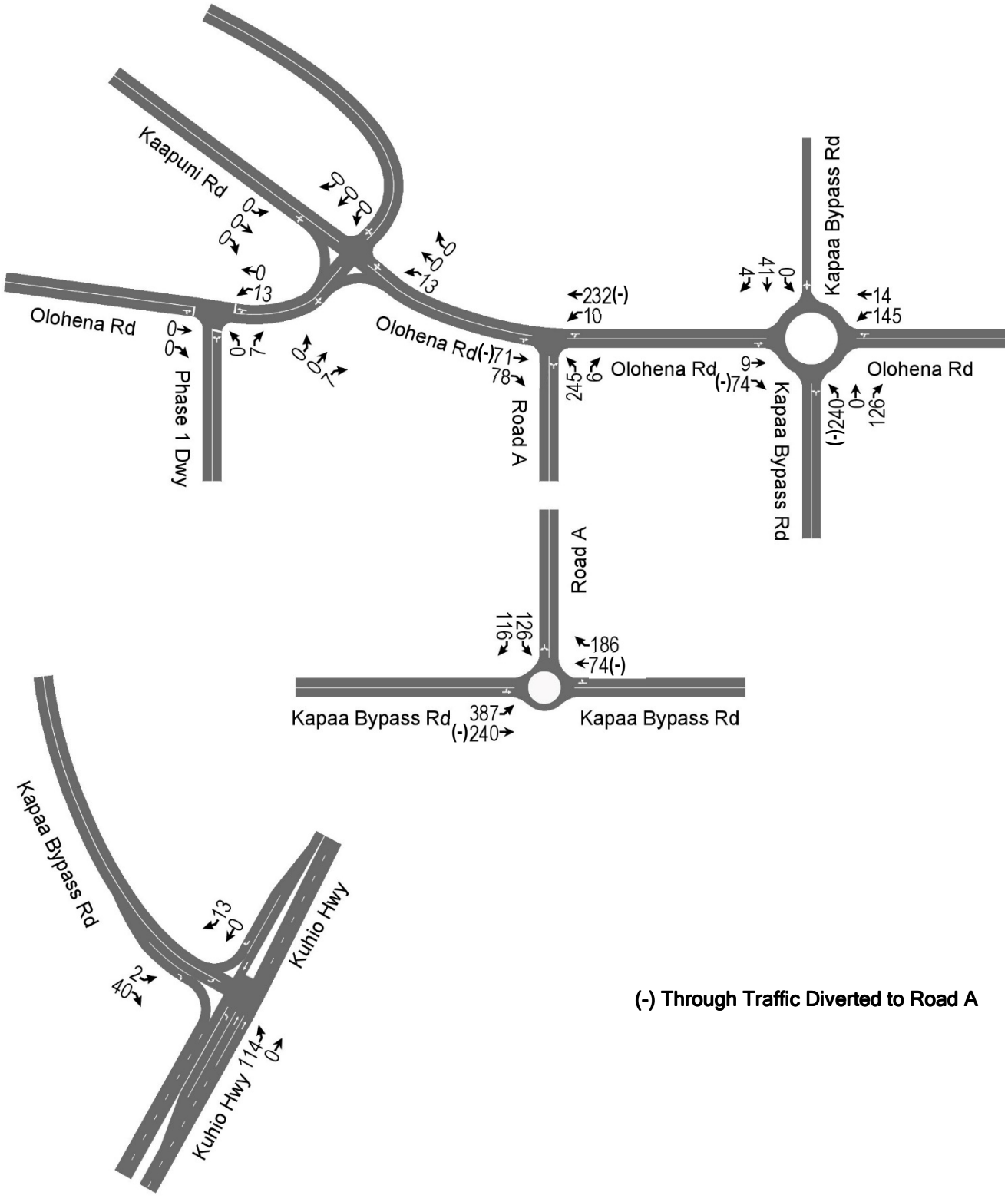

Figure 14. PM Peak Hour Site Traffic Assignment (Cont'd.)

Bernard P. Carvalho, Jr.
Mayor

Wallace G. Rezentes, Jr.
Managing Director

Lyle Tabata
Acting County Engineer

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County of Kaua'i, State of Hawai'i
4444 Rice 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 Kūhiō 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 multi-family dwelling units, but the trip generation calculations are based on 800 multi-family 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 Ka'apuni 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 Kūhiō 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 Kūhiō 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

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 Kūhi'ō 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'apuni 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

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