



Waikiki Traffic Study

Waikiki, Oahu, Hawaii

October 2013



**Department of Transportation Services
City & County of Honolulu**

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I. INTRODUCTION

Waikiki is Hawaii's economic engine and tourism hub. The transportation system in Waikiki provides services to Waikiki's visitors, businesses, workers, and residents by accommodating various transportation modes such as vehicles, bicycles, and walking. Consequently, these various modes compete for time and space in Waikiki's streets. Responding to the community's growing interests in bicycles and walking, the City and County of Honolulu Department of Transportation Services (DTS) have recently launched several projects to improve livability and walkability in Waikiki: The sidewalk improvement project on Royal Hawaiian Avenue between Kuhio Avenue and Aloha Drive was awarded in September 2012 with a construction completion date of May 2013; The bike path along Kalakaua Avenue was recently completed allowing the bicyclists to travel on the path from Ala Moana Boulevard to Kapahulu Avenue and beyond in Waikiki; and the Waikiki Regional Circulator Study was launched in 2011 in order to improve public transit services and to select the optimal bus route to connect Waikiki to the planned Ala Moana Shopping Center transit station.

As part of these greater efforts, the City DTS, in a joint effort with Waikiki Transportation Stakeholders Oversight Committee (WTSOC), initiated Waikiki Traffic Study by focusing on multi-modal transportation concepts and improving traffic operational efficiency. The purposes of the study are:

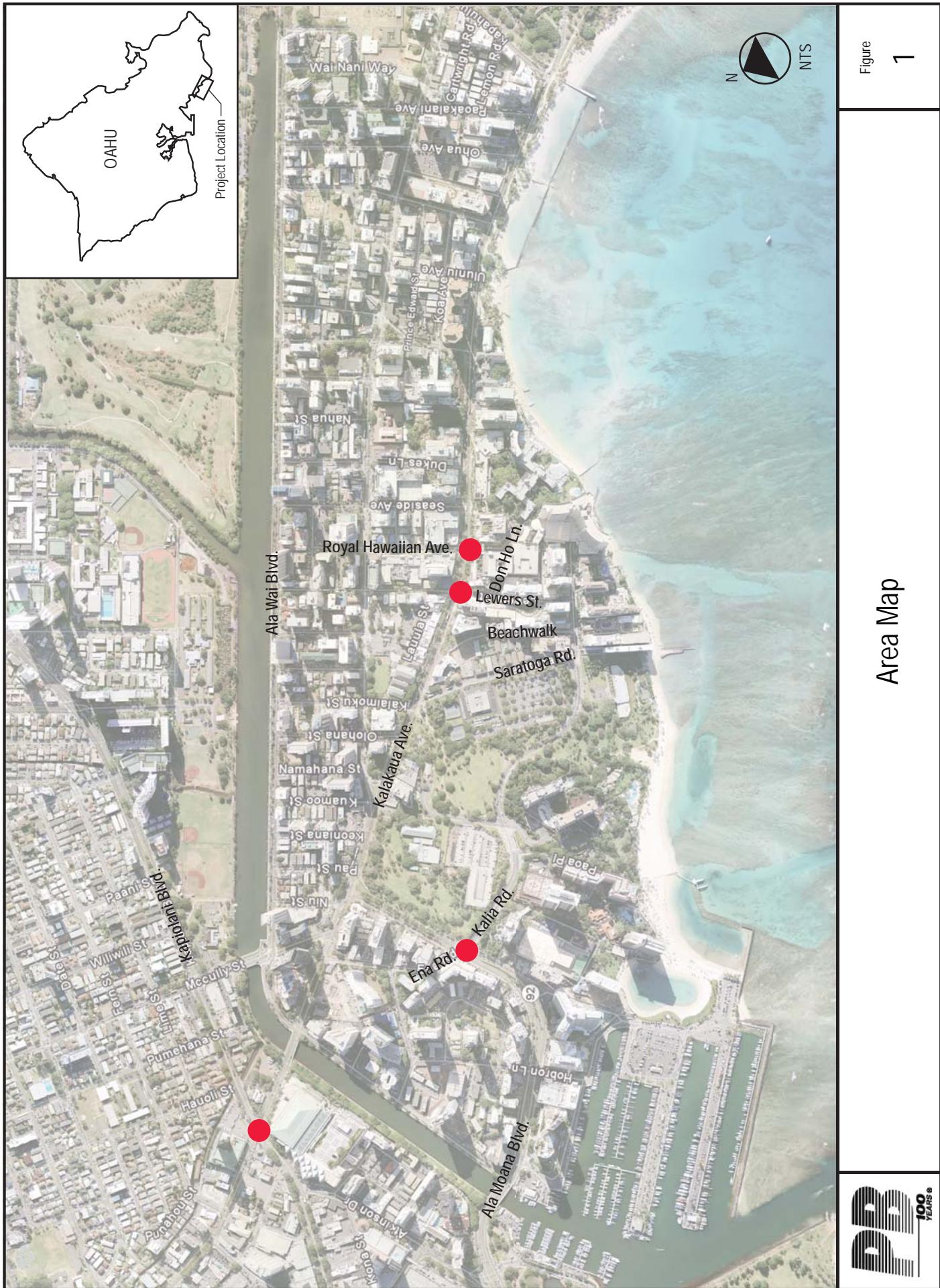
- 1) to explore ways to further integrate multi-modal transportation concepts including bus, bike, and pedestrian into Waikiki,
- 2) to identify the most effective physical and operational actions that can be used to create and maintain a livable and sustainable environment,
- 3) to facilitate the development of a Complete Streets Policy for the City and County of Honolulu.

This study is closely coordinated with the Waikiki Regional Circulator Study. A series of the WTSOC meetings and the public workshops were conducted from September 2011 to January 2013. Among many traffic issues identified, the following key locations have been prioritized to be analyzed further in this study.

The key locations as shown in Figure 1 are:

- 1) At the intersection of Kalakaua Avenue and Royal Hawaiian Avenue and at the intersection of Kalakaua Avenue and Lewers Street, Diamond Head bound right turn vehicles interfere with makai leg pedestrian crossings. This causes excessive Diamond Head bound queuing and undesirable pedestrian movements especially during PM peak hours. What can be done to make pedestrian crossing safer and reduce the delays for both vehicles and pedestrians?
- 2) At the intersection of Kalakaua Avenue and Kapiolani Boulevard, the mauka-bound left turning movement is currently prohibited. Permitting a left turn for the buses will be essential for the regional circulator between Waikiki and the planned Ala Moana Shopping Center transit station. However, will this cause adverse impacts to the already congested intersection?
- 3) At the intersection of Ala Moana Boulevard and Kalia Road/Ena Road, heavy pedestrian volumes cross the intersection and high level of pedestrian and vehicle conflicts were observed. Adding an All-Pedestrian Phase will separate the vehicular traffic and the foot traffic. However, this will inevitably deteriorate LOS on the already congested Kalia Road and Ala Moana Boulevard. What alternative can be investigated to create a balance between the competing vehicular and foot traffic?

This report will identify the abovementioned inefficiencies and evaluate the constraints and opportunities to improve operation and safety. Traffic analysis will be conducted to evaluate the Measurement of Effectiveness (MOEs) of the proposed measures in terms of delay and queuing not only for vehicles but also for pedestrians. Mitigative measures will generally be retrofit recommendations that do not involve right-of-way taking given the limited right-of-way in Waikiki.



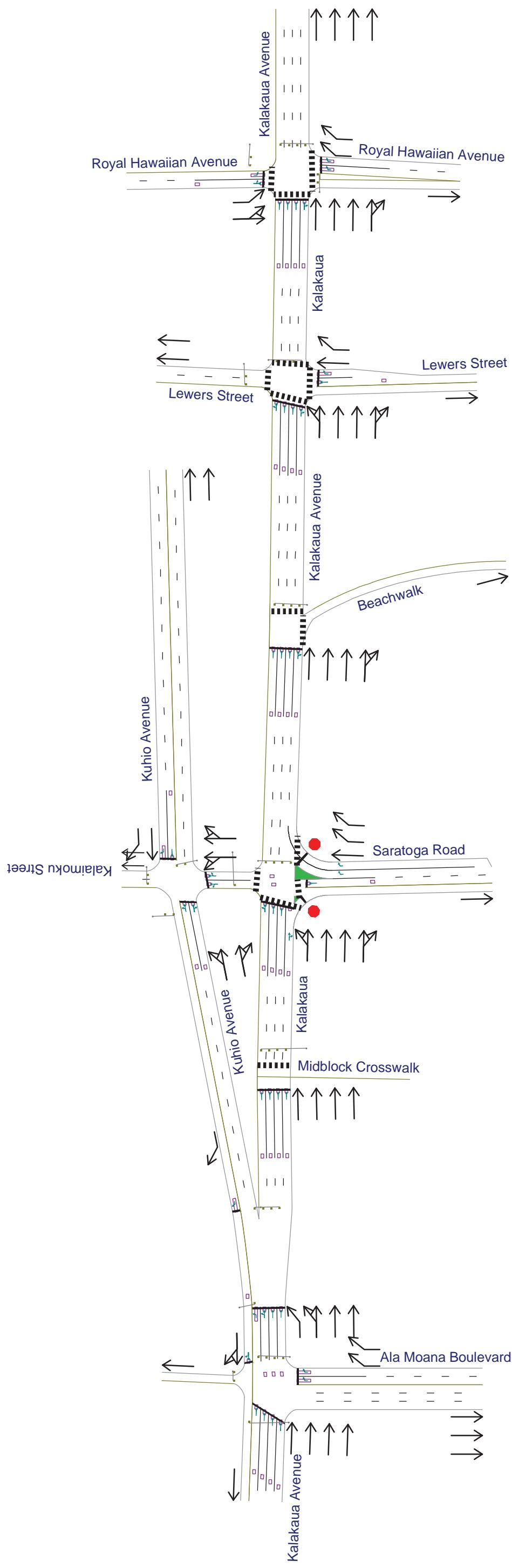
II. KALAKAUA AVENUE/ROYAL HAWAIIAN AVENUE INTERSECTION AND KALAKAUA AVENUE/LEWERS STREET INTERSECTION

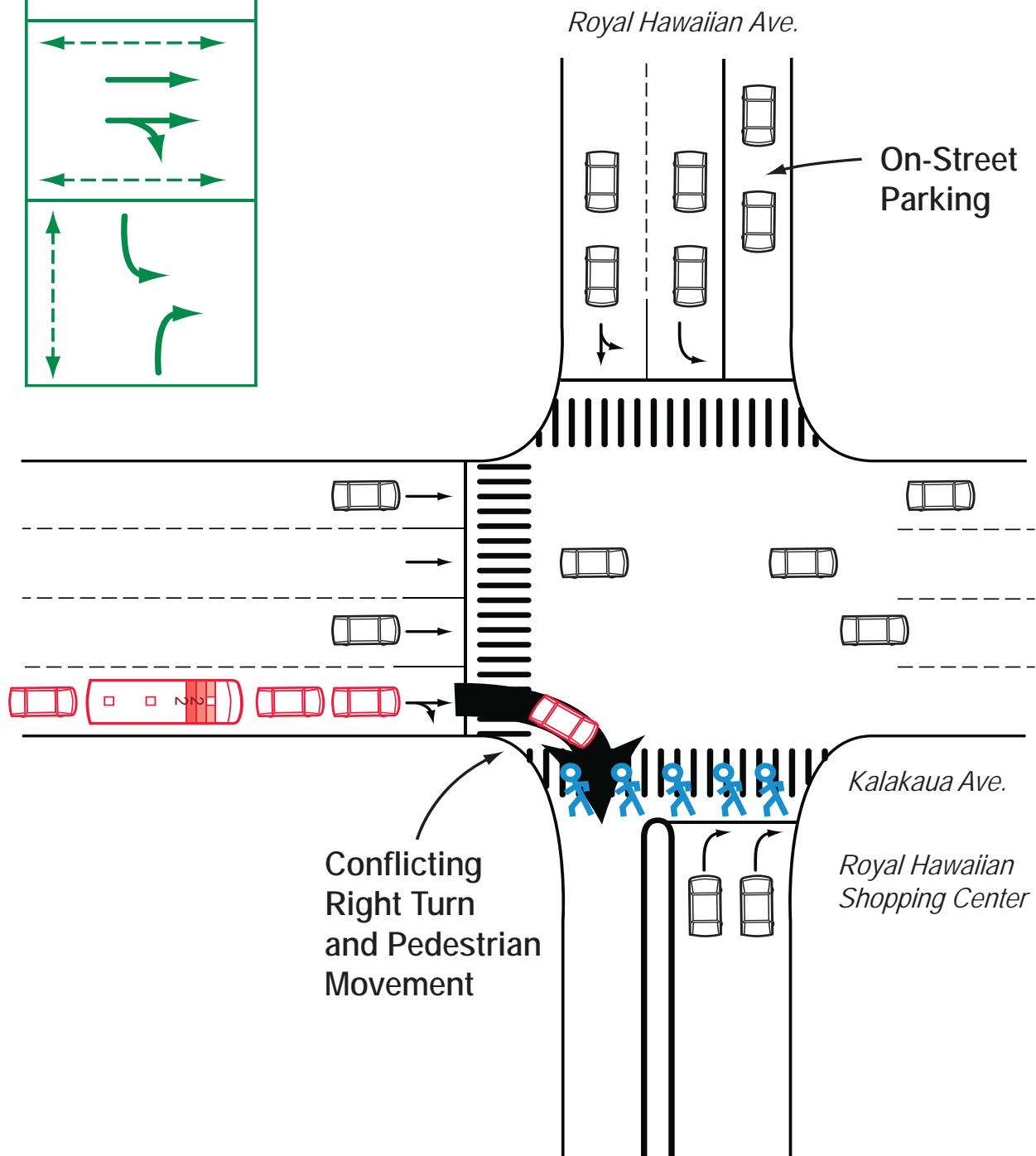
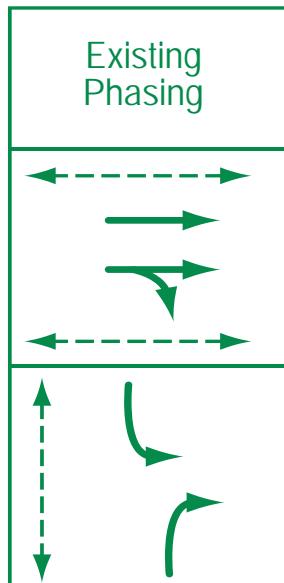
A. Existing Condition Assessment

Kalakaua Avenue is a collector roadway which forms a couplet with Ala Wai Boulevard to serve most of Waikiki. It originates at Beretania Street and is two-way roadway until it hits McCully Street. From there it becomes a one-way makai-bound roadway while providing a single mauka-bound lane for buses only. This single bus lane originates from Kuhio Avenue. Kalakaua Avenue is entirely one-way Diamond Head bound after its intersection with Kuhio Avenue. Kalakaua Avenue runs in the Diamond Head bound direction through the entirety of Waikiki. Beyond Kapahulu Avenue, it passes the Honolulu Zoo and Kapiolani Park before terminating at Diamond Head Road. Within the study area, it provides four Diamond Head bound lanes as shown in Figure 2. The speed limit on Kalakaua Avenue is 25 miles per hour.

Kalakaua Avenue's intersection with Royal Hawaiian Avenue is a four-legged, signalized intersection. Crosswalks are provided at both Royal Hawaiian Avenue approaches and at the near-side of Kalakaua Avenue approach. There is no crosswalk at the far-side of Kalakaua Avenue to avoid conflict with makai bound left turning movements out of Royal Hawaiian Avenue.

Being at the heart of Waikiki, the intersection serves very high volumes of pedestrians at all hours. During peak hours, especially PM peak hours, it was observed that the Diamond Head bound right turning vehicles queued back along Kalakaua Avenue due to the increasing pedestrian activities on the makai leg of Royal Hawaiian Avenue as shown in Figure 3. The right turning vehicle queuing would spill over to the adjacent through lane on Kalakaua Avenue and queue back to Lewers Street, where the congestion became worse. The intersection of Kalakaua Avenue and Lewers Street shares a similar problem with the intersection of Kalakaua Avenue and Royal Hawaiian Avenue: the Diamond Head bound right turning vehicles can hardly find gaps in the high volumes of pedestrian crossings. The queuing contributed to the overall congestion that can easily go upstream and beyond Ala Moana Boulevard. It was realized early that any solution proposed at the two intersections must not exaggerate the existing corridor-wide congestions and the data collection and the analysis effort should be expanded to cover up to Ala Moana Boulevard.





Conflicting Right Turns and Pedestrians
at Royal Hawaiian Avenue Intersection

Figure
3

B. Data Collection

Intersection turning movement counts and pedestrian counts were conducted at the following intersections:

1. Kalakaua Avenue and Saratoga Road
2. Kalakaua Avenue and Beachwalk
3. Kalakaua Avenue and Lewers Street
4. Kalakaua Avenue and Royal Hawaiian Avenue
5. Lewers Street and Don Ho Lane

These counts were performed over the course of several days summarized below:

- Tuesday, April 3, 2012: AM, mid-day, and PM peak periods
- Saturday, April 7, 2012: mid-day peak period
- Wednesday, April 11, 2012: evening peak period
- Friday, April 20, 2012: evening peak period

The traffic volumes were then summarized into weekday AM, weekday mid-day, weekday PM, Friday evening, and weekend mid-day peak hour volumes included in Appendix A. The Friday evening counts, which represent the most interference of right turning vehicles and pedestrians are shown in Figures 4, 5, 6, 7, and 8 for each intersection. One unique characteristic of those volumes is that the pedestrian volumes are either equal or even greater than vehicular volumes, which underscores the greater needs for improving walkability in Waikiki.

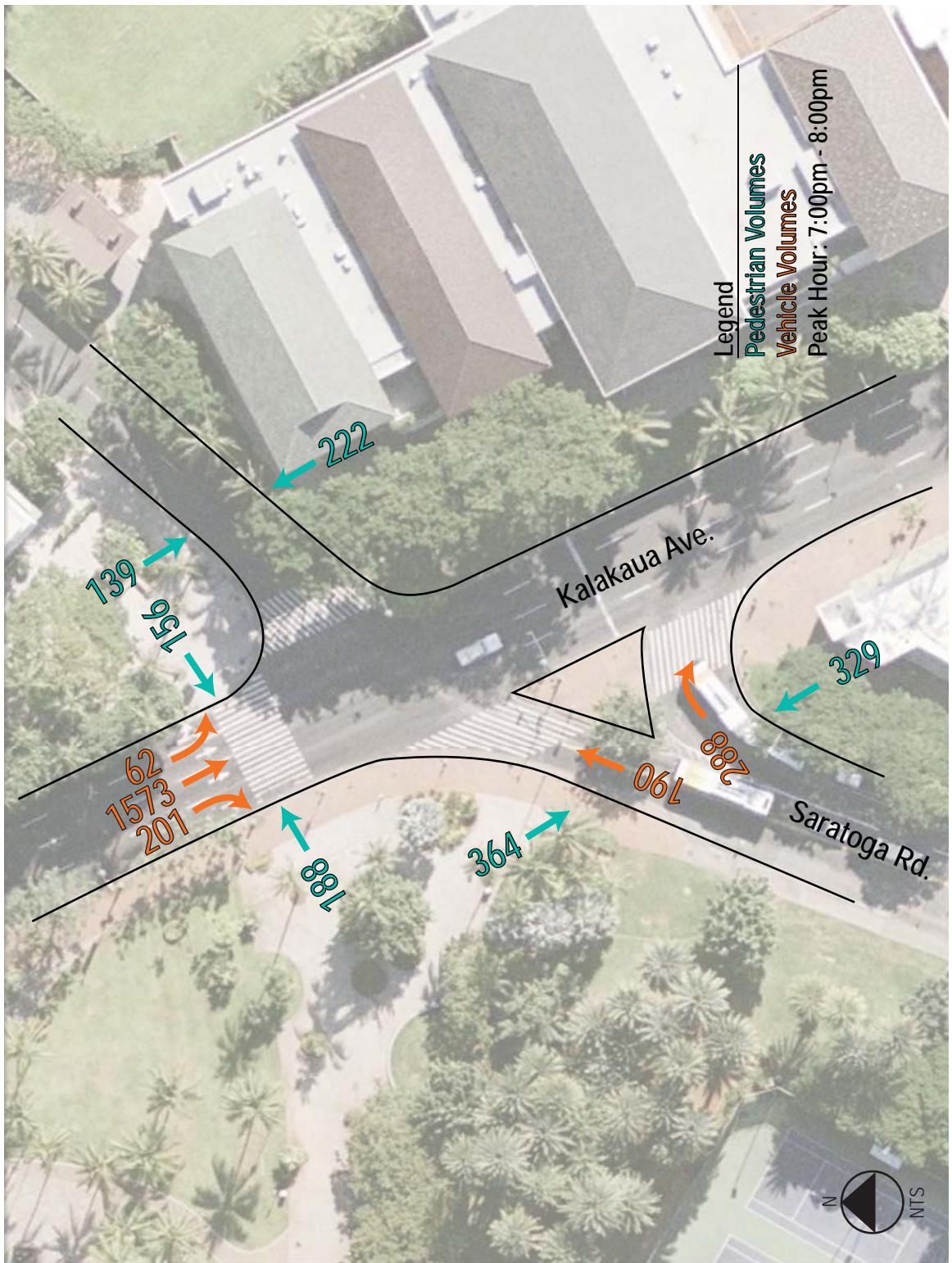


Figure
4

Kalakaua Avenue and Saratoga Road Volume

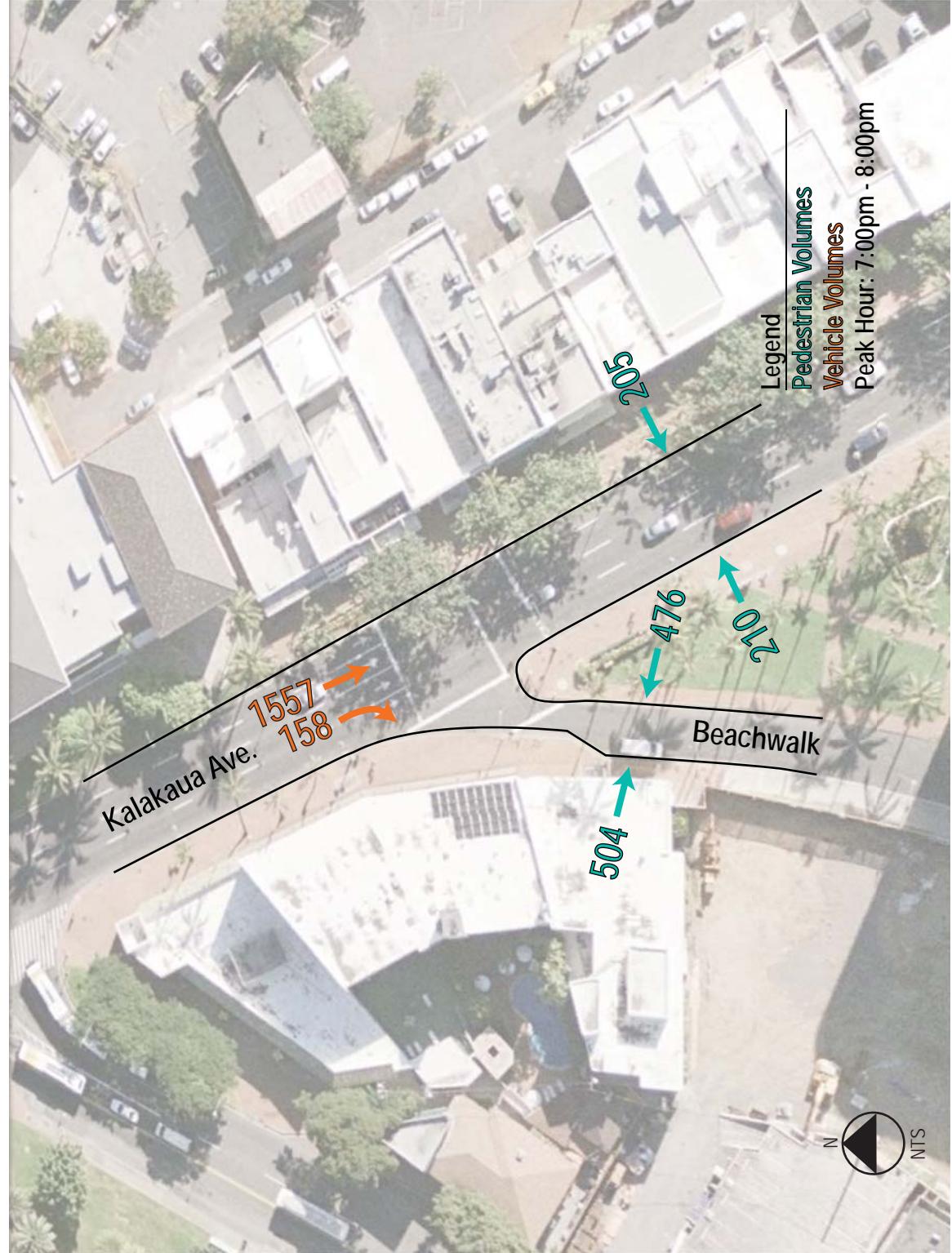


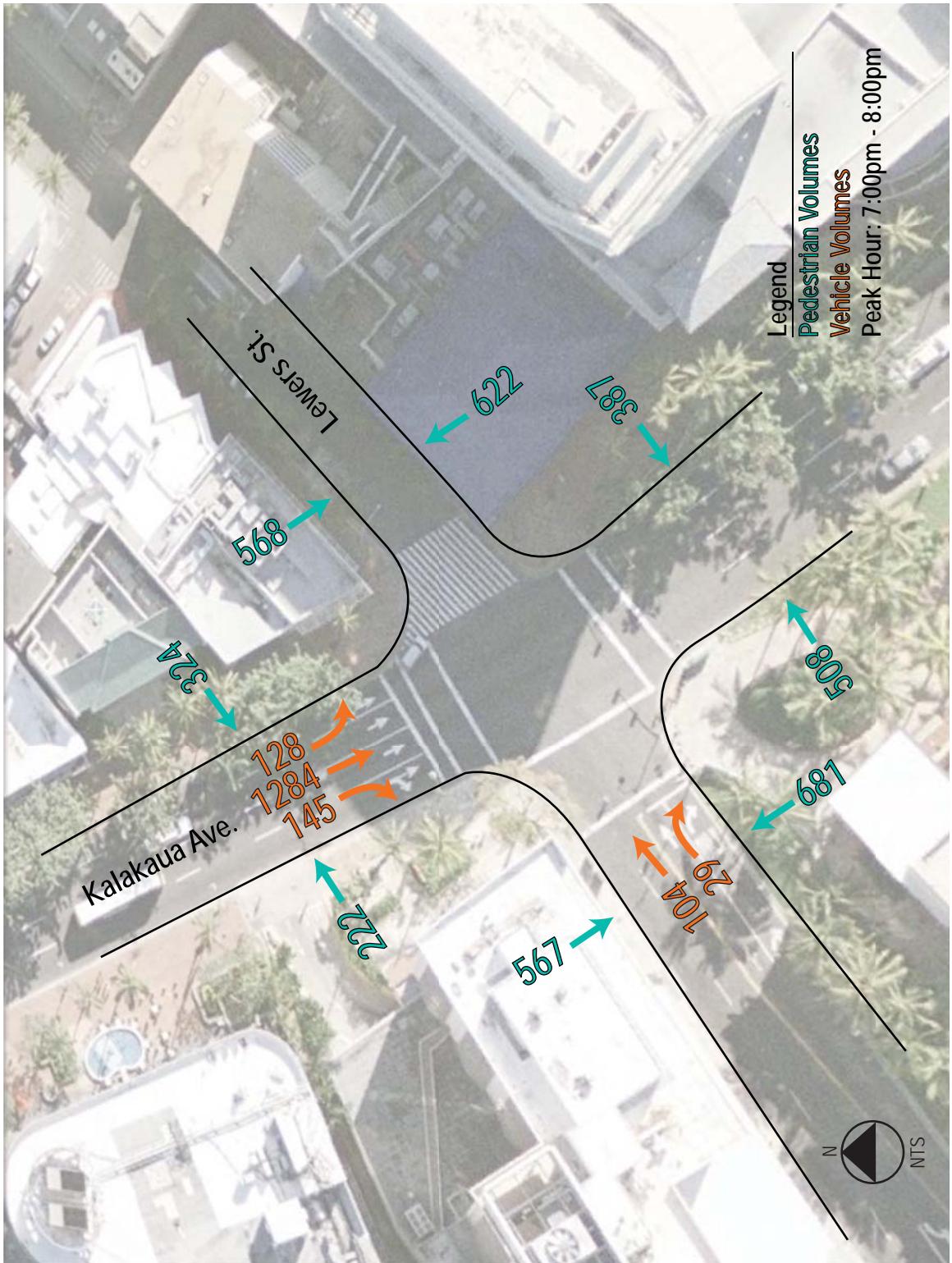
Figure
5

Kalakaua Avenue and Beachwalk Volume

Figure
6



Kalakaua Avenue and Lewers Street Volume



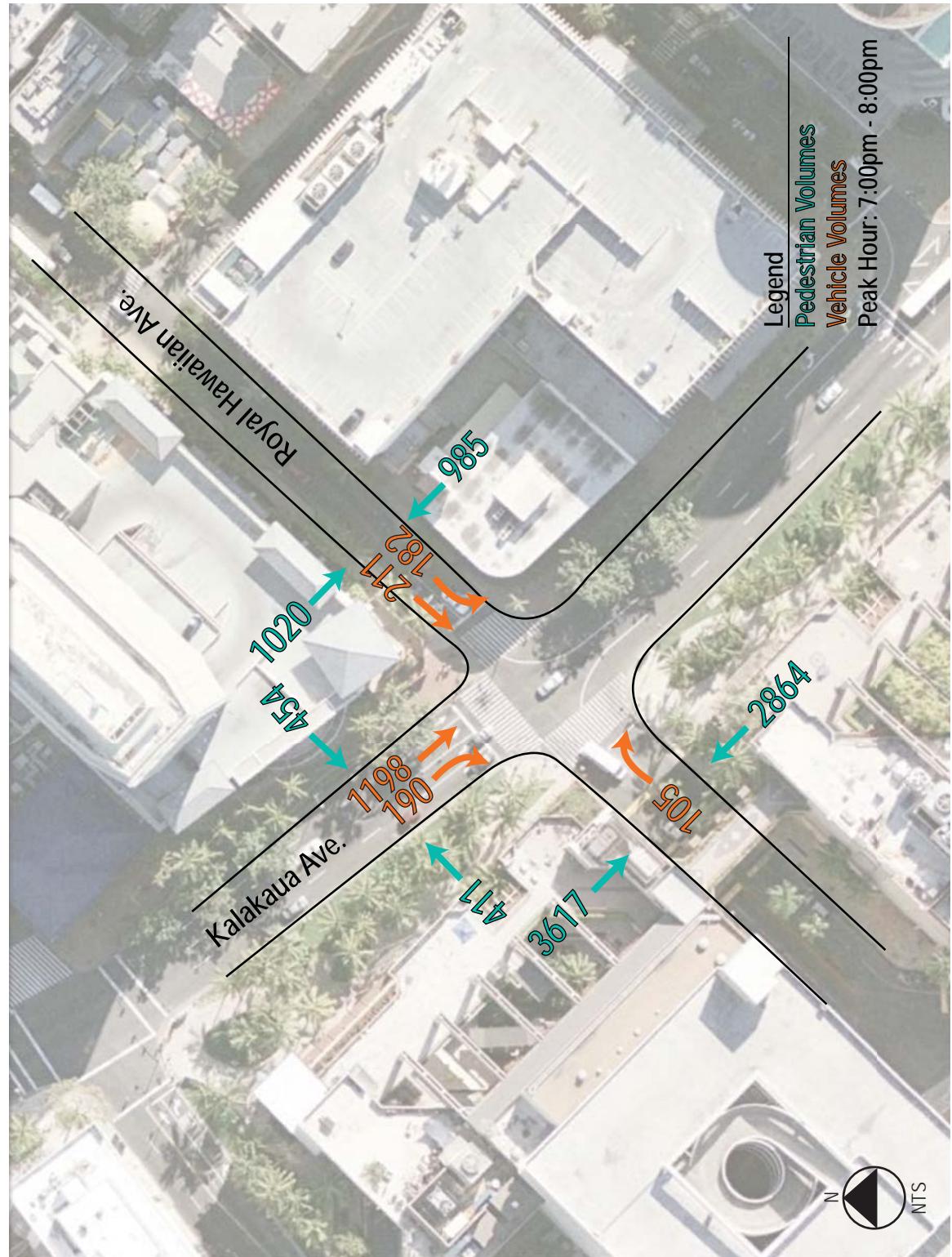


Figure
7

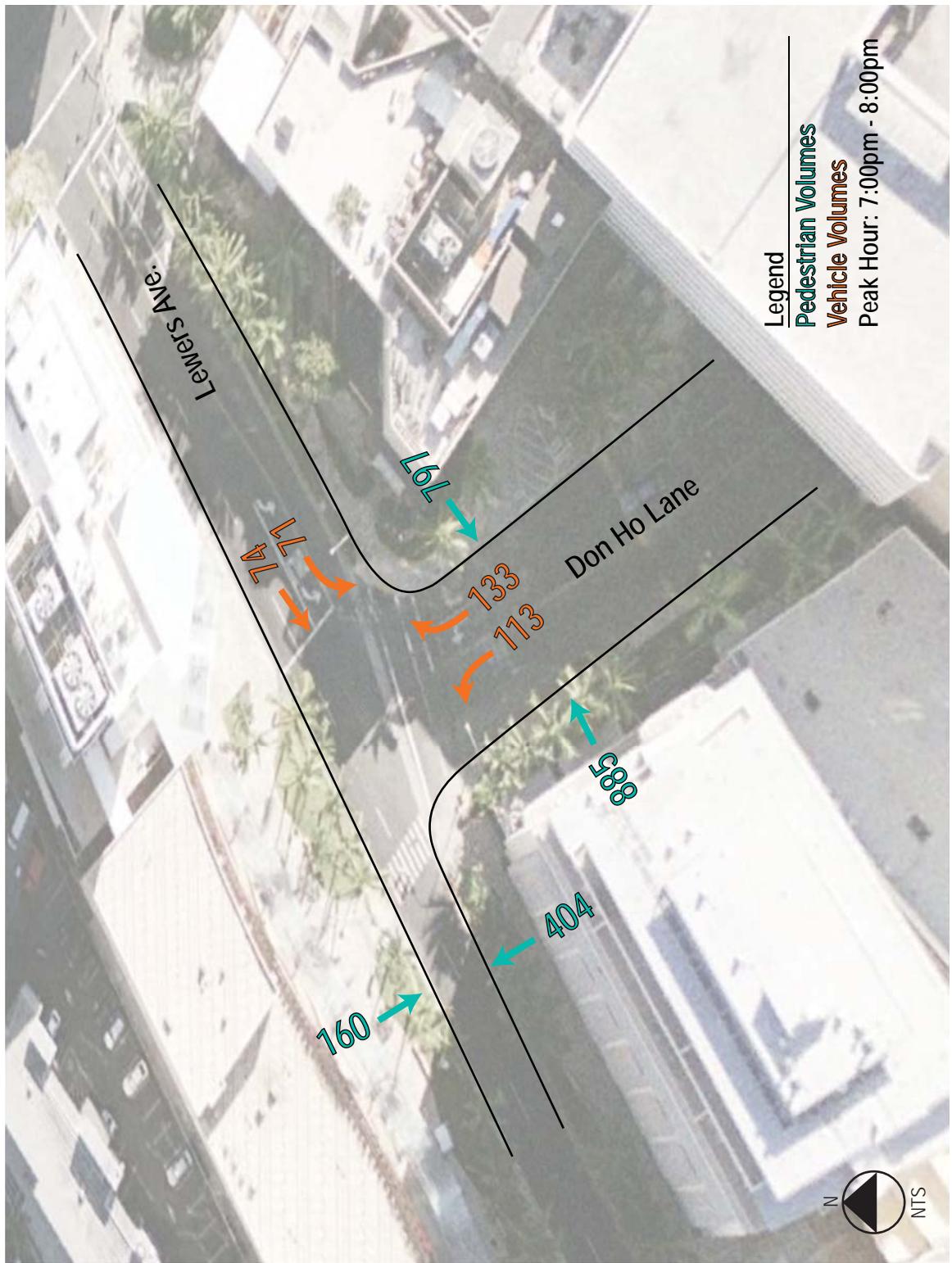


Figure
8

C. Traffic Analyses

1. Alternatives

The key to solving the pedestrian vehicle conflicts is to separate them. Two alternatives are proposed at Kalakaua Avenue/Royal Hawaiian Avenue and Kalakaua Avenue/Lewers Street. The first is Right Turn Hold. As illustrated in Figure 9, this alternative will break up Kalakaua Avenue traffic signal phase into two parts. In the first phase, the Diamond Head bound through movement will be given green but the right turning vehicles from Kalakaua Avenue to Royal Hawaiian Avenue would have to hold. At this time, pedestrians will be given signal to cross Royal Hawaiian Avenue. In the second phase, the right turning vehicles will be given a right turning green arrow and pedestrians on makai leg will not be allowed to cross to avoid the conflicts, but pedestrians on mauka leg can continue to cross.

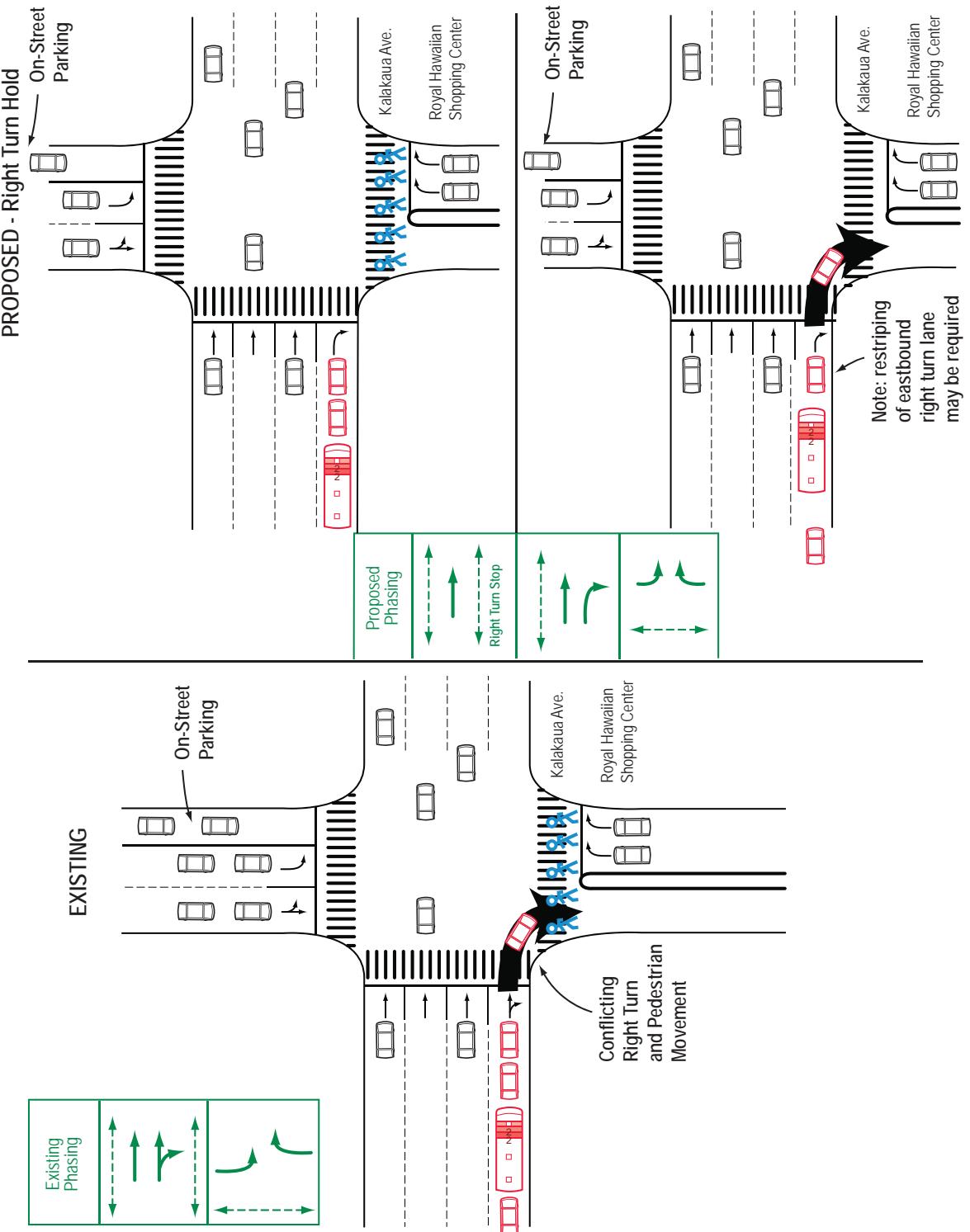
Figure 10 shows the signal phasing change for the Right Turn Hold alternative. The Right Turn Hold alternative would involve intersection signal modification and restriping for which the construction cost is estimated in the range of \$100,000 to \$200,000. The rightmost lane on Kalakaua Avenue would have to be converted to a right turn only lane from the shared right and through lane so that held right turns will not block the through vehicles.

The second alternative is an All-Pedestrian Phase, also known as Barnes Dance or Square Dance. This alternative would add an exclusive pedestrian phase to completely separate pedestrians and vehicles at the intersection. Figure 11 illustrates the new phasing. One of the advantages is that with this All-Pedestrian Phase, pedestrians can directly cross Kalakaua Avenue on the Diamond Head leg as opposed to current conditions, where they have to cross three legs due to the missing crosswalk. Figure 12 shows the signal phasing change for All-Pedestrian Phase alternative. The study area intersections along Kalakaua Avenue all run at an 80 second cycle. Because of the added pedestrian phase, either the cycle length at the intersection of Royal Hawaiian Avenue and Lewers Street need to be increased or, if the cycle length remains at 80 seconds the maximum splits on Kalakua Avenue and the side streets need to be reduced to compensate the added pedestrian phase. Both signal timing plans were studied.

The All-Pedestrian Phase alternative will involve intersection signal modification and restriping. The construction cost is estimated in the range of \$150,000 to \$250,000.

N
NTS

Figure
9



Right Turn Hold at Royal Hawaiian Avenue and Lewers Street

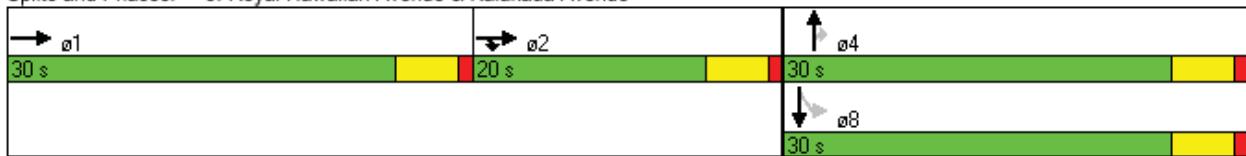
Existing Phasing During PM Peak Hours

Splits and Phases: 1: Royal Hawaiian Avenue & Kalakaua Avenue



Proposed Right Turn Hold During PM Peak Hours

Splits and Phases: 3: Royal Hawaiian Avenue & Kalakaua Avenue



Right Turn Hold Phasing

Figure
10

PROPOSED - All-Pedestrian phase

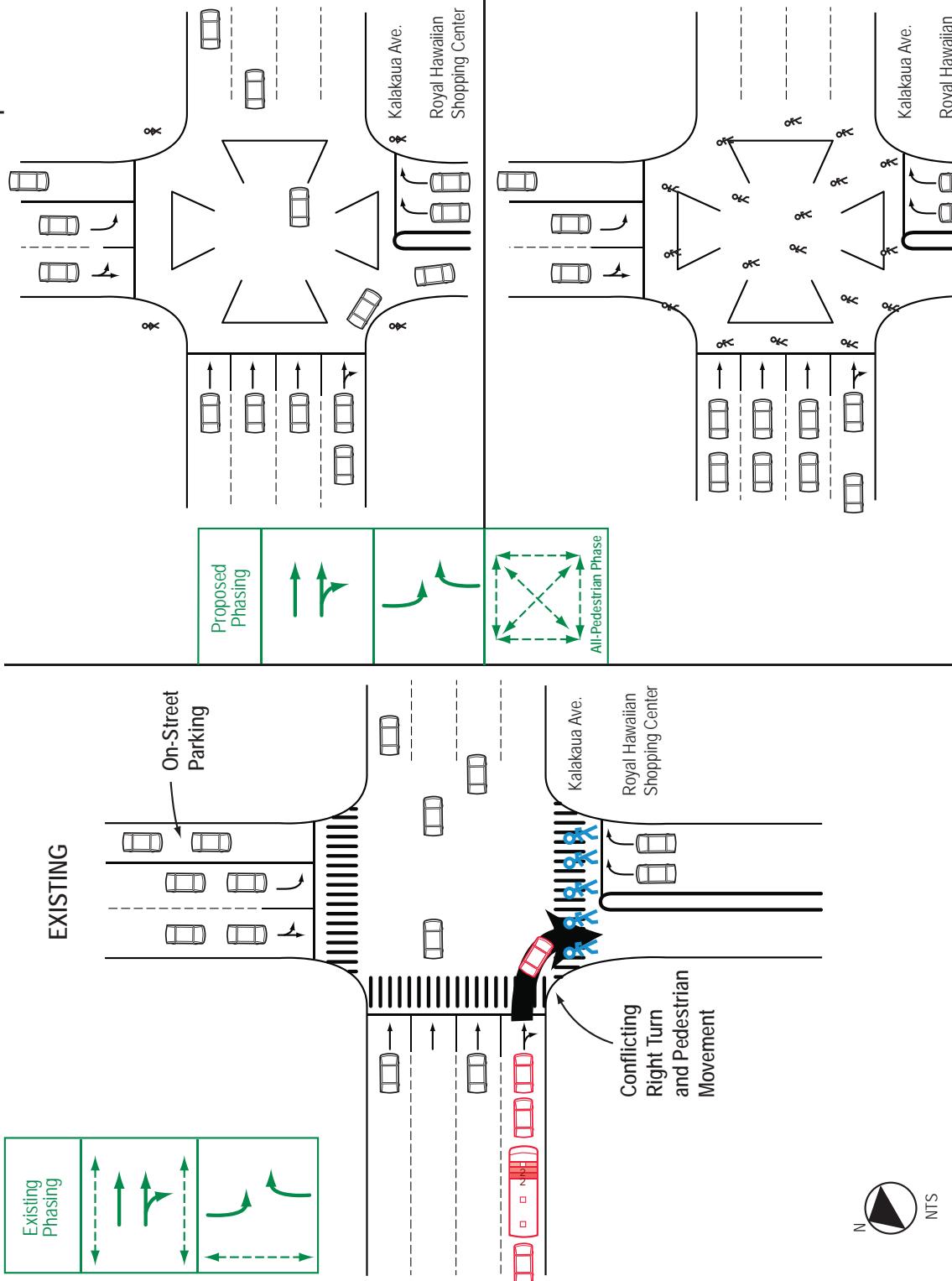
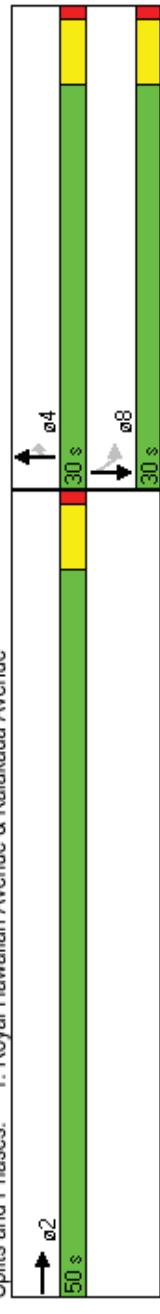


Figure 11

All-Pedestrian Phase at Royal Hawaiian Avenue and Lewers Street

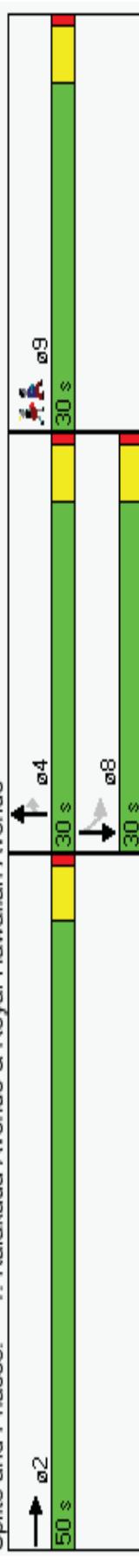
Existing Phasing, 80 second cycle

Splits and Phases: 1: Royal Hawaiian Avenue & Kalakaua Avenue



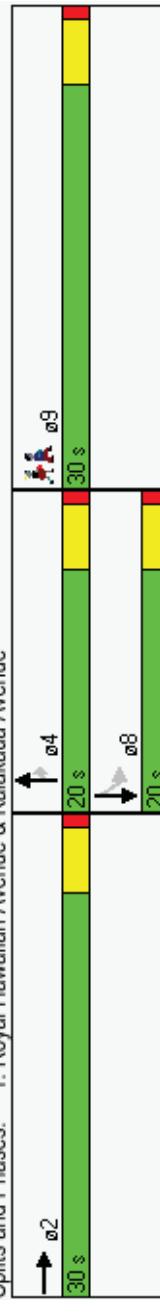
Proposed Square Dance Phasing, 80 second cycle

Splits and Phases: 1: Kalakaua Avenue & Royal Hawaiian Avenue



Proposed Square Dance Phasing, 80 second cycle

Splits and Phases: 1: Royal Hawaiian Avenue & Kalakaua Avenue



All-Pedestrian Signal Phasing

Figure 12

2. Methodology

VISSIM is a microscopic simulation program for multi-modal traffic flow modeling and is suitable to best document the pedestrian vehicle conflicts and the queuing interaction between intersections. The VISSIM analysis was used to represent the baseline conditions along Kalakaua Avenue up to Ala Moana Boulevard. Then the alternatives were modeled and the Measures of Effectiveness (MOEs) such as queuing and delay for the alternatives were recorded through the VISSIM analysis for comparison purpose. One beneficial characteristics of VISSIM analysis is that it can calculate delay not only for vehicles but also for pedestrians.

3. Results

The extended cycle length of 110 seconds for the All-Pedestrian Phase was modeled first. The results showed that due to the discrepancy of the cycle length with other intersections along Kalakaua Avenue, the extended cycle length at Royal Hawaiian Avenue and Lewers Street yielded longer queuing and delay along Kalakaua Avenue. Therefore the extended cycle length alternative was dropped and the All-Pedestrian Phase alternative with the cycle length of 80 seconds was compared with the Right Turn Hold alternative.

The VISSIM analyses are summarized in Table 1. Columns 1 to 7 of Table 1 show the corridor wide MOEs along Kalakaua Avenue. Both the Right Turn Hold and the All-Pedestrian Phase alternatives were able to shorten the through lane queuing on Kalakaua Avenue because the right turns going makai at Royal Hawaiian Avenue and Lewers Street would be able to clear within a cycle and avoid impacting the Kalakaua Avenue through movement. This queuing improvement was reflected by the through vehicle travel time savings. The right turning vehicles going makai at Royal Hawaiian Avenue and Lewers Street experienced the most improvements as shown in Columns 4 and 5. The corridor wide MOEs such as average speed and delay as shown in Column 6 and 7 also confirmed the improvements by the Right Turn Hold and the All-Pedestrian Phase alternatives.

Local MOEs at the Royal Hawaiian Avenue intersection and at the Lewers Street intersection are shown in Columns 8 to 11 of Table 1. The Right Turn Hold alternative reduced vehicular delay by 7 seconds per vehicle at Royal Hawaiian Avenue and produced comparable vehicular delay to existing conditions at Lewers Street. The All- Pedestrian Phase alternative produced comparable vehicular delay to existing conditions

Table 1 Right Turn Hold and All-Pedestrian Phase Alternatives Result Summary

Column Number	1	2	3	4	5	6	7	8	9	10	11
	Total DH bound through lane	Total DH bound through lane	DH bound through Kalakaua Ave	Total DH bound Right Turn lane	DH bound right turn Kalakaua Ave	Ave travel time (min)	Total Delay (sec/veh)	Intersection Delay at Royal Hawaiian Ave. (sec/veh)	Pedestrian Delay at Royal Hawaiian Ave. (sec/ped)	Intersection Delay at Lewers St.(sec/veh)	Pedestrian Delay at Lewers St.(sec/ped)
	Total DH bound through lane	Average queuing (ft)	travel time (min)	Total DH bound Right Turn lane	Ave travel time (min)	Average Speed (mph)	Total Delay (sec/veh)	Intersection Delay at Royal Hawaiian Ave. (sec/veh)	Pedestrian Delay at Royal Hawaiian Ave. (sec/ped)	Intersection Delay at Lewers St.(sec/veh)	Pedestrian Delay at Lewers St.(sec/ped)
Existing Conditions	2922	1810	4.8	3007	10.2	3.6	259	23	55	55	63
Right Turn Hold	2440	1283	3.9	1790	4.2	8.7	162	16	56	58	65
Square Dance	2510	1664	4.8	1725	5.5	6.6	164	21	47	65	46

at Royal Hawaiian Avenue. It also produced 10 seconds per vehicle longer delay than existing conditions at Lewers Street because the green time on Kalakaua Avenue and Lewers Street must be taken away to compensate the added pedestrian phase.

In terms of the pedestrian delay, the All-Pedestrian Phase alternative outperformed Right Turn Hold alternative. This is because in Right Turn Hold alternative, the pedestrian crossing time on the makai leg must be cut short to allow the held right turn vehicles to turn right. In the All-Pedestrian Phase alternative, the added pedestrian crosswalk at the Diamond Head leg of Kalakaua Avenue and Royal Hawaiian Avenue also contributed to the overall lower pedestrian delay.

D. Summary

Based on the VISSIM analyses, the All-Pedestrian Phase alternative is recommended for the following reasons:

1. It provides complete separation between vehicles and pedestrians;
2. It produces the least amount of pedestrian delay and reduces right turning vehicle queuing significantly at both intersections;
3. It causes less confusion for both motorists and pedestrians compared to the Right Turn Hold alternative;
4. The missing Diamond Head-side crosswalk at Royal Hawaiian Avenue intersection could be added, which would contribute to overall better LOS for pedestrians.

At the August 29th 2012 WTSOC meeting, the committee unanimously agreed to support the All-Pedestrian Phase alternative and urged DTS actions. At the October 9th 2012 Waikiki Neighborhood Board meeting, the board unanimously agreed to support the All-Pedestrian Phase alternative.

III. KALAKAUA AVENUE/KAPIOLANI BOULEVARD INTERSECTION

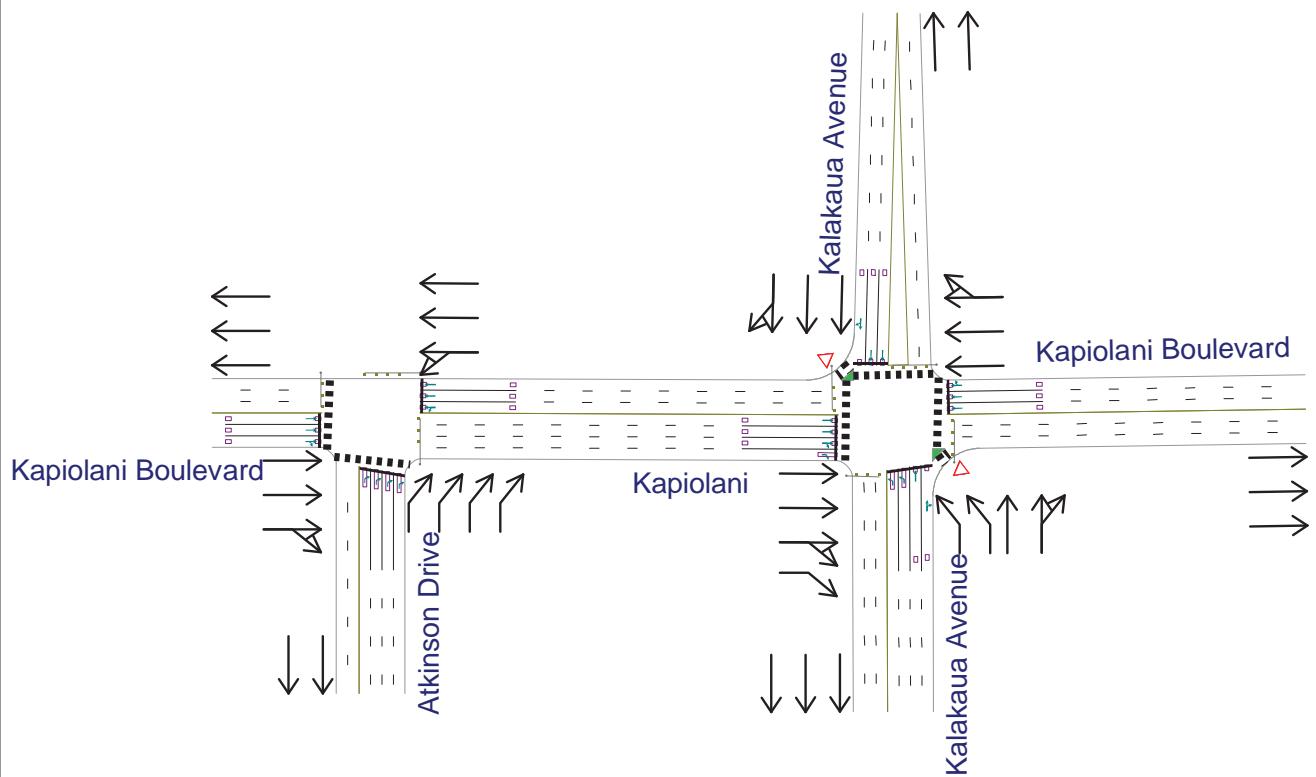
Going from Waikiki to Ala Moana Shopping Center, the preferred Waikiki Regional Circulator bus route needs to make a mauka-bound left turn from Kalakaua Avenue to Kapiolani Boulevard. However, the left turning movement at this intersection during PM peak hours is currently prohibited. This study was tasked to investigate the feasibility of lifting the left turn ban so that the preferred Waikiki Regional Circulator bus route becomes practical. This will involve either allowing this left turn for bus-only or allowing for all vehicles.

A. Existing Condition Assessment

Kapiolani Boulevard is a major collector roadway providing Ewa-Diamond Head mobility in the primary urban core of Honolulu. Within the study area, it is a six-lane roadway. A contraflow lane is provided during the AM and PM peak periods, providing four lanes in the Ewa-bound direction during the AM peak and four lanes in the Diamond Head-bound direction during the PM peak. In the vicinity of Kalakaua Avenue the speed limit is 35 miles per hour.

The Kalakaua Avenue and Kapiolani Boulevard intersection is a four-legged, signalized intersection as shown in Figure 13. Left turns from Kapiolani Boulevard and makai-bound left turns from Kalakaua Avenue are prohibited. The mauka-bound Kalakaua Avenue left turn movement is allowed except during the PM peak period when it is also prohibited and the left turning bay is coned off. As a result there is no protected mauka-bound left turning phase during PM peak hours. The intersection signal runs a different time of day plan. Figure 14 shows the signal phasing and timing plan during AM, midday, and PM peak hours. It is noted that during the PM peak period, there is no mauka-bound Kalakaua Avenue left turn phasing. Furthermore, a contraflow lane is provided on Kapiolani Boulevard in the Ewa-bound direction during the AM peak period and in the Diamond Head-bound direction during the PM peak period.

Crosswalks are provided at the Kapiolani legs and the mauka Kalakaua leg. There is no makai Kalakaua leg crosswalk. The missing makai crosswalk coupled with the missing mauka crosswalk at the intersection of Kalakaua Avenue and Ala Wai Boulevard further complicates pedestrian crossing Kalakaua Avenue in this area. Figure 15 shows that

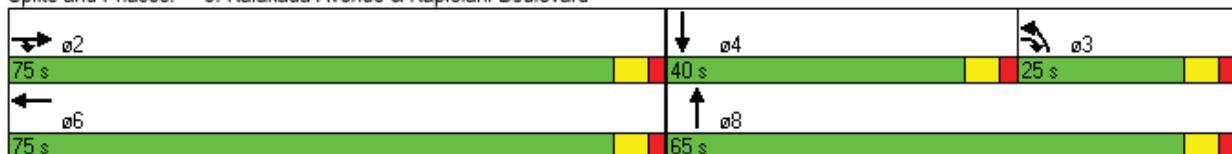


Kalakaua Ave and Kapiolani Blvd Lane Configuration

Figure
13

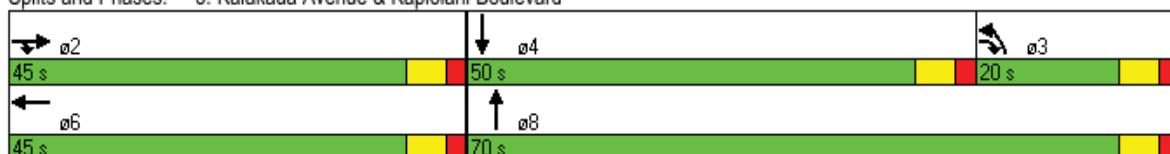
AM - Town-bound contraflow, 140 seconds

Splits and Phases: 3: Kalakaua Avenue & Kapiolani Boulevard



MD - normal condition, no contraflow, 115 seconds

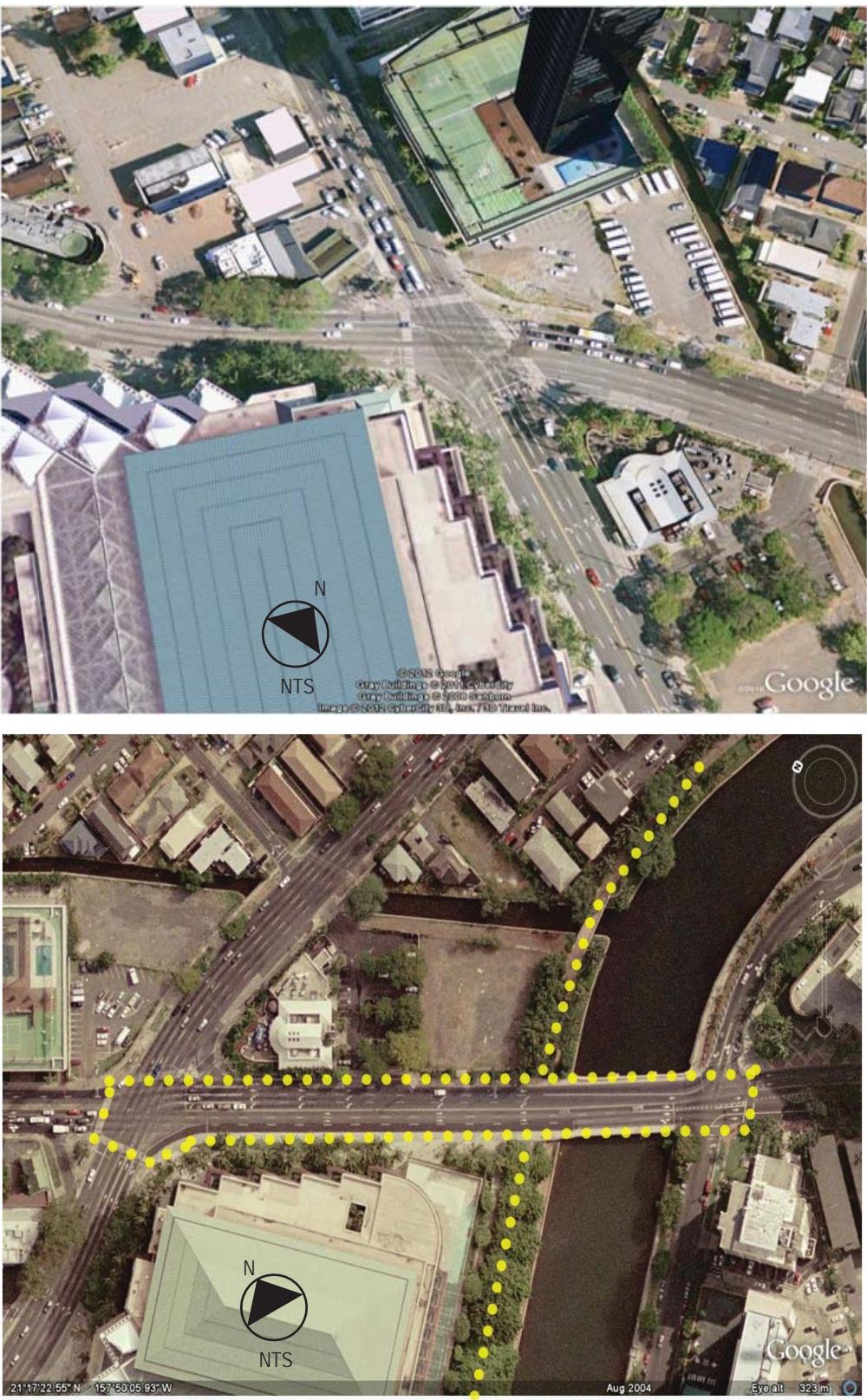
Splits and Phases: 3: Kalakaua Avenue & Kapiolani Boulevard



PM - DH-bound contraflow, LT from Kalakaua prohibited, 140 seconds

Splits and Phases: 3: Kalakaua Avenue & Kapiolani Boulevard





Pedestrians wanting to cross Kalakaua Avenue have to walk to Kapiolani Boulevard or Ala Wai Boulevard to use the crosswalk.
Source: Weslin Consulting Services, Inc.



Missing Kalakaua Avenue Pedestrian Crossing

Figure
15

pedestrians have to cross three legs of either intersection to get to the other side of Kalakaua Avenue.

The intersection of Kapiolani Boulevard and Atkinson Drive is also included in the study due to its proximity to the intersection of Kalakaua Avenue and Kapiolani Boulevard. The Kapiolani Boulevard and Atkinson Drive intersection is a signalized tee-intersection. Contraflow is provided during the AM and PM peak periods in Ewa-bound and Diamond Head-bound directions, respectively. Crosswalks are provided on the Ewa Kapiolani leg and the makai Atkinson leg.

B. Data Collection

Manual turning movement counts and pedestrian counts were conducted at both intersections. The traffic volumes were then summarized into AM and PM peak hour volumes shown in Figure 16. The contraflow lane traffic was counted and labeled separately from the through traffic in the peak hours. The study AM and PM peak hours were 7:00-8:00 AM and 3:30-4:30 PM, respectively.

The Diamond Head right turning volume from Kapiolani Boulevard to Kalakaua Avenue is constantly high during the day and the queuing occasionally spilled beyond Atkinson Street. This constitutes a major challenge if a crosswalk is added at the makai leg of the intersection.

The detailed counts are included in Appendix A.

C. Traffic Analyses

1. Alternatives

The key to allowing the mauka-bound left turn during PM peak hours is determining how to allocate green time for the added phase while maintaining the existing cycle length of 140 seconds without adversely impacting overall intersection operation. Two signal timing plans are proposed as shown in Figure 17. Alternative 1 would shorten Kapiolani Boulevard green time by 15 seconds so that the 65 seconds of green time for Kalakaua Avenue can be broken into 40 seconds for makai-bound through and 25 seconds for mauka-bound left turns. Alternative 2 would maintain Kapiolani Boulevard green time but shorten the makai-

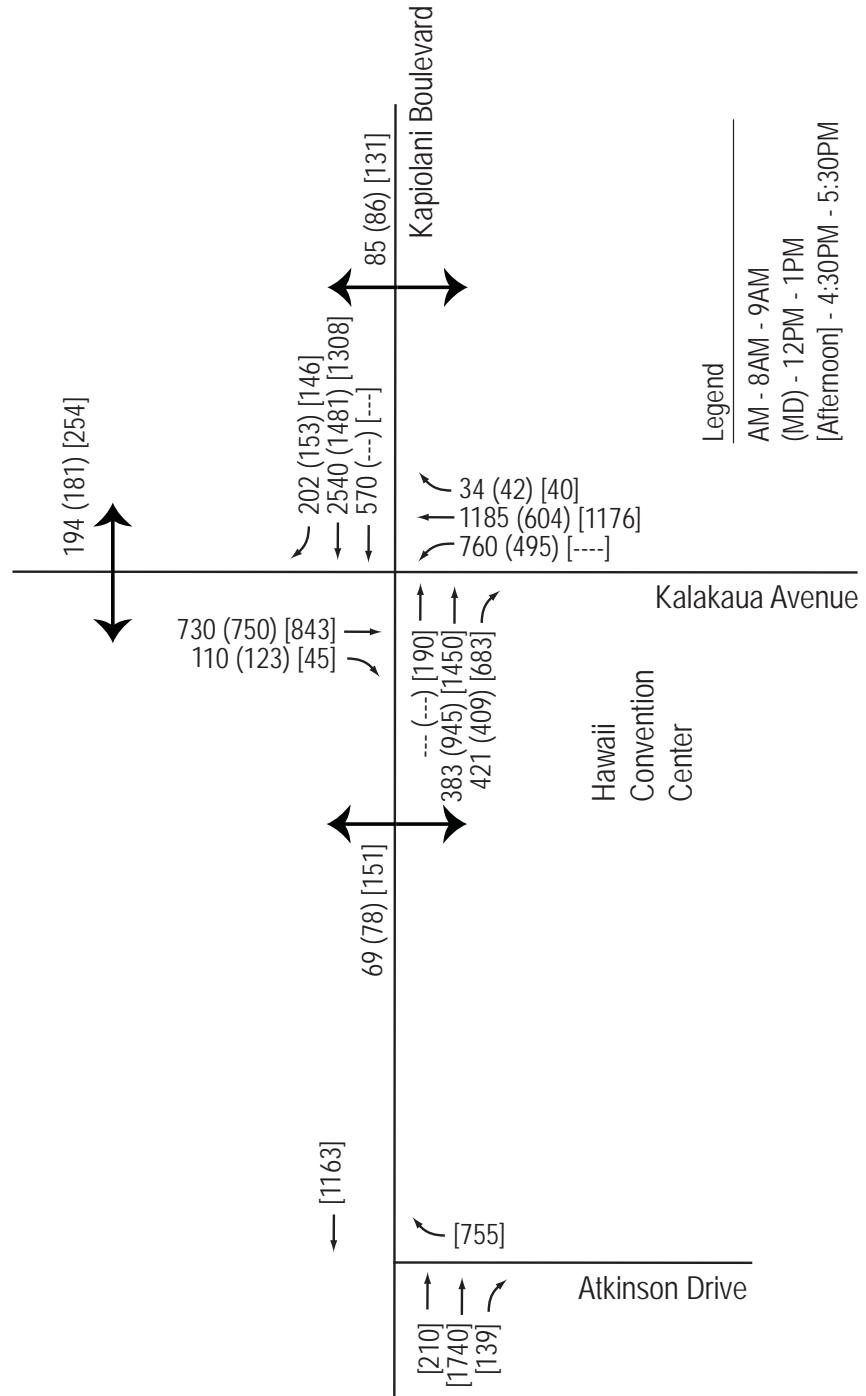


Figure
16

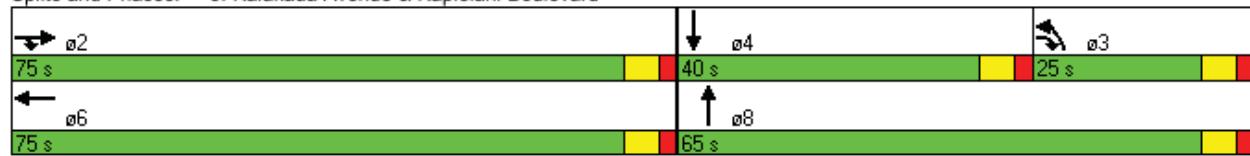
PM - DH contraflow, LT from Kalakaua prohibited, 140 seconds

Splits and Phases: 3: Kalakaua Avenue & Kapiolani Boulevard



PM Proposed, 140 second, Alternative #1

Splits and Phases: 3: Kalakaua Avenue & Kapiolani Boulevard



PM Proposed, 140 second, Alternative #2

Splits and Phases: 3: Kalakaua Avenue & Kapiolani Boulevard



bound through green time on Kalakaua Avenue. As a result, there is a 30 second green time for makai-bound through and 20 seconds for mauka-bound left turns.

2. Methodology

In order to evaluate the intersection operation, it is important to estimate the volumes of the mauka-bound left turn if permitted during PM peak hours. There is no clearly defined methodology for projecting this volume. Therefore a sensitivity analysis was conducted with the preset volumes at 20, 300, 500, and 700 vehicles per hour level. The 20 vehicles per hour volume reflects the bus-only scenario during the peak hours. The Waikiki Regional Circulator bus will be dispatched at three minutes headway as planned. The preset volume of 300, 500, and 700 reflects the scenario that the left turns will be allowed for the general public. They are estimated based on the mauka-bound left turn counts of 760 vehicles per hour during the AM peak hour and 495 vehicles per hour during the midday peak hour.

The intersections were analyzed using the methodologies for signalized intersections outlined in the 2010 Highway Capacity Manual (HCM). Operating conditions at an intersection by approach are expressed as a qualitative measure known as Level of Service (LOS) ranging from A to F. LOS A represents free-flow operations with low delay, while LOS F represents congested conditions with relatively high delay. The overall intersection LOS is a weighted average of the LOS of individual traffic movement groups. Appendix B has more detailed definitions of intersection LOS. Field observations were performed at the intersections to verify the results of the intersection analyses.

3. Results

The preliminary analysis showed that the Alternative 1 signal timing yielded excessive queuing along Kapiolani Boulevard that often spilled over to the intersection of Kapiolani Boulevard and Atkinson Street. Therefore Alternative 1 was dropped and only Alternative 2 was analyzed and compared with the existing conditions.

Table 2 displays LOS for the existing conditions and Alternative 2. With the bus-only scenario at 20 buses per hour left turns, the intersection overall LOS and delay changes were not significant. For 300 vehicles per hour left turns, the overall intersection LOS increased from LOS D with delay of 50 seconds per vehicle to E with delay of 64 seconds per vehicle. With higher volumes at 500 and 700 vehicles per hour level, the intersection LOS further deteriorated to F with delay of 84 seconds per vehicle and F with delay of 122

seconds per vehicle. In all scenarios that allow general public to use the mauka-bound left turning phase, the mauka-bound left turn on Kalakaua Avenue experienced LOS F with delays that are longer than the cycle length in the last two scenarios. This means that the most left turning vehicles will have to wait more than one cycle to go through the intersection and likely spill over to block the through lanes.

D. Summary

The analyses demonstrated that permitting mauka-bound left turns on Kalakaua Avenue for only the Waikiki Regional Circulator buses would not cause significant impact to the intersection operation at Kapiolani Boulevard and Kalakaua Avenue. However, permitting mauka-bound left turns for all vehicles would cause excessive delay and unacceptable LOS at the intersection. Subsequently the planned circulator buses will be stuck along with other general public vehicles at this intersection and the bus level of service will be compromised. It is recommended that the left turn ban be lifted for the circulator buses only. Along with prohibitive signs, other Intelligent Transportation Systems such as an opticom for buses only can be applied to trigger the left turn phase. An electronic traffic enforcement system is also available for consideration.

Table 2 Kapiolani Boulevard and Kalakaua Avenue Result Summary

	Existing PM		20 Left Turns (veh/hr)		300 Left Turns (veh/hr)		500 Left Turns (veh/hr)		700 Left Turns (veh/hr)	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Kapiolani & Kalakaua	D	50	D	52	E	64	F	84	F	122
Kapiolani DH bound Through-Right	B	18	B	18	B	17	B	17	B	17
Kapiolani DH bound Right	B	18	B	15	A	8	A	8	A	8
Kapiolani Ewa bound Through-Right	C	24	C	24	C	24	C	24	C	24
Kalakaua mauka-bound Left	*	*	E	65	F	98	F	339	F	621
Kalakaua mauka-bound Through-Right	F	149	F	149	F	149	F	149	F	149
Kalakaua makai-bound Through-Right	D	41	D	53	F	130	F	130	F	130

IV. ALA MOANA BOULEVARD AND KALIA ROAD/ENA ROAD INTERSECTION

At the intersection of Ala Moana Boulevard and Kalia Road/Ena Road, heavy pedestrian volumes cross the intersection and a high level of pedestrian and vehicle conflicts were observed. Adding an all-pedestrian phase would separate the vehicular traffic and the foot traffic but would inevitably deteriorate LOS on the already congested Kalia Road and Ala Moana Boulevard. This section investigates the alternatives to create a balance between the competing vehicular and foot traffic.

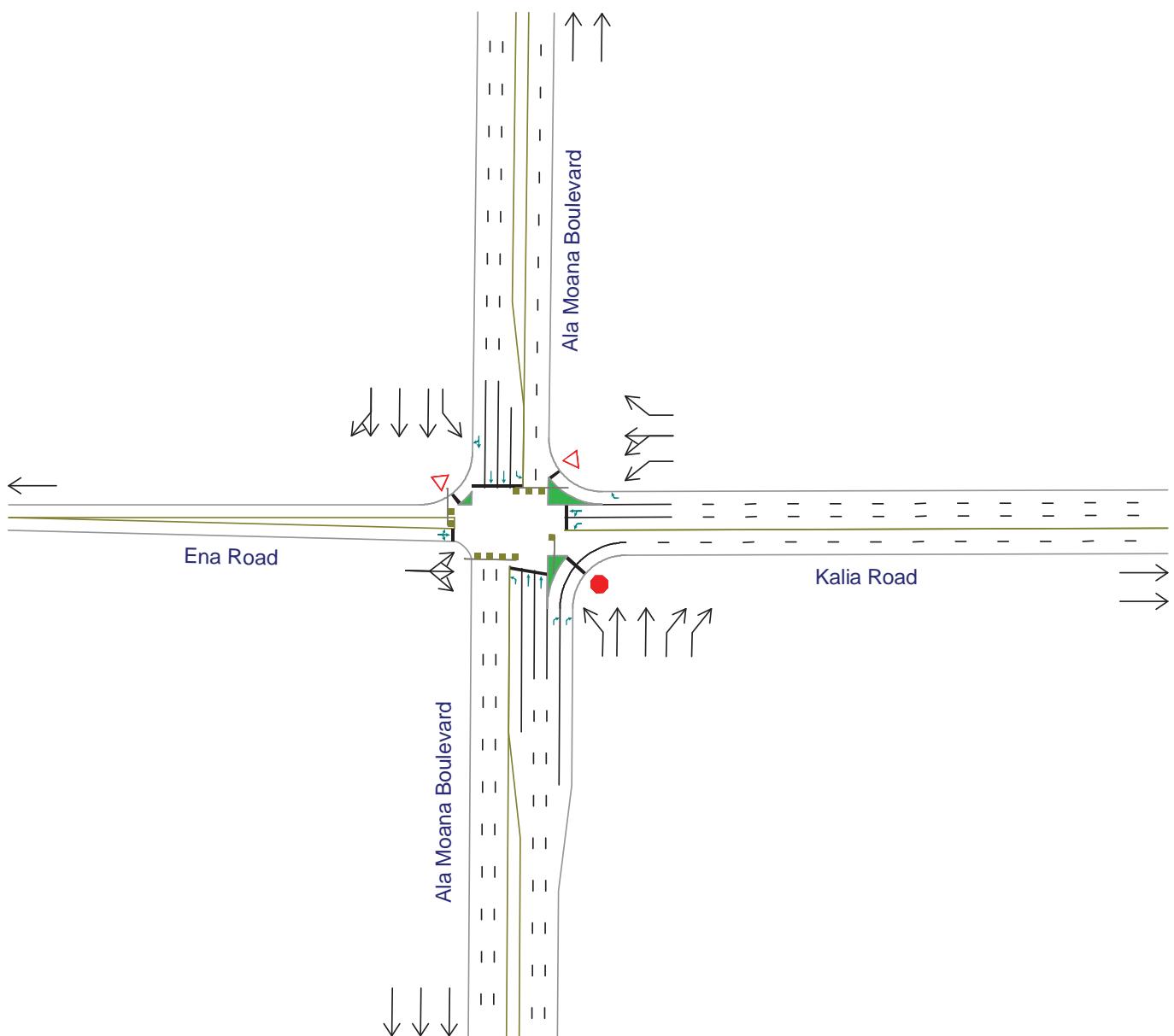
A. Existing Condition Assessment

Ala Moana Boulevard is an arterial roadway which provides mobility in the downtown and Waikiki areas. Within the study area, it is a six-lane roadway. Ala Moana Boulevard terminates at its intersection with Kalakaua Avenue. The speed limit on Ala Moana Boulevard is 35 miles per hour.

Kalia Road is a two-lane local street. It originates at the Halekulani Hotel, just Diamond Head of Lewers Street. Before intersecting Ala Moana Boulevard, Kalia provides access to the Hale Koa Hotel and Hilton Hawaiian Village. Beyond Ala Moana, Kalia Road becomes Ena Road, where it terminates at Kalakaua Avenue. The speed limit on Kalia Road and Ena Road is 25 miles per hour.

The Ala Moana Boulevard and Kalia Road/Ena Road intersection is a four-legged, signalized intersection as shown in Figure 18. Protected left turn phasing is provided for Ala Moana left turn movements and split phasing is provided for the Kalia Road and Ena Road approaches partially because Ena Road has only one lane that serves left turns, through, and right turns. Crosswalks are provided at all approaches. A pedestrian island is provided on the makai-Ewa corner which is accessed by a crosswalk spanning the Ala Moana double right turn lanes. A pedestrian island is also provided at the mauka-Diamond Head corner. The intersection serves heavy foot traffic and experiences recurrent congestion, especially during PM peak hour.

Part of the congestion is caused by inefficiency of the Ena Road signal phase. Figure 19 illustrates that due to high volumes of pedestrians crossing the makai crosswalk, the right turning vehicles out of Ena Road can hardly find gaps to make the turn and as a result often



Existing Phasing During PM Peak Hours

Splits and Phases: 3: Ala Moana Boulevard & Ena Road



Ala Moana Blvd & Ena Rd / Kalia Rd Intersection
Lane Configuration and Signal Phasing

Figure
18



Just after the beginning of the Ena Road Phase



Vehicles driving through Ena Road drive outside of the striping to go around the right turning vehicles



Ending of Kalia Road Phase



Right turning vehicle and pedestrian conflict



Figure
19

block the single lane on Ena Road. It was observed that during the whole green time for Ena Road only a few vehicles were able to clear the intersection.

B. Data Collection

Manual turning movement counts and pedestrian counts were conducted at the intersection. These counts were performed over the course of several days summarized below:

- Tuesday, April 3, 2012: AM, mid-day, and PM peak periods
- Saturday, April 7, 2012: mid-day peak period
- Wednesday, April 11, 2012: evening peak period
- Friday, April 20, 2012: evening peak period

The turning movement counts and the pedestrian counts are summarized in Figure 20. It is evident that low volumes were processed during each cycle on Ena Road. Despite having its own signal phase, Ena Road was not used efficiently due to the heavy pedestrian volumes crossing the downtown leg of Ala Moana Boulevard. The detailed counts are included in Appendix A.

C. Traffic Analyses

1. Alternatives

An all-pedestrian phase was proposed initially. According to the Manual on Uniform Traffic Control Devices 2009 Edition, a pedestrian phase as long as 52 seconds would be required to allow the pedestrians to cross diagonally at this intersection. With this additional pedestrian phase, the cycle length will have to be increased to the maximum 240 seconds from the existing 210 seconds. Subsequently, the green time for Ena Road must be reduced to 28 seconds from the existing 50 seconds as shown in Figure 21.

Eliminating the inefficient Ena Road signal phase may be able to make time for the added pedestrian phase. To do that, Ena Road will have to be converted into a one-way street. As an alternative to the long 240 second cycle, the 210 second cycle can remain with the added pedestrian phase because the added pedestrian phase can be offset by the saving

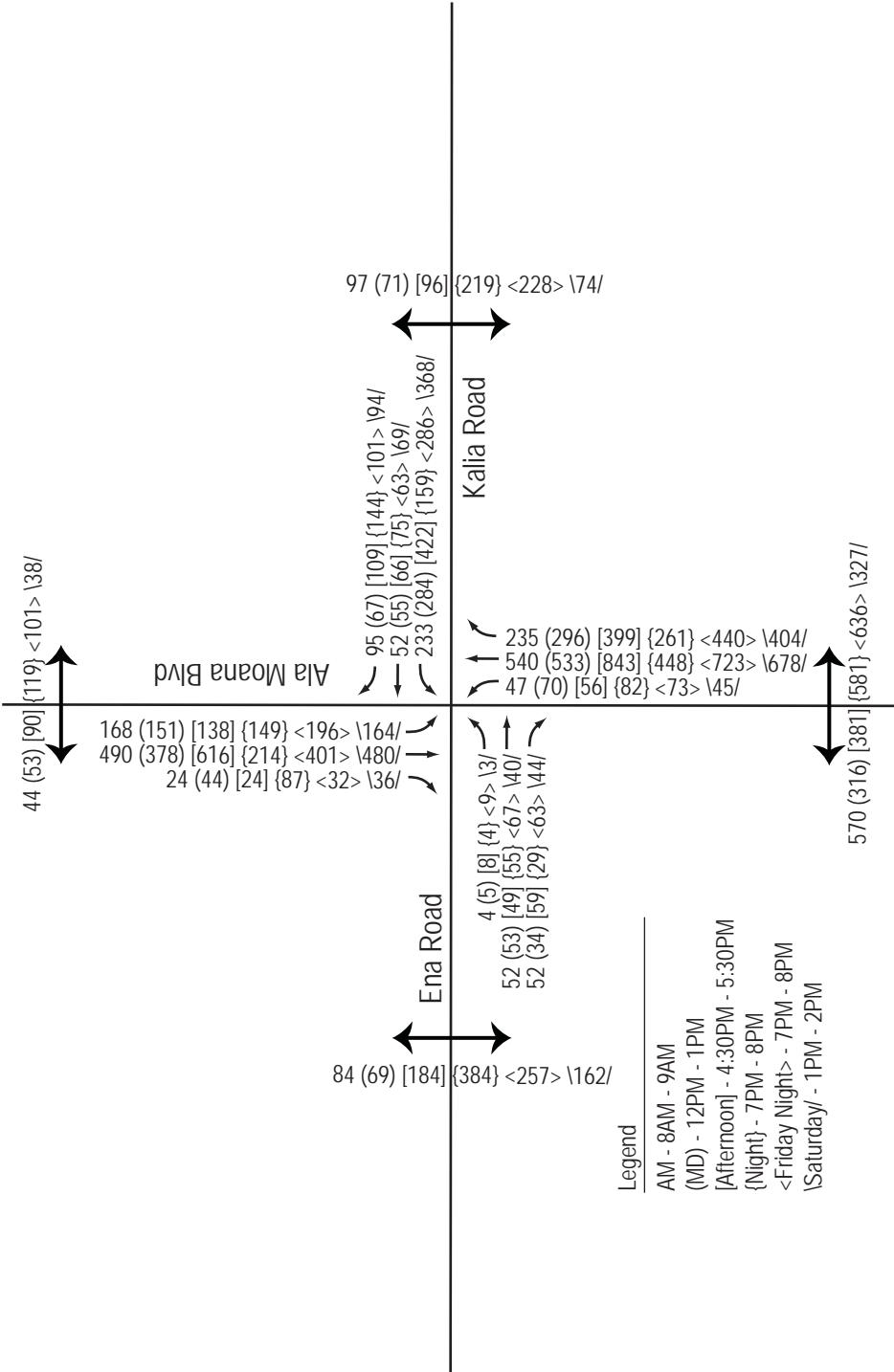
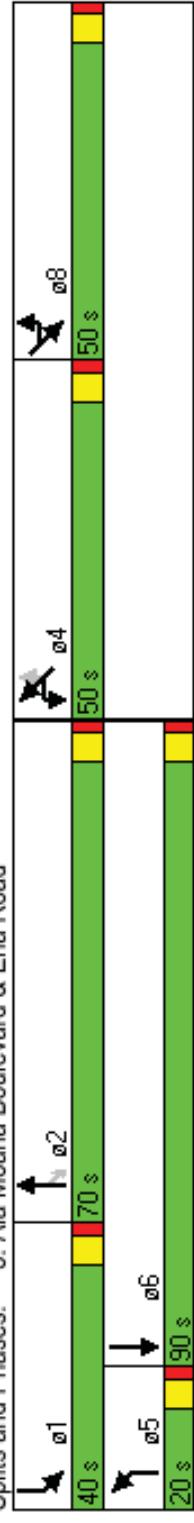


Figure
20

Ala Moana Boulevard and Kalia Road Ena Road Intersection Counts

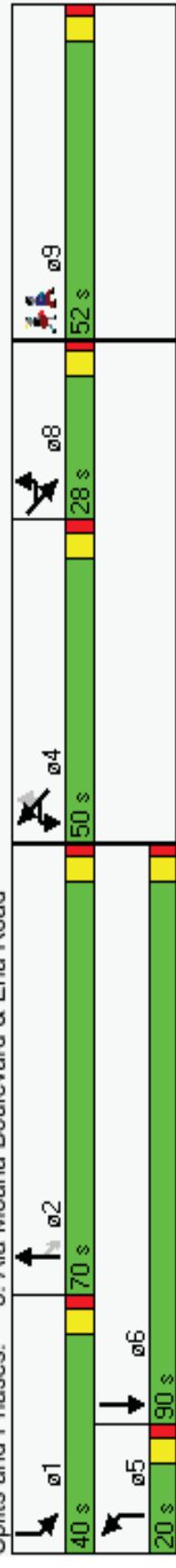
Existing Phasing, 210 second cycle

Splits and Phases: 3: Ala Moana Boulevard & Ena Road



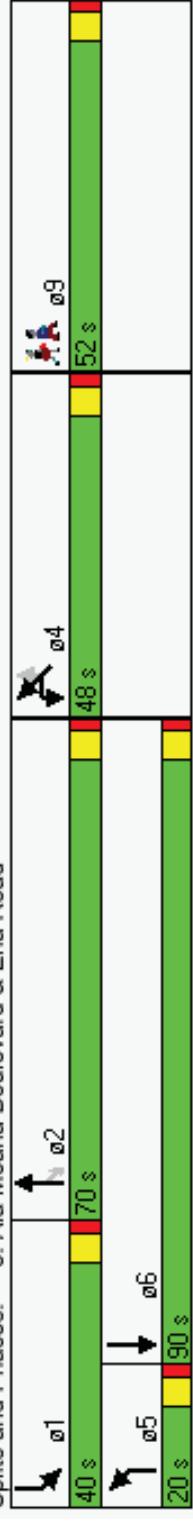
Existing Phasing With Pedestrian Phase, 240 second cycle

Splits and Phases: 3: Ala Moana Boulevard & Ena Road



Proposed One-Way Ena Road Phasing, 210 second cycle

Splits and Phases: 3: Ala Moana Boulevard & Ena Road



The cycle length will remain the same. The Ena Road Phase is replaced with a pedestrian phase.



Proposed Alternative

Figure
21

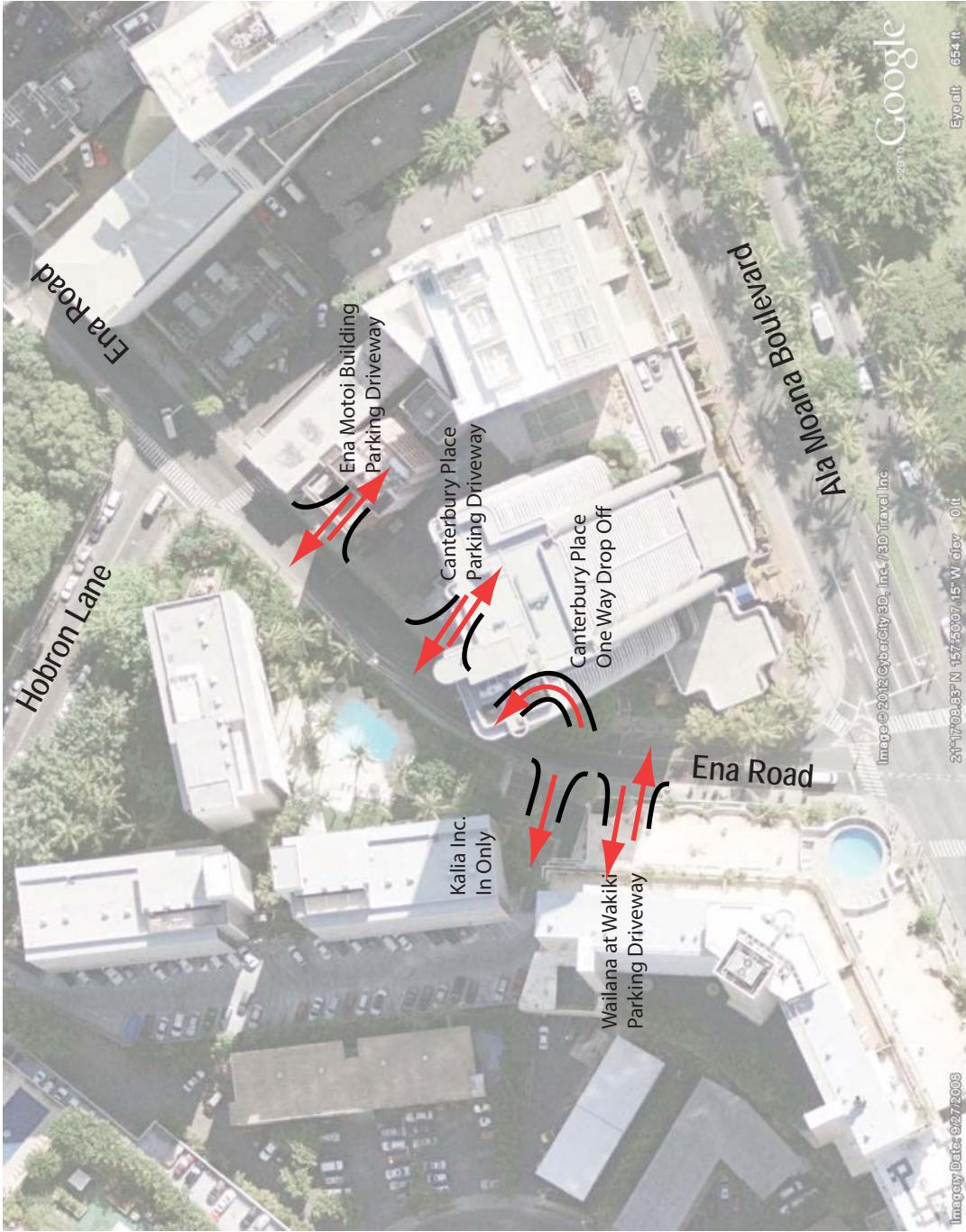
of the Ena Road phase. This would generate minimal adverse impacts to other movements at this intersection. The signal phasing for this alternative is shown in Figure 21. The signal phase for Ena Road would be replaced with the All-Pedestrian Phase and the signal phases for other movements at this intersection would remain largely unchanged.

The one-way section of Ena Road would run from Ala Moana Boulevard to Hobron Lane. The prohibited Ena Road movements would require detours to preserve the accessibility to Ena Road. Figure 22 illustrates the existing driveways used by the properties along Ena Road whose access routes would be altered by converting Ena Road to a one-way street. They are Wailana at Waikiki parking driveway, Kalia Inc. inbound only driveway, Canterbury Place one-way drop off, Canterbury Place parking driveway, and Ena Motoi parking driveway. Proposed detours are illustrated in Figure 23. In general, the detoured volumes would be low and it is not expected that the neighboring intersections would be impacted significantly.

The existing curb-to-curb width on Ena Road is 30 feet. With the proposed one-way conversion, only 12 feet will be required as the one-travel lane. In conjunction with the one-way conversion and the additional availability of right-of-way, more parking, wider sidewalks, planters, and other street amenities can be considered during the conceptual design phase in the future.

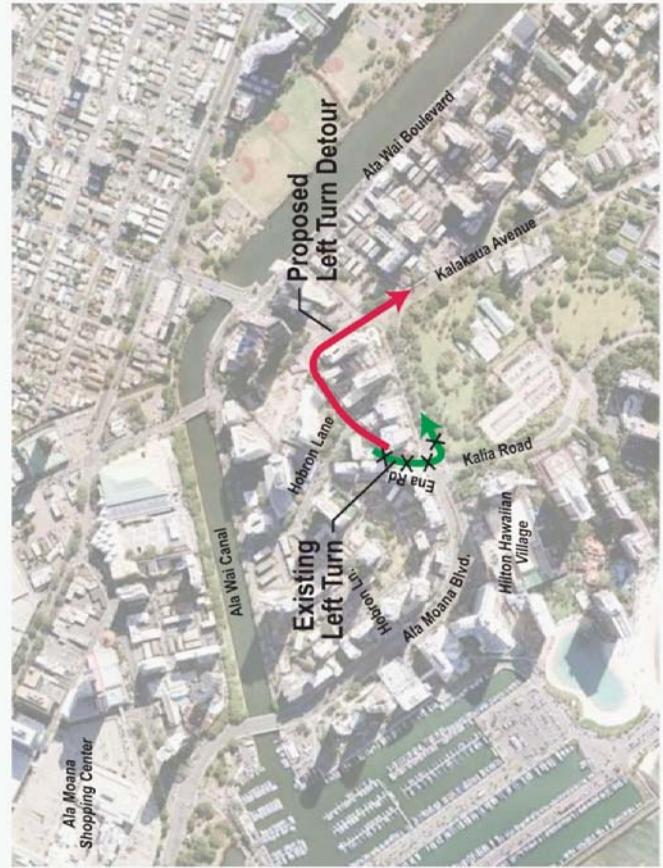
2. Methodology

The intersection was analyzed using the methodologies for signalized intersections outlined in the 2010 Highway Capacity Manual (HCM). Operating conditions at an intersection by approach are expressed as a qualitative measure known as Level of Service (LOS) ranging from A to F. LOS A represents free-flow operations with low delay, while LOS F represents congested conditions with relatively high delay. The overall intersection LOS is a weighted average of the LOS of individual traffic movement groups. Appendix B has more detailed definitions of intersection LOS. Field observations were performed at the intersections to verify the results of the intersection analyses.

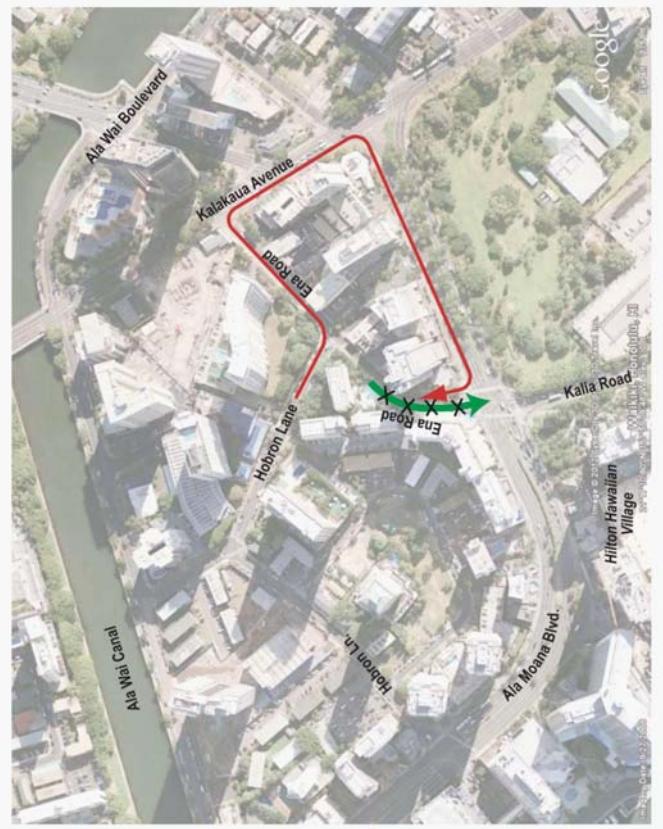


Existing Ena Road Driveways

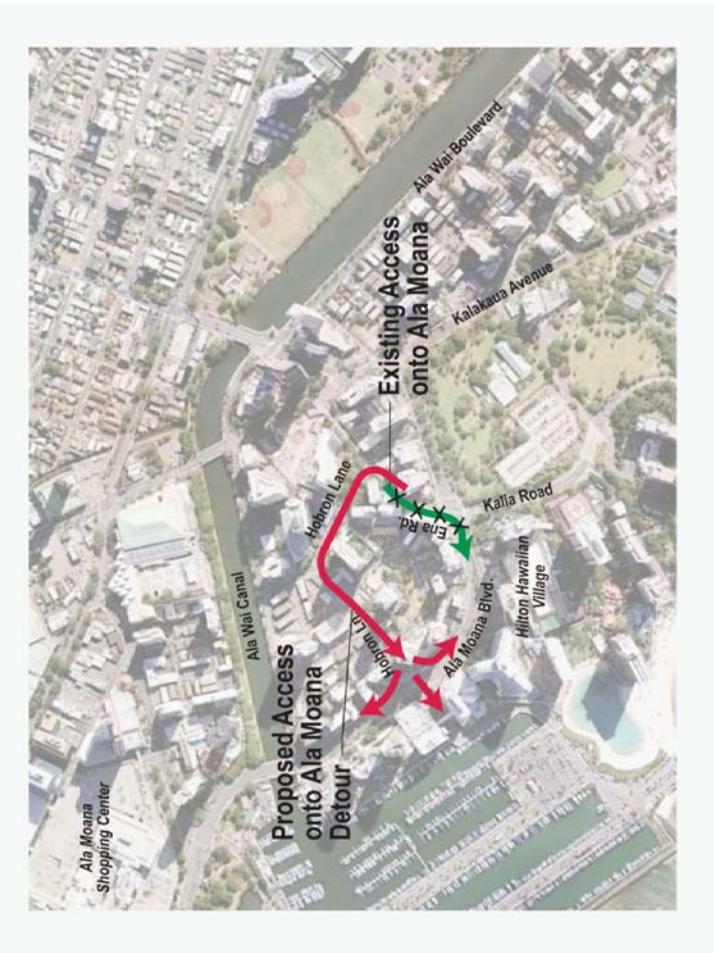
Figure 22



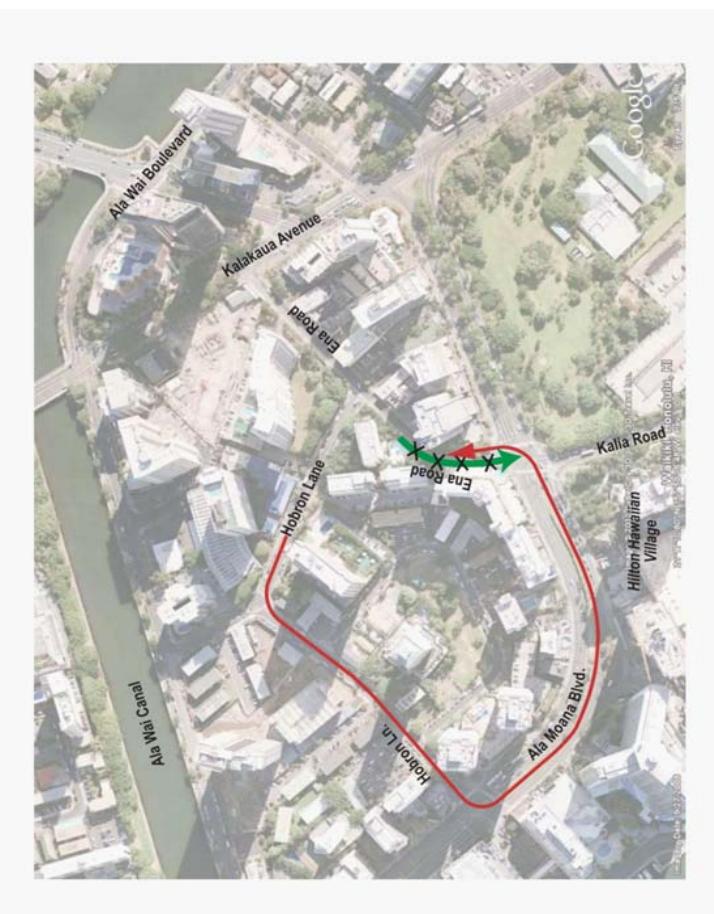
To Ena Road Alternative #1



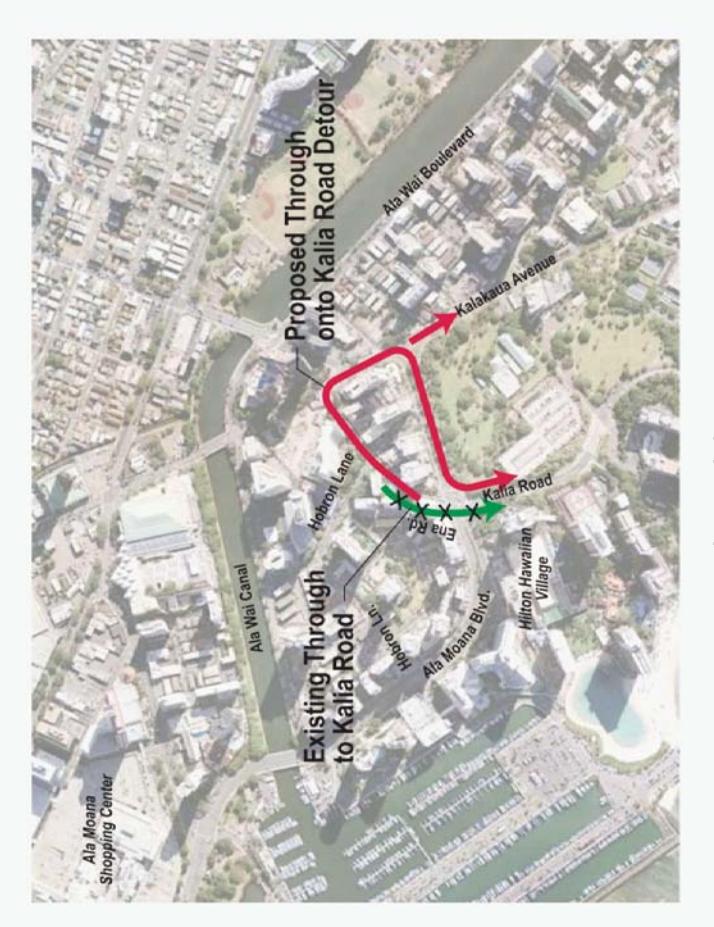
To Ena Road Alternative #2



From Ena Road to Ala Moana Boulevard -
Alternative for right turns



From Ena Road to Kalia Road -
Alternative for through vehicles



From Kalihi Avenue to Ala Moana Boulevard -
Alternative for left turns

3. Results

Table 3 shows the LOS for the existing condition, the All-Pedestrian Phase alternative, and the one-way Ena Road alternative during PM peak hour. Under the existing conditions, the overall intersection would operate at LOS E with all left turning movements operating at LOS F. Despite the low volumes, the Ena Road approach would operate at LOS E.

With the added All-Pedestrian Phase and the longer 240 second cycle length, the overall intersection LOS would deteriorate to F with the delay growing to 108 seconds per vehicle. This analysis does not reflect the pedestrian delay reduction and the safety benefit of separating the pedestrians and the turning vehicles, however the adverse impacts to the overall intersection would be considerable.

With the added All-Pedestrian Phase one-way Ena Road alternative produced similar vehicular delay as the existing conditions. The inefficient Ena Road phase is replaced with the All-Pedestrian Phase. The pedestrian delay decrease and the safety benefit of separating the pedestrians and the turning vehicles are also expected.

D. Summary

The analyses clearly demonstrated that adding an All-Pedestrian Phase at the intersection of Ala Moana Boulevard and Kalia Road/Ena Road will cause considerable adverse impacts to other vehicular movements at this intersection and may cause queuing often to spill over to the upstream intersections.

Converting Ena Road to one-way would replace the inefficient Ena Road with the All-Pedestrian Phase. It will not cause considerable adverse impacts to other vehicular movements at this intersection. The pedestrian delay is expected to decrease and the safety would be improved due to separation of the pedestrians and the turning vehicles.

Public support will be the key to implement a one-way Ena Street. The negative impacts to the driveways along the one-way section of Ena Road between Ala Moana Boulevard and Hobron Lane can be addressed. In general, the detoured volumes are low and it is not expected that the neighboring intersections will be impacted significantly. The saved right-of-way by one-way Ena Road provides many opportunities to implement the complete street improvements such as wider sidewalks, landscaped sidewalks, more parking, and bike routes.

Table 3 Ala Moana Boulevard and Kalia Road/Ena Road LOS and Delay Comparison

PM Peak hour	Existing		Ped Phase*		One-way Ena Road	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Ala Moana at Kalia & Ena	E	73	F	108	E	71
Ala Moana mauka-bound Left	F	127	F	161	F	127
Ala Moana mauka-bound Through	E	72	F	96	E	72
Ala Moana mauka-bound Right	E	78	F	131	E	64
Ala Moana makai-bound Left	F	104	F	137	F	104
Ala Moana makai-bound Through-Right	D	42	E	57	D	42
Ena Left-Through-Right	E	79	F	231	N/A	N/A
Kalia Left	F	81	F	101	F	84
Kalia Left-Through	F	81	F	101	F	84
Kalia Right	E	67	F	82	E	69

*52 Second pedestrian phase added, Ena Road phase reduced from 50 seconds to 28 seconds, overall cycle length is 240 seconds

V. Conclusion and Recommendation

Kalakaua Avenue/Royal Hawaiian Avenue Intersection and Kalakaua Avenue/Lewers Street Intersection

Based on the VISSIM analyses, the All-Pedestrian Phase alternative is recommended for the following reasons:

1. It provides complete separation between vehicles and pedestrians;
2. It produces the least amount of pedestrian delay and reduces right turning vehicle queuing significantly at both intersections;
3. It causes less confusion for both motorists and pedestrians compared to the Right Turn Hold alternative;
4. The missing Diamond Head-side crosswalk at Royal Hawaiian Avenue intersection could be added, which would contribute to overall better LOS for pedestrians.

At the August 29th 2012 WTSOC meeting, the committee unanimously agreed to support the Pedestrian Phase alternative and urged DTS actions. At the October 9th 2012 Waikiki Neighborhood Board meeting, the board unanimously agreed to support the All-Pedestrian Phase alternative.

Kalakaua Avenue and Kapiolani Boulevard Intersection

The analyses demonstrated that permitting mauka-bound left turns on Kalakaua Avenue for only the Waikiki Regional Circulator buses would not cause significant impact to the intersection operation at Kapiolani Boulevard and Kalakaua Avenue. However, permitting mauka-bound left turns for all vehicles would cause excessive delay and unacceptable LOS at the intersection. Subsequently the planned circulator buses will be stuck along with other general public vehicles at this intersection and the bus level of service will be compromised. It is recommended that the left turn ban be lifted for the circulator buses only. Along with prohibitive signs, other Intelligent Transportation Systems such as an opticom for buses only can be applied to trigger the left turn phase. An electronic traffic enforcement system is also available for consideration.

Ala Moana Boulevard and Kalia Road/Ena Road Intersection

The analyses clearly demonstrated that adding an All-Pedestrian Phase at the intersection of Ala Moana Boulevard and Kalia Road/Ena Road will cause considerable adverse impacts to other vehicular movements at this intersection and may often cause queuing to spill over to the upstream intersections.

Converting Ena Road to one-way would replace the inefficient Ena Road signal phase with the All-Pedestrian Phase. It will not cause considerable adverse impacts to other vehicular movements at this intersection. The pedestrian delay is expected to decrease and the safety would be improved due to separation of the pedestrians and the turning vehicles.

Public support will be the key to implement a one-way Ena Road. The negative impacts to the driveways along the one-way section of Ena Road between Ala Moana Boulevard and Hobron Lane can be addressed. In general, the detoured volumes are low and it is not expected that the neighboring intersections will be impacted significantly. The saved right-of-way by one-way Ena Road provides many opportunities to implement the complete street improvements such as wider sidewalks, landscaped sidewalks, more parking, and bike routes.

It is also noted that Ala Moana Boulevard and Kalia Road/Ena Road intersection is under the State jurisdiction. The coordination with Hawaii State Department of Transportation should be conducted during the early planning stage.

Conclusion

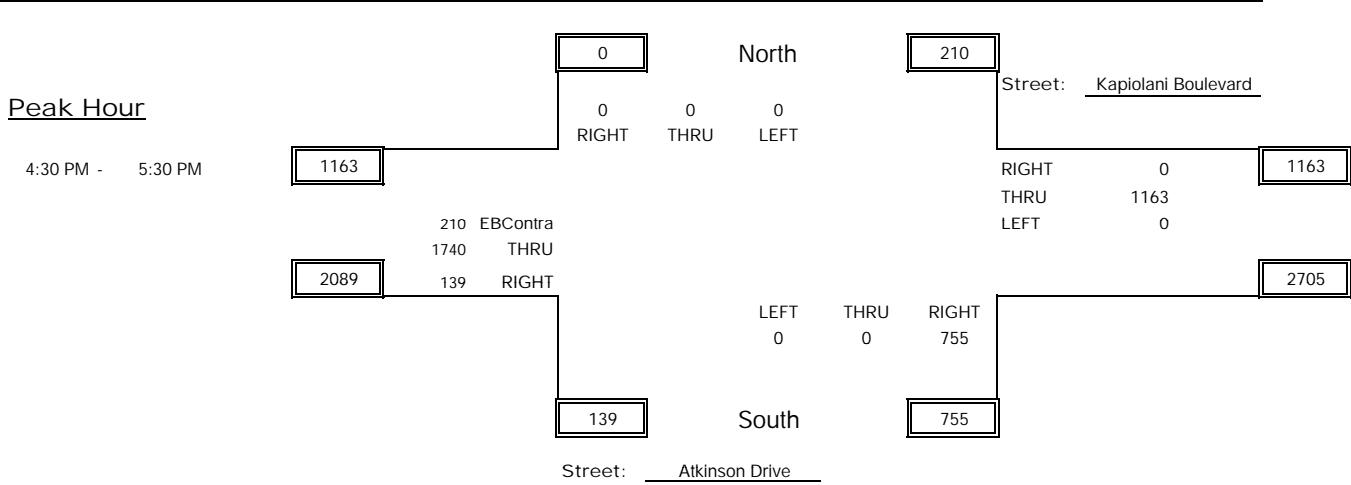
Despite all the completed and planned improvements that aim at enhancing walking and biking experiences in Waikiki, continuous effort and long term commitments are needed to address the missing links in pedestrian walkways and bike routes. Those missing links are being identified in many public meetings throughout the study process. They are included in Waikiki Regional Circulator Study Working Papers #12 and # 21. It was felt that many measures and proposals warrant further studies, planning, and actions that would lead to implementation.

Appendix A
Existing Traffic Data

PM COUNT SHEET

North											
Intersection:	<u>Kapiolani Blvd & Atkinson Dr</u>										
Date:	<u>Monday, 8/13/2012</u>										
By:	<u>SL and DM</u>										
Weather:	<u>Sunny</u>										
 Street: <u>Kapiolani Boulevard</u> Street: <u>Atkinson Drive</u>											

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
4:00 PM - 4:15 PM	46	373	26	0	0	0	0	210	0	175	0	0	830	3667
4:15 PM - 4:30 PM	39	391	29	0	0	0	0	330	0	166	0	0	955	3871
4:30 PM - 4:45 PM	26	387	57	0	0	0	0	248	0	191	0	0	909	4007
4:45 PM - 5:00 PM	38	449	46	0	0	0	0	261	0	179	0	0	973	4084
5:00 PM - 5:15 PM	32	442	62	0	0	0	0	312	0	186	0	0	1034	4055
5:15 PM - 5:30 PM	43	462	45	0	0	0	0	342	0	199	0	0	1091	
5:30 PM - 5:45 PM	56	400	21	0	0	0	0	339	0	170	0	0	986	
5:45 PM - 6:00 PM	81	320	22	0	0	0	0	349	0	172	0	0	944	
Phf	0.808	0.942	0.847	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.850	#DIV/0!	0.948	#DIV/0!	#DIV/0!	Peak	Phf
4:30 PM - 5:30 PM	139	1740	210	0	0	0	0	1163	0	755	0	0	4007	0.969



AM COUNT SHEET

Intersection:	<u>Kapiolani Blvd & Kalakaua Ave</u>
Date:	<u>Wednesday, 5/2/2012</u>
By:	<u>Shenghong Li</u>
Weather:	<u>Clear</u>

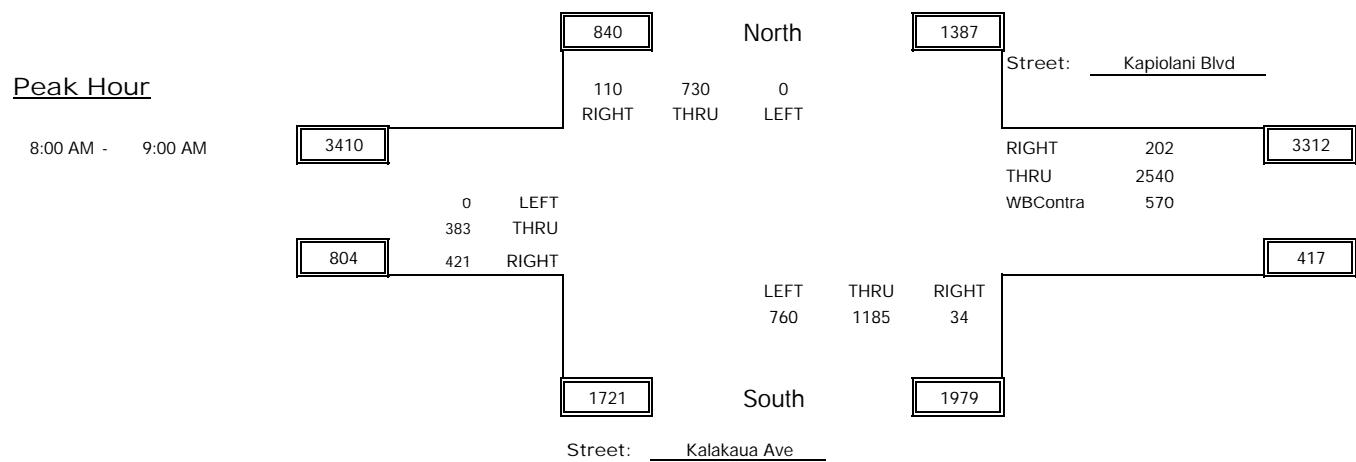
Street: Kapiolani Blvd

North

South

Street: Kalakaua Ave

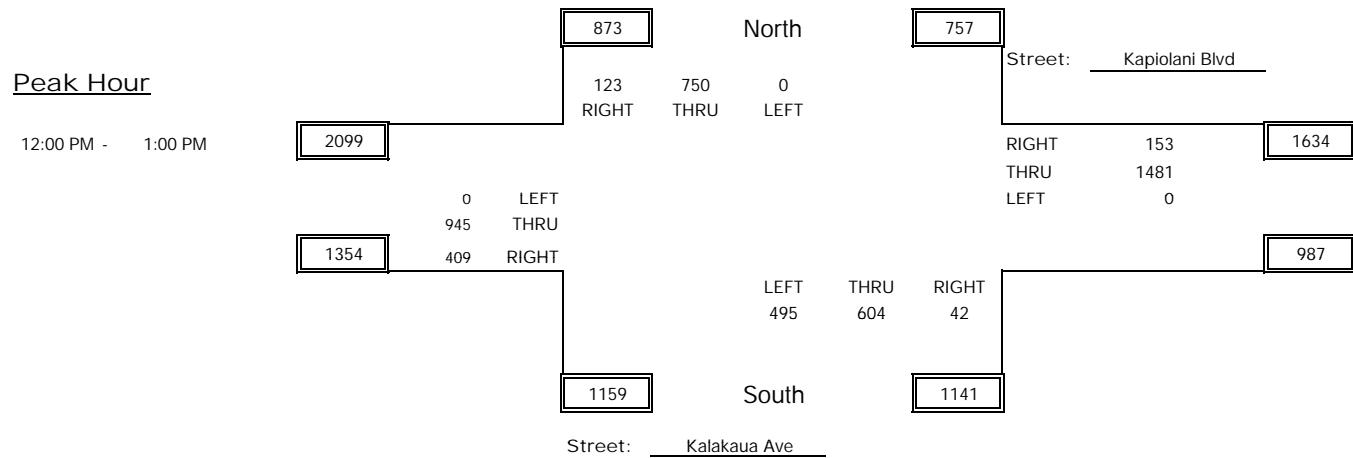
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
7:00 AM - 7:15 AM	40	54	0	12	160	0	9	457	88	3	85	58	966	5438
7:15 AM - 7:30 AM	84	81	0	10	124	0	21	584	91	8	117	106	1226	6362
7:30 AM - 7:45 AM	76	94	0	17	131	0	40	678	142	13	238	133	1562	6815
7:45 AM - 8:00 AM	83	116	0	14	153	0	68	619	139	42	257	193	1684	7005
8:00 AM - 8:15 AM	130	95	0	21	170	0	49	800	169	3	263	190	1890	6935
8:15 AM - 8:30 AM	121	89	0	19	206	0	35	539	137	14	333	186	1679	
8:30 AM - 8:45 AM	79	98	0	34	162	0	66	597	146	10	337	223	1752	
8:45 AM - 9:00 AM	91	101	0	36	192	0	52	604	118	7	252	161	1614	
Phf	0.810	0.948	#DIV/0!	0.764	0.886	#DIV/0!	0.765	0.794	0.843	0.607	0.879	0.852	Peak	Phf
8:00 AM - 9:00 AM	421	383	0	110	730	0	202	2540	570	34	1185	760	6935	0.917



MD COUNT SHEET

Intersection:	<u>Kapiolani Blvd & Kalakaua Ave</u>											
Date:	<u>Wednesday, 5/2/2012</u>											
By:	<u>Shenghong Li</u>											
Weather:	<u>Clear</u>											

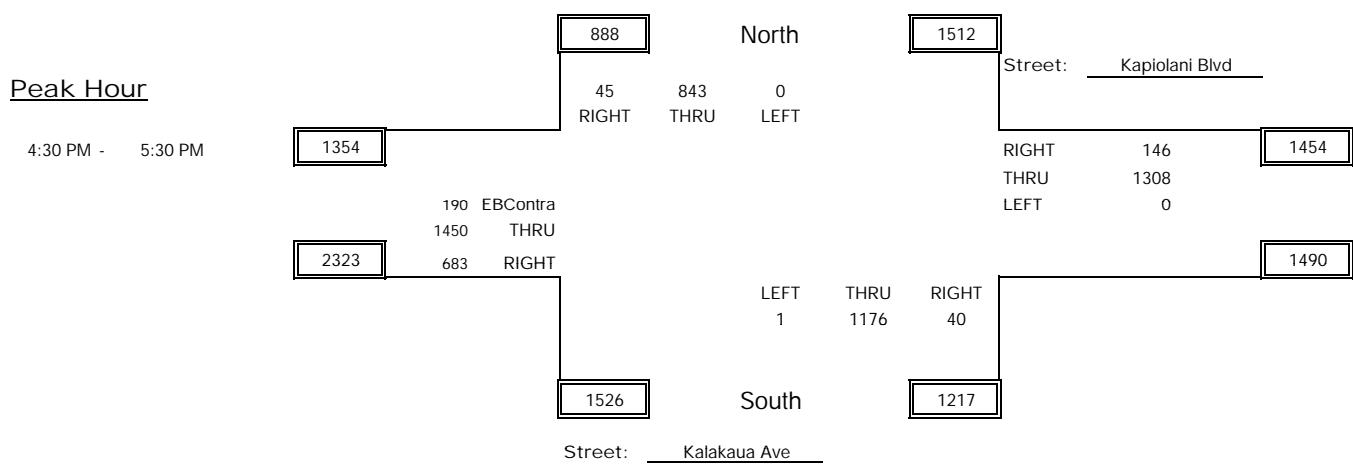
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
11:00 AM - 11:15 AM	86	217	0	35	172	0	32	373	0	14	97	118	1144	5046
11:15 AM - 11:30 AM	124	206	0	24	190	0	47	388	1	15	177	159	1331	5154
11:30 AM - 11:45 AM	114	219	0	30	174	0	44	393	0	18	148	159	1299	5038
11:45 AM - 12:00 PM	105	236	0	27	177	0	34	367	0	9	149	168	1272	4939
12:00 PM - 12:15 PM	107	238	0	34	184	0	48	364	0	6	133	138	1252	5002
12:15 PM - 12:30 PM	115	212	0	28	192	0	28	392	0	10	132	106	1215	
12:30 PM - 12:45 PM	90	244	0	30	198	0	23	337	0	16	158	104	1200	
12:45 PM - 1:00 PM	97	251	0	31	176	0	54	388	0	10	181	147	1335	
Phf	0.889	0.941	#DIV/0!	0.904	0.947	#DIV/0!	0.708	0.945	#DIV/0!	0.656	0.834	0.842	Peak	Phf
12:00 PM - 1:00 PM	409	945	0	123	750	0	153	1481	0	42	604	495	5002	0.963



PM COUNT SHEET

Intersection:	<u>Kapiolani Blvd & Kalakaua Ave</u>											
Date:	<u>Wednesday, 5/2/2012</u>											
By:	<u>Shenghong Li</u>											
Weather:	<u>Clear</u>											
 North Street: <u>Kapiolani Blvd</u> South Street: <u>Kalakaua Ave</u>												

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
3:30 PM - 3:45 PM	118	276	23	22	197	0	31	314	0	32	233	0	1246	5517
3:45 PM - 4:00 PM	117	302	39	19	184	0	31	320	0	15	368	0	1395	5706
4:00 PM - 4:15 PM	127	276	25	11	228	0	53	369	1	10	306	0	1406	5750
4:15 PM - 4:30 PM	172	302	40	17	218	0	60	352	0	12	297	0	1470	5985
4:30 PM - 4:45 PM	181	307	29	9	194	0	33	338	0	10	334	0	1435	5882
4:45 PM - 5:00 PM	134	330	48	10	219	0	41	330	0	8	319	0	1439	
5:00 PM - 5:15 PM	181	375	68	13	200	0	34	398	0	6	365	1	1641	
5:15 PM - 5:30 PM	187	438	45	13	230	0	38	242	0	16	158	0	1367	
Phf	0.913	0.828	0.699	0.865	0.916	#DIV/0!	0.890	0.822	#DIV/0!	0.625	0.805	0.250	Peak	Phf
4:30 PM - 5:30 PM	683	1450	190	45	843	0	146	1308	0	40	1176	1	5882	1.000



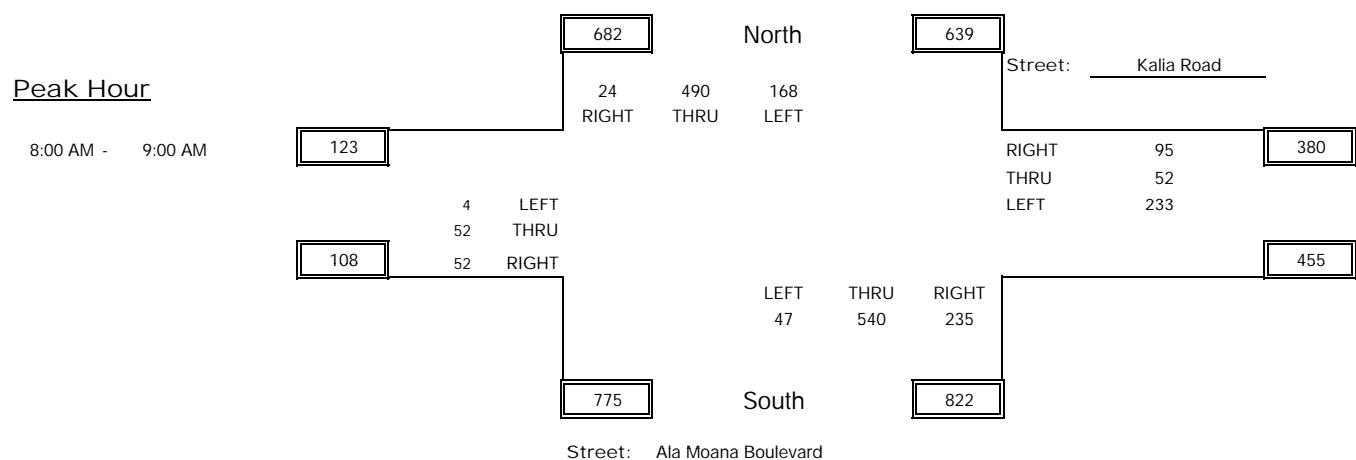
AM COUNT SHEET

Intersection:	<u>Ala Moana Blvd & Kalia Rd/Ena St</u>	
Date:	<u>Tuesday, 4/3/2012</u>	
By:	<u>Herbert Pulido & David Miyasaki</u>	
Weather:	<u>Clear</u>	

Street: Kalia Road

Street: Ala Moana Boulevard

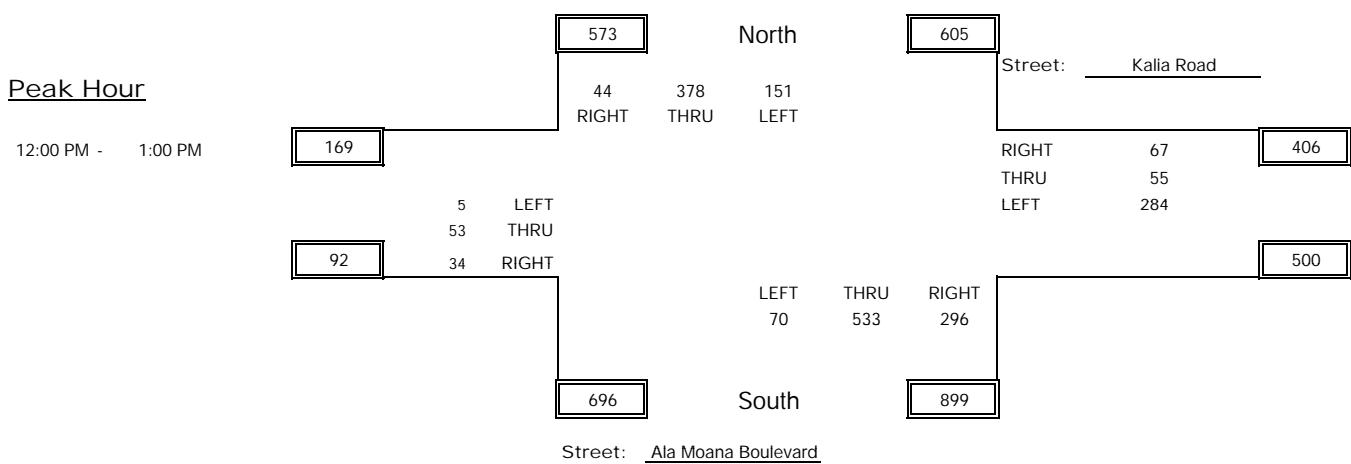
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
7:00 AM - 7:15 AM	7	25	2	4	110	45	10	19	67	80	93	5	467	2104
7:15 AM - 7:30 AM	3	22	2	17	111	37	22	15	79	62	148	14	532	2116
7:30 AM - 7:45 AM	5	18	2	4	170	59	15	9	73	61	143	20	579	2085
7:45 AM - 8:00 AM	11	13	2	5	139	61	20	14	78	62	109	12	526	1976
8:00 AM - 8:15 AM	10	11	1	9	124	43	26	11	62	38	139	5	479	1992
8:15 AM - 8:30 AM	15	14	1	3	127	54	18	15	35	65	139	15	501	
8:30 AM - 8:45 AM	13	20	2	6	109	34	29	14	67	62	100	14	470	
8:45 AM - 9:00 AM	14	7	0	6	130	37	22	12	69	70	162	13	542	
Phf	0.867	0.650	0.500	0.667	0.942	0.778	0.819	0.867	0.844	0.839	0.833	0.783	Peak	Phf
8:00 AM - 9:00 AM	52	52	4	24	490	168	95	52	233	235	540	47	1992	0.860



MD COUNT SHEET

Intersection:	<u>Ala Moana Blvd & Kalia Rd/Ena St</u>											
Date:	<u>Tuesday, 4/3/2012</u>											
By:	<u>Herbert Pulido & David Miyasaki</u>											
Weather:	<u>Clear</u>											
 Street: <u>Ala Moana Boulevard</u> Street: <u>Kalia Road</u>												

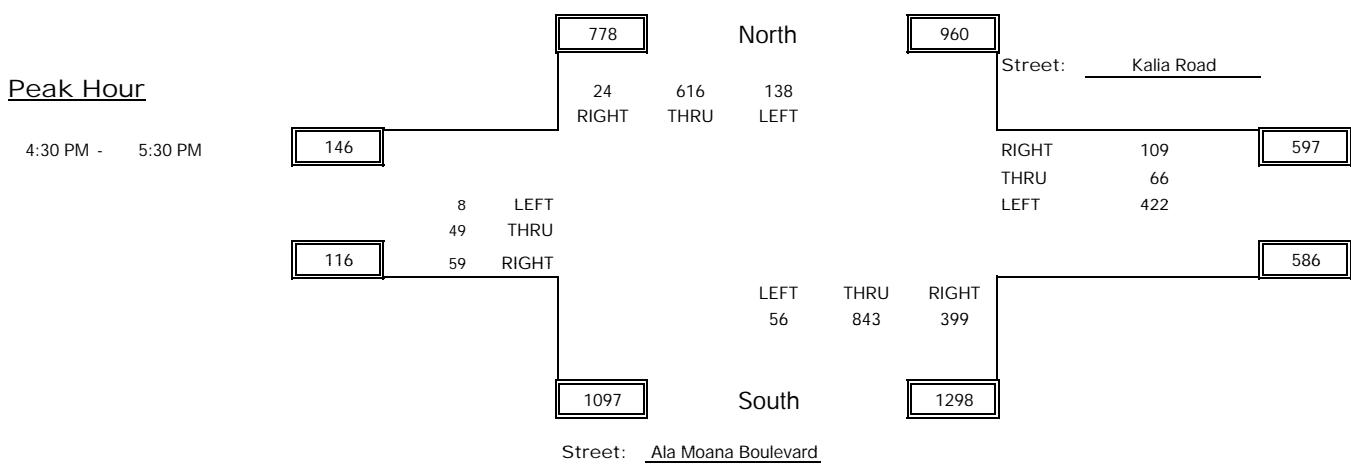
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
11:00 AM - 11:15 AM	8	10	1	7	85	35	30	15	91	61	130	2	475	1932
11:15 AM - 11:30 AM	12	16	1	5	72	23	14	17	96	66	149	9	480	1981
11:30 AM - 11:45 AM	9	15	3	7	98	26	27	10	72	90	141	14	512	1942
11:45 AM - 12:00 PM	11	2	1	7	80	37	23	16	90	60	126	12	465	1959
12:00 PM - 12:15 PM	11	15	2	11	101	40	24	18	82	66	131	23	524	1970
12:15 PM - 12:30 PM	4	6	0	12	110	37	16	9	64	67	100	16	441	
12:30 PM - 12:45 PM	13	18	1	8	79	37	19	17	72	81	166	18	529	
12:45 PM - 1:00 PM	6	14	2	13	88	37	8	11	66	82	136	13	476	
Phf	0.654	0.736	0.625	0.846	0.859	0.944	0.698	0.764	0.866	0.902	0.803	0.761	Peak	Phf
12:00 PM - 1:00 PM	34	53	5	44	378	151	67	55	284	296	533	70	1970	0.940



PM COUNT SHEET

Intersection:	<u>Ala Moana Blvd & Kalia Rd/Ena St</u>											
Date:	<u>Tuesday, 4/3/2012</u>											
By:	<u>Herbert Pulido & David Miyasaki</u>											
Weather:	<u>Clear</u>											
 Street: <u>Ala Moana Boulevard</u> Street: <u>Kalia Road</u>												

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
3:30 PM - 3:45 PM	13	18	1	9	111	51	32	34	131	87	172	17	676	2886
3:45 PM - 4:00 PM	17	11	3	5	153	43	24	16	126	101	238	11	748	2991
4:00 PM - 4:15 PM	10	22	2	6	117	42	47	22	122	86	195	9	680	2930
4:15 PM - 4:30 PM	23	13	0	5	170	36	25	17	118	122	241	12	782	2944
4:30 PM - 4:45 PM	17	26	3	7	167	46	25	16	140	104	211	19	781	2789
4:45 PM - 5:00 PM	12	4	1	8	185	34	26	11	96	103	191	16	687	
5:00 PM - 5:15 PM	9	8	2	5	141	34	32	20	107	99	227	10	694	
5:15 PM - 5:30 PM	21	11	2	4	123	24	26	19	79	93	214	11	627	
Phf	0.702	0.471	0.667	0.750	0.832	0.750	0.852	0.825	0.754	0.959	0.928	0.737	Peak	Phf
4:30 PM - 5:30 PM	59	49	8	24	616	138	109	66	422	399	843	56	2789	0.892



Saturday COUNT SHEET

Intersection: Ala Moana Blvd & Kalia Rd/Ena St
 Date: Saturday, 4/7/2012
 By: Herbert Pulido & Paula Brooks
 Weather: Clear

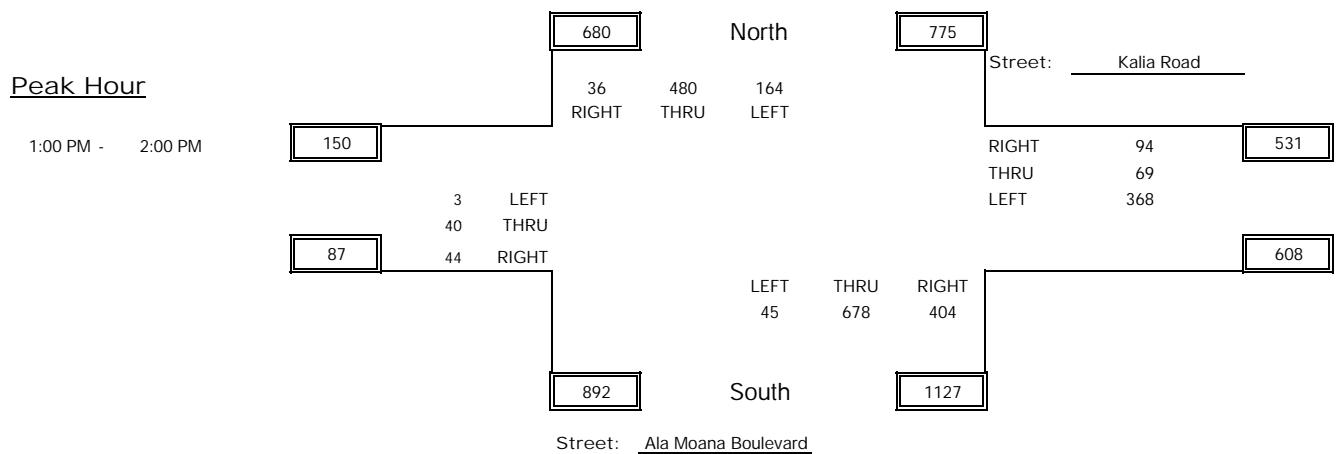
North

Street: Kalia Road

South

Street: Ala Moana Boulevard

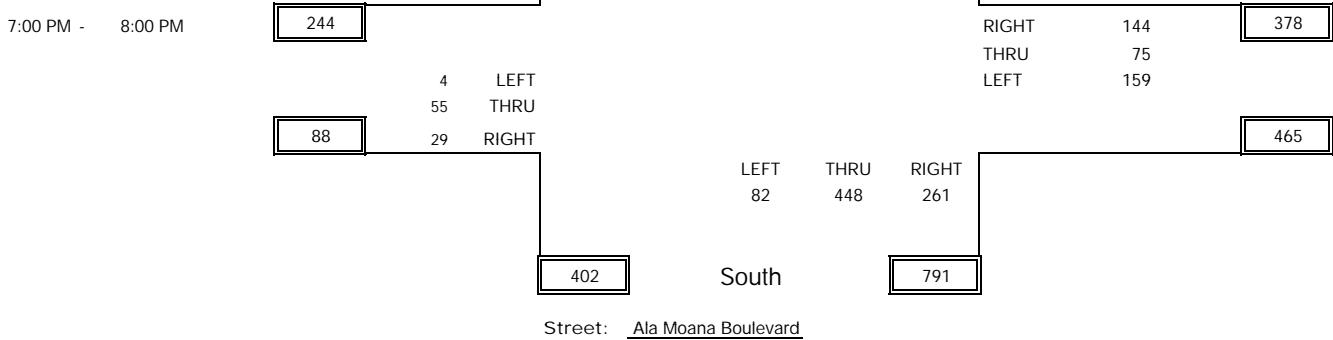
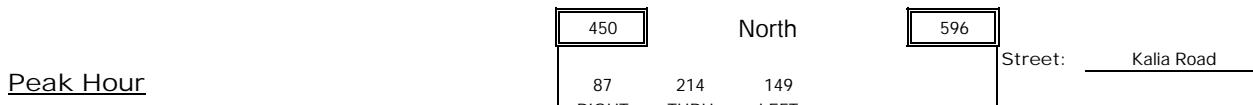
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
11:00 AM - 11:15 AM	4	18	0	11	116	38	31	10	79	94	167	8	576	2291
11:15 AM - 11:30 AM	8	14	3	13	112	56	22	17	98	68	128	8	547	2325
11:30 AM - 11:45 AM	12	6	0	8	116	66	15	12	101	91	158	13	598	2364
11:45 AM - 12:00 PM	8	13	1	8	133	38	29	11	91	82	145	11	570	2396
12:00 PM - 12:15 PM	9	11	3	15	119	34	26	19	102	84	174	14	610	2386
12:15 PM - 12:30 PM	-26	10	1	9	124	69	20	12	87	105	161	14	586	2376
12:30 PM - 12:45 PM	44	15	0	15	94	23	27	18	108	86	188	12	630	2465
12:45 PM - 1:00 PM	38	18	2	7	113	36	12	11	58	87	159	19	560	2362
1:00 PM - 1:15 PM	18	10	1	6	112	34	28	21	97	113	155	5	600	2425
1:15 PM - 1:30 PM	11	10	0	8	150	34	33	13	105	99	196	16	675	
1:30 PM - 1:45 PM	9	6	1	11	89	36	16	19	78	97	156	9	527	
1:45 PM - 2:00 PM	6	14	1	11	129	60	17	16	88	95	171	15	623	
Phf	0.611	0.714	0.750	0.818	0.800	0.683	0.712	0.821	0.876	0.894	0.865	0.703	Peak	Phf
1:00 PM - 2:00 PM	44	40	3	36	480	164	94	69	368	404	678	45	2425	0.898



Night COUNT SHEET

Intersection:	<u>Ala Moana Blvd & Kalia Rd/Ena St</u>											
Date:	<u>Wednesday, 4/11/2012</u>											
By:	<u>Herbert Pulido</u>											
Weather:	<u>Clear</u>											

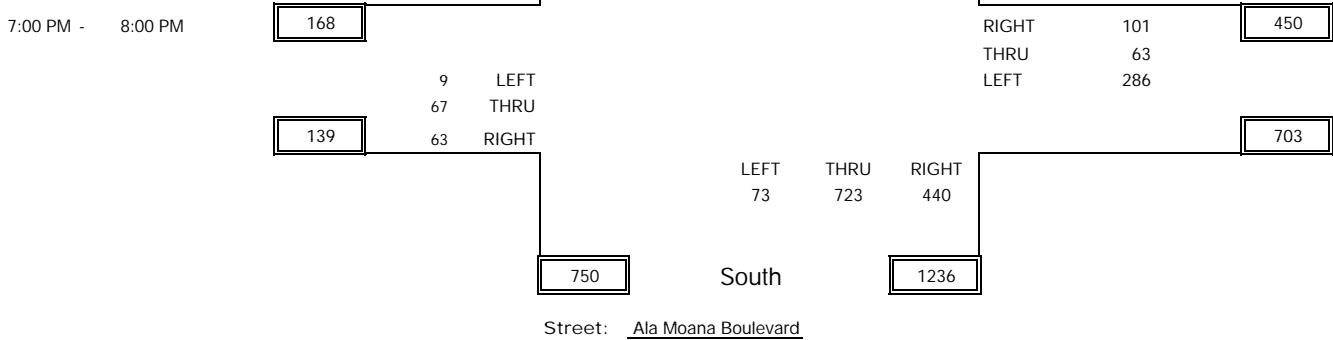
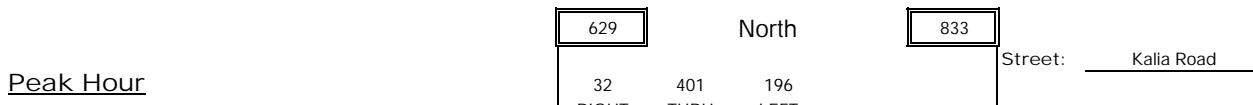
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 PM - 5:45 PM	16	24	1	7	111	29	29	34	128	113	185	7	684	2610
5:45 PM - 6:00 PM	10	19	1	8	115	53	15	16	88	126	172	17	640	2611
6:00 PM - 6:15 PM	11	19	4	14	124	38	28	12	99	140	196	20	705	2565
6:15 PM - 6:30 PM	12	13	2	4	92	60	26	16	62	118	160	16	581	2359
6:30 PM - 6:45 PM	12	17	0	15	100	42	33	8	75	136	223	24	685	2277
6:45 PM - 7:00 PM	11	16	1	28	85	44	28	22	59	112	158	30	594	1939
7:00 PM - 7:15 PM	5	14	0	30	71	52	35	9	31	75	152	25	499	1707
7:15 PM - 7:30 PM	9	16	3	27	58	33	50	26	41	82	130	24	499	
7:30 PM - 7:45 PM	7	9	1	21	43	30	29	23	40	43	80	21	347	
7:45 PM - 8:00 PM	8	16	0	9	42	34	30	17	47	61	86	12	362	
Phf	0.806	0.859	0.333	0.725	0.754	0.716	0.720	0.721	0.846	0.796	0.737	0.820	Peak	Phf
7:00 PM - 8:00 PM	29	55	4	87	214	149	144	75	159	261	448	82	1707	0.605



Friday Night COUNT SHEET

Intersection:	<u>Ala Moana Blvd & Kalia Rd/Ena St</u>											
Date:	<u>Friday, 4/20/2012</u>											
By:	<u>David Miyasaki</u>											
Weather:	<u>Clear</u>											

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 PM - 5:45 PM	14	31	0	11	145	60	24	41	102	176	219	13	836	3320
5:45 PM - 6:00 PM	12	30	1	14	117	64	19	17	81	234	231	18	838	3237
6:00 PM - 6:15 PM	20	29	6	6	137	84	33	13	90	178	220	21	837	3090
6:15 PM - 6:30 PM	21	15	1	7	133	73	30	15	88	169	224	33	809	2925
6:30 PM - 6:45 PM	12	29	1	9	123	53	37	21	70	167	212	19	753	2733
6:45 PM - 7:00 PM	35	14	0	4	106	50	25	15	82	155	184	21	691	2572
7:00 PM - 7:15 PM	22	20	3	12	119	49	26	12	72	124	197	16	672	2454
7:15 PM - 7:30 PM	16	12	2	6	90	66	19	19	79	114	176	18	617	
7:30 PM - 7:45 PM	13	19	3	6	92	40	30	18	53	113	180	25	592	
7:45 PM - 8:00 PM	12	16	1	8	100	41	26	14	82	89	170	14	573	
Phf	0.716	0.838	0.750	0.667	0.842	0.742	0.842	0.829	0.872	0.887	0.918	0.730	Peak	Phf
7:00 PM - 8:00 PM	63	67	9	32	401	196	101	63	286	440	723	73	2454	0.732



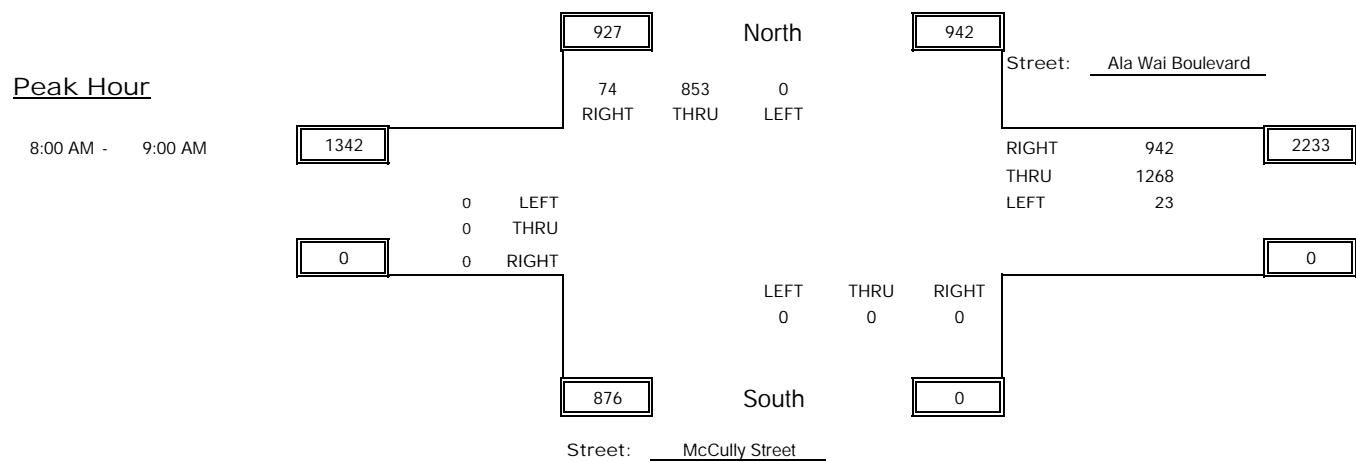
AM COUNT SHEET

Intersection:	<u>Ala Wai Blvd & McCully St</u>	
Date:	<u>Tuesday, 4/3/2012</u>	
By:	<u>ShengHong Li</u>	
Weather:	<u>Clear</u>	

Street: Ala Wai Boulevard

South
Street: McCully Street

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
7:00 AM - 7:15 AM	0	0	0	10	109	0	270	309	5	0	0	0	703	2985
7:15 AM - 7:30 AM	0	0	0	18	150	0	203	342	3	0	0	0	716	3082
7:30 AM - 7:45 AM	0	0	0	25	162	0	197	379	3	0	0	0	766	3109
7:45 AM - 8:00 AM	0	0	0	25	196	0	223	353	3	0	0	0	800	3071
8:00 AM - 8:15 AM	0	0	0	26	192	0	204	367	11	0	0	0	800	3160
8:15 AM - 8:30 AM	0	0	0	20	202	0	216	299	6	0	0	0	743	
8:30 AM - 8:45 AM	0	0	0	16	150	0	286	272	4	0	0	0	728	
8:45 AM - 9:00 AM	0	0	0	12	309	0	236	330	2	0	0	0	889	
Phf	#DIV/0!	#DIV/0!	#DIV/0!	0.712	0.690	#DIV/0!	0.823	0.864	0.523	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
8:00 AM - 9:00 AM	0	0	0	74	853	0	942	1268	23	0	0	0	3160	0.988



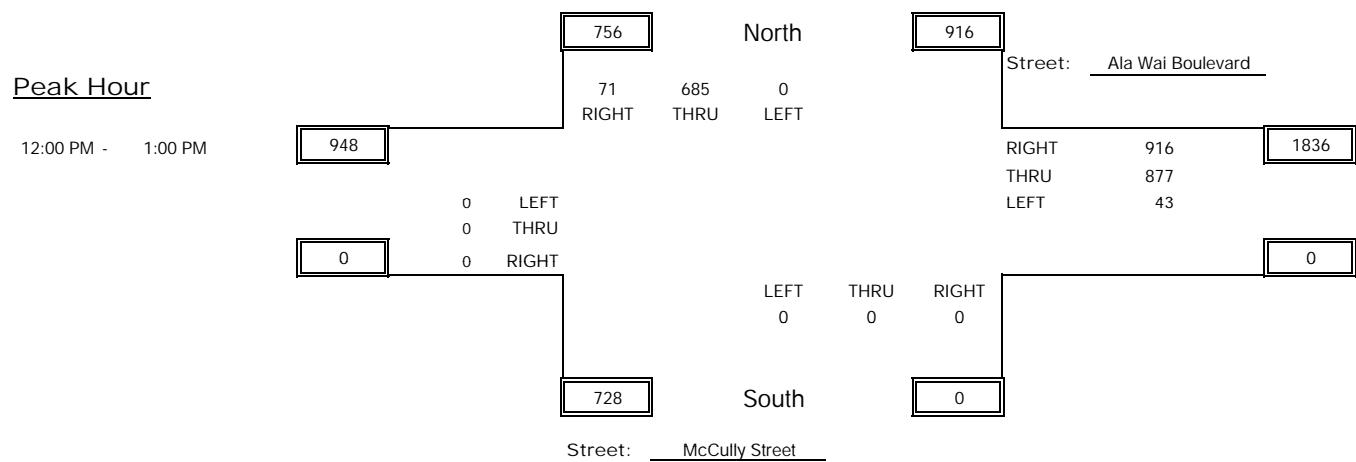
MD COUNT SHEET

Intersection:	<u>Ala Wai Blvd & McCully St</u>		
Date:	<u>Tuesday, 4/3/2012</u>		
By:	<u>ShengHong Li</u>		
Weather:	<u>Clear</u>		

Street: Ala Wai Boulevard

Street: McCully Street

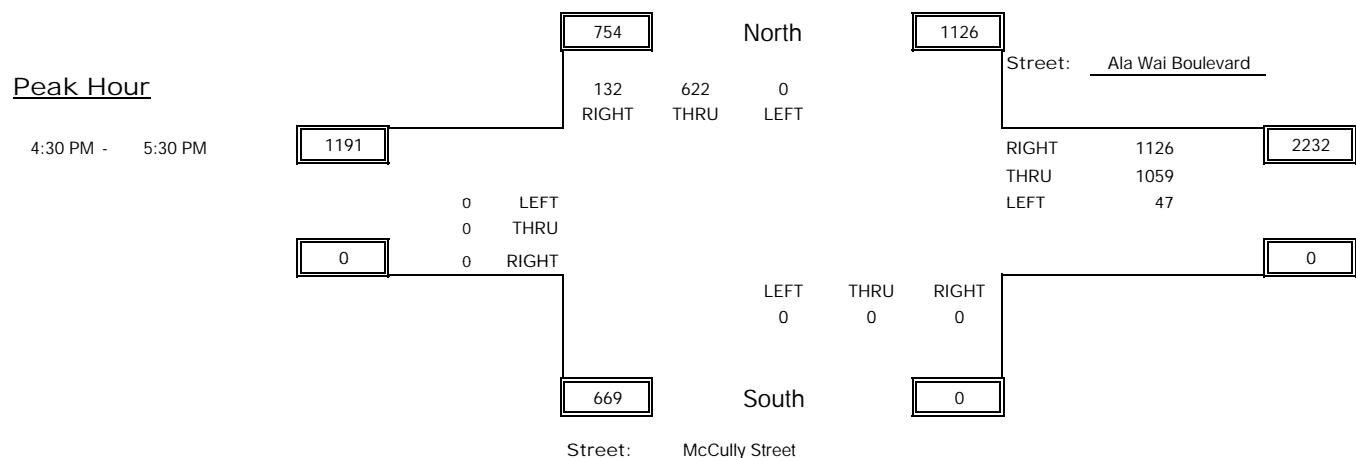
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
11:00 AM - 11:15 AM	0	0	0	18	146	0	251	230	4	0	0	0	649	2679
11:15 AM - 11:30 AM	0	0	0	19	144	0	234	243	9	0	0	0	649	2688
11:30 AM - 11:45 AM	0	0	0	19	155	0	216	260	12	0	0	0	662	2683
11:45 AM - 12:00 PM	0	0	0	18	172	0	246	278	5	0	0	0	719	2662
12:00 PM - 12:15 PM	0	0	0	21	152	0	252	228	5	0	0	0	658	2592
12:15 PM - 12:30 PM	0	0	0	18	180	0	213	220	13	0	0	0	644	
12:30 PM - 12:45 PM	0	0	0	19	139	0	267	206	10	0	0	0	641	
12:45 PM - 1:00 PM	0	0	0	13	214	0	184	223	15	0	0	0	649	
Phf	#DIV/0!	#DIV/0!	#DIV/0!	0.845	0.800	#DIV/0!	0.858	0.962	0.717	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
12:00 PM - 1:00 PM	0	0	0	71	685	0	916	877	43	0	0	0	2592	0.901



PM COUNT SHEET

Intersection:	<u>Ala Wai Blvd & McCully St</u>	
Date:	<u>Tuesday, 4/3/2012</u>	
By:	<u>ShengHong Li</u>	
Weather:	<u>Clear</u>	

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
3:30 PM - 3:45 PM	0	0	0	34	146	0	203	229	13	0	0	0	625	2875
3:45 PM - 4:00 PM	0	0	0	28	148	0	253	299	9	0	0	0	737	3034
4:00 PM - 4:15 PM	0	0	0	43	130	0	300	253	8	0	0	0	734	3016
4:15 PM - 4:30 PM	0	0	0	43	162	0	290	273	11	0	0	0	779	2974
4:30 PM - 4:45 PM	0	0	0	44	117	0	335	283	5	0	0	0	784	2986
4:45 PM - 5:00 PM	0	0	0	33	140	0	259	276	11	0	0	0	719	
5:00 PM - 5:15 PM	0	0	0	19	157	0	257	246	13	0	0	0	692	
5:15 PM - 5:30 PM	0	0	0	36	208	0	275	254	18	0	0	0	791	
Phf	#DIV/0!	#DIV/0!	#DIV/0!	0.750	0.748	#DIV/0!	0.840	0.936	0.653	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
4:30 PM - 5:30 PM	0	0	0	132	622	0	1126	1059	47	0	0	0	2986	0.952



Saturday COUNT SHEET

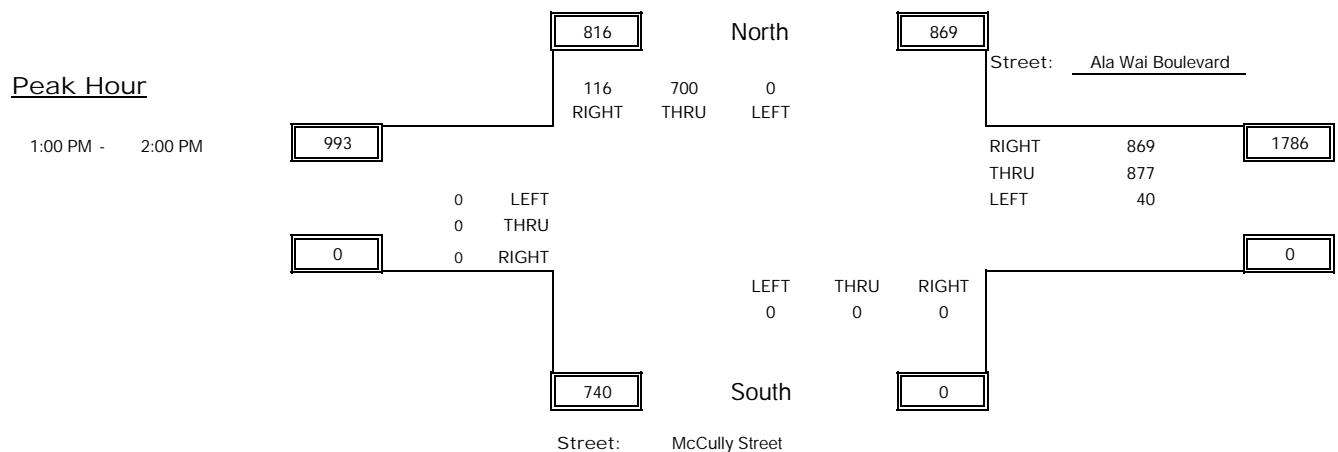
Intersection:	<u>Ala Wai Blvd & McCully St</u>		North
Date:	<u>Saturday, 4/7/2012</u>		
By:	<u>ShengHong Li</u>		
Weather:	<u>Clear</u>		

Street: Ala Wai Boulevard

South

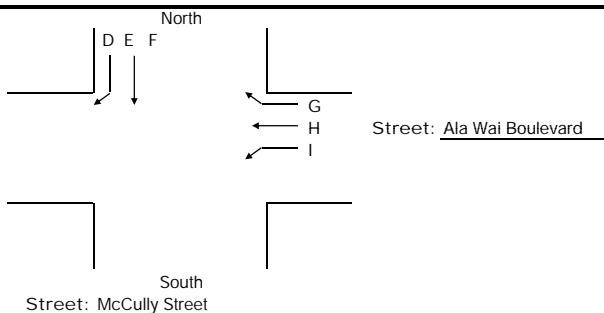
Street: McCully Street

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
11:00 AM - 11:15 AM	0	0	0	17	162	0	282	267	10	0	0	0	738	2765
11:15 AM - 11:30 AM	0	0	0	20	172	0	241	239	10	0	0	0	682	2708
11:30 AM - 11:45 AM	0	0	0	20	146	0	274	220	15	0	0	0	675	2689
11:45 AM - 12:00 PM	0	0	0	24	154	0	250	235	7	0	0	0	670	2621
12:00 PM - 12:15 PM	0	0	0	12	146	0	281	231	11	0	0	0	681	2631
12:15 PM - 12:30 PM	0	0	0	26	176	0	222	222	17	0	0	0	663	2539
12:30 PM - 12:45 PM	0	0	0	14	164	0	212	214	3	0	0	0	607	2568
12:45 PM - 1:00 PM	0	0	0	27	187	0	231	229	6	0	0	0	680	2670
1:00 PM - 1:15 PM	0	0	0	26	134	0	191	228	10	0	0	0	589	2602
1:15 PM - 1:30 PM	0	0	0	49	175	0	245	212	11	0	0	0	692	
1:30 PM - 1:45 PM	0	0	0	26	217	0	244	214	8	0	0	0	709	
1:45 PM - 2:00 PM	0	0	0	15	174	0	189	223	11	0	0	0	612	
Phf	#DIV/0!	#DIV/0!	#DIV/0!	0.592	0.806	#DIV/0!	0.887	0.962	0.909	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
1:00 PM - 2:00 PM	0	0	0	116	700	0	869	877	40	0	0	0	2602	0.917

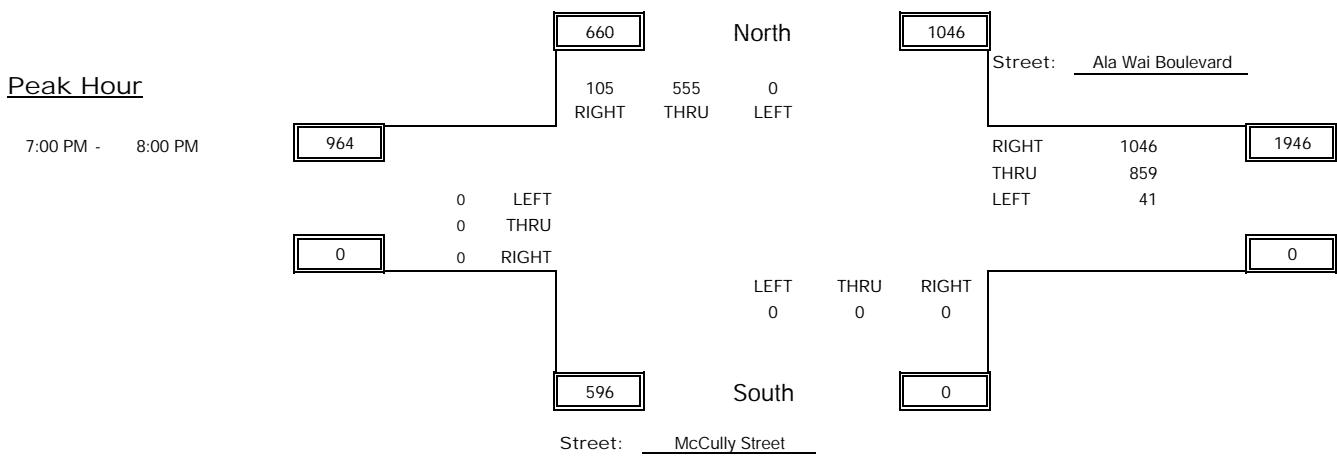


Night COUNT SHEET

Intersection: Ala Wai Blvd & McCully St
Date: Wednesday, 4/11/2012
By: ShengHong Li
Weather: Clear



TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 PM - 5:45 PM	0	0	0	20	173	0	214	223	14	0	0	0	644	2754
5:45 PM - 6:00 PM	0	0	0	23	158	0	289	222	10	0	0	0	702	2763
6:00 PM - 6:15 PM	0	0	0	37	156	0	294	223	16	0	0	0	726	2848
6:15 PM - 6:30 PM	0	0	0	19	117	0	329	206	11	0	0	0	682	2793
6:30 PM - 6:45 PM	0	0	0	12	133	0	293	203	12	0	0	0	653	2838
6:45 PM - 7:00 PM	0	0	0	43	227	0	307	192	18	0	0	0	787	2815
7:00 PM - 7:15 PM	0	0	0	32	132	0	285	215	7	0	0	0	671	2606
7:15 PM - 7:30 PM	0	0	0	21	160	0	288	251	7	0	0	0	727	
7:30 PM - 7:45 PM	0	0	0	30	126	0	250	214	10	0	0	0	630	
7:45 PM - 8:00 PM	0	0	0	22	137	0	223	179	17	0	0	0	578	
Phf	#DIV/0!	#DIV/0!	#DIV/0!	0.820	0.867	#DIV/0!	0.908	0.856	0.603	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
7:00 PM - 8:00 PM	0	0	0	105	555	0	1046	859	41	0	0	0	2606	0.897



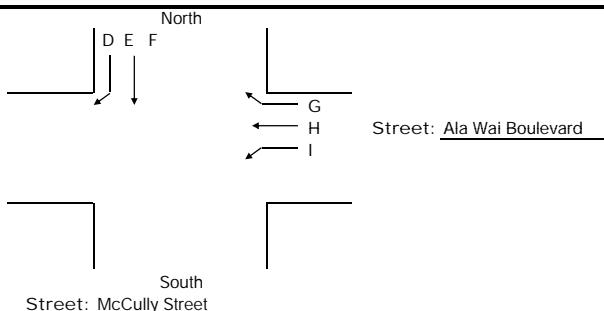
Friday Night COUNT SHEET

Intersection: Ala Wai Blvd & McCully St

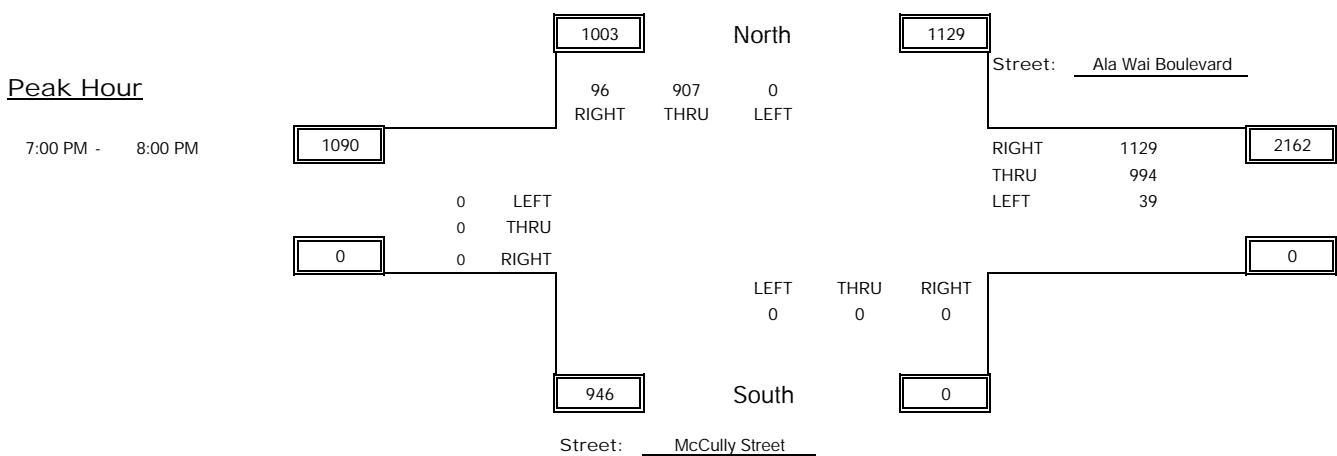
Date: Friday, 4/20/2012

By: ShengHong Li

Weather: Clear



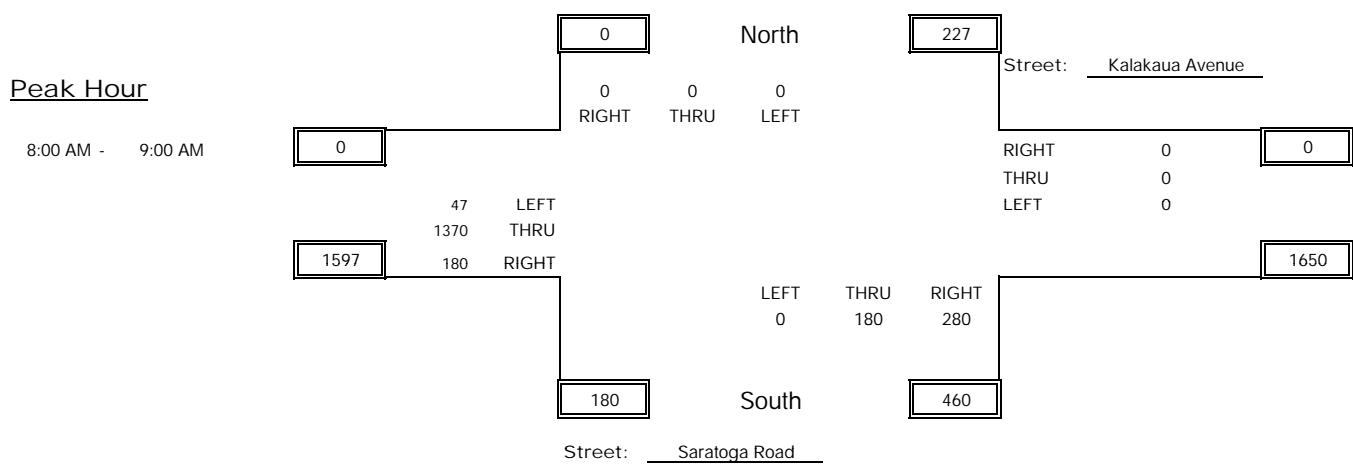
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 PM - 5:45 PM	0	0	0	18	181	0	284	280	17	0	0	0	780	3114
5:45 PM - 6:00 PM	0	0	0	16	197	0	293	228	24	0	0	0	758	3003
6:00 PM - 6:15 PM	0	0	0	53	177	0	261	236	16	0	0	0	743	3056
6:15 PM - 6:30 PM	0	0	0	19	270	0	309	229	6	0	0	0	833	3128
6:30 PM - 6:45 PM	0	0	0	15	183	0	264	197	10	0	0	0	669	3124
6:45 PM - 7:00 PM	0	0	0	23	237	0	313	235	3	0	0	0	811	3257
7:00 PM - 7:15 PM	0	0	0	27	236	0	303	237	12	0	0	0	815	3165
7:15 PM - 7:30 PM	0	0	0	23	222	0	272	300	12	0	0	0	829	
7:30 PM - 7:45 PM	0	0	0	13	236	0	298	247	8	0	0	0	802	
7:45 PM - 8:00 PM	0	0	0	33	213	0	256	210	7	0	0	0	719	
Phf	#DIV/0!	#DIV/0!	#DIV/0!	0.727	0.961	#DIV/0!	0.932	0.828	0.813	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
7:00 PM - 8:00 PM	0	0	0	96	907	0	1129	994	39	0	0	0	3165	0.950



AM COUNT SHEET

Intersection:	<u>Kalakaua Ave & Saratoga Rd</u>		North			
Date:	<u>Tuesday, 4/3/2012</u>					
By:	<u>Tiffany Hamada</u>		C B A		Street: <u>Kalakaua Avenue</u>	
Weather:	<u>Clear</u>				K J	South
					Street: <u>Saratoga Road</u>	

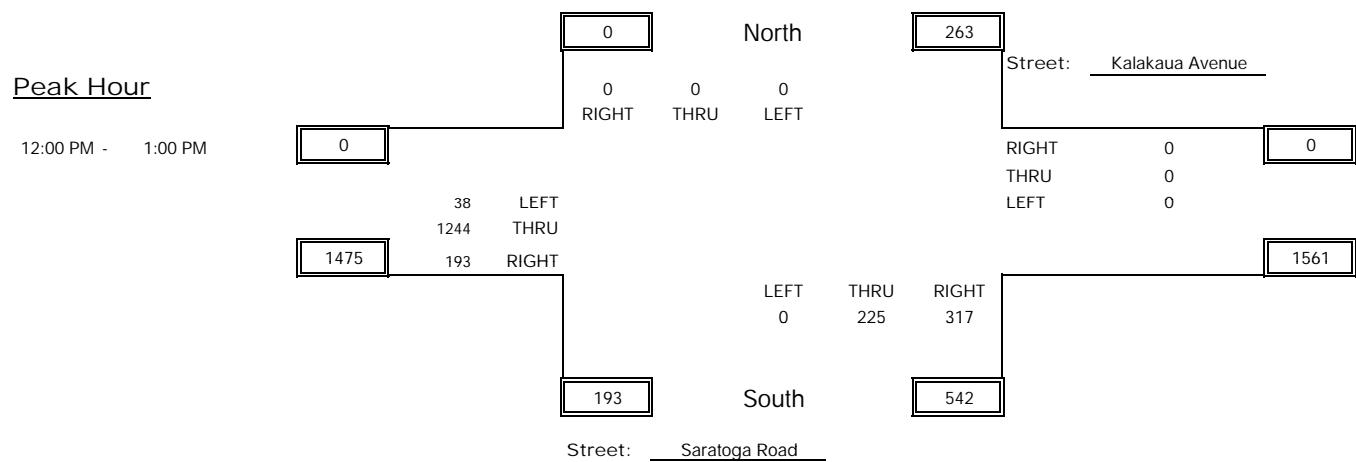
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
7:00 AM - 7:15 AM	48	258	18	0	0	0	0	0	0	64	45	0	433	1866
7:15 AM - 7:30 AM	43	310	8	0	0	0	0	0	0	64	45	0	470	1906
7:30 AM - 7:45 AM	39	359	8	0	0	0	0	0	0	38	20	0	464	1939
7:45 AM - 8:00 AM	51	362	17	0	0	0	0	0	0	44	25	0	499	1986
8:00 AM - 8:15 AM	43	323	17	0	0	0	0	0	0	55	35	0	473	2057
8:15 AM - 8:30 AM	43	348	10	0	0	0	0	0	0	64	38	0	503	
8:30 AM - 8:45 AM	43	338	13	0	0	0	0	0	0	78	39	0	511	
8:45 AM - 9:00 AM	51	361	7	0	0	0	0	0	0	83	68	0	570	
Phf	0.882	0.949	0.691	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.843	0.662	#DIV/0!	Peak	Phf
8:00 AM - 9:00 AM	180	1370	47	0	0	0	0	0	0	280	180	0	2057	1.022



MD COUNT SHEET

Intersection:	<u>Kalakaua Ave & Saratoga Rd</u>	
Date:	<u>Tuesday, 4/3/2012</u>	
By:	<u>Tiffany Hamada</u>	
Weather:	<u>Clear</u>	

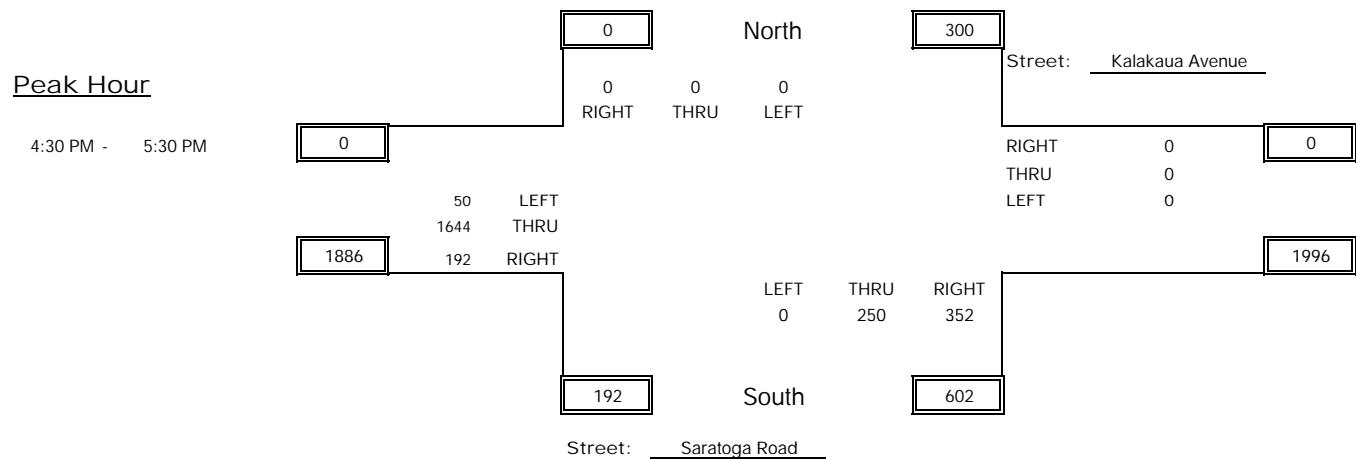
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
11:00 AM - 11:15 AM	57	298	8	0	0	0	0	0	0	65	57	0	485	2027
11:15 AM - 11:30 AM	50	332	6	0	0	0	0	0	0	74	52	0	514	2049
11:30 AM - 11:45 AM	45	320	8	0	0	0	0	0	0	78	49	0	500	2038
11:45 AM - 12:00 PM	34	349	10	0	0	0	0	0	0	73	62	0	528	2044
12:00 PM - 12:15 PM	49	312	11	0	0	0	0	0	0	77	58	0	507	2017
12:15 PM - 12:30 PM	51	312	9	0	0	0	0	0	0	77	54	0	503	
12:30 PM - 12:45 PM	56	309	11	0	0	0	0	0	0	74	56	0	506	
12:45 PM - 1:00 PM	37	311	7	0	0	0	0	0	0	89	57	0	501	
Phf	0.862	0.997	0.864	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.890	0.970	#DIV/0!	Peak	Phf
12:00 PM - 1:00 PM	193	1244	38	0	0	0	0	0	0	317	225	0	2017	0.955



PM COUNT SHEET

Intersection:	<u>Kalakaua Ave & Saratoga Rd</u>	
Date:	<u>Tuesday, 4/3/2012</u>	
By:	<u>Tiffany Hamada</u>	
Weather:	<u>Clear</u>	

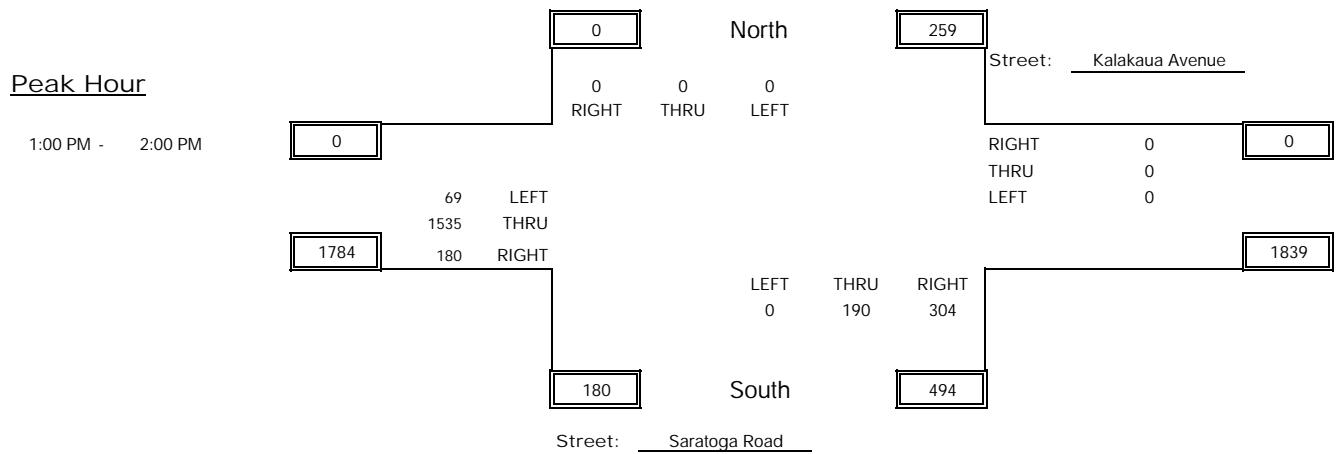
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
3:30 PM - 3:45 PM	61	396	13	0	0	0	0	0	0	101	69	0	640	2541
3:45 PM - 4:00 PM	59	403	11	0	0	0	0	0	0	93	49	0	615	2531
4:00 PM - 4:15 PM	44	413	10	0	0	0	0	0	0	101	68	0	636	2527
4:15 PM - 4:30 PM	52	385	13	0	0	0	0	0	0	109	91	0	650	2495
4:30 PM - 4:45 PM	46	419	13	0	0	0	0	0	0	77	75	0	630	2488
4:45 PM - 5:00 PM	51	398	10	0	0	0	0	0	0	93	59	0	611	
5:00 PM - 5:15 PM	45	415	14	0	0	0	0	0	0	82	48	0	604	
5:15 PM - 5:30 PM	50	412	13	0	0	0	0	0	0	100	68	0	643	
Phf	0.941	0.981	0.893	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.880	0.833	#DIV/0!	Peak	Phf
4:30 PM - 5:30 PM	192	1644	50	0	0	0	0	0	0	352	250	0	2488	0.957



Saturday COUNT SHEET

Intersection:	<u>Kalakaua Ave & Saratoga Rd</u>	North
Date:	<u>Saturday, 4/7/2012</u>	
By:	<u>Tiffany Hamada</u>	Street: <u>Kalakaua Avenue</u>
Weather:	<u>Clear</u>	

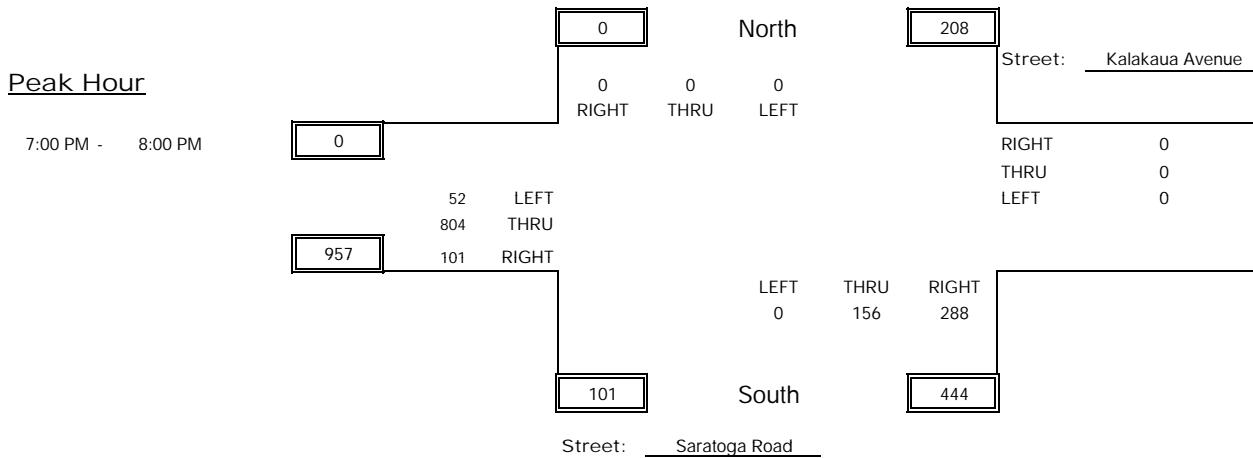
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
11:00 AM - 11:15 AM	56	335	13	0	0	0	0	0	0	86	60	0	550	2150
11:15 AM - 11:30 AM	61	337	6	0	0	0	0	0	0	78	50	0	532	2132
11:30 AM - 11:45 AM	52	288	11	0	0	0	0	0	0	77	47	0	475	2137
11:45 AM - 12:00 PM	55	378	13	0	0	0	0	0	0	99	48	0	593	2223
12:00 PM - 12:15 PM	51	336	8	0	0	0	0	0	0	84	53	0	532	2149
12:15 PM - 12:30 PM	60	343	7	0	0	0	0	0	0	78	49	0	537	2157
12:30 PM - 12:45 PM	54	373	20	0	0	0	0	0	0	71	43	0	561	2192
12:45 PM - 1:00 PM	41	334	12	0	0	0	0	0	0	84	48	0	519	2225
1:00 PM - 1:15 PM	50	356	18	0	0	0	0	0	0	72	44	0	540	2278
1:15 PM - 1:30 PM	50	392	7	0	0	0	0	0	0	73	50	0	572	
1:30 PM - 1:45 PM	39	408	24	0	0	0	0	0	0	82	41	0	594	
1:45 PM - 2:00 PM	41	379	20	0	0	0	0	0	0	77	55	0	572	
Phf	0.900	0.941	0.719	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.927	0.864	#DIV/0!	Peak	Phf
1:00 PM - 2:00 PM	180	1535	69	0	0	0	0	0	0	304	190	0	2278	0.959



Night COUNT SHEET

Intersection:	Kalakaua Ave & Saratoga Rd						North					
Date:	Wednesday, 4/11/2012											
By:	Tiffany Hamada										Street: Kalakaua Avenue	
Weather:	Clear										South	
											Street: Saratoga Road	

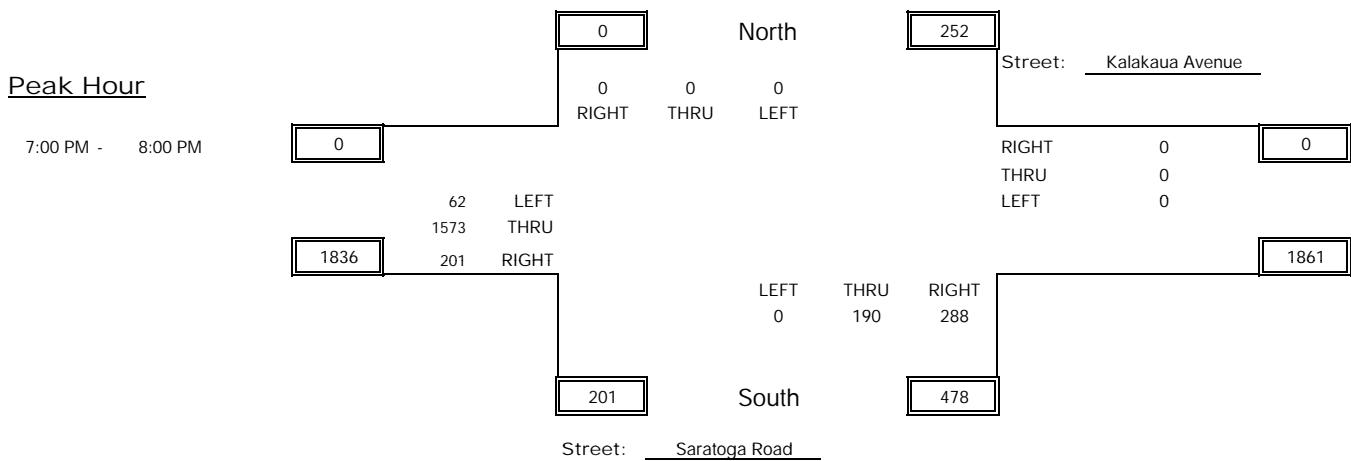
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 PM - 5:45 PM	50	414	18	0	0	0	0	0	0	99	62	0	643	2383
5:45 PM - 6:00 PM	46	442	14	0	0	0	0	0	0	82	46	0	630	2238
6:00 PM - 6:15 PM	45	364	13	0	0	0	0	0	0	92	48	0	562	2166
6:15 PM - 6:30 PM	35	370	19	0	0	0	0	0	0	63	61	0	548	2035
6:30 PM - 6:45 PM	39	350	16	0	0	0	0	0	0	54	39	0	498	1915
6:45 PM - 7:00 PM	39	361	13	0	0	0	0	0	0	94	51	0	558	1832
7:00 PM - 7:15 PM	39	279	12	0	0	0	0	0	0	55	46	0	431	1401
7:15 PM - 7:30 PM	33	263	21	0	0	0	0	0	0	70	41	0	428	
7:30 PM - 7:45 PM	29	262	19	0	0	0	0	0	0	62	43	0	415	
7:45 PM - 8:00 PM	0	0	0	0	0	0	0	0	0	101	26	0	127	
Phf	0.647	0.720	0.619	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.713	0.848	#DIV/0!	Peak	Phf
7:00 PM - 8:00 PM	101	804	52	0	0	0	0	0	0	288	156	0	1401	0.556



Friday Night COUNT SHEET

Intersection:	<u>Kalakaua Ave & Saratoga Rd</u>	
Date:	<u>Friday, 4/20/2012</u>	
By:	<u>Herbert Pulido</u>	
Weather:	<u>Clear</u>	

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 PM - 5:45 PM	72	452	25	0	0	0	0	0	0	104	47	0	700	2675
5:45 PM - 6:00 PM	55	453	18	0	0	0	0	0	0	95	54	0	675	2582
6:00 PM - 6:15 PM	41	436	24	0	0	0	0	0	0	77	65	0	643	2483
6:15 PM - 6:30 PM	62	438	18	0	0	0	0	0	0	91	48	0	657	2437
6:30 PM - 6:45 PM	52	407	21	0	0	0	0	0	0	75	52	0	607	2420
6:45 PM - 7:00 PM	53	391	18	0	0	0	0	0	0	70	44	0	576	2400
7:00 PM - 7:15 PM	46	416	21	0	0	0	0	0	0	69	45	0	597	2314
7:15 PM - 7:30 PM	59	437	17	0	0	0	0	0	0	73	54	0	640	
7:30 PM - 7:45 PM	62	380	11	0	0	0	0	0	0	79	55	0	587	
7:45 PM - 8:00 PM	34	340	13	0	0	0	0	0	0	67	36	0	490	
Phf	0.810	0.900	0.738	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.911	0.864	#DIV/0!	Peak	Phf
7:00 PM - 8:00 PM	201	1573	62	0	0	0	0	0	0	288	190	0	2314	0.857



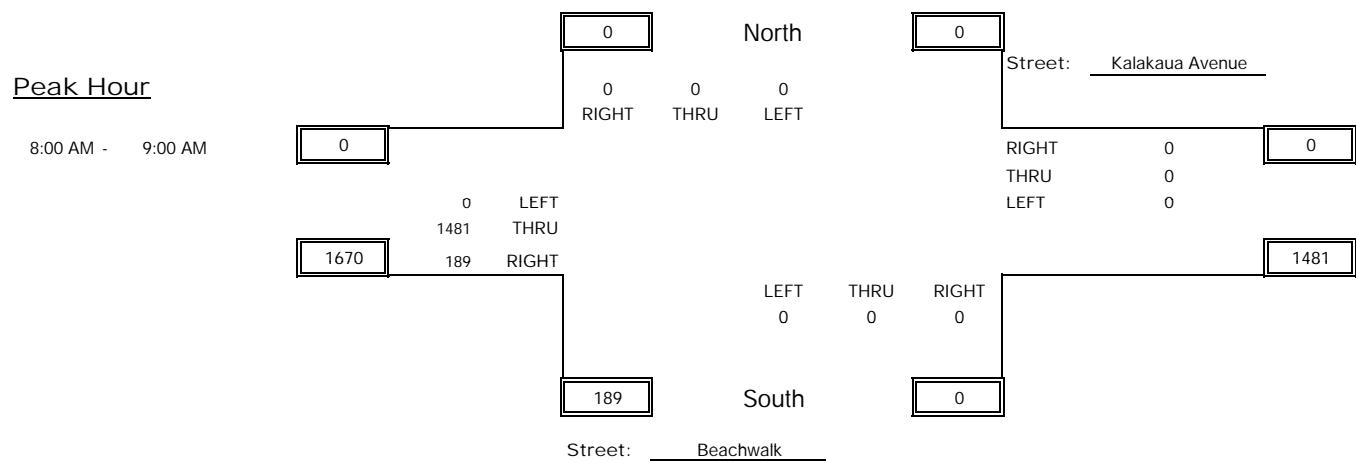
AM COUNT SHEET

Intersection:	<u>Kalakaua Ave & Beachwalk</u>	North
Date:	<u>Tuesday, 4/3/2012</u>	
By:	<u>Russel Isobe</u>	Street: <u>Kalakaua Avenue</u>
Weather:	<u>Clear</u>	



South
Street: Beachwalk

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
7:00 AM - 7:15 AM	31	300	0	0	0	0	0	0	0	0	0	0	331	1579
7:15 AM - 7:30 AM	47	317	0	0	0	0	0	0	0	0	0	0	364	1623
7:30 AM - 7:45 AM	48	385	0	0	0	0	0	0	0	0	0	0	433	1663
7:45 AM - 8:00 AM	65	386	0	0	0	0	0	0	0	0	0	0	451	1665
8:00 AM - 8:15 AM	35	340	0	0	0	0	0	0	0	0	0	0	375	1670
8:15 AM - 8:30 AM	53	351	0	0	0	0	0	0	0	0	0	0	404	
8:30 AM - 8:45 AM	53	382	0	0	0	0	0	0	0	0	0	0	435	
8:45 AM - 9:00 AM	48	408	0	0	0	0	0	0	0	0	0	0	456	
Phf	0.892	0.907	#DIV/0!	Peak	Phf									
8:00 AM - 9:00 AM	189	1481	0	0	0	0	0	0	0	0	0	0	1670	0.926

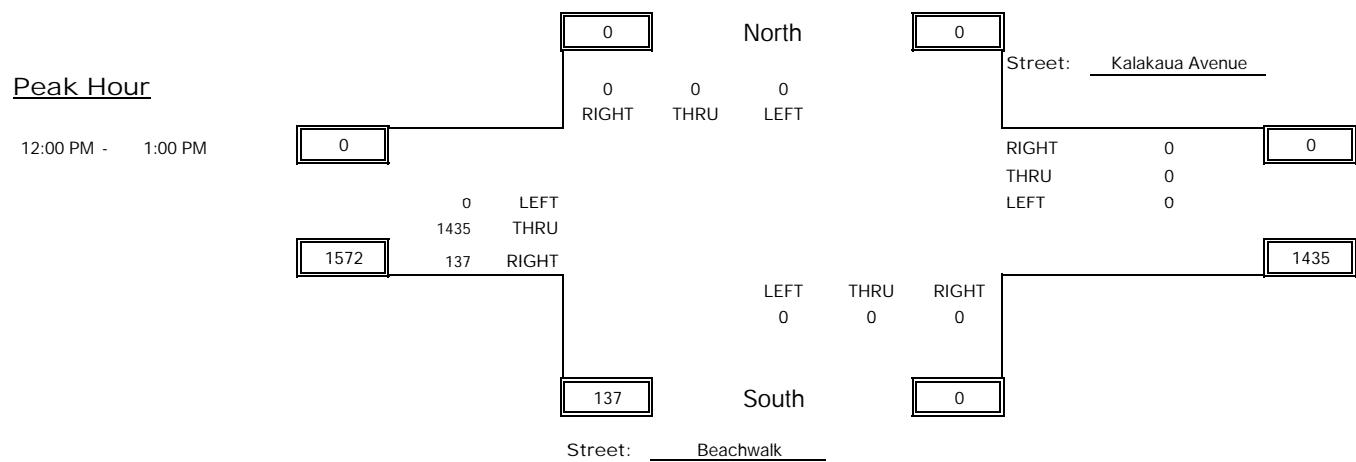


MD COUNT SHEET

Intersection:	<u>Kalakaua Ave & Beachwalk</u>	North
Date:	<u>Tuesday, 4/3/2012</u>	Street: <u>Kalakaua Avenue</u>
By:	<u>Russel Isobe</u>	
Weather:	<u>Clear</u>	

South
Street: Beachwalk

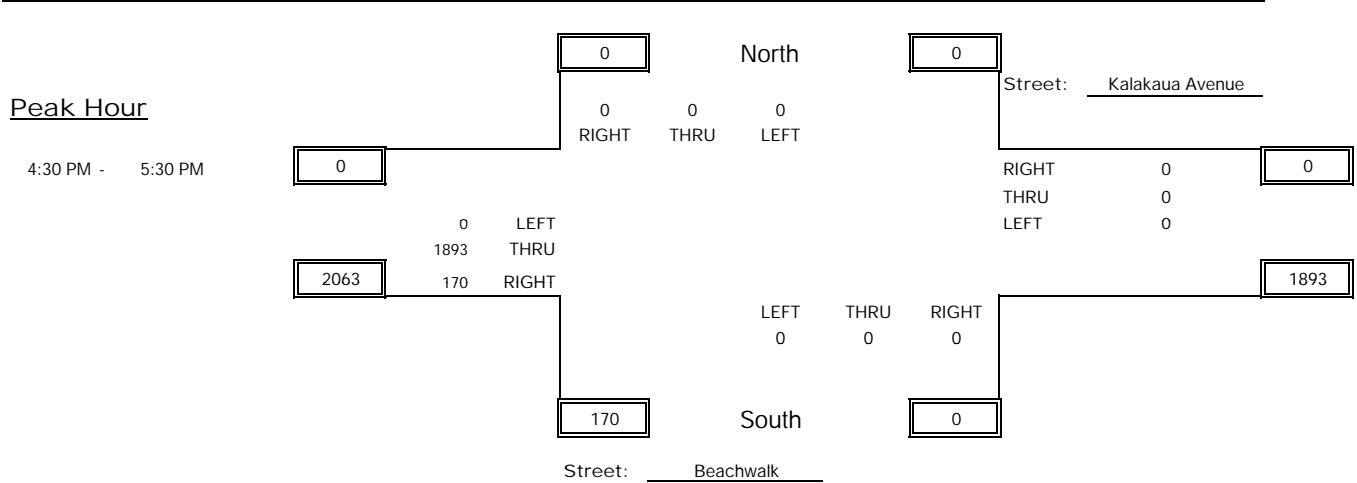
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
11:00 AM - 11:15 AM	25	359	0	0	0	0	0	0	0	0	0	0	384	1619
11:15 AM - 11:30 AM	38	383	0	0	0	0	0	0	0	0	0	0	421	1630
11:30 AM - 11:45 AM	35	356	0	0	0	0	0	0	0	0	0	0	391	1583
11:45 AM - 12:00 PM	37	386	0	0	0	0	0	0	0	0	0	0	423	1593
12:00 PM - 12:15 PM	29	366	0	0	0	0	0	0	0	0	0	0	395	1572
12:15 PM - 12:30 PM	29	345	0	0	0	0	0	0	0	0	0	0	374	
12:30 PM - 12:45 PM	40	361	0	0	0	0	0	0	0	0	0	0	401	
12:45 PM - 1:00 PM	39	363	0	0	0	0	0	0	0	0	0	0	402	
Phf	0.856	0.980	#DIV/0!	Peak	Phf									
12:00 PM - 1:00 PM	137	1435	0	0	0	0	0	0	0	0	0	0	1572	0.929



PM COUNT SHEET

Intersection:	Kalakaua Ave & Beachwalk										
Date:	Tuesday, 4/3/2012										
By:	Russel Isobe										
Weather:	Clear										
	North Street: Kalakaua Avenue South Street: Beachwalk										

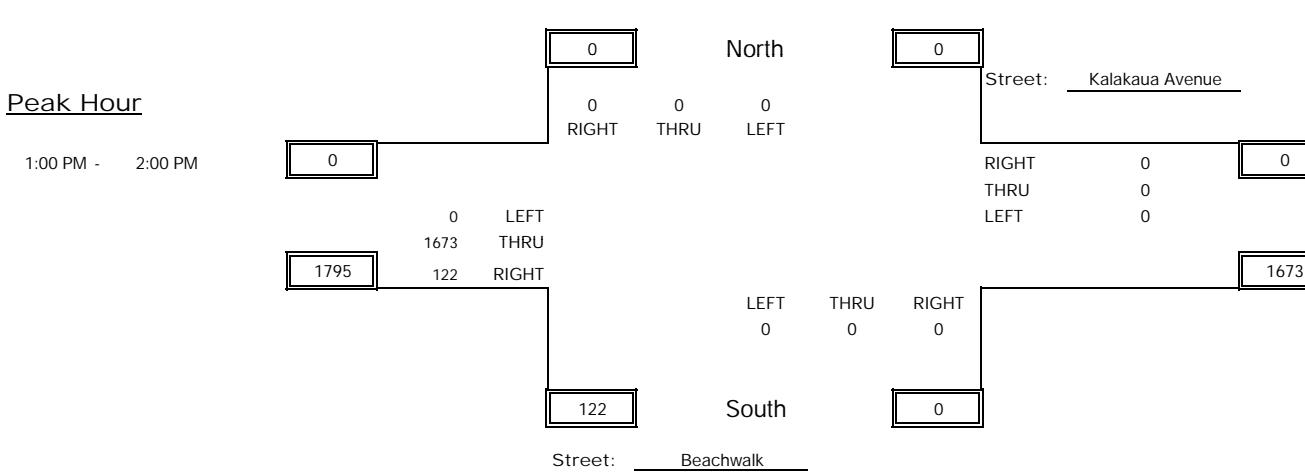
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
3:30 PM - 3:45 PM	49	455	0	0	0	0	0	0	0	0	0	0	504	2023
3:45 PM - 4:00 PM	44	463	0	0	0	0	0	0	0	0	0	0	507	2018
4:00 PM - 4:15 PM	49	467	0	0	0	0	0	0	0	0	0	0	516	2005
4:15 PM - 4:30 PM	48	448	0	0	0	0	0	0	0	0	0	0	496	2029
4:30 PM - 4:45 PM	41	458	0	0	0	0	0	0	0	0	0	0	499	2063
4:45 PM - 5:00 PM	41	453	0	0	0	0	0	0	0	0	0	0	494	
5:00 PM - 5:15 PM	47	493	0	0	0	0	0	0	0	0	0	0	540	
5:15 PM - 5:30 PM	41	489	0	0	0	0	0	0	0	0	0	0	530	
Phf	0.904	0.960	#DIV/0!	Peak	Phf									
4:30 PM - 5:30 PM	170	1893	0	0	0	0	0	0	0	0	0	0	2063	1.000



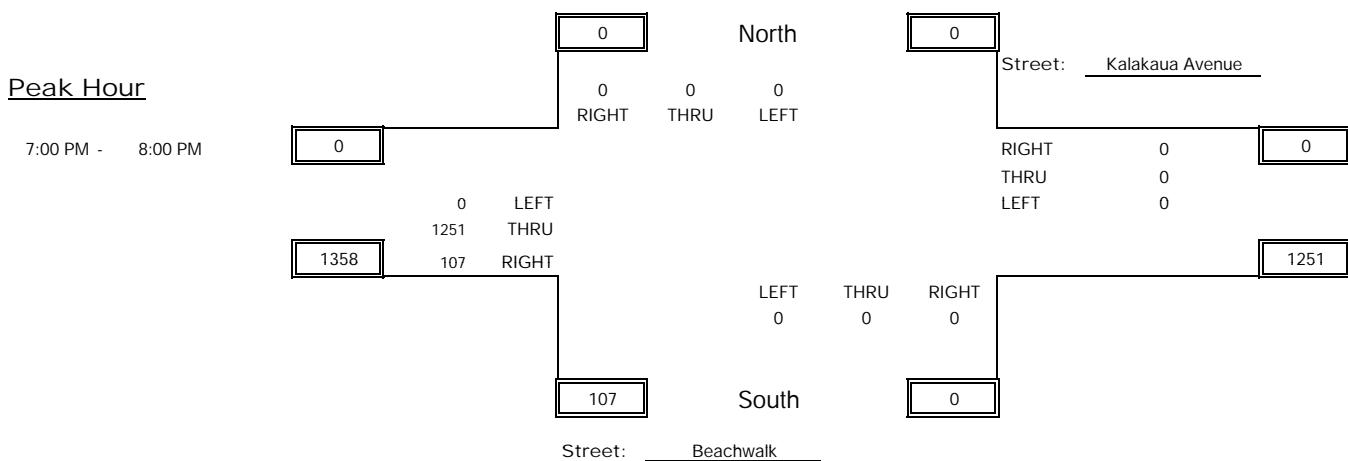
Saturday COUNT SHEET

Intersection:	Kalakaua Ave & Beachwalk											
Date:	Saturday, 4/7/2012											
By:	Russel Isobe											
Weather:	Clear											
North Street: <u>Kalakaua Avenue</u> South Street: <u>Beachwalk</u>												

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
11:00 AM - 11:15 AM	39	378	0	0	0	0	0	0	0	0	0	0	417	1655
11:15 AM - 11:30 AM	25	355	0	0	0	0	0	0	0	0	0	0	380	1625
11:30 AM - 11:45 AM	21	376	0	0	0	0	0	0	0	0	0	0	397	1679
11:45 AM - 12:00 PM	30	431	0	0	0	0	0	0	0	0	0	0	461	1738
12:00 PM - 12:15 PM	18	369	0	0	0	0	0	0	0	0	0	0	387	1719
12:15 PM - 12:30 PM	27	407	0	0	0	0	0	0	0	0	0	0	434	1745
12:30 PM - 12:45 PM	31	425	0	0	0	0	0	0	0	0	0	0	456	1741
12:45 PM - 1:00 PM	37	405	0	0	0	0	0	0	0	0	0	0	442	1809
1:00 PM - 1:15 PM	23	390	0	0	0	0	0	0	0	0	0	0	413	1795
1:15 PM - 1:30 PM	29	401	0	0	0	0	0	0	0	0	0	0	430	
1:30 PM - 1:45 PM	48	476	0	0	0	0	0	0	0	0	0	0	524	
1:45 PM - 2:00 PM	22	406	0	0	0	0	0	0	0	0	0	0	428	
Phf	0.635	0.879	#DIV/0!	Peak	Phf									
1:00 PM - 2:00 PM	122	1673	0	0	0	0	0	0	0	0	0	0	1795	0.856



Night COUNT SHEET



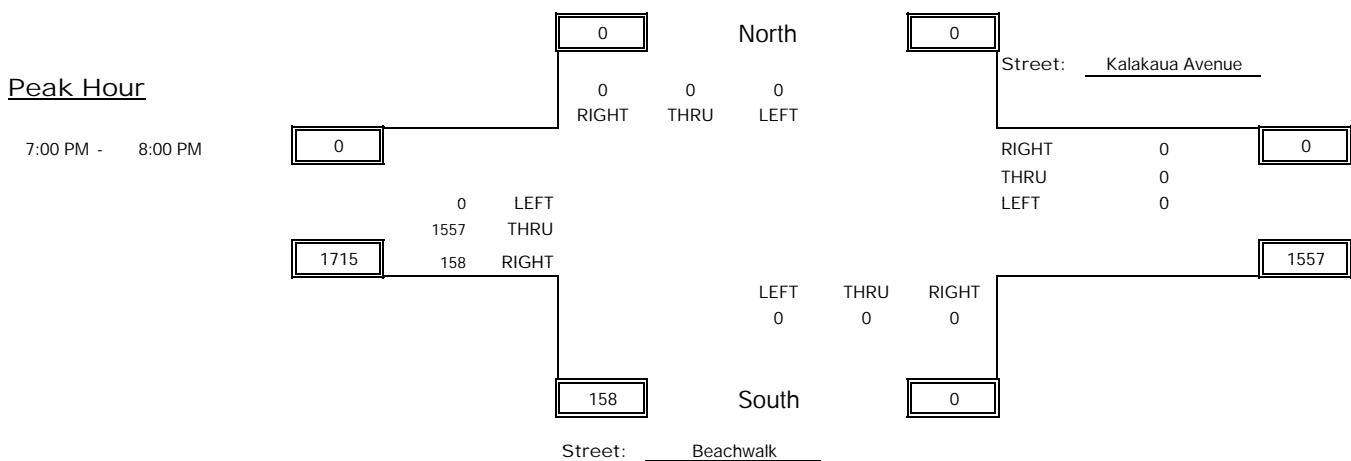
Friday Night COUNT SHEET

Intersection:	Kalakaua Ave & Beachwalk	North
Date:	Friday, 4/20/2012	
By:	Jonathan Yoshida	Street: <u>Kalakaua Avenue</u>
Weather:	Clear	

B →
A →

South
Street: Beachwalk

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 PM - 5:45 PM	39	486	0	0	0	0	0	0	0	0	0	0	525	2056
5:45 PM - 6:00 PM	55	480	0	0	0	0	0	0	0	0	0	0	535	1993
6:00 PM - 6:15 PM	31	453	0	0	0	0	0	0	0	0	0	0	484	1929
6:15 PM - 6:30 PM	42	470	0	0	0	0	0	0	0	0	0	0	512	1855
6:30 PM - 6:45 PM	23	439	0	0	0	0	0	0	0	0	0	0	462	1768
6:45 PM - 7:00 PM	27	444	0	0	0	0	0	0	0	0	0	0	471	1744
7:00 PM - 7:15 PM	35	375	0	0	0	0	0	0	0	0	0	0	410	1715
7:15 PM - 7:30 PM	41	384	0	0	0	0	0	0	0	0	0	0	425	
7:30 PM - 7:45 PM	46	392	0	0	0	0	0	0	0	0	0	0	438	
7:45 PM - 8:00 PM	36	406	0	0	0	0	0	0	0	0	0	0	442	
Phf	0.859	0.959	#DIV/0!	Peak	Phf									
7:00 PM - 8:00 PM	158	1557	0	0	0	0	0	0	0	0	0	0	1715	0.801



AM COUNT SHEET

Intersection:	<u>Kalakaua Ave & Lewers St</u>	
Date:	<u>Tuesday, 4/3/2012</u>	
By:	<u>Stephanie Doan</u>	
Weather:	<u>Clear</u>	

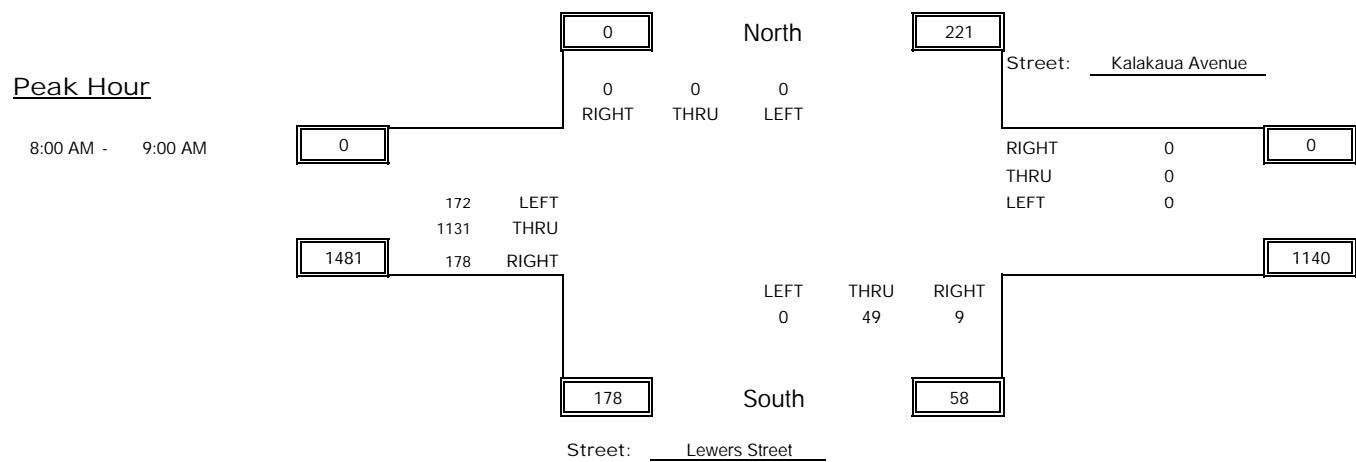
Street: Kalakaua Avenue

North

South

Street: Lewers Street

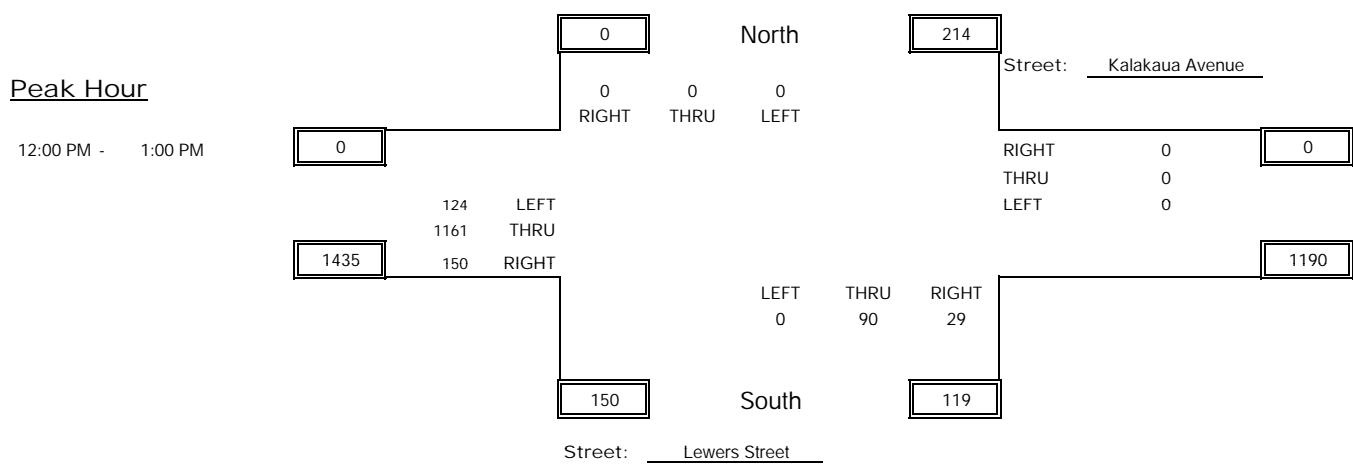
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
7:00 AM - 7:15 AM	53	215	32	0	0	0	0	0	0	0	11	0	311	1438
7:15 AM - 7:30 AM	58	237	22	0	0	0	0	0	0	1	12	0	330	1482
7:30 AM - 7:45 AM	54	308	23	0	0	0	0	0	0	1	11	0	397	1513
7:45 AM - 8:00 AM	49	306	31	0	0	0	0	0	0	0	14	0	400	1517
8:00 AM - 8:15 AM	48	258	34	0	0	0	0	0	0	4	11	0	355	1539
8:15 AM - 8:30 AM	40	273	38	0	0	0	0	0	0	1	9	0	361	
8:30 AM - 8:45 AM	46	285	51	0	0	0	0	0	0	2	17	0	401	
8:45 AM - 9:00 AM	44	315	49	0	0	0	0	0	0	2	12	0	422	
Phf	0.927	0.898	0.843	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.563	0.721	#DIV/0!	Peak	Phf
8:00 AM - 9:00 AM	178	1131	172	0	0	0	0	0	0	9	49	0	1539	0.962



MD COUNT SHEET

Intersection:	Kalakaua Ave & Lewers St						North					
Date:	Tuesday, 4/3/2012											
By:	Stephanie Doan										Street: Kalakaua Avenue	
Weather:	Clear										Street: Lewers Street	

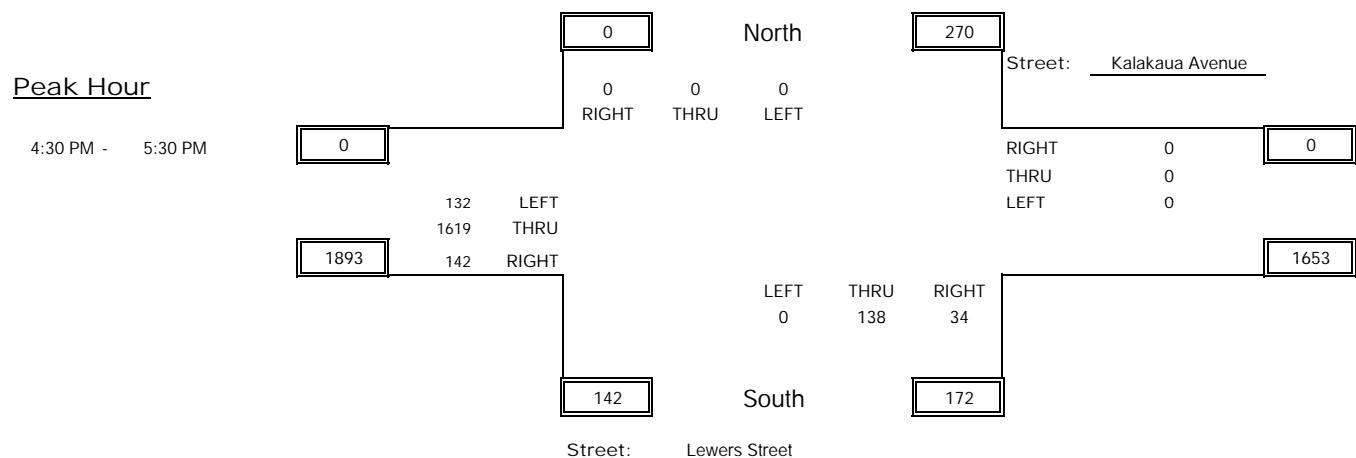
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
11:00 AM - 11:15 AM	39	280	40	0	0	0	0	0	0	10	23	0	392	1597
11:15 AM - 11:30 AM	48	296	39	0	0	0	0	0	0	9	17	0	409	1609
11:30 AM - 11:45 AM	40	289	27	0	0	0	0	0	0	6	22	0	384	1566
11:45 AM - 12:00 PM	84	266	36	0	0	0	0	0	0	5	21	0	412	1573
12:00 PM - 12:15 PM	37	295	34	0	0	0	0	0	0	3	35	0	404	1554
12:15 PM - 12:30 PM	37	280	28	0	0	0	0	0	0	5	16	0	366	
12:30 PM - 12:45 PM	38	288	35	0	0	0	0	0	0	7	23	0	391	
12:45 PM - 1:00 PM	38	298	27	0	0	0	0	0	0	14	16	0	393	
Phf	0.987	0.974	0.886	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.518	0.643	#DIV/0!	Peak	Phf
12:00 PM - 1:00 PM	150	1161	124	0	0	0	0	0	0	29	90	0	1554	0.943



PM COUNT SHEET

Intersection:	<u>Kalakaua Ave & Lewers St</u>	
Date:	<u>Tuesday, 4/3/2012</u>	
By:	<u>Stephanie Doan</u>	
Weather:	<u>Clear</u>	

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
3:30 PM - 3:45 PM	41	385	29	0	0	0	0	0	0	7	46	0	508	2050
3:45 PM - 4:00 PM	41	385	37	0	0	0	0	0	0	8	33	0	504	2041
4:00 PM - 4:15 PM	45	382	40	0	0	0	0	0	0	9	59	0	535	2027
4:15 PM - 4:30 PM	36	385	27	0	0	0	0	0	0	12	43	0	503	2032
4:30 PM - 4:45 PM	31	398	29	0	0	0	0	0	0	10	31	0	499	2065
4:45 PM - 5:00 PM	37	383	33	0	0	0	0	0	0	8	29	0	490	
5:00 PM - 5:15 PM	45	418	30	0	0	0	0	0	0	9	38	0	540	
5:15 PM - 5:30 PM	29	420	40	0	0	0	0	0	0	7	40	0	536	
Phf	0.789	0.964	0.825	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.850	0.863	#DIV/0!	Peak	Phf
4:30 PM - 5:30 PM	142	1619	132	0	0	0	0	0	0	34	138	0	2065	0.965



Saturday COUNT SHEET

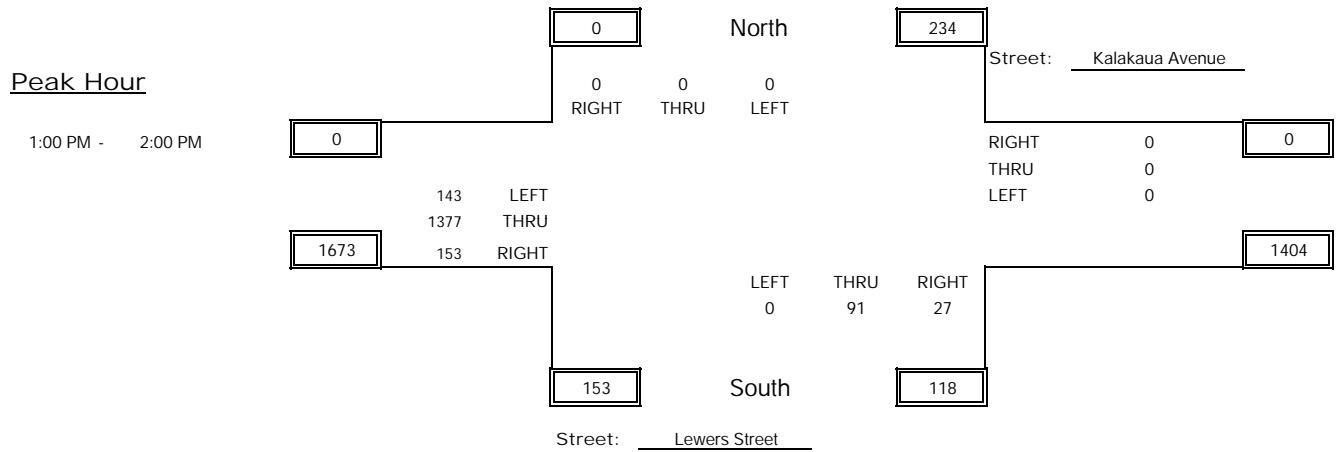
Intersection:	Kalakaua Ave & Lewers St	North
Date:	Saturday, 4/7/2012	
By:	Stephanie Doan	Street: Kalakaua Avenue
Weather:	Clear	

North

Street: Kalakaua Avenue

Street: Lewers Street

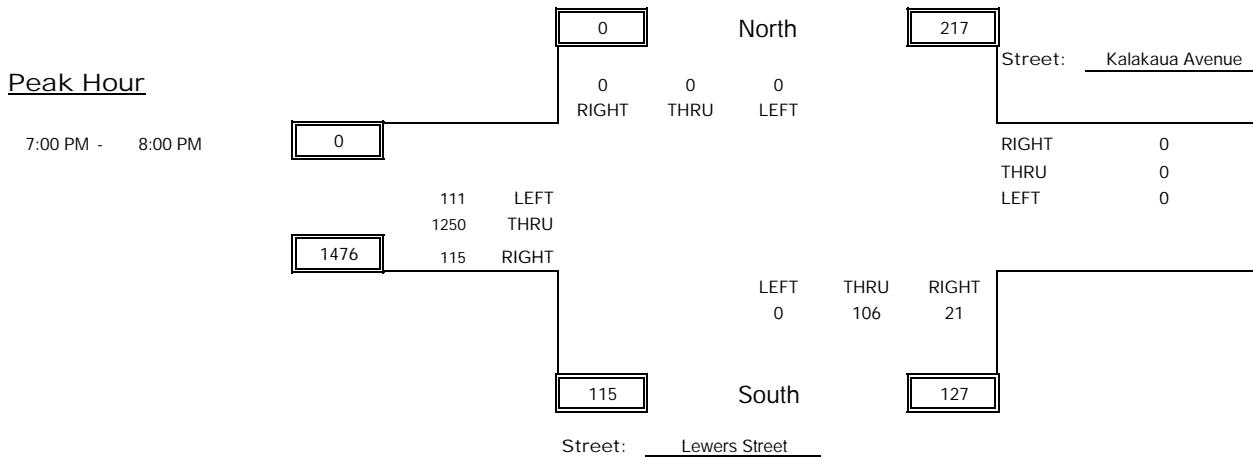
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
11:00 AM - 11:15 AM	34	308	36	0	0	0	0	0	0	6	20	0	404	1631
11:15 AM - 11:30 AM	43	282	30	0	0	0	0	0	0	2	20	0	377	1622
11:30 AM - 11:45 AM	42	314	20	0	0	0	0	0	0	3	16	0	395	1680
11:45 AM - 12:00 PM	35	366	30	0	0	0	0	0	0	1	23	0	455	1733
12:00 PM - 12:15 PM	28	309	32	0	0	0	0	0	0	3	23	0	395	1711
12:15 PM - 12:30 PM	41	340	26	0	0	0	0	0	0	6	22	0	435	1733
12:30 PM - 12:45 PM	36	360	29	0	0	0	0	0	0	4	19	0	448	1730
12:45 PM - 1:00 PM	31	349	25	0	0	0	0	0	0	7	21	0	433	1782
1:00 PM - 1:15 PM	39	319	32	0	0	0	0	0	0	7	20	0	417	1791
1:15 PM - 1:30 PM	25	339	37	0	0	0	0	0	0	6	25	0	432	
1:30 PM - 1:45 PM	53	381	42	0	0	0	0	0	0	6	18	0	500	
1:45 PM - 2:00 PM	36	338	32	0	0	0	0	0	0	8	28	0	442	
Phf	0.722	0.904	0.851	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.844	0.813	#DIV/0!	Peak	Phf
1:00 PM - 2:00 PM	153	1377	143	0	0	0	0	0	0	27	91	0	1791	0.896



Night COUNT SHEET

Intersection:	Kalakaua Ave & Lewers St						North					
Date:	Wednesday, 4/11/2012											
By:	Paula Brooks										Street: Kalakaua Avenue	
Weather:	Clear										Street: Lewers Street	

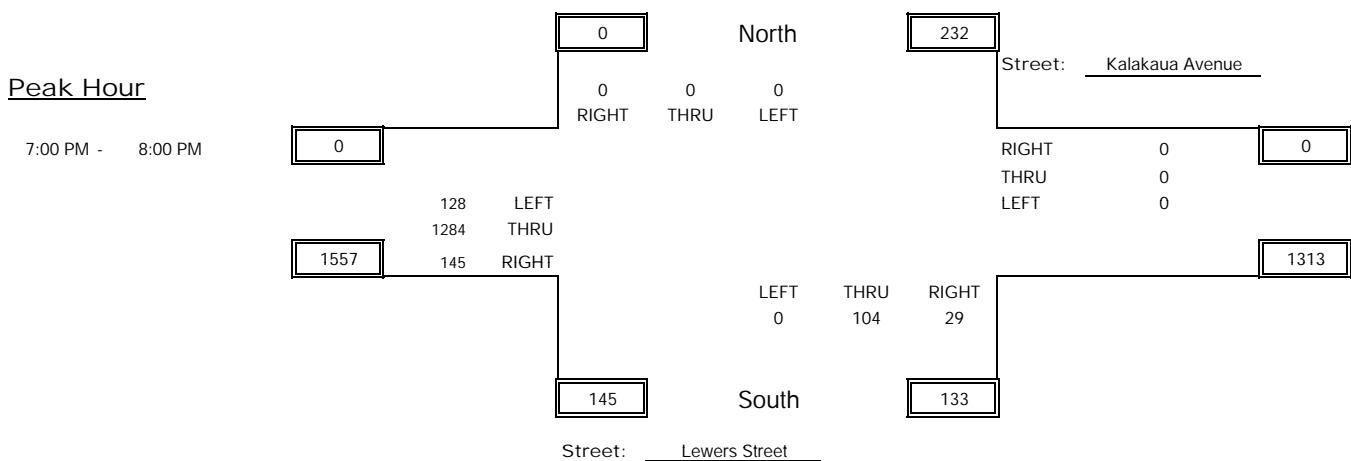
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 PM - 5:45 PM	39	414	33	0	0	0	0	0	0	5	22	0	513	1910
5:45 PM - 6:00 PM	38	406	31	0	0	0	0	0	0	6	29	0	510	1825
6:00 PM - 6:15 PM	39	348	26	0	0	0	0	0	0	10	39	0	462	1749
6:15 PM - 6:30 PM	41	326	30	0	0	0	0	0	0	4	24	0	425	2533
6:30 PM - 6:45 PM	36	336	26	0	0	0	0	0	0	4	26	0	428	2465
6:45 PM - 7:00 PM	25	360	25	0	0	0	0	0	0	7	17	0	434	
7:00 PM - 7:15 PM	36	336	26	0	0	0	0	0	0	4	26	0	428	
7:15 PM - 7:30 PM	25	360	25	0	0	0	0	0	0	7	17	0	434	
7:30 PM - 7:45 PM	31	288	27	0	0	0	0	0	0	6	32	0	384	
7:45 PM - 8:00 PM	23	266	33	0	0	0	0	0	0	4	31	0	357	
Phf	0.799	0.868	0.841	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.750	0.828	#DIV/0!	Peak	Phf
7:00 PM - 8:00 PM	115	1250	111	0	0	0	0	0	0	21	106	0	1603	0.786



Friday Night COUNT SHEET

Intersection:	<u>Kalakaua Ave & Lewers St</u>	
Date:	<u>Friday, 4/20/2012</u>	
By:	<u>Paula Brooks</u>	
Weather:	<u>Clear</u>	

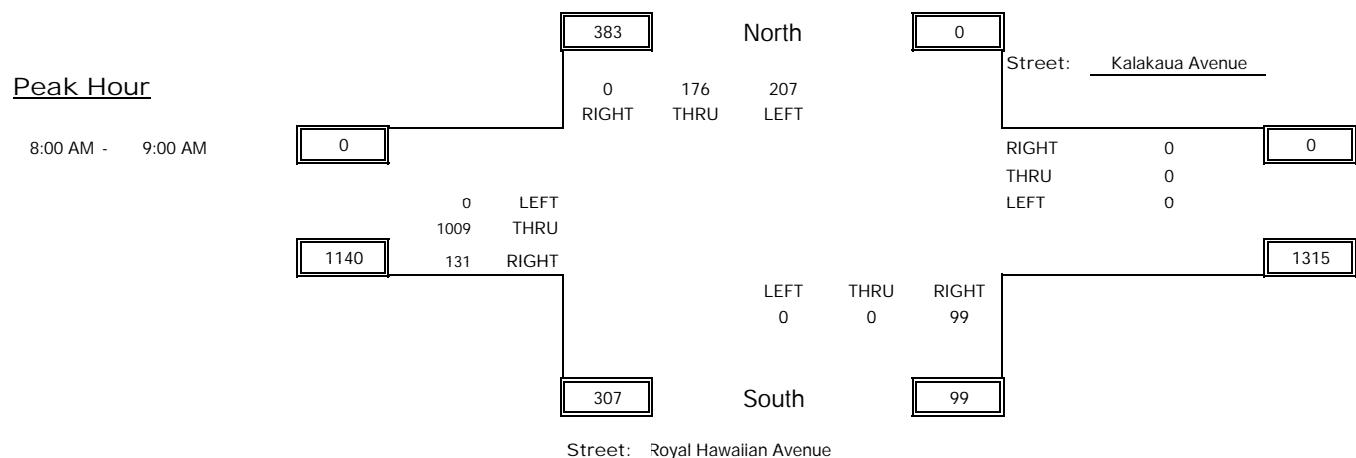
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 PM - 5:45 PM	55	406	25	0	0	0	0	0	0	10	43	0	539	2047
5:45 PM - 6:00 PM	47	392	41	0	0	0	0	0	0	8	29	0	517	1972
6:00 PM - 6:15 PM	44	381	28	0	0	0	0	0	0	8	30	0	491	1932
6:15 PM - 6:30 PM	47	388	35	0	0	0	0	0	0	9	21	0	500	2692
6:30 PM - 6:45 PM	48	360	31	0	0	0	0	0	0	7	18	0	464	2631
6:45 PM - 7:00 PM	46	363	35	0	0	0	0	0	0	6	27	0	477	
7:00 PM - 7:15 PM	33	320	22	0	0	0	0	0	0	3	34	0	412	
7:15 PM - 7:30 PM	31	318	35	0	0	0	0	0	0	8	23	0	415	
7:30 PM - 7:45 PM	40	310	42	0	0	0	0	0	0	11	21	0	424	
7:45 PM - 8:00 PM	41	336	29	0	0	0	0	0	0	7	26	0	439	
Phf	0.884	0.955	0.762	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.659	0.765	#DIV/0!	Peak	Phf
7:00 PM - 8:00 PM	145	1284	128	0	0	0	0	0	0	29	104	0	1690	0.817



AM COUNT SHEET

Intersection:	<u>Kalakaua Ave & Royal Hawaiian</u>	
Date:	<u>Tuesday, 4/3/2012</u>	
By:	<u>Sharen Nakashima</u>	
Weather:	<u>Clear</u>	

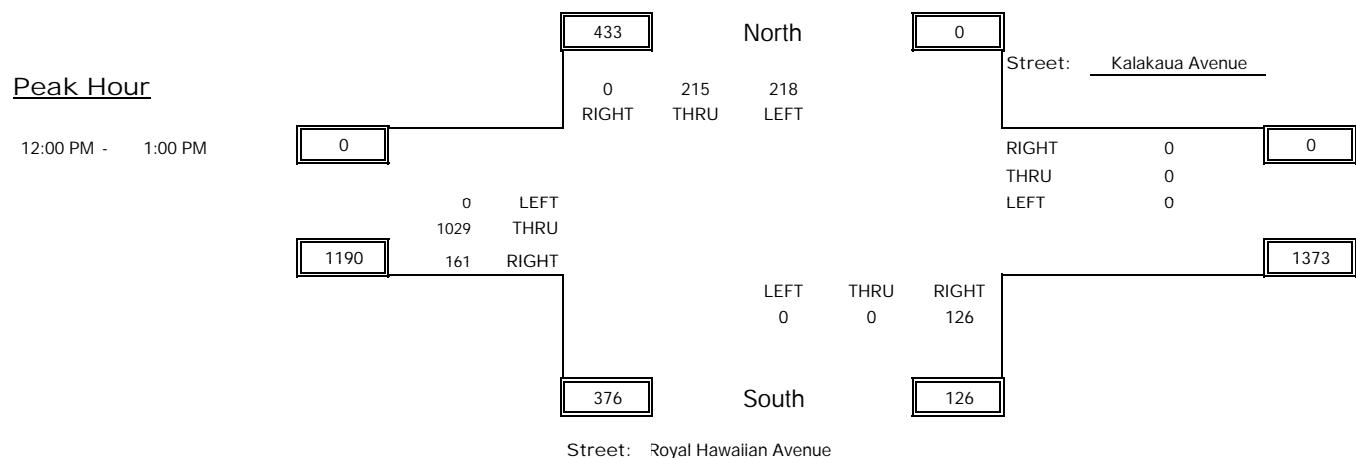
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
7:00 AM - 7:15 AM	11	204	0	0	48	27	0	0	0	9	0	0	299	1427
7:15 AM - 7:30 AM	18	220	0	0	28	17	0	0	0	22	0	0	305	1492
7:30 AM - 7:45 AM	33	276	0	0	58	39	0	0	0	16	0	0	422	1568
7:45 AM - 8:00 AM	21	285	0	0	38	49	0	0	0	8	0	0	401	1556
8:00 AM - 8:15 AM	26	236	0	0	38	42	0	0	0	22	0	0	364	1622
8:15 AM - 8:30 AM	35	239	0	0	41	49	0	0	0	17	0	0	381	
8:30 AM - 8:45 AM	28	259	0	0	50	43	0	0	0	30	0	0	410	
8:45 AM - 9:00 AM	42	275	0	0	47	73	0	0	0	30	0	0	467	
Phf	0.780	0.917	#DIV/0!	#DIV/0!	0.880	0.709	#DIV/0!	#DIV/0!	#DIV/0!	0.825	#DIV/0!	#DIV/0!	Peak	Phf
8:00 AM - 9:00 AM	131	1009	0	0	176	207	0	0	0	99	0	0	1622	0.961



MD COUNT SHEET

Intersection:	<u>Kalakaua Ave & Royal Hawaiian</u>	
Date:	<u>Tuesday, 4/3/2012</u>	
By:	<u>Sharen Nakashima</u>	
Weather:	<u>Clear</u>	

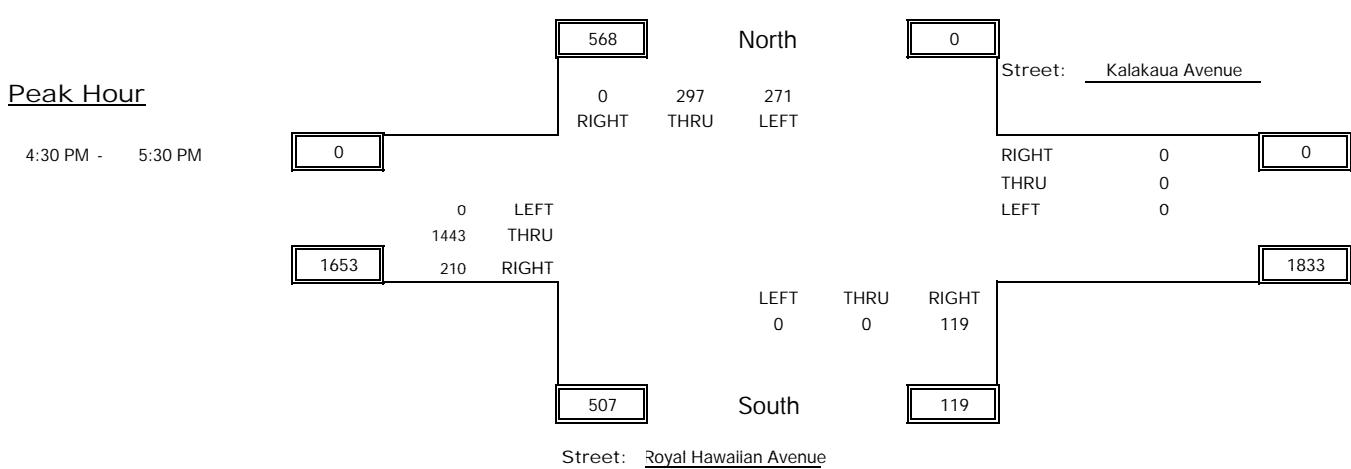
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
11:00 AM - 11:15 AM	32	258	0	0	45	41	0	0	0	26	0	0	402	1676
11:15 AM - 11:30 AM	41	264	0	0	36	48	0	0	0	29	0	0	418	1730
11:30 AM - 11:45 AM	57	238	0	0	64	80	0	0	0	21	0	0	460	1715
11:45 AM - 12:00 PM	66	205	0	0	45	53	0	0	0	27	0	0	396	
12:00 PM - 12:15 PM	33	265	0	0	58	62	0	0	0	38	0	0	456	
12:15 PM - 12:30 PM	39	246	0	0	48	42	0	0	0	28	0	0	403	
12:30 PM - 12:45 PM	45	250	0	0	51	52	0	0	0	29	0	0		
12:45 PM - 1:00 PM	44	268	0	0	58	62	0	0	0	31	0	0		
Phf	0.894	0.960	#DIV/0!	#DIV/0!	0.927	0.879	#DIV/0!	#DIV/0!	#DIV/0!	0.829	#DIV/0!	#DIV/0!	Peak	Phf
12:00 PM - 1:00 PM	161	1029	0	0	215	218	0	0	0	126	0	0	1749	0.951



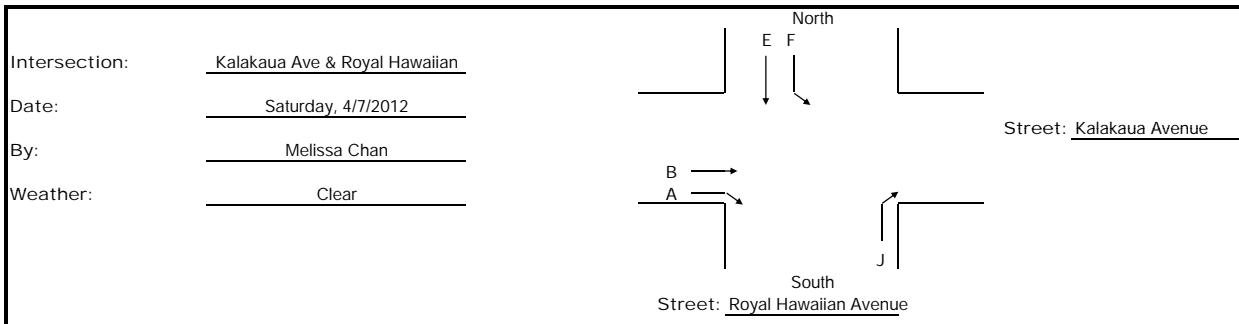
PM COUNT SHEET

Intersection:	<u>Kalakaua Ave & Royal Hawaiian</u>											
Date:	<u>Tuesday, 4/3/2012</u>				North E F ↓							
By:	<u>Sharen Nakashima</u>										Street: <u>Kalakaua Avenue</u>	
Weather:	<u>Clear</u>				B → A ←						J ↑ South Street: <u>Royal Hawaiian Avenue</u>	

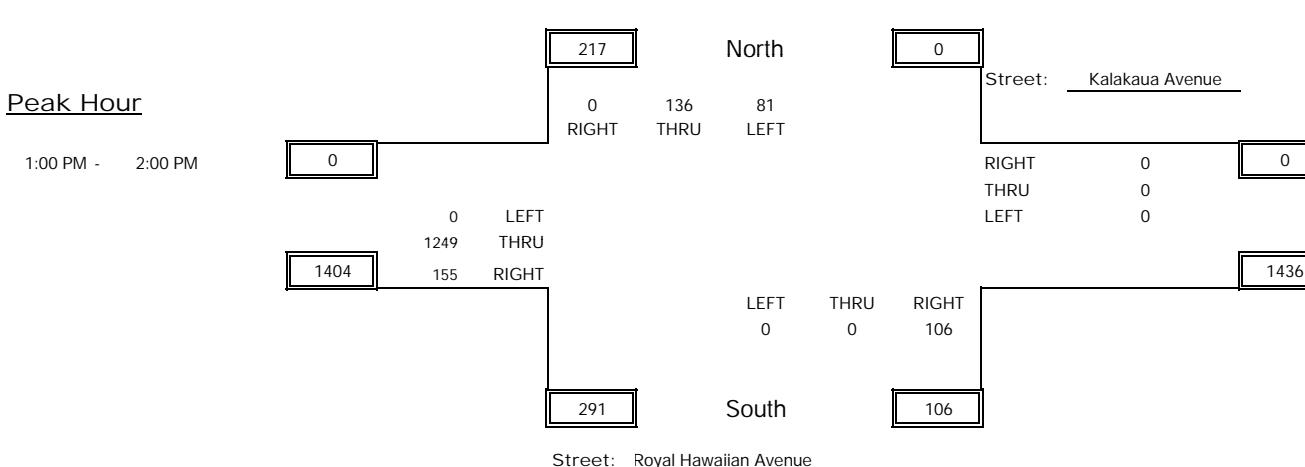
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
3:30 PM - 3:45 PM	48	344	0	0	65	61	0	0	0	21	0	0	539	2235
3:45 PM - 4:00 PM	55	338	0	0	43	59	0	0	0	35	0	0	530	2282
4:00 PM - 4:15 PM	75	316	0	0	57	61	0	0	0	52	0	0	561	2332
4:15 PM - 4:30 PM	48	349	0	0	84	79	0	0	0	45	0	0	605	
4:30 PM - 4:45 PM	72	336	0	0	75	71	0	0	0	32	0	0	586	
4:45 PM - 5:00 PM	46	345	0	0	85	82	0	0	0	22	0	0	580	
5:00 PM - 5:15 PM	48	379	0	0	70	63	0	0	0	38	0	0		
5:15 PM - 5:30 PM	44	383	0	0	67	55	0	0	0	27	0	0		
Phf	0.729	0.942	#DIV/0!	#DIV/0!	0.874	0.826	#DIV/0!	#DIV/0!	#DIV/0!	0.783	#DIV/0!	#DIV/0!	Peak	Phf
4:30 PM - 5:30 PM	210	1443	0	0	297	271	0	0	0	119	0	0	2340	0.967



Saturday COUNT SHEET



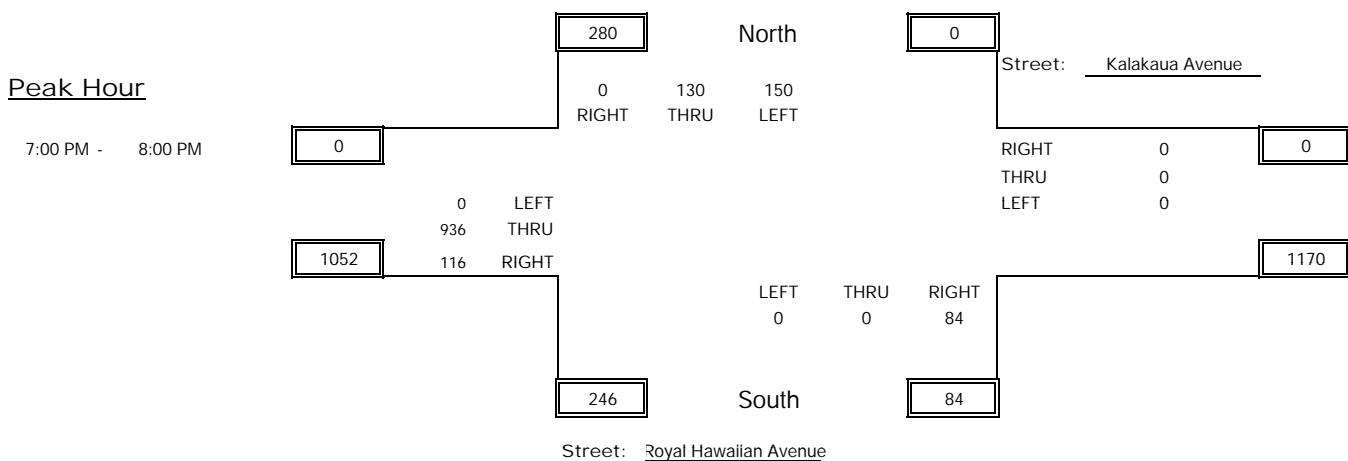
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
11:00 AM - 11:15 AM	42	272	0	0	37	45	0	0	0	24	0	0	420	1707
11:15 AM - 11:30 AM	17	267	0	0	38	42	0	0	0	21	0	0	385	1713
11:30 AM - 11:45 AM	33	284	0	0	40	50	0	0	0	29	0	0	436	1782
11:45 AM - 12:00 PM	22	345	0	0	39	39	0	0	0	21	0	0	466	1833
12:00 PM - 12:15 PM	43	269	0	0	38	50	0	0	0	26	0	0	426	1843
12:15 PM - 12:30 PM	35	311	0	0	37	42	0	0	0	29	0	0	454	1848
12:30 PM - 12:45 PM	41	323	0	0	42	53	0	0	0	28	0	0	487	1848
12:45 PM - 1:00 PM	44	312	0	0	45	49	0	0	0	26	0	0	476	1866
1:00 PM - 1:15 PM	35	291	0	0	33	49	0	0	0	23	0	0	431	1727
1:15 PM - 1:30 PM	39	306	0	0	32	45	0	0	0	32	0	0	454	
1:30 PM - 1:45 PM	38	349	0	0	40	47	0	0	0	31	0	0	505	
1:45 PM - 2:00 PM	43	303	0	0	31	-60	0	0	0	20	0	0	337	
Phf	0.901	0.895	#DIV/0!	#DIV/0!	0.850	0.413	#DIV/0!	#DIV/0!	#DIV/0!	0.828	#DIV/0!	#DIV/0!	Peak	Phf
1:00 PM - 2:00 PM	155	1249	0	0	136	81	0	0	0	106	0	0	1727	0.855



Night COUNT SHEET

Intersection:	<u>Kalakaua Ave & Royal Hawaiian</u>	
Date:	<u>Wednesday, 4/11/2012</u>	
By:	<u>Melissa Chan</u>	
Weather:	<u>Clear</u>	

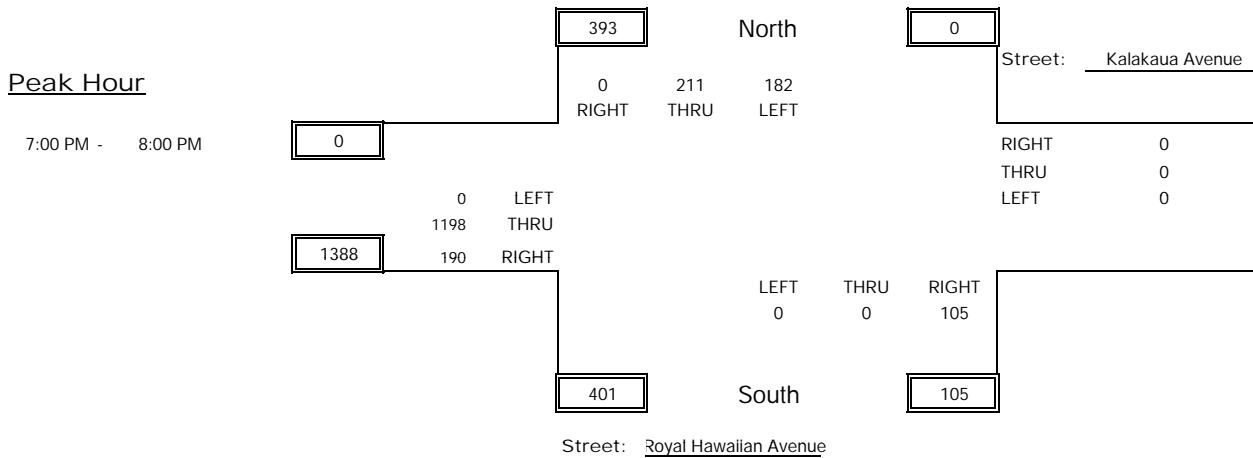
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 PM - 5:45 PM	28	391	0	0	39	38	0	0	0	35	0	0	531	2012
5:45 PM - 6:00 PM	39	373	0	0	57	51	0	0	0	32	0	0	552	1944
6:00 PM - 6:15 PM	28	330	0	0	41	65	0	0	0	23	0	0	487	1857
6:15 PM - 6:30 PM	28	302	0	0	26	58	0	0	0	28	0	0	442	1760
6:30 PM - 6:45 PM	36	304	0	0	35	56	0	0	0	32	0	0	463	1668
6:45 PM - 7:00 PM	30	337	0	0	35	42	0	0	0	21	0	0	465	1563
7:00 PM - 7:15 PM	26	268	0	0	38	38	0	0	0	20	0	0	390	1416
7:15 PM - 7:30 PM	26	244	0	0	31	31	0	0	0	18	0	0	350	
7:30 PM - 7:45 PM	34	219	0	0	36	45	0	0	0	24	0	0	358	
7:45 PM - 8:00 PM	30	205	0	0	25	36	0	0	0	22	0	0	318	
Phf	0.853	0.873	#DIV/0!	#DIV/0!	0.855	0.833	#DIV/0!	#DIV/0!	#DIV/0!	0.875	#DIV/0!	#DIV/0!	Peak	Phf
7:00 PM - 8:00 PM	116	936	0	0	130	150	0	0	0	84	0	0	1416	0.641



Friday Night COUNT SHEET

Intersection:	<u>Kalakaua Ave & Royal Hawaiian</u>											
Date:	<u>Friday, 4/20/2012</u>				North E F ↓							
By:	<u>Melissa Chan</u>										Street: <u>Kalakaua Avenue</u>	
Weather:	<u>Clear</u>				B → A ←						J ↗ South Street: <u>Royal Hawaiian Avenue</u>	

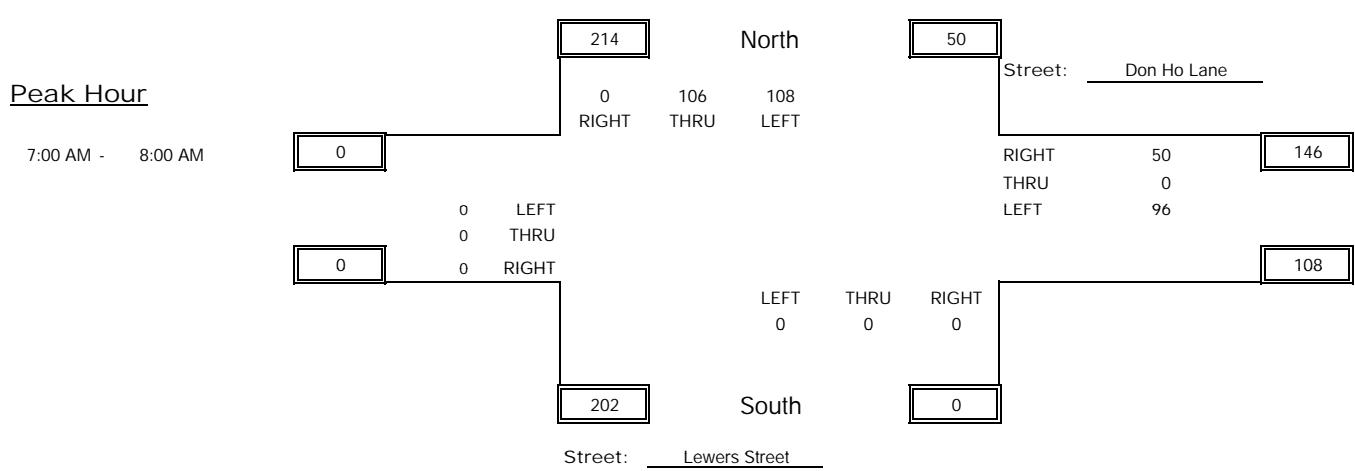
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 PM - 5:45 PM	57	392	0	0	68	66	0	0	0	26	0	0	609	2279
5:45 PM - 6:00 PM	60	361	0	0	78	52	0	0	0	21	0	0	572	2188
6:00 PM - 6:15 PM	56	355	0	0	69	53	0	0	0	25	0	0	558	2130
6:15 PM - 6:30 PM	56	353	0	0	55	51	0	0	0	25	0	0	540	2059
6:30 PM - 6:45 PM	54	324	0	0	55	60	0	0	0	25	0	0	518	1978
6:45 PM - 7:00 PM	52	338	0	0	53	55	0	0	0	16	0	0	514	1926
7:00 PM - 7:15 PM	38	316	0	0	68	34	0	0	0	31	0	0	487	1886
7:15 PM - 7:30 PM	56	285	0	0	52	45	0	0	0	21	0	0	459	
7:30 PM - 7:45 PM	47	284	0	0	54	50	0	0	0	31	0	0	466	
7:45 PM - 8:00 PM	49	313	0	0	37	53	0	0	0	22	0	0	474	
Phf	0.848	0.948	#DIV/0!	#DIV/0!	0.776	0.858	#DIV/0!	#DIV/0!	#DIV/0!	0.847	#DIV/0!	#DIV/0!	Peak	Phf
7:00 PM - 8:00 PM	190	1198	0	0	211	182	0	0	0	105	0	0	1886	0.824



AM COUNT SHEET

Intersection:	Lewers St & Don Ho Ln			Street:	Don Ho Lane	
Date:	Tuesday, 4/3/2012					
By:	Mala					
Weather:	Clear					
Street: Lewers Street						

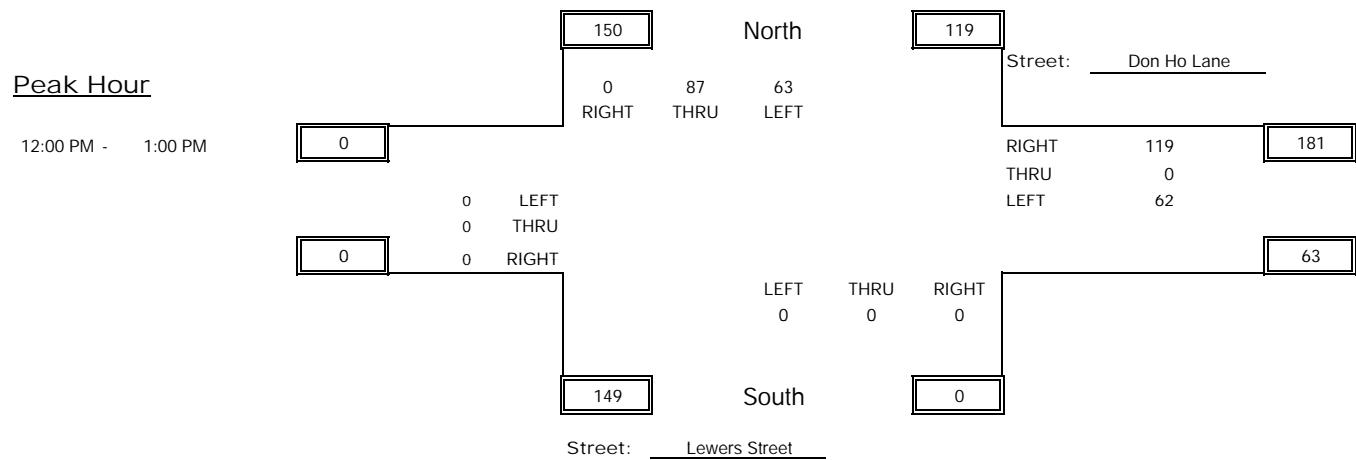
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
7:00 AM - 7:15 AM	0	0	0	0	31	22	11	0	23	0	0	0	87	360
7:15 AM - 7:30 AM	0	0	0	0	28	30	13	0	27	0	0	0	98	349
7:30 AM - 7:45 AM	0	0	0	0	19	35	12	0	23	0	0	0	89	319
7:45 AM - 8:00 AM	0	0	0	0	28	21	14	0	23	0	0	0	86	310
8:00 AM - 8:15 AM	0	0	0	0	15	33	15	0	13	0	0	0	76	302
8:15 AM - 8:30 AM	0	0	0	0	16	24	10	0	18	0	0	0	68	
8:30 AM - 8:45 AM	0	0	0	0	20	26	19	0	15	0	0	0	80	
8:45 AM - 9:00 AM	0	0	0	0	18	26	14	0	20	0	0	0	78	
Phf	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.855	0.771	0.893	#DIV/0!	0.889	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
7:00 AM - 8:00 AM	0	0	0	0	106	108	50	0	96	0	0	0	360	1.011



MD COUNT SHEET

Intersection:	<u>Lewers St & Don Ho Ln</u>	 North E F ↓ ↘ G I South Street: <u>Lewers Street</u>
Date:	<u>Tuesday, 4/3/2012</u>	
By:	<u>Mala</u>	
Weather:	<u>Clear</u>	

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
11:00 AM - 11:15 AM	0	0	0	0	26	13	33	0	24	0	0	0	96	397
11:15 AM - 11:30 AM	0	0	0	0	29	19	26	0	14	0	0	0	88	399
11:30 AM - 11:45 AM	0	0	0	0	18	22	28	0	18	0	0	0	86	384
11:45 AM - 12:00 PM	0	0	0	0	53	31	26	0	17	0	0	0	127	376
12:00 PM - 12:15 PM	0	0	0	0	20	17	38	0	23	0	0	0	98	331
12:15 PM - 12:30 PM	0	0	0	0	20	17	21	0	15	0	0	0	73	
12:30 PM - 12:45 PM	0	0	0	0	23	15	30	0	10	0	0	0	78	
12:45 PM - 1:00 PM	0	0	0	0	24	14	30	0	14	0	0	0	82	
Phf	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.906	0.926	0.783	#DIV/0!	0.674	#DIV/0!	#DIV/0!	Peak	Phf
12:00 PM - 1:00 PM	0	0	0	0	87	63	119	0	62	0	0	0	331	0.652

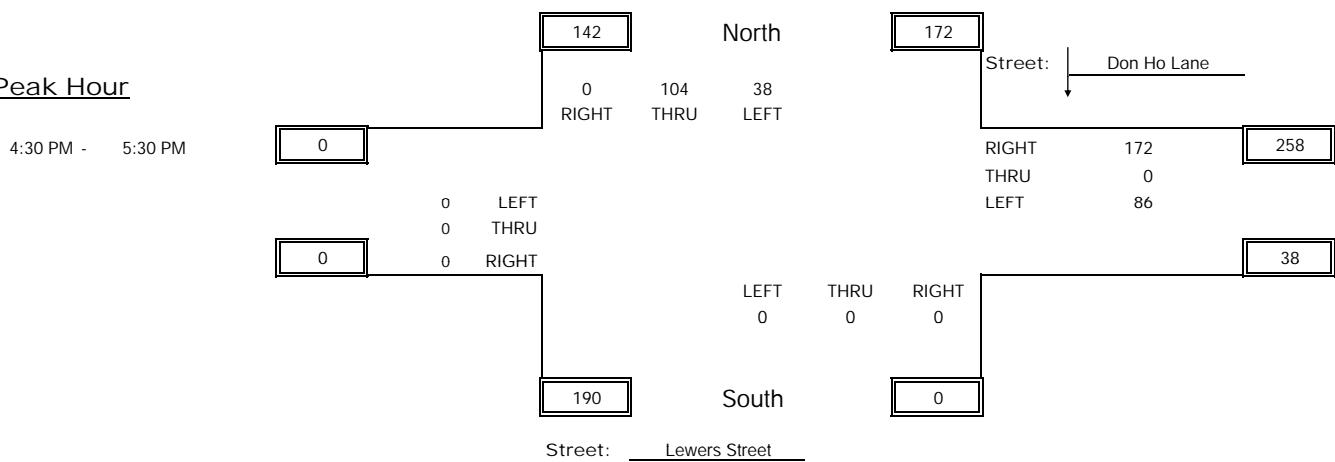


PM COUNT SHEET

Intersection:	Lewers St & Don Ho Ln		
Date:	Tuesday, 4/3/2012		
By:	Mala		
Weather:	Clear		
			Street: Don Ho Lane
			South
			Street: Lewers Street

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
3:30 PM - 3:45 PM	0	0	0	0	28	13	53	0	30	0	0	0	124	496
3:45 PM - 4:00 PM	0	0	0	0	22	19	41	0	32	0	0	0	114	479
4:00 PM - 4:15 PM	0	0	0	0	27	18	68	0	26	0	0	0	139	463
4:15 PM - 4:30 PM	0	0	0	0	23	13	55	0	28	0	0	0	119	425
4:30 PM - 4:45 PM	0	0	0	0	22	9	41	0	35	0	0	0	107	400
4:45 PM - 5:00 PM	0	0	0	0	19	18	37	0	24	0	0	0	98	
5:00 PM - 5:15 PM	0	0	0	0	37	8	47	0	9	0	0	0	101	
5:15 PM - 5:30 PM	0	0	0	0	26	3	47	0	18	0	0	0	94	
Phf	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.703	0.528	0.915	#DIV/0!	0.614	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
4:30 PM - 5:30 PM	0	0	0	0	104	38	172	0	86	0	0	0	400	0.719

Peak Hour



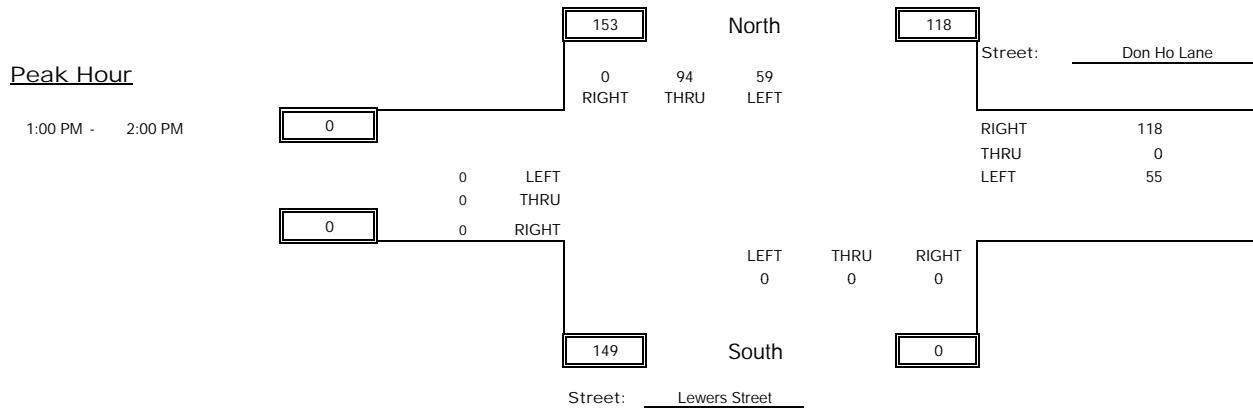
Saturday COUNT SHEET

Intersection:	Lewers St & Don Ho Ln	
Date:	Saturday, 4/7/2012	
By:	Mala	
Weather:	Clear	

North
E F
↓
G
I
Street: Don Ho Lane

South
Street: Lewers Street

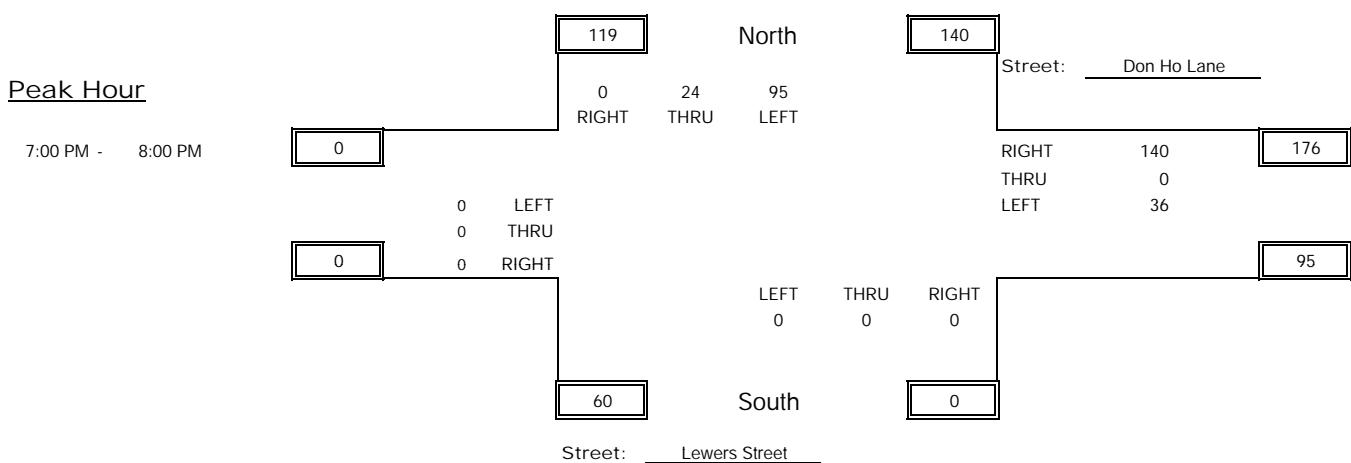
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
11:00 AM - 11:15 AM	0	0	0	0	27	7	26	0	10	0	0	0	70	332
11:15 AM - 11:30 AM	0	0	0	0	32	11	22	0	28	0	0	0	93	342
11:30 AM - 11:45 AM	0	0	0	0	33	9	19	0	29	0	0	0	90	341
11:45 AM - 12:00 PM	0	0	0	0	24	11	24	0	20	0	0	0	79	337
12:00 PM - 12:15 PM	0	0	0	0	20	8	26	0	26	0	0	0	80	335
12:15 PM - 12:30 PM	0	0	0	0	24	17	28	0	23	0	0	0	92	332
12:30 PM - 12:45 PM	0	0	0	0	19	17	23	0	27	0	0	0	86	309
12:45 PM - 1:00 PM	0	0	0	0	19	12	28	0	18	0	0	0	77	319
1:00 PM - 1:15 PM	0	0	0	0	24	15	27	0	11	0	0	0	77	326
1:15 PM - 1:30 PM	0	0	0	0	14	11	31	0	13	0	0	0	69	
1:30 PM - 1:45 PM	0	0	0	0	32	21	24	0	19	0	0	0	96	
1:45 PM - 2:00 PM	0	0	0	0	24	12	36	0	12	0	0	0	84	
Phf	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.734	0.702	0.819	#DIV/0!	0.724	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
1:00 PM - 2:00 PM	0	0	0	0	94	59	118	0	55	0	0	0	326	0.886



Night COUNT SHEET

Intersection:	Lewers St & Don Ho Ln	
Date:	Wednesday, 4/11/2012	
By:	David Miyasaki	
Weather:	Clear	

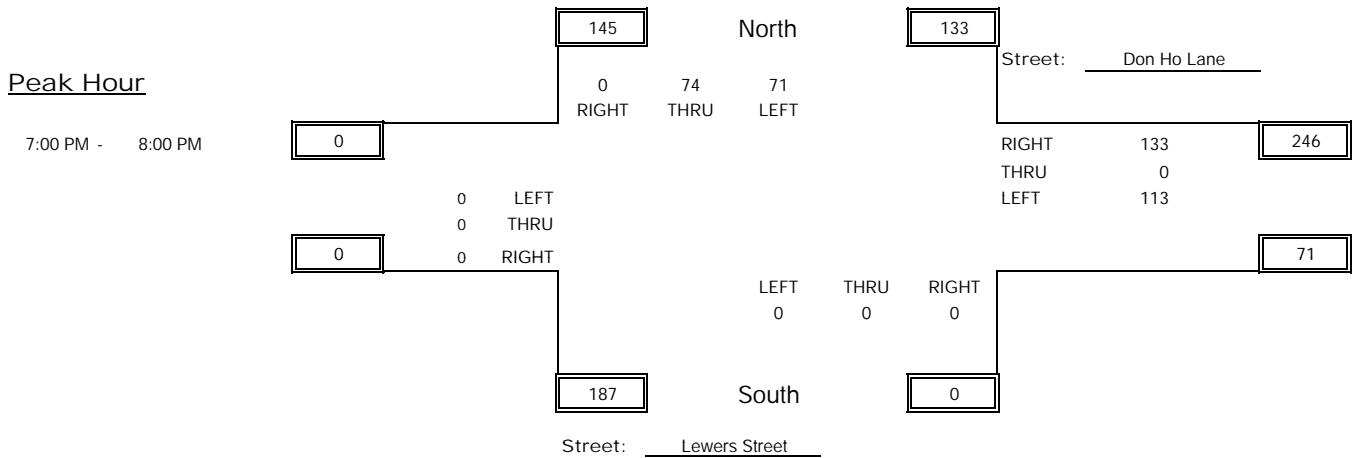
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 PM - 5:45 PM	0	0	0	0	19	20	27	0	11	0	0	0	77	352
5:45 PM - 6:00 PM	0	0	0	0	3	35	35	0	7	0	0	0	80	357
6:00 PM - 6:15 PM	0	0	0	0	11	28	49	0	21	0	0	0	109	336
6:15 PM - 6:30 PM	0	0	0	0	16	25	28	0	17	0	0	0	86	308
6:30 PM - 6:45 PM	0	0	0	0	17	19	30	0	16	0	0	0	82	286
6:45 PM - 7:00 PM	0	0	0	0	5	20	24	0	10	0	0	0	59	277
7:00 PM - 7:15 PM	0	0	0	0	1	30	38	0	12	0	0	0	81	295
7:15 PM - 7:30 PM	0	0	0	0	-1	24	35	0	6	0	0	0	64	
7:30 PM - 7:45 PM	0	0	0	0	12	18	34	0	9	0	0	0	73	
7:45 PM - 8:00 PM	0	0	0	0	12	23	33	0	9	0	0	0	77	
Phf	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.500	0.792	0.921	#DIV/0!	0.750	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
7:00 PM - 8:00 PM	0	0	0	0	24	95	140	0	36	0	0	0	295	0.677



Friday Night COUNT SHEET

Intersection:	Lewers St & Don Ho Ln			Street: Don Ho Lane
Date:	Friday, 4/20/2012			
By:	Phil Matsunaga			
Weather:	Clear			
South Street: Lewers Street				

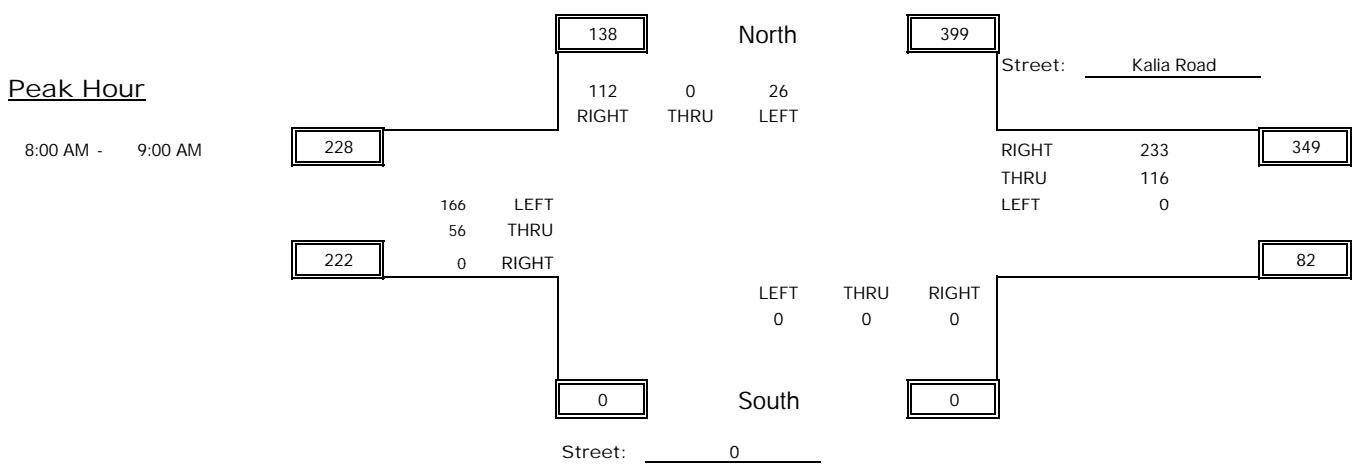
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 PM - 5:45 PM	0	0	0	0	24	31	53	0	32	0	0	0	140	472
5:45 PM - 6:00 PM	0	0	0	0	19	28	37	0	41	0	0	0	125	429
6:00 PM - 6:15 PM	0	0	0	0	7	37	38	0	25	0	0	0	107	418
6:15 PM - 6:30 PM	0	0	0	0	17	30	30	0	23	0	0	0	100	412
6:30 PM - 6:45 PM	0	0	0	0	14	34	25	0	24	0	0	0	97	405
6:45 PM - 7:00 PM	0	0	0	0	25	21	33	0	35	0	0	0	114	405
7:00 PM - 7:15 PM	0	0	0	0	15	18	37	0	31	0	0	0	101	391
7:15 PM - 7:30 PM	0	0	0	0	13	18	31	0	31	0	0	0	93	
7:30 PM - 7:45 PM	0	0	0	0	25	15	32	0	25	0	0	0	97	
7:45 PM - 8:00 PM	0	0	0	0	21	20	33	0	26	0	0	0	100	
Phf	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.740	0.888	0.899	#DIV/0!	0.911	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
7:00 PM - 8:00 PM	0	0	0	0	74	71	133	0	113	0	0	0	391	0.857



AM COUNT SHEET

Intersection:	Saratoga Rd & Kalia Rd						Street: Kalia Road
Date:	Tuesday, 4/3/2012						Street: Saratoga Road
By:	Eugene dela Cruz		C	F	G	H	
Weather:	Clear		B	→	→	←	←

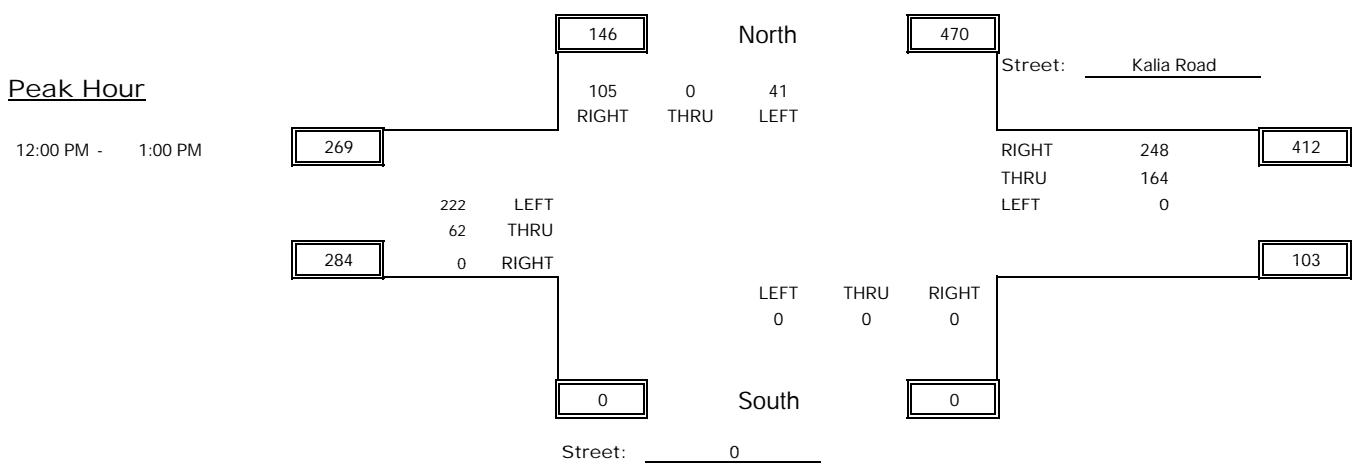
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
7:00 AM - 7:15 AM	0	17	34	32	0	7	35	49	0	0	0	0	174	675
7:15 AM - 7:30 AM	0	10	37	31	0	9	38	41	0	0	0	0	166	647
7:30 AM - 7:45 AM	0	12	37	24	0	4	46	38	0	0	0	0	161	676
7:45 AM - 8:00 AM	0	19	32	48	0	2	37	36	0	0	0	0	174	690
8:00 AM - 8:15 AM	0	13	27	19	0	7	55	25	0	0	0	0	146	709
8:15 AM - 8:30 AM	0	14	61	29	0	9	55	27	0	0	0	0	195	
8:30 AM - 8:45 AM	0	13	31	30	0	3	67	31	0	0	0	0	175	
8:45 AM - 9:00 AM	0	16	47	34	0	7	56	33	0	0	0	0	193	
Phf	#DIV/0!	0.875	0.680	0.824	#DIV/0!	0.722	0.869	0.879	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
8:00 AM - 9:00 AM	0	56	166	112	0	26	233	116	0	0	0	0	709	0.909



MD COUNT SHEET

Intersection:	Saratoga Rd & Kalia Rd		Street: Saratoga Road				Street: Kalia Road			
Date:	Tuesday, 4/3/2012		D	F		G	H			
By:	Eugene dela Cruz		C		B					
Weather:	Clear									

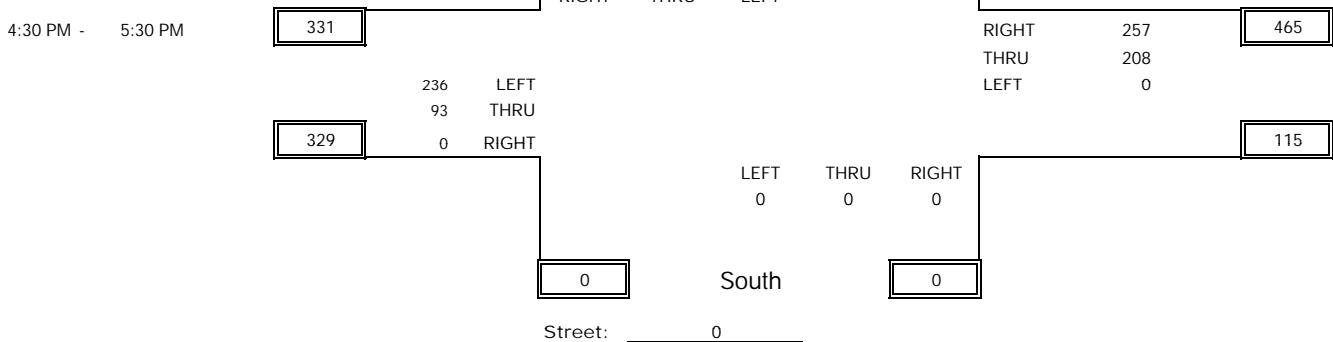
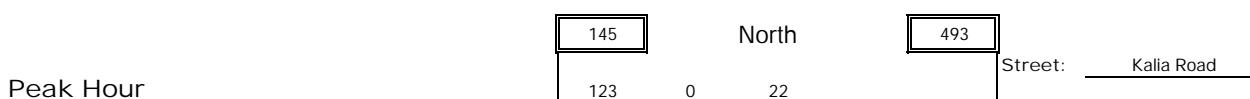
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
11:00 AM - 11:15 AM	0	12	45	27	0	9	61	60	0	0	0	0	214	831
11:15 AM - 11:30 AM	0	21	42	21	0	10	70	47	0	0	0	0	211	827
11:30 AM - 11:45 AM	0	12	51	37	0	6	67	41	0	0	0	0	214	830
11:45 AM - 12:00 PM	0	17	38	26	0	8	61	42	0	0	0	0	192	822
12:00 PM - 12:15 PM	0	13	51	25	0	10	65	46	0	0	0	0	210	842
12:15 PM - 12:30 PM	0	17	65	29	0	12	56	35	0	0	0	0	214	
12:30 PM - 12:45 PM	0	19	50	22	0	13	55	47	0	0	0	0	206	
12:45 PM - 1:00 PM	0	13	56	29	0	6	72	36	0	0	0	0	212	
Phf	#DIV/0!	0.816	0.854	0.905	#DIV/0!	0.788	0.861	0.872	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
12:00 PM - 1:00 PM	0	62	222	105	0	41	248	164	0	0	0	0	842	0.984



PM COUNT SHEET

Intersection:	Saratoga Rd & Kalia Rd					Street: Kalia Road
Date:	Tuesday, 4/3/2012					
By:	Eugene dela Cruz					
Weather:	Clear					

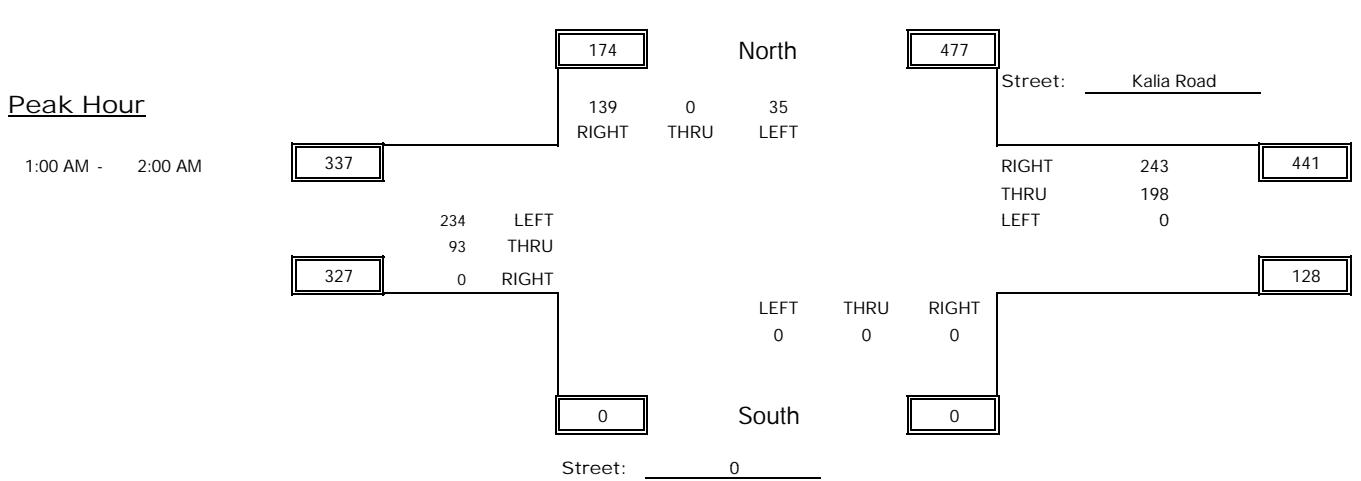
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
3:30 PM - 3:45 PM	0	24	66	43	0	4	64	59	0	0	0	0	260	1026
3:45 PM - 4:00 PM	0	24	57	38	0	8	70	58	0	0	0	0	255	1001
4:00 PM - 4:15 PM	0	9	60	25	0	9	68	66	0	0	0	0	237	981
4:15 PM - 4:30 PM	0	30	76	38	0	4	66	60	0	0	0	0	274	973
4:30 PM - 4:45 PM	0	23	65	20	0	3	64	60	0	0	0	0	235	939
4:45 PM - 5:00 PM	0	16	63	34	0	7	60	55	0	0	0	0	235	
5:00 PM - 5:15 PM	0	26	55	32	0	9	63	44	0	0	0	0	229	
5:15 PM - 5:30 PM	0	28	53	37	0	3	70	49	0	0	0	0	240	
Phf	#DIV/0!	0.830	0.908	0.831	#DIV/0!	0.611	0.918	0.867	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
4:30 PM - 5:30 PM	0	93	236	123	0	22	257	208	0	0	0	0	939	0.857



Saturday COUNT SHEET

Intersection:	Saratoga Rd & Kalia Rd		Street: Saratoga Road				Street: Kalia Road			
Date:	Saturday, 4/7/2012		D	F		G	H			
By:	Eugene dela Cruz		C		B					
Weather:	Clear									

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
11:00 AM - 11:15 AM	0	15	64	44	0	9	63	49	0	0	0	0	244	926
11:15 AM - 11:30 AM	0	18	52	27	0	9	48	54	0	0	0	0	208	909
11:30 AM - 11:45 AM	0	17	61	44	0	7	53	42	0	0	0	0	224	924
11:45 AM - 12:00 PM	0	20	65	47	0	12	60	46	0	0	0	0	250	943
12:00 AM - 12:15 AM	0	14	67	32	0	6	61	47	0	0	0	0	227	954
12:15 AM - 12:30 AM	0	13	69	25	0	6	51	59	0	0	0	0	223	944
12:30 AM - 12:45 AM	0	17	63	35	0	9	67	52	0	0	0	0	243	970
12:45 AM - 1:00 AM	0	20	62	42	0	15	56	66	0	0	0	0	261	964
1:00 AM - 1:15 AM	0	24	57	26	0	10	59	41	0	0	0	0	217	942
1:15 AM - 1:30 AM	0	27	63	29	0	10	61	59	0	0	0	0	249	
1:30 AM - 1:45 AM	0	19	59	42	0	6	64	47	0	0	0	0	237	
1:45 AM - 2:00 AM	0	23	55	42	0	9	59	51	0	0	0	0	239	
Phf	#DIV/0!	0.861	0.929	0.827	#DIV/0!	0.875	0.949	0.839	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
1:00 AM - 2:00 AM	0	93	234	139	0	35	243	198	0	0	0	0	942	0.902



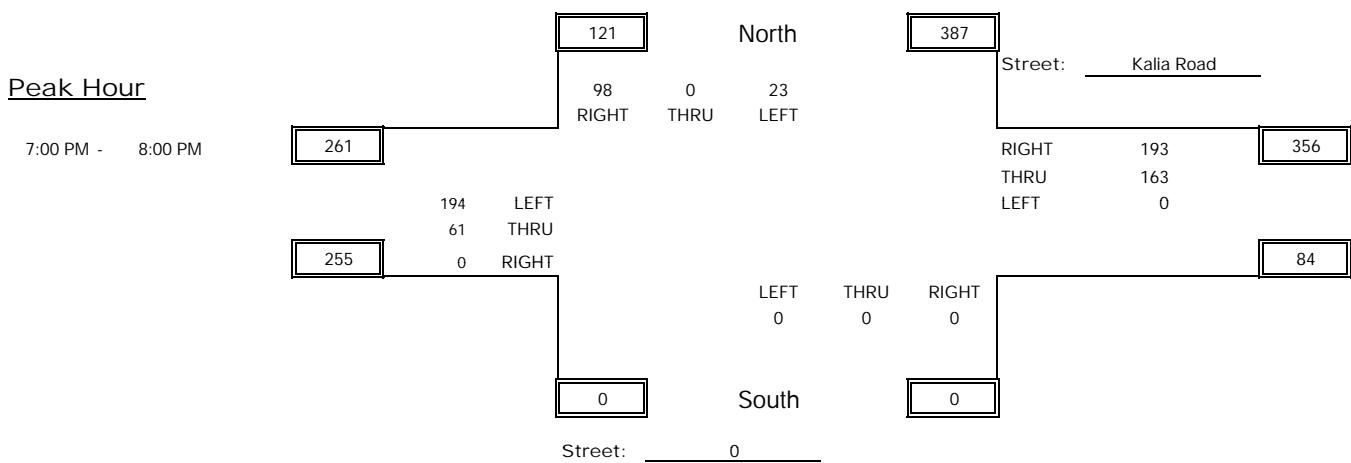
Night COUNT SHEET

Intersection:	Saratoga Rd & Kalia Rd
Date:	Wednesday, 4/11/2012
By:	Eugene dela Cruz
Weather:	Clear

Street: Saratoga Road

Street: Kalia Road

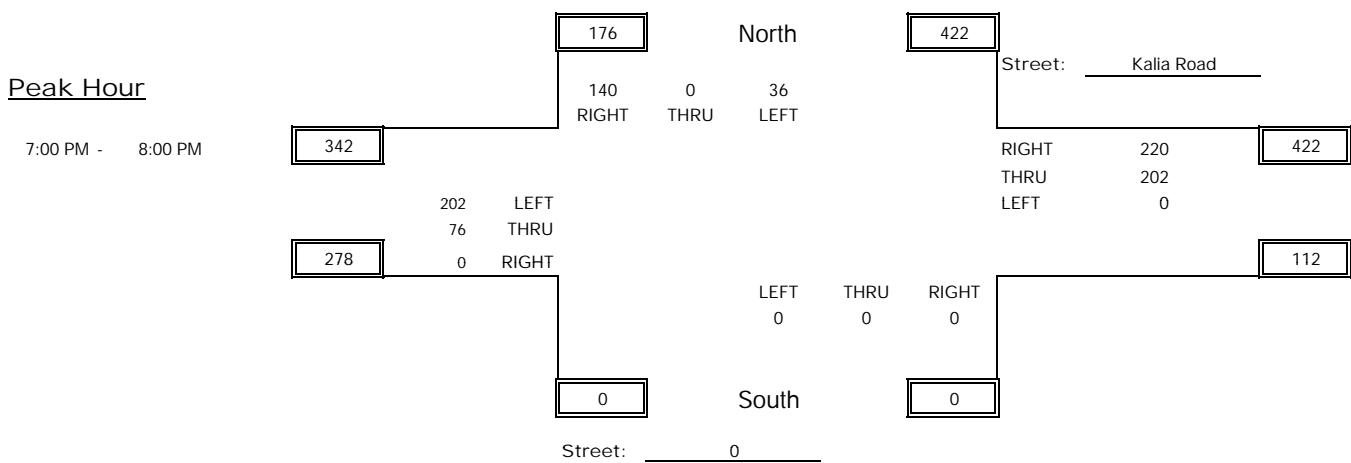
TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 PM - 5:45 PM	0	28	77	41	0	9	68	62	0	0	0	0	285	1013
5:45 PM - 6:00 PM	0	26	62	28	0	9	72	54	0	0	0	0	251	931
6:00 PM - 6:15 PM	0	20	62	40	0	5	67	63	0	0	0	0	257	913
6:15 PM - 6:30 PM	0	23	48	20	0	9	74	46	0	0	0	0	220	854
6:30 PM - 6:45 PM	0	13	66	22	0	7	61	34	0	0	0	0	203	833
6:45 PM - 7:00 PM	0	19	47	25	0	24	57	61	0	0	0	0	233	817
7:00 PM - 7:15 PM	0	13	56	29	0	10	49	41	0	0	0	0	198	732
7:15 PM - 7:30 PM	0	18	50	24	0	6	59	42	0	0	0	0	199	
7:30 PM - 7:45 PM	0	12	56	26	0	4	43	46	0	0	0	0	187	
7:45 PM - 8:00 PM	0	18	32	19	0	3	42	34	0	0	0	0	148	
Phf	#DIV/0!	0.847	0.866	0.845	#DIV/0!	0.575	0.818	0.886	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
7:00 PM - 8:00 PM	0	61	194	98	0	23	193	163	0	0	0	0	732	0.712



Friday Night COUNT SHEET

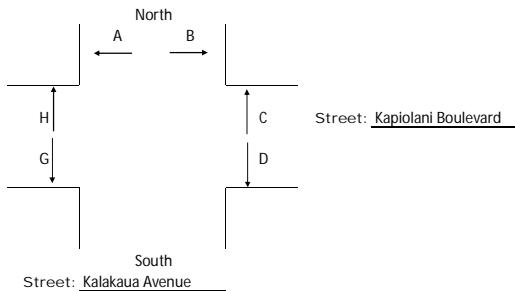
Intersection:	Saratoga Rd & Kalia Rd	Street: Saratoga Road
Date:	Friday, 4/20/2012	
By:	Eugene dela Cruz	Street: Kalia Road
Weather:	Clear	

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
5:30 PM - 5:45 PM	0	21	70	45	0	10	63	58	0	0	0	0	267	1003
5:45 PM - 6:00 PM	0	20	64	40	0	9	51	57	0	0	0	0	241	977
6:00 PM - 6:15 PM	0	23	67	27	0	7	70	57	0	0	0	0	251	972
6:15 PM - 6:30 PM	0	18	60	48	0	12	54	52	0	0	0	0	244	951
6:30 PM - 6:45 PM	0	30	61	28	0	11	63	48	0	0	0	0	241	937
6:45 PM - 7:00 PM	0	20	63	36	0	9	58	50	0	0	0	0	236	919
7:00 PM - 7:15 PM	0	26	49	35	0	10	54	56	0	0	0	0	230	876
7:15 PM - 7:30 PM	0	13	52	40	0	11	61	53	0	0	0	0	230	
7:30 PM - 7:45 PM	0	23	53	41	0	8	53	45	0	0	0	0	223	
7:45 PM - 8:00 PM	0	14	48	24	0	7	52	48	0	0	0	0	193	
Phf	#DIV/0!	0.731	0.953	0.854	#DIV/0!	0.818	0.902	0.902	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
7:00 PM - 8:00 PM	0	76	202	140	0	36	220	202	0	0	0	0	876	0.873



AM PEAK HOUR

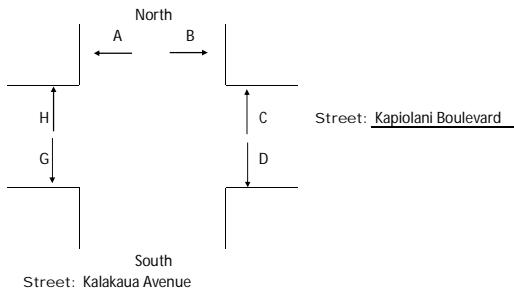
Intersection: Kalakaua Ave/Kapiolani Blvd
 Date: Wednesday, 5/2/2012
 By: Herbert Pulido
 Weather: Sunny



TIME	A	B	C	D	E	F	G	H
7:00 AM - 7:15 AM	13	3	8	4			11	3
7:15 AM - 7:30 AM	16	10	4	7			15	6
7:30 AM - 7:45 AM	16	12	9	9			13	8
7:45 AM - 8:00 AM	26	14	29	9			15	9
8:00 AM - 8:15 AM	35	18	14	4			6	12
8:15 AM - 8:30 AM	35	5	15	4			4	10
8:30 AM - 8:45 AM	31	12	15	6			12	6
8:45 AM - 9:00 AM	36	22	20	7			9	10

MD PEAK HOUR

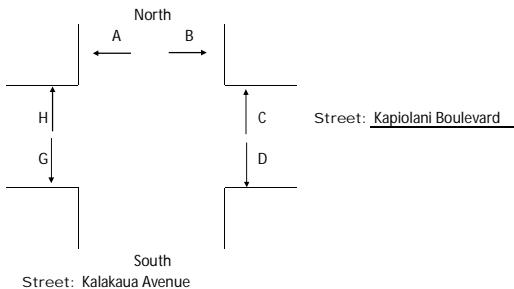
Intersection: Kalakaua Ave/Kapiolani Blvd
 Date: Wednesday, 5/2/2012
 By: Herbert Pulido
 Weather: Sunny



TIME	A	B	C	D	E	F	G	H
11:00 AM - 11:15 AM	31	14	10	2			12	10
11:15 AM - 11:30 AM	14	10	4	7			14	13
11:30 AM - 11:45 AM	20	21	23	9			22	12
11:45 AM - 12:00 PM	28	8	17	7			12	11
12:00 PM - 12:15 PM	31	16	16	5			10	12
12:15 PM - 12:30 PM	25	14	21	7			6	11
12:30 PM - 12:45 PM	47	11	10	6			10	9
12:45 PM - 1:00 PM	23	14	14	7			8	12

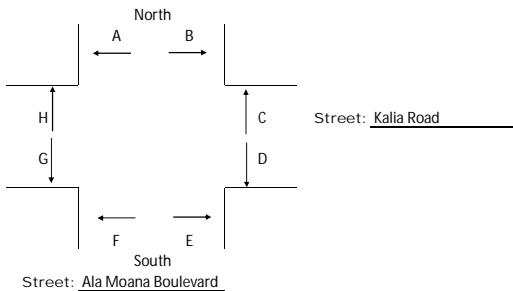
PM PEAK HOUR

Intersection: Kalakaua Ave/Kapiolani Blvd
 Date: Wednesday, 5/2/2012
 By: Herbert Pulido
 Weather: Sunny



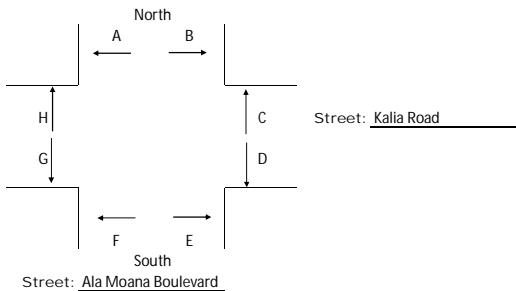
TIME	A	B	C	D	E	F	G	H
3:00 PM - 3:15 PM	23	19	18	13			16	12
3:15 PM - 3:30 PM	26	19	22	15			17	19
3:30 PM - 3:45 PM	37	17	15	9			27	11
3:45 PM - 4:00 PM	25	25	21	9			20	16
4:00 PM - 4:15 PM	27	32	14	5			15	10
4:15 PM - 4:30 PM	46	24	37	9			28	20
4:30 PM - 4:45 PM	44	39	24	13			23	18
4:45 PM - 5:00 PM	26	16	19	10			21	16
5:00 PM - 5:15 PM	37	38	27	14			17	23
5:15 PM - 5:30 PM	26	39	16	10			29	14
5:30 PM - 5:45 PM	27	35	20	13			25	29
5:45 PM - 6:00 PM	20	41	19	15			22	16

AM COUNT SHEET

Intersection: Ala Moana Blvd & Kalia Rd/Ena StDate: Tuesday, 4/3/2012By: Stephanie TignerWeather: Sunny

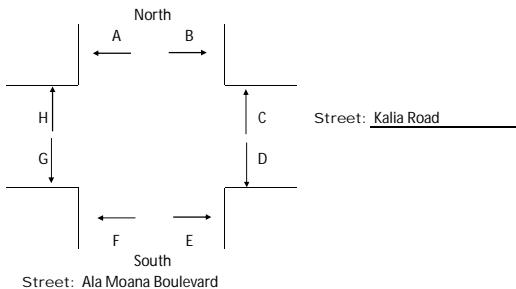
TIME	A	B	C	D	E	F	G	H
7:00 AM - 7:15 AM	5	5	10	7	52	62	23	8
7:15 AM - 7:30 AM	3	2	7	4	28	41	10	9
7:30 AM - 7:45 AM	1	4	3	8	33	49	16	7
7:45 AM - 8:00 AM	4	8	10	15	55	103	6	4
8:00 AM - 8:15 AM	2	5	8	9	62	48	12	23
8:15 AM - 8:30 AM	7	8	6	13	56	102	14	7
8:30 AM - 8:45 AM	2	12	28	11	89	94	8	4
8:45 AM - 9:00 AM	6	2	13	9	61	58	6	10

MD COUNT SHEET

Intersection: Ala Moana Blvd & Kalia Rd/Ena StDate: Tuesday, 4/3/2012By: Stephanie TignerWeather: Sunny

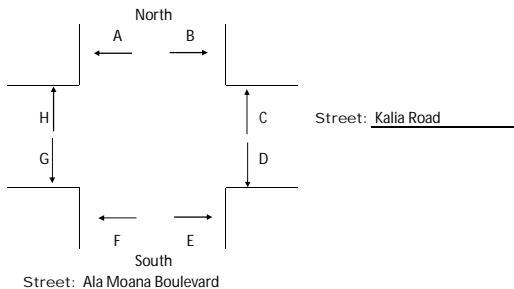
TIME	A	B	C	D	E	F	G	H
11:00 AM - 11:15 AM	6	5	13	13	64	33	8	12
11:15 AM - 11:30 AM	3	11	24	4	64	37	21	18
11:30 AM - 11:45 AM	7	12	11	11	50	38	13	17
11:45 AM - 12:00 PM	3	7	14	17	37	35	25	24
12:00 PM - 12:15 PM	17	3	15	15	41	55	10	11
12:15 PM - 12:30 PM	2	1	2	5	30	47	3	10
12:30 PM - 12:45 PM	4	17	6	6	31	31	8	11
12:45 PM - 1:00 PM	2	7	2	20	34	47	9	7

PM COUNT SHEET

Intersection: Ala Moana Blvd & Kalia Rd/Ena StDate: Tuesday, 4/3/2012By: Stephanie TignerWeather: Sunny

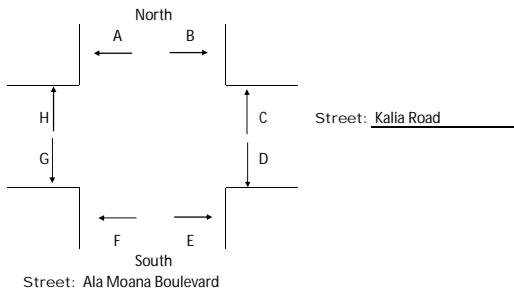
TIME	A	B	C	D	E	F	G	H
3:30 PM - 3:45 PM	10	5	3	7	54	25	19	15
3:45 PM - 4:00 PM	3	9	3	3	35	38	6	5
4:00 PM - 4:15 PM	8	6	9	7	30	50	12	20
4:15 PM - 4:30 PM	4	2	10	4	40	40	15	11
4:30 PM - 4:45 PM	7	20	8	4	38	33	23	14
4:45 PM - 5:00 PM	22	9	3	5	39	67	14	19
5:00 PM - 5:15 PM	3	4	16	24	42	47	17	44
5:15 PM - 5:30 PM	18	7	28	8	51	64	33	20

Saturday COUNT SHEET

Intersection: Ala Moana Blvd & Kalia Rd/Ena StDate: Saturday, 4/7/2012By: Stephanie TignerWeather: Clear

TIME	A	B	C	D	E	F	G	H
11:00 AM - 11:15 AM	2	1	4	12	61	49	16	24
11:15 AM - 11:30 AM	5	7	12	25	69	35	13	17
11:30 AM - 11:45 AM	4	8	5	15	76	65	14	8
11:45 AM - 12:00 PM	2	13	13	12	60	27	24	14
12:00 PM - 12:15 PM	1	1	13	15	66	34	8	2
12:15 PM - 12:30 PM	3	5	13	20	50	72	10	27
12:30 PM - 12:45 PM	12	7	15	9	74	82	11	26
12:45 PM - 1:00 PM	23	3	18	21	48	47	19	13
1:00 PM - 1:15 PM	7	8	19	10	56	36	28	25
1:15 PM - 1:30 PM	2	8	10	8	47	18	13	28
1:30 PM - 1:45 PM	5	5	7	6	48	38	17	16
1:45 PM - 2:00 PM	1	2	13	1	56	35	28	7

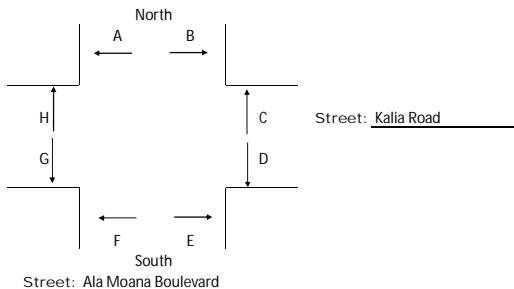
Night COUNT SHEET

Intersection: Ala Moana Blvd & Kalia Rd/Ena StDate: Wednesday, 4/11/2012By: Stephanie TignerWeather: Clear

TIME	A	B	C	D	E	F	G	H
5:30 PM - 5:45 PM	15	31	14	16	28	73	26	18
5:45 PM - 6:00 PM	22	18	38	20	70	85	22	17
6:00 PM - 6:15 PM	15	8	37	9	52	52	20	39
6:15 PM - 6:30 PM	12	6	23	11	83	60	3	20
6:30 PM - 6:45 PM	12	17	36	16	45	84	42	30
6:45 PM - 7:00 PM	15	21	27	15	40	83	24	66
7:00 PM - 7:15 PM	10	5	29	16	82	100	48	72
7:15 PM - 7:30 PM	19	4	20	38	42	92	23	48
7:30 PM - 7:45 PM	16	32	27	37	69	68	29	73
7:45 PM - 8:00 PM	18	15	34	18	59	69	49	42

Friday Night COUNT SHEET

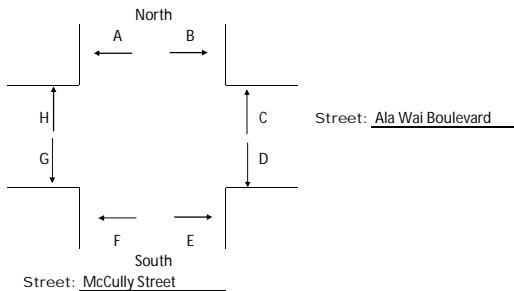
Intersection: Ala Moana Blvd & Kalia Rd
 Date: Friday, 4/20/2012
 By: Stephanie Tigner
 Weather: Clear



TIME	A	B	C	D	E	F	G	H
5:30 PM - 5:45 PM	9	8	23	26	60	59	12	48
5:45 PM - 6:00 PM	8	8	17	17	101	74	36	30
6:00 PM - 6:15 PM	16	15	11	42	61	69	20	19
6:15 PM - 6:30 PM	4	17	49	27	62	40	30	32
6:30 PM - 6:45 PM	23	21	29	24	46	52	41	29
6:45 PM - 7:00 PM	17	10	5	25	70	48	27	21
7:00 PM - 7:15 PM	19	12	11	36	84	62	28	13
7:15 PM - 7:30 PM	13	6	26	49	148	92	58	43
7:30 PM - 7:45 PM	17	20	9	55	116	26	20	43
7:45 PM - 8:00 PM	6	8	12	30	74	34	24	28

AM PEAK HOUR

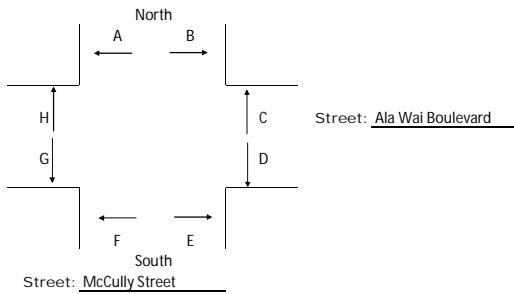
Intersection: Ala Wai Blvd/McCully St
 Date: Tuesday, 4/3/2012
 By: N/A
 Weather: Clear



TIME	A	B	C	D	E	F	G	H
7:00 AM - 7:15 AM	8	8	12	19	6	7	3	3
7:15 AM - 7:30 AM	8	2	16	10	5	10	2	1
7:30 AM - 7:45 AM	8	5	19	16	4	10	5	1
7:45 AM - 8:00 AM	8	5	19	16	4	10	5	0
8:00 AM - 8:15 AM	8	4	17	7	7	6	4	8
8:15 AM - 8:30 AM	2	3	12	19	10	6	4	2
8:30 AM - 8:45 AM	2	3	26	12	8	4	8	2
8:45 AM - 9:00 AM	6	1	15	10	11	10	4	6

MD PEAK HOUR

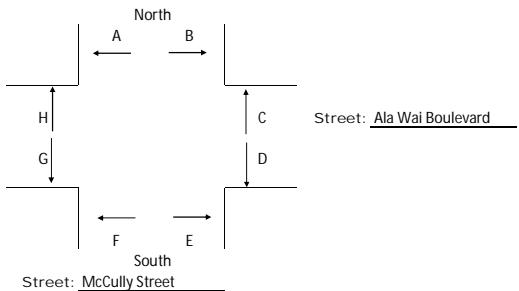
Intersection: Ala Wai Blvd/McCully St
 Date: Tuesday, 4/3/2012
 By: N/A
 Weather: Clear



TIME	A	B	C	D	E	F	G	H
11:00 AM - 11:15 AM	2	6	7	10	5	7	4	2
11:15 AM - 11:30 AM	6	3	12	5	13	5	6	6
11:30 AM - 11:45 AM	2	3	15	25	10	16	4	2
11:45 AM - 12:00 PM	1	4	3	13	5	12	4	1
12:00 PM - 12:15 PM	1	2	6	14	8	13	4	8
12:15 PM - 12:30 PM	2	6	7	15	5	20	2	11
12:30 PM - 12:45 PM	3	2	11	6	5	5	1	3
12:45 PM - 1:00 PM	5	3	7	15	9	7	2	4

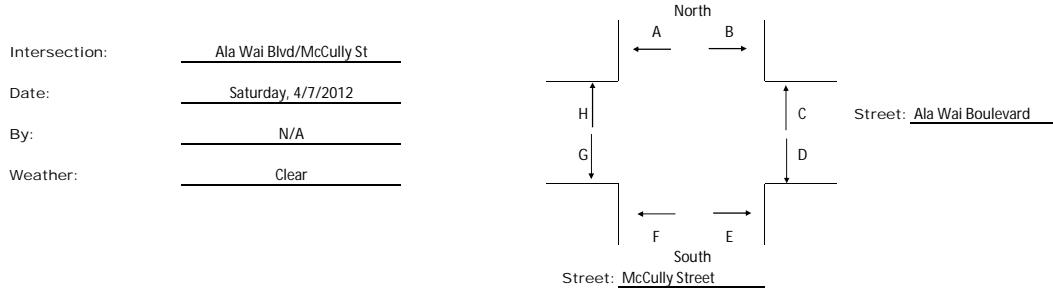
PM PEAK HOUR

Intersection: Ala Wai Blvd/McCully St
 Date: Tuesday, 4/3/2012
 By: N/A
 Weather: Clear



TIME	A	B	C	D	E	F	G	H
3:30 PM - 3:45 PM	2	4	11	18	5	14	7	7
3:45 PM - 4:00 PM	2	5	7	18	9	10	8	8
4:00 PM - 4:15 PM	1	5	14	25	5	5	5	6
4:15 PM - 4:30 PM	2	3	16	25	3	10	4	4
4:30 PM - 4:45 PM	5	7	22	39	13	1	1	0
4:45 PM - 5:00 PM	3	5	9	17	18	4	4	11
5:00 PM - 5:15 PM	0	9	16	20	14	6	6	6
5:15 PM - 5:30 PM	7	3	18	14	7	2	2	10

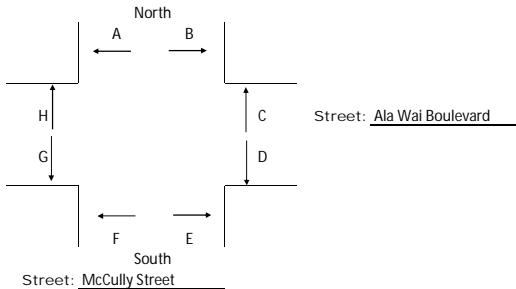
Saturday PEAK HOUR



TIME	A	B	C	D	E	F	G	H
11:00 AM - 11:15 AM	6	2	5	18	5	7	4	8
11:15 AM - 11:30 AM	4	4	13	10	7	2	1	6
11:30 AM - 11:45 AM	5	2	6	14	8	4	10	0
11:45 AM - 12:00 PM	7	2	6	28	6	6	6	5
12:00 PM - 12:15 PM	4	1	14	23	11	20	5	11
12:15 PM - 12:30 PM	9	3	9	17	8	10	3	6
12:30 PM - 12:45 PM	3	1	5	15	6	12	12	7
12:45 PM - 1:00 PM	4	2	15	14	6	2	4	2
1:00 PM - 1:15 PM	4	3	16	27	7	5	8	3
1:15 PM - 1:30 PM	5	6	5	20	10	7	3	4
1:30 PM - 1:45 PM	2	3	19	17	15	5	8	0
1:45 PM - 2:00 PM	1	3	9	16	3	2	6	4

Night PEAK HOUR

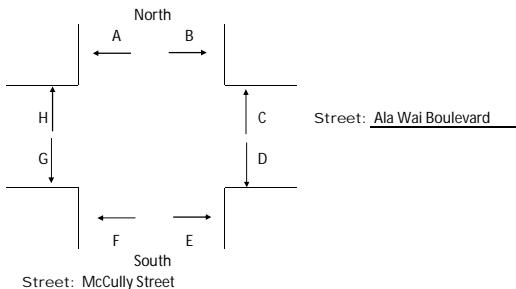
Intersection: Ala Wai Blvd/McCully St
 Date: Wednesday, 4/11/2012
 By: N/A
 Weather: Clear



TIME	A	B	C	D	E	F	G	H
5:30 PM - 5:45 PM	7	6	21	21	11	14	3	6
5:45 PM - 6:00 PM	7	5	10	22	16	9	7	4
6:00 PM - 6:15 PM	5	12	19	26	16	9	1	8
6:15 PM - 6:30 PM	4	2	15	17	11	13	7	8
6:30 PM - 6:45 PM	2	10	17	31	7	8	3	13
6:45 PM - 7:00 PM	6	8	11	21	12	10	2	9
7:00 PM - 7:15 PM	4	2	18	23	14	13	9	5
7:15 PM - 7:30 PM	6	9	23	22	17	10	2	7
7:30 PM - 7:45 PM	3	7	9	22	7	14	8	4
7:45 PM - 8:00 PM	8	2	19	18	18	5	11	5

Friday Night PEAK HOUR

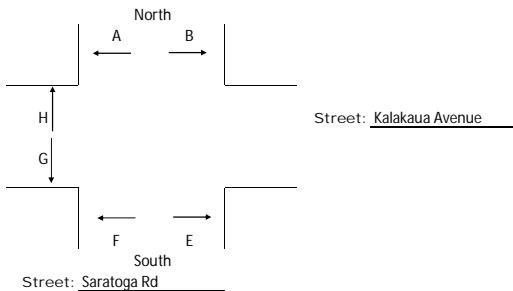
Intersection: Ala Wai Blvd/McCully St
 Date: Friday, 4/20/2012
 By: N/A
 Weather: Clear



TIME	A	B	C	D	E	F	G	H
5:30 PM - 5:45 PM	8	9	25	33	31	16	7	8
5:45 PM - 6:00 PM	5	5	21	11	11	18	7	9
6:00 PM - 6:15 PM	8	5	14	34	11	11	12	8
6:15 PM - 6:30 PM	5	2	13	22	9	10	4	4
6:30 PM - 6:45 PM	2	5	16	28	7	14	4	0
6:45 PM - 7:00 PM	7	8	17	19	8	15	9	11
7:00 PM - 7:15 PM	8	1	17	18	16	5	5	13
7:15 PM - 7:30 PM	10	3	23	10	6	7	7	9
7:30 PM - 7:45 PM	5	5	13	19	13	11	4	14
7:45 PM - 8:00 PM	1	2	10	17	6	3	3	1

AM PEAK HOUR

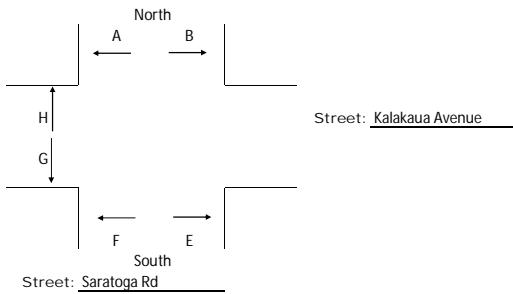
Intersection: Kalakaua Ave/Saratoga Rd
 Date: Tuesday, 4/3/2012
 By: Gary Goo
 Weather: Sunny



TIME	A	B	C	D	E	F	G	H
7:00 AM - 7:15 AM	15	9			14	42	18	8
7:15 AM - 7:30 AM	2	4			33	26	4	4
7:30 AM - 7:45 AM	11	11			57	27	7	7
7:45 AM - 8:00 AM	16	8			57	53	15	10
8:00 AM - 8:15 AM	19	19			18	36	16	10
8:15 AM - 8:30 AM	19	15			17	39	12	13
8:30 AM - 8:45 AM	5	9			16	62	14	10
8:45 AM - 9:00 AM	7	25			31	43	18	0

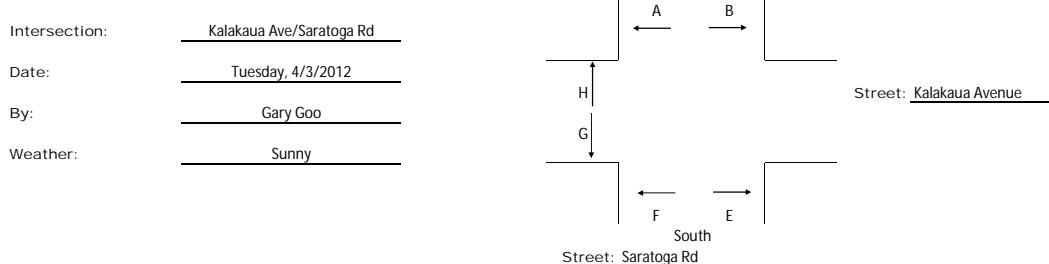
MD PEAK HOUR

Intersection: Kalakaua Ave/Saratoga Rd
 Date: Tuesday, 4/3/2012
 By: Gary Goo
 Weather: Sunny



TIME	A	B	C	D	E	F	G	H
11:00 AM - 11:15 AM	25	20			38	50	14	17
11:15 AM - 11:30 AM	26	9			38	67	25	9
11:30 AM - 11:45 AM	24	13			26	57	15	16
11:45 AM - 12:00 PM	14	15			28	40	16	16
12:00 PM - 12:15 PM	12	5			33	43	22	13
12:15 PM - 12:30 PM	27	19			33	37	6	20
12:30 PM - 12:45 PM	19	19			38	51	9	16
12:45 PM - 1:00 PM	21	24			53	70	17	10

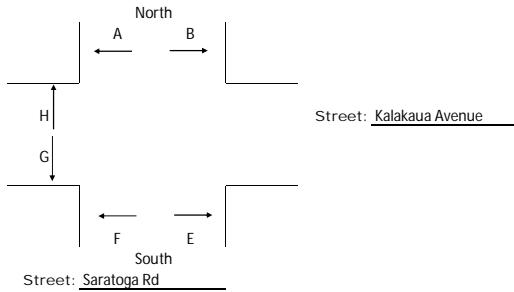
PM PEAK HOUR



TIME	A	B	C	D	E	F	G	H
3:30 PM - 3:45 PM	13	17			57	52	19	16
3:45 PM - 4:00 PM	13	16			39	45	9	11
4:00 PM - 4:15 PM	29	17			54	50	22	29
4:15 PM - 4:30 PM	31	26			52	84	19	17
4:30 PM - 4:45 PM	28	29			68	88	28	45
4:45 PM - 5:00 PM	29	23			30	87	33	12
5:00 PM - 5:15 PM	33	19			99	78	43	20
5:15 PM - 5:30 PM	12	18			39	93	32	23

Saturday PEAK HOUR

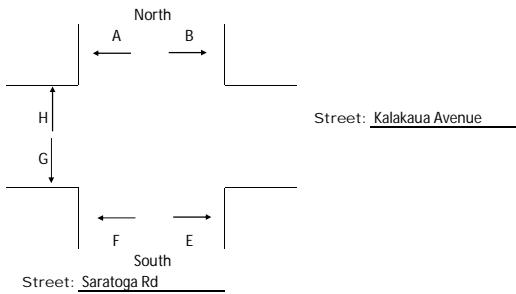
Intersection: Kalakaua Ave/Saratoga Rd
 Date: Saturday, 4/7/2012
 By: Gary Goo
 Weather: Clear



TIME	A	B	C	D	E	F	G	H
11:00 AM - 11:15 AM	24	33			46	66	15	31
11:15 AM - 11:30 AM	43	24			51	42	12	24
11:30 AM - 11:45 AM	23	19			41	75	17	36
11:45 AM - 12:00 PM	44	24			59	48	14	19
12:00 PM - 12:15 PM	44	24			48	59	12	31
12:15 PM - 12:30 PM	31	18			34	32	15	30
12:30 PM - 12:45 PM	10	29			56	54	22	20
12:45 PM - 1:00 PM	24	20			61	45	9	15
1:00 PM - 1:15 PM	26	35			62	59	7	29
1:15 PM - 1:30 PM	44	24			59	48	12	31
1:30 PM - 1:45 PM	60	30			55	43	27	36
1:45 PM - 2:00 PM	32	27			45	52	27	20

Night PEAK HOUR

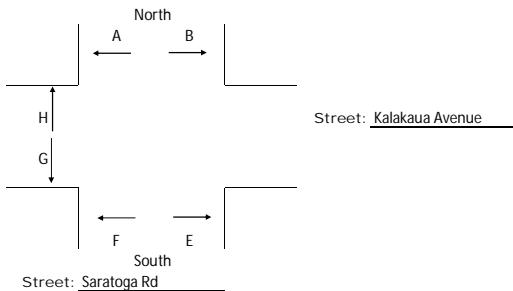
Intersection: Kalakaua Ave/Saratoga Rd
 Date: Wednesday, 4/11/2012
 By: Gary Goo
 Weather: Clear



TIME	A	B	C	D	E	F	G	H
5:30 PM - 5:45 PM	23	23			70	71	18	27
5:45 PM - 6:00 PM	55	54			75	68	30	33
6:00 PM - 6:15 PM	46	42			83	49	20	29
6:15 PM - 6:30 PM	38	29			124	78	34	18
6:30 PM - 6:45 PM	38	29			79	63	38	24
6:45 PM - 7:00 PM	41	24			91	93	42	22
7:00 PM - 7:15 PM	53	30			90	103	26	50
7:15 PM - 7:30 PM	22	12			40	58	8	18
7:30 PM - 7:45 PM	74	16			72	116	45	23
7:45 PM - 8:00 PM	51	32			51	125	24	43

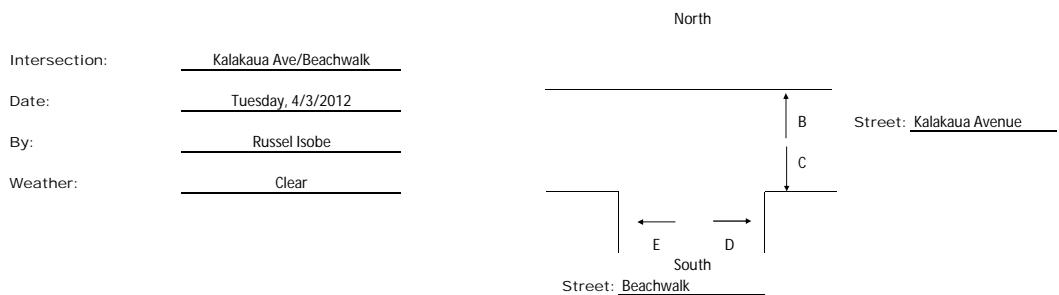
Friday Night PEAK HOUR

Intersection: Kalakaua Ave/Saratoga Rd
 Date: Friday, 4/20/2012
 By: Gary Goo
 Weather: Clear



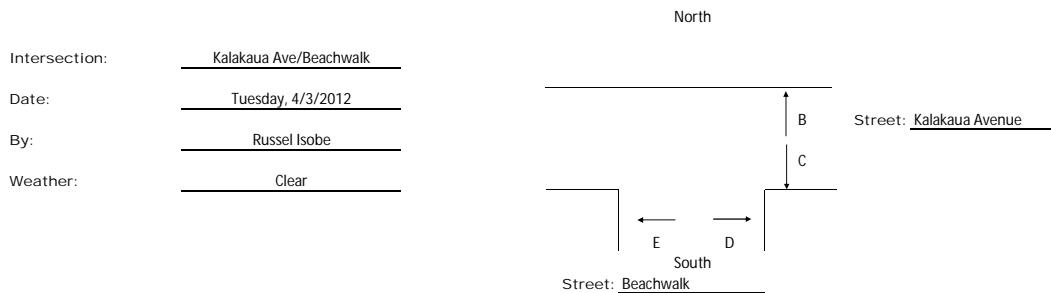
TIME	A	B	C	D	E	F	G	H
5:30 PM - 5:45 PM	61	45			61	61	35	33
5:45 PM - 6:00 PM	40	87			81	40	20	31
6:00 PM - 6:15 PM	50	14			87	101	44	42
6:15 PM - 6:30 PM	59	68			87	90	36	19
6:30 PM - 6:45 PM	81	27			48	66	27	25
6:45 PM - 7:00 PM	60	71			87	66	36	33
7:00 PM - 7:15 PM	46	34			94	100	44	42
7:15 PM - 7:30 PM	48	30			98	96	67	44
7:30 PM - 7:45 PM	59	37			83	70	13	52
7:45 PM - 8:00 PM	69	38			89	63	32	50

AM PEAK HOUR



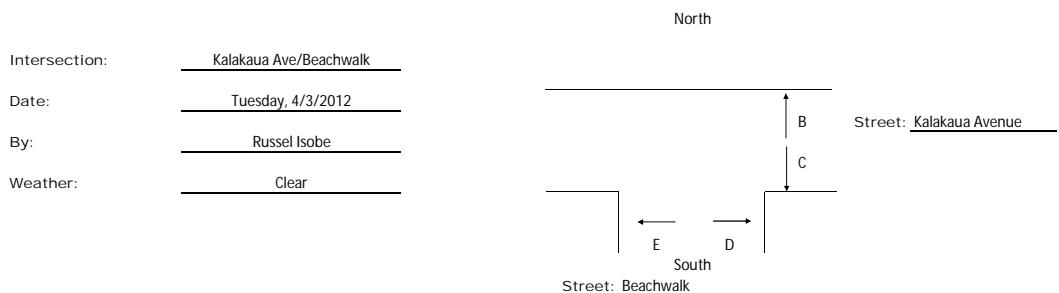
TIME	A	B	C	D	E	F	G	H
7:00 AM - 7:15 AM		9	12	41	36			
7:15 AM - 7:30 AM		5	9	44	39			
7:30 AM - 7:45 AM		12	13	53	39			
7:45 AM - 8:00 AM		14	9	71	40			
8:00 AM - 8:15 AM		27	19	50	48			
8:15 AM - 8:30 AM		10	16	63	43			
8:30 AM - 8:45 AM		25	15	79	32			
8:45 AM - 9:00 AM		17	15	78	42			

MD PEAK HOUR



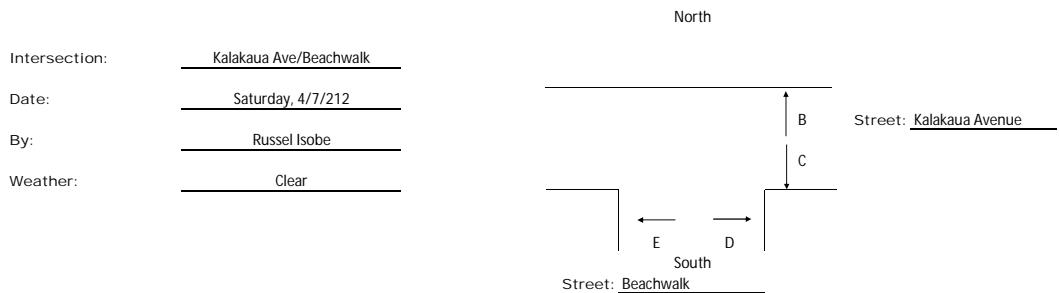
TIME	A	B	C	D	E	F	G	H
11:00 AM - 11:15 AM		18	28	65	54			
11:15 AM - 11:30 AM		26	35	51	47			
11:30 AM - 11:45 AM		22	37	94	71			
11:45 AM - 12:00 PM		21	39	73	78			
12:00 PM - 12:15 PM		42	31	51	51			
12:15 PM - 12:30 PM		30	32	93	88			
12:30 PM - 12:45 PM		50	50	74	67			
12:45 PM - 1:00 PM		22	29	72	80			

PM PEAK HOUR



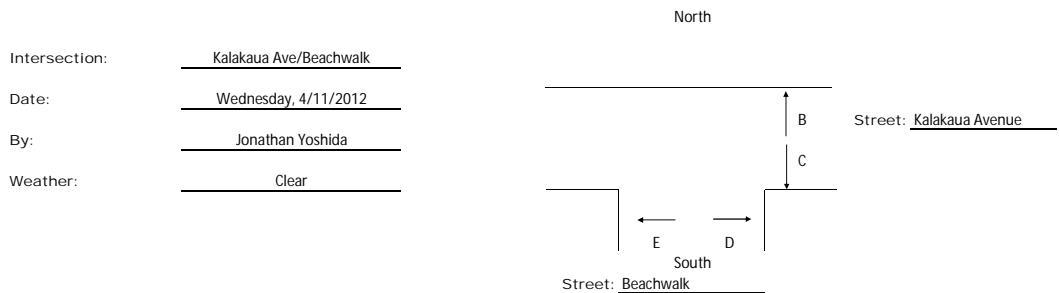
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3:30 PM - 3:45 PM		32	28	76	64			
3:45 PM - 4:00 PM		33	33	92	76			
4:00 PM - 4:15 PM		25	38	57	71			
4:15 PM - 4:30 PM		24	32	89	64			
4:30 PM - 4:45 PM		51	36	118	76			
4:45 PM - 5:00 PM		37	47	112	89			
5:00 PM - 5:15 PM		51	33	123	91			
5:15 PM - 5:30 PM		36	31	118	63			

Saturday PEAK HOUR



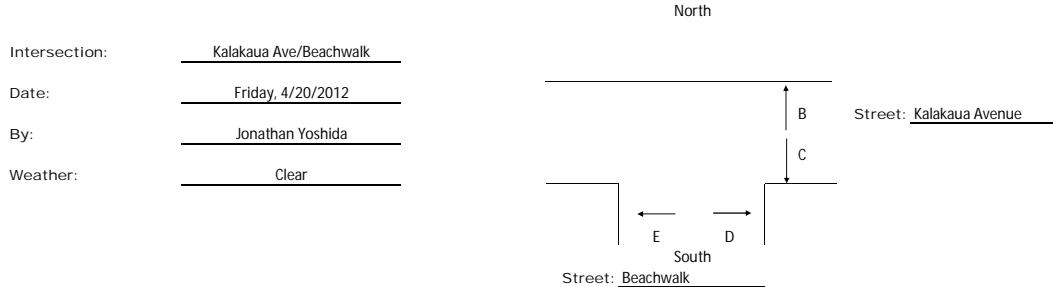
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11:00 AM - 11:15 AM		37	37	62	62			
11:15 AM - 11:30 AM		45	45	79	79			
11:30 AM - 11:45 AM		36	36	69	69			
11:45 AM - 12:00 PM		24	24	55	55			
12:00 PM - 12:15 PM		30	30	57	57			
12:15 PM - 12:30 PM		57	57	31	31			
12:30 PM - 12:45 PM		53	75	27	49			
12:45 PM - 1:00 PM		75	76	47	32			
1:00 PM - 1:15 PM		82	62	35	34			
1:15 PM - 1:30 PM		81	92	37	36			
1:30 PM - 1:45 PM		87	64	28	40			
1:45 PM - 2:00 PM		85	76	60	40			

Night PEAK HOUR



TIME	A	B	C	D	E	F	G	H
- 12:15 AM		30	52	85	89			
12:15 AM - 12:30 AM		38	39	100	78			
12:30 AM - 12:45 AM		49	37	116	69			
12:45 AM - 1:00 AM		38	43	102	95			
1:00 AM - 1:15 AM		29	61	185	104			
1:15 AM - 1:30 AM		75	58	147	112			
1:30 AM - 1:45 AM		54	66	142	115			
1:45 AM - 2:00 AM		58	50	119	109			
2:00 AM - 2:15 AM		69	45	151	115			
2:15 AM - 2:30 AM		85	58	153	150			

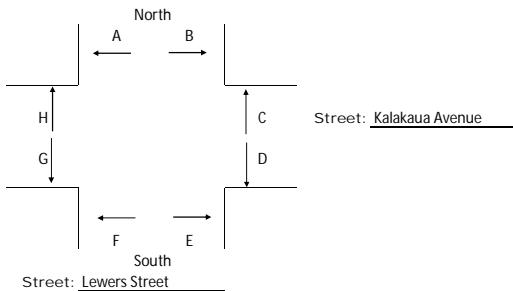
Friday Night PEAK HOUR



TIME	A	B	C	D	E	F	G	H
5:30 PM - 5:45 PM		49	54	102	87			
5:45 PM - 6:00 PM		37	59	123	119			
6:00 PM - 6:15 PM		80	51	137	120			
6:15 PM - 6:30 PM		33	48	63	137			
6:30 PM - 6:45 PM		42	56	133	48			
6:45 PM - 7:00 PM		48	67	116	158			
7:00 PM - 7:15 PM		48	47	113	139			
7:15 PM - 7:30 PM		58	51	129	138			
7:30 PM - 7:45 PM		60	53	157	97			
7:45 PM - 8:00 PM		44	54	105	102			

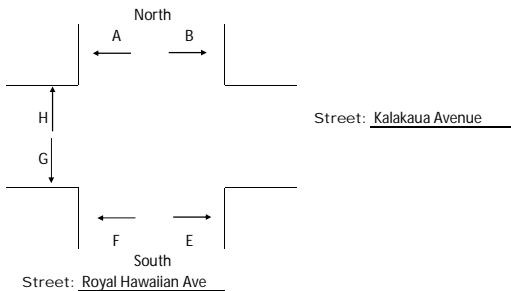
Friday Night PEAK HOUR

Intersection: Kalakaua Ave/Lewers St
 Date: Friday, 4/20/2012
 By:
 Weather: 0



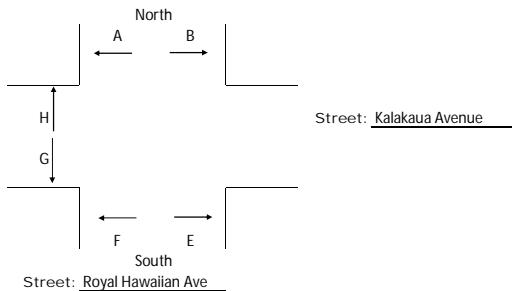
TIME	A	B	C	D	E	F	G	H
5:30 PM - 5:45 PM	119	127	52	111	159	171	62	61
5:45 PM - 6:00 PM	146	145	83	101	110	154	58	47
6:00 PM - 6:15 PM	125	142	54	101	114	139	81	48
6:15 PM - 6:30 PM	111	86	75	52	126	135	78	48
6:30 PM - 6:45 PM	111	126	48	74	134	142	86	56
6:45 PM - 7:00 PM	120	128	50	72	142	140	57	37
7:00 PM - 7:15 PM	153	147	107	90	135	162	81	40
7:15 PM - 7:30 PM	106	103	83	72	189	176	122	70
7:30 PM - 7:45 PM	121	72	62	63	114	165	68	44
7:45 PM - 8:00 PM					129	178	53	68

AM PEAK HOUR

Intersection: Kalakaua Ave/Royal Hawaiian AveDate: Tuesday, 4/3/2012By: Armay CabatuWeather: Sunny

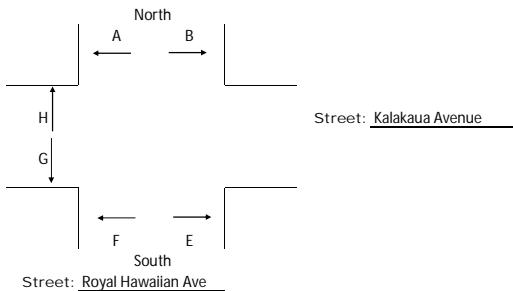
TIME	A	B	C	D	E	F	G	H
7:00 AM - 7:15 AM	14	17			43	75	26	23
7:15 AM - 7:30 AM	42	33			107	142	12	23
7:30 AM - 7:45 AM	23	28			38	87	8	28
7:45 AM - 8:00 AM	53	17			167	70	25	23
8:00 AM - 8:15 AM	35	35			57	66	11	44
8:15 AM - 8:30 AM	53	33			59	46	18	32
8:30 AM - 8:45 AM	55	41			43	77	26	42
8:45 AM - 9:00 AM	126	68			113	127	28	90

MD PEAK HOUR

Intersection: Kalakaua Ave/Royal Hawaiian AveDate: Tuesday, 4/3/2012By: Armay CabatuWeather: Sunny

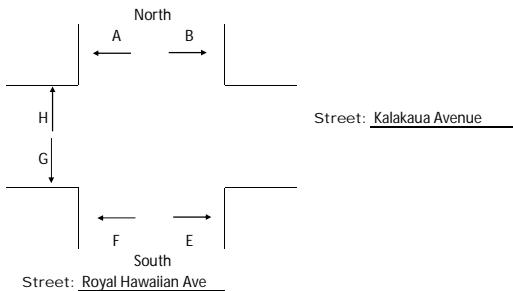
TIME	A	B	C	D	E	F	G	H
11:00 AM - 11:15 AM	146	129			133	105	52	55
11:15 AM - 11:30 AM	144	114			122	123	39	50
11:30 AM - 11:45 AM	133	117			133	139	58	50
11:45 AM - 12:00 PM	125	135			146	124	85	64
12:00 PM - 12:15 PM	106	107			108	133	74	56
12:15 PM - 12:30 PM	248	120			142	117	73	78
12:30 PM - 12:45 PM	140	122			122	129	112	64
12:45 PM - 1:00 PM	157	130			166	110	83	49

PM PEAK HOUR

Intersection: Kalakaua Ave/Royal Hawaiian AveDate: Tuesday, 4/3/2012By: Armay CabatuWeather: Sunny

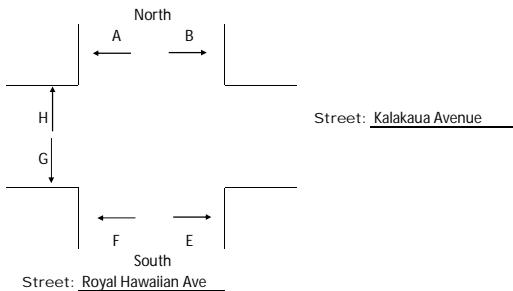
TIME	A	B	C	D	E	F	G	H
3:30 PM - 3:45 PM	158	155			182	165	98	79
3:45 PM - 4:00 PM	161	113			181	187	110	102
4:00 PM - 4:15 PM	172	150			147	188	82	82
4:15 PM - 4:30 PM	143	139			144	156	93	80
4:30 PM - 4:45 PM	168	203			184	229	117	90
4:45 PM - 5:00 PM	197	178			201	207	124	81
5:00 PM - 5:15 PM	175	162			251	195	103	85
5:15 PM - 5:30 PM	245	205			317	228	135	113

Saturday PEAK HOUR

Intersection: Kalakaua Ave/Royal Hawaiian AveDate: Saturday, 4/7/2012By: Armay CabatuWeather: Clear

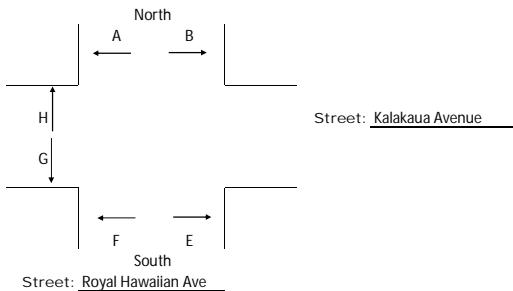
TIME	A	B	C	D	E	F	G	H
11:00 AM - 11:15 AM	116	139			99	106	37	50
11:15 AM - 11:30 AM	103	94			128	127	73	100
11:30 AM - 11:45 AM	113	117			133	125	44	78
11:45 AM - 12:00 PM	150	98			127	109	59	38
12:00 PM - 12:15 PM	115	80			128	90	90	63
12:15 PM - 12:30 PM	85	92			115	131	89	68
12:30 PM - 12:45 PM	96	112			114	107	83	66
12:45 PM - 1:00 PM	116	142			114	150	88	80
1:00 PM - 1:15 PM	121	89			115	130	101	76
1:15 PM - 1:30 PM	135	94			120	141	93	65
1:30 PM - 1:45 PM	109	126			124	142	81	90
1:45 PM - 2:00 PM	165	99			142	131	87	83

Night PEAK HOUR

Intersection: Kalakaua Ave/Royal Hawaiian AveDate: Wednesday, 4/11/2012By: Armay CabatuWeather: Clear

TIME	A	B	C	D	E	F	G	H
5:30 PM - 5:45 PM	196	119			164	151	86	83
5:45 PM - 6:00 PM	186	165			174	193	71	78
6:00 PM - 6:15 PM	189	166			177	232	92	109
6:15 PM - 6:30 PM	153	99			209	264	68	76
6:30 PM - 6:45 PM	182	140			257	237	92	120
6:45 PM - 7:00 PM	211	188			270	325	113	88
7:00 PM - 7:15 PM	299	167			281	256	116	128
7:15 PM - 7:30 PM	189	202			290	245	106	97
7:30 PM - 7:45 PM	304	209			254	295	145	106
7:45 PM - 8:00 PM	340	236			262	331	87	89

Friday Night PEAK HOUR

Intersection: Kalakaua Ave/Royal Hawaiian AveDate: Friday, 5/4/2012By: Armay CabatuWeather: Clear

TIME	A	B	C	D	E	F	G	H
5:30 PM - 5:45 PM	233	223			181	212	127	77
5:45 PM - 6:00 PM	254	187			163	239	103	122
6:00 PM - 6:15 PM	319	185			335	190	126	97
6:15 PM - 6:30 PM	205	194			245	239	98	105
6:30 PM - 6:45 PM	300	193			182	195	132	98
6:45 PM - 7:00 PM	245	170			255	247	115	143
7:00 PM - 7:15 PM	439	219			269	270	185	146
7:15 PM - 7:30 PM	255	240			279	272	155	125
7:30 PM - 7:45 PM	466	241			178	312	112	133
7:45 PM - 8:00 PM	337	279			242	356	111	151

AM COUNT SHEET

				North									
Intersection:		Lewers St & Don Ho Ln											
Date:		Tuesday, 4/3/2012											
By:		Mala						C Street: Don Ho Lane					
Weather:		Sunny				D							
						F E		South					
						Street: Lewers St							
TIME		A	B	C	D	E	F	G	H				
7:00 AM	-	7:15 AM			22	38	3	5					
7:15 AM	-	7:30 AM			31	39	2	3					
7:30 AM	-	7:45 AM			34	85	12	12					
7:45 AM	-	8:00 AM			48	21	4	9					
8:00 AM	-	8:15 AM			65	38	2	16					
8:15 AM	-	8:30 AM			57	40	11	18					
8:30 AM	-	8:45 AM			60	47	13	55					
8:45 AM	-	9:00 AM			88	63	4	27					

MD COUNT SHEET

				North									
Intersection:	Lewers St & Don Ho Ln					C	Street:	Don Ho Lane					
Date:	Tuesday, 4/3/2012					D							
By:	Mala												
Weather:	Sunny					F	E						
								South					
								Street:	Lewers St				
TIME	A	B	C	D	E	F	G	H					
11:00 AM - 11:15 AM			86	60	6	12							
11:15 AM - 11:30 AM			91	60	13	5							
11:30 AM - 11:45 AM			63	66	15	21							
11:45 AM - 12:00 PM			58	81	3	18							
12:00 PM - 12:15 PM			88	77	3	16							
12:15 PM - 12:30 PM			71	83	21	26							
12:30 PM - 12:45 PM			89	121	6	22							
12:45 PM - 1:00 PM			116	77	2	18							

PM COUNT SHEET

				North									
Intersection:	Lewers St & Don Ho Ln												
Date:	Tuesday, 4/3/2012												
By:	Mala					C	Street: Don Ho Lane						
Weather:	Sunny				D								
						F	E						
								South					
								Street: Lewers St					
TIME	A	B	C	D	E	F	G	H					
3:30 PM - 3:45 PM			89	105	7	13							
3:45 PM - 4:00 PM			75	94	9	41							
4:00 PM - 4:15 PM			75	60	16	42							
4:15 PM - 4:30 PM			93	97	17	32							
4:30 PM - 4:45 PM			124	72	19	32							
4:45 PM - 5:00 PM			84	115	21	59							
5:00 PM - 5:15 PM			106	69	40	52							
5:15 PM - 5:30 PM			160	83	22	40							

Saturday COUNT SHEET

North							
Intersection:	Lewers St & Don Ho Ln						
Date:	Saturday, 4/11/2012						
By:	David Miyasaki						
Weather:	Sunny						
				← →			
			F E				
			South				
			Street: Lewers St				
TIME	A	B	C	D	E	F	G
11:00 AM - 11:15 AM			103	74	12	22	
11:15 AM - 11:30 AM			86	102	8	42	
11:30 AM - 11:45 AM			64	118	17	24	
11:45 AM - 12:00 PM			75	74	28	6	
12:00 PM - 12:15 PM			96	82	18	18	
12:15 PM - 12:30 PM			95	93	27	15	
12:30 PM - 12:45 PM			87	95	19	29	
12:45 PM - 1:00 PM			105	89	23	20	
1:00 PM - 1:15 PM			103	101	18	20	
1:15 PM - 1:30 PM			80	139	20	33	
1:30 PM - 1:45 PM			96	71	41	46	
1:45 PM - 2:00 PM			101	151	3	14	

Night COUNT SHEET

				North																			
Intersection:	Lewers St & Don Ho Ln																						
Date:	Wednesday, 4/11/2012											C	Street: Don Ho Lane										
By:	David Miyasaki											D											
Weather:	Sunny											F	E										
												South											
												Street: Lewers St											
TIME		A	B	C	D	E	F	G	H														
5:30 PM	-	5:45 PM			153	131	15	71															
5:45 PM	-	6:00 PM			131	123	25	40															
6:00 PM	-	6:15 PM			182	158	29	83															
6:15 PM	-	6:30 PM			171	124	39	82															
6:30 PM	-	6:45 PM			184	171	30	117															
6:45 PM	-	7:00 PM			311	188	45	103															
7:00 PM	-	7:15 PM			221	203	33	70															
7:15 PM	-	7:30 PM			229	180	23	92															
7:30 PM	-	7:45 PM			212	195	45	94															
7:45 PM	-	8:00 PM			207	214	25	91															

Friday Night COUNT SHEET

				North																			
Intersection:	Lewers St & Don Ho Ln																						
Date:	Friday, 4/20/2012											C	Street: Don Ho Lane										
By:	Russel Isobe											D											
Weather:	Sunny											F	E										
												South											
												Street: Lewers St											
TIME		A	B	C	D	E	F	G	H														
5:30 PM	-	5:45 PM																					
5:45 PM	-	6:00 PM																					
6:00 PM	-	6:15 PM			158	154	34	82															
6:15 PM	-	6:30 PM			194	139	21	86															
6:30 PM	-	6:45 PM			204	165	21	103															
6:45 PM	-	7:00 PM			231	104	35	110															
7:00 PM	-	7:15 PM			222	172	43	123															
7:15 PM	-	7:30 PM			230	209	16	87															
7:30 PM	-	7:45 PM			239	165	55	77															
7:45 PM	-	8:00 PM			194	251	46	117															

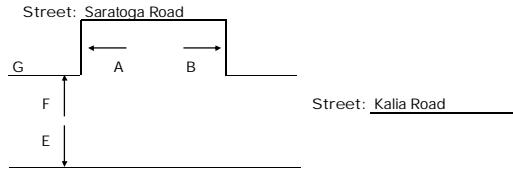
AM COUNT SHEET

MD COUNT SHEET

PM COUNT SHEET

Saturday PEAK HOUR

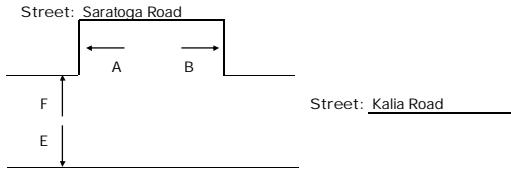
Intersection: Saratoga Rd & Kalia Rd
 Date: Saturday, 4/7/2012
 By: Jesse Danco
 Weather: Sunny



TIME	A	B	C	D	E	F	G	H
11:00 AM - 11:15 AM	37	5			33	6		
11:15 AM - 11:30 AM	30	17			23	18		
11:30 AM - 11:45 AM	33	26			40	21		
11:45 AM - 12:00 PM	33	17			27	10		
12:00 PM - 12:15 PM	20	20			21	21		
12:15 PM - 12:30 PM	26	29			33	22		
12:30 PM - 12:45 PM	28	27			36	19		
12:45 PM - 1:00 PM	33	10			24	8		
1:00 PM - 1:15 PM	31	17			43	23		
1:15 PM - 1:30 PM	21	24			25	40		
1:30 PM - 1:45 PM	27	12			19	13		
1:45 PM - 2:00 PM	27	16			25	25		

Night PEAK HOUR

Intersection: Saratoga Rd & Kalia Rd
 Date: Wednesday, 4/11/2012
 By: Jesse Danco
 Weather: Sunny

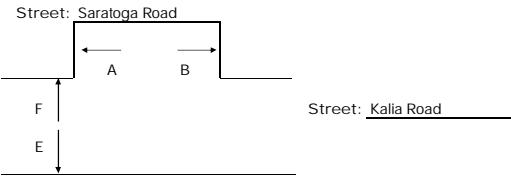


South

TIME	A	B	C	D	E	F	G	H
5:30 PM - 5:45 PM	41	28			31	65		
5:45 PM - 6:00 PM	21	19			26	29		
6:00 PM - 6:15 PM	20	20			21	31		
6:15 PM - 6:30 PM	21	24			30	27		
6:30 PM - 6:45 PM	35	32			35	36		
6:45 PM - 7:00 PM	20	33			19	37		
7:00 PM - 7:15 PM	29	31			19	50		
7:15 PM - 7:30 PM	22	4			17	31		
7:30 PM - 7:45 PM	45	14			37	26		
7:45 PM - 8:00 PM	46	24			48	26		

Friday Night PEAK HOUR

Intersection: Saratoga Rd & Kalia Rd
 Date: Friday, 4/20/2012
 By: Jesse Danco
 Weather: Sunny



TIME	A	B	C	D	E	F	G	H
5:30 PM - 5:45 PM	27	38			34	24		
5:45 PM - 6:00 PM	27	32			28	24		
6:00 PM - 6:15 PM	23	33			30	25		
6:15 PM - 6:30 PM	39	26			34	21		
6:30 PM - 6:45 PM	39	48			38	21		
6:45 PM - 7:00 PM	49	50			65	30		
7:00 PM - 7:15 PM	54	54			73	35		
7:15 PM - 7:30 PM	51	50			75	31		
7:30 PM - 7:45 PM	57	22			61	8		
7:45 PM - 8:00 PM	62	65			67	76		

Appendix B

Level of Service Definitions

The *Highway Capacity Manual* defines six Level of Service (LOS), labeled A through F, from best to worst conditions. Level of Service for signalized and unsignalized intersections are defined in terms of average user delays. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time.

For unsignalized intersections, the *Highway Capacity Manual* evaluates gaps in the major street traffic flow and calculates available gaps for left-turns across oncoming traffic and for the left and right-turns onto the major roadway from the minor street.

LEVEL-OF-SERVICE A: Little or no delay.

LEVEL-OF-SERVICE B: Short traffic delays.

LEVEL-OF-SERVICE C: Average traffic delays.

LEVEL-OF-SERVICE D: Long traffic delays.

LEVEL-OF-SERVICE E: Very long traffic delays.

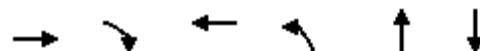
LEVEL-OF-SERVICE F: Demand volume exceeds capacity, resulting in extreme delays with queuing that may cause severe congestion and affect other movements at the intersection.

Appendix C
Intersection Analysis Worksheets

Timings
3: Kapiolani Boulevard & Kalakaua Avenue

Existing AM

2/1/2013



Lane Group	EBT	EBR	WBT	NBL	NBT	SBT
Lane Configurations	↑↑	↑↑	↑↑↓	↑↑	↑↑↓	↑↑↓
Volume (vph)	383	421	1481	760	1185	730
Turn Type		pt+ov		Prot		
Protected Phases	2	2 3	6	3	8	4
Permitted Phases						
Detector Phase	2	2 3	6	3	8	4
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	22.0		22.0	10.0	22.0	21.0
Total Split (s)	75.0	100.0	75.0	25.0	65.0	40.0
Total Split (%)	53.6%	71.4%	53.6%	17.9%	46.4%	28.6%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	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			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		Max	None	None	None
Act Effct Green (s)	69.0	94.3	69.0	19.3	57.6	32.3
Actuated g/C Ratio	0.50	0.68	0.50	0.14	0.42	0.23
v/c Ratio	0.24	0.24	0.79	1.73	0.91	0.85
Control Delay	20.5	9.1	31.9	372.5	48.3	59.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	9.1	31.9	372.5	48.3	59.1
LOS	C	A	C	F	D	E
Approach Delay	14.5		31.9		172.8	59.1
Approach LOS	B		C		F	E

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 138.6

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.73

Intersection Signal Delay: 86.1

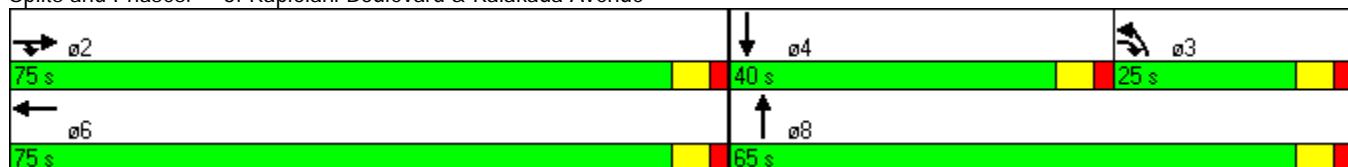
Intersection LOS: F

Intersection Capacity Utilization 89.8%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: Kapiolani Boulevard & Kalakaua Avenue



HCM Signalized Intersection Capacity Analysis

3: Kapiolani Boulevard & Kalakaua Avenue

Existing AM

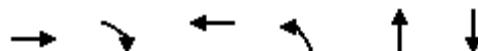
2/1/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑↑				↑↑	↑↑			↑↑↑	
Volume (vph)	0	383	421	0	1481	202	760	1185	34	0	730	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0			6.0	6.0			6.0	
Lane Util. Factor	0.95	0.88		0.91			0.97	0.95			0.91	
Frpb, ped/bikes	1.00	1.00		0.93			1.00	0.99			0.93	
Flpb, ped/bikes	1.00	1.00		1.00			1.00	1.00			1.00	
Fr	1.00	0.85		0.98			1.00	1.00			0.98	
Flt Protected	1.00	1.00		1.00			0.95	1.00			1.00	
Satd. Flow (prot)	3539	2787		4669			3433	3498			4630	
Flt Permitted	1.00	1.00		1.00			0.95	1.00			1.00	
Satd. Flow (perm)	3539	2787		4669			3433	3498			4630	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	416	458	0	1610	220	826	1288	37	0	793	120
RTOR Reduction (vph)	0	0	0	0	4	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	416	458	0	1826	0	826	1324	0	0	913	0
Confl. Peds. (#/hr)	1118				1118	100			100	1700		1700
Turn Type			pt+ov				Prot					
Protected Phases	2	2	3		6		3	8			4	
Permitted Phases												
Actuated Green, G (s)	69.0	94.3		69.0			19.3	57.6			32.3	
Effective Green, g (s)	69.0	94.3		69.0			19.3	57.6			32.3	
Actuated g/C Ratio	0.50	0.68		0.50			0.14	0.42			0.23	
Clearance Time (s)	6.0			6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0			3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	1762	1896		2324			478	1454			1079	
v/s Ratio Prot	0.12	0.16		c0.39			c0.24	c0.38			0.20	
v/s Ratio Perm												
v/c Ratio	0.24	0.24		0.79			1.73	0.91			0.85	
Uniform Delay, d1	19.8	8.5		28.7			59.6	38.1			50.8	
Progression Factor	1.00	1.00		1.00			1.00	1.00			1.00	
Incremental Delay, d2	0.1	0.1		2.8			336.3	8.8			6.3	
Delay (s)	19.9	8.5		31.5			396.0	46.9			57.0	
Level of Service	B	A		C			F	D			E	
Approach Delay (s)	13.9			31.5				181.0			57.0	
Approach LOS	B			C			F				E	
Intersection Summary												
HCM Average Control Delay	88.6			HCM Level of Service			F					
HCM Volume to Capacity ratio	1.00											
Actuated Cycle Length (s)	138.6			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	89.8%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

Timings
3: Kapiolani Boulevard & Kalakaua Avenue

Existing MD

2/1/2013



Lane Group	EBT	EBR	WBT	NBL	NBT	SBT
Lane Configurations	↑↑	↑↑	↑↑↓↑	↑↑	↑↑↓	↑↑↓↑
Volume (vph)	945	409	1481	495	604	750
Turn Type		pt+ov		Prot		
Protected Phases	2	2 3	6	3	8	4
Permitted Phases						
Detector Phase	2	2 3	6	3	8	4
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	22.0		22.0	10.0	22.0	21.0
Total Split (s)	45.0	65.0	45.0	20.0	70.0	50.0
Total Split (%)	39.1%	56.5%	39.1%	17.4%	60.9%	43.5%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	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			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		Max	None	None	None
Act Effct Green (s)	39.1	59.2	39.1	14.0	48.6	28.6
Actuated g/C Ratio	0.39	0.59	0.39	0.14	0.49	0.29
v/c Ratio	0.74	0.27	0.95	1.11	0.42	0.72
Control Delay	30.8	11.1	41.8	116.5	16.8	35.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	11.1	41.8	116.5	16.8	35.1
LOS	C	B	D	F	B	D
Approach Delay	24.8		41.8		60.0	35.1
Approach LOS	C		D		E	D

Intersection Summary

Cycle Length: 115

Actuated Cycle Length: 99.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 40.2

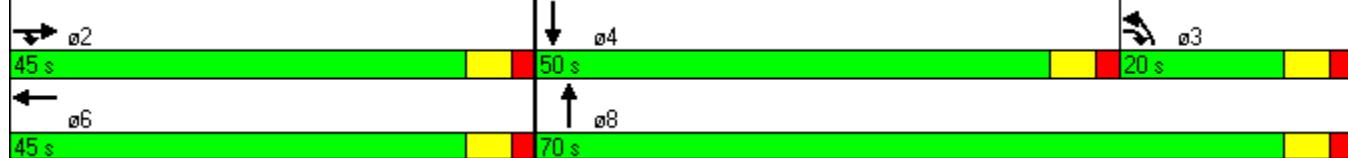
Intersection LOS: D

Intersection Capacity Utilization 81.7%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 3: Kapiolani Boulevard & Kalakaua Avenue



HCM Signalized Intersection Capacity Analysis

3: Kapiolani Boulevard & Kalakaua Avenue

Existing MD

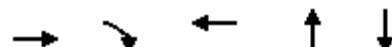
2/1/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	945	409	0	1481	153	495	604	42	0	750	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0			6.0	6.0			6.0	
Lane Util. Factor	0.95	0.88		0.91			0.97	0.95			0.91	
Frpb, ped/bikes	1.00	1.00		0.95			1.00	0.99			0.92	
Flpb, ped/bikes	1.00	1.00		1.00			1.00	1.00			1.00	
Fr _t	1.00	0.85		0.99			1.00	0.99			0.98	
Fl _t Protected	1.00	1.00		1.00			0.95	1.00			1.00	
Satd. Flow (prot)	3539	2787		4760			3433	3460			4597	
Fl _t Permitted	1.00	1.00		1.00			0.95	1.00			1.00	
Satd. Flow (perm)	3539	2787		4760			3433	3460			4597	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1027	445	0	1610	166	538	657	46	0	815	134
RTOR Reduction (vph)	0	0	0	0	10	0	0	5	0	0	1	0
Lane Group Flow (vph)	0	1027	445	0	1766	0	538	698	0	0	948	0
Confl. Peds. (#/hr)	1118				1118	100			100	1700		1700
Turn Type			pt+ov				Prot					
Protected Phases	2	2	3		6		3	8			4	
Permitted Phases												
Actuated Green, G (s)	39.1	59.2		39.1			14.1	48.6			28.5	
Effective Green, g (s)	39.1	59.2		39.1			14.1	48.6			28.5	
Actuated g/C Ratio	0.39	0.59		0.39			0.14	0.49			0.29	
Clearance Time (s)	6.0			6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0			3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	1388	1655		1867			486	1687			1314	
v/s Ratio Prot	0.29	0.16		c0.37			c0.16	0.20			c0.21	
v/s Ratio Perm												
v/c Ratio	0.74	0.27		0.95			1.11	0.41			0.72	
Uniform Delay, d1	25.9	9.8		29.3			42.8	16.4			32.0	
Progression Factor	1.00	1.00		1.00			1.00	1.00			1.00	
Incremental Delay, d2	2.1	0.1		11.5			73.3	0.2			2.0	
Delay (s)	28.1	9.9		40.8			116.1	16.6			34.0	
Level of Service	C	A		D			F	B			C	
Approach Delay (s)	22.6			40.8				59.7			34.0	
Approach LOS	C			D			E				C	
Intersection Summary												
HCM Average Control Delay	39.0			HCM Level of Service			D					
HCM Volume to Capacity ratio	0.90											
Actuated Cycle Length (s)	99.7			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	81.7%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

Timings
3: Kapiolani Boulevard & Kalakaua Avenue

Existing PM

2/1/2013



Lane Group	EBT	EBR	WBT	NBT	SBT
Lane Configurations	↑↑↑→	↑	↑↑→	↑↑→	↑↑↑→
Volume (vph)	1640	683	1308	1176	843
Turn Type	Perm				
Protected Phases	2		6	8	4
Permitted Phases		2			
Detector Phase	2	2	6	8	4
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	21.0
Total Split (s)	90.0	90.0	90.0	50.0	50.0
Total Split (%)	64.3%	64.3%	64.3%	35.7%	35.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	Max	None	None
Act Effct Green (s)	84.0	84.0	84.0	44.0	44.0
Actuated g/C Ratio	0.60	0.60	0.60	0.31	0.31
v/c Ratio	0.58	0.59	0.80	1.20	0.63
Control Delay	18.1	21.3	25.4	141.3	43.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	21.3	25.4	141.3	43.0
LOS	B	C	C	F	D
Approach Delay	18.7		25.4	141.3	43.0
Approach LOS	B		C	F	D

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.20

Intersection Signal Delay: 49.4

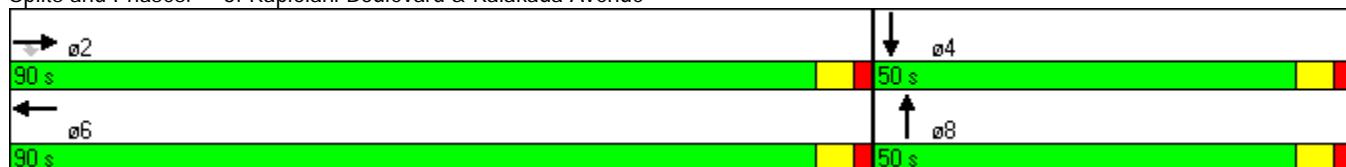
Intersection LOS: D

Intersection Capacity Utilization 86.1%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: Kapiolani Boulevard & Kalakaua Avenue



HCM Signalized Intersection Capacity Analysis

3: Kapiolani Boulevard & Kalakaua Avenue

Existing PM

2/1/2013

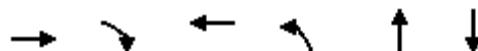
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↓	↑		↑↓			↑↓		↑↑↓	↑↑↓	
Volume (vph)	0	1640	683	0	1308	146	0	1176	40	0	843	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	0.81	0.81			0.95			0.95			0.91	
Frpb, ped/bikes	1.00	1.00			0.95			0.99			0.97	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Fr	0.98	0.85			0.98			1.00			0.99	
Flt Protected	1.00	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	5909	1282			3296			3491			4908	
Flt Permitted	1.00	1.00			1.00			1.00			1.00	
Satd. Flow (perm)	5909	1282			3296			3491			4908	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1783	742	0	1422	159	0	1278	43	0	916	49
RTOR Reduction (vph)	0	0	0	0	1	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	2072	453	0	1580	0	0	1320	0	0	964	0
Confl. Peds. (#/hr)	1118				1118	100		100	1700		1700	
Turn Type												
Protected Phases	2				6			8			4	
Permitted Phases		2										
Actuated Green, G (s)	84.0	84.0			84.0			44.0			44.0	
Effective Green, g (s)	84.0	84.0			84.0			44.0			44.0	
Actuated g/C Ratio	0.60	0.60			0.60			0.31			0.31	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	3545	769			1978			1097			1543	
v/s Ratio Prot	0.35				c0.48			c0.38			0.20	
v/s Ratio Perm		0.35										
v/c Ratio	0.58	0.59			0.80			1.20			0.62	
Uniform Delay, d1	17.2	17.3			21.5			48.0			41.0	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	0.2	1.2			3.5			100.2			0.8	
Delay (s)	17.5	18.5			25.0			148.2			41.7	
Level of Service	B	B			C			F			D	
Approach Delay (s)	17.7				25.0			148.2			41.7	
Approach LOS	B				C			F			D	
Intersection Summary												
HCM Average Control Delay	50.1				HCM Level of Service			D				
HCM Volume to Capacity ratio	0.94											
Actuated Cycle Length (s)	140.0				Sum of lost time (s)			12.0				
Intersection Capacity Utilization	86.1%				ICU Level of Service			E				
Analysis Period (min)	15											
c Critical Lane Group												

Timings

3: Kapiolani Boulevard & Kalakaua Avenue

Proposed Condition - 20 LT busses

2/1/2013



Lane Group	EBT	EBR	WBT	NBL	NBT	SBT
Lane Configurations	↑↑↑↓	↗	↑↖	↖↑	↑↗	↑↑↖
Volume (vph)	1640	683	1308	20	1176	843
Turn Type		pt+ov		Prot		
Protected Phases	2	2 3	6	3	8	4
Permitted Phases						
Detector Phase	2	2 3	6	3	8	4
Switch Phase						
Minimum Initial (s)	4.0		4.0	2.0	4.0	4.0
Minimum Split (s)	22.0		22.0	6.0	22.0	21.0
Total Split (s)	90.0	96.0	90.0	6.0	50.0	44.0
Total Split (%)	64.3%	68.6%	64.3%	4.3%	35.7%	31.4%
Yellow Time (s)	4.0		4.0	3.0	4.0	4.0
All-Red Time (s)	2.0		2.0	1.0	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			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		Max	None	None	None
Act Effct Green (s)	84.0	91.3	84.0	5.7	44.0	34.3
Actuated g/C Ratio	0.60	0.65	0.60	0.04	0.31	0.24
v/c Ratio	0.58	0.54	0.79	0.16	1.20	0.78
Control Delay	18.1	17.3	24.8	69.9	142.2	53.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	17.3	24.8	69.9	142.2	53.9
LOS	B	B	C	E	F	D
Approach Delay	17.9		24.8		141.0	53.9
Approach LOS	B		C		F	D

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.20

Intersection Signal Delay: 50.8

Intersection LOS: D

Intersection Capacity Utilization 85.6%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: Kapiolani Boulevard & Kalakaua Avenue



HCM Signalized Intersection Capacity Analysis

3: Kapiolani Boulevard & Kalakaua Avenue

Proposed Condition - 20 LT busses

2/1/2013

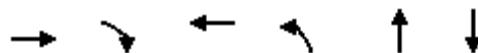
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↓	↑		↑↑↓		↑↑	↑↑		↑↑↑↓		
Volume (vph)	0	1640	683	0	1308	146	20	1176	40	0	843	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0			4.0	6.0			6.0	
Lane Util. Factor	0.81	0.81		0.95			0.97	0.95			0.91	
Frpb, ped/bikes	1.00	1.00		0.96			1.00	0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00			1.00	1.00			1.00	
Fr	0.98	0.85		0.98			1.00	1.00			0.99	
Flt Protected	1.00	1.00		1.00			0.95	1.00			1.00	
Satd. Flow (prot)	5909	1282		3353			3433	3486			4997	
Flt Permitted	1.00	1.00		1.00			0.95	1.00			1.00	
Satd. Flow (perm)	5909	1282		3353			3433	3486			4997	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1783	742	0	1422	159	22	1278	43	0	916	49
RTOR Reduction (vph)	0	1	1	0	0	0	0	1	0	0	5	0
Lane Group Flow (vph)	0	2071	452	0	1581	0	22	1320	0	0	960	0
Confl. Peds. (#/hr)	254				254	151		131	131		151	
Turn Type			pt+ov				Prot					
Protected Phases	2	2	3		6		3	8			4	
Permitted Phases												
Actuated Green, G (s)	84.0	93.7		84.0			5.7	44.0			34.3	
Effective Green, g (s)	84.0	89.7		84.0			5.7	44.0			34.3	
Actuated g/C Ratio	0.60	0.64		0.60			0.04	0.31			0.24	
Clearance Time (s)	6.0			6.0			4.0	6.0			6.0	
Vehicle Extension (s)	3.0			3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	3545	821		2012			140	1096			1224	
v/s Ratio Prot	0.35	0.35		c0.47			0.01	c0.38			0.19	
v/s Ratio Perm												
v/c Ratio	0.58	0.55		0.79			0.16	1.20			0.78	
Uniform Delay, d1	17.2	14.0		21.2			64.8	48.0			49.4	
Progression Factor	1.00	1.00		1.00			1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.8		3.2			0.5	100.7			3.4	
Delay (s)	17.5	14.8		24.4			65.4	148.7			52.8	
Level of Service	B	B		C			E	F			D	
Approach Delay (s)	17.0			24.4				147.3			52.8	
Approach LOS	B			C				F			D	
Intersection Summary												
HCM Average Control Delay	51.5			HCM Level of Service			D					
HCM Volume to Capacity ratio	0.93											
Actuated Cycle Length (s)	140.0			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	85.6%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

Timings

Alternative 1 - 300 LT

2/1/2013

3: Kapiolani Boulevard & Kalakaua Avenue



Lane Group	EBT	EBR	WBT	NBL	NBT	SBT
Lane Configurations	↑↑↑→	↑	↑↑→	↑↑	↑↑→	↑↑↑→
Volume (vph)	1640	683	1308	300	1176	843
Turn Type		pt+ov		Prot		
Protected Phases	2	2 3	6	3	8	4
Permitted Phases						
Detector Phase	2	2 3	6	3	8	4
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	22.0		22.0	10.0	22.0	21.0
Total Split (s)	75.0	100.0	75.0	25.0	65.0	40.0
Total Split (%)	53.6%	71.4%	53.6%	17.9%	46.4%	28.6%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	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			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		Max	None	None	None
Act Effct Green (s)	69.0	94.2	69.0	19.2	57.3	32.1
Actuated g/C Ratio	0.50	0.68	0.50	0.14	0.41	0.23
v/c Ratio	0.70	0.52	0.94	0.68	0.91	0.83
Control Delay	27.8	13.8	45.2	65.2	48.8	57.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	13.8	45.2	65.2	48.8	57.3
LOS	C	B	D	E	D	E
Approach Delay	25.3		45.2		52.1	57.3
Approach LOS	C		D		D	E

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 138.3

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 41.1

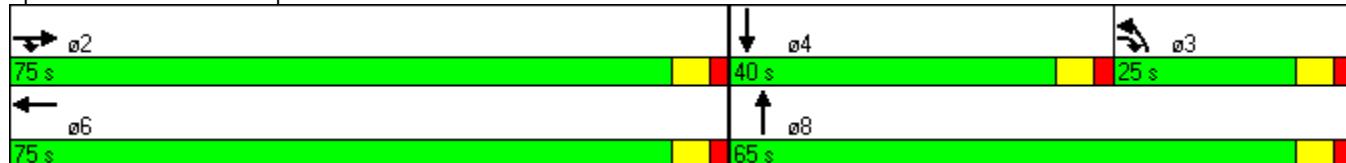
Intersection LOS: D

Intersection Capacity Utilization 85.6%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: Kapiolani Boulevard & Kalakaua Avenue



HCM Signalized Intersection Capacity Analysis
3: Kapiolani Boulevard & Kalakaua Avenue

Alternative 1 - 300 LT

2/1/2013

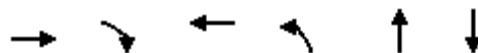
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↓	↑		↑↑↓		↑↑	↑↑↓		↑↑↑↓		
Volume (vph)	0	1640	683	0	1308	146	300	1176	40	0	843	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0			6.0	6.0			6.0	
Lane Util. Factor	0.81	0.81		0.95			0.97	0.95			0.91	
Frpb, ped/bikes	1.00	1.00		0.96			1.00	0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00			1.00	1.00			1.00	
Fr	0.98	0.85		0.98			1.00	1.00			0.99	
Flt Protected	1.00	1.00		1.00			0.95	1.00			1.00	
Satd. Flow (prot)	5909	1282		3354			3433	3486			4994	
Flt Permitted	1.00	1.00		1.00			0.95	1.00			1.00	
Satd. Flow (perm)	5909	1282		3354			3433	3486			4994	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1783	742	0	1422	159	326	1278	43	0	916	49
RTOR Reduction (vph)	0	21	0	0	4	0	0	2	0	0	4	0
Lane Group Flow (vph)	0	2051	453	0	1577	0	326	1319	0	0	961	0
Confl. Peds. (#/hr)	254				254	151			131	131		151
Turn Type			pt+ov				Prot					
Protected Phases	2	2	3		6		3	8			4	
Permitted Phases												
Actuated Green, G (s)	69.0	94.2		69.0			19.2	57.3			32.1	
Effective Green, g (s)	69.0	94.2		69.0			19.2	57.3			32.1	
Actuated g/C Ratio	0.50	0.68		0.50			0.14	0.41			0.23	
Clearance Time (s)	6.0			6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0			3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	2948	873		1673			477	1444			1159	
v/s Ratio Prot	0.35	0.35		c0.47			0.09	c0.38			0.19	
v/s Ratio Perm												
v/c Ratio	0.70	0.52		0.94			0.68	0.91			0.83	
Uniform Delay, d1	26.6	10.9		32.8			56.7	38.2			50.5	
Progression Factor	1.00	1.00		1.00			1.00	1.00			1.00	
Incremental Delay, d2	0.7	0.5		12.1			4.0	9.1			5.0	
Delay (s)	27.3	11.4		44.9			60.7	47.3			55.5	
Level of Service	C	B		D			E	D			E	
Approach Delay (s)	24.5			44.9			50.0				55.5	
Approach LOS	C			D			D				E	
Intersection Summary												
HCM Average Control Delay	40.0			HCM Level of Service			D					
HCM Volume to Capacity ratio	0.93											
Actuated Cycle Length (s)	138.3			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	85.6%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

Timings

Alternative 2 - 300 LT

2/1/2013

3: Kapiolani Boulevard & Kalakaua Avenue



Lane Group	EBT	EBR	WBT	NBL	NBT	SBT
Lane Configurations	↑↑↑→	↑	↑↑→	↑↑	↑↑→	↑↑↑→
Volume (vph)	1640	683	1308	300	1176	843
Turn Type		pt+ov		Prot		
Protected Phases	2	2 3	6	3	8	4
Permitted Phases						
Detector Phase	2	2 3	6	3	8	4
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	22.0		22.0	10.0	22.0	21.0
Total Split (s)	90.0	110.0	90.0	20.0	50.0	30.0
Total Split (%)	64.3%	78.6%	64.3%	14.3%	35.7%	21.4%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	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			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		Max	None	None	None
Act Effct Green (s)	84.0	104.0	84.0	14.0	44.0	24.0
Actuated g/C Ratio	0.60	0.74	0.60	0.10	0.31	0.17
v/c Ratio	0.58	0.48	0.79	0.95	1.20	1.13
Control Delay	17.5	9.1	24.8	99.6	142.2	122.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	9.1	24.8	99.6	142.2	122.9
LOS	B	A	C	F	F	F
Approach Delay	16.0		24.8		133.8	122.9
Approach LOS	B		C		F	F

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.20

Intersection Signal Delay: 62.3

Intersection LOS: E

Intersection Capacity Utilization 85.6%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: Kapiolani Boulevard & Kalakaua Avenue



HCM Signalized Intersection Capacity Analysis
3: Kapiolani Boulevard & Kalakaua Avenue

Alternative 2 - 300 LT

2/1/2013

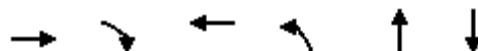
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↓	↑		↑↑↓		↑↑	↑↑		↑↑↑↓		
Volume (vph)	0	1640	683	0	1308	146	300	1176	40	0	843	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0			6.0	6.0			6.0	
Lane Util. Factor	0.81	0.81		0.95			0.97	0.95			0.91	
Frpb, ped/bikes	1.00	1.00		0.96			1.00	0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00			1.00	1.00			1.00	
Fr	0.98	0.85		0.98			1.00	1.00			0.99	
Flt Protected	1.00	1.00		1.00			0.95	1.00			1.00	
Satd. Flow (prot)	5909	1282		3353			3433	3486			4977	
Flt Permitted	1.00	1.00		1.00			0.95	1.00			1.00	
Satd. Flow (perm)	5909	1282		3353			3433	3486			4977	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1783	742	0	1422	159	326	1278	43	0	916	49
RTOR Reduction (vph)	0	21	0	0	0	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	2051	453	0	1581	0	326	1320	0	0	961	0
Confl. Peds. (#/hr)	254				254	151			131	131		151
Turn Type			pt+ov				Prot					
Protected Phases	2	2	3		6		3	8			4	
Permitted Phases												
Actuated Green, G (s)	84.0	104.0		84.0			14.0	44.0			24.0	
Effective Green, g (s)	84.0	104.0		84.0			14.0	44.0			24.0	
Actuated g/C Ratio	0.60	0.74		0.60			0.10	0.31			0.17	
Clearance Time (s)	6.0			6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0			3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	3545	952		2012			343	1096			853	
v/s Ratio Prot	0.35	0.35		c0.47			0.09	c0.38			0.19	
v/s Ratio Perm												
v/c Ratio	0.58	0.48		0.79			0.95	1.20			1.13	
Uniform Delay, d1	17.2	7.2		21.2			62.7	48.0			58.0	
Progression Factor	1.00	1.00		1.00			1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.4		3.2			35.6	100.7			71.8	
Delay (s)	17.4	7.5		24.4			98.3	148.7			129.8	
Level of Service	B	A		C			F	F			F	
Approach Delay (s)	15.6			24.4				138.7			129.8	
Approach LOS	B			C				F			F	
Intersection Summary												
HCM Average Control Delay	64.2			HCM Level of Service			E					
HCM Volume to Capacity ratio	0.93											
Actuated Cycle Length (s)	140.0			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	85.6%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

Timings

3: Kapiolani Boulevard & Kalakaua Avenue

Proposed Condition - 500 LT

2/1/2013



Lane Group	EBT	EBR	WBT	NBL	NBT	SBT
Lane Configurations	↑↑↑→	↑	↑↑	↑↑	↑↑→	↑↑↑→
Volume (vph)	1640	683	1308	500	1176	843
Turn Type		pt+ov			Prot	
Protected Phases	2	2 3	6	3	8	4
Permitted Phases						
Detector Phase	2	2 3	6	3	8	4
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	22.0		22.0	10.0	22.0	21.0
Total Split (s)	90.0	110.0	90.0	20.0	50.0	30.0
Total Split (%)	64.3%	78.6%	64.3%	14.3%	35.7%	21.4%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	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			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		Max	None	None	None
Act Effct Green (s)	84.0	104.0	84.0	14.0	44.0	24.0
Actuated g/C Ratio	0.60	0.74	0.60	0.10	0.31	0.17
v/c Ratio	0.58	0.48	0.79	1.58	1.20	1.13
Control Delay	17.5	9.1	24.8	315.0	142.2	122.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	9.1	24.8	315.0	142.2	122.9
LOS	B	A	C	F	F	F
Approach Delay	16.0		24.8		192.5	122.9
Approach LOS	B		C		F	F

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.58

Intersection Signal Delay: 80.3

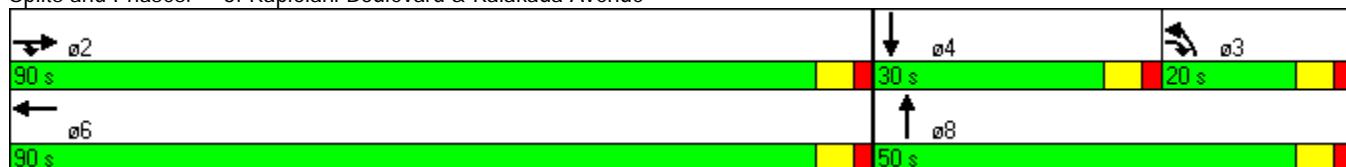
Intersection LOS: F

Intersection Capacity Utilization 88.6%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: Kapiolani Boulevard & Kalakaua Avenue



HCM Signalized Intersection Capacity Analysis
3: Kapiolani Boulevard & Kalakaua Avenue

Proposed Condition - 500 LT

2/1/2013

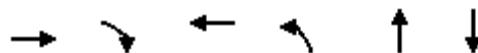
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↓	↑		↑↑↓		↑↑	↑↑		↑↑↑↓		
Volume (vph)	0	1640	683	0	1308	146	500	1176	40	0	843	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0			6.0	6.0			6.0	
Lane Util. Factor	0.81	0.81		0.95			0.97	0.95			0.91	
Frpb, ped/bikes	1.00	1.00		0.96			1.00	0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00			1.00	1.00			1.00	
Fr	0.98	0.85		0.98			1.00	1.00			0.99	
Flt Protected	1.00	1.00		1.00			0.95	1.00			1.00	
Satd. Flow (prot)	5909	1282		3353			3433	3486			4977	
Flt Permitted	1.00	1.00		1.00			0.95	1.00			1.00	
Satd. Flow (perm)	5909	1282		3353			3433	3486			4977	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1783	742	0	1422	159	543	1278	43	0	916	49
RTOR Reduction (vph)	0	21	0	0	0	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	2051	453	0	1581	0	543	1320	0	0	961	0
Confl. Peds. (#/hr)	254				254	151			131	131		151
Turn Type			pt+ov				Prot					
Protected Phases	2	2	3		6		3	8			4	
Permitted Phases												
Actuated Green, G (s)	84.0	104.0		84.0			14.0	44.0			24.0	
Effective Green, g (s)	84.0	104.0		84.0			14.0	44.0			24.0	
Actuated g/C Ratio	0.60	0.74		0.60			0.10	0.31			0.17	
Clearance Time (s)	6.0			6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0			3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	3545	952		2012			343	1096			853	
v/s Ratio Prot	0.35	0.35		c0.47			c0.16	c0.38			0.19	
v/s Ratio Perm												
v/c Ratio	0.58	0.48		0.79			1.58	1.20			1.13	
Uniform Delay, d1	17.2	7.2		21.2			63.0	48.0			58.0	
Progression Factor	1.00	1.00		1.00			1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.4		3.2			275.9	100.7			71.8	
Delay (s)	17.4	7.5		24.4			338.9	148.7			129.8	
Level of Service	B	A		C			F	F			F	
Approach Delay (s)	15.6			24.4				204.1			129.8	
Approach LOS	B			C			F				F	
Intersection Summary												
HCM Average Control Delay	84.2			HCM Level of Service			F					
HCM Volume to Capacity ratio	0.99											
Actuated Cycle Length (s)	140.0			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	88.6%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

Timings

3: Kapiolani Boulevard & Kalakaua Avenue

Proposed Condition - 700 LT

2/1/2013



Lane Group	EBT	EBR	WBT	NBL	NBT	SBT
Lane Configurations	↑↑↑→	↑	↑↑→	↑↑	↑↑→	↑↑↑→
Volume (vph)	1640	683	1308	700	1176	843
Turn Type		pt+ov		Prot		
Protected Phases	2	2 3	6	3	8	4
Permitted Phases						
Detector Phase	2	2 3	6	3	8	4
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	22.0		22.0	10.0	22.0	21.0
Total Split (s)	90.0	110.0	90.0	20.0	50.0	30.0
Total Split (%)	64.3%	78.6%	64.3%	14.3%	35.7%	21.4%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	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			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		Max	None	None	None
Act Effct Green (s)	84.0	104.0	84.0	14.0	44.0	24.0
Actuated g/C Ratio	0.60	0.74	0.60	0.10	0.31	0.17
v/c Ratio	0.58	0.48	0.79	2.22	1.20	1.13
Control Delay	17.5	9.1	24.8	585.4	142.2	122.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	9.1	24.8	585.4	142.2	122.9
LOS	B	A	C	F	F	F
Approach Delay	16.0		24.8		304.2	122.9
Approach LOS	B		C		F	F

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 2.22

Intersection Signal Delay: 116.2

Intersection LOS: F

Intersection Capacity Utilization 94.3%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 3: Kapiolani Boulevard & Kalakaua Avenue



HCM Signalized Intersection Capacity Analysis
3: Kapiolani Boulevard & Kalakaua Avenue

Proposed Condition - 700 LT

2/1/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↓	↑		↑↑↓		↑↑	↑↑		↑↑↑↓		
Volume (vph)	0	1640	683	0	1308	146	700	1176	40	0	843	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0			6.0	
Lane Util. Factor	0.81	0.81		0.95			0.97	0.95			0.91	
Frpb, ped/bikes	1.00	1.00		0.96			1.00	0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00			1.00	1.00			1.00	
Fr	0.98	0.85		0.98			1.00	1.00			0.99	
Flt Protected	1.00	1.00		1.00			0.95	1.00			1.00	
Satd. Flow (prot)	5909	1282		3353			3433	3486			4977	
Flt Permitted	1.00	1.00		1.00			0.95	1.00			1.00	
Satd. Flow (perm)	5909	1282		3353			3433	3486			4977	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1783	742	0	1422	159	761	1278	43	0	916	49
RTOR Reduction (vph)	0	21	0	0	0	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	2051	453	0	1581	0	761	1320	0	0	961	0
Confl. Peds. (#/hr)	254				254	151			131	131		151
Turn Type			pt+ov				Prot					
Protected Phases	2	2	3		6		3	8			4	
Permitted Phases												
Actuated Green, G (s)	84.0	104.0		84.0			14.0	44.0			24.0	
Effective Green, g (s)	84.0	104.0		84.0			14.0	44.0			24.0	
Actuated g/C Ratio	0.60	0.74		0.60			0.10	0.31			0.17	
Clearance Time (s)	6.0			6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0			3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	3545	952		2012			343	1096			853	
v/s Ratio Prot	0.35	0.35		c0.47			c0.22	c0.38			0.19	
v/s Ratio Perm												
v/c Ratio	0.58	0.48		0.79			2.22	1.20			1.13	
Uniform Delay, d1	17.2	7.2		21.2			63.0	48.0			58.0	
Progression Factor	1.00	1.00		1.00			1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.4		3.2			557.8	100.7			71.8	
Delay (s)	17.4	7.5		24.4			620.8	148.7			129.8	
Level of Service	B	A		C			F	F			F	
Approach Delay (s)	15.6			24.4				321.2			129.8	
Approach LOS	B			C				F			F	
Intersection Summary												
HCM Average Control Delay	121.9			HCM Level of Service			F					
HCM Volume to Capacity ratio	1.07											
Actuated Cycle Length (s)	140.0			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	94.3%			ICU Level of Service			F					
Analysis Period (min)	15											
c Critical Lane Group												

Timings
3: Ala Moana Boulevard & Ena Road

Existing PM

2/1/2013

Lane Group	NBL	NBT	NBR	SBL	SBT	SET	NWL	NWT	NWR
Lane Configurations									
Volume (vph)	73	723	440	196	401	67	286	63	101
Turn Type	Prot		Perm	Prot			Split		Perm
Protected Phases	5	2		1	6	8	4	4	
Permitted Phases				2					4
Detector Phase	5	2	2	1	6	8	4	4	4
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	38.0	38.0	10.0	38.0	50.0	50.0	50.0	50.0
Total Split (s)	20.0	70.0	70.0	40.0	90.0	50.0	50.0	50.0	50.0
Total Split (%)	9.5%	33.3%	33.3%	19.0%	42.9%	23.8%	23.8%	23.8%	23.8%
Yellow Time (s)	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
Lost Time Adjust (s)	0.0	0.0	0.0	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	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	Max								
Act Effct Green (s)	14.0	64.0	64.0	34.0	84.0	44.0	44.0	44.0	44.0
Actuated g/C Ratio	0.07	0.30	0.30	0.16	0.40	0.21	0.21	0.21	0.21
v/c Ratio	0.71	0.76	0.83	0.78	0.26	0.51	0.56	0.56	0.31
Control Delay	126.3	72.0	36.0	104.1	41.9	71.2	81.6	81.6	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	126.3	72.0	36.0	104.1	41.9	71.2	81.6	81.6	12.1
LOS	F	E	D	F	D	E	F	F	B
Approach Delay		62.4			61.3	71.2		65.9	
Approach LOS		E			E	E		E	

Intersection Summary

Cycle Length: 210

Actuated Cycle Length: 210

Offset: 40 (19%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 150

Control Type: Pretimed

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 63.2

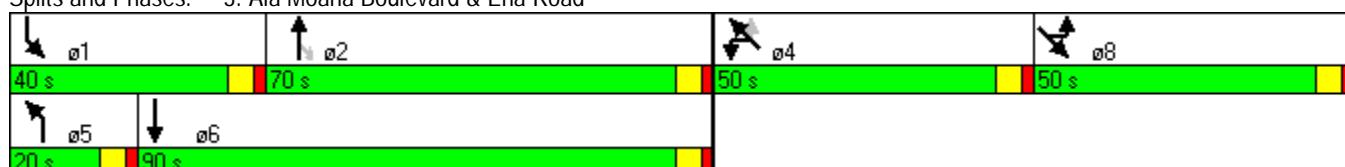
Intersection LOS: E

Intersection Capacity Utilization 116.7%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 3: Ala Moana Boulevard & Ena Road



HCM Signalized Intersection Capacity Analysis

3: Ala Moana Boulevard & Ena Road

Existing PM

2/1/2013

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations	↑	↑↑	↑↑	↑	↑↑↑			↔		↑	↑	↑
Volume (vph)	73	723	440	196	401	32	9	67	63	286	63	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.88	1.00	0.91			1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.44	1.00	0.96			0.81		1.00	1.00	0.85
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	1.00
Fr	1.00	1.00	0.85	1.00	0.99			0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00		0.95	0.97	1.00
Satd. Flow (prot)	1687	3374	1172	1687	4588			1347		1603	1634	1282
Flt Permitted	0.95	1.00	1.00	0.95	1.00			1.00		0.95	0.97	1.00
Satd. Flow (perm)	1687	3374	1172	1687	4588			1347		1603	1634	1282
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	786	478	213	436	35	10	73	68	311	68	110
RTOR Reduction (vph)	0	0	218	0	4	0	0	14	0	0	0	87
Lane Group Flow (vph)	79	786	260	213	467	0	0	137	0	187	192	23
Confl. Peds. (#/hr)	257		228	228		257	101		636	636		101
Turn Type	Prot		Perm	Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2									4
Actuated Green, G (s)	14.0	64.0	64.0	34.0	84.0			44.0		44.0	44.0	44.0
Effective Green, g (s)	14.0	64.0	64.0	34.0	84.0			44.0		44.0	44.0	44.0
Actuated g/C Ratio	0.07	0.30	0.30	0.16	0.40			0.21		0.21	0.21	0.21
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	6.0
Lane Grp Cap (vph)	112	1028	357	273	1835			282		336	342	269
v/s Ratio Prot	0.05	c0.23		c0.13	0.10			c0.10		0.12	c0.12	
v/s Ratio Perm			0.22									0.02
v/c Ratio	0.71	0.76	0.73	0.78	0.25			0.49		0.56	0.56	0.09
Uniform Delay, d1	96.0	66.2	65.3	84.4	42.1			73.0		74.3	74.4	66.8
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	31.2	5.4	12.3	19.5	0.3			5.9		6.5	6.5	0.6
Delay (s)	127.1	71.6	77.6	104.0	42.4			78.9		80.8	80.9	67.4
Level of Service	F	E	E	F	D			E		F	F	E
Approach Delay (s)		77.0			61.6			78.9			77.8	
Approach LOS		E			E			E			E	
Intersection Summary												
HCM Average Control Delay			73.3			HCM Level of Service			E			
HCM Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			210.0			Sum of lost time (s)			24.0			
Intersection Capacity Utilization			116.7%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

Timings

3: Ala Moana Boulevard & Ena Road

existing with ped phase

2/1/2013

Lane Group	NBL	NBT	NBR	SBL	SBT	SET	NWL	NWT	NWR	ø9
Lane Configurations	↑	↑↑	↑↑	↓	↑↑↑	↔	↑	↑	↑	
Volume (vph)	73	723	440	196	401	67	286	63	101	
Turn Type	Prot		Perm	Prot			Split		Perm	
Protected Phases	5	2		1	6	8	4	4		9
Permitted Phases				2					4	
Detector Phase	5	2	2	1	6	8	4	4	4	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	38.0	38.0	10.0	38.0	28.0	50.0	50.0	50.0	10.0
Total Split (s)	20.0	70.0	70.0	40.0	90.0	28.0	50.0	50.0	50.0	52.0
Total Split (%)	8.3%	29.2%	29.2%	16.7%	37.5%	11.7%	20.8%	20.8%	20.8%	22%
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	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					
Recall Mode	Max	Max								
Act Effct Green (s)	14.0	64.0	64.0	34.0	84.0	22.0	44.0	44.0	44.0	
Actuated g/C Ratio	0.06	0.27	0.27	0.14	0.35	0.09	0.18	0.18	0.18	
v/c Ratio	0.81	0.87	0.98	0.89	0.29	1.13	0.64	0.64	0.34	
Control Delay	157.5	95.7	72.8	134.8	56.3	195.3	101.5	101.5	14.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	157.5	95.7	72.8	134.8	56.3	195.3	101.5	101.5	14.0	
LOS	F	F	E	F	E	F	F	F	B	
Approach Delay		91.2			80.8	195.3			81.8	
Approach LOS		F			F	F			F	

Intersection Summary

Cycle Length: 240

Actuated Cycle Length: 240

Offset: 40 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 150

Control Type: Pretimed

Maximum v/c Ratio: 1.13

Intersection Signal Delay: 92.7

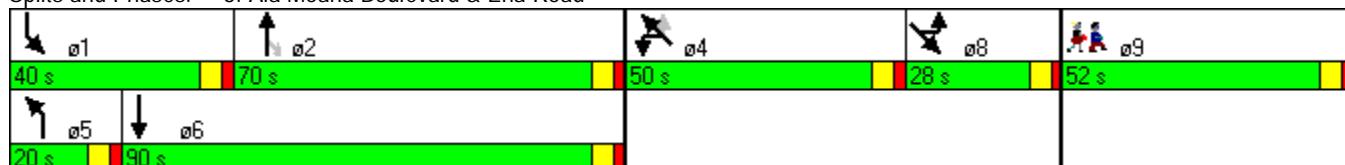
Intersection LOS: F

Intersection Capacity Utilization 116.7%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 3: Ala Moana Boulevard & Ena Road



HCM Signalized Intersection Capacity Analysis

3: Ala Moana Boulevard & Ena Road

existing with ped phase

2/1/2013

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations	↑	↑↑	↑↑	↑	↑↑↑			↔		↑	↑	↑
Volume (vph)	73	723	440	196	401	32	9	67	63	286	63	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.88	1.00	0.91			1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.42	1.00	0.96			0.80		1.00	1.00	0.83
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	1.00
Fr	1.00	1.00	0.85	1.00	0.99			0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00		0.95	0.97	1.00
Satd. Flow (prot)	1687	3374	1117	1687	4580			1328		1603	1634	1252
Flt Permitted	0.95	1.00	1.00	0.95	1.00			1.00		0.95	0.97	1.00
Satd. Flow (perm)	1687	3374	1117	1687	4580			1328		1603	1634	1252
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	786	478	213	436	35	10	73	68	311	68	110
RTOR Reduction (vph)	0	0	191	0	4	0	0	13	0	0	0	90
Lane Group Flow (vph)	79	786	287	213	467	0	0	138	0	187	192	20
Confl. Peds. (#/hr)	257		228	228		257	101		636	636		101
Turn Type	Prot		Perm	Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2									4
Actuated Green, G (s)	14.0	64.0	64.0	34.0	84.0			22.0		44.0	44.0	44.0
Effective Green, g (s)	14.0	64.0	64.0	34.0	84.0			22.0		44.0	44.0	44.0
Actuated g/C Ratio	0.06	0.27	0.27	0.14	0.35			0.09		0.18	0.18	0.18
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	6.0
Lane Grp Cap (vph)	98	900	298	239	1603			122		294	300	230
v/s Ratio Prot	0.05	0.23		c0.13	0.10			c0.10		0.12	c0.12	
v/s Ratio Perm			c0.26									0.02
v/c Ratio	0.81	0.87	0.96	0.89	0.29			1.13		0.64	0.64	0.09
Uniform Delay, d1	111.7	84.1	86.9	101.2	56.5			109.0		90.6	90.7	81.3
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	48.9	11.5	43.8	35.7	0.5			121.8		10.1	10.0	0.8
Delay (s)	160.6	95.6	130.6	136.9	56.9			230.8		100.7	100.7	82.1
Level of Service	F	F	F	F	E			F		F	F	F
Approach Delay (s)		111.9			81.8			230.8			96.5	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay				108.1		HCM Level of Service			F			
HCM Volume to Capacity ratio				0.89								
Actuated Cycle Length (s)				240.0		Sum of lost time (s)			76.0			
Intersection Capacity Utilization				116.7%		ICU Level of Service			H			
Analysis Period (min)				15								
c Critical Lane Group												

Timings

3: Ala Moana Boulevard & Ena Road

Proposed One-Way Ena Road Phasing

2/1/2013



Lane Group	NBL	NBT	NBR	SBL	SBT	NWL	NWT	NWR	ø9
Lane Configurations									
Volume (vph)	73	723	440	196	401	286	63	101	
Turn Type	Prot		Perm	Prot		Split		Perm	
Protected Phases	5	2		1	6	4	4		9
Permitted Phases				2				4	
Detector Phase	5	2	2	1	6	4	4	4	
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	38.0	38.0	10.0	38.0	48.0	48.0	48.0	52.0
Total Split (s)	20.0	70.0	70.0	40.0	90.0	48.0	48.0	48.0	52.0
Total Split (%)	9.5%	33.3%	33.3%	19.0%	42.9%	22.9%	22.9%	22.9%	25%
Yellow Time (s)	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
Lost Time Adjust (s)	0.0	0.0	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	6.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	Max	Max							
Act Effct Green (s)	14.0	64.0	64.0	34.0	84.0	42.0	42.0	42.0	
Actuated g/C Ratio	0.07	0.30	0.30	0.16	0.40	0.20	0.20	0.20	
v/c Ratio	0.71	0.76	0.67	0.78	0.25	0.58	0.59	0.32	
Control Delay	126.3	72.0	25.7	104.1	41.8	84.4	84.4	12.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	126.3	72.0	25.7	104.1	41.8	84.4	84.4	12.6	
LOS	F	E	C	F	D	F	F	B	
Approach Delay		58.7			61.2		68.3		
Approach LOS		E			E		E		

Intersection Summary

Cycle Length: 210

Actuated Cycle Length: 210

Offset: 40 (19%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 150

Control Type: Pretimed

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 61.2

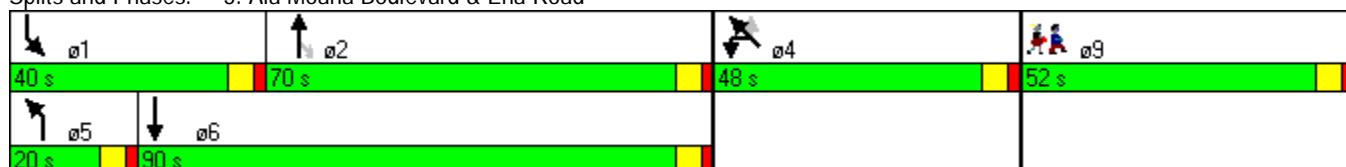
Intersection LOS: E

Intersection Capacity Utilization 62.1%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: Ala Moana Boulevard & Ena Road



HCM Signalized Intersection Capacity Analysis
3: Ala Moana Boulevard & Ena Road

Proposed One-Way Ena Road Phasing

2/1/2013

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	73	723	440	196	401	32	0	0	0	286	63	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.88	1.00	0.91					0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.61	1.00	0.98					1.00	1.00	0.84
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00					1.00	1.00	1.00
Fr _t	1.00	1.00	0.85	1.00	0.99					1.00	1.00	0.85
Fl _t Protected	0.95	1.00	1.00	0.95	1.00					0.95	0.97	1.00
Satd. Flow (prot)	1687	3374	1630	1687	4674					1603	1634	1267
Fl _t Permitted	0.95	1.00	1.00	0.95	1.00					0.95	0.97	1.00
Satd. Flow (perm)	1687	3374	1630	1687	4674					1603	1634	1267
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	786	478	213	436	35	0	0	0	311	68	110
RTOR Reduction (vph)	0	0	218	0	4	0	0	0	0	0	0	88
Lane Group Flow (vph)	79	786	260	213	467	0	0	0	0	187	192	22
Confl. Peds. (#/hr)	257		228	228		257	101		636	636		101
Turn Type	Prot		Perm	Prot						Split		Perm
Protected Phases	5	2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)	14.0	64.0	64.0	34.0	84.0					42.0	42.0	42.0
Effective Green, g (s)	14.0	64.0	64.0	34.0	84.0					42.0	42.0	42.0
Actuated g/C Ratio	0.07	0.30	0.30	0.16	0.40					0.20	0.20	0.20
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0					6.0	6.0	6.0
Lane Grp Cap (vph)	112	1028	497	273	1870					321	327	253
v/s Ratio Prot	0.05	c0.23		c0.13	0.10					0.12	c0.12	
v/s Ratio Perm			0.16									0.02
v/c Ratio	0.71	0.76	0.52	0.78	0.25					0.58	0.59	0.09
Uniform Delay, d1	96.0	66.2	60.4	84.4	42.0					76.1	76.1	68.4
Progression Factor	1.00	1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2	31.2	5.4	3.9	19.5	0.3					7.5	7.5	0.7
Delay (s)	127.1	71.6	64.3	104.0	42.3					83.6	83.7	69.1
Level of Service	F	E	E	F	D					F	F	E
Approach Delay (s)		72.3			61.5			0.0			80.4	
Approach LOS		E			E			A			F	
Intersection Summary												
HCM Average Control Delay			70.9		HCM Level of Service				E			
HCM Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			210.0		Sum of lost time (s)				70.0			
Intersection Capacity Utilization			62.1%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												