

LIHUE TOWN CORE URBAN DESIGN PLAN

IN LIHUE, KAUAI, HAWAII

Prepared For

PBR HAWAII, INC.

and

COUNTY OF KAUAI PLANNING DEPARTMENT

Prepared By

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1. INTRODUCTION

Phillip Rowell and Associates (PRA) has been retained to prepare the following traffic analysis report for Lihue Town Core Urban Design Plan. PRA is a sub-consultant to PBR Hawaii, Inc. on this project.

This introductory chapter presents the purpose and objective of the study, the study area, methodology and order of presentation.

Objective of Study

The objectives of this study are:

- 1. Identify and quantify <u>existing</u> vehicular deficiencies within the study area, including pedestrian circulation issues.
- 2. Estimate future traffic projections for the study intersections and roadway facilities within the study area.
- 3. Identify and develop traffic engineering solutions to address short-term and long-term transportation deficiencies, including traffic management and calming programs.

Study Methodology

- 1. Previously completed traffic studies for the area were obtained, reviewed and summarized.
- 2. An inventory of existing transportation facilities in the study area was performed. The following characteristics of the roadway network were identified:
 - 1. Classification and jurisdiction of roadways
 - 2. Existing roadway cross-sections
 - 3. Intersection lane configurations
 - 4. Traffic control devices
 - 5. Major traffic generators, such as schools and shopping districts
- 3. The data obtained during the inventory and review of previous studies were used to design and perform the following traffic surveys:
 - a. Existing morning and afternoon peak hour traffic volumes for the study intersections were obtained and summarized.
 - b. Existing operating conditions of the study intersections were evaluated with a level-of-service analysis using AM and PM traffic data obtained during the traffic surveys. The methodology described in the 2000 Highway Capacity Manual (HCM) was used to estimate the existing levels-of-service at the study intersections.
- 4. The results of the traffic surveys and analyses were used to identify and quantify existing deficiencies. The deficiencies were quantified relative to delays, volume-to-capacity ratios and levels-of-service.
- 5. Future traffic conditions in the study area were estimated based on future roadway and development projects in the area, anticipated background traffic growth and traffic projections provided in the *Kauai* Long-Range Land Transportation Plan.
- 6. Traffic and transportation improvements needed to mitigate existing and near term deficiencies in the study area were identified.
- 7. The potential transportation improvements were evaluated using established criteria. The criteria included, but was not limited to the following:
 - 1. Final volume-to-capacity ratio
 - 2. Reduction in vehicular delay
 - 3. Pedestrian circulation
- 8. Conclusions of the analyses performed and recommendations were summarized in a report.

Study Area

The study area and the study intersections are shown as Figure 1. The study area is bounded by Kuhio Highway, Ahukini Road, Kapule Highway and Rice Street. This area includes Hardy Street, Akahi Street, Elua Street and Umi Street.

The study area for the project includes the following intersections:

- 1. Kuhio Highway at Rice Street
- 2. Haleko Street at Rice Street
- 3. Eiwa Street at Rice Street
- 4. Umi Street at Rice Street
- 5. Hardy Street/Kalena Street at Rice Street
- 6. Hoolako Street at Rice Street
- 7. Kapule Highway at Rice Street
- 8. Kuhio Highway at Hardy Street
- 9. Akahi Street at Hardy Street
- 10. Eiwa Street at Hardy Street
- 11. Elua Street at Hardy Street
- 12. Umi Street at Hardy Street
- 13. Kuhio Highway at Oxford Street
- 14. Akahi Street at Ahukini Road
- 15. Elua Street at Ahukini Road
- 16. Umi Street at Ahukini Road
- 17. Palai Street at Ahukini Road
- 18. Kapule Highway at Ahukini Road
- 19. Kapule Highway at Ka'ana Street

Order of Presentation

Chapter 2 describes existing traffic conditions, the Level-of-Service (LOS) concept and the results of the Level-of-Service analysis of existing conditions.

Chapter 3 describes the alternative future roadway networks.

Chapter 4 presents the 2020 traffic forecasts for the alternative roadway networks described in Chapter 3.

Chapter 5 describes the criteria used to evaluate the alternatives, identifies deficiencies and presents the final recommendations.

Chapter 6 presents conceptual designs for Rice Street between Kuhio Highway and Umi Street, Hardy Street between Kuhio Highway and Umi Street and Ahukini Road between Kuhio Highway and Umi Street.

2. ANALYSIS OF EXISTING CONDITIONS

This chapter presents the existing traffic conditions on the roadways adjacent to and within the study area. The level-of-service (LOS) concept and the results of the Level-of-Service analysis for existing conditions are also presented.

Existing Street Network

The existing street network is shown as Figure 1. Shown are the existing streets and the study intersections. All of the streets within the study area are two-lane, two-way roadways except Kuhio Highway and Rice Street, which are both four-lanes wide. Along Rice Street, parking is allowed along both sides during the off-peak hours. Parking is prohibited from 7:00 AM to 9:00 AM and from 3:00 PM to 5:00 PM on weekdays.

Existing Peak Hour Traffic Volumes

The existing morning and afternoon peak hour traffic volumes are shown in Figures 2 and 3, respectively. The peak hour volumes at the intersections adjacent to the Civic Center were obtained from the traffic study for the Lihue Civic Center Site Improvement Project. The peak hour volumes for the remaining intersections were determined from manual traffic counts.

- 1. The counts were performed during the first week of November 2004.
- 2. The counts shown include buses, large vehicles and motorcycles. They do not include bicycles and mopeds.
- 3. The total approach and departure volumes may not match those of adjacent intersections because the peak hour of one intersection may be different from that of an adjacent intersection and because there are driveways and on-street parking between intersections.

4. The peak hours of the intersections counted for this project are shown in Table 1. The remaining intersections were counted for the Civic Center TIAR, which indicated that the peak hours are from 7:15 to 8:15 AM and from 4:00 to 5:00 PM.

Intersection No.	Intersection	AM Peak Hour	PM Peak Hour
5	Kalena Street at Rice Street	7:15 - 8:15	4:45 - 5:45
6	Hoolako Street at Rice Street	7:30 - 8:30	3:30 - 4:30
7	Kapule Highway at Rice Street	7:00 - 8:00	4:00 - 5:00
13	Kuhio Highway at Ahukini Road / Oxford Street	7:15 - 8:15	4:00 - 5:00
14	Akahi Street at Ahukini Road	7:45 - 8:45	3:30 - 4:30
15	Elua Street at Ahukini Road	7:15 - 8:15	4:00 - 5:00
16	Umi Street at Ahukini Road	7:00 - 8:00	4:00 - 5:00
17	Palai Street at Ahukini Road	7:00 - 8:00	4:30 - 5:30
18	Kapule Highway at Ahukini Road	7:15 - 8:15	3:30 - 4:30
19	Kapule Highway at Ka Ana Road	7:30 - 8:30	3:30 - 4:30

Table 1 Peak Hours of Study Intersections

Level-of-Service Concept

Signalized Intersections

"Level-of-Service" is a term which denotes any of an infinite number of combinations of traffic operating conditions that may occur on a given lane or roadway when it is subjected to various traffic volumes. Level-of-service is a qualitative measure of the effect of a number of factors which include space, speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience.

There are six levels-of-service, A through F, which relate to the driving conditions from best to worst, respectively. The characteristics of traffic operations for each level-of-service are summarized in Table 2. In general, Level-of-Service A represents free-flow conditions with no congestion. Level-of-Service F, on the other hand, represents severe congestion with stop-and-go conditions.

Corresponding to each level-of-service shown in the table is a volume/capacity ratio. This is the ratio of either existing or projected traffic volumes to the capacity of the intersection. Capacity is defined as the maximum number of vehicles that can be accommodated by the roadway during a specified period of time. The capacity of a particular roadway is dependent upon its physical characteristics such as the number of lanes, the operational characteristics of the roadway (one-way, two-way, turn prohibitions, bus stops, etc.), the type of traffic using the roadway (trucks, buses, etc.) and turning movements.

Level of Service	Interpretation	Volume-to-Capacity Ratio ⁽²⁾	Stopped Delay (Seconds)
Α, Β	Uncongested operations; all vehicles clear in a single cycle.	0.000-0.700	<20.0
С	Light congestion; occasional backups on critical approaches	0.701-0.800	20.1-35.0
D	Congestion on critical approaches but intersection functional. Vehicles must wait through more than one cycle during short periods. No long standing lines formed.	0.801-0.900	35.1-55.0
E	Severe congestion with some standing lines on critical approaches. Blockage of intersection may occur if signal does not provide protected turning movements.	0.901-1.000	55.1-80.0
F	Total breakdown with stop-and-go operation	>1.001	>80.0
Notes:(1)Source: F(2)This is the	lighway Capacity Manual, 2000. a ratio of the calculated critical volume to Level-of-Service E Capacity.		

 Table 2
 Level-of-Service Definitions for Signalized Intersections⁽¹⁾

Level-of-service D is typically considered acceptable for peak hour conditions in urban areas. To be consistent with the conclusions of the TIAR for the Lihue Civic Center Master Plan, Level-of-Service E is considered acceptable under certain circumstances. "Although this level is generally considered undesirable for a signalized intersection, Level-of-Service E is sometimes tolerated for minor movements such as left turns when there are no feasible mitigating measures or if it helps maintain the main through movements at acceptable levels-of-service."¹

¹ M&E Pacific, Inc. Traffic Impact Analysis Report for Lihue Civic Center Master Plan, October 2005, p. 25

Unsignalized Intersections

Like signalized intersections, the operating conditions of intersections controlled by stop signs can be classified by a level-of-service from A to F. However, the method for determining level-of-service for unsignalized intersections is based on the use of gaps in traffic on the major street by vehicles crossing or turning through that stream. Specifically, the capacity of the controlled legs of an intersection is based on two factors: 1) the distribution of gaps in the major street traffic stream, and 2) driver judgement in selecting gaps through which to execute a desired maneuver. The criteria for level-of-service at an unsignalized intersection is therefore based on delay of each controlled lane group. Table 3 summarizes the definitions for level-of-service and the corresponding delay. *The lane group with the lowest level-of-service defines the level-of-service of the overall unsignalized intersection.* This means that if all the controlled movements of an unsignalized intersection operate at Level-of-Service B except one that is Level-of-Service F, the intersection Level-of-Service is F.

Table 3 Level-of-Service Definitions for Unsignalized Intersections⁽¹⁾

	Expected Delay to Minor Street	
Level-of-Service	Traffic	Delay (Seconds)
A	Little or no delay	<10.0
В	Short traffic delays	10.1 to 15.0
С	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	See note (2) below	>50.1
Nataa		

Notes: (1) (2)

Source: Highway Capacity Manual, 2000.

When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants improvement of the intersection.

Level-of-Service Analysis of Existing Conditions

The results of the level-of-service analysis of the study intersections are summarized in Table 4. Shown in the table are the level-of-service of the overall intersection for signalized intersection and the lowest level-of-service of the controlled lane groups for the unsignalized intersections. Lastly, the levels-of-service shown are defined by delay rather than volume-to-capacity ratio.

A detailed summary of the level-of-service analysis results is presented as Appendix A.

No.	Intersection	Right-of-Way Control	AM Peak Hour Level-of-Service	PM Peak Hour Level-of-Service	Conclusions and Comments
1	Kuhio Hwy at Rice St	Signalized	В	В	All movements are C, or better.
2	Haleko St at Rice St	Unsignalized	С	С	All movements operate at B and C.
3	Eiwa St at Rice St	Unsignalized	E	F	Southbound left operates at E during AM and F during PM. Remaining movements operate at C, or better.
4	Umi St at Rice St	Signalized	В	В	All movements operate at B, or better.
5	Hardy St at Rice St	Signalized	A	А	All movements operate at A and B.
6	Hoolako St at Rice St	Signalized	В	В	All movements operate at B, or better.
7	Kapule St at Rice St	Unsignalized	E	F	Southbound left operates at E and F during AM and PM, respectively. Intersection is to be reconfigured and signalized by SDOT. Design is underway.
8	Kuhio Hwy at Hardy St	Unsignalized	F	F	Westbound left operates at F during AM and PM.
9	Akahi St at Hardy St	Unsignalized	С	С	All movements operate at C, or better.
10	Eiwa St at Hardy St	Unsignalized	E	D	Northbound left operates at E during AM (39.3 seconds per vehicle), but is acceptable of short periods during peak periods. All other movements operate at D, or better.
11	Elua St at Hardy St	Unsignalized	С	С	All movements operate at C, or better.
12	Umi St at Hardy St	Unsignalized	F	F	Northbound approach operates at F during AM and PM. All other movements operate at D, or better.
13	Kuhio Hwy at Ahukini Rd	Signalized	В	С	Westbound left operates at E during AM and F during PM. All other movements operate at D, or better.
14	Akahi St at Ahukini Rd	Unsignalized	С	С	All movements operate at C, or better.
15	Elua St at Ahukini Rd	Unsignalized	С	D	All movements operate at D, or better.
16	Umi St at Ahukini Rd	Unsignalized	F	F	Northbound left operates at F during AM and PM.
17	Palai St at Ahukini Rd	Unsignalized	D	D	All movements operate at D, or better.
18	Kapule Hwy at Ahukini Rd	Signalized	D	D	Eastbound left and westbound left operate a F and E during AM. Eastbound left operates at F during PM and northbound thru and southbound left operates at E. All remaining movements operate at D, or better.
19	Kapule Hwy at Ka Ana St	Signalized	А	А	All movements operate at D, or better.
NOTES (1) (2) (3) (4)	NOTES: (1) The delays and levels-of-service shown for unsignalized intersections is the delay and level-of-service of the worse movement or lane group. (2) Level-of-Service was calculated using the operations method described in <i>Highway Capacity Manual</i> . Level-of-Service is based on delay (3) See Appendix B for detailed levels-of-service analysis worksheets. (4) See Appendix C for level-of-service analysis worksheets.				

Table 4	Existing (2004) Levels-of-Service ^{(1),(2)}

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The conclusions of the level-of-service analysis are that the following intersections operate at Level-of-Service E or F, which are unacceptable levels-of-service:

	Intersection	<u>AM</u>	PM
1.	Eiwa Street at Rice Street	Е	F
2.	Kapule Highway at Rice Street	Е	F
3.	Kuhio Highway at Hardy Street	F	F
4.	Eiwa Street at Hardy Street	Е	D
5.	Umi Street at Hardy Street	F	F
6.	Umi Street at Ahukini Road	F	F

The following improvements are in the planning or design phase and will mitigate the poor levels-of-service at the respective intersections:

- 1. Improvements for the intersection of Kapule Highway at Rice Street being designed by State of Hawaii Department of Transportation. These improvements consists of redesign of the intersection such that the Kapule Highway-Nawiliwili movement is a through movement and installation of traffic signals.
- 2. The County of Kauai Department of Public Works is planning to signalize the intersection of Hardy Street at Kuhio Highway and construct a roundabout at the intersection of Hardy Street at Umi Street as part of the Lihue Civic Center Site Improvements project. The timing of these improvement is not determined at this time.

3. FUTURE ROADWAY NETWORKS

The purpose of this chapter is to discuss the assumptions and data used to estimate 2020 traffic conditions.

Future traffic growth consists of two components. The first is ambient background growth that is a result of regional growth and cannot be attributed to a specific project. The second component is estimated traffic that will be generated by other development projects in the vicinity of the proposed project.

Design, or Horizon, Year

The design, or horizon, year is the future date for which traffic forecasts are developed. The year 2020 was selected as the design, or horizon, year. This year was selected because it is consistent with the *Kauai Long Range Land Transportation Plan*, completed in May, 1997. We are not aware of any updates planned or in progress.

Network A

Network A reflects the existing roadway network plus the following proposed or in progress roadway projects:

- 1. Kaumualii Highway is widened from two to four lanes south of Rice Street
- 2. The intersection of Rice Street at Kapule Highway is reconstructed and signalized.
- 3. Ahukini Road east of Kuhio Highway has been realigned so that the intersection with Kuhio Highway is relocated approximately one block north of the existing intersection. Ahukini Road will align with Ehiku Street.
- 4. Ahukini Road is widened from two to four lanes between Kuhio Highway and Kapule

Highway.

- 5. Kapule Highway is widened from two to four lanes between Ahukini Road and Rice Street.
- 6. The street network as shown is the Lihue-Hanama'ulu Master Plan has been completed. This includes extending Kaana Street to Kapule Highway and Ho`olako Street to Ahukini Road.
- 7. The intersection of Kuhio Highway at Hardy Street is signalized.
- 8. The intersection of Hardy Street at Umi Street is reconstructed with a roundabout as described in the Lihue Civic Center Master Plan TIAR.
- 9. Umi Street is extended north of Ahukini Road.

Network A is shown as Figure 4.

Network B - Proposed Network A Plus Lihue Bypass

Network B is shown as Figure 5. This network consists of the existing roadway network, Network A and the Lihue Bypass. The alignment shown for the Bypass is taken from the *Kauai Long Range Land Transportation Plan*. The bypass is described as "a new four-lane divided roadway between Kipu and the north side of Lihue-Hanamaulu town with a two-lane connector road to Kaumualii Highway at Nuhou Road, a two-lane connector road to Kuhio Highway at Ehiku Street."²

Rice Street Alternatives

Alternative configurations for Rice Street were assessed early in the study. The objective of the alternative assessment was to determine if the width of Rice Street could be reduced from four to two lanes with a center turn lane to provide space for wider sidewalks and bicycle lanes and enhance the pedestrian feeling of the area. In addition, the viability of converting Rice Street and Hardy Street into a one-way couplet was part of the analysis in order to make up for the lost capacity.

Upon study of the traffic projections for both networks, it was determined that reduction of the width of Rice Street from four to two lanes would divert too much peak hour traffic for Hardy Street to accommodate as a two-lane road. Additionally, a public survey concluded that there was little community support for the one-way alternative. Accordingly, the alternatives were not studied further.

² Austin, Tsutsumi & Associates, Inc., Kauai Long Range Land Transportation Plan, May 1997, page ES-18

4. 2020 TRAFFIC FORECASTS AND LEVEL-OF-SERVICE ANALYSIS

Background Traffic Growth

The *Kauai Long Range Land Transportation Plan*³ concluded that traffic along various roadways within the study area would increase between 1.2% per year and 2.3% per year from 1994 to 2020. A weighted average growth rate of 1.6% was used to estimate the background growth between 2004 and 2020, which is the design year for this project. The growth factor was calculated to be 1.29 using the following formula:

$$F = (1 + i)^{n}$$

where F = Growth Factor i = Average annual growth rate, or 0.016

n = Growth period, or 3 years

As will be discussed in the following section, this factor was reduced by 50% to account for potential double counting of traffic generated by related projects.

³ Austin, Tsutsumi & Associates, May 1997

Related Development Projects

The second component in estimating background traffic volumes is traffic resulting from other proposed projects in the vicinity. Related projects are defined as those projects that are under construction, have been approved for construction or have a high probability of being constructed and would significantly impact traffic in the study area. Related projects may be development projects or roadway improvements.

The following projects were identified as related projects:

- 1. Civic Center, which includes closure of Eiwa Street between Hardy Street and Rice Street
- 2. Lihue-Hanamaulu
- 3. Costco
- 4. Puakea Development

It was determined that traffic associated with all of the related projects are within the 2020 forecasts provided by the *Kauai Long Range Land Transportation Plan*. However, traffic associated with the Lihue-Hanamaulu project appeared to be greater than traffic estimated in the *Kauai Long Range Land Transportation Plan*. Accordingly, a separate trip generation and assignment analysis was performed for this particular project. See Appendix A. The project description and trip distribution data provided in the traffic impact study for Lihue-Hanamaulu was used as the basis for these calculations.

The background growth rate was reduced by 50% to avoid double counting the estimated background traffic generated by the Lihue-Hanamaulu project and what was reported in the *Kauai Long-Range Land Transportation Plan*.

2020 Traffic Forecasts

2020 cumulative traffic projections were calculated by expanding existing traffic volumes by the appropriate background growth rate and then superimposing traffic generated by related projects. The resulting 2020 peak hour traffic forecasts for the existing roadway network, referred to as Baseline, are shown as Figures 6 and 7. The 2020 peak hour traffic forecasts for Network A are shown in Figures 8 and 9 and the 2020 peak hour traffic forecasts for Network B are shown in Figures 10 and 11.

Level-of-Service Analysis for 2020 Conditions

2020 Baseline Conditions

The 2020 Baseline conditions represent the 2020 traffic projections on the existing roadway network. None of the improvements previously noted in this report are considered in this scenario. This is a "No Build Scenario."

The results of the level-of-service analysis for 2020 Baseline conditions are summarized in Table 5. Shown are the levels-of-service of the study intersections for 2020 traffic projections for existing intersection and roadway conditions. For this scenario, the following intersections will operate at Level-of-Service E or F:

	Intersection	<u>AM</u>	<u>PM</u>
1.	Eiwa Street at Rice Street	F	F
2.	Kapule Highway at Rice Street	F	F
3.	Kuhio Highway at Hardy Street	F	F
4.	Akahi Street at Hardy Street	D	F
5.	Eiwa Street at Hardy Street	F	F
6.	Elua Street at Hardy Street	Е	Е
7.	Umi Street at Hardy Street	F	F
8.	Kuhio Highway at Ahukini Road	Е	Е
9.	Akahi Street at Ahukini Road	Е	F
10.	Elua Street at Ahukini Road	F	D
11.	Umi Street at Ahukini Road	F	F
12.	Palai Street at Ahukini Road	F	F
13.	Kapule Highway at Ahukini Road	Е	F

No.	Intersection	Right-of-Way Control	AM Peak Hour Level-of-Service	PM Peak Hour Level-of-Service	Conclusions and Comments	
1	Kuhio Hwy at Rice St	Signalized	D	D	Northbound thru operates at F during AM. During PM, westbound and northbound left operates at F.	
2	Haleko St at Rice St	Unsignalized	D	D	All movements operate at D, or better, AM and PM.	
3	Eiwa Street at Rice Street	Unsignalized	F	F	Southbound left operates at F, AM and PM. All other movements are D, or better.	
4	Umi St at Rice St	Signalized	В	В	All movements are B, or better.	
5	Hardy St at Rice St	Signalized	В	В	All movements are B, or better.	
6	Hoolako St at Rice St	Signalized	В	С	All movements are D, or better.	
7	Kapule St at Rice St	Unsignalized	F	F	Southbound left operates at F, AM and PM. All other movements are C, or better.	
8	Kuhio Hwy at Hardy St	Unsignalized	F	F	Westbound left and Southbound left are F during AM. Westbound left and right are F during PM.	
9	Akahi St at Hardy St	Unsignalized	D	F	Southbound left is F during PM.	
10	Eiwa St at Hardy St	Unsignalized	F	F	Northbound left is F during AM and PM. All other movements are D, or better.	
11	Elua St at Hardy St	Unsignalized	E	E	Eastbound left and thru is A, AM and PM. Southbound left and right is E, AM and PM.	
12	Umi St at Hardy St	Unsignalized	F	F	Northbound and Southbound approaches are F during the AM and PM.	
13	Kuhio Hwy at Ahukini Rd	Signalized	E	E	Only Northbound approach is acceptable. All other movements are E or F.	
14	Akahi St at Ahukini Rd	Unsignalized	E	F	Northbound approach operates at E during AM and F during PM. Other movements are A.	
15	Elua St at Ahukini Rd	Unsignalized	F	D	Northbound left operates at F during AM. All other movements are D, or better.	
16	Umi St at Ahukini Rd	Unsignalized	F	F	Northbound operates at F, AM and PM.	
17	Palai St at Ahukini Rd	Unsignalized	F	F	Northbound operates at F, AM and PM.	
18	Kapule Hwy at Ahukini Rd	Signalized	E	F	Only 5 of 12 movements are acceptable during AM. Only 3 are acceptable during PM.	
19	Kapule Hwy at Ka Ana St	Signalized	А	С	Northbound left is F during AM. All others are D, or better.	
NOTE (1) (2)	NOTES: (1) The delays and levels-of-service shown for unsignalized intersections is the delay and level-of-service of the worse movement or lane group. (2) Level-of-Service was calculated using the operations method described in <i>Hiahway Capacity Manual</i> . Level-of-Service is based on delay					

 Table 5
 Results of Levels-of-Service Analysis of 2020 Baseline Conditions ^{(1),(2)}

Network A

The results of the level-of-service analysis for Network A are summarized in Table 6. Shown are the overall levels-of-service for the study intersections. Detailed results indicating the delay and level-of-service of each lane group is presented as Appendix B.

The assumptions used for the level-of-service analysis are:

- 1. Kaumualii Highway is widened from two to four lanes south of Rice Street
- 2. The intersection of Rice Street at Kapule Highway is reconstructed and signalized.
- 3. Ahukini Road east of Kuhio Highway has been realigned. The old alignment of Ahukini Road is referred to as Old Ahukini Road.
- 4. The old intersection of Ahukini Road at Kuhio Highway is retained but only right turns in and right turns out will be allowed. Left turns will not be allowed because queues from the new intersection.
- 5. Umi Street is extended across Ahukini Road and behind Walmart to the hospital. The intersection of Ahukini Road at Umi Street is signalized
- 6. Akahi Street is extended from Old Ahukini Road to the new Ahukini Road. The intersection of Ahukini Road is restricted to right turns only because the turn queue from Kuhio Highway.
- 7. Ahukini Road is widened from two to four lanes between Kuhio Highway and Kapule Highway.
- 8. Kapule Highway is widened from two to four lanes between Ahukini Road and Rice Street.
- 9. Kaana Street is extended to Kapule Highway.
- 10. Ho'olako Street is extended to Ahukini Road.
- 11. The intersection of Kuhio Highway at Hardy Street is signalized.
- 12. The intersection of Hardy Street at Umi Street is converted to a roundabout.
- 13. Eiwa Street between Hardy Street and Rice Street is demolished.

Network B

The results of the level-of-service analysis for Network B are summarized in Table 7. Detailed results indicating the delay and level-of-service of each lane group is presented as Appendix B.

Table	0 R	esuits of Leve	eror-service A	<u>Analysis ol 20</u>	
No.	Intersection	Right-of-Way Control	AM Peak Hour Level-of-Service	PM Peak Hour Level-of-Service	Conclusions and Comments
1	Kuhio Hwy at Rice St	Signalized	С	С	Northbound thru is F during AM and PM. Westbound left is F during PM only. All other movements operate at Level-of-Service D, or better.
2	Haleko St at Rice St	Unsignalized	D	D	All movements operate at Level-of-Service D, or better, AM and PM.
3	Eiwa St at Rice St	Removed	-	-	Eiwa Street removed as part of Lihue Civic Center improvements.
4	Umi St at Rice St	Signalized	В	В	All movements operate at Level-of-Service A or B.
5	Hardy St at Rice St	Signalized	В	В	All movements operate at Level-of-Service B, or better.
6	Hoolako St at Rice St	Signalized	В	С	All movements operate at Level-of-Service D, or better.
7	Kapule St at Rice St	Signalized	В	С	All movements operate at Level-of-Service D, or better.
8	Kuhio Hwy at Hardy St	Signalized	С	С	Traffic signals are installed. Southbound left operates at E during PM.
9	Akahi St at Hardy St	Unsignalized	F	F	Northbound and Southbound approaches operate at F, AM and PM. Other movements are A. Signalization should be considered when warrants are met. Signalization will improve the level-of-service to C or better during both AM and PM peak periods.
10	Eiwa St at Hardy St	Removed	-	-	Eiwa Street removed as part of Lihue Civic Center improvements.
11	Elua St at Hardy St	Unsignalized	E	E	Southbound left and right are E, AM and PM. Eastbound left and thru are A, AM and PM.
12	Umi St at Hardy St	Roundabout	D	В	Level-of-Service D, or better during AM. Level-of-Service B, or better during PM.
13	Kuhio Hwy at Ahukini Rd "New"	Signalized	В	С	Southbound left is E during PM. All other movements Level-of-Service D, or better, AM and PM.
14	Akahi St at Ahukini Rd "New"	Unsignalized	В	В	All movements Level-of-Service B, or better.
15	Elua St at Ahukini Rd "New"	Not Applicable	-	-	No intersection created.
16	Umi St at Ahukini Rd "New"	Signalized	В	В	All movements Level-of-Service D, or better.
17	Palai St at Ahukini Rd	Unsignalized	F	E	Northbound left is F during AM and E during PM. All other movements are A or B.
18	Kapule Hwy at Ahukini Rd	Signalized	С	С	Westbound left is E during AM. All other movements are D, or better.
19	Kapule Hwy at Ka Ana St	Signalized	С	В	Northbound left is Level-of-Service F during the AM. All remaining movements are D or better.
NOTES: (1) (2)	The delays and Level-of-Service	levels-of-service show	n for unsignalized inte	rsections is the delay a	and level-of-service of the worse movement or lane group. / Capacity Manual. Level-of-Service is based on delay

Table 6	Results of Level-of-Service Analysis of 2020 Network A Conditions $^{(1),(2)}$
	NESUIS OF LEVER-OF-SERVICE ANALYSIS OF 2020 NELWORK A COMULIONS

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No	Intersection	Right-of-Way	AM Peak Hour	PM Peak Hour	Conclusions and Comments
1	Kuhio Hwy at Rice St	Signalized	C	C	Southbound left is E during PM. All other movements are D, or better. The Bypass will divert 650 vehicles per hour during the morning peak hour and 450 during the afternoon peak hour from Kuhio Highway.
2	Haleko St at Rice St	Unsignalized	D	D	All movements operate at Level-of-Service D, or better, AM and PM.
3	Eiwa St at Rice St	Removed	-	-	Eiwa Street removed as part of Lihue Civic Center improvements.
4	Umi St at Rice St	Signalized	В	В	All movements operate at Level-of-Service C, or better.
5	Hardy St at Rice St	Signalized	В	В	All movements operate at Level-of-Service B, or better.
6	Hoolako St at Rice St	Signalized	В	С	All movements operate at Level-of-Service D, or better.
7	Kapule St at Rice St	Signalized	В	С	All movements operate at Level-of-Service D, or better.
8	Kuhio Hwy at Hardy St	Signalized	С	С	All movements are D, or better.
9	Akahi St at Hardy St	Unsignalized	F	F	Northbound and Southbound approaches operate at F, AM and PM. Other movements are A. Signalization should be considered when warrants are met. Signalization will improve the level-of-service to C or better during both AM and PM peak periods.
10	Eiwa St at Hardy St	Removed	-	-	Eiwa Street removed as part of Lihue Civic Center improvements.
11	Elua St at Hardy St	Unsignalized	E	E	Southbound left and right are E, AM and PM. Eastbound left and thru are A, AM and PM.
12	Umi St at Hardy St	Roundabout	D	В	Level-of-Service D, or better during AM. Level-of-Service B, or better during PM.
13	Kuhio Hwy at Ahukini Rd "New"	Signalized	С	С	Eastbound left and northbound left is F during AM. Eastbound left is F and westbound left is E during PM.
14	Akahi St at Ahukini Rd "New"	Unsignalized	В	В	All movements Level-of-Service B, or better.
15	Elua St at Ahukini Rd "New"	Not Applicable	-	-	No intersection created.
16	Umi St at Ahukini Rd "New"	Signalized	В	В	All movements Level-of-Service D, or better.
17	Palai St at Ahukini Rd	Unsignalized	F	E	Northbound left is F during AM and E during PM. All other movements are D, or better.
18	Kapule Hwy at Ahukini Rd	Signalized	С	С	Eastbound left and westbound left is E during AM. All other movements are D, or better.
19	Kapule Hwy at Ka Ana St	Signalized	С	В	Northbound left is Level-of-Service F during the PM. All remaining movements are D or better.
NOTES: (1) (2)	The delays and Level-of-Service	levels-of-service show was calculated using	n for unsignalized inte the operations method	rsections is the delay a d described in <i>Highwa</i> y	and level-of-service of the worse movement or lane group. / Capacity Manual. Level-of-Service is based on delay

Table 7	Results of Level-of-Service Anal	vsis of 2020 Network B Conditions ^{(1),(2)}
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5. CONCLUSIONS AND RECOMMENDATIONS

Planning Criteria

The Institute of Transportation Engineers recommends that Level-of-Service D should be the minimum acceptable level-of-service for urban peak hour conditions. Accordingly, this criterion has been used for this study.

Level-of-service D is typically considered acceptable for peak hour conditions in urban areas. To be consistent with the conclusions of the TIAR for the Lihue Civic Center Master Plan, Level-of-Service E is considered acceptable under certain circumstances. "Although this level is generally considered undesirable for a signalized intersection, Level-of-Service E is sometimes tolerated for minor movements such as left turns when there are no feasible mitigating measures or if it helps maintain the main through movements at acceptable levels-of-service."⁴

⁴ M&E Pacific, Inc. Traffic Impact Analysis Report for Lihue Civic Center Master Plan, October 2005, p. 25

Conclusions and Recommendations

1. Rice Street at Kuhio Highway

Currently, this intersection operates at Level-of-Service B during both peak periods. All movements operate at Level-of-Service C, or better.

For 2020 Baseline conditions, the intersection will operate at Level-of-Service D during both peak periods. During the morning peak hour, the northbound through movement will operate at Level-of-Service F. The remaining movements will operate at Level-of-Service C, or better. During the afternoon peak hour, the westbound left and right and the northbound through movement will operate at Level-of-Service F and the remaining movements will operate at Level-of-Service C, or better.

For 2020 Network A conditions, the intersection will operate at Level-of-Service C, during both peak periods. During the morning peak hour, the southbound left turn will operate at Level-of-Service E and the remaining movements will operate at Level-of-Service D, or better. During the afternoon peak hour, the westbound left turn will operate at Level-of-Service E and the southbound left turn will operate at Level-of-Service F. The remaining movements will operate at Level-of-Service D, or better.

For 2020 Network B conditions, the intersection will also operate at Level-of-Service C during both peak hours. All movements will operate at Level-of-Service D, or better, except the southbound left turn, which will operate at Level-of-Service E during the afternoon peak hour.

An alternative that improves the level-of-service to Level-of-Service B during both peak periods is discussed in Chapter 6. It involves the addition of a second left turn lane from westbound Rice Street to southbound Kuhio Highway.

2. Rice Street at Haleko Street

The westbound approach currently operates at Level-of-Service B and the northbound approach operates at Level-of-Service C during both peak periods. For 2020 conditions, the westbound approach will also operate at Level-of-Service B, but the northbound right turn will operate at Level-of-Service D during the morning peak hour. During the afternoon peak hour, both the westbound and the northbound approaches will operate at Level-of-Service D. The levels-of-service will be the same for 2020 Baseline, Network A and Network B conditions.

3. Rice Street at Eiwa Street

Currently, the southbound left turn operates at Level-of-Service E during the morning peak hour and Level-of-Service F during the afternoon peak hour. The remaining movements operate at Level-of-Service C, or better. For 2020 baseline conditions, the southbound left turn will operate at Level-of-Service F during both peak periods and the remaining movements will operate at Level-of-Service D, or better. As Eiwa Street between Hardy Street and Rice Street will be removed as part of the Civic Center Improvement project, there are no level-of-service calculations for Networks A and B.

4. Rice Street at Umi Street

The intersection operates at Level-of-Service B during both peak periods. All movements operate at Level-of-Service A or B.

For 2020 conditions (Baseline, Network A and Network B), the intersection will operate at Level-of-Service B during both peak periods and all movements will operate at Level-of-Service C, or better.

5. Rice Street at Hardy Street

The intersection operates at Level-of-Service A during both peak periods. All movements operate at Level-of-Service A or B.

For 2020 conditions (Baseline, Network A and Network B), the intersection will operate at Level-of-Service B during both peak periods and all movements will operate at Level-of-Service B, or better.

6. Rice Street at Hoolako Street

This intersection currently operates at Level-of-Service B during the morning and afternoon peak periods. All movements operate at Level-of-Service B, or better. For future conditions (Baseline, Network A and Network B), the intersection will operate at Level-of-Service B during the morning peak hour and Level-of-Service C during the afternoon peak hour. All movements will operate at Level-of-Service D, or better. The eastbound left and through lane will operate as a default left turn lane and the volume-to-capacity ratio will exceed 1.35. However, the average vehicle delay implies Level-of-Service C.

7. Rice Street at Kapule Street

This intersection is currently unsignalized. The left turn from southbound Kapule Highway at eastbound Rice Street operates at Level-of-Service E during the morning peak hour and Level-of-Service F during the afternoon peak hour. For future Baseline conditions, this left turn will operate at Level-of-Service F during both peak periods. All other movements will operate at Level-of-Service C, or better.

For Networks A and B, the intersection will be reconfigured and signalized. The left turn from southbound Kapule Highway to eastbound Rice Street, which currently operates at Level-of-Service E and F, will be the southbound through movement. For Network A and Network B conditions, the overall intersection will operate at Level-of-Service B during the morning peak hour and all movements will operate at Level-of-Service C, or better. During the afternoon peak hour, the intersection will operate at Level-of-Service C and all movements will operate at Level-of-Service D, or better.

8. Hardy Street at Kuhio Highway

This intersection is currently unsignalized and operates at Level-of-Service F during both peak periods. The westbound left operates at Level-of-Service F, but the remaining movements operate at Level-of-Service B or C.

For 2020 Baseline conditions, the intersection will also operate at Level-of-Service F. During the morning peak hour, the westbound left turn and the southbound left turn will both operate at Level-of-Service F. During the afternoon peak hour, the westbound left turn and right turn will both operate at Level-of-Service F.

The intersection will be signalized under the Network A and Network B scenarios. As a signalized intersection, the intersection will operate at Level-of-Service C during both peak periods. For Network A, all movements will operate at Level-of-Service D, or better, except the southbound left turn during the afternoon peak hour, which will operate at Level-of-Service E. For Network B conditions, all movements will operate at Level-of-Service E. For Network B conditions, all movements will operate at Level-of-Service B, or better. This is a result of diverting a portion of the northbound and southbound through traffic from Kuhio Highway to the by pass (620 vehicles per hour during the morning peak hour and 450 vehicles per hour during the afternoon peak hour).

9. Hardy Street at Akahi Street

During the morning and afternoon peak hours, all movements currently operate at Level-of-Service C, or better. For 2020 Baseline conditions, the southbound left turn will operate at Level-of-Service D during the morning peak hour and Level-of-Service F during the afternoon peak hour.

As part of the Civic Center Improvements, the new entrance to the Civic Center parking lot will be aligned with Akahi Street. Therefore, for Networks A and B, this intersection will be a four-legged intersection with the south leg as the entrance to and exit from the Civic Center parking lot. Traffic along Hardy Street will operate at Level-of-Service A, which implies that traffic turning into and out of the Civic Center will have a minimal impact on traffic operations along Hardy Street. However, traffic approaching along southbound Akahi Street and exiting the Civic Center parking lot will experience long delays and will operate at Level-of-Service F during both peak periods. This implies that the peak hour delay warrants will be satisfied and the intersection may have to be signalized for 2020 conditions. As a signalized intersection, all movements will operate at Level-of-Service B during the morning peak hour and Level-of-Service C during the afternoon peak hour. It is our understanding that this intersection will be monitored to determine when the warrants for a traffic signal are satisfied.

10. Hardy Street at Eiwa Street

Currently, the northbound left turn operates at Level-of-Service E during the morning peak hour and Level-of-Service D during the afternoon peak hour. The remaining movements operate at Level-of-Service B, or better. For 2020 baseline conditions, the northbound left turn will operate at Level-of-Service F during both peak periods and the remaining movements will operate at Level-of-Service D, or better. As the closure of Eiwa Street between Hardy Street and Rice Street is recommended as part of the Civic Center Improvement project, there are no level-of-service calculations for Networks A and B.

11. Hardy Street at Elua Street

Under existing conditions, all movements operate at Level-of-Service C, or better. The southbound left and right turns will operate at Level-of-Service E during both peak periods under Baseline, Network A and Network B conditions.

12. Hardy Street at Umi Street

Under existing conditions, this intersection operates at Level-of-Service F during both peak periods. The northbound approach of Umi Street operates at Level-of-Service F and therefore determines the level-of-service of the intersection.

For 2020 Baseline conditions, the northbound and southbound approaches of Umi Street will operate at Levelof-Service F during both peak periods. The westbound and eastbound approaches of Hardy Street will operate at Level-of-Service A during both peak periods.

For Networks A and B conditions, the intersection will be converted to a roundabout. As a roundabout, the intersection will operate at Level-of-Service D (v/c = 0.89) during the morning peak hour and Level-of-Service B during the afternoon peak hour (v/c = 0.63). These level-of-service are based on the volume-to-capacity ratio (rather than delay) which is not widely accepted to determine the level-of-service of a roundabout.

13. Ahukini Road at Kuhio Highway

Under existing conditions, the overall intersection operates at Level-of-Service B during the morning peak hour and Level-of-Service C during the afternoon peak hour. The left turns from westbound Ahukini Road to southbound Kuhio Highway operate at Level-of-Service E during the morning peak hour and Level-of-Service F during the afternoon peak hour. All remaining movements operate at Level-of-Service D, or better.

For 2020 Baseline conditions, the overall intersection will operate at Level-of-Service E during both peak hours. During the morning peak hour all movements will operate at Level-of-Service E or F except the northbound approach which will operate at Level-of-Service A and the westbound approach which will operate at Level-of-Service D. During the afternoon peak hour, all movements will operate at Level-of-Service E or F except the northbound approach which will operate at Level-of-Service B.

For Network A conditions, Ahukini Road will be realigned and will tie into the Lihue Bypass via Ehiku Street. The new intersection of Ahukini Road at Kuhio Highway will operate at Level-of-Service B during the morning peak hour and all movements will operate at Level-of-Service D, or better. During the afternoon peak hour, the overall intersection will operate at Level-of-Service C and all movements will operate at Level-of-Service D, or better, except the southbound left turn which will operate at Level-of-Service E. The recommended lane configuration is described in Chapter 6.

For Network B, Ahukini Road will also be realigned. The overall intersection will operate at Level-of-Service C during both peak periods. During the morning peak hour, the eastbound and northbound left turns will operate at Level-of-Service F. All remaining movements will operate at Level-of-Service C, or better. During the afternoon peak hour, the eastbound and westbound left turns will operate at Level-of-Service F and E, respectively. All remaining movements will operate at Level-of-Service D, or better.

The intersection of Old Ahukini Road at Kuhio Highway will have to be restricted to right turns only because of the short distance between the this intersection and the new intersection. This intersection will operate at Level-of-Service B during the morning peak hour and Level-of-Service C during the afternoon peak hour for Network A and Network B conditions.

14. Ahukini Road at Akahi Street

Currently, the northbound left and right turns operate at Level-of-Service C and the westbound through and left turns operate at Level-of-Service A. For 2020 Baseline conditions, the northbound left and right turns will operate at Level-of-Service E during the morning peak hour and Level-of-Service F during the afternoon peak hour.

For Networks A and B, Ahukini Road will be realigned as discussed earlier. The intersection of Akahi Street at the realigned Ahukini will be restricted to right turns only because of the left turn storage lane requirements of the new intersection of Ahukini Road at Kuhio Highway. The right turns will operate at Level-of-Service B during both peak periods.

The intersection of Akahi Street at Old Ahukini Road will be a four-legged, unsignalized intersection. All movements of this intersection will operate at Level-of-Service A or B.

15. Ahukini Road at Elua Street

For existing conditions, this intersection operates at Level-of-Service C during the morning peak hour and Level-of-Service D during the afternoon peak hour. The northbound left and right turns determine the level-of-service of the intersection. For 2020 Baseline conditions, the northbound left and right turns will operate at Level-of-Service F during the morning peak hour and Level-of-Service D during the afternoon peak hour.

Elua Street will not be extended from Old Ahukini Road to the realigned Ahukini Road. The intersection of Old Ahukini Road at Elua Street will be a T-intersection. This intersection will operate at Level-of-Service B during the morning peak hour and Level-of-Service A during the afternoon peak hour.

16. Ahukini Road at Umi Street

Under existing conditions, the northbound left turns operate at Level-of-Service F during both peak periods. All other movements operate at Level-of-Service A or B.

For 2020 Baseline conditions, the northbound left turns will operate at Level-of-Service F during both peak periods and all other movements will operate at Level-of-Service C, or better.

The realignment of Ahukini Road also affects this intersection. Umi Street will be extended across the realigned Ahukini Road and east of the existing Walmart. The intersection of the realigned Ahukini Road with Umi Street will have to be signalized to accommodate left turns from both approaches of Ahukini Street. As a signalized intersection, the intersection will operate at Level-of-Service B during both peak periods and all movements will operate at Level-of-Service D, or better.

The intersection of Umi Street with Old Ahukini Road will be unsignalized and will operate at Level-of-Service B during both peak periods.

17. Ahukini Road at Palai Street

Under existing conditions, all movements operate at Level-of-Service D, or better.

For 2020 Baseline conditions, the left turn from northbound Palai Street to westbound Ahukini Road will operate at Level-of-Service F during both peak periods. All remaining movements will operate at Level-of-Service C, or better.

This intersection will be unsignalized and Ahukini Road will be widened from two to four lanes for Network A and Network B conditions. For 2020 Network A and Network B conditions, the northbound left turn will operate at Level-of-Service F during the morning peak hour and Level-of-Service E during the afternoon peak hour.

18. Ahukini Road at Kapule Highway

For existing conditions, this intersection operates at Level-of-Service D during both peak periods. During the morning peak hour, the eastbound left operates at Level-of-Service F and the westbound left operates at Level-of-Service E. During the afternoon peak hour, the eastbound left operates at Level-of-Service F and the northbound through and southbound left operates at Level-of-Service E.

For 2020 Baseline conditions, the intersection will operate at Level-of-Service E during the morning peak hour and Level-of-Service F during the afternoon peak hour. During the afternoon peak hour, all movements will operate at Level-of-Service D, or worse.

For Network A and Network B conditions, Ahukini Road and Kapule Highway will be widened from two to four lanes. As a result, the intersection will operate at Level-of-Service C during both peak periods. All movements except the westbound left will operate at Level-of-Service D, or better. The westbound left will operate at Level-of-Service D during the afternoon peak hour and Level-of-Service D during the afternoon peak hour.

19. Kapule Highway at Ka Ana Street

Under existing conditions, this intersection operates at Level-of-Service A during both peak periods. All movements operate at Level-of-Service D, or better.

For 2020 Baseline conditions, the overall intersection will operate at Level-of-Service B during the morning peak hour and Level-of-Service C during the afternoon peak hour. All movements will operate at Level-of-Service D, or better, except the northbound left turn during the morning peak hour which will operate at Level-of-Service F.

For 2020 Network A and Network B conditions, Kapule Highway will be widened from two to four lanes. The intersection will operate at Level-of-Service C during the morning peak hour and Level-of-Service B during the afternoon peak hour. The northbound left turn will operate at Level-of-Service F during the morning peak hour, but all other movements will operate at Level-of-Service D, or better, during both peak periods.

Summary

The level-of-service analysis concluded that the several intersections within the study area will be at or overcapacity by 2020 even with the major improvements included in Network A.

The overall levels-of-service of the intersections along Kuhio Highway are acceptable. However, each intersection has lane groups or movements that operate at Level-of-Service E or F, resulting in congested conditions along Kuhio Highway.

It appears that sufficient traffic must be diverted from Kuhio Highway so that the overall intersections and all the lane groups along Kuhio Highway will operate at acceptable levels-of-service. The most viable way to accomplish this is to construct the Lihue Bypass before the levels-of-service deteriorate to unacceptable levels. For 2020 conditions with the Lihue Bypass, the intersections along Kuhio Highway will operate at Level-of-Service D, or better.

There is some point between now (2005) and 2020 when the Bypass is needed in order to maintain acceptable levels-of-service along Kuhio Highway. The Bypass will divert 650 vehicles per hour during the morning peak hour and 450 vehicles per hour during the afternoon peak hour from Kuhio Highway. This date will have to be determined based on a review of traffic conditions as other roadway improvement projects are made in the area as well as community priorities.

6. CONCEPTUAL DESIGNS

The purpose of this chapter is to present the conceptual designs for the major roadway improvements within the study area and to discuss the resulting impacts of the levels-of-service. These roadway improvements include the following:

- 1. Realignment of Ahukini Road between Umi Street and Kuhio Highway
- 2. Signalization of the intersection of Kuhio Highway at Hardy Street and roadway improvements between Umi Street and Kuhio Highway
- 3. Roadway improvements along Rice Street between Hardy Street and Kuhio Highway

The engineering objective of the conceptual designs is to provided sufficient capacity for traffic to operate at acceptable levels-of-service. Therefore, the primary considerations in developing the conceptual designs are the required lane configurations as determined from the level-of-service analysis and the required left turn lane storage requirements. In addition to the engineering considerations, the need to landscaping space was also considered.

Prior to discussion of the conceptual designs, the standards used in the development of the conceptual designs is presented.

Standard for Left Turn Storage Lane Lengths

The left turn storage lengths required to accommodate estimated traffic volumes were calculated using guidelines in *A Policy on Geometric Design of Highways and Streets* published by the American Association of State Highway and Transportation Officials, 1990 edition. There are separate policies for signalized and unsignalized intersections. Based on this policy, the assumptions used to determine the required lengths of the left turn storage lanes are:

- (1) For signalized intersections, the length of the left turn storage lane should be 1.5 to 2.0 times the average number of vehicles arriving during a signal cycle during the peak hour.
- (2) For unsignalized intersections, the length of the left turn storage lane should be1.5 to 2.0 times the average number of vehicles arriving during a 60-second cycle.
- (3) The average length required per vehicle is 25 feet.
- (4) The traffic signal cycle lengths are 120 seconds. There is a direct relationship between the traffic signal cycle length and the length required for the left turn storage lane. A cycle length of 60 seconds will require half the storage length of a 120 second cycle. However, the existing traffic signals cycle lengths along Kuhio Highway were timed at approximately 120 seconds. Using 120 seconds as the cycle length will result in conservative calculations and allow flexibility in future modifications to the traffic signal system. However, this will result in longer queues lengths and limited space can become an issue.
- (5) The minimum length of a left turn storage lane should be 60 feet, which is sufficient to accommodate one automobile and one medium size truck.

Ahukini Road between Umi Street and Kuhio Highway

The conceptual design for Ahukini Road between Umi Street and Kuhio Highway is shown as Figure 12. The major components of the plan are:

- 1. The intersection of Ahukini Road at Kuhio Highway is relocated approximately one block north of the existing intersection. Ahukini Road intersects Kuhio Highway at Ehiku Street rather than Oxford Street. The realigned section of Ahukini Road is north of Hilo Hatties rather than along the south side.
- 2. Traffic movements at the intersection of Old Ahukini Road at Kuhio Highway is restricted to right turns only. This is because the left turn storage length required for northbound to westbound left turns at the new intersection of Ahukini Road is longer than the distance between the two intersections.
- 3. Umi Street is extended across Ahukini Road, between Walmart to the hospital. This intersection is signalized.

The required lengths of the left turn storage lanes were determined using the criteria cited above and the peak hour left turn traffic projections presented in the previous chapter. The calculations are shown in Table 8.

					Average	e Required Length (1)				
Intersecti		Decian	Cycle	Cyclos	Vehicles	Minimum		Desirable		Length
on	Approach	Volume	(Seconds)	per Hour	Cycle ⁽²⁾	Veh	Ft	Veh	Ft	(Ft)
Ahukini Rd at Kuhio Hwy	EB	30	120	30	1	2	50	2	50	100
	WB	410	120	30	14	21	525	28	700	2@350" = 700'
Ahukini Rd et Umi	EB	75	120	30	3	5	125	6	150	150
St St	WB	460	120	30	15	23	575	30	750	2@375' = 800'
NOTE: (1) (2)	Minimum queue The average nu	e length is 1.5 Imber of vehic	time average r les per cycle is	number of vehi	cles. Desirable	e queue length sign volume b	is 2.0 time ave y the number o	erage number	of vehicles. our.	

Table 8 Tur	rn Lane Length Requirements	for Proposed Improvements	Along Ahukini Road
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The results of the level-of-service analysis reflecting the proposed improvements are summarized in Table 9. As shown, all movements will operate at Level-of-Service D, or better, except the left turn from westbound Ahukini Road to southbound Kuhio Highway, which will operate at Level-of-Service E during the morning peak hour.

Table 9	Levels-of-Service - Ahukini Road Between Kuhio Highway and Umi Street	

		AM Peak Hour		PM Peak Hour			
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	
Kuhio Highway at Ahukini Road	0.68	22.8	С	0.76	30.9	С	
Eastbound Left	0.23	34.8	С	0.79	46.8	D	
Eastbound Thru & Right	0.15	16.2	В	0.17	40.4	D	
Westbound Left	0.83	32.0	С	0.97	73.9	E	
Westbound Thru & Right	0.66	8.3	А	0.25	31.9	D	
Northbound Left	0.18	35.2	D	0.51	53.3	С	
Northbound Thru	0.58	20.1	С	0.90	33.4	D	
Northbound Right	0.45	4.6	А	0.26	18.0	В	
Southbound Left	0.67	36.0	D	0.62	35.8	D	
Southbound Thru & Right	0.75	15.0	В	0.53	15.5	В	
Umi Street at Ahukini Road	0.61	19.9	В	0.80	22.7	С	
Eastbound Left	0.35	29.2	С	0.45	29.3	С	
Eastbound Thru & Right	0.69	22.0	С	0.78	25.2	С	
Westbound Left	0.73	26.3	С	0.78	33.9	С	
Westbound Thru & Right	0.73	16.4	В	0.60	17.7	В	
Northbound Left & Thru	0.49	19.5	В	0.81	28.6	С	
Northbound Right	0.04	13.5	В	0.14	11.3	В	
Southbound Left & Thru	0.15	14.8	В	0.28	13.8	В	
Southbound Right	0.12	14.2	В	0.16	11.4	В	

NOTES:

V/C denotes ratio of volume to capacity. 1.

2. Delay is in seconds per vehicle.

LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections. 3. 4.

Ahukini Road at Kuhio Highway

The right-of-way needed to provide the roadway improvements shown along Kuhio Highway may not be obtainable. Therefore, there may be sufficient right-of-way to provide only four lanes. The configuration would have to be comparable to that shown as Figure 13, which is for two lanes each for southbound and northbound traffic along Kuhio Highway. Turns would be shared with the through lanes. For this scenario, the intersection of Ahukini Road at Kuhio Highway will operate at Level-of-Service E during both peak hour. If the traffic signal phasing were to split the northbound and southbound phases, the intersection will operate at Level-of-Service F during both peak hours.

The left turn storage lane required for left turns from westbound Ahukini Road to southbound Kuhio Highway extends beyond the intersection of Ahukini Road with Akahi Street. Left turns from Akahi Street across the left turn storage lane will not be a safe maneuver. Accordingly, turning movements at the intersection of Ahukini Road at Akahi Street should be restricted to right turn only.

Impacts of Optimized Traffic Signal Timing Along Ahukini Road

In response to comments, an alternate design for Ahukini Road was developed based using optimized traffic signal cycle lengths, which has a direct impact of the left turn storage lane requirements. Reduction of the left turn lane storage length requirements may provide additional area that could be used for landscaping.

The optimum traffic signal cycle lengths were determined using Synchro 7. Separate cycle lengths were determined for morning and afternoon peak hours. It was also assumed that the intersections with Kuhio Highway and Umi Street would be synchronized meaning that both intersections would have the same cycle length. The optimum traffic signal cycle lengths for the morning and afternoon peak hours were determined to be 70 seconds and 90 seconds, respectively. The resulting left turn lane storage requirements are summarized in Table 10. As shown there is a significant reduction in the left turn storage length required. Since the lane configurations and cycle splits are the same as the previously discussed design, the impacts of the levels-of-service are negligible. A revised conceptual design using the revised signal cycle lengths is provided as Figure 14. The conceptual plan is shown for the alternative with widening along Kuhio Highway. The required lengths of the left turn storage lanes along the Ahukini Road approaches to Kuhio Highway will be approximately the same regardless of the number of lanes along Kuhio Highway.

						Average	e Required Length (1)				
Intersecti	Appr & T	oach	Design	Cycle Length	Cycles	Vehicles per	Minimum		Desirable		Length Recommended
on	Period		Volume	(Seconds)	per Hour	Cycle ⁽²⁾	Veh	Ft	Veh	Ft	(Ft)
Ahukini Rd at Kuhio Hwy	ED	AM	30	70	51	1	2	50	2	50	100
	LD	PM	20	90	40	1	2	50	2	50	
		AM	370	70	51	7	11	275	14	350	2@250" = 500'
	٧D	PM	410	90	40	10	15	375	20	500	
	ED	AM	50	70	51	1	2	50	2	50	100
Ahukini Rd at Umi	LD	PM	75	90	40	2	3	75	4	100	
St	W/B	AM	460	70	51	9	14	350	18	450	2@225' = 450'
	VVD	PM	320	90	40	8	12	300	16	400	
NOTE: (1) M (2) 7	Vinimur The ave	n queue	e length is 1.5	time average r	number of vehic	cles. Desirable	e queue length	is 2.0 time ave	erage number	of vehicles.	

Table 10 Left Turn Lane Length Requirements for Proposed Improvements Along Ahukini **Road With Optimized Traffic Signal Cycle Length**

Minimum queue length is 1.5 time average number of vehicles. Desirable queue length is 2.0 time average number of vehicles. The average number of vehicles per cycle is calculated by dividing the design volume by the number of cycles per hour.

Elimination of Umi Street Extension

The extension of Umi Street north of Ahukini Road was added late in the study in response to future development north of and east of the existing Walmart. Based on a subjective assessment of traffic volumes and levels-of-service in the area, it was determined that is additional link would provide an alternative route to Kuhio Highway between Rice Street and the existing entrance to Walmart along Kuhio Highway, which has and will have low levels-of-service. Therefore, an improvement of conditions along this section of Kuhio Highway would result. A level-of-service analysis without this extension concluded that both morning and afternoon levels-of-service at the intersection of Kuhio Highway at Ahukini Road would decrease one level-of-service (ie: from Level-of-Service C to Level-of-Service D). The level-of-service of the intersection of Ahukini Road at Umi Street would be Level-of-Service B, morning and afternoon. This is the same level-of-service as for a four-legged intersection. A schematic drawing of this intersection without the extension is presented as Figure 15.

Hardy Street between Kuhio Highway and Umi Street

The conceptual design for Hardy Street between Umi Street and Kuhio Highway is shown as Figure 16. The major components of the plan are:

1. The intersection of Kuhio Highway at Hardy Street is signalized. There will be separate southbound to eastbound left turn phase. The existing southbound left turn lane will be retained and the westbound approach of Hardy Street will remain as existing, which is a left turn lane and a right turn lane. Under these conditions, the intersection will operate at Level-of-Service D during the morning peak hour and Level-of-Service E during the afternoon peak hour.

If sufficient right-of-way can be obtained to provide a second left turn lane the morning and afternoon levels-of-service would be Level-of-Service D during both peak periods. The length needed for the westbound left turn storage lane would be reduced from 450 feet to 225 feet. This would eliminate potential backup through the upstream unsignalized intersection at Akahi Street.

- 2. It was assumed that the intersection of Hardy Street at Akahi Street will be signalized for 2020 conditions. This intersection is the north entrance to the Civic Center. The eastbound and westbound left turns will be protected and there will be separate left turn lanes.
- 3. The intersection of Hardy Street at Umi Street will be converted to a roundabout. The level-of-service analysis assessed the intersection as a two-way STOP sign controlled intersection and as a four-way STOP sign controlled intersection. For both cases, the intersection operated at Level-of-Service F. As a roundabout, the maximum volume-to-capacity ratio is 0.89, which implies Level-of-Service D.

The required lengths of the left turn storage lanes were determined using the criteria cited above. The calculations are shown in Table 11.

					Average	Required Length (1)			(1)		
		Design	Cycle	Cycles	Vehicles	Mini	num	Desirable		Length Recommended	
Intersection	Approach	Volume	(Seconds)	per Hour	Cycle (2)	Veh	Ft	Veh	Ft	(Ft)	Notes
Hardy St at Kuhio Hwy	WB	270	120	30	9	14	350	18	450	275	Signalized
Hardv St at	EB	60	60	60	1	2	50	2	50	60	Unsignalized
Akahi St	WB	95	60	60	2	3	75	4	100	100	Unsignalized
Hardy St at Elua St	EB	130	60	60	2	3	75	4	100	100	Unsignalized
NOTE: (1) Mini (2) The	mum queue ler	ngth is 1.5 tim	e average nu	mber of vehic	cles. Desirab	le queue l esign volu	ength is 2.	0 time ave	erage num	ber of vehicles.	

Table 11	Turn Lane Length Requireme	ents for Proposed Improvemer	ts Along Hardy Street
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Impacts of Optimized Traffic Signal Timing Along Hardy Street

The required lengths of the left turn storage lanes were determined using optimized traffic signal cycle lengths are shown in Table 12. Because there is insufficient length to provide the desirable lengths between Kuhio Highway and Akahi Street, the recommended lane lengths are the same as without the optimized cycle lengths.

	Intersection Approach Volume Cycle Cycles			Average	R	equired	Length	(1)				
			Design	Cycle	Cycles	Vehicles	Mini	Minimum		rable	Length	
Intersection			Volume	(Seconds)	per Hour	Cycle (2)	Veh	Ft	Veh	Ft	(Ft)	Notes
Hardy St at Kuhio Hwy	WB	AM	100	90	40	3	5	125	6	150	075	Signalized
		PM	270	80	45	6	9	225	12	300	275	
	WB	AM	95	90	40	2	3	75	4	100)) 60	
Hardy St at		PM	70	80	45	2	3	75	4	100		Signalized
Akahi St	EB	AM	60	90	40	2	3	75	4	100	100	Unsignalized
		PM	40	80	45	1	2	50	2	50	- 100	Unsignalized
Hardy St at	EB	AM	130	60	60	2	3	75	4	100	100	Unsignalized
Elua St	EB	PM	130	60	60	2	3	75	4	100	100	Unsignalized

Table 12Turn Lane Length Requirements for Proposed Improvements Along Hardy Street
With Optimized Traffic Signal Cycle Length

NOTE: (1) (2) (3) (4)

Minimum queue length is 1.5 time average number of vehicles. Desirable queue length is 2.0 time average number of vehicles.

The average number of vehicles per cycle is calculated by dividing the design volume by the number of cycles per hour.

The cycle length for unsignalized intersections is based seconds based on the AASHTO standards as discussed earlier in this chapter. As discussed in Chapter 5 of this report, the intersection of Hardy at Akahi Street may be signalized. Therefore, the lengths of the left turn storage lane

As discussed in Chapter 5 of this report, the intersection of Hardy at Akahi Street may be signalized. Therefore, the lengths of the left turn storage lane were determined for signalized conditions since the lengths for signalized conditions are longer than for unsignalized conditions. This minimizes the possibility that the pertinent section of Hardy Street will have to be reconstructed when signals are installed.

Rice Street between Kuhio Highway and Hardy Street

The conceptual design for this section of Rice Street is shown as Figure 17. The major improvement is the widening of the Rice Street approach to Kuhio Highway to provide a double westbound to southbound left turn. With this improvement, the intersection will operate at Level-of-Service B during both peak periods. This can be accomplished with SDOT's project to widen Kaumualii Highway from two to four lanes.

The calculations for the required length of the left turn storage lane are shown in Table 13. The required length could not be provided because of the geometry of the intersection and constraints by existing buildings adjacent to the roadway. Reduction of the traffic signal cycle length to approximately 70 seconds would reduce the required length to match the recommended length.

Table 13 Turn Storage Lane Requirements for Proposed Improvements Along Rice Street

							Required	Length (1)			
		Design	Cycle	Cycles	Average Vehicles	Minimum		Desirable		Length Recommended	
Intersection	Approach	Volume	(Seconds)	per Hour	per Cycle	Veh	Ft	Veh	Ft	(Ft)	
Rice St at Kuhio Hwy	WB	480	120	30	16	24	600	32	800	2@200' =400'	
NOTE: (1) Minimum queue length is 1.5 time average number of vehicles. Desirable queue length is 2.0 time average number of vehicles.											

The optimized traffic signal lengths are 75 seconds for the morning peak hour and 90 seconds for the afternoon peak hour. This implies that there is sufficient length to accommodate morning peak hour queues.
FIGURES

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Figure 2 Existing (2005) AM Peak Hour Traffic Volumes



Figure 3 Existing (2005) PM Peak Hour Traffic Volumes









Figure 6 Baseline AM Peak Hour Traffic Projections



Figure 7 Baseline PM Peak Hour Traffic Projections



Figure 8 Network A - AM Peak HourTraffic Projections



Figure 9 Network A - PM Peak Hour Traffic Projections



Figure 10 Network B - AM Peak Hour Traffic Projections



Figure 11 Network B - PM Peak Hour Traffic Projections



Figure 12 Conceptual Plan for Ahukini Road Between Umi Street and Kuhio Highway Alternate 1



Figure 13 Conceptual Plan for Ahukini Road Between Umi Street and Kuhio Highway Alternate 2



Figure 14 Conceptual Plan for Ahukini Road Between Umi Street and Kuhio Highway With Optimized Traffic Signal Lengths



Figure 15 Conceptual Plan for Ahukini Road Between Umi Street and Kuhio Highway Without Umi Street Extension



Figure 16 Conceptual Plan for Hardy Street Between Kuhio Highway and Umi Street





APPENDIX A TRAFFIC ASSIGNMENT WORKSHEETS FOR LIHUE - HANAMAULU



HANAMA'ULU TRIP ASSIGNMENTS AM PEAK HOUR



HANAMA'ULU TRIP ASSIGNMENTS PM PEAK HOUR

APPENDIX B DETAILED LEVEL-OF-SERVICE RESULTS

AM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	0.64	12.7	В	0.94	38.9	D	0.89	22.2	С	0.86	20.4	С
Rice Street, Westbound Left	0.63	23.4	С	0.81	31.5	С	0.91	51.9	D	0.81	31.5	С
Rice Street, Westbound Right	0.04	17.5	В	0.05	16.8	В	0.05	22.9	С	0.05	16.8	В
Kuhio Highway, Northbound Thru	0.63	17.0	В	1.12	84.4	F	0.87	26.8	С	0.92	31.3	С
Kuhio Highway, Northbound Right	0.18	0.2	А	0.30	0.5	А	0.30	0.5	А	0.30	0.5	А
Kuhio Highway, Southbound Left	0.67	25.8	С	0.82	34.9	С	0.92	58.5	Е	0.82	34.9	С
Kuhio Highway, Southbound Thru	0.36	5.2	В	0.54	7.5	А	0.49	6.8	А	0.34	5.9	А
PM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
2 11	0.71	14.0	В	1.04	52.3	D	0.96	30.3	С	0.91	23.7	С
Rice Street, Westbound Left	0.78	30.1	С	1.11	95.5	F	0.98	65.7	E	0.94	48.3	D
Rice Street, Westbound Right	0.06	17.8	В	0.08	16.6	В	0.08	22.7	С	0.08	17.0	В
Kuhio Highway, Northbound Thru	0.68	17.2	В	1.17	104.8	F	0.93	36.5	D	0.88	30.2	С
Kuhio Highway, Northbound Right	0.26	0.4	А	0.36	0.6	А	0.36	0.6	А	0.37	0.6	А
Kuhio Highway, Southbound Left	0.71	31.8	С	0.72	29.5	С	0.98	87.6	F	0.90	57.3	Е
Kuhio Highway, Southbound Thru	0.36	5.7	А	0.61	8.9	А	0.60	12.0	В	0.53	10.1	В

Intersection 1 Levels-of-Service Analysis at Rice Street & Kuhio Avenue - Signalized

NOTES:

1. V/C denotes ratio of volume to capacity.

2. Delay is in seconds per vehicle.

3. 4. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections.

Levels-of-Service Analysis at Haleko Street & Rice Street - Unsignalized Intersection 2

				•								
AM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	See Note 4			See Note 4			See Note 4			See Note 4		
Rice Street, Westbound Left & Thru		10.2	В		13.1	В		13.1	В		13.1	В
Haleko Street, Northbound Right		16.7	С		34.2	D		34.2	D		34.2	D
PM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	See Note 4			See Note 4			See Note 4			See Note 4		
Rice Street, Westbound Left & Thru		14.1	В		27.6	D		27.6	D		27.6	D
Haleko Street, Northbound Right		17.8	С		33.2	D		33.2	D		33.2	D

NOTES:

V/C denotes ratio of volume to capacity.

1. 2. 3. 4.

Delay is in seconds per vehicle. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections.

Intersection 3 Levels-of-Service Analysis at Eiwa Street & Rice Street - Unsignalized

AM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	See Note 4			See Note 4								
Rice Street, Eastbound Left & Thru		9.8	А		12.1	В						
Eiwa Street, Southbound Left		42.3	Е		200.5	F		DELETED			DELETED	
Eiwa Street, Southbound Right		12.4	В		16.2	С						
PM Peak Hour		Existing			Baseline							
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS						
	See Note 4			See Note 4								
Rice Street, Eastbound Left & Thru		10.9	В		15.8	С						
Eiwa Street, Southbound Left		79.3	F		819.5	F		DELETED			DELETED	
Eiwa Street, Southbound Right		15.8	С		32.8	D						

NOTES:

V/C denotes ratio of volume to capacity. 1.

2. 3. 4. Delay is in seconds per vehicle.

LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections.

AM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	0.43	10.2	В	0.46	10.0	В	0.46	10.0	В	0.46	10.0	В
Rice Street, Eastbound Left, Thru & Right	0.62	11.4	В	0.63	11.4	В	0.63	11.4	В	0.63	11.4	В
Rice Street, Westbound Left, Thru & Right	0.49	9.8	А	0.57	10.4	В	0.57	10.4	В	0.57	10.4	В
Umi Street, Northbound Left, Thru & Right	0.02	5.8	А	0.14	6.8	А	0.14	6.8	А	0.14	6.8	А
Umi Street, Southbound Left & Thru	0.28	7.7	А	0.32	8.4	А	0.32	8.4	А	0.32	8.4	А
Umi Street, Southbound Right	0.01	5.8	А	0.09	6.5	А	0.09	6.5	А	0.09	6.5	А
PM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
<i>·</i> · · · ·	0.66	15.9	В	0.69	15.7	В	0.69	15.7	В	0.69	15.7	В
Rice Street, Eastbound Left, Thru & Right	0.90	23.0	С	0.90	23.1	С	0.90	23.1	С	0.90	23.1	С
Rice Street, Westbound Left, Thru & Right	0.59	10.2	В	0.73	12.4	В	0.73	12.4	В	0.73	12.4	В
Umi Street, Northbound Left, Thru & Right	0.04	7.3	А	0.21	8.5	А	0.21	8.5	А	0.21	8.5	А
Umi Street, Southbound Left & Thru	0.42	10.9	В	0.47	11.8	В	0.47	11.8	В	0.47	11.8	В
Limi Street, Southhound Dight	0.04	74	•	0.04	~ ~	۸	0.04	~ ~	•	0.04	~ ~	

Intersection 4 Levels-of-Service Analysis at Rice Street & Umi Street - Signalized

NOTES:

1. V/C denotes ratio of volume to capacity.

2. Delay is in seconds per vehicle.

3.

LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections. 4.

				-								
AM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
· • • •	0.40	9.1	А	0.56	11.6	В	0.56	11.6	В	0.56	11.6	В
Rice Street, Eastbound Left, Thru & Right	0.44	9.7	А	0.75	13.8	В	0.75	13.8	В	0.75	13.8	В
Rice Street, Westbound Left, Thru & Right	0.57	10.7	В	0.71	12.4	В	0.71	12.4	В	0.71	12.4	В
Hardy Street, Northbound Left & Thru	0.21	6.8	А	0.30	8.7	А	0.30	8.7	А	0.30	8.7	А
Hardy Street, Northbound Right	0.05	5.7	А	0.06	6.7	А	0.06	6.7	А	0.06	6.7	А
Hardy Street, Southbound Left & Thru	0.28	7.5	А	0.40	10.0	В	0.40	10.0	В	0.40	10.0	В
Hardy Street, Southbound Right	0.09	6.0	А	0.20	7.6	А	0.20	7.6	А	0.20	7.6	А
PM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
2 11	0.44	9.9	А	0.61	13.1	В	0.61	13.1	В	0.61	13.1	В
Rice Street, Eastbound Left, Thru & Right	0.55	10.3	В	0.70	12.1	В	0.70	12.1	В	0.70	12.1	В
Rice Street, Westbound Left, Thru & Right	0.63	11.4	В	0.83	16.7	В	0.83	16.7	В	0.83	16.7	В
Hardy Street, Northbound Left & Thru	0.28	7.8	А	0.40	10.4	В	0.40	10.4	В	0.40	10.4	В
Hardy Street, Northbound Right	0.05	6.2	А	0.07	7.3	А	0.07	7.3	А	0.07	7.3	А
Hardy Street, Southbound Left & Thru	0.27	7.9	А	0.41	10.8	В	0.41	10.8	В	0.41	10.8	В
Hardy Street, Southbound Right	0.04	6.1	А	0.13	7.6	А	0.13	7.6	А	0.13	7.6	А

Levels-of-Service Analysis at Rice Street & Hardy Street - Signalized Intersection 5

NOTES:

1. V/C denotes ratio of volume to capacity.

2. Delay is in seconds per vehicle.

3.

LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections. 4.

AM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
· • •	0.36	10.7	В	0.54	11.9	В	0.53	11.6	В	0.53	11.6	В
Rice Street, Eastbound Left, Thru & Right	0.66	13.3	В	0.79	15.5	В	0.79	15.1	В	0.79	15.1	В
Rice Street, Westbound Left, Thru & Right	0.50	11.1	В	0.55	10.2	В	0.55	9.8	А	0.55	9.8	А
Hoolako Street, Northbound Left & Thru	0.17	6.0	А	0.28	9.5	А	0.28	9.3	А	0.28	9.3	А
Hoolako Street, Northbound Right	0.02	5.2	А	0.03	7.5	А	0.03	7.3	А	0.03	7.3	А
Hoolako Street, Southbound Left & Thru	0.11	5.7	А	0.25	9.3	А	0.26	9.1	А	0.26	9.1	А
Hoolako Street, Southbound Right	0.06	5.4	А	0.08	7.8	А	0.08	7.6	А	0.08	7.6	А
PM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
· • • •	0.64	13.0	В	0.99	25.0	С	0.95	25.0	С	0.95	25.0	С
Rice Street, Eastbound Left, Thru & Right	0.91	17.5	В	1.36	34.5	С	1.36	34.5	С	1.36	34.5	С
Rice Street, Westbound Left, Thru & Right	0.53	10.6	В	0.70	11.5	В	0.70	11.5	В	0.70	11.5	В
Hoolako Street, Northbound Left & Thru	0.25	9.1	А	0.52	16.6	В	0.52	16.6	В	0.52	16.6	В
Hoolako Street, Northbound Right	0.05	7.6	А	0.07	9.8	А	0.07	9.8	А	0.07	9.8	А
Hoolako Street, Southbound Left & Thru	0.48	12.1	В	0.93	43.6	D	0.93	43.6	D	0.93	43.6	D
Hoolako Street, Southbound Right	0.07	7.7	А	0.09	10.0	А	0.09	10.0	Α	0.09	10.0	А

Levels-of-Service Analysis at Rice Street & Hoolako Street - Signalized Intersection 6

NOTES:

1. V/C denotes ratio of volume to capacity.

2. Delay is in seconds per vehicle.

3.

LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections. 4.

			Unsig	nalized			Signalized					
AM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	See Note 4			See Note 4			0.51	15.5	В	0.51	15.5	В
Rice Street, Eastbound Left		8.9	А		11.2	В	0.71	25.0	С	0.71	25.0	С
Rice Street, Eastbound Thru												
Rice Street, Eastbound Right							0.15	17.1	В	0.15	17.1	В
Rice Street, Westbound Thru & Right												
Kapule Highway, Northbound Left							0.68	26.0	С	0.68	26.0	С
Kapule Highway, Northbound Thru							0.22	5.1	А	0.22	5.1	А
Kapule Highway, Southbound Left		47.8	Е		163.6	F						
Kapule Highway, Southbound Thru							0.26	14.2	В	0.26	14.2	В
Kapule Highway, Southbound Right		9.9	А		11.5	В	0.15	13.7	В	0.15	13.7	В
			Unsig	nalized					Signa	alized		
PM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	See Note 4			See Note 4			0.86	24.2	С	0.86	24.2	С
Rice Street, Eastbound Left		12.1	В		20.9	С	0.88	38.3	D	0.88	38.3	D
Rice Street, Eastbound Thru												
Rice Street, Eastbound Right							0.62	22.5	С	0.62	22.5	С
Rice Street, Westbound Thru & Right												
Kapule Highway, Northbound Left							0.87	42.5	D	0.87	42.5	D
Kapule Highway, Northbound Thru							0.34	7.2	А	0.34	7.2	А
Kapule Highway, Southbound Left		>999.9	F		>999.9	F						
Kapule Highway, Southbound Thru							0.82	27.9	С	0.82	27.9	С
Kapule Highway, Southbound Right		12.8	В		19.2	С	0.29	18.7	В	0.29	18.7	В
NOTES												

Intersection 7 Levels-of-Service Analysis at Rice Street & Kapule Highway

NOTES

1. V/C denotes ratio of volume to capacity.

2.

3.

Delay is in seconds per vehicle. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections. 4.

	00111007	anaryoro	at Haray	011001.0		iginay						
			Unsigi	nalized					Signa	alized		
AM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
· · · · ·	See Note 4			See Note 4			0.85	24.6	С	0.75	21.9	С
Hardy Street, Westbound Left		401.8	F		>999.9	F	0.49	36.2	D	0.49	36.2	D
Hardy Street, Westbound Right		13.6	В		20.8	С	0.21	33.8	С	0.21	33.8	С
Kuhio Highway, Northbound Thru & Right							0.91	33.2	С	0.72	23.8	С
Kuhio Highway, Southbound Left		14.0	В		64.2	F	0.92	49.5	D	0.89	42.9	D
Kuhio Highway, Southbound Thru							0.50	4.0	А	0.35	3.1	А
			Unsigi	nalized					Signa	alized		
PM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	See Note 4			See Note 4			0.90	25.5	С	0.83	21.1	С
Hardy Street, Westbound Left		751.9	F		>999.9	F	0.86	49.5	D	0.77	34.9	С
Hardy Street, Westbound Right		23.1	С		94.3	F	0.55	30.9	С	0.37	23.7	С
Kuhio Highway, Northbound Thru & Right							0.91	30.0	С	0.84	25.4	С
Kuhio Highway, Southbound Left		13.5	В		27.6	D	0.91	55.7	Е	0.86	42.6	D
Kuhio Highway, Southbound Thru							0.55	6.5	А	0.50	6.4	А

Intersection 8 Levels-of-Service Analysis at Hardy Street & Kuhio Highway

NOTES:

1. V/C denotes ratio of volume to capacity.

2. 3. 4. Delay is in seconds per vehicle.

LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections.

AM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	See Note 4			See Note 4			See Note 4			See Note 4		
Hardy Street, Eastbound Left								8.1	А		8.1	А
Hardy Street, Eastbound Left & Thru		7.8	А		8.1	А						
Hardy Street, Westbound Left								9.4	А		9.4	А
Akahi Street, Northbound Left, Thru & Right								200.8	F		200.8	F
Akahi Street, Southbound Left, Thru & Right								147.7	F		147.7	F
Akahi Street, Southbound Left		15.4	С		31.2	D						
Akahi Street, Southbound Right		9.7	А		10.7	В						
PM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	See Note 4			See Note 4			See Note 4			See Note 4		
Hardy Street, Eastbound Left								9.0	А		9.0	А
Hardy Street, Eastbound Left & Thru		8.1	А		9.0	А						
Hardy Street, Westbound Left								9.1	А		9.1	А
Akahi Street, Northbound Left, Thru & Right									F			F
Akabi Street, Southbound Loft, Thru & Pight								774 5	E		774 5	F
Akam Street, Southbound Left, Third & Right								114.5			114.5	•
Akahi Street, Southbound Leit, Third & Right Akahi Street, Southbound Left		23.4	С		133.0	F		114.5	Г		114.5	

Intersection 9 Levels-of-Service Analysis at Hardy Street & Akahi Street - Unsignalized

NOTES:

1. 2. 3. 4.

V/C denotes ratio of volume to capacity. Delay is in seconds per vehicle. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections.

Intersection 10	Levels-of-Service Analy	sis at Eiwa Street & Haro	ly Street - Unsignalized

AM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	See Note 4			See Note 4								
Hardy Street, Westbound Left & Thru		9.6	А		12.5	В						
Eiwa Street, Northbound Left		39.3	Е		338.6	F		DELETED			DELETED	
Eiwa Street, Northbound Right		14.1	В		25.1	D						
PM Peak Hour		Existing			Baseline							
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS						
	See Note 4			See Note 4								
Hardy Street, Westbound Left & Thru		8.9	А		9.9	А						
Eiwa Street, Northbound Left		34.6	D		325.2	F		DELETED			DELETED	
Eiwa Street, Northbound Right		13.8	В		19.8	С						

NOTES:

1.

V/C denotes ratio of volume to capacity. Delay is in seconds per vehicle. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections. 2. 3. 4.

Intersection 11	Levels-of-Service Analy	sis Elua Street at Hard	y Street - Unsignalized
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AM Peak Hour	Existing			Baseline			Network A			Network B		
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	See Note 4			See Note 4			See Note 4			See Note 4		
Hardy Street, Eastbound Left & Thru		8.2	А		8.8	А		8.8	А		8.8	А
Elua Street, Southbound Left & Right		16.2	С		40.0	Е		40.0	Е		40.0	Е
PM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	See Note 4			See Note 4			See Note 4			See Note 4		
Hardy Street, Eastbound Left & Thru		8.2	А		9.3	А		9.3	А		9.3	А
Elua Street, Southbound Left & Right		16.2	С		44.5	Е		44.5	E		44.5	E

NOTES:

1.

1. 2. 3. 4.

V/C denotes ratio of volume to capacity. Delay is in seconds per vehicle. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections.

								Roundabout						
AM Peak Hour	Existing			Baseline				Network A		Network B				
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS		
	See Note 4			See Note 4	ļ		0.86		D	0.86		D		
Hardy Street, Eastbound Left, Thru & Right		7.8	А		8.1	Α	0.89		D	0.89		D		
Hardy Street, Westbound Left, Thru & Right		8.4	А		9.7	Α	0.44		А	0.44		А		
Umi Street, Northbound Left, Thru & Right		64.4	F			F	0.39		Α	0.39		Α		
Umi Street, Southbound Left, Thru & Right		26.1	D		375.5	F	0.40		А	0.40		А		
							Roundabout							
PM Peak Hour	Existing			Baseline				Network A		Network B				
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS		
	See Note 4			See Note 4	ļ		0.60		В	0.60		В		
Hardy Street, Eastbound Left, Thru & Right		7.9	А		8.9	А	0.63		В	0.63		В		
Hardy Street, Westbound Left, Thru & Right		8.1	А		8.5	А	0.63		В	0.63		В		
Umi Street, Northbound Left, Thru & Right		55.1	F		846.8	F	0.37		А	0.37		А		
Umi Street, Southbound Left, Thru & Right		18.0	С			F	0.21		А	0.21		А		

Levels-of-Service Analysis at Hardy Street & Umi Street - Unsignalized Intersection 12

NOTES: 1. 2. 3. 4. V/C denotes ratio of volume to capacity. Delay is in seconds per vehicle. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections.

	Existing			Baseline				Network A		Network B		
AM Peak Hour	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Intersection, Approach and Movement	0.67	16.2	В	1.10	69.3	Е	0.64	15.5	В	0.50	23.4	С
Ahukini Road, Eastbound Left							0.88	35.2	D	0.87	125.6	F
Ahukini Road, Eastbound Thru							0.21	37.5	D	0.21	32.9	С
Ahukini Road, Eastbound Right	0.01	46.1	D	0.02	72.9	Е	0.32	40.3	D	0.02	30.9	D
Ahukini Road, Westbound Left	0.93	72.7	Е	1.31	222.7	F	0.83	25.6	С	0.90	47.7	С
Ahukini Road, Westbound Thru							0.11	25.5	С	0.13	24.9	С
Ahukini Road, Westbound Thru & Right	0.11	28.9	С	0.19	48.3	D						
Ahukini Road, Westbound Right							0.10	25.5	С	0.10	24.8	С
Kuhio Highway, Northbound Left, Thru & Right				0.53	9.9	А						
Kuhio Highway, Northbound Left							0.13	11.6	В	1.38	393.6	F
Kuhio Highway, Northbound Thru							0.46	12.9	В	0.41	15.9	В
Kuhio Highway, Northbound Thru & Right	0.37	5.9	А									
Kuhio Highway, Northbound Right							0.24	11.3	В	0.24	14.9	В
Kuhio Highway, Southbound Left, Thru & Right	0.65	9.2	А	1.10	77.0	Е						
Kuhio Highway, Southbound Left							0.44	6.5	А	0.53	23.8	С
Kuhio Highway, Southbound Thru & Right							0.61	8.0	А	0.47	8.5	А
		Existing			Baseline			Network A			Network B	
PM Peak Hour	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Intersection, Approach and Movement	0.82	24.4	С	1.15	72.4	Е	0.76	26.2	С	0.70	26.5	С
Ahukini Road, Eastbound Left							1.10	279.3	С	0.79	126.9	F
Ahukini Road, Eastbound Thru							0.28	41.5	D	0.36	43.9	D
Ahukini Road, Eastbound Right	0.02	52.9	D	0.02	66.7	Е	0.02	39.6	D	0.02	40.9	D
Ahukini Road, Westbound Left	1.03	107.1	F	1.30	214.7	F	0.93	62.2	В	0.91	58.1	Е
Ahukini Road, Westbound Thru							0.09	30.0	А	0.10	31.2	С
Ahukini Road, Westbound Thru & Right	0.48	38.3	D	0.84	58.0	Е						
Ahukini Road, Westbound Right							0.56	35.3	А	0.22	32.1	С
Kuhio Highway, Northbound Left, Thru & Right				0.81	23.1	В						
Kuhio Highway, Northbound Left							0.09	11.5	С	0.51	53.3	D
Kuhio Highway, Northbound Thru							0.78	22.7	D	0.68	22.5	С
Kuhio Highway, Northbound Thru & Right	0.58	9.1	А									
							0.26	14.5	C	0.26	16.8	В
Kuhio Highway, Northbound Right							0.20	1 1.0	C	0.20	10.0	
Kuhio Highway, Northbound Right Kuhio Highway, Southbound Left, Thru & Right	1.07dl	16.2	В	3.40dl	120.7	F	0.20	11.0	C	0.20	10.0	
Kunio Highway, Northbound Right Kuhio Highway, Southbound Left, Thru & Right Kuhio Highway, Southbound Left	1.07dl	16.2	В	3.40dl	120.7	F	0.71	28.6	E	0.68	39.7	D

Intersection 13 Levels-of-Service Analysis at Ahukini Road & Kuhio Highway - Signalized

NOTES:

1. V/C denotes ratio of volume to capacity.

2. 3. 4. Delay is in seconds per vehicle.

LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections.
Intersection 14 Levels-of-Service Analysis at Anukini Road & Akani Street - Unsignaliz
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AM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	See Note 4			See Note 4			See Note 4			See Note 4		
Ahukini Road, Westbound Left & Thru		8.3	А		9.3	А						
Akahi Street, Northbound Left & Right		17.9	С		37.4	Е						
Akahi Street, Northbound Right								12.1	В		12.1	В
PM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	See Note 4			See Note 4			See Note 4			See Note 4		
Ahukini Road, Westbound Left & Thru		8.7	А		9.6	А						
Akahi Street, Northbound Left & Right		19.5	С		51.1	F						
Akahi Street, Northbound Right								12.0	В		12.0	В

NOTES:

1.

2. 3. 4.

V/C denotes ratio of volume to capacity. Delay is in seconds per vehicle. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections.

Levels-of-Service Analysis at Ahukini Road & Elua Street - Unsignalized Intersection 15

AM Peak Hour		Existing		Baseline			Network A			Network B		
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	See Note 4			See Note 4			See Note 4	ļ		See Note 4		
Ahukini Road, Westbound Left & Thru		8.4	А		9.4	А						
Elua Street, Northbound Left & Right		23.6	С		86.9	F		DELETED			DELETED	
PM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	See Note 4			See Note 4			See Note 4	ļ		See Note 4		
Ahukini Road, Westbound Left & Thru		8.4	A		9.0	A						
Elua Street, Northbound Left & Right		29.2	D		201.5	D		DELETED			DELETED	

NOTES:

V/C denotes ratio of volume to capacity.

1. 2. 3. 4.

Delay is in seconds per vehicle. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections.

			Unsig	nalized			Signalized						
AM Peak Hour		Existing			Baseline			Network A			Network B		
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	
	See Note 4			See Note 4			0.52	14.9	В	0.52	14.9	В	
Ahukini Road, Eastbound Left							0.50	26.4	С	0.50	26.4	С	
Ahukini Road, Eastbound Thru & Right							0.58	14.5	В	0.58	14.5	В	
Ahukini Road, Westbound Left							0.67	26.4	С	0.67	26.4	С	
Ahukini Road, Westbound Left & Thru	See Note 4	8.6	А	See Note 4	9.9	А							
Ahukini Road, Westbound Thru & Right							0.59	12.7	В	0.59	12.7	В	
Umi Street, Northbound Left		76.6	F		750.2	F	0.37	14.3	В	0.37	14.3	В	
Umi Street, Northbound Thru & Right		10.9	В		13.5	В	0.13	11.3	В	0.13	11.3	В	
Umi Street, Southbound Left							0.12	11.4	В	0.12	11.4	В	
Umi Street, Southbound Thru & Right							0.12	11.2	В	0.12	11.2	В	
PM Peak Hour		Existing			Baseline			Network A			Network B		
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	
	See Note 4			See Note 4			0.48	15.3	В	0.48	15.3	В	
Ahukini Road, Eastbound Left							0.52	25.5	С	0.52	25.5	С	
Ahukini Road, Eastbound Thru & Right							0.67	16.1	В	0.67	16.1	В	
Ahukini Road, Westbound Left							0.48	22.5	С	0.48	22.5	С	
Ahukini Road, Westbound Left & Thru	See Note 4	8.8	А	See Note 4	9.8	А							
Ahukini Road, Westbound Thru & Right							0.67	14.9	С	0.67	14.9	С	
Umi Street, Northbound Left		59.6	F		541.5	F	0.38	13.6	D	0.38	13.6	D	
Umi Street, Northbound Thru & Right		14.0	В		21.5	С	0.38	12.0	В	0.38	12.0	В	
Umi Street, Southbound Left							0.25	12.5	В	0.25	12.5	В	
Umi Street, Southbound Thru & Right							0.10	10.5	В	0.10	10.5	В	
NOTES:													

Intersection 16 Levels-of-Service Analysis at Ahukini Road & Umi Street - Unsignalized - Signalized

2. 3.

Delay is in seconds per vehicle. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections. 4.

Intersection 17	Levels-of-Service Analy	ysis at Ahukini Road &	Palai Street - Unsignalized
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AM Peak Hour		Existing			Baseline			Network A		Network B		
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	See Note 4			See Note 4			See Note 4			See Note 4		
Ahukini Road, Westbound Left & Thru		8.3	А		9.6	А		9.6	А		9.6	А
Palai Street, Northbound Left		30.4	D		158.7	F		64.0	F		64.0	F
Palai Street, Northbound Right		10.8	В		14.1	В		11.0	В		11.0	В
PM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	See Note 4			See Note 4			See Note 4			See Note 4		
Ahukini Road, Westbound Left & Thru		8.9	А		9.8	А		9.8	А		9.8	А
Palai Street, Northbound Left		29.3	D		98.3	F		47.4	Е		47.4	Е
Palai Street, Northbound Right		12.8	В		16.3	С		11.8	В		11.8	В

NOTES:

1.

2. 3. 4.

V/C denotes ratio of volume to capacity. Delay is in seconds per vehicle. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections.

Intersection 18	Levels-of-Service Analysis at Ahukini Road & Kapule Highwa	y - Signalized

AM Book Hour		Existing			Baseline			Network A			Network R	
AN Feat Toul	V/C ⁽¹⁾	Delav ⁽²⁾	1 OS ⁽³⁾	V/C	Delav	LOS	V/C ⁽¹⁾	Delav ⁽²⁾	1 OS ⁽³⁾	V/C	Delay	105
Intersection, Approach and Movement	0.75	39.8	D	0.93	56.6	E	0.78	33.8	C	0.74	34.8	C
Ahukini Road, Eastbound Left	1.48	278.0	F	0.98	92.1	F	0.66	45.5	D	0.87	59.7	E
Ahukini Road, Eastbound Thru	0.57	26.5	С	0.86	60.2	Е	0.65	41.6	D	0.56	37.6	D
Ahukini Road, Eastbound Right	0.06	22.0	C	0.08	35.1	D	0.08	44.8	D	0.08	34.0	С
Ahukini Road, Westbound Left	0.87	67.7	Е	0.96	84.4	F	0.90	65.1	Е	0.90	65.1	Е
Ahukini Road, Westbound Thru	0.54	25.7	С	1.01	91.7	F	0.55	34.9	D	0.68	40.8	D
Ahukini Road, Westbound Right	0.03	21.8	С	0.04	33.9	С	0.04	31.0	С	0.04	33.6	С
Kapule Highway, Northbound Left	0.46	24.6	С	0.92	96.2	F	0.62	43.1	D	0.70	49.5	D
Kapule Highway, Northbound Thru	0.53	17.7	В	0.71	32.3	С	0.37	21.1	С	0.39	22.1	С
Kapule Highway, Northbound Right	0.09	12.5	В	0.16	21.1	С	0.16	19.1	В	0.16	19.9	В
Kapule Highway, Southbound Left	0.41	21.5	С	0.84	66.0	Е	0.71	44.5	D	0.73	46.5	D
Kapule Highway, Southbound Thru	0.75	20.9	С	1.02	64.7	Е	0.56	21.6	С	0.56	22.0	С
Kapule Highway, Southbound Right	0.37	13.3	В	0.80	34.5	С	0.83	35.5	D	0.80	33.6	С
PM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	0.97	51.6	D	1.28	124.6	F	0.74	34.5	С	0.74	34.5	С
Ahukini Road, Eastbound Left	1.08	97.1	F	1.38	238.0	F	0.94	49.5	D	0.94	49.5	D
Ahukini Road, Eastbound Thru	0.31	26.1	С	0.79	56.3	E	0.65	32.4	С	0.65	32.4	С
Ahukini Road, Eastbound Right	0.04	23.9	С	0.07	39.3	D	0.05	26.9	С	0.05	26.9	С
Ahukini Road, Westbound Left	0.71	46.1	D	0.99	112.7	F	0.85	49.4	D	0.85	49.4	D
Ahukini Road, Westbound Thru	0.78	50.1	D	1.20	182.5	F	0.65	34.3	С	0.65	34.3	С
Ahukini Road, Westbound Right	0.10	33.1	С	0.47	58.6	E	0.22	29.9	С	0.22	29.9	С
Kapule Highway, Northbound Left	0.72	51.8	D	0.98	125.4	F	0.75	45.3	D	0.75	45.3	D
Kapule Highway, Northbound Thru	0.98	62.1	E	1.23	161.7	F	0.80	31.8	С	0.80	31.8	С
Kapule Highway, Northbound Right	0.12	21.3	С	0.45	37.3	D	0.25	22.0	С	0.25	22.0	С
Kapule Highway, Southbound Left	0.71	57.4	E	1.33	270.0	F	0.69	43.7	D	0.69	43.7	D
Kapule Highway, Southbound Thru	0.68	34.4	С	0.86	61.0	E	0.53	26.3	С	0.53	26.3	С
Kapule Highway, Southbound Right	0.18	24.2	С	0.35	39.6	D	0.23	23.3	С	0.23	23.3	С

NOTES:

V/C denotes ratio of volume to capacity. 1.

2. Delay is in seconds per vehicle.

3.

LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections. 4.

AM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
	0.45	3.5	А	0.69	10.3	А	0.59	31.5	С	0.59	31.5	С
Ka Ana Street, Eastbound Left	0.25	46.9	D	0.35	28.9	С	0.34	19.5	В	0.34	19.5	В
Ka Ana Street, Eastbound Right	0.00	44.2	D	0.01	26.8	С	0.01	17.9	В	0.01	17.9	В
Kapule Highway, Northbound Left	0.40	54.2	D	0.82	84.1	F	1.41	236.3	F	1.41	236.3	F
Kapule Highway, Northbound Thru	0.32	1.4	А	0.53	4.2	А	0.30	2.7	А	0.30	2.7	А
Kapule Highway, Southbound Thru	0.45	3.2	А	0.74	10.9	В	0.50	7.6	А	0.50	7.6	А
Kapule Highway, Southbound Right	0.03	1.5	А	0.14	4.1	А	0.03	5.1	А	0.03	5.1	А
PM Peak Hour		Existing			Baseline			Network A			Network B	
Intersection, Approach and Movement	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS	V/C ⁽¹⁾	Delay ⁽²⁾	LOS ⁽³⁾	V/C	Delay	LOS
2 11	0.60	5.8	А	0.96	32.3	С	0.60	9.3	В	0.60	9.3	В
Ka Ana Street, Eastbound Left	0.33	40.9	D	0.69	29.2	С	0.63	22.1	С	0.63	22.1	С
Ka Ana Street, Eastbound Right	0.01	38.5	D	0.04	20.4	С	0.04	16.3	В	0.04	16.3	В
Kapule Highway, Northbound Left	0.42	54.2	D	0.50	47.9	D	0.41	35.8	D	0.41	35.8	D
Kapule Highway, Northbound Thru	0.62	4.3	А	1.03	45.2	D	0.58	7.0	А	0.58	7.0	А
Kapule Highway, Southbound Thru	0.42	4.1	А	0.78	15.3	В	0.46	8.4	А	0.46	8.4	А
Kapule Highway, Southbound Right	0.01	2.2	А	0.01	5.3	А	0.03	5.9	А	0.03	5.9	А

Intersection 19 Levels-of-Service Analysis at Ka Ana Street & Kapule Highway - Signalized

NOTES:

V/C denotes ratio of volume to capacity. 1.

2. Delay is in seconds per vehicle.

LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. Volume-to-capacity ratios are not calculated for unsignalized intersections. Overall intersection delays and levels-of-service are also not calculated for unsignalized intersections. 3. 4.

APPENDIX C LEVEL-OF-SERVICE ANALYSIS WORKSHEETS





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Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	ካ	*	**	7	¥	* *	A faif we being with any program the second s
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.85	1.00	0.85	1.00	1.00	
Fit Protected	0.95	1.00	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539	
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1583	3539	1583	1770	3539	
Volume (vph)	225	60	765	260	215	745	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	245	65	832	283	234	810	
RTOR Reduction (vph)	0	51	0	0	0	0	
Lane Group Flow (vph)	245	14	832	283	234	810	
Turn Type		Perm		Free	Prot		
Protected Phases	8		2		1	6	
Permitted Phases		8		Free			
Actuated Green, G (s)	12.4	12.4	21.0	56.6	11.2	36.2	
Effective Green, g (s)	12.4	12.4	21.0	56.6	11.2	36.2	
Actuated g/C Ratio	0.22	0.22	0.37	1.00	0.20	0.64	
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	388	347	1313	1583	350	2263	
v/s Ratio Prot	c0.14		c0.24		c0.13	0.23	
v/s Ratio Perm		0.01		0.18			
v/c Ratio	0.63	0.04	0.63	0.18	0.67	0.36	
Uniform Delay, d1	20.0	17.4	14.6	0.0	21.0	4.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.3	0.0	2.3	0.2	4.8	0.4	
Delay (s)	23.4	17.5	17.0	0.2	25.8	5.2	
Level of Service	С	В	B	A	С	A	
Approach Delay (s)	22.1		12.7			9.8	
Approach LOS	С		В			А	
Intersection Summary							
HCM Average Control D	Delay		12.7	H	ICM Lev	vel of Se	ervice B
HCM Volume to Capacit	ty ratio		0.64	- <u>1</u>			
Actuated Cycle Length ((s)		56.6	S	Sum of lo	ost time	(s) 12.0
Intersection Capacity Ut	ilization		55.5%	l.	CU Leve	el of Sen	vice B
Analysis Period (min)			15				
c Critical Lane Group							

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Movement	WBL	WBR	NBT	NBR	SBL	SBT				
Lane Configurations	۲	۴	本 本	*	٦	* *			<u> </u>	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0				
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95				
Frt	1.00	0.85	1.00	0.85	1.00	1.00				
Fit Protected	0.95	1.00	1.00	1.00	0.95	1.00				
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539				
FIt Permitted	0.95	1.00	1.00	1.00	0.95	1.00				
Satd. Flow (perm)	1770	1583	3539	1583	1770	3539				
Volume (vph)	330	80	1220	430	280	1070				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92				
Adj. Flow (vph)	359	87	1326	467	304	1163				
RTOR Reduction (vph)	0	65	0	0	0	0				
Lane Group Flow (vph)	359	22	1326	467	304	1163				
Turn Type		Perm		Free	Prot					
Protected Phases	8		2		1	6				
Permitted Phases		8		Free						
Actuated Green, G (s)	14.7	14.7	19.7	58.8	12.4	36.1				
Effective Green, g (s)	14.7	14.7	19.7	58.8	12.4	36.1				
Actuated g/C Ratio	0.25	0.25	0.34	1.00	0.21	0.61				
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0				
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0				
Lane Grp Cap (vph)	443	396	1186	1583	373	2173				
v/s Ratio Prot	c0.20		c0.37		c0.17	0.33				
v/s Ratio Perm		0.01		0.29						
v/c Ratio	0.81	0.05	1.12	0.30	0.82	0.54				
Uniform Delay, d1	20.7	16.8	19.5	0.0	22.1	6.5				
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Incremental Delay, d2	10.7	0.1	64.9	0.5	12.8	0.9				
Delay (s)	31.5	16.8	84.4	0.5	34.9	7.5				
Level of Service	С	В	F	А	С	A				
Approach Delay (s)	28.6		62.6			13.2				
Approach LOS	С		E			В				
Intersection Summary									Ren	
HCM Average Control E	elay		38.9	F	ICM Lev	vel of Serv	ice	D		
HCM Volume to Capacit	ty ratio		0.94							
Actuated Cycle Length ((s)		58.8	5	Sum of le	ost time (s))	12.0		
Intersection Capacity Ut	ilization		77.5%	l.	CU Leve	el of Servic	e	D		
Analysis Period (min)			15							
c Critical Lane Group										

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Movement	WBL	WBR	NBT	NBR	SBL	SBT		110,000		2 478-71	C Males
Lane Configurations	*	*	44	7	3	<u>م</u> م	*** * * *	4	~ x <u></u>	~~~~~~	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900					
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0					
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95					
Frt	1.00	0.85	1.00	0.85	1.00	1.00					
Fit Protected	0.95	1.00	1.00	1.00	0.95	1.00					
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539					
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00					
Satd. Flow (perm)	1770	1583	3539	1583	1770	3539					
Volume (vph)	330	80	1220	430	280	1070					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92					
Adj. Flow (vph)	359	87	1326	467	304	1163					
RTOR Reduction (vph)	0	68	0	0	0	0					
Lane Group Flow (vph)	359	19	1326	467	304	1163					
Turn Type		Perm		Free	Prot						
Protected Phases	8		2		1	6					
Permitted Phases		8		Free							
Actuated Green, G (s)	16.7	16.7	32.0	74.7	14.0	50.0					
Effective Green, g (s)	16.7	16.7	32.0	74.7	14.0	50.0					
Actuated g/C Ratio	0.22	0.22	0.43	1.00	0.19	0.67					
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0					
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0					
Lane Grp Cap (vph)	396	354	1516	1583	332	2369					
v/s Ratio Prot	c0.20		c0.37		c0.17	0.33					
v/s Ratio Perm		0.01		0.29							
v/c Ratio	0.91	0.05	0.87	0.30	0.92	0.49					
Uniform Delay, d1	28.2	22.8	19.5	0.0	29.8	6.1					
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00					
Incremental Delay, d2	23.7	0.1	7.3	0.5	28.7	0.7					
Delay (s)	51.9	22.9	26.8	0.5	58.5	6.8					
Level of Service	D	С	С	A	E	А					
Approach Delay (s)	46.3		20.0			17.5					
Approach LOS	D		В			В					
Intersection Summary	C										
HCM Average Control E	Delay		22.2	ŀ	ICM Le	vel of Sen	vice		С		
HCM Volume to Capaci	ty ratio		0.89								
Actuated Cycle Length	(s)		74.7	5	Sum of l	ost time (s	5)	1:	2.0		
Intersection Capacity UI	tilization		77.5%	ł	CU Leve	el of Servi	ce		D		
Analysis Period (min)			15								
c Critical Lane Group											

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Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	3	7	**	7	<u>ች</u>	**	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.85	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539	
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1583	3539	1583	1770	3539	
Volume (vph)	330	80	1000	430	280	670	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	359	87	1087	467	304	728	
RTOR Reduction (vph)	0	65	0	0	0	0	
Lane Group Flow (vph)	359	22	1087	467	304	728	
Turn Type		Perm		Free	Prot		
Protected Phases	8		2		1	6	
Permitted Phases		8		Free			
Actuated Green, G (s)	14.7	14.7	19.7	58.8	12.4	36.1	
Effective Green, g (s)	14.7	14.7	19.7	58.8	12.4	36.1	
Actuated g/C Ratio	0.25	0.25	0.34	1.00	0.21	0.61	
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	443	396	1186	1583	373	2173	
v/s Ratio Prot	c0.20		c0.31		c0.17	0.21	
v/s Ratio Perm		0.01		0.29			
v/c Ratio	0.81	0.05	0.92	0.30	0.82	0.34	
Uniform Delay, d1	20.7	16.8	18.8	0.0	22.1	5.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.7	0.1	12.5	0.5	12.8	0.4	
Delay (s)	31.5	16.8	31.3	0.5	34.9	5.9	
Level of Service	С	В	С	A	С	А	
Approach Delay (s)	28.6		22.0			14.5	
Approach LOS	С		С			В	
Intersection Summary			×. ×. ×. attack				
HCM Average Control D	Pelay		20.4	F	HCM Lev	vel of Ser	vice C
HCM Volume to Capaci	ty ratio		0.86				
Actuated Cycle Length ((s)		58.8	S	Sum of lo	ost time (s	s) 12.0
Intersection Capacity Ut	ilization		71.4%	ŀ	CU Leve	el of Servi	ice C
Analysis Period (min)			15				
c Critical Lane Group							

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Movement	WBL	WBR	NBT	NBR	SBL	SBT				
Lane Configurations	ħ	7	**	7	¥.	**		-		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0				
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95				
Frt	1.00	0.85	1.00	0.85	1.00	1.00				
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00				
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539				
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00				
Satd. Flow (perm)	1770	1583	3539	1583	1770	3539				
Volume (vph)	300	90	900	380	180	730				*
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92				
Adj. Flow (vph)	326	98	978	413	196	793				
RTOR Reduction (vph)	0	75	0	0	0	0				
Lane Group Flow (vph)	326	23	978	413	196	793				
Turn Type		Perm		Free	Prot					
Protected Phases	8		2		1	6				
Permitted Phases		8		Free						
Actuated Green, G (s)	14.2	14.2	24.3	59.9	9.4	37.7				
Effective Green, g (s)	14.2	14.2	24.3	59.9	9.4	37.7				
Actuated g/C Ratio	0.24	0.24	0.41	1.00	0.16	0.63				
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0				
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0				
Lane Grp Cap (vph)	420	375	1436	1583	278	2227				
v/s Ratio Prot	c0.18		c0.28		c0.11	0.22				
v/s Ratio Perm		0.01		0.26						
v/c Ratio	0.78	0.06	0.68	0.26	0.71	0.36				
Uniform Delay, d1	21.4	17.7	14.6	0.0	23.9	5.3				
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Incremental Delay, d2	8.7	0.1	2.6	0.4	7.9	0.4				
Delay (s)	30.1	17.8	17.2	0.4	31.8	5.7				
Level of Service	С	В	В	А	С	A				
Approach Delay (s)	27.2		12.2			10.9				
Approach LOS	С		B			В				
Intersection Summary								1 11 1		
HCM Average Control E	Delay		14.0	ŀ	ICM Lev	vel of Ser	vice		В	
HCM Volume to Capaci	ty ratio		0.71							
Actuated Cycle Length	(s)		59.9	5	Sum of le	ost time (s)	1	12.0	
Intersection Capacity UI	tilization		61.5%	1	CU Leve	el of Serv	ice		В	
Analysis Period (min)			15							
c Critical Lane Group										

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	*	•	1	1	×	Ļ			
Movement	WBL	WBR	NBT	NBR	SBL	SBT	A STATE OF STREET		
Lane Configurations	5	ķ	44	*	۲	* *			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900			
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95			
Frt	1.00	0.85	1.00	0.85	1.00	1.00			
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00			
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539			
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00			
Satd. Flow (perm)	1770	1583	3539	1583	1770	3539			
Volume (vph)	480	120	1280	520	230	1190		120100	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92			
Adj. Flow (vph)	522	130	1391	565	250	1293			
RTOR Reduction (vph)	0	95	0	0	0	0			
Lane Group Flow (vph)	522	35	1391	565	250	1293	1111111	121.2	29 march and and and
Turn Type		Perm		Free	Prot				
Protected Phases	8		2		1	6			
Permitted Phases		8		Free					
Actuated Green, G (s)	16.0	16.0	20.2	60.0	11.8	36.0			
Effective Green, g (s)	16.0	16.0	20.2	60.0	11.8	36.0			
Actuated g/C Ratio	0.27	0.27	0.34	1.00	0.20	0.60			
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	472	422	1191	1583	348	2123			
v/s Ratio Prot	c0.29		c0.39		c0.14	0.37			
v/s Ratio Perm		0.02		0.36					
v/c Ratio	1.11	0.08	1.17	0.36	0.72	0.61			
Uniform Delay, d1	22.0	16.5	19.9	0.0	22.5	7.6			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	73.5	0.1	84.9	0.6	6.9	1.3			
Delay (s)	95.5	16.6	104.8	0.6	29.5	8.9			
Level of Service	F	В	F	A	С	A			
Approach Delay (s)	79.8		74.7			12.2			
Approach LOS	E		E			В			
Intersection Summary			MARIN						
HCM Average Control E)elay		52.3	F	HCM Le	vel of Serv	vice	D	
HCM Volume to Capaci	ty ratio		1.04						
Actuated Cycle Length	(s)		60.0	5	Sum of le	ost time (s	5)	12.0	
Intersection Capacity Ut	tilization		84.7%	1	CU Leve	el of Servi	ce	E	
Analysis Period (min)			15						
c Critical Lane Group									

7/6/2006	
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	1	*	Ť		5	Ļ				
Movement	WBL	WBR	NBT	NBR	SBL	SBT				
Lane Configurations	¥	7	44	Ť	ሻ	A A				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0				
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95				
Frt	1.00	0.85	1.00	0.85	1.00	1.00				
Fit Protected	0.95	1.00	1.00	1.00	0.95	1.00				
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539				
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00				
Satd. Flow (perm)	1770	1583	3539	1583	1770	3539				
Volume (vph)	480	120	1280	520	230	1190				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92				
Adj. Flow (vph)	522	130	1391	565	250	1293				
RTOR Reduction (vph)	0	91	0	0	0	0				
Lane Group Flow (vph)	522	39	1391	565	250	1293				
Turn Type		Perm		Free	Prot					
Protected Phases	8		2		1	6				
Permitted Phases		8		Free						
Actuated Green, G (s)	27.0	27.0	38.0	90.0	13.0	55.0				
Effective Green, g (s)	27.0	27.0	38.0	90.0	13.0	55.0				
Actuated g/C Ratio	0.30	0.30	0.42	1.00	0.14	0.61				
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0				
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0				
Lane Grp Cap (vph)	531	475	1494	1583	256	2163				
v/s Ratio Prot	c0.29		c0.39		c0.14	0.37				
v/s Ratio Perm		0.02		0.36						
v/c Ratio	0.98	0.08	0.93	0.36	0.98	0.60				
Uniform Delay, d1	31.3	22.6	24.8	0.0	38.3	10.7				
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Incremental Delay, d2	34.5	0.1	11.8	0.6	49.2	1.2				
Delay (s)	65.7	22.7	36.5	0.6	87.6	12.0				
Level of Service	E	C	D	A	F	В				
Approach Delay (s)	57.2		26.2			24.2				
Approach LOS	Е		С			С				
Intersection Summary		1							Distant	
HCM Average Control E	Delay		30.3	H	ICM Le	vel of Ser	vice	C	;	
HCM Volume to Capaci	ty ratio		0.96							
Actuated Cycle Length	(s)		90.0	5	Sum of le	ost time (s)	12.0)	
Intersection Capacity UI	tilization		84.7%	1	CU Leve	el of Serv	ice	E		
Analysis Period (min)			15							
c Critical Lane Group										

	¥	۰.	1	/	5	↓		
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations	٦	7	**	#	X	**		/
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	0.85	1.00	1.00		
FIt Protected	0.95	1.00	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539		
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	1770	1583	3539	1583	1770	3539		
Volume (vph)	480	120	1030	520	230	990		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	522	130	1120	565	250	1076		
RTOR Reduction (vph)	0	89	0	0	0	0		
Lane Group Flow (vph)	522	41	1120	565	250	1076		
Turn Type		Perm		Free	Prot			
Protected Phases	8		2		1	6		
Permitted Phases		8		Free				
Actuated Green, G (s)	21.8	21.8	25.0	69.8	11.0	40.0		
Effective Green, g (s)	21.8	21.8	25.0	69.8	11.0	40.0		
Actuated g/C Ratio	0.31	0.31	0.36	1.00	0.16	0.57		
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0		
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	553	494	1268	1583	279	2028		
v/s Ratio Prot	c0.29		c0.32		c0.14	0.30		
v/s Ratio Perm		0.03		0.36				
v/c Ratio	0.94	0.08	0.88	0.36	0.90	0.53		
Uniform Delay, d1	23.4	16.9	21.0	0.0	28.8	9.1		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	24.9	0.1	9.1	0.6	28.5	1.0		
Delay (s)	48.3	17.0	30.2	0.6	57.3	10.1		
Level of Service	D	В	С	А	E	В		
Approach Delay (s)	42.1		20.3			19.0		
Approach LOS	D		С			В		
Intersection Summary								
HCM Average Control E	Delay		23.7	ŀ	ICM Le	vel of Servi	ice C	
HCM Volume to Capaci	ty ratio		0.91					
Actuated Cycle Length ((s)		69.8	5	Sum of le	ost time (s)) 12.0	
Intersection Capacity Ut	tilization		77.8%	ŀ	CU Leve	el of Servic	D D	
Analysis Period (min)			15					
c Critical Lane Group								





TWO-WAY STOP CONTROL SUMMARY

General Information			Site	nformati				
	•			action		lot 2 - Ex	icting am	
			lurisdi	iction			sung.am	
Date Performed	1/16/2006	ĥ	Analys	sis Year				
Analysis Time Period		-						
Project Description Lib	ue Urban Core							
Fast/West Street: Rice :	Street		North/S	South Stree	et: Haleko	Street		
Intersection Orientation:	East-West		Study I	Period (hrs)): 0.25			
Vohicle Volumes ar	d Adjustme	nte						
Major Street		Fastbound				Westhou	nd	
Movement	1	2	3		4	5		6
	L		R		L	Т		R
Volume	0	380	95		340	280		0
Peak-Hour Factor, PHF	0.92	0.92	0.92		0.92	0.92		0.92
Hourly Flow Rate, HFR	0	413	103		369	304		0
Percent Heavy Vehicles	0				0			
Median Type		Undivided						
RT Channelized			0					0
Lanes	0	2	0		0	2		0
Configuration		T	TR		LT	τ		
Upstream Signal		0				0		
Minor Street		Northbound				Southboi	Jnd	
Movement	7	8	9		10	11		12
	L	Т	R		L	T		R
Volume	0	0	410		0	0		0
Peak-Hour Factor, PHF	0.92	0.92	0.92	,	0.92	0.92		0.92
Hourly Flow Rate, HFR	0	0	445		0	0		0
Percent Heavy Vehicles	0	0	0		0	0		0
Percent Grade (%)		0				0		
Flared Approach		N				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	0	1		0	0		0
Configuration			R					
Delay, Queue Length, a	nd Level of Se	ervice						
Approach	EB	WB		Northbound	t	5	Southbour	d
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT			R			
v (vph)		369			445			
C (m) (vph)		1060			747			
v/c		0.35			0.60			1
95% queue length		1.57			4.00	1		
Control Delav		10.2			16.7	1		1
LOS		B			C			
Aonroach Delay				167				1
Chhingen FOG				0				

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		IWO	J-WAY STOP	CONTR	OL SUM	VIARY				
General Information	n			Site I	nformati	on				
Analyst				Interse	ection		Int 2 - Ba	seline.a	am	
Agency/Co.				Jurisd	iction					
Date Performed		1/16/2006	\$	Analys	sis Year					
Analysis Time Period										
Project Description Lil	hue Ul	rban Core								
East/West Street: Rice	Stree	t		North/S	South Stree	t: Haleko	Street			
Intersection Orientation:	Eas	t-West		Study	Period (hrs)): 0.25				
Vehicle Volumes ar	nd A	diustme	nts							
Major Street	1		Eastbound				Westbou	und		
Movement		1	2	3		4	5		E	ô
		Ł	Т	R		L	Ť		F	۲
Volume		0	580	120		440	400		0)
Peak-Hour Factor, PHF		0.97	0.97	0.97	'	0.97	0.97		0.9	€7
Hourly Flow Rate, HFR		Ö	597	123		453	412		0)
Percent Heavy Vehicles		0				0			_	-
Median Type					Undivided	1				
RT Channelized				0					0)
Lanes		0	2	0		0	2		0)
Configuration			Т	TR		LT	Т			
Upstream Signal			0				0			
Minor Street			Northbound				Southbo	und		
Movement		7	8	9		10	11		1	2
,		L	Т Т	R		L	Т		F	२
Volume	+	0	0	530		0	0		0)
Peak-Hour Factor, PHF		0.97	0.97	0.97	,	0.97	0.97		0.9	97
Hourly Flow Rate, HFR	<u> </u>	0	0	546		0	0		0)
Percent Heavy Vehicles		0	0	0		0	0		0	}
Percent Grade (%)			0				0			
Flared Approach	-		N	T			N			
Storage	+		0				0			
PT Chappelized				0)
						0	0			,)
Configuration		0				U			0	,
	<u> </u>		<u> </u>	<u> </u>						
Delay, Queue Length, a	and Lo	evel of Se	irvice		Nadhhava	4		Coutbbe	ound	
Approach		EB	VVB							40
Movement		1	4	/	8	9	10	11	<u> </u>	12
Lane Configuration			LT			R			-+	
v (vph)			453			546			\rightarrow	
C (m) (vph)			891			642			\square	
v/c	`		0.51			0.85				
95% queue length			2.94			9.52				
Control Delay			13.1			34.2				
LOS			В			D				
Approach Delay					34.2				L	
Approach LOS					D					
				1			1			

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TWO-WAY STOP CONTROL SUMMARY

General Information	1		Site I	nformati	on			
Analyst			Interse	ection		Int 2 - Ex	istina nm	
Agency/Co.			Jurisdi	iction			ioong.pm	
Date Performed	1/16/2006	6	Analys	sis Year				
Analysis Time Period								
Project Description Lit	ue Urban Core							
East/West Street: Rice	Street		North/S	South Stre	et: Haleko	Street		
Intersection Orientation:	East-West		Study I	Period (hrs	s): 0.25			
Vehicle Volumes ar	nd Adjustme	nts						
Major Street		Eastbound				Westbou	und	
Movement	1	2	3		4	5		6
	L	Т	Ŕ		L	Т		R
Volume	0	330	230		545	385		0
Peak-Hour Factor, PHF	0.92	0.92	0.92	2	0.92	0.92		0.92
Hourly Flow Rate, HFR	0	358	249		592	418		0
Percent Heavy Vehicles	0				0			
Median Type				Undivide	d			
RT Channelized			0					0
Lanes	0	2	0		0	2		0
Configuration		T	TR		LT	T		
Upstream Signal		0				0		
Minor Street		Northbound	_			Southbo	und	
Movement	7	8	9		10	11		12
	L	Т	R		L	T		R
Volume	0	0	390		0	0		0
Peak-Hour Factor, PHF	0.92	0.92	0.92		0.92	0.92		0.92
Hourly Flow Rate, HFR	0	0	423		0	0		0
Percent Heavy Vehicles	0	0	0		0	0		0
Percent Grade (%)		0				0		
Flared Approach		N				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	0	1		0	0		0
Configuration	, , , , , , , , , , , , , , , , , , ,		R					
Delay, Queue Length, a	nd Level of Se	ervice						
Approach	£Β	WB		Northbour	d	5	Southbou	nd
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT			R			
v (vph)		592		1	423			
C(m)(vph)		981			698	<u> </u>		
v/c	•	0.60			0.61		1	
95% queue length		4.20			4.12		1	
Control Delay		14.1			17.8			
		8			C	1	1	
Approach Delay				17 8	L Ŭ		I	
Approach Delay	_						_	
Approach LOS								

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TWO WAY STOD CONTROL SUMMARY

	E VV	0-WAT 310P	CONTR						
General Information	1		Site I	nformatio	on				
Analyst			Interse	ection		Int 2 - Ba	seline.pm		
Agency/Co.			Jurisdi	iction					
Date Performed	1/16/200	6	Analys	sis Year					
Analysis Time Period									
Project Description Lih	ue Urban Cor	е							
East/West Street: Rice	Street		North/S	South Stree	t: Haleko	Street			
Intersection Orientation:	East-West		Study F	Period (hrs)): 0.25				
Vehicle Volumes an	d Adjustm	ents							
Major Street		Eastbound				Westbou	Ind		
Movement	1	2	3		4	5		6	
	L	Ť	R		L	Т		R	
Volume	0	450	300		700	590		0	
Peak-Hour Factor, PHF	0.97	0.97	0.97	′	0.97	0.97		0.97	
Hourly Flow Rate, HFR	0	463	309		721	608		0	
Percent Heavy Vehicles	0		-		0				
Median Type			-	Undivided	1			-	
RT Channelized			0					0	
Lanes	0	2	0		0	2		0	
Configuration		- /	IR		LI	1			
Upstream Signal		0				0			
Minor Street		Northbound				Southbou	- Baseline.pm -		
Movement	7	8	9	9 10		11		12	
	L	T	R		L	T		R	
Volume	0	0	500		0	0		0	
Peak-Hour Factor, PHF	0.97	0.97	0.97	·	0.97	0.97		0,97	
Hourly Flow Rate, HFR		0	515		0	0		0	
Percent Heavy Vehicles	0	0	0		0	0		0	
Percent Grade (%)		0	_			0			
Flared Approach		N				N			
Storage		0				0			
RT Channelized			0					0	
Lanes	0	0	1		0	0		0	
Configuration			R						
Delay, Queue Length, a	nd Level of S	ervice							
Approach	EB	WB		Northbound	ł		Bouthbound	d	
Movement	1	4	7	8	9	10	11	12	
Lane Configuration		LT			R				
v (vph)		721			515				
C(m)(vph)		852			618				
v/c	`	0.85			0.83		1	1	
95% queue length		10.18			8.88				
Control Dolou		27.6			33.2			<u> </u>	
		27.0			55.2				
					D			1	
Approach Delay	-			33.2					
Approach LOS				D					

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	D	# 3. Eine St. at	Rice St.
CASE Existing Ary	CASE Baseline Hol	CASE Network A	CASE Meland B
EB LT 28 4	12.1 3		2
38 L 42.3 E	209.5 F	Y	
36 R 12.4 B	162 C	Deletel	



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	TWO	WAY STOP	CONTR	OL S	UM	MARY					
General Informatic	n		Site l	nforr	nati	ion					
Analyst			Inters	ection			Int 3 - Ex	cisting.	am		
Agency/Co.			Jurisd	iction							
Date Performed	1/16/2006	5	Analy	sis Yea	ar						
Analysis Time Period											
Project Description L	ihue Urban Co	re									
East/West Street: Rice	e Street		North/	South	Stre	et: <i>Eiwa</i>	Street				
Intersection Orientation	: East-West		Study	Period	{ (hrs	s): 0.25					
Vehicle Volumes a	nd Adjustn	ients									
Major Street	-	Eastbound					Westbou	Ind			
Movement	1	2	3			4	5			6	
	L	Т	R			L	T	$ \rightarrow $		R	
Volume	175	495	0			0	540			75	
Peak-Hour Factor, PHF	0.92	0.92	0,92	2		0.92	0.92		0	.92	
Hourly Flow Rate, HFR	190	538	0			0	586			87	
Percent Heavy Vehicles	<u>s 0</u>					0					
Median Type				Undiv	/idec	1				-	
RT Channelized			0					-+		0	
Lanes	0	2	0			0	2			0	
Configuration	L/	- /					1			IR	
Upstream Signal		0					0				
Minor Street		Northbound			40		Southbor	und			
Movement	7	8	9			10	11	\rightarrow		12	
	L,	Т	R			L	Т			R	
Volume	0	0	0			30	0		1	70	
Peak-Hour Factor, PHF	0.92	0.92	0.92	?		0.92	0.92		0	.92	
Hourly Flow Rate, HFR	0	0	0			32	0	\rightarrow	1	84	
Percent Heavy Vehicles	5 0	0	0			0	0			0	
Percent Grade (%)		0					0				
Flared Approach		N					N				
Storage		0					0				
RT Channelized			0							0	
Lanes	0	0	0			1	0			1	
Configuration						L				R	
Delay, Queue Length,	and Level of	Service									
Approach	EB	WB	1	Northb	ound	ł	S	outhb	ounc	ł	
Movement	1	4	7	8		9	10	11	1	12	
Lane Configuration	LT						L			R	
v (vph)	190						32			184	
C (m) (vph)	932						128			668	
v/c	0.20						0.25			0.28	
95% queue length	0.76						0.93			1.12	
Control Delay	9.8						42.3			12.4	
LOS	A						E			В	
Approach Delay									16.8		
Approach LOS			C					C	>		

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	 TW	O-WAY	STOP	CONTR	OL S	UMI	MARY				
General Informatio	n			Site I	nforn	natio	on				
Analyst				Interse	ection	-		Int 3 - Ba	aseline.	am	[
Agency/Co.				Jurisd	iction						
Date Performed	1/16/200	6		Analys	sis Yea	ar					
Analysis Time Period											
Project Description Lil	hue Urban Cor	e									
East/West Street: Rice	Street			North/S	South S	Stree	t: Eiwa St	reet			
Intersection Orientation:	East-West	_		Study	Period	(hrs)	: 0.25				
Vehicle Volumes a	n <mark>d Adjustm</mark>	ents					-				
Major Street		East	bound					Westbo	und		
Movement	1	_	2	3			4	5	1		6
			T					T	6		R
Volume	230		30	0			0	/40		1	100
Hourly Slow Data HED	0.92		92 00	0.92			0.92	0.92			1.92
Percent Heavy Vahiclas	249	- /	93				0	004	-	1	08
Median Type					Undi	uidoa	0		110	_	
RT Channelized	_			0	01101	loed			-		<u>^</u>
t anes	0		2	0			0	2			0
Configuration	17	-	2. T				0				
Upstream Signal		0						0		_	
Minor Street		0						Southbo	und		
Movement	7	Northbound 7 8 9					10			-	12
	· ·		T T	R			10	т			8
Volume	0		0				40	0		2	20
Peak-Hour Factor, PHF	0.92	0	92	0.92	2	0.92		0.92			.92
Hourly Flow Rate, HFR	0		0	0			43	0		2	239
Percent Heavy Vehicles	0		0	0			0	0			0
Percent Grade (%)			0	-				0			
Flared Approach			N					N			
Storage			0					0			
RT Channelized				0							0
Lanes	0		0	- ō			1	0			1
Configuration			-				L				R
Delay, Queue Length, a	and Level of S	ervice		1							
Approach	EB	W	з		Northb	ounc	1		Southb	ound	
Movement	1	4		7	8		9	10	1	1	12
Lane Configuration	LT				_			L			R
v (voh)	249							43			239
C(m)(vob)	755							52			557
	• 0.33							0.83			0.43
95% queue length	1 11							3.49			2 14
Control Delay	10 1							200.5			16.2
	Paray 12.1										0.2
OS B							U				
Approach Delay								44.3			
Approach LOS	<u>44.3</u> E										

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	TWO	-WAY STOP	CONTR	OL S	SUM	MARY				
General Informatio	Site Information									
Analyst			Inters	ection			Int 3 - Ex	isting	j.pm	
Agency/Co.			Jurisd	iction				¥		
Date Performed	1/16/200	6	Analy	sis Ye	ar					
Analysis Time Period	_									
Project Description L	ihue Urban Co	ore								
East/West Street: Rice	Street		North/	South	Stre	et: <i>Eiwa</i>	Street			
Intersection Orientation	East-West		Study	Period	l (hrs	s): 0.25				
Vehicle Volumes a	nd Adjustr	nents								
Major Street		Eastbound					Westbou	ind		
Movement	1	2	3			4	5			6
N / a la una a	L		R			L		_		R N
Volume	230	- 515	0 000			0	005		<u> </u>	95
Hourly Elow Poto HEP	240	0.92	0.92			0.92	657		1	.92
Percent Heavy Vehicles	249	009				0			1	_
Median Type	<u> </u>			Undis	vider	1				
RT Channelized			0	Unun	1000	<i>.</i>				0
Lanes	0	2	0			0	2			0
Configuration	1 T	<u>7</u>				0	T		-	TR
Upstream Signal		0					0			
Minor Street		Northbound					Southho	und		
Movement	7	8	9			10	11			12
	L	Т	R			L	Т			R
Volume	0	0	0	0		35	0		2	270
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92		0.92	0.92		0	.92
Hourly Flow Rate, HFR	0	0	0			38	0		2	93
Percent Heavy Vehicles	6 0	0	0			0	0			0
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0							0
Lanes	0	0	0			1	0			1
Configuration						L				R
Delay, Queue Length.	and Level of	Service	-						_	
Approach	EB	WB	1	Northb	ound	ż	S	outht	bound	1
Movement	1	4	7	8		9	10	1	1	12
Lane Configuration	LT						L			R
v (vph)	249						38			293
C (m) (vph)	861			1			84			624
v/c	0.29						0.45			0.47
95% queue length	1.20			1			1.87			2.50
Control Delay	10.9						79.3			15.8
LOS	В						F			С
Approach Delay	_	-		•				23.	1	
Approach LOS			C .							

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TIMO MAY STOP CONTROL SUMMARY

General Information Site Information Analysis Intersection Int 3 - Baseline.pm Agency/Co. Unrisdiction Intersection Date Performed 1/16/2006 Analysis Time Priod Intersection Analysis Time Priod Intersection Intersection Intersection Intersection Orientation. East-West Study Period (hrs): 0.25 Vehicle Volumes and Adjustments Major Street Study Period (hrs): 0.25 Volume L T R L T Volume 0.0 680 0 0 922 0.92 Volume 0.0 680 0 0 945 100 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 Percent Heavy Vehicles 0 - - 0 - - Moury Flow Rate, HFR 0 0 0 2 0 0 Lanes 0 2 0.92 0.92 0.92 0.92		1 1 1	U-WAT 510P	CONTR					
Analyst Intersection Int 3 - Baseline pm Agency/Co. Unsdiction Analysis Year	General Information	n		Site I	nformati	on			
Agency/Co. Duradiction Image of the second	Analyst			Interse	ection		Int 3 - Ba	seline.pm	
Date Perior Inalysis Year Analysis Time Period Inarbayis Time Period Inarbayis Time Period Project Description Lihue Urban Core Study Period (hrs): 0.25 EastWest Street North/South Street: Eiwa Street Marenetin 1 2 3 4 5 6 Morenent 1 2 3 4 5 6 Vericle Volumes and Adjustments Westbound Morenent R L T R Volume 300 680 0 0 970 120 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 Hourty Flow Rate, HFR 326 739 0 0 945 130 Percent Heavy Vehicles 0 -	Agency/Co.		-	Jurisd	iction				
Analysis Time Period Image: Street North/South Street: Elive Street East/West Street: Rice Street Study Period (hrs): 0.25 Vehicle Volumos and Adjustments Westbound Morth/South Street: Study Period (hrs): 0.25 Major Street Eastbound Westbound Movement 1 2 3 4 5 6 Movement 1 2 3 4 5 6 Volume 300 680 0 0 870 120 Poak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 Hedian Type Undivided - - 0 - - RT Channelized 0 2 0 0 2 0 Configuration LT T R L T R Upstream Signal 0 0 50 0 380 Percent Heavy Vehicles 0 380 Percent Heavy Vehicles 0 380 Percent	Date Performed	1/16/200	6	Analys	sis Year				
Project Description Lihue Urban Core EastWest Street North/South Street: Eiwa Street Intersection Orientalion: East-West Study Period (hrs): 0.25 Vehicle Volumes and Adjustments Major Street Eastbound Movement 1 2 3 4 5 6 our EastBound Westbound Movement 1 2 3 4 5 6 Volume 1 1 2 3 4 5 6 Our EastBound 0 0 870 120 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 326 739 0 0 945 130 Percent Heavy Vehicles 0 0 Median Type Undivided RT Channelized 0 0 Median Type 0 0 0 0 2 0 Lanes 0 2 0 0 0 2 0 Minor Street Northbound 0 Movement 7 8 9 10 11 12 Upstream Signal 0 0 0 50 0 350 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 Moure 0 0 0 50 0 350 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 Moure 0 0 0 50 0 350 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 Moure 0 0 0 50 0 360 Percent Heavy Vehicles 0 0 0 50 0 360 Percent Heavy Vehicles 0 0 0 0 50 0 11 12 NorthWorth Control 11 12 NorthWorth Control 11 12 NorthWorth Control 11 12 NorthWorth Control 11 12 NorthPound 0 0 0 50 0 360 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 Moure 0 0 0 50 0 10 Percent Heavy Vehicles 0 0 0 0 50 0 360 Percent Heavy Vehicles 0 0 0 0 50 0 360 Percent Heavy Vehicles 0 0 0 0 50 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0	Analysis Time Period								
EastWest Street North/South Street Eives Street Intersection Orientation: East-West Study Period (hrs): 0.25 Vehicle Volumes and Adjustments Eastbound Westbound Movement 1 2 3 4 5 6 Volume 300 680 0 0 870 120 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 326 739 0 0 - - RT Channelized 0 - - 0 - - - RT Channelized 0 2 0 0 2 0 Lanes 0 2 0 0 2 0 Morement 7 8 9 10 11 12 Movement 7 8 9 10 11 12 Movement 7 8 9 10 11	Project Description Lik	nue Urban Core	}						
Intersection Orientation: East-West [Study Period (hrs): 0.25 Vehicle Volumes and Adjustments Movement 1 2 3 4 5 6 Movement 1 2 3 4 5 6 Volume 300 680 0 0 870 120 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Percent Heavy Vehicles 0 - - 0 - - Median Type Undivided 0 0 2 0 0 2 0 Configuration L.T T T T T R L T R Volume 0 0 0 0 0 350 92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	East/West Street: Rice	Street		North/S	South Stree	et: Eiwa S	treet		
Vehicle Volumes and Adjustments Major Street Westbound Movement 1 2 3 4 5 6 L T R L T R Volume 300 660 0 0 870 120 Peak-Hour Factor, PHF 0.92	Intersection Orientation:	East-West		Study	Period (hrs	s): 0.25			
Major Street Testbound Westbound Movement 1 2 3 4 5 6 Volume 300 680 0 0 870 120 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 326 739 0 0 945 130 Percent Heavy Vehicles 0 0 RT Channelized 0 - - 0 2 0 0 2 0 Lanes 0 2 0 0 2 0 0 2 0 Morement 1 7 8 9 10 11 12 Volume 0 0 0 50 0 350 9 10 11 12 12 12 12 12 12 12 12 130 12 12 12	Vehicle Volumes ar	nd Adjustme	ents						
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Major Street		Eastbound				Westbou	und	
L T R L T R Volume 300 680 0 0 870 120 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 326 739 0 0 945 130 Percent Heavy Vehicles 0 - - 0 - - Median Type Undivided 0 0 0 0 0 Lanes 0 2 0 0 2 0 Configuration LT T T R 0 0 Morement 7 8 9 10 11 12 Movement 7 8 9 10 11 12 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 0 0 0 0 0 0	Movement	1	2	3		4	5		6
Volume 300 680 0 0 870 120 Peak-Hour Factor, PHF 0.92	<u> </u>	L	T	R			T		R
Peak-Hour Factor, PHF 0.92 <t< td=""><td>Volume</td><td>300</td><td>680</td><td>0</td><td></td><td>0</td><td>870</td><td></td><td>120</td></t<>	Volume	300	680	0		0	870		120
Houry Prov Rate, HPR 320 739 0 0 345 130 Percent Heavy Vehicles 0 0 <td>Peak-Hour Factor, PHF</td> <td>0.92</td> <td>0.92</td> <td>0.92</td> <td><u> </u></td> <td>0.92</td> <td>0.92</td> <td></td> <td>0.92</td>	Peak-Hour Factor, PHF	0.92	0.92	0.92	<u> </u>	0.92	0.92		0.92
Percent Heavy Vehicles 0 - - 0 -	Houriy Flow Rate, HFR	326	/39	0		0	945		130
And Control of the second se	Percent Heavy Vehicles	0			الم الم الم	0			-
KT Crighthetized 0 2 0 0 2 0 Lanes 0 2 0 0 2 0 Configuration LT T T TR Upstream Signal 0 0 Minor Street Northbound Southbound Southbound Movement 1 12 L T R L T R Northbound Southbound Volume 0 0 0 50 0 350 Peach-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 0 0 0 0 380 Percent Heavy Vehicles 0 0 0 0 0 Flared Approach N N N Storage 0 0 1 0 Lanes 0 0 1 0 1 1 1 1 1 1 1 1 <	Median Type				Undivide	đ	1		
Larres 0 2 0 0 2 0 Configuration LT T T T TR Upstream Signal 0 0 0 0 0 Minor Street Northbound Southbound 0 11 12 Movement 7 8 9 10 11 12 Volume 0 0 0 50 0 350 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 Percent Grade (%) 0 0 0 0 0 0 RT Channelized N I N I R 0 1 Lanes 0 0 1 1 1 1 1 1 1 1 <td>RT Channelized</td> <td></td> <td></td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td>0</td>	RT Channelized			0					0
Configuration L1 1 <th1< th=""> 1 1 <</th1<>	Canfiguration		Z	0		0	<u></u>	-	
Display Northbound Southbound Movement 7 8 9 10 11 12 L T R L T R Volume 0 0 0 50 0 350 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 0 0 0 54 0 380 Percent Heavy Vehicles 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 Flared Approach N N 0 1 0 1 Storage 0 0 0 1 0 1 1 1 2 R Delay, Queue Length, and Level of Service Approach EB WB Northbound Southbound Movement 1 1 1 1 1 1		L1	1				1		IR
Minor Street Northbound Southbound Movement 7 8 9 10 11 12 L T R L T R Volume 0 0 0 50 0 350 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 0 0 0 54 0 380 Percent Heavy Vehicles 0 0 0 0 0 0 Flared Approach N 0 0 0 0 Storage 0 0 0 1 0 1 Storage 0 0 1 0 1 0 Configuration 0 1 0 1 1 Delay, Queue Length, and Level of Service Approach K 9 10 11 12 Lane Configuration L7		<u> </u>							
Movement 1<	Minor Street	- 7	Northbound			10	Southbou		10
L I R L I R Volume 0 0 0 50 0 350 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 0 0 0 54 0 380 Percent Heavy Vehicles 0 0 0 0 0 0 Percent Grade (%) 0 0 0 0 0 0 Flared Approach N N 0 0 Storage 0 0 0 1 0 1 Storage 0 0 0 1 0 1 Configuration 0 1 0 1 2 Approach EB WB Northbound Southbound Movement 1 4 7 8 9 10 11 12 Lane Configuration LT </td <td>iviovement</td> <td>/</td> <td>8</td> <td>9</td> <td></td> <td>10</td> <td></td> <td></td> <td>12</td>	iviovement	/	8	9		10			12
Volume 0 0 30 0 330 Peak-Hour Factor, PHF 0.92			1	R R					R
Preserved 0.92	Volume Book Hour Footor, BHE	0	0 00	0.00	<u> </u>	50	0		350
How Nate, Hi K 0	Hourly Flow Pate HEP	0.92	0.92	0.92		0.92 54	0.92		280
Indext (Nearly Vertices) Image I	Percent Heavy Vehicles	0	0	0		0			0
Flared Approach N N Storage 0 0 RT Channelized 0 0 Lanes 0 0 Configuration L R Delay, Queue Length, and Level of Service R Approach EB WB Northbound Southbound Movement 1 4 1 4 7 8 9 10 11 12 Lane Configuration LT Image: Configuration L R R V(vph) 326 Image: Configuration L R V(vph) 326 Image: Configuration 26 493 V(c 0.50 Image: Configuration 2.78 Image: Configuration 2.78 South Delay 15.8 Image: Configuration 2.78 Image: Configuration 32.8 LOS C Image: Configuration Image: Configuration Image: Configuration Image: Configuration Image: Configuration Vic 0.50 Image: Configuration Image: Configuration Image: Configuration <td>Percent Grade (%)</td> <td>0</td> <td></td> <td>v</td> <td></td> <td>0</td> <td></td> <td></td> <td>0</td>	Percent Grade (%)	0		v		0			0
Index Approach IV IV IV IV Storage 0 0 0 0 0 RT Channelized 0 0 1 0 1 Lanes 0 0 1 0 1 Configuration L R R R Delay, Queue Length, and Level of Service Northbound Southbound Movement 1 4 7 8 9 10 11 12 Lane Configuration LT L R R R R Movement 1 4 7 8 9 10 11 12 Lane Configuration LT L R R v (vph) 326 26 493 V/c 0.50 2.08 0.77 95% queue length 2.78 6.58 6.81 Control Delay 15.8 819.5 32.8 LOS C F D Appro	Flored Approach								
Storage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 1 1 2 0 1 </td <td></td> <td></td> <td>^N</td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td>			^N	-					
R1 Channelized 0 0 0 1 0 1 Lanes 0 0 0 1 0 1 0 1 Configuration L R R R R R Delay, Queue Length, and Level of Service Approach EB WB Northbound Southbound Movement 1 4 7 8 9 10 11 12 Lane Configuration LT L R R v (vph) 326 54 380 C (m) (vph) 656 0 26 493 v/c 0.50 2.08 0.77 95% queue length 2.78 6.58 6.81 Control Delay 15.8 819.5 32.8 LOS C F D Approach Delay 130.7 F			0				0		^
Lanes 0 0 0 1 0 1 Configuration L R Delay, Queue Length, and Level of Service R Approach EB WB Northbound Southbound Movement 1 4 7 8 9 10 11 12 Lane Configuration LT Image: Configuration LT R R v (vph) 326 Image: Configuration L R R v (vph) 326 Image: Configuration L R R v/c 0.50 Image: Configuration L R R 95% queue length 2.78 Image: Configuration 2.08 0.77 95% queue length 2.78 Image: Configuration R R R LOS C Image: Configuration 15.8 Image: Configuration R D Approach Delay Tmage: Configuration Image: Configuration Image: Configuration<				0					0
Contiguration L R Delay, Queue Length, and Level of Service Approach EB WB Northbound Southbound Movement 1 4 7 8 9 10 11 12 Lane Configuration LT Image: Control Diagonal or the structure Image: Control Diagona or the structure Image: Control Diagona or the	Lanes	0	0	0		1	0		1
Delay, Queue Length, and Level of Service Approach EB WB Northbound Southbound Movement 1 4 7 8 9 10 11 12 Lane Configuration LT L R v (vph) 326 54 380 C (m) (vph) 656 26 493 v/c 0.50 2.08 0.77 95% queue length 2.78 6.58 6.81 Control Delay 15.8 32.8 LOS C 7 D Approach Delay 130.7 -						L			ĸ
Approach EB WB Northbound Southbound Movement 1 4 7 8 9 10 11 12 Lane Configuration LT L R v (vph) 326 54 380 C (m) (vph) 656 26 493 v/c 0.50 2.08 0.77 95% queue length 2.78 6.58 6.81 Control Delay 15.8 819.5 32.8 LOS C 730.7 Approach Delay F D	Delay, Queue Length, a	and Level of Se	ervice	1					
Movement 1 4 7 8 9 10 11 12 Lane Configuration LT L R R v (vph) 326 54 380 380 C (m) (vph) 656 26 493 493 v/c 0.50 2.08 0.77 95% queue length 2.78 6.58 6.81 Control Delay 15.8 819.5 32.8 D LOS C F D D 70.7	Approach	EB	WB		Northboun	d	5	Southboun	d
Lane Configuration LT L R v (vph) 326 54 380 C (m) (vph) 656 26 493 v/c 0.50 2.08 0.77 95% queue length 2.78 6.58 6.81 Control Delay 15.8 819.5 32.8 LOS C F D Approach Delay 50.7	Movement	1	4	7	8	9	10	11	12
v (vph) 326 54 380 C (m) (vph) 656 26 493 v/c 0.50 2.08 0.77 95% queue length 2.78 6.58 6.81 Control Delay 15.8 819.5 32.8 LOS C F D Approach Delay 730.7	Lane Configuration	LT					L		R
C (m) (vph) 656 26 493 v/c 0.50 2.08 0.77 95% queue length 2.78 6.58 6.81 Control Delay 15.8 819.5 32.8 LOS C F D Approach Delay 130.7 Approach LOS F D	v (vph)	326					54		380
v/c 0.50 2.08 0.77 95% queue length 2.78 6.58 6.81 Control Delay 15.8 819.5 32.8 LOS C F D Approach Delay 130.7	C (m) (vph)	656					26		493
95% queue length 2.78 6.58 6.81 Control Delay 15.8 819.5 32.8 LOS C F D Approach Delay 130.7 Approach LOS F F	v/c	0.50					2.08		0.77
Control Delay 15.8 819.5 32.8 LOS C F D Approach Delay 130.7 Approach LOS F E	95% queue length	2.78					6.58		6.81
LOS C F D Approach Delay 130.7 Approach LOS F F	Control Delay	15,8					819.5		32.8
Approach Delay 130.7	LOS	С		1			F		D
Approach LOS F	Approach Delav			1		• •		130.7	
	Approach LOS							F	

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ብጉ			47.			¢.,			ب اً	ř
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	4.0
Lane Util. Factor		0.95			0.95			1.00			1.00	1.00
Frt		0.99			0.98			0.99			1.00	0.85
Flt Protected		0.99			1.00			0.98			0.96	1.00
Satd. Flow (prot)		3482			3452			1802			1782	1583
Flt Permitted		0.76			0.94			0.90			0.75	1.00
Satd. Flow (perm)		2687			3253			1660			1400	1583
Volume (vph)	100	410	25	10	440	85	7	6	1	145	15	10
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)	109	446	27	11	478	92	8	7	1	158	16	11
RTOR Reduction (vph)	0	10	0	0	42	0	0	1	0	0	0	6
Lane Group Flow (vph)	0	572	0	0	539	0	0	15	0	0	174	5
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			8			2		_	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)		12.5			12.5			16.1			16.1	16.1
Effective Green, g (s)		12.5			12.5			16.1			16.1	16.1
Actuated g/C Ratio		0.34			0.34			0.44			0.44	0.44
Clearance Time (s)		4.0			4.0			4.0			4.0	4.0
Venicle Extension (s)		3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)		918			1111			730			616	696
v/s Ratio Prot		0.04						0.04				0.00
v/s Ratio Perm		c0.21			0.17			0.01			c0.12	0.00
V/c Ratio		0.62			0.49			0.02			0.28	0.01
Uniform Delay, d1		10.1			9.5			5.8			6.6	5.8
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		1.3			0.3			0.1			1.1	0.0
Delay (s)		11.4			9.8			5.8			1.1	0.C
Level of Service		B			A			E O			A	A
Approach Delay (S)		11.4 D			9.0			0.0			1.0	
Approach LOS		В			A			A			A	
Intersection Summary		1993										
HCM Average Control D	elay		10.2	F	ICM Le	vel of Se	ervice		В			
HCM Volume to Capaci	ty ratio		0.43									
Actuated Cycle Length (s)		36.6	S	Sum of l	ost time	(s)		8.0			
Intersection Capacity Ut	ilization		54.9%		CU Leve	el of Sei	rvice		A			
Analysis Period (min)			15									
c Critical Lane Group												

Phillip Rowell & Associates

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		412			đþ			4.			đ	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	4.0
Lane Util. Factor		0.95			0.95			1.00			1.00	1.00
Frt		0.99			0.98			0.95			1.00	0.85
Flt Protected		0.99			1.00			0.98			0.96	1.00
Satd. Flow (prot)		3490			3457			1750			1782	1583
Flt Permitted		0.67			0.94			0.91			0.72	1.00
Satd. Flow (perm)		2368			3257			1618			1346	1583
Volume (vph)	130	620	30	10	610	110	10	10	10	190	20	10
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)	141	674	33	11	663	120	11	11	11	207	22	11
RTOR Reduction (vph)	0	7	0	0	36	0	0	7	0	0	0	7
Lane Group Flow (vph)	0	841	0	0	758	0	0	26	0	0	229	4
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)		15.6			15.6			16.0			16.0	16.0
Effective Green, g (s)		15.6			15.6			16.0			16.0	16.0
Actuated g/C Ratio		0.39			0.39			0.40			0.40	0.40
Clearance Time (s)		4.0			4.0			4.0			4.0	4.0
Vehicle Extension (s)		3.0		2 6	3.0	Same		3.0			3.0	3.0
Lane Grp Cap (vph)		933			1283			654			544	640
v/s Ratio Prot		FILLS.										
v/s Ratio Perm		c0.36			0.23			0.02			c0.17	0.00
v/c Ratio		0.90			0.59			0.04			0.42	0.01
Uniform Delay, d1		11.3			9.5			7.1			8.5	7.1
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		11.7			0.7			0.1			2.4	0.0
Delay (s)		23.0			10.2			1.3			10.9	1.1
Level of Service		C			B			A			B	A
Approach Delay (s)		23.0			10.2			1.3			10.7	
Approach LOS		C			В			A			В	
Intersection Summary		5	1-11-1-							-		
HCM Average Control D	elay		15.9	H	ICM Le	vel of Se	ervice		В			
HCM Volume to Capacit	y ratio		0.66									
Actuated Cycle Length (s)		39.6	S	Sum of l	ost time	(s)		8.0			
Intersection Capacity Ut	ilization		70.8%	10	CU Leve	el of Sei	rvice		С			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis 4: Rice Street & Umi Street

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		414			4 î b			44			ل ه	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	4.0
Lane Util. Factor		0.95			0.95			1.00			1.00	1.00
Frt		0.99			0.99			0.99			1.00	0.85
FIt Protected		0.99			1.00			0.97			0.96	1.00
Satd. Flow (prot)		3489			3489			1787			1784	1583
FIt Permitted		0.81			0.94			0.77			0.71	1.00
Satd. Flow (perm)		2832			3291			1428			1318	1583
Volume (vph)	75	480	30	10	555	55	55	20	5	150	20	135
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)	82	522	33	11	603	60	60	22	5	163	22	147
RTOR Reduction (vph)	0	10	0	0	20	0	0	3	0	0	0	83
Lane Group Flow (vph)	0	627	0	0	654	0	0	84	0	0	185	64
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)		13.0			13.0			16.1			16.1	16.1
Effective Green, g (s)		13.0			13.0			16.1			16.1	16,1
Actuated g/C Ratio		0.35			0.35			0.43			0.43	0.43
Clearance Time (s)		4.0			4.0			4.0			4.0	4.0
Vehicle Extension (s)		3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)		992			1153			620			572	687
v/s Ratio Prot												
v/s Ratio Perm		c0.22			0.20			0.06			c0.14	0.04
v/c Ratio		0.63			0.57			0.14			0.32	0.09
Uniform Delay, d1		10.1			9.8			6.3			6.9	6.2
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		1.3			0.6			0.5			1.5	0.3
Delay (s)		11.4			10.4			6.8			8.4	6.5
Level of Service		В			В			А			A	А
Approach Delay (s)		11.4			10.4			6.8			7.5	
Approach LOS		В			В			А			А	
Intersection Summary												
HCM Average Control E	Delay		10.0	ŀ	ICM Le	vel of S	ervice		В			
HCM Volume to Capaci	ty ratio		0.46									
Actuated Cycle Length ((s)		37.1	5	Sum of le	ost time	(s)		8.0			
Intersection Capacity Ut	ilization		55.6%	þ	CU Leve	el of Se	rvice		В			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4P			4 P			4.			र्स	7
Ideal Flow (vphpi)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	4.0
Lane Util. Factor		0.95			0.95			1.00			1.00	1.00
Frt		0.99			0.99			0.99			1.00	0.85
Fit Protected		0.99			1.00			0.97			0.96	1.00
Satd. Flow (prot)		3490			3496			1783			1786	1583
Fit Permitted		0.67			0.94			0.74			0.67	1.00
Satd. Flow (perm)		2359			3301			1366			1254	1583
Volume (vph)	100	640	40	10	810	70	70	30	10	190	30	170
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)	109	696	43	11	880	76	76	33	11	207	33	185
RTOR Reduction (vph)	0	10	0	0	16	0	0	7	0	0	0	34
Lane Group Flow (vph)	0	838	0	- 0	951	0	0	113	0	0	240	151
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)		15.6			15.6			16.0			16.0	16.0
Effective Green, g (s)		15.6			15.6			16.0			16.0	16.0
Actuated g/C Ratio		0.39			0.39			0.40			0.40	0.40
Clearance Time (s)		4.0			4.0			4.0			4.0	4.0
Vehicle Extension (s)		3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)		929			1300			552			507	640
v/s Ratio Prot												
v/s Ratio Perm		c0.36			0.29			0.08			c0.19	0.10
v/c Ratio		0.90			0.73			0.21			0.47	0.24
Uniform Delay, d1		11.3			10.2			7.7			8.7	7.8
Progression Factor		1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2		11.8			2.2			8.0			3.1	0.9
Delay (s)		23.1			12.4			8.5			11.8	8.6
Level of Service		C			B			A			B	A
Approach Delay (s)		23.1			12.4			8.5			10.4	
Approach LOS		C			в			А			В	
Intersection Summary							<u>.</u>					
HCM Average Control L	Delay		15.7	F	ICM Lev	vel of Se	ervice		В			
HCM Volume to Capaci	ty ratio		0.69									
Actuated Cycle Length	(S)		39.6	5	oun of le	ost time	(S)		8.0			
Intersection Capacity UI	ilization		12.9%	1	CU Leve	er of Sei	vice		U			
Analysis Period (min)			15									
c Critical Lane Group												





HCM Signalized Intersection Capacity Analysis 5: Rice Street & Hardy Street

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Movement	EBL	ËBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		412			4 b			ર્સ	7		र्स	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	1.00
Frt		0.99			0.97			1.00	0.85		1.00	0.85
Flt Protected		1.00			1.00			0.97	1.00		0.96	1.00
Satd. Flow (prot)		3477			3432			1807	1583		1788	1583
Flt Permitted		0.90			0.88			0.78	1.00		0.71	1.00
Satd. Flow (perm)		3138			3038			1456	1583		1313	1583
Volume (vph)	27	372	43	50	425	99	75	48	66	126	25	135
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)	29	404	47	54	462	108	82	52	72	137	27	147
RTOR Reduction (vph)	0	23	0	0	50	0	0	0	40	0	0	81
Lane Group Flow (vph)	0	457	0	0	574	0	0	134	32	0	164	66
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		11.9			11.9			16.1	16.1		16.1	16.1
Effective Green, g (s)		11.9			11.9			16.1	16.1		16.1	16.1
Actuated g/C Ratio		0.33			0.33			0.45	0.45		0.45	0.45
Clearance Time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1037			1004			651	708		587	708
v/s Ratio Prot												
v/s Ratio Perm		0.15			c0.19			0.09	0.02		c0.12	0.04
v/c Ratio		0.44			0.57			0.21	0.05		0.28	0.09
Uniform Delay, d1		9.4			9.9			6.1	5.6		6.3	5.7
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3			0.8			0.7	0.1		1.2	0.3
Delay (s)		9.7			10.7			6.8	5.7		7.5	6.0
Level of Service		А			В			A	A		A	A
Approach Delay (s)		9.7			10.7			6.4			6.8	
Approach LOS		A			В			A			A	
Intersection Summary												
HCM Average Control D	elay		9.1	H	HCM Le	vel of Se	ervice		A			
HCM Volume to Capacit	ty ratio		0.40									
Actuated Cycle Length (s)		36.0	5	Sum of l	ost time	(\$)		8.0			
Intersection Capacity Ut	ilization		53.8%	þ	CU Leve	el of Sei	rvice		А			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4 î b			41>			۹ ۴	*		4	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	1.00
Frt		0.99			0.97			1.00	0.85		1.00	0.85
Flt Protected		0.99			1.00			0.97	1.00		0.96	1.00
Satd. Flow (prot)		3467			3434			1806	1583		1788	1583
Flt Permitted		0.73			0.85			0.74	1.00		0.66	1.00
Satd, Flow (perm)		2531			2944			1370	1583	- 1. M M 1884	1225	1583
Volume (vph)	90	510	60	60	560	130	100	60	90	160	30	200
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)	98	554	65	65	609	141	109	65	98	174	33	217
RTOR Reduction (vph)	0	20	0	0	46	0	0	0	57	0	0	85
Lane Group Flow (vph)	0	697	0	0	769	0	0	174	41	0	207	132
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		14.1			14.1			16.1	16.1		16.1	16.1
Effective Green, g (s)		14.1			14.1			16.1	16.1		16.1	16.1
Actuated g/C Ratio		0.37			0.37			0.42	0.42		0.42	0.42
Clearance Time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	_	3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		934			1087			577	667		516	667
v/s Ratio Prot												
v/s Ratio Perm		c0.28			0.26			0.13	0.03		c0.17	0.08
v/c Ratio		0.75			0.71			0.30	0.06		0.40	0.20
Uniform Delay, d1		10.5			10.3			7.3	6.6		7.7	7.0
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		3.3			2.1			1.3	0.2		2.3	0.7
Delay (s)		13.8			12.4			8.7	6.7		10.0	7.6
Level of Service		В			В			A	A		В	A
Approach Delay (s)		13.8			12.4			8.0			8.8	
Approach LOS		В			В			A			A	
Intersection Summary								2100				
HCM Average Control D	Delay		11.6	H	HCM Lev	vel of S	ervice		В			
HCM Volume to Capaci	ty ratio		0.56									
Actuated Cycle Length ((s)		38.2	5	Sum of le	ost time	(s)		8.0			
Intersection Capacity Ut	ilization		67.1%	ŀ	CU Leve	el of Sei	rvice		С			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4î î>			4 î b			e	7		é.	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	1.00
Frt		0.99			0.99			1.00	0.85		1.00	0.85
Fit Protected		1.00			0.99			0.97	1.00		0.96	1.00
Satd. Flow (prot)		3482			3479			1809	1583		1790	1583
Flt Permitted		0.87			0.83			0.77	1.00		0.69	1.00
Satd. Flow (perm)		3058			2905			1443	1583		1291	1583
Volume (vph)	42	466	46	71	488	45	96	66	78	115	27	58
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)	46	507	50	77	530	49	104	72	85	125	29	63
RTOR Reduction (vph)	0	18	0	0	16	0	0	0	48	0	0	36
Lane Group Flow (vph)	0	585	0	0	640	0	0	176	37	0	154	27
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		12.9			12.9			16.1	16.1		16.1	16.1
Effective Green, g (s)		12.9			12.9			16.1	16.1		16.1	16.1
Actuated g/C Ratio		0.35			0.35			0.44	0.44		0.44	0.44
Clearance Time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1066			1013			628	689		562	689
v/s Ratio Prot												
v/s Ratio Perm		0.19			c0.22			c0.12	0.02		0.12	0.02
v/c Ratio		0.55			0.63			0.28	0.05		0.27	0.04
Uniform Delay, d1		9.7			10.1			6.7	6.0		6.7	6.0
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		0.6			1.3			1.1	0.1		1.2	0.1
Delay (s)		10.3			11.4			7.8	6.2		7.9	6.1
Level of Service		В			В			A	А		A	A
Approach Delay (s)		10.3			11.4			7.3			1.4	
Approach LOS		В			8			A			A	
Intersection Summary				1.363								
HCM Average Control Delay			9.9	H	HCM Lev	vel of Se	ervice		A			
HCM Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			37.0	5	Sum of le	ost time	(s)		8.0			
Intersection Capacity Utilization			58.0%	ł	CU Leve	el of Sei	vice		В			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		đ þ			đ î ji			र्स	ť		ર્લ	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	1.00
Frt		0.99			0.99			1.00	0.85		1.00	0.85
Flt Protected		1.00			0.99			0.97	1.00		0.96	1.00
Satd. Flow (prot)		3481			3481			1811	1583		1788	1583
Flt Permitted		0.82			0.77			0.74	1.00		0.63	1.00
Satd. Flow (perm)		2852			2680			1385	1583		1178	1583
Volume (vph)	60	610	60	90	660	60	120	90	100	150	30	130
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)	65	663	65	98	717	65	130	98	109	163	33	141
RTOR Reduction (vph)	0	17	0	0	15	0	0	0	65	0	0	60
Lane Group Flow (vph)	0	776	0	0	865	0	0	228	44	0	196	81
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		15.2			15.2			16.0	16.0		16.0	16.0
Effective Green, g (s)		15.2			15.2			16.0	16.0		16.0	16.0
Actuated g/C Ratio		0.39			0.39			0.41	0.41		0.41	0.41
Clearance Time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1106			1039			565	646		481	646
v/s Ratio Prot												
v/s Ratio Perm		0.27			c0.32			0.16	0.03		c0.17	0.05
v/c Ratio		0.70			0.83			0.40	0.07		0.41	0.13
Uniform Delay, d1		10.1			10.9			8.2	7.1		8.2	7.2
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		2.0			5.8			2.1	0.2		2.5	0.4
Delay (s)		12.1			16.7			10.4	7.3		10.8	7.6
Level of Service		В			В			В	A		В	A
Approach Delay (s)		12.1			16.7			9.4			9.5	
Approach LOS		8			В			A			А	
Intersection Summary							-					
HCM Average Control Delay			13.1	F	ICM Lev	vel of Se	ervice		В			
HCM Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			39.2	5	Sum of lost time (s)				8.0			
Intersection Capacity Utilization			71.3%		CU Leve	el of Sei	vice		С			
Analysis Period (min)			15									
c Critical Lane Group												
#6- Hoslako St. at Rice St.





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HCM Signalized Intersection Capacity Analysis 6: Rice Street & Hoolako Street

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		412			472			4	1		*	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	1.00
Frt		0.99			0.98			1.00	0.85		1.00	0.85
Fit Protected		0.99			1.00			0.96	1.00		0.97	1.00
Satd. Flow (prot)		3449			3462			1792	1583		1798	1583
Flt Permitted		0.75			0.93			0.78	1.00		0.81	1.00
Satd. Flow (perm)		2621			3222			1459	1583		1507	1583
Volume (vph)	109	348	51	18	404	64	85	23	29	55	21	83-
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)	118	378	55	20	439	70	92	25	32	60	23	90
RTOR Reduction (vph)	0	22	0	0	33	0	0	0	17	0	0	47
Lane Group Flow (vph)	0	529	0	0	496	0	0	117	15	0	83	43
Turn Type	Perm			Perm			Perm	1.00	Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		12.6			12.6			19.2	19.2		19.2	19.2
Effective Green, g (s)		11.6			11.6			18.2	18.2		18.2	18.2
Actuated g/C Ratio		0.31			0.31			0.48	0.48		0.48	0.48
Clearance Time (s)		3.0			3.0			3.0	3.0		3.0	3.0
Vehicle Extension (s)		3.0	12 mar		3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		804			989			702	762		726	762
v/s Ratio Prot												
v/s Ratio Perm		c0.20			0.15			c0.08	0.01		0.06	0.03
v/c Ratio		0.66			0.50			0.17	0.02		0.11	0.06
Uniform Delay, d1		11.4			10.7			5.5	5.1		5.4	5.2
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		2.0			0.4			0.5	0.0		0.3	0.1
Delay (s)		13.3			11.1			6.0	5.2		5.7	5.4
Level of Service		В			В			А	А		А	A
Approach Delay (s)		13.3			11.1			5.9			5.5	
Approach LOS		В			В			А			A	
Intersection Summary				-								
HCM Average Control D	Delay		10.7	1	HCM Le	vel of S	ervice		B	(
HCM Volume to Capaci	ty ratio		0.36	1								
Actuated Cycle Length ((s)		37.8		Sum of I	ost time	e (s)		8.0			
Intersection Capacity Ut	tilization	i.	50.7%		ICU Lev	el of Se	rvice		А			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		4°}			472			Ą	1		ţ,	7	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	1.00	
Frt		0.98			0.97			1.00	0.85		1.00	0.85	
Flt Protected		0.99			1.00			0.96	1.00		0.96	1.00	
Satd. Flow (prot)		3450			3427			1792	1583		1794	1583	
Flt Permitted		0.67			0.93			0.72	1.00		0.73	1.00	
Satd. Flow (perm)		2319			3186			1347	1583		1358	1583	
Volume (vph)	140	480	70	20	530	140	110	30	40	100	30	110	-
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)	152	522	76	22	576	152	120	33	43	109	33	120	
RTOR Reduction (vph)	0	20	0	0	54	0	0	0	25	0	0	71	
Lane Group Flow (vph)	_ 0	730	0	0	696	0	0	153	18	0	142	49	
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm	
Protected Phases		4			8			2			6		
Permitted Phases	4			8			2		2	6		6	
Actuated Green, G (s)		17.9			17.9			18.3	18.3		18.3	18.3	
Effective Green, g (s)		16.9			16.9			17.3	17.3		17.3	17.3	
Actuated g/C Ratio		0.40			0.40			0.41	0.41		0.41	0.41	
Clearance Time (s)		3.0			3.0			3.0	3.0		3.0	3.0	
Vehicle Extension (s)		3.0			3.0		-under H	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		929			1276			552	649		557	649	
v/s Ratio Prot													
v/s Ratio Perm		c0.32			0.24			c0.11	0.03		0.10	0.08	
v/c Ratio		0.79			0.55			0.28	0.03		0.25	0.08	/
Uniform Delay, d1		11.1			9.7			8.3	7.4		8.2	7.6	
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.4			0.5			1.2	0.1		1.1	0.2	
Delay (s)		15.5			10.2			9.5	7.5		9.3	7.8	1
Level of Service		В			В			А	А		А	А	2
Approach Delay (s)		15.5			10.2			9.1			8.6		
Approach LOS		В			В			A			А		
Intersection Summary	1000125			-					The second second			- 3	
HCM Average Control D	elay		11.9	<	HCM Le	vel of S	ervice		В	1			
HCM Volume to Capacil	ty ratio		0.54	1									
Actuated Cycle Length (s)		42.2		Sum of I	ost time	(s)		8.0				
Intersection Capacity Ut	ilization		63.6%	1111	ICU Lev	el of Se	rvice		В				
Analysis Period (min)			15										
c Critical Lane Group													



HCM Signalized Intersection Capacity Analysis

6: RICE STREET & Hoola Ko Struct

1/21/2006

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		đþ			đĥ			đ.	Ť		સં	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	1.00
Frt		0.98			0.97			1.00	0.85		1.00	0.85
Flt Protected		0.99			1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)		3450			3427			1792	1583		1794	1583
Flt Permitted		0.67			0.93			0.72	1.00		0.73	1.00
Satd. Flow (perm)	_	2332			3186			1346	1583		1357	1583
Volume (vph)	140	480	70	20	530	140	110	30	40	100	30	110
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)	152	522	76	22	576	152	120	33	43	109	33	120
RTOR Reduction (vph)	0	22	0	0	57	0	0	0	26	0	0	72
Lane Group Flow (vph)	0	728	0	0	693	0	0	153	17	0	142	48
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		16.9			16.9			17.2	17.2		17.2	17.2
Effective Green, g (s)		15.9			15.9			16.2	16.2		16.2	16.2
Actuated g/C Ratio		0.40			0.40			0.40	0.40		0.40	0.40
Clearance Time (s)		3.0			3.0			3.0	3.0		3.0	3.0
Vehicle Extension (s)	-	3.0			3.0		_	3.0	3.0	_	3.0	3.0
Lane Grp Cap (vph)		925			1263			544	640		548	640
v/s Ratio Prot												
v/s Ratio Perm		c0.31			0.22			c0.11	0.01		0.10	0.03
v/c Ratio		0.79			0.55			0.28	0.03		0.26	0.08
Uniform Delay, d1		10.6			9.3			8.0	7.2		8.0	7.3
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		4.5			0.5			1.3	0.1		1.1	0.2
Delay (s)		15.1			9.8			9.3	7.3		9.1	7.6
Level of Service		В			A			A	A		А	A
Approach Delay (s)		15.1			9.8			8.9			8.4	
Approach LOS		В			А			A			А	
Intersection Summary												
HCM Average Control E	Delay		11.6	/	HCM Le	vel of S	ervice		В	1		
HCM Volume to Capaci	ty ratio		0.53	/								
Actuated Cycle Length	(s)		40.1		Sum of I	ost time	(s)		8.0			
Intersection Capacity U	lilization		63.6%		CU Lev	el of Se	rvice		B			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4Tr			412			ર્સ	7		સ્	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	1.00
Frt		0.98			0.97			1.00	0.85		1.00	0.85
Flt Protected		0.99			1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)		3450			3427			1792	1583		1794	1583
Flt Permitted		0.67			0.93			0.72	1.00		0.73	1.00
Satd. Flow (perm)		2332			3186		6	1346	1583		1357	1583
Volume (vph)	140	480	70	20	530	140	110	30	40	100	30	110
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)	152	522	76	22	576	152	120	33	43	109	33	120
RTOR Reduction (vph)	0	22	0	0	57	0	0	0	26	0	0	72
Lane Group Flow (vph)	0	728	0	0	693	0	0	153	17	0	142	48
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		16.9			16.9			17.2	17.2		17.2	17.2
Effective Green, g (s)		15.9			15.9			16.2	16.2		16.2	16.2
Actuated g/C Ratio		0.40			0.40			0.40	0.40		0.40	0.40
Clearance Time (s)		3.0			3.0			3.0	3.0		3.0	3.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph) v/s Ratio Prot		925			1263			544	640		548	640
v/s Ratio Perm		c0.31			0.22			c0.11	0.01		0.10	0.03
v/c Ratio		0.79			0.55			0.28	0.03		0.26	0.08
Uniform Delay, d1		10.6			9.3			8.0	7.2		8.0	7.3
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		4.5			0.5			1.3	0.1		1.1	0.2
Delay (s)		15.1			9.8			9.3	7.3		9.1	7.6
Level of Service		В			А			А	A		А	A
Approach Delay (s)		15.1			9.8			8.9			8.4	
Approach LOS		В			А			А			A	
Intersection Summary												
HCM Average Control D)elay		11.6	1 1	HCM Le	vel of Se	ervice		В	/		
HCM Volume to Capaci	ty ratio		0.53	1								
Actuated Cycle Length ((s)		40.1	5	Sum of l	ost time	(s)		8.0			
Intersection Capacity Ut	ilization		63.6%	1	CU Leve	el of Sei	rvice		В			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 6: Rice Street & Hoolako Street

1/14/2006

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		414			472			é.	7		ଣ	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	1.00
Frt		0.97			0.99			1.00	0.85		1.00	0.85
Flt Protected		0.98			0.99			0.97	1.00		0.96	1.00
Satd. Flow (prot)		3342			3471			1805	1583		1789	1583
Flt Permitted		0.61			0.78			0.73	1.00		0.67	1.00
Satd. Flow (perm)		2090			2740			1362	1583		1249	1583
Volume (vph)	304	213	155	82	418	43	85	47	79	191	40	98
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)	330	232	168	89	454	47	92	51	86	208	43	107
RTOR Reduction (vph)	0	65	0	0	15	0	0	0	50	0	0	62
Lane Group Flow (vph)	0	665	0	0	575	0	0	143	36	0	251	45
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		18.1			18.1			19.3	19.3		19.3	19.3
Effective Green, g (s)		17.1			17.1			18.3	18.3		18.3	18.3
Actuated g/C Ratio		0.39			0.39			0.42	0.42		0.42	0.42
Clearance Time (s)		3.0			3.0			3.0	3.0		3.0	3.0
Vehicle Extension (s)		3.0	115-34		3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		823			1080			574	667		527	667
V/s Ratio Prot												
v/s Ratio Perm		c0.32			0.21			0.10	0.02		c0.20	0.03
V/C Ratio		0.910			0.53			0.25	0.05		0.48	0.07
Uniform Delay, d1		11.7			10.1			8.1	1.4		9.1	7.5
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		5.8			0.5			1.0	0.2		3.1	0.2
Delay (s)		17.5			10.6			9.1	7.6		12.1	1.1
Level of Service		B			В			A	A		В	A
Approach Delay (s)		17.5			10.6			8.6			10.8	
Approach LOS		8			В			A			В	
Intersection Summary												
HCM Average Control D	Delay		13.0	/ +	HCM Le	vel of Se	ervice		В	1		
HUM Volume to Capaci	ty ratio		0.64	1								
Actuated Cycle Length ((S)		43.4		Sum of le	ost time	(S)		8.0			
Intersection Capacity Ut	ilization		64.3%	I	CU Leve	el of Ser	vice		С			
Analysis Period (min)	-		15									
di Defacto Left Lane.	Recode	with 11	nough l	lane as	a left la	ne.						

c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		đ î i			ፋፑ			4	1		ţ,	7
Ideal Flow (vphpi)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	1.00
Frt		0.97			0.99			1.00	0.85		1.00	0.85
FIt Protected		0.98			0.99			0.97	1.00		0.96	1.00
Satd. Flow (prot)		3342			3464			1804	1583		1786	1583
FIt Permitted		0.57			0.70			0.54	1.00		0.63	1.00
Satd. Flow (perm)		1950			2432			1010	1583		1180	1583
Volume (vph)	390	280	200	110	570	70	110	60	100	310	50	130 -
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)	424	304	217	120	620	76	120	65	109	337	54	141
RTOR Reduction (vph)	0	62	0	0	17	0	0	0	70	0	0	91
Lane Group Flow (vph)	0	883	0	0	799	0	0	185	39	0	391	50
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		22.0			22.0	3		17.0	17.0		17.0	17.0
Effective Green, g (s)		21.0			21.0			16.0	16.0		16.0	16.0
Actuated g/C Ratio		0.47			0.47			0.36	0.36		0.36	0.36
Clearance Time (s)		3.0			3.0			3.0	3.0		3.0	3.0
Vehicle Extension (s)		3.0	1000		3.0	1100		3.0	3.0		3.0	3.0
Lane Grp Cap (vph) v/s Ratio Prot		910			1135			359	563		420	563
v/s Ratio Perm		c0.48			0.34			0.18	0.07		c0.33	0.09
v/c Ratio		1.36dl			0.70			0.52	0.07		0.93	0.09
Uniform Delay, d1		11.7			9.5			11.4	9.6		14.0	9.6
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		22.8			2.0			5.2	0.2		29.6	0.3
Delay (s)		34.5			11.5			16.6	9.8		43.6	10.0
Level of Service		С			В			В	А		D	A
Approach Delay (s)		34.5			11.5			14.1			34.7	
Approach LOS		С			В			В			С	
Intersection Summary												1
HCM Average Control D HCM Volume to Capacit	elay ty ratio	-	25.0 0.99	1 +	HCM Lev	vel of Se	ervice		С	/		
Actuated Cycle Length (s)		45.0	5	Sum of le	ost time	(s)		8.0			
Intersection Capacity Ut	ilization		83.1%	1	CU Leve	el of Ser	vice		E			
Analysis Period (min)			15		and any other							
di Defacto Left Lane	Recode	with 1	though	ane as	a left la	A						

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis 6: RICE STREET &

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	1000	412	1000	1000	eî∱∌	1000	1000	ب ۱	*	1000	्री	1000	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	1.00	
		0.97			0.99			1.00	0.85		1.00	0.85	
Fit Protected		0.98			0.99			0.97	1.00		0.96	1.00	
Satd. Flow (prot)		3342			3464			1804	1583		1/86	1583	
Fit Permitted		0.57			0.70			0.54	1.00		0.63	1.00	
Satd. Flow (perm)		1950			2432	-		1010	1583		1180	1583	
Volume (vph)	390	280	200	110	570	/0	110	60	100	310	50	130	-
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)	424	304	217	120	620	76	120	65	109	337	54	141	
RTOR Reduction (vph)	0	62	0	0	17	0	0	0	70	0	0	91	
Lane Group Flow (vph)	0	883	0	0	799	0	0	185	39	0	391	50	
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm	
Protected Phases		4			8			2			6		
Permitted Phases	4			8			2		2	6		6	
Actuated Green, G (s)		22.0			22.0			17.0	17.0		17.0	17.0	
Effective Green, g (s)		21.0			21.0			16.0	16.0		16.0	16.0	
Actuated g/C Ratio		0.47			0.47			0.36	0.36		0.36	0.36	
Clearance Time (s)		3.0			3.0			3.0	3.0		3.0	3.0	
Vehicle Extension (s)		3.0	11000	1.200	3.0		Sec. 1	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph) v/s Ratio Prot		910			1135			359	563		420	563	
v/s Ratio Perm		c0.45			0.33			0.18	0.02		c0.33	0.03	
v/c Ratio		1.36dl			0.70			0.52	0.07		0.93	0.09	1
Uniform Delay, d1		11.7			9.5			11.4	9.6		14.0	9.6	
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00	
Incremental Delay, d2		22.8			2.0			5.2	0.2		29.6	0.3	
Delay (s)		34.5			11.5			16.6	9.8		43.6	10.0	
Level of Service		С			В			В	А		D	A	
Approach Delay (s)		34.5			11.5			14.1			34.7		
Approach LOS		С			В			В			С		
Intersection Summary													
HCM Average Control D	elay		25.0	1	HCM Le	vel of S	ervice		С	/			
HCM Volume to Capacit	ty ratio		0.95	1									
Actuated Cycle Length (s)		45.0		Sum of I	ost time	(s)		8.0				
Intersection Capacity Ut	ilization		83.1%	1	CU Leve	el of Sei	rvice		E				
Analysis Period (min)			15										
dl Defacto Left Lane.	Recode	with 1	though	ane as	a left la	ne.							

c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ፋፑ			ፋኁ			ન	7		र्भ	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	1.00
Frt		0.97			0.99			1.00	0.85		1.00	0.85
Flt Protected		0.98			0.99			0.97	1.00		0.96	1.00
Satd. Flow (prot)		3342			3464			1804	1583		1786	1583
Flt Permitted		0.57			0.70			0.54	1.00		0.63	1.00
Satd. Flow (perm)		1950			2432			1010	1583		1180	1583
Volume (vph)	390	280	200	110	570	70	110	60	100	310	50	130
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)	424	304	217	120	620	76	120	65	109	337	54	141
RTOR Reduction (vph)	0	62	0	0	17	0	0	0	70	0	0	91
Lane Group Flow (vph)	0	883	0	0	799	0	0	185	39	0	391	50
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		22.0			22.0			17.0	17.0		17.0	17.0
Effective Green, g (s)		21.0			21.0			16.0	16.0		16.0	16.0
Actuated g/C Ratio		0.47			0.47			0.36	0.36		0.36	0.36
Clearance Time (s)		3.0			3.0			3.0	3.0		3.0	3.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		910			1135			359	563		420	563
v/s Ratio Prot												
v/s Ratio Perm		c0.45			0.33			0.18	0.02		c0.33	0.03
v/c Ratio		1.36dl			0.70			0.52	0.07		0.93	0.09
Uniform Delay, d1		11.7			9.5			11.4	9.6		14.0	9.6
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		22.8			2.0			5.2	0.2		29.6	0.3
Delay (s)		34.5			11.5			16.6	9.8		43.6	10.0
Level of Service		С			В			В	A		D	A
Approach Delay (s)		34.5			11.5			14.1			34.7	
Approach LOS		С			В			В			С	
Intersection Summary												
HCM Average Control D	elay		25.0	/ F	ICM Lev	vel of Se	ervice		С	1		110-11-10-9- T
HCM Volume to Capacit	ty ratio		0.95	/								
Actuated Cycle Length (s)		45.0	S	Sum of le	ost time	(s)		8.0			
Intersection Capacity Ut	ilization		83.1%	ŀ	CU Leve	el of Ser	vice		E			
Analysis Period (min)			15									
II Defeate Left Laws	Desale	A alking a	المانية ومعام		- 1-A 1-							

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

$$\frac{3}{2} \frac{9}{10} \left[\frac{1}{2} \frac{275}{150} \right] \frac{3}{10} \frac{9}{10} \left[\frac{1}{2} \frac{490}{240} \right] \frac{1}{2} \frac{490}{420} \frac{1}{2} \frac{1}{10} \frac{1$$

Int 7

		O-WAY STOP	CONTRO	DL SI	JMM	IARY			1
neral Information			Site Ir	nform	atio	n			
ງ _ທ ະຫ <mark>alyst</mark>		-	Interse	ction			Int 7 - Exis	sting.am	
Agency/Co.			Jurisdi	ction				Ť	
Date Performed	1/16/2006		Analys	is Yea	٢				1
Analysis Time Period									
Project Description Lihe	ie Urban Core								
East/West Street: Rice S	treet		North/S	outh S	street:	: Kapule H	ighway		
Intersection Orientation:	East-West		Study F	Period	(hrs):	0.25			1
Vehicle Volumes an	d Adjustment	s							
Major Street		Eastbound	-				Westbou	ind	1.0
Movement	1	2	3			4	5		6
	L	T	R				T		R
Volume	195	150	0			0	130		275
Peak-Hour Factor, PHF	0.92	0.92	0.92			0.92	0.92		0.92
Porcept Heavy Vehicles	211	103	0			0	747		298
	0			Noulo			^{ستر بنه}		-
RT Channelized				way Le	<u>n 10</u>	ni Lane	<u> </u>		0
	1	1	0			0	1		1
Configuration	1	<i>τ</i>	0			0	τ ,		R
Upstream Signal	<u> </u>	, ,					0		Л
Minor Street									
Movement		8	9	9 10		10	11		12
	L	т –	R			L	Т		R
Ivolume		0	0			340	0		160
Peak-Hour Factor, PHF	0.92	0.92	0.92			0.92	0.92		0.92
Hourly Flow Rate, HFR	0	0	0			369	0		173
Percent Heavy Vehicles	0	0	0			0	0		0
Percent Grade (%)		0					0	•	
Flared Approach		N					N		
Storage		0					0		
RT Channelized			0						0
Lanes	0		0			1	0		1
Configuration						L			R
Delay, Queue Length, ar	d Level of Serv	ce	-				•		
Approach	EB	WB		Northb	ound			Southbound	1
Movement	1	4	7	8	,	9	10	11	12
Lane Configuration	L						L		R
v (vph)	211						369		173
C (m) (vph)	1132						427		912
v/c	0.19						0.86		0.19
95% queue length	0.68						8 68		0.70
Control Delay	80						47.8		9.9
	0.3 A						F		Δ
	~							25.7	
roach Delay	-		30.7						
Approach LOS							E		

	TW	O-WAY STOP			UMN	IARY				
General Information	n		Site	nforn	natic	n				
Analyst			Inters	ection			Int 7 - Ba	selíne.	am	
Agency/Co.			Jurisd	liction						
Date Performed	1/16/2000	ĵ	Analy	sis Yea	31					
Analysis Time Period					,					
Project Description Lif	nue Urban Core)								
East/West Street: Rice	Street		North/	South S	Street	: Kapule	Highway			
Intersection Orientation:	East-West		Study	Period	(hrs):	0.25				
Vehicle Volumes an	nd Adjustme	ents								
Major Street		Eastbound					Westbou	und		
Movement	1	2	3			4	5			6
	L	T	R				T			R
Volume	280	220				0	230		4	40
Peak-Hour Factor, PHF	0.92	0.92	0.92	2		0.92	0.92		0	.92
Houriy Flow Rate, HFR	304	239	0			0	249		4	478
Madian Type	0		 	1/01/20	<u># 7</u>	U	-			
PT Channelized	_			/vay Le		n Lane	1			0
	- 1	1				0	1			1
Configuration	1	, т	0			0				
Linstream Signal	<u> </u>	1					· ·			Л
		Nardhhaurad					U			
Movement	7					10		na I		10
	,					10				
		1				200				220
Peak-Hour Eactor PHE	0.92	<u> </u>	0.92	·		230 192	0.92			92
Hourly Flow Rate, HFR	0	0	0.02			315	0.02		2	239
Percent Heavy Vehicles	0	0	0			0	0			0
Percent Grade (%)		0	-				0			<u> </u>
Flared Approach		N N					N			
Storage		0					0			
BT Channelized	-									0
KT Channenzeu			0			1	0			1
Configuration	0	0	0			1				7
Configuration						L				Л
Delay, Queue Length, a	ind Level of Se	ervice					1 _			
Approach	EB	WB		Northb	ound		5	Southbo	bund	
Movement	1	4	7	8	·	9	10	11		12
Lane Configuration	L						L			R
v (vph)	304						315			239
C (m) (vph)	` 886						261			795
v/c	0.34			1			1.21		-	0.30
95% queue length	1.53						14.76			1.27
Control Delav	11.2		877 V	-			163.6			11.5
LOS	В						F			В
Approach Delay		-		L				98.0)	
Approach LOS										
-upitadii LOB							Г			

	کر	\mathbf{r}	*	1	Ļ	-		
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations	7	1	1	**	* *	7		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00		
Frt	1.00	0.85	1.00	1.00	1.00	0.85		
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00		
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583		
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00		
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583		
Volume (vph)	280	220	230	440	290	220		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	304	239	250	478	315	239		
RTOR Reduction (vph)	0	181	0	0	0	158		
Lane Group Flow (vph)	304	58	250	478	315	81		
Turn Type		Perm	Prot			Perm		
Protected Phases	4		5	2	6			
Permitted Phases		4				6		
Actuated Green, G (s)	13.8	13.8	11.8	35.1	19.3	19.3		
Effective Green, g (s)	13.8	13.8	11.8	35.1	19.3	19.3		
Actuated g/C Ratio	0.24	0.24	0.21	0.62	0.34	0.34		
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	429	384	367	2183	1200	537		
v/s Ratio Prot	c0.17		c0.14	0.14	c0.09			
v/s Ratio Perm		0.04				0.05		
v/c Ratio	0.71	0.15	0.68	0.22	0.26	0.15		
Uniform Delay, d1	19.7	16.9	20.8	4.8	13.6	13.1		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	5.3	0.2	5.1	0.2	0.5	0.6		
Delay (s)	25.0	17.1	26.0	5.1	14.2	13.7		
Level of Service	С	В	С	А	В	В		
Approach Delay (s)	21.5			12.2	14.0			
Approach LOS	С			В	В			
Intersection Summary								
HCM Average Control D	elay		15.5	F	ICM Le	vel of Ser	rvice B	
HCM Volume to Capacit	ty ratio		0.51					
Actuated Cycle Length ((s)		56.9	5	Sum of l	ost time ((s) 12.0	
Intersection Capacity Ut	ilization		46.3%	I	CU Leve	el of Serv	vice A	
Analysis Period (min)			15					
c Critical Lane Group								

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Synchro 6 Report Page 1

	TW	O-WAY STOP	CONTR	OL SUN	IMARY		-	
General Information	n		Site I	nformat	ion			
Analyst			Interse	ection		Int 7 - Exis	sting.pm	
Agency/Co.			Jurisd	iction				
Date Performed	1/16/200	6	Analys	sis Year				
Analysis Time Period								
Project Description Lil	hue Urban Core)						
East/West Street: Rice	Street		North/S	South Stre	et: Kapul	le Highway		
Intersection Orientation:	East-West		Study I	Period (hr:	s): 0.25			
Vehicle Volumes ar	nd Adjustme	ents						
Major Street	_	Eastbound				Westbour	<u>nd</u>	
Movement	1	2	3		4	5		6
		1	<u>- </u>		L			R
Pook Hour Easter DHE	310	400	0)	0 00	240		490
Hourly Flow Pate HEP	0.92	0.92	0.92		0.92	0.92		0.92 500
Percent Heavy Vehicles	0350	404			0	200		032
Median Type				Naviati T	um Lana			
RT Channelized			1000	vay Leit i	um Lane	1	<u> </u>	0
Lanes	1	1	0		0	1		1
Configuration	1	T			U	T		R
Upstream Signal		0				0		
Minor Street		Northbound	_		_	Southbou	bo	
Movement	7	8	9		10	11		12
	L	<u>т</u>	R		1	T	_	R
Volume	0	0	0		560	0	1	300
Peak-Hour Factor, PHF	0.92	0.92	0.92	2	0.92	0.92		0.92
Hourly Flow Rate, HFR	0	0	0		608	0		326
Percent Heavy Vehicles	0	0	0		0	0		0
Percent Grade (%)		0				0		
Flared Approach		N				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	0	0		1	0		1
Configuration		Ť			L.			R
Delay, Queue Length, a	Ind Level of Se						•	
Approach	EB	WB		Northbour	nd	S	outhbour	nd
Movement	1	4	7	8	9	10	11	12
Lane Configuration		· · · · · · · · · · · · · · · · · · ·						R
v (voh)	.336					608		326
(vpn)	· 838					181		784
	0.40				+	3.26		0.42
	1.40					5.50		0,42
95% queue length	1.95					57.35		2.00
Control Delay	12.1					+		12.8
LOS	В		ļ			F		В
Approach Delay	-*						729.7	
Approach LOS							F	

HCS2000TM

	TWO	D-WAY STOP	CONTRO	L SUMN	IARY					
General Informatio	n		Site Information							
Analyst			Intersec	tion		Int 7 - Bas	eline.µ	om		
Agency/Co.			Jurisdict	tion						
Date Performed	1/16/2006		Analysis	e Year						
Analysis Time Period										
Project Description Li	hue Urban Core									
East/West Street: Rice	Street		North/Sc	outh Street	: Kapul	le Highway				
ntersection Orientation:	East-West		Study Pe	eriod (hrs):	0.25					
Vehicle Volumes a	nd Adjustme	nts	_							
Major Street		Eastbound				Westbou	nd			
Movement	1	2	3		4	5		6		
	L	Т	R		L	T		R		
Volume	410	580	0		0	320		660		
Peak-Hour Factor, PHF	0.92	0.92	0.92	(0.92	0.92		0.92		
Hourly Flow Rate, HFR	445	630	0		0	347		717		
Percent Heavy Vehicles	0		-		0					
Vedian Type		-		Undivided						
RT Channelized			0					0		
_anes	1	1	0		0	1		1		
Configuration	L	Т				Τ		R		
Jpstream Signal		0				0				
Minor Street		Northbound				Southbou	nd			
Novement	7	8	9		10	11		12		
	L	Т	R		L	Т		R		
/olume	0	0	0		810	0		420		
Peak-Hour Factor, PHF	0.92	0.92	0.92	(0.92	0.92		0.92		
Hourly Flow Rate, HFR	0	0	0		880	0		456		
Percent Heavy Vehicles	0	0	0		0	0		0		
Percent Grade (%)		0	_			0				
Flared Approach		N				N				
Storage		0				0	l			
RT Channelized			0					0		
anes	0	0	0		1	0		1		
Configuration					L		-	R		
Delay, Queue Length, a	and Level of Sei	rvice				-				
Approach	EB	WB	N	orthbound		S	outhbo	and		
Movement	1	4	7	8	9	10	11	12		
ane Configuration	L					L		R		
/ (vph)	445					880		456		
C (m) (vph)	662					27		701		
//c	0.67					32.59		0.65		
35% queue length	5.17					109.63		4.82		
Control Delay	20.9							19.2		
08	<u> </u>					F		C		
						- 1 - 1 - 1				

Approach Delay

Approach LOS

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F

	≯	\mathbf{i}	-	Ť	Ļ	4			
Movement	EBL	EBR	NBL	NBT	SBT	SBR	all all starts		
Lane Configurations	5	15	×,	≜ ≜	**	7		de 8 refersively an	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900			
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00			
Frt	1.00	0.85	1.00	1.00	1.00	0.85			
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00			
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583			
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00			
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583			
Volume (vph)	410	580	320	660	810	420	A TRACE		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92			
Adj. Flow (vph)	446	630	348	717	880	457			
RTOR Reduction (vph)	0	351	0	0	0	319			
Lane Group Flow (vph)	446	279	348	717	880	138			
Turn Type		Perm	Prot			Perm			
Protected Phases	4		5	2	6				
Permitted Phases		4				6			
Actuated Green, G (s)	18.4	18.4	14.5	38.0	19.5	19.5			
Effective Green, g (s)	18.4	18.4	14.5	38.0	19.5	19.5			
Actuated g/C Ratio	0.29	0.29	0.23	0.59	0.30	0.30			
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	506	452	399	2088	1072	479			
v/s Ratio Prot	c0.25		c0.20	0.20	c0.25				
v/s Ratio Perm		0.18				0.09			
v/c Ratio	0.88	0.62	0.87	0.34	0.82	0.29			
Uniform Delay, d1	22.0	20.0	24.1	6.8	20.8	17.2			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	16.4	2.5	18.5	0.5	7.1	1.5			
Delay (s)	38.3	22.5	42.5	7.2	27.9	18.7			
Level of Service	D	С	D	A	С	В			
Approach Delay (s)	29.0			18.8	24.7				
Approach LOS	С			В	С				
Intersection Summary									
HCM Average Control D	Delay		24.2	F	ICM Lev	vel of Service	e	С	
HCM Volume to Capaci	ty ratio		0.86						
Actuated Cycle Length (s)		64.4	S	Sum of lo	ost time (s)	1	2.0	
Intersection Capacity Ut	ilization		72.8%	10	CU Leve	el of Service		С	
Analysis Period (min)			15						
c Critical Lane Group									

Network A PM

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Synchro 6 Report Page 1

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SIS COL	
CASE Ex Arg United 3000 SBL 1400 B COBL 401.8 P COBR 13.6 B	CASE Bandon dirit Unsignalized Case Method Arr Gelz F - F 20.5 C 20.5 C 20.5 C Construction of the second o
2017 2017 2017 2017 2017 2017 2017 2017	$\frac{1}{1}$
CASE F. Pry Unsignalized 313 L 13.5 B WB L 751.9 F WB 23.1 C	CASE $3 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - $

	TWO	-WAY STOP	CONTR	OL S	UMN	IARY					
General Informati	on		Site I	nforn	natio	n					
Analyst Agency/Co. Date Performed Analysis Time Period	1/16/200	6	Interse Jurisdi Analys	Intersection Int 8 - Existing.am Jurisdiction Analysis Year							
Project Description 1	_ihue Urban Co	ore									
East/West Street: Hai	rdy Street		North/South Street: Kuhio Highway								
Intersection Orientation	n: North-Sout	h	Study	Study Period (hrs): 0.25							
Vehicle Volumes a	and Adjustn	nents									
Major Street		Northbound					Southbo	und			
Movement	1	2	3			4	5			6	
	L	Ť	R			L	Т			R	
Volume	0	615	190		3	55	945			0	
Peak-Hour Factor, PHF	0.92	0.92	0.92		0.	92	0.92		0.	.92	
Hourly Flow Rate, HFR	0	668	206		3	85	1027			0	
Percent Heavy Vehicle	s 0					0					
Median Type	_		1 -	Undiv	rided					-	
RT Channelized			0					0			
Lanes	0	2	1			1	2			0	
Configuration	_	<u> </u>					1				
Upstream Signal		0					0				
Minor Street		Westbound	ound				Eastbou	ind			
Movement	1	8	9			10				12	
			R			L				R R	
Volume	30	0	230			0	0 0 0 0 0			0	
Heak-Hour Factor, PHI	- 0.92	0.92	0.92		0.	92	0.92		- 0.	92	
Percent Heavy Vahiala		0	249			0	0			0	
Percent Heavy Vehicle	5 0		0			0					
Flared Approach		//					N				
Storage	_	0					0			-	
RTChannelized			0							0	
Lanes	1	0	1			0	0			0	
Configuration	L		R								
Delay, Queue Length	and Level of	Service					1				
Approach	NB	SB	\\	Nestbo	ound		6	Eastbo	und		
Movement	1	4	7	8		9	10	11		12	
Lane Configuration		L	L			R					
v (vph)		385	32			249					
C (m) (vph)		781	29			668					
v/c		0.49	1.10			0.37					
95% queue length		2.76	3,66			1.73					
Control Delay		14.0	401.8			13.6					
LOS		В	F			В	Contract of the second s				
Approach Delav			57.8								
Approach LOS		- F									
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	тwo	-WAY STOP	CONTR		MMARY					
General Informatio	on		Site I	nforma	ation					
Analyst Agency/Co. Date Performed Analysis Time Period	1/16/2000	5	Intersection Int 8 - Baseline.am Jurisdiction Analysis Year							
Project Description L	ihue Urban Co	ore								
East/West Street: Hard	dy Street		North/South Street: Kuhio Highway							
Intersection Orientation	North-Sout	h	Study Period (hrs): 0.25							
Vehicle Volumes a	nd Adiustn	nents		· · ·						
Major Street		Northbound				Southbo	und			
Movement	1	2	3		4	5		6		
	L	Т	R		L	Т		R		
Volume	0	860	400		460	1280		0		
Peak-Hour Factor, PHF	0.92	0.92	0.92	?	0.92	0.92		0.92		
Hourly Flow Rate, HFR	0	934	434		499	1391		0		
Percent Heavy Vehicles	0				0					
Median Type				Undivid	led					
RT Channelized			0					0		
Lanes	0	2	1		1	2		0		
Configuration		τ	R		L	Т				
Upstream Signal		0				0				
Minor Street	<u> </u>	Westhound	esthound Easthound							
Movement	7	8	9	9 10		11		12		
		T	R			τ		R		
Volume	100		300		0	0		0		
Peak-Hour Factor, PHE	0.92	0.92	0.92	,	0.92	0.92		0.92		
Hourly Flow Rate, BER	108	0	326		0	0		0		
Percent Heavy Vehicles		0	0		0	0		0		
Percent Grade (%)		0	Ţ		•	0				
Flared Approach		N				N				
Storage		0				0				
RT Channelized		0	0					0		
l ange	1		1		<u> </u>	0		0		
Configuration	1	0			0	0		0		
Delay, Queue Length,	And Level of	Service	, I	Nocthou	nd	1 6	Factbour	od.		
Moyomont	1		7			10	11	12		
	'	4	,	0		10	- ''	12		
		400	108		326					
		509 509	,00		549					
		0.00	0		040					
		0.98		<u> </u>	0.59					
95% queue length		13.13			3.8/					
Control Delay		64.2	-		20.8			-		
LOS		F	F		С					
Approach Delay		-								
Approach LOS										

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7/6/2006

	*	•	1	1	-	¥	
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	ሻ	7	≜ î⊧		ň	**	5. 1911 - 19 1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.85	0.95		1.00	1.00	
Fit Protected	0.95	1.00	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583	3371		1770	3539	
Flt Permitted	0.95	1.00	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583	3371		1770	3539	
Volume (vph)	100	300	860	400	460	1280	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	109	326	935	435	500	1391	
RTOR Reduction (vph)	0	285	58	0	0	0	
Lane Group Flow (vph)	109	41	1312	0	500	1391	
Turn Type		Perm			Prot		
Protected Phases	8		2		1	6	
Permitted Phases		8					
Actuated Green, G (s)	10.6	10.6	36.1		26.0	66.1	
Effective Green, g (s)	10.6	10.6	36.1		26.0	66.1	
Actuated g/C Ratio	0.13	0.13	0.43		0.31	0.78	
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	and the second second second second
Lane Grp Cap (vph)	222	198	1437		543	2762	
v/s Ratio Prot	c0.06		c0.39		c0.28	0.39	
v/s Ratio Perm		0.03					
v/c Ratio	0.49	0.21	0.91		0.92	0.50	
Uniform Delay, d1	34.5	33.3	22.8		28.4	3.4	
Progression Factor	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.5	10.4		21.1	0.7	
Delay (s)	36.2	33.8	33.2		49.5	4.0	
Level of Service	D	С	С		D	A	
Approach Delay (s)	34.4		33.2			16.0	
Approach LOS	С		С			В	
Intersection Summary			-		151		
HCM Average Control E	Delay		24.6	H	ICM Le	vel of Ser	vice C
HCM Volume to Capaci	ty ratio		0.85				
Actuated Cycle Length	(s)		84.7	S	Sum of le	ost time (s	s) 12.0
Intersection Capacity U	tilization		77.6%	10	CU Leve	el of Servi	ice D
Analysis Period (min)			15				
c Gritical Lane Group							

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	-	×.	1	1	1	Ļ	
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	ň	7	≜ 1≽		*	**	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.85	0.94		1.00	1.00	
Flt Protected	0.95	1.00	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583	3329		1770	3539	
Flt Permitted	0.95	1.00	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583	3329		1770	3539	
Volume (vph)	100	300	610	400	460	880	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	1
Adj. Flow (vph)	109	326	663	435	500	957	
RTOR Reduction (vph)	0	285	111	0	0	0	
Lane Group Flow (vph)	109	41	987	0	500	957	
Turn Type		Perm			Prot		
Protected Phases	8		2		1	6	
Permitted Phases		8					
Actuated Green, G (s)	10.6	10.6	35.1		27.0	66.1	
Effective Green, g (s)	10.6	10.6	35.1		27.0	66.1	
Actuated g/C Ratio	0.13	0.13	0.41		0.32	0.78	
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	222	198	1380		564	2762	
v/s Ratio Prot	c0.06		c0.30		c0.28	0.27	
v/s Ratio Perm		0.03					
v/c Ratio	0.49	0.21	0.72		0.89	0.35	
Uniform Delay, d1	34.5	33.3	20.6		27.4	2.8	
Progression Factor	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.5	3.2		15.5	0.3	
Delay (s)	36.2	33.8	23.8		42.9	3.1	
Level of Service	D	С	С		D	А	
Approach Delay (s)	34.4		23.8			16.8	
Approach LOS	С		С			В	
Intersection Summary				_			
HCM Average Control D	Delay		21.9	J.	ICM Lev	vel of Se	ervice C
HCM Volume to Capaci	ty ratio		0.75				
Actuated Cycle Length ((s)		84.7	S	Sum of le	ost time	(s) 12.0
Intersection Capacity Ut	ilization		70.7%	ļ	CU Leve	el of Serv	vice C
Analysis Period (min)			15				
c Critical Lane Group							

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	TWO	-WAY STOP	CONTR		MARY					
General Informatio	n		Site I	nforma	tion					
Analyst Agency/Co. Date Performed Analysis Time Period	1/16/2000	3	Intersection Int 8 - Existing.pm Jurisdiction Analysis Year							
Project Description Li	hue Urban Co	ore								
East/West Street: Hard	y Street		North/South Street: Kuhio Highway							
Intersection Orientation:	North-Sout	h	Study	Period (h	rs): 0.25					
Vehicle Volumes a	nd Adjustn	nents								
Major Street		Northbound				Southbo	und			
Movement	1	2	3		4	5		6		
	L	Т	R		L	ĩ		R		
Volume	0	845	107		240	930		0		
Peak-Hour Factor, PHF	0.92	0.92	0.92	<u> </u>	0.92	0.92		0.92		
Houriy Flow Rate, HFR	0	918	116		260	1010		0		
Percent Heavy Venicles	0		-	المتعانية الم	0			-		
DT Channelized										
					1	2		0		
Configuration	0	- <u>-</u>				$\frac{2}{\tau}$		0		
		1	<u></u>		L	0				
Misser Street										
Movement	7							12		
	7		9	B R				D		
Volume	70	0	225					Λ Λ		
Peak-Hour Factor PHE	0.92	0.92	0.92	>	<u>0</u> 092	.92 0.92		0.92		
Hourly Flow Rate, HFR	76	0.52	364	_	0.02	0.02		0		
Percent Heavy Vehicles	0	0	0		0	0		0		
Percent Grade (%)		0			•	0		•		
Flared Approach		N				N	-			
Storage		0				0				
RT Channelized			0			, v		0		
Lanes	1	0	1		0	0				
Configuration	,				0			0		
Delay Queue Length	nd level of									
Approach	NB	SB	1	Westbour	d	1	Fastboun	d		
Movement	1	4	7	8	9	10	11	12		
Lane Configuration	,		L		R					
v (vph)		260	76		364					
C (m) (vph)		680	36		554					
v/c		0.38	2.11		0.66					
95% queue length		1.80	8.39		4.78					
Control Delay		13.5	751.9		23.1			1 Day of		
LOS		B	F		С					
Approach Delay			149.0							
Approach LOS			F							

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	TWO	-WAY STOP	CONTR		MMARY						
General Information	on		Site	nforma	tion						
Analyst Agency/Co. Date Performed Analysis Time Period	1/16/200	6	Intersection Int 8 - Baseline.pm Jurisdiction Analysis Year								
Project Description L	ihue Urban Co	ore									
East/West Street: Har	dy Street		North/South Street: Kuhio Highway								
Intersection Orientation	n: North-Sou	th	Study	Study Period (hrs): 0.25							
Vehicle Volumes a	and Adjustr	nents									
Major Street		Northbound Southbound									
Movement	1	2	3		4	5		6			
	L	Т	R		L	Т		R			
Volume	0	1140	170		310	1270		0			
Peak-Hour Factor, PHF	0.92	0.92	0.92	2	0.92	0.92		0.92			
Hourly Flow Rate, HFR	0	1239	184		336	1380		0			
Percent Heavy Vehicle	s 0			0							
Median Type		Undivided									
RT Channelized	-	0 0									
Lanes	0	2	1		1	2		0			
Configuration		Т	R		L	Т					
Upstream Signal		0				0					
Minor Street		Westbound	•			Eastbou	ind				
Movement	7	8	8 9		10	11		12			
	L	Т	R	R L		Τ		R			
Volume	270	0	430	430 0		0		0			
Peak-Hour Factor, PHF	0.92	0.92	0.92	2	0.92	0.92		0.92			
Hourly Flow Rate, HFR	293	0	467		0	0		0			
Percent Heavy Vehicle	s 0	0	0		0	0		0			
Percent Grade (%)		0	•			0					
Flared Approach		N				N					
Storage		0				0					
RT Channelized			0					0			
Lanes	1	0	1		0	0		0			
Configuration	L		R								
Delay, Queue Length	and level of	Service				•	<u> </u>				
Aoproach	NB	SB		Vestbour	d d	E	Eastbound	d			
Movement	1	4	7	8	<u> </u>	10	11	- 12			
Lane Configuration		1	L L		R						
v (voh)		336	293		467						
C (m) (vph)		484	6		436						
		0.69	48 83		1.07						
95% queue length		5.30	38.71		15.31			1			
Control Delay		27.6			94.3						
LOS		D	F		F						
Approach Delay					1		<u></u>	4			
Approach LOS				F	1	_					
			J	'		I					
2											

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Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	۲	7	* 1.		3	**	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.85	0.98		1.00	1.00	
Fit Protected	0.95	1.00	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583	3470		1770	3539	
Flt Permitted	0.95	1.00	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583	3470		1770	3539	
Volume (vph)	270	430	1140	170	310	1270	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	3
Adj. Flow (vph)	293	467	1239	185	337	1380	
RTOR Reduction (vph)	0	300	14	0	0	0	
Lane Group Flow (vph)	293	167	1410	0	337	1380	
Turn Type		Perm			Prot		
Protected Phases	8		2		1	6	
Permitted Phases		8					
Actuated Green, G (s)	15.3	15.3	35.4		16.6	56.0	
Effective Green, g (s)	15.3	15.3	35.4		16.6	56.0	
Actuated g/C Ratio	0.19	0.19	0.45		0.21	0.71	
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	342	305	1549		371	2499	
v/s Ratio Prot	c0.17		c0.41		c0.19	0.39	
v/s Ratio Perm		0.11					
v/c Ratio	0.86	0.55	0.91		0.91	0.55	
Uniform Delay, d1	30.9	28.9	20.5		30.6	5.6	
Progression Factor	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.6	2.0	9.5		25.1	0.9	
Delay (s)	49.5	30.9	30.0		55.7	6.5	
Level of Service	D	С	С		E	A	
Approach Delay (s)	38.1		30.0			16.2	
Approach LOS	D		С			8	
Intersection Summary	39						
HCM Average Control E	elay		25.5	H	ICM Lev	el of Ser	ervice C
HCM Volume to Capaci	ty ratio		0.90				
Actuated Cycle Length ((s)		79.3	S	sum of lo	ost time ((s) 12.0
Intersection Capacity Ut	ilization		79.1%	10	CU Leve	el of Serv	vice D
Analysis Period (min)			15				
c Critical Lane Group							

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	F		1	1	- \	Ļ				
Movement	WBL	WBR	NBT	NBR	SBL	SBT				
Lane Configurations	ኻ	Ť	Å ĵ		۲	**				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0				
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95				
Frt	1.00	0.85	0.98		1.00	1.00				
Fit Protected	0.95	1.00	1.00		0.95	1.00				
Satd. Flow (prot)	1770	1583	3454		1770	3539				
FIt Permitted	0.95	1.00	1.00		0.95	1.00				
Satd. Flow (perm)	1770	1583	3454		1770	3539				
Volume (vph)	270	430	890	170	310	1080				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92				
Adi, Flow (vph)	293	467	967	185	337	1174				
RTOR Reduction (vph)	0	343	22	0	0	0				
Lane Group Flow (vph)	293	124	1130	0	337	1174				
Turn Type		Perm			Prot					
Protected Phases	8		2		1	6				
Permitted Phases		8								
Actuated Green, G (s)	14.7	14.7	26.8		15.2	46.0				
Effective Green, g (s)	14.7	14.7	26.8		15.2	46.0				
Actuated g/C Ratio	0.21	0.21	0.39		0.22	0.67				
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0				
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0				
Lane Grp Cap (vph)	379	339	1347	_	392	2370				
v/s Ratio Prot	c0.17		c0.33		c0.19	0.33				
v/s Ratio Perm		0.08								
v/c Ratio	0.77	0.37	0.84		0.86	0.50				
Uniform Delay, d1	25.4	23.0	19.0		25.7	5.6				
Progression Factor	1.00	1.00	1.00		1.00	1.00				
Incremental Delay, d2	9.4	0.7	6.4		16.9	0.7				
Delay (s)	34.9	23.7	25.4		42.6	6.4				
Level of Service	C	C	С		D	А				
Approach Delay (s)	28.0	-	25.4			14.4				
Approach LOS	С		С			В				
Intersection Summary										_
HCM Average Control D	elay		21.1	H	ICM Lev	vel of Ser	vice		С	
HCM Volume to Capacil	ty ratio		0.83							
Actuated Cycle Length (s)		68.7	S	Sum of le	ost time (s)	12	2.0	
Intersection Capacity Ut	ilization		72.2%	10	CU Leve	el of Serv	ice		С	
Analysis Period (min)			15							
c Critical Lane Group										

	тw	O-WAY STOP	CONTR	OL S	SUM	MARY						
General Informati	on		Site I	nfori	mat	ion						
Analyst			Inters	ection			Int 9 - Ex	cistina.arr	}			
Agency/Co.			Jurisd	liction								
Date Performed	1/16/20	06	Analy	sis Ye	ar							
Analysis Time Period												
Project Description	Lihue Urban (Core										
East/West Street: Ha	rdy Street		North/	South	i Street							
Intersection Orientation	n: East-Wes	st	Study	Study Period (hrs): 0.25								
Vehicle Volumes	hicle Volumes and Adjustments											
Major Street		Eastbound					_					
Movement	1	2	3		4		5		6			
			R			<u> </u>	T 105		R			
Volume Deelk Lleum Feeter, DLI	- 45	320	0	, ,		0	765		45			
Peak-Hour Factor, PH	- 0.92	0.92	0.92			0.92	0.92		0.92			
Houriy Flow Rate, HFF	x 48	347	0			0	179		48			
Median Type	s 0											
RT Channelized									0			
						0	1		0			
Configuration		·····				0	,					
Lipstream Signal	+	0										
							Soutbhound					
Minor Street	7					10			10			
Movement		<u></u>							12. P			
Valuma									65			
Peak-Hour Factor PHI		0.02	0 02	>		<u>/0</u> 0.02	0 02		000			
Hourly Flow Rate HES	2 0	0.32	0.52			76	0.32		70			
Percent Heavy Vehicle	<u>s</u> 0	0	0				0		0			
Percent Grade (%)			0			0	0					
Elared Approach	-											
	-											
Storage							0					
RI Channelized			0						0			
Lanes	0	0	0			1	0		1			
Configuration	<u> </u>			_		L			<u></u>			
Delay, Queue Length	, and Level o	of Service) a satia (a								
Approach	E8	VVB			ound		10					
Movement	1	4	/	8		9	10	11	12			
Lane Configuration		_							R			
v (vph)	48			<u> </u>			/6		70			
C (m) (vph)	1353						423		843			
v/c	0.04						0.18		0.08			
95% queue length	0.11				1		0.65		0.27			
Control Delay	7.8						15.4		9.7			
LOS	А						C		A			
Approach Delay			12.6			12.6						
Approach LOS		-						В	В			

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TWO-WAY STOP CONTROL SUMMARY												
General Informati	on			Site	nfor	mat	ion					
Analyst				Inters	ection			Int 9 - Ba	aseline	e.am		
Agency/Co.				Jurisd	liction							
Date Performed		1/16/2006	<u>}</u>	Analy	sis Ye	ar						
Analysis Time Period												
Project Description I	ihue l	Urban Co	re									
East/West Street: Hai	rdy Str	reet		North/	North/South Street: Akahi Street							
Intersection Orientation	n: Ea	ast-West		Study	Study Period (hrs): 0.25							
Vehicle Volumes	and /	Adjustn	ients									
Major Street			Eastbound					Westbou	<u>bnu</u>			
Movement		1	2	3			4	5			6	
	_		T	R			<u> </u>	T			R	
Volume	_	60	570	0	<u> </u>		0	2/0		~	60	
Haurly Flow Pote HEE	-	0.92	0.92	0.92	<u> </u>		0.92	0.92		0	.92	
Percent Heavy Vehicle	<u> </u>	0	679	0			0	293			00	
Median Type	3	U			Undi	vider		_			-	
RT Channelized										n		
		0	1	0			0	1			0	
Configuration		17	,	0			V	7				
Upstream Signal			0				0			/1\		
Minor Street	<u> </u>	Northbound Southbound						und				
Movement		7		9	9 10					12		
		 	T	R	<u> </u>		10	<u>т</u>			R	
Volume		0	0			90		0			80	
Peak-Hour Factor, PH	=	0.92	0.92	0.92	2		0.92	0.92		0	.92	
Hourly Flow Rate, HFF	2	0	0	0	·		97	0			86	
Percent Heavy Vehicle	s	0	0	0			0	0			0	
Percent Grade (%)			0					0				
Flared Approach			N					N				
Storage			0					0				
RT Channelized				0							0	
	-	0	0				1	0			1	
Configuration	+						1		 		R	
Delay, Queue Length	and	loval of	Service				2				<u> </u>	
Approach	<u>and</u>	EB	WB	(Northb	ound	ł	s	outhb	ound		
Movement	-	1	4	7	8		9	10	1	1	12	
Lane Configuration		T T		-				L		-	R	
v (vph)		65						97			86	
C(m)(vnh)	12	212						232			720	
	^ ^	05						0.42			0.12	
95% queue length		17						1.02			0.40	
Control Delay	۵	1		0.000				312			10.7	
	0	A						D	-	-	B	
Approach Delay								0	21.4	ŝ		
Approach Delay						-	- 1940		21.0	,	-	
Approach LOS				С								

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	TWO	-WAY STOP	CONTR	OL SI	JM	MARY								
General Information	on		Site I	nform	ati	ion								
Analyst			Inters	ection			Int 9 - Ne	etwor	'k A.a	m				
Agency/Co.			Jurisd	iction										
Date Performed	1/16/200	6	Analy	sis Yea	r									
Analysis Time Period														
Project Description	ihue Urban Co	ore												
East/West Street: Hai	dy Street		North/South Street: Akahi Street											
Intersection Orientatior	n: East-West		Study Period (hrs): 0,25											
Vehicle Volumes a	and Adjustr	nents												
Major Street		Eastbound					Westbou	Ind						
Movement	1	2	3			4	5			6				
		Ť	R				T			R				
Volume	60	570	55			95	270			60				
Peak-Hour Factor, PHI	- 0.92	0.92	0.92		1	0.92	0.92		0	.92				
Hourly Flow Rate, HFR	65	619	59			103	293			65				
Percent Heavy Vehicle	s 0						-			-				
Median Type				Undivided						~~~~				
			0			4	4			0				
Laries	1	1				1	1							
	<u> </u>		IR			L	0							
Upstream Signal		0				0								
Minor Street		Northbound				10	Southbol	und I		10				
	/		9			10	11			12				
Valuesa	L	1				L	10			R 20				
Volume	90	15	80			00	10	_	0	30				
Peak-nour Factor, Phr		0.92	86			70	0.92	_	0	22				
Dercent Heavy Vehicle						/0	- 10			0				
Porcent Crada (%)	s 0		0	<u> </u>		0					0			
			1				U							
		N					N							
Storage		0					0							
RT Channelized			0							0				
Lanes	0	1	0			0	1			0				
Configuration		LTR					LTR							
Delay, Queue Length,	and Level of	Service					-							
Approach	EB	WB	រ	Vorthbo	unc	1	S	outhi	bound					
Movement	1	4	7	8		9	10	1	1	12				
Lane Configuration	L	L		LTR				LI	rR					
v (vph)	65	103		199				11	12					
C (m) (vph) .	1212	923		162				1	15					
v/c	0.05	0.11	1.23					0.	97					
95% queue length	0.17	0.38	11.2		;			6.	30					
Control Delay	8.1	9.4	200.		200.8		0.8		7.		7.7			
LOS	A	A	F				Ŧ				F		5	
Approach Delay				200.8	}			147.7						
Approach LOS				F			F							

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	TWO	-WAY STOP	CONTR	ROL SUI	MMARY					
General Information	on		Site	Informa	tion					
Analyst			Inters	ection		Int 9 - No	etwork E	.am		
Agency/Co.			Juriso	liction						
Date Performed	1/16/200	6	Analy	sis Year						
Analysis Time Period										
Project Description L	ihue Urban Co	ore								
East/West Street: Har	dy Street		North/South Street: Akahi Street							
Intersection Orientation	i: <u>East-West</u>		Study Period (hrs): 0.25							
Vehicle Volumes a	and Adjustr	nents								
Major Street		Eastbound				Westbou				
Movement	1	2	3		4	5	_	6		
		T	<u> </u>			T		R		
Volume	60	570	55		95	270		60		
Hourby Flow Poto HER	- 0.92 65	0.92	0.92	<u></u>	0.92	0.92		0.92		
Percent Hoovy Vahiolo		679			103	293		63		
Median Type	<u> </u>									
RT Channelized			0					0		
l anes	1	1 -	0		1	1		0		
Configuration	1				1	,		TR		
Unstream Signal		0	,,,		L	0				
Minor Street	+	Northbound Southbound								
Movement	7		9		10			12		
	<u> </u>	<u> </u>	R		10	<u>т</u>				
Volume		15	80		65	10		30		
Peak-Hour Factor, PHF	0.92	0.92	0.92	2	0.92	0.92		0.92		
Hourly Flow Rate, HFR	97	16	86		70	10	_	32		
Percent Heavy Vehicles	s O	0	0		0	0		0		
Percent Grade (%)		0				0				
Flared Approach		N				N				
Storage		0				0				
RT Channelized			0					0		
Lanes		1			0	1		0		
Configuration		I TR				, I TR		V		
Delay, Queue Length	and Level of	Service								
Approach	EB	WB		Northbour	d	s	outhbou	nd		
Movement	1	4	7	8	9	10	11	12		
Lane Configuration	L	L		LTR			LTR			
v (vph)	65	103		199			112			
C(m)(vph)	1212	923		162			115			
v/c	0.05	0.11		1.23			0.97			
95% queue length	0.17	0.38	1.23				6.30			
Control Delay	8.1	9.4	200				147.7			
LOS	A	A	200.8							
Approach Delay			200 8			147				
Approach LOS				F		E				
	100		<u> </u>							

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TWO-WAY STOP CONTROL SUMMARY										
General Informati	on		Site I	nfor	nat	ion				
Analyst			Inters	ection			Int 9 - Ex	(isting.	от	
Agency/Co.			Jurisd	iction				Ψ.		
Date Performed	1/16/200)6	Analy	Analysis Year						
Analysis Time Period										
Project Description	Lihue Urban C	ore								
East/West Street: Ha	rdy Street		North/	North/South Street: Akah						
Intersection Orientation	n: East-West	<u> </u>	Study	Study Period (hrs): 0.25						
Vehicle Volumes	and Adjust	ments								
Major Street		Eastbound					Westbou	<u>ind</u>		
Movement	1	2	3		4		5			6
Valuma	L	405	R R				200			R 45
Volume Reak-Hour Factor, PHI	= 0.02	405		•		0	290	\rightarrow		40 02
Hourly Flow Rate HEF	2 32	440	0.92			0.92	315			.92 48
Percent Heavy Vehicle						0		-+		
Median Type				Undi	video	1				
RT Channelized		0							0	
Lanes	0	1	0			0	1			0
Configuration	LT									TR
Upstream Signal		0					0			
Minor Street		Northbound					Southbox	und		
Movement	7	8	9			10	11			12
	L	Т	R			L	Т			R
Volume	0	0	0			125	0			50
Peak-Hour Factor, PH	F 0.92	0.92	0.92	0.92		0.92	0.92		0	.92
Hourly Flow Rate, HFF	2 0	0	0			135	0			54
Percent Heavy Vehicle	es O	0	0			0	0			0
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0							0
Lanes	0	0	0			1	0			1
Configuration						L				R
Delay, Queue Length	, and Level of	Service								
Approach	€B	WB	1	Northb	ound	Ł	S	outhbo	ounc	
Movement	1	4	7	8		9	10	11		12
Lane Configuration	LT						L			R
v (vph)	32						135			54
C (m) (vph)	1207						328			708
v/c	0.03						0.41			0.08
95% queue length	0.08	- T					1.94			0.25
Control Delay	8.1						23.4	-		10.5
LOS	А						С			В
Aporoach Delav							19.7		19.7	
Approach LOS							C			
						`				

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TWO-WAY STOP CONTROL SUMMARY											
General Informati	on			Site	nfori	nat	ion				
Analyst				Inters	ection			Int 9 - Ba	aselin	e.pm	
Agency/Co.				Jurisd	liction						
Date Performed		1/16/2006		Analy	sis Ye	ar					
Analysis Time Period		_							_		
Project Description	Lihue	Urban Coi	re								
East/West Street: Ha	rdy Sti	reet		North/	South	Stre	et: Akahi	Street			
Intersection Orientation	n: Ea	ast-West		Study Period (hrs): 0.25							
Vehicle Volumes	and /	Adjustm	ients		_						
Major Street	er Street E							Westbou	nd		
Movement		1	2	3		4		5			6
		L (0	T	R				T			R
Volume	_	40	550	0			0	550		0	60
Hourty Flow Roto HE		0.92	0.92	0.92	:		0.92	507		0	.92 65
Percent Heavy Vehicle		43	597	0			0				
Median Type											
RT Channelized				0	01101	nue					0
Lanes		0	1	0			0	1			0
Configuration		17	· · -	- v				,			TR
Uostream Signal			0					0			
Minor Street	<u> </u>	Northbound Southbound						und			
Movement		7	8	9		•	10				12
			Τ	R			<u>т</u>	-		R	
Volume		0	0	0			160	0			60
Peak-Hour Factor, PH	F –	0.92	0.92	0.92	2		0.92	0.92		0	.92
Hourly Flow Rate, HFF	2	0	0	0			173	0			65
Percent Heavy Vehicle	s	0	0	0			0	0			0
Percent Grade (%)			0					0			
Flared Approach			N					N			
Storage			0					0		_	
RT Channelized	-			0							0
Lanes		0	0	0			1	0			1
Configuration	-			<u> </u>			L				R
Delay, Queue Length	, and	Level of S	Service	<u> </u>			_	1			
Approach		EB	WB	1	Vorthb	ound	d	S	outhb	ound	J
Movement		1	4	7	8		9	10	1	1	12
Lane Configuration	L	T						L			R
v (vph)	4	43						173			65
C(m)(voh)	9	36						168			485
V/c	0	.05						1.03			0.13
95% queue length	0	14				_		8.37			0.46
Control Delay	0.	0				-	-	133.0			13.6
LOS		A			-			F		-	B
Approach Dolou									100	4	
Approach LOC		-		_					- F	.4	
Approach LOS		-		F							

TWO-WAY STOP CONTROL SUMMARY													
General Informatio		Site Information											
Analyst		Inters	Intersection				Int 9 - Network A.pm						
Agency/Co.		Jurisd	Jurisdiction										
Date Performed	1/16/200	Analy	Analysis Year										
Analysis Tíme Period	alysis Tíme Period												
Project Description Lil	hue Urban Co)re	•										
East/West Street: Hard	North/South Street: Akahi Street												
Intersection Orientation:	East-West		Study	Study Period (hrs): 0.25									
Vehicle Volumes a	n <mark>d Adjust</mark> r	nents											
Major Street		Eastbound			Westbound				•				
Movement	1	2	3			4	5		6				
	L	Ť	R				T			R			
Volume	40	550	30			70	550		60				
Peak-Hour Factor, PHF	0.92	0.92	0.92			0.92	0.92		0.92				
Houriy Flow Rate, HFR	43	597	32	32		76	597			00			
Median Type	0			0						-			
RT Channelized			0							0			
	1	1	0			1		0					
Configuration	,	,											
Upstream Signal		0				<u>د</u>	0						
Minor Street	İ.	1				Southbound							
Movement	7	8	9		10		11		12				
		Т	R	R L		1	Т		R				
Volume	225	10	45		160		10		60				
Peak-Hour Factor, PHF	0.92	0.92	0.92	2		0.92	0.92		0.92				
Hourly Flow Rate, HFR	244	10	48			173	10			65			
Percent Heavy Vehicles	0	0	0			0	0			0			
Percent Grade (%)		0	•				0	I					
Flared Approach		N					N						
Storage		0					0						
RT Channelized			0						0				
Lanes	0	1	0		0		1		0				
Configuration		LTR					LTR						
Delay, Queue Length, a	and Level of	Service											
Approach	EB	WB	1	Northbound		đ	South		uthbound				
Movement	1	4	7	8		9	10	1	1	12			
Lane Configuration	L	L		LTI				LTR					
v (vph)	43	76		302				248					
C (m) (vph)	936	963		84				99					
v/c	0.05	0.08		3.60			2.51		51				
95% gueue length	0.14	0.26		30.91				22.72		4			
Control Delay	9.0	9.1					1000	774.5					
LOS	A	A		F						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
Approach Delay		-					774.5		5				
Approach LOS			_	F			F						

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	- TWC	D-WAY STOP		ROL S	UN	MARY				
General Informati		Site Information			ion					
Analyst					Intersection				B.pm	
Agency/Co.					Jurisdiction					
Date Performed	1/16/20	1/16/2006			Analysis Year					
Analysis Time Period	nalysis Time Period									
Project Description	ore									
East/West Street: Ha	North/South Street: Akahi Street									
Intersection Orientation	t	Study Period (hrs): 0.25								
Vehicle Volumes	and Adjust	ments								
Major Street		Eastbound					Westbou	und		
Movement	1	2	3			4	5		6	
	L	550							R	
Peak-Hour Factor DH	F 0.02	0.02	30	,		70			00	
Hourly Flow Rate HEF	$\frac{1}{2}$	597	22			76	507		65	
Percent Heavy Vehicle						0				
Median Type			Undiv	/idea	2					
RT Channelized			0			-			0	
Lanes	1	1	0			1	1		0	
Configuration	L		TR			L			TR	
Upstream Signal		0					0	_		
Minor Street	Northbound	[Southbound						
Movement	7	8	9	9		10	11		12	
	L	Т	R			L	Ť		R	
Volume	225	10	45			160	10		60	
Peak-Hour Factor, PH	F 0.92	0.92	0.92	?		0.92	0.92		0.92	
Hourly Flow Rate, HFF	244	10	48			173	10		65	
Percent Heavy Vehicle	es O	0	0			0	0		0	
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0						0	
Lanes	0	1	0		0		1		0	
Configuration		LTR					LTR			
Delay, Queue Length	, and Level o	f Service								
Approach	EB	WB	1	Northbo		d	S	outhbou	Ind	
Movement	1	4	7	8		9	10	11	12	
Lane Configuration	L	L		LTR	R			LTR		
v (vph)	43	76		302				248		
C (m) (vph)	936	963		84				99		
v/c	0.05	0.08		3.60				2.51		
95% queue length	0.14	0.26		30.91				22.72		
Control Delay	9.0	9.1				A CONTRACTOR OF		774.5		
LOS	A	A		F				F		
Approach Delav							774.5			
Approach LOS			F				F			
	l	1	· · ·			,				

\$10 Handy St. at Eiwa St.



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TWO-WAY STOP CONTROL SUMMARY												
General Information				Site I	Site Information							
Analyst					Intersection				Int 10 - Existing.am			
Agency/Co.					liction							
Date Performed		1/16/2006			Analysis Year							
Analysis Time Period												
Project Description	re											
East/West Street: Hardy Street					North/South Street: Eiwa Street							
Intersection Orientation: East-West					Study Period (hrs): 0.25							
Vehicle Volumes	Adjustn	nents										
Major Street	Eastbound								Westbound			
Movement		1	2	3	3		4	5		6		
			T	R			L	T			R	
Volume	_	0	495	85			165	220		,	0	
Peak-Hour Factor, PH		0.92	0.92	0.92			170	0.92		0.92		
Recent Hacky Vahiala		0	538	92			<u>//9</u>	239	1		U	
Median Typo	:5	0			U							
RT Channelized	_					nuel)	1			0	
	+	ρ	1	0			0	1		0		
Configuration	+	0	,				17	,			<u> </u>	
Upstream Signal			0				0					
Minor Street	+		I				Southbo	und				
Movement		7	8	9	9		10	11		12		
		<u> </u>	T T	B	R I		10	T		R		
Volume	+	65	0	110	110		0	0				
Peak-Hour Factor, PHI	=	0.92	0.92	0.92	0.92		0.92	0.92		0.92		
Hourly Flow Rate, HFF	2	70	0	119			0	0		0		
Percent Heavy Vehicle	s	0	0	0			0	0			0	
Percent Grade (%)			0					0				
Flared Approach			N					N				
Storage			0					0				
RT Channelized	<u> </u>			0						0		
	+	1	0	1		0		0				
Configuration				R		~		+			<u> </u>	
Delay, Queue Length	and	- Level of	Service									
Aoproach	and	EB	WB	1	Northbound			South		bound		
Movement	-	1	4	7	7 8		9	10	1	1	12	
Lane Configuration			LT	L			R					
v (vph)			179	70			119					
C (m) (vph)			962	173			515					
v/c			0.19	0.40			0.23					
95% queue length			0.68	1.79			0.89					
Control Delay			9.6	39.3			14.1			-	1.000031	
LOS			A	E			В					
Approach Delay				23.4		4						
Approach LOS			-	С								

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		1 44 6	J-WAT SIOP										
General Information				Site Ir	Site Information								
Analyst				Interse	ection	Int 10 - Baseline.am							
Agency/Co.					ction								
Date Performed		1/16/2006			is Year								
Analysis Time Period													
Project Description Lil	hue U	rban Core											
East/West Street: Hard	y Stre	et		North/S	North/South Street: Eiwa Street								
Intersection Orientation:	Study Period (hrs): 0.25												
Vehicle Volumes a	nd A	djustme	nts										
Major Street			Eastbound	_		Westbound							
Movement		1	2	3		4	5			6			
	_		T	R		L	T			R			
Volume	_	0	800	110		210	340		0				
Peak-Hour Factor, PHF		0.92	0.92	0.92		0.92	0.92		0.	0			
Proving Flow Rate, HFR	+	0	009	119		220	309			0			
Median Type	+	U		-	Updivido	4							
RT Channelized				0	0 Unaividea					0			
	+	0	1	0		0	1		0				
Configuration	+	0	,	TR		LT	1						
Uostream Signal	+	0				0							
Minor Street	+-		Northbound			Southbound							
Movement				9	9		11		12				
, instantion	+	,	т	R		1	Т			R			
Volume		80	0	140	140 0		0		0				
Peak-Hour Factor, PHF	+	0.92	0.92	0.92	0.92 0.92		0.92		0.92				
Hourly Flow Rate, HFR	+	86	0	152	152 0		0			0			
Percent Heavy Vehicles		0	0	0		0	0		0				
Percent Grade (%)			0				0						
Flared Approach			N				N						
Storage			0				0		1				
RT Channelized	+			0			1		0				
Lanes	-	1	0	1		0	0		0				
Configuration	+	L		R									
Delay, Queue Length, a	and L	evel of Se	rvice	· ·	•								
Approach		EB WB			Northbound			Southbound					
Movement		1	4	7	8	9	10	11		12			
Lane Configuration			LT	L		R							
v (vph)			228	86		152							
C (m) (vph)			708	64		328							
v/c			0.32	1.34		0.46							
95% queue length			1.39	7.22		2.34							
Control Delay			12.5	338.6		25.1							
LOS			В	F		D							
Approach Delay				138.4									
Approach LOS				F									
										_			

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	TWC	-WAY STOP	CONTR	OL S	UM	MARY					
General Informatio		Site I	nforn	nati	ion						
Analyst			Inters	ection			Int 10 - E	Existii	ng.pr	}	
Agency/Co.	_		Jurisd	iction					<u>v</u>		
Date Performed	1/16/200	06	Analy	sis Yea	ər						
Analysis Time Period											
Project Description Li	hue Urban C	ore									
East/West Street: Hard	ly Street		North/	South	Stre	et: <i>Eiwa</i>	Street		_		
Intersection Orientation:	East-West	•	Study	Study Period (hrs): 0.25							
Vehicle Volumes a	n <mark>d A</mark> djusti	ments									
Major Street		Eastbound					Westbo	und			
Movement	1	2	3			4	5			6	
	L	Ť	R			L	Т			R	
Volume	0	365	120			120	205			0	
Peak-Hour Factor, PHF	0.92	0.92	0.92	<u>'</u>		0.92	0,92			0.92	
Hourly Flow Rate, HFR	0		130			130	222			0	
Percent Heavy Vehicles	0					0					
Median Type				Undiv	ridec	1					
RT Channelized			0	-						0	
Lanes	0	1	0			0	1			0	
Configuration			TR			LT					
Upstream Signal		0					0				
Minor Street		Northbound	_				Southbound				
Movement	77	8	9			10	11			12	
	L	Т	R			Ĺ	T			R	
Volume	130	0	180			0 0				0	
Peak-Hour Factor, PHF	0.92	0.92	0.92		0.92		0.92		().92	
Hourly Flow Rate, HFR	141	0	195			0	0			0	
Percent Heavy Vehicles	0	0	0			0	0			0	
Percent Grade (%)		0					0				
Flared Approach		N					N				
Storage		0					0				
RT Channelized			0							0	
Lanes	1	0	1			0	0			0	
Configuration	L		R								
Delay, Queue Length,	and Level of	Service									
Approach	EB	WB	1	Vorthb	ound	ł	S	South	bound	4	
Movement	1	4	7	8		9	10	1	1	12	
Lane Configuration		LT	L			R					
v (vph)		130	141			195					
C (m) (vph)		1051	258			605					
v/c		0.12	0.55			0.32					
95% queue length		0.42	3.00			1.39			_		
Control Delay		8.9	34.6		1	13.8					
LOS		A	D			В		_			
Approach Delay		-		22.3	5						
Approach LOS			C								

Version 4.1c

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TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information							
Analyst				Interse	ection		Int 10 - B	aseline nr	}	
Agency/Co				Jurisdi	ction				,	
Date Performed		1/16/2006	5	Analys	is Year					
Analysis Time Period										
Project Description Lil	nue Ui	rban Core								
East/West Street: Hard	y Stre	et		North/S	South Stree	t: Eiwa Si	treet			
Intersection Orientation:	Eas	t-West		Study F	Period (hrs)	: 0.25				
Vehicle Volumes a	nd Ar	diustme	nts							
Major Street			Eastbound			-	Westbou	und		
Movement		1	2	3	-	4	5		6	
		L	Т	R		L	T		R	
Volume		0	500	150		150	440		0	
Peak-Hour Factor, PHF		0.92	0.92	0.92		0.92	0.92		0.92	
Hourly Flow Rate, HFR		0	543	163		163	478	_	0	
Percent Heavy Vehicles		0				0			-	
Median Type				-	Undivideo					
RT Channelized				0					0	
Lanes		0	1	0		0	1		0	
Configuration				TR		LT				
Upstréam Signal			0				0			
Minor Street	_		Northbound				Southbo			
Movement		7	8	9		10	11		12	
···		L	T	R		L	Т		R	
Volume	_	170	0	230		0	0		0	
Peak-Hour Factor, PHF		0.92	0.92	0.92		0.92	0.92		0.92	
Hourly Flow Rate, HFR	_	184	0	249		0			0	
Percent Heavy Vehicles	_	0	0	0		0			0	
Percent Grade (%)			0			_	0			
Flared Approach			N				N			
Storage			0				0	_		
RT Channelized				0					0	
Lanes		1	0	1		0	0		0	
Configuration		L		R						
Delay, Queue Length, a	and Le	evel of Se	rvice							
Approach		ĘВ	WB		Northbound		5	Southbound		
Movement		1	4	7	8	9	10	11	12	
Lane Configuration			LT	L		R				
v (vph)			163	184		249				
C (m) (vph)			902	123		489				
v/c	•		0.18	1.50		0.51				
95% queue length			0.66	12.95		2.84			1	
Control Delay			9.9	325.2		19.8			1	
LOS			A	F		С		1		
Approach Delay					149.5		1			
					F	_				

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	тwc	D-WAY STOP	CONTR	OL S	SUMN	IARY				
General Informati	General Information Analyst					on				
Analyst			Inters	ection			Int 11 - E	Existing	g.am	
Agency/Co.			Jurisd	liction						
Date Performed	1/16/200	06	Analy	sis Ye	ar					
Analysis Time Period										
Project Description	Lihue Urban C	Core								
East/West Street: Ha	rdy Street		North/	South	Stree	t: <i>Elua</i>	Street			
Intersection Orientation	n: East-Wes	t	Study	Study Period (hrs): 0.25						
Vehicle Volumes	and Adjust									
Major Street		Eastbound	-					Ind		
Movement	1	2	3			4	5			6
	L	Ť	R			L	T			R
	100	350	0			0	250			50
Peak-Hour Factor, PH	F 0.92	0.92	0.92	?	0	.92	0.92		0.	92
Houriy Flow Rate, HFF	<u> 108</u>	380	0			0	271		<u> </u>	04
Percent Heavy Vehicle		0		(Jarali	بناء ما	0				
Neolan Type					viaea					0
		1				0	1			0
Configuration		1				0	,		7	0 -p
Linstream Signal	Li	0					0		,	<u></u>
		Narth barrad	<u> </u>				Couthhou			
Movement	7					10		םוור		10
Novement	· · ·	о Т	9			10				וב ח
		}	R A		50					75
Peak-Hour Factor, PH	E 0.02	002	0		50					02
Hourly Flow Rate HF8	3 0	0.92	0.92			.92 54	0.32		.ں ۶	32
Percent Heavy Vehicle		0	0		<u> </u>	0	0			0
Percent Grade (%)			Ů			<u> </u>	0			<u> </u>
Flared Approach										
Storage	_	0								
DT Channelized	-									0
		0				0				0
Lanes	0	0	0			0				0
Delay, Queue Length	, and Level of	f Service			<u> </u>					
Approach	EB	WB		Northb	ound		S	outhbe	ound	
Movement	1	4	7	8		9	10	11		12
Lane Configuration	LT							LR	,	
v (vph)	108							135	5	
C (m) (vph)	(vph) 1246							455	5	
v/c	0.09							0.3	0	
95% gueue length	0.28			-				1.2	3	
Control Delay	8.2							16.	2	
IOS	A	-		-				С		
Approach Delay					_	-		16.2	,	
Approach LOS	Approach Delay									
Approach LOS	-7						C			

	_	TWO-	WAY STOP	CONTR	OL S	UM	MARY	-			
General Informati	on			Site I	n for r	nati	ion				
Analyst				Interse	ection			Int 11 - B	laselin	e.am	,
Agency/Co.				Jurisd	iction			-			
Date Performed	1	/16/2006		Analys	sis Yea	ar					
Analysis Time Period											
Project Description	Lihue L	Jrban Cor	те Т			-					
East/West Street: Ha	rdy Stre	eet		North/	South	Stre	et: Elua S	Street			
Intersection Orientation	<u>n: Ea</u>	st-West		Study	Period	(hrs	s): <i>0.25</i>		-		
Vehicle Volumes	and A	djustm	ents								
Major Street			Eastbound					Westbou	ind		
Movement		1	2	3			4	5			6
			Т	R			L	T			R
Volume	_	130	610	0			0	380		6	50 60
Peak-Hour Factor, PH		0.92	0.92	0.92	?		0.92	0.92		0.	92
Hourly Flow Rate, HFF	<u> </u>	141	663	0			0	413		6	5
Percent Heavy Vehicle	s	0 -			1 (mali	.i.d.a.a	0			-	
Median Type				Unaiv	laec	1					
							0	1			0
Lanes	_		1	0			0	1		т Т	
		LI	0					0			<u>R</u>
Opstream Signal									<u></u>		
Minor Street	_		Northbound				10	Southbol	ouna		10
wovernent		/	8	9			10	31 T			
			1	R							
Volume Dock Hour Footor DH		000	002	0			00	000		$\frac{\pi}{2}$	00
Hourly Flow Poto LEE		<u>0.92</u>	0.92	0.92		0.92		0.92		0.	92
Percent Heavy Vehicle		0	0				0.5	0			0
Percent Grade (%)		0					U				<u> </u>
Flored Approach				1							
Flared Approach	_	_	/v	<u> </u>				//	-+		
Storage	_	_	0					0			
RT Channelized				0							0
Lanes		0	0	0			0	0			0
Configuration											
Delay, Queue Length	, and L	evel of S	Service								
Approach	E	B	WB	ł	Vorthb	ound	<u></u>	S	outhbo	ound	
Movement		1	4	7	8		9	10	11		12
Lane Configuration	L	Т							LR	2	
v (vph)	14	41							173	3	
C (m) (vph)	10	95							268	3	
v/c	0.1	13							0.6	5	
95% queue length	0	44							4.0	7	
Control Delay	8.	.8							40.0	0	
LOS	1	4		-					E		
Approach Delay				S					410.0)	
Approach LOS									E		
						_					

	TWO	-WAY STOP	CONTR	OL S	SUM	MARY			
General Information	on		Site I	nfor	mati	ion			
Analyst			Inters	ection			Int 11 - N	letwork	A.am
Agency/Co.			Jurisd	iction					
Date Performed	1/16/200	6	Analy	sis Ye	ar				
Analysis Time Period									
Project Description L	ihue Urban Co	ore							
East/West Street: Har	dy Street		North/	South	Stre	et: Elua	Street		
Intersection Orientation	: East-West		Study	Period	d (hrs	s): 0.25			
Vehicle Volumes a	and Adjustr	nents							
Major Street		Eastbound	1				Westbou	Ind	
Movement	1	2	3			4	5		6
N / - 1		T Cra	R				1 000		R
Volume	130	610	0			0	380	-	60
Hearty Flow Pactor, Pfir	- 0.92	0.92	0.92			0.92	0.92	-	65
Porcent Heavy Vehicle		003	U			0	473		05
Median Type	5 0			Undi	L		-		
RT Channelized			0	01101		,	-		0
	0	1	0			0	1		0
Configuration		'	0			0	· · ·	-	TR
Unstream Signal	<u> </u>						0		11
Minor Street	1	Northbound					Southbou	und	
Movement	7	8	9			10	11		12
	- <u> </u>	<u>т</u>	R				Т		R
Volume	0		0			60	0		100
Peak-Hour Factor, PHF	- 0.92	0.92	0.92	>		0.92	0.92		0.92
Hourly Flow Rate, HFR	0	0	0			65	0		108
Percent Heavy Vehicle	s 0	0	0			0	0		0
Percent Grade (%)		0					0		
Flared Approach		N					N		
Storage		0					0		
RT Channelized	+		0				_		0
	0	0	0			0	0		0
Configuration							L.R.		-
Delay, Queue Length	and Level of	Service							
Anoroach	FB	WB	1	Northb	ound	5	l s	outhbo	und
Movement		4	7	8		9	10	11	12
Lane Configuration	LT	· ·						LR	
v (vph)	141							173	
C (m) (vph)	1095							268	
v/c	0.13			<u> </u>				0.65	
95% queue length	0.44				-			4.07	
Control Delay	8.8							40.0	
LOS	A					1		E	
Approach Delay	pproach Delay				-			40.0	
Approach LOS							E		

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	TWO	WAY STOP	CONTR	OL SI	JMMARY	r			
General Informatio	n		Site I	nform	ation				
Analyst			Inters	ection	_	Int 11 - N	letwork B	.am	
Agency/Co.			Jurisd	iction					
Date Performed	1/16/2000	5	Analy	sis Yea	r				
Analysis Time Period							_		
Project Description Li	hue Urban Co	ore							
East/West Street: Hard	ly Street		North/	South S	street: Elua	a Street			
Intersection Orientation:	East-West		Study	Period	(hrs): 0.25	;			
Vehicle Volumes a	<u>nd Adjustn</u>	nents							
Major Street		Eastbound				Westbou	und		
Movement	1	2	3		4	5		6	
	L	T	R			000		R	
Volume	130	610	0 00		0	380		00	
Houriv Flow Poto HER	0.92	662	0.92		0.92	413	_	65	
Percent Heavy Vehicles	0				0	+13	_		
Median Type				Undivi	ded				
RT Channelized				0,,0,0,	<u></u>			0	
Lanes	0	1	0		0	1		0	
Configuration	IT	· · ·				,		TR	
Upstream Signal		0				0			
Minor Street		Northbound				Southbound			
Movement	7	8	9		10	11		12	
		T	R		L	T		R	
Volume	0	0	0		60	0		100	
Peak-Hour Factor, PHF	0.92	0.92	0.92		0.92	0.92		0.92	
Hourly Flow Rate, HFR	0	0	0		65	0		108	
Percent Heavy Vehicles	0	0	0		0	0		0	
Percent Grade (%)		0				0			
Flared Approach		N				N			
Storage		0				0			
RT Channelized			0					0	
Lanes	0	0	0		0	0		0	
Configuration	Ť Ť		-			LR		-	
Delay Queue Length	and Level of	Service							
Approach	EB	WB	1	Vorthbo	und	s	outhboun	d	
Movement	1	4	7	8	9	10	11	12	
	17		,	Ť			LR		
	1.1.1						173		
	1005						268	+	
C (m) (vpn)	0.40						0.65		
	0.13			-			0.05		
95% queue length	0.44						4.07		
Control Delay	8.8				_	-	40.0		
LOS	A						E		
Approach Delay	8	-				-	40.0		
Approach LOS						E			

		TWO	WAY STOP	CONTR	OL S	SUN	IMARY					
General Informati	on			Site	Infor	mat	ion					
Analyst				Inters	ection			Int 11 - E	xístir	ng.pm		
Agency/Co.				Juriso	liction					<u> </u>		
Date Performed	1	1/16/2006	;	Analy	sis Ye	ar						
Analysis Time Period												
Project Description	Lihue L	Jrban Co.	re									
East/West Street: Hai	rdy Str	eet		North/	South	Stre	et: Elua	Street				
Intersection Orientation	<u>n: Ea</u>	st-West		Study	Period	d (hr	s): 0.25					
Vehicle Volumes	and A	\djustm	ients					_				
Major Street			Eastbound					Westbou	ind			
Movement		1	2	3			4	5			6	
			T	R			L	Т			R	
Volume	_	100	350	0			0	250			50	
Peak-Hour Factor, PHI	-	0.92	0.92	0.92	2		0.92	0.92		0	.92	
Hourly Flow Rate, HFF	<	108	380	0			0	2/1			54	
Percent Heavy Venicle	s	0	-				0					
Median Type	_		-1	Undi	videa	2	1			0		
RT Channelized	_										0	
			1	0			0	1				
	_										IR	
	_		U					0				
Minor Street	_		Northbound					Southbo	und			
		/	8	9	9		10	11			12	
	_	<u> </u>		R							<u>к</u>	
Volume	_	0	0	0	<u> </u>		50	0			75	
Heurly Flow Deta, HEF	-	0.92	0.92	0.92	<u>.</u>	0.92		0.92		0	.92	
Porcent Heavy Vehicle	<u> </u>	0	0	0			04				<u>81</u>	
Percent Fleavy Vehicle	5	U		0			0				0	
Flared Approach	_		N					N				
Storage			0					0				
RT Channelized				0							0	
Lanes		0	0	0			0	0			0	
Configuration								LR				
Delay, Queue Length,	, and L	evel of S	Service									
Approach	E	B	WB	1	Northb	oun	d	S	outht	ounc		
Movement		1	4	7	8		9	10	1	1	12	
Lane Configuration	L	Т							LI	ዋ		
v (vph)	10	28							13	35		
C (m) (vph) .	12	46							45	55		
v/c	0.0	09							0.3	30		
95% queue length	0.2	0.28							1.2	23		
Control Delay	8.	.2							16	.2		
LOS	F	4					C		-			
Approach Delay			16.2									
Approach LOS	ay				<u>C</u>							
- 40100011 E00							C					

	TWO	WAY STOP	CONTR		SUM	IMARY					
General Informatio	n		Site I	nfor	mat	ion					
Analyst			Inters	ection			Int 11 - E	Baseline	.pm		
Agency/Co.			Jurisd	iction							
Date Performed	1/16/2000	6	Analy	sis Ye	ar						
Analysis Time Period											
Project Description Li	hue Urban Co	ore									
East/West Street: Hard	ly Street		North/	South	Stre	et: Elua	Street				
Intersection Orientation:	East-West		Study Period (hrs): 0.25								
Vehicle Volumes a	n <mark>d Adjustn</mark>	nents									
Major Street		Eastbound					Westbou	ind			
Movement	1	2	3			4	5		6		
	L L	T	R	<u>к</u>			T		R		
Volume	130	480	0			0	500		60		
Peak-Hour Factor, PRF	0.92	0.92	0.92	-		0.92	0.92		0.92		
Hourly Flow Rate, FIFR	141	521	0			0	543		00		
Percent Reavy Vehicles	0	0 –		Undi	uida	<u> </u>	-		-		
PT Channelized		1	0	01101	video)	1				
l anes		1	0				1		0		
Configuration	17	· ·	0			0			TR		
Upstream Signal		0					0		11		
Minor Street	1	Northbound					Southbor	und			
Movement	7	8	9			10	11		12		
	L L	Т	R			L	τ		R		
Volume	0	0	0			60	0		100		
Peak-Hour Factor, PHF	0.92	0.92	0.92	2	0.92		0.92		0.92		
Hourly Flow Rate, HFR	0	0	0		65		0		108		
Percent Heavy Vehicles	0	0	0		0		0		0		
Percent Grade (%)		0					0				
Flared Approach		N					N				
Storage		0					0				
RT Channelized			0						0		
Lanes	0	0	0			0	0		0		
Configuration							LR				
Delay, Queue Length, a	and Level of	Service	•				·				
Approach	EB	WB	1	Northb	oun	4	S	outhbou	Ind		
Movement	1	4	7	8		9	10	11	12		
Lane Configuration	LT							LR			
v (vph)	141							173			
C (m) (vph)	980							255			
v/c	0.14							0.68			
95% gueue length	0.50							4.42	-		
Control Delay	9.3						1 and a state of the	44.5	-		
LOS	A	The second second					1	E			
Approach Delay		-						44.5			
Approach LOS		E									

	тν	VO-1	WAY STOP	CONTR	OL S	SUM	MARY			
General Informati	on			Site I	nforr	nati	ion			
Analyst				Inters	ection			Int 11 - N	letwork /	A.pm
Agency/Co.				Jurisd	iction					
Date Performed	1/16/2	2006		Analys	sis Ye	ar				
Analysis Time Period										
Project Description	ihue Urbar	Cor	е							
East/West Street: Hai	rdy Street			North/	South	Stre	et: <i>Elua</i> :	Street		
Intersection Orientation	n: East-W	est		Study	Study Period (hrs): 0.25					
Vehicle Volumes	and Adju	stm	ents							
Major Street			Eastbound					Westbou	ind	
Movement	1		2	3			4	5		6
			T (00	R				T		R
Volume	- 130		480	0			0	500		60
Peak-Hour Factor, PHI	- 0.92		0.92	0.92			0.92	0.92		0.92
Hourly Flow Rate, FIFF	141		521	0			0	543		03
Percent Heavy Vehicle	s 0		-	-	Undi	uidar	<u> </u>			-
DT Channelized					Unun	videc				0
							0	1		0
Configuration			1				0	1		τρ
	L/		0							77
Opstream Signal										
Minor Street			Northbound				10	Southbou	und	40
Movement			8	9	9		10	11	_	12
			1	R	R		L		_	R
Volume	0		0	0		60		0		100
Peak-Hour Factor, PH	- 0.92		0.92	0.92		0.92		0.92		0.92
Houriy Flow Rate, HFF			0	0		65		0		108
Percent Fleavy Vehicle	<u>s</u> 0			0			0			0
								0		
Flared Approach			N					N		
Storage			0					0		
RT Channelized				0						0
Lanes	0		0	0			0	0		0
Configuration								LR		
Delay, Queue Length	and Level	of S	ervice							
Approach	EB		WB	1	Northb	oun	b	S	outhbou	nd
Movement	1		4	7	8		9	10	11	12
Lane Configuration	LT								LR	
v (vph)	141								173	
C (m) (vph)	980								255	
v/c	0.14								0.68	
95% queue length	0.50								4.42	
Control Delay	9.3								44.5	
LOS	A	A					-	-	E	
Approach Delay				44.5						
Approach LOS				E						

	тwo	-WAY STOP	CONTR		MMARY			
General Informatio	on		Site	nforma	ation			
Analyst			Inters	ection		Int 11 - N	Vetwork E	.pm
Agency/Co.			Jurisd	liction				
Date Performed	1/16/2000	6	Analy	sis Year			-	
Analysis Time Period								
Project Description L	ihu e Urban Co	ore						
East/West Street: Hard	dy Street		North/	South St	reet: Elua	Street		
Intersection Orientation	East-West		Study	Period (I	hrs): 0.25			
Vehicle Volumes a	nd <mark>Adjus</mark> tn	nents						
Major Street		Eastbound				Westbou	und	
Movement	1	2	3		4	5		6
	L	Ť	R		L	T		R
Volume	130	480	0		0	500		60
Peak-Hour Factor, PHF	0.92	0.92	0.92	2	0.92	0.92		0.92
Hourly Flow Rate, HFR	141	521	0		0	543		65
Percent Heavy Vehicles				17	0	-		
Median Type				Undivid	ed			^
RT Channelized			0					0
	0	1	0		0	1		0
								IR
Opstream Signal		0				0		
Minor Street	~	Northbound				Southbo	und	
Movement	7	8	9		10	11		12
	L	T	R			T		R
Volume	0	0	0		60	0		100
Peak-Hour Factor, PHF	0.92	0.92	0.92	<u></u>	0.92	0.92		0.92
Hourly Flow Rate, HFR	0	0	0		65	0		108
Percent Heavy Vehicles	0		0		0	0		0
Percent Grade (%)		0				0		
Flared Approach		N				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	0	0		0	0		0
Configuration						LR		
Delay, Queue Length,	and Level of	Service						
Approach	EB	WB	1	Vorthbou	ınd	S	outhbour	d
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	141						173	
C (m) (vph)	980						255	
v/c	0.14						0.68	
95% queue length	0.50						4.42	
Control Delay	9.3		-				44.5	
LOS	A						E	
Approach Delay	-				44.5			
Approach LOS	-						E	

HCS2000TM

		TWO-	WAY STOP	CONTR	OL S	SUM	MARY						
General Information	on			Site I	inforr	nat	ion						
Analyst				Inters	ection			Int 12 - E	Existii	ng.am			
Agency/Co.				Jurisd	liction					<u> </u>			
Date Performed	1/	/16/2006		Analy	sis Ye	ar							
Analysis Time Period													
Project Description L	ihue Ui	rban Cor	re								¢.		
East/West Street: Har	dy Stre	et		North/	South	Stre	et: Umi S	Street					
Intersection Orientation	n: Eas	t-West		Study Period (hrs): 0.25									
Vehicle Volumes a	and A	djustm	ents										
Major Street			Eastbound					Westbo	und				
Movement		1	2	3			4	5			6		
		L	T	R			L	Т			R		
Volume		55	255	185			45	160			40		
Peak-Hour Factor, PHF	- 0).92	0.92	0,92	<u>}</u>		0.92	0.92		0	.92		
Hourly Flow Rate, HFR		59	277	201			48	173			43		
Percent Heavy Vehicle	s	0		-			0						
Median Type					Undiv	video	1						
RT Channelized				0							0		
Lanes		0	1	0			0	1			0		
Configuration	L	TR					LTR						
Upstream Signal			0					0					
Minor Street			Northbound					Southbo	und				
Movement		7	8	9			10	11	11				12
		L	Т	R			L	T			R		
Volume		70	55	65			15	85		1	25		
Peak-Hour Factor, PHF	= C).92	0.92	0.92	2		1.00 0.92			0	.92		
Hourly Flow Rate, HFR	:	76	59	70		15		92		1	35		
Percent Heavy Vehicle	s	0	0	0			0	0			0		
Percent Grade (%)			0	_				0					
Flared Approach			N					N					
Storage			0					0					
RT Channelized				0							0		
Lanes		0	1	0			0	1			0		
Configuration			LTR					LTR					
Delay, Queue Length,	and Le	evel of S	Service										
Approach	EE	в	WB	1	Northb	ound	t	S	South	bound			
Movement	1		4	7	8		9	10	1	1	12		
Lane Configuration	LTI	R	LTR		LTF	۲			L7	rr			
v (vph)	59)	48		205	5			24	42			
C (m) (vph)	136	66	1095		247			-	40	06			
v/c	0.0	4	0.04	0.83		3		0.6		60			
95% queue length	0.1	4	0.14	6.53		3			З.	74	2		
Control Delay	7.8	3	8.4	64.4		4			26.1				
LOS	A		A	F									
Approach Delay	-	-			64.	64.4			26	.1			
Approach LOS		-			F			D					

TWO-WAY STOP CONTROL SUMMARY											
General Informati	on			Site I	nforr	nat	ion				
Analyst				Inters	ection			Int 12 - E	aseline	e.am	
Agency/Co.				Jurisd	iction						
Date Performed		1/16/2006		Analy	sis Ye	ar					
Analysis Time Period											
Project Description	Lihue	Urban Col	re								
East/West Street: Ha	rdy St	reet		North/	South	Stre	et: Umi S	Street			
Intersection Orientation	ו: <i>E</i>	ast-West		Study	Study Period (hrs): 0.25						
Vehicle Volumes	and <i>i</i>	Adjustm	ients								
Major Street			Eastbound			Westbound					
Movement		1	2	3			4	5			6
			T	R			L	T			R
	<u> </u>	70	490	240			60	270			0
Peak-Hour Factor, PH	-	0.92	0.92	0.92			0.92	0.92		0.	92
Hourly Flow Rate, HFF	<u> </u>	/6	532	260			65	293		5	4
Percent Heavy Vehicle	s	0			المعال	ida a	<u> </u>			-	-
Median Type			1		Unan	laed					<u> </u>
		0	1				0	1) n
Configuration			1				0 עדו	1			,
Linstream Signal			0					0			
Miner Street			Northbound					Southbox	und L		
Movement		7			9		10	500(100)			12
		/	<u>г</u>	9 P			10	<u></u> τ	<u></u> Τ		P
Volume		<u></u>	70	80	R		20	0 110		1	50
Peak-Hour Factor PH	╤┤──	0.92	0.92	0.92	,		1.00	0.92		0	92
Hourly Flow Rate, HFF	<u>- -</u>	97	76	86			20	119		1	73
Percent Heavy Vehicle	s	0	0	0			0 0			(2
Percent Grade (%)	-	-	0	-			-	0			
Flared Approach								N			
Storage			0					0			
RT Channelized				0							2
		<u>^</u>	1	0			0	1			2
Configuration		0					0	, I TR			
	-										
Approach	anu	FR	W/R	5	Jorthh	ດມານ	1	S	outhbo	und	
Movement		1	4	7	8		9	10	11		12
Lane Configuration	1		ITR	,		, ,		10		+	,
		76	65		250	, ,			312	-+	
	1	222	00		20.	,			185	+	
C (m) (vpn)		223	0.00						1 60	-+	
	0	.06	0.08						1.09	-	
95% queue length	0	.20	0.25					-	27.30	,	-
Control Delay	8	8.7	9.7			-			375.0	<u>,</u>	
LOS		A A		F		_	F				
Approach Delay					-	-		375.5			
Approach LOS			-					F			

	ROUNDABOUIS	- UNSIGNAL								
General Info	ormation		Site Information							
Analyst Agency/Co. Date Performec Time Period	2/24/2006		Intersection Jurisdiction Analysis Year	Int 12.Network#	A.am					
Project Descrip	tion		<u>.</u>							
Volume Adj	ustments									
		EB	WB	NB	SB					
	Volume, veh/h	70	60	90	20					
LT Traffic	PHF	0.95	0.95	0.95	0.95					
	Flow rate, veh/h	73	63	94	21					
	Volume, veh/h	490	270	70	110					
TH Traffic	PHF	0.95	0.95	0.95	0.95					
	Flow rate, veh/h	515	284	73	115					
	Volume, veh/h	240	60	80	160					
RT Traffic	PHF	0.95	0.95	0.95	0.95					
	Flow rate, veh/h	252	63	84	168					
Approach F	low Computation									
Ар	proach Flow (veh/h)			Va (veh/h)						
	Vae			840						
	Vaw			410						
	Van			251						
	Vas			304						
Circulating	Flow Computation									
Ар	proach Flow (veh/h)			Vc (veh/h)						
	Vce			199						
	Vcw			240						
	Vcn			009 1/1						
Canacity Co	mnutation									
capabily ou		FB	WB	NB	SB					
		1195	11/7	855	079					
Capacity		070	1147	000	9/0					
-	Lower bound	979	945	685	/94					
v/c Ratio	Upper bound	0.71	0.36	0.29	0.31					
	Lower bound	0.86	0.43 0.37 0.							

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	TWC	-WAY STOP	CONTR		MMARY				
General Informatio	n		Site	Site Information					
Analyst			Inters	ection		Int 12 - E	Existing.pr	n	
Agency/Co.			Jurisc	liction			¥./_		
Date Performed	1/16/200	6	Analy	sis Year					
Analysis Time Period									
Project Description Li	nue Urban C	ore							
East/West Street: Hard	y Street		North/	South St	treet: <i>Umi</i>	Street			
Intersection Orientation:	<u>Ea</u> st-West		Study	Period (h rs): 0.2 5				
Vehicle Volumes a	n <mark>d Adjust</mark> i	ments							
Major Street		Eastbound				Westbou	Jung		
Movement	1	2	3		4	5		6	
N / a h - sea a	L	1	R			T 170		<u>R</u>	
Volume	105	235	105	<u> </u>	30	1/0		40	
Hearty Flow Pote HEP	0,92	0.92	0.92	:	0.92	0.92		<u>0.92</u>	
Porcent Heavy Vehicles	0	200	114		<u> </u>	164		43	
Median Type	0			Lindivia	U lod				
RT Channelized					160			0	
	0	1			0	1		0	
Configuration		· · · · · · · · · · · · · · · · · · ·	+					U	
Upstream Signal		0				0			
	I	Alexthe sup d				Cauthhau			
Movement	7				10			12	
	/		9 	9 10 R 1				12 D	
Volume	65	05	35			10		60	
Peak-Hour Factor PHF	0.92	0.92	0.92)	0.92	0.92		0.92	
Hourly Flow Rate HFR	70	103	38	·	8	43		65	
Percent Heavy Vehicles	0	0	0		0	0		0	
Percent Grade (%)		0	-			0		-	
Flared Approach		N				N			
Storage		0				, ·			
DT Chappelized								0	
	0				0	4		0	
	0	1	0		0	1		U	
						LIR			
Delay, Queue Length, a			r	Jorthhou	Ind		outhhour	d	
Movement		4	7			10		1 12	
Lone Configuration		4 / TP			3	10	ITR	12	
	114	32		211			116		
C(m)(nb)	1353	1201		267			391		
	0.08	0.03		0.79	-		0.30	· · · · · ·	
95% queue length	0.28	0.08		6.06			1.22	-	
Control Delay	7.9	8.1		55.1			18.0		
LOS	A	A		F			С		
Approach Delay		55.1 18.0							
Approach LOS	- 1	-		F			С		
	- F C								

	TWC	-WAY STOP	CONTR	OL SU	MMARY			
General Informati	on		Site	Inform	ation			
Analyst			Inters	ection		Int 12 - E	Baseline.	pm
Agency/Co.			Jurisc	liction				
Date Performed	1/16/200		Anały	sis Year				
Analysis Time Period								
Project Description	Lihue Urban C	ore						
East/West Street: Ha	rdy Street		North/	South St	treet: Umi	Street		
Intersection Orientation	n: East-West	<u> </u>	Study	Period (hrs): 0.25			
Vehicle Volumes	and Adjust	ments						
Major Street		Eastbound				Westbou	und	
Movement	1	2	3		4	5		6
		000	R			100		R
Volurne Rock Hour Factor, RWI	<u>140</u>	330	140	<u> </u>	40	400	-	0.02
Hourly Flow Pate HEE	F 0.92	258	152		0.92	134		0.92 54
Percent Heavy Vehicle	x 702		102					-
Median Type	,3 0			Undivid	led U			
RT Channelized			0					0
l anes	0	1	0		0	1		0
Configuration	LTR	· · ·			LTR	,		<u> </u>
Upstream Signal		0				0		
Minor Street		Northbound				Southho	und	
Movement	7	8	9		10	11		12
	L	Τ	R		L	Ť		R
Volume	80	120	50		10	50		80
Peak-Hour Factor, PH	F 0.92	0.92	0.92	2	0.92	0.92		0.92
Hourly Flow Rate, HFF	₹ 86	130	54		10	54		86
Percent Heavy Vehicle	es O	0	0		0	0		0
Percent Grade (%)		0				0		
Flared Approach		N				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	1	0		0	1		0
Configuration		LTR				LTR		
Delay, Queue Length	, and Level of	Service		-			-	
Approach	EB	WB	(Northbou	und	s	outhbou	nd
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (vph)	152	43		270			150	
C (m) (vph)	1086	1065		101			0	
v/c	0.14	0.04		2.67				
95% queue length	0.49	0.13		25.15				
Control Delay	8.9	8.5		846.8				
LOS	A	А		F			F	
Approach Delav	-			846.8	-			
Approach LOS				F				
		1	,			1		

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	ROUNDABOUTS	- UNSIGNAL	ZED INTERSECTIONS WORKSHEET							
General Info	ormation		Site Information							
Analyst Agency/Co. Date Performeo Time Period	d 2/24/2006		Intersection Jurisdiction Analysis Year	Int 12.Network	A.pm					
Project Descrip	tion		I							
Volume Adj	ustments									
		EB	WB	NB	SB					
	Volume, veh/h	140	40	80	10					
LT Traffic	PHF	0.95	0.95	0.95	0.95					
	Flow rate, veh/h	147	42	84	10					
	Volume, veh/h	330	400	120	50					
TH Traffic	PHF	0.95	0.95	0.95	0.95					
	Flow rate, veh/h	347	421	126	52					
	Volume, veh/h	140	50	50	80					
RT Traffic	PHF	0.95	0.95	0.95	0.95					
	Flow rate, veh/h	147	52	52	84					
Approach F	low Computation									
Ар	proach Flow (veh/h)			Va (veh/h)						
	Vae			641						
	Vaw			515						
	Van			262						
	Vas			146						
Circulating	Flow Computation									
Ар	proach Flow (veh/h)			Vc (veh/h)						
	Vce			104						
	Vcw			357						
	Vcn			504						
Canacity Co	mnutation			547						
capacity oc	mputation	FB	WB	NB	SB					
		1276	1046	020	808					
Capacity		1270	1040	330	090					
	Lower bound	1062	854	/51	123					
v/c Ratio	Upper bound	0.50	0.49	0.49 0.28						
., 0 1 (0.10	Lower bound	0.60	0.60	0.35	0.20					

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		·	ŕ	7	ĥ			1			17	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0	4.0			4.0			4.0	
Lane Util. Factor			1.00	1.00	1.00			0.95			0.95	
Frt			0.86	1.00	0.86			0.96			1.00	
Flt Protected			1.00	0.95	1.00			1.00			1.00	
Satd. Flow (prot)			1611	1770	1607			3387			3515	
Fit Permitted			1.00	0.95	1.00			0.95			0.75	
Satd. Flow (perm)			1611	1770	1607			3218			2649	
Volume (vph)	0	0	10	250	10	110	5	560	225	110	985	15
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	0	11	272	11	120	5	609	245	120	1071	16
RTOR Reduction (vph)	0	0	11	0	95	0	0	30	0	0	1	0
Lane Group Flow (vph)	0	0	0	272	36	0	0	829	0	0	1206	0
Turn Type		С	ustom	Prot			Perm			Perm		
Protected Phases				3	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)			1.1	15.8	19.9			64.1			64.1	
Effective Green, g (s)			0.1	14.8	18.9			63.1			63.1	
Actuated g/C Ratio			0.00	0.16	0.21			0.70			0.70	
Clearance Time (s)			3.0	3.0	3.0			3.0			3.0	
Vehicle Extension (s)			3.0	3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)			2	291	337			2256			1857	
v/s Ratio Prot				c0.15	c0.02							
v/s Ratio Perm			0.00					0.26			c0.46	
v/c Ratio			0.01	0.93	0.11			0.37			0.65	-
Uniform Delay, d1			44.9	37.1	28.7			5.4			7.4	
Progression Factor			1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2			1.2	35.6	0.1			0.5			1.8	
Delay (s)			46.1	72.7	28.9			5.9			9.2	4
Level of Service			D	E	С			А			А	
Approach Delay (s)		46.1			58.4			5.9			9.2	
Approach LOS		D			E			А			А	
Intersection Summary												
HCM Average Control D	elay		16.2	< F	ICM Le	vel of Se	ervice		В	1		
HCM Volume to Capacity	y ratio		0.67	1								
Actuated Cycle Length (s)		90.0	5	Sum of le	ost time	(s)		8.0			
Intersection Capacity Uti	lization		77.6%	Į.	CU Leve	el of Ser	vice		D			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			7	5	ĥ			đĥ			đ þ	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0	4.0			4.0			4.0	
Lane Util. Factor			1.00	1.00	1.00			0.95			0.95	
Frt			0.86	1.00	0.88			0.95			1.00	
Flt Protected			1.00	0.95	1.00			1.00			0.99	
Satd. Flow (prot)			1611	1770	1630			3366			3510	
Flt Permitted			1.00	0.95	1.00			0.88			0.57	
Satd. Flow (perm)			1611	1770	1630			2963			2012	
Volume (vph)	0	0	30	370	30	150	20	720	350	190	1280	20
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	0	33	402	33	163	22	783	380	207	1391	22
RTOR Reduction (vph)	0	0	32	0	128	0	0	28	0	0	1	0
Lane Group Flow (vph)	0	0	1	402	68	0	0	1157	0	0	1619	0
Turn Type		C	ustom	Prot			Perm			Perm		
Protected Phases				3	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)			3.5	27.0	33.5			110.5			110.5	
Effective Green, g (s)			2.5	26.0	32.5			109.5			109.5	
Actuated g/C Ratio			0.02	0.17	0.22			0.73			0.73	
Clearance Time (s)			3.0	3.0	3.0			3.0			3.0	
Vehicle Extension (s)	-	1.24	3.0	3.0	3.0	1000		3.0			3.0	
Lane Grp Cap (vph)			27	307	353			2163			1469	
v/s Ratio Prot				c0.23	c0.04							
v/s Ratio Perm			0.00					0.39			c0.81	
v/c Ratio			0.02	1.31	0.19			0.53			1.10	
Uniform Delay, d1			72.5	62.0	48.0			9.0			20.2	
Progression Factor			1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2			0.3	160.7	0.3			1.0			56.8	
Delay (s)			72.9	222.7	48.3			9.9			77.0	1
Level of Service			E	F	D			А			E	
Approach Delay (s)		72.9			165.6			9.9			77.0	
Approach LOS		Ε			ㅋ			А			E	
Intersection Summary												
HCM Average Control D	elay		69.3	∕, ⊦	HCM Lev	vel of Se	ervice		E/	·		
HCM Volume to Capacit	y ratio		1.10	/								
Actuated Cycle Length (s)		150.0	5	Sum of le	ost time	(s)		8.0			
Intersection Capacity Ut	ilization	1	03.7%	1	CU Leve	el of Ser	vice		G			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 13: KUHIO HIGHWAY &

6/30/2006

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	1	7	ካካ	Ť	۴	5	<u>†</u> †	1	٦	≜ 1≽	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	3433	1863	1583	1770	3539	1583	1770	3531	
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.19	1.00	1.00	0.25	1:00	
Satd. Flow (perm)	1770	1863	1583	3433	1863	1583	347	3539	1583	474	3531	
Volume (vph)	20	10	30	370	30	150	20	720	350	190	1280	20
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)	22	11	33	402	33	163	22	783	380	207	1391	22
RTOR Reduction (vph)	0	0	18	0	0	138	0	0	197	0	1	0
Lane Group Flow (vph)	22	11	15	402	33	25	22	783	183	207	1412	0
Turn Type	Prot		Perm	Prot		Perm	Perm		Perm	pm+pt		
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	2.0	3.0	3.0	10.9	11.9	11.9	34.8	34.8	34.8	47.1	47.1	
Effective Green, g (s)	1.0	2.0	2.0	9.9	10.9	10.9	33.8	33.8	33.8	46.1	46.1	
Actuated g/C Ratio	0.01	0.03	0.03	0.14	0.16	0.16	0.48	0.48	0.48	0.66	0.66	
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	25	53	45	486	290	246	168	1709	764	466	2325	
v/s Ratio Prot	0.01	0.01		c0.12	0.02			0.22		0.05	c0.40	
v/s Ratio Perm			c0.01			0.02	0.06		0.12	0.24		
v/c Ratio	0.88	0.21	0.32	0.83	0.11	0.10	0.13	0.46	0.24	0.44	0.61	/ 1
Uniform Delay, d1	34.4	33.2	33.3	29.2	25.4	25.4	10.0	12.0	10.6	5.8	6.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	127.2	1.9	4.1	11.1	0.2	0.2	1.6	0.9	0.7	0.7	1.2	
Delay (s)	161.6	35.2	37.5	40.3	25.6	25.5	11.6	12.9	11.3	6.5	8.0	1
Level of Service	F	D	D	D	С	С	В	В	В	A	A	/
Approach Delay (s)		78.5			35.4			12.4			7.8	1.5.5.1
Approach LOS		E			D			В			А	
Intersection Summary							1					
HCM Average Control D	Delay		15.5	F	ICM Le	vel of S	ervice		В	/		
HCM Volume to Capaci	ty ratio		0.64	1								
Actuated Cycle Length	(s)		70.0	5	Sum of l	ost time	(s)		12.0			
Intersection Capacity Ut	ilization		66.6%](CU Leve	el of Se	rvice		С			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 13: KUHIO HIGHWAY & March Le

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	٦	†	7	ካካ	†	Ť	٦	^	ř	٦	† 1	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	3433	1863	1583	1770	3539	1583	1770	3527	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	3433	1863	1583	1770	3539	1583	1770	3527	
Volume (vph)	30	10	30	370	30	150	20	500	350	190	880	20 -
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)	33	11	33	402	33	163	22	543	380	207	957	22
RTOR Reduction (vph)	0	0	32	0	0	141	0	0	237	0	2	0
Lane Group Flow (vph)	33	11	1	402	33	22	22	543	143	207	977	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	2.4	2.8	2.8	9.5	9.9	9.9	1.6	25.4	25.4	15.3	39.1	
Effective Green, g (s)	1.4	1.8	1.8	8.5	8.9	8.9	0.6	24.4	24.4	14.3	38.1	
Actuated g/C Ratio	0.02	0.03	0.03	0.13	0.14	0.14	0.01	0.38	0.38	0.22	0.59	
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	38	52	44	449	255	217	16	1328	594	389	2067	
v/s Ratio Prot	0.02	0.01		c0.12	c0.02		0.01	0.15		c0.12	c0.28	
v/s Ratio Perm			0.00			0.01			0.09			
v/c Ratio	0.87	0.21	0.02	0.90	0.13	0.10	1.38	0.41	0.24	0.53	0.47	/
Uniform Delay, d1	31.7	30.9	30.7	27.8	24.6	24.6	32.2	15.0	13.9	22.4	7.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	93.8	2.0	0.2	19.9	0.2	0.2	361.4	0.9	1.0	1.4	0.8	
Delay (s)	125.6	32.9	30.9	47.7	24.9	24.8	393.6	15.9	14.9	23.8	8.5	1
Level of Service	F	С	С	D	С	С	F	В	B	С	A	/
Approach Delay (s)		71.8			40.2			24.3			11.2	
Approach LOS		E			D			С			В	
Intersection Summary				1				-		- 10-		
HCM Average Control D	Delay		23.4	, F	ICM Le	vel of S	ervice		C	i.		
HCM Volume to Capacit	ty ratio		0.50	1								
Actuated Cycle Length ((s)		65.0	S	Sum of I	ost time	(s)		8.0			
Intersection Capacity Ut	ilization		55.5%	4	CU Leve	el of Se	rvice		В			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			7	٣	Ĥ			↑ ₽			đ þ	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	190,0	1900
Total Lost time (s)			4.0	4.0	4.0			4.0			4.0	
Lane Util. Factor			1.00	1.00	1.00			0.95			0.95	
Frt			0.86	1.00	0.86			0.97			1.00	
Fit Protected			1.00	0.95	1.00			1.00			0.99	
Satd. Flow (prot)			1611	1770	1608			3424			3493	
Fit Permitted			1.00	0.95	1.00			0.94			0.53	
Satd. Flow (perm)			1611	1770	1608			3208			1850	
Volume (vph)	0	0	25	275	20	210	15	950	260	165	770	30
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	0	27	299	22	228	16	1033	283	179	837	33
RTOR Reduction (vph)	0	0	26	0	81	0	0	16	0	0	1	0
Lane Group Flow (vph)	0	0	1	299	169	O	0	1316	0	0	1048	0
Turn Type		С	ustom	Prot			Perm			Perm		
Protected Phases				3	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)			3.3	19.0	25.3			78.7			78.7	
Effective Green, g (s)			2.3	18.0	24.3			77.7			77.7	
Actuated g/C Ratio			0.02	0.16	0.22			0.71			0.71	
Clearance Time (s)			3.0	3.0	3.0			3.0			3.0	
Vehicle Extension (s)			3.0	3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)			34	290	355			2266			1307	
v/s Ratio Prot				c0.17	c0.11							
v/s Ratio Perm			0.00					0.41			c0.57	
v/c Ratio			0.02	1.03	0.48			0.58			1.07dl	
Uniform Delay, d1			52.7	46.0	37.3			8.0			10.9	
Progression Factor			1.00	1.00	1.00			1.00			1.00	
Incremental Delay, d2			0.2	61.1	1.0			1.1			5.3	
Delay (s)			52.9	107.1	38.3			9.1			16.2	1
Level of Service			D	F	D			A			В	/
Approach Delay (s)		52.9			75.8			9.1			16.2	
Approach LOS		D			E			А			В	
Intersection Summary												
HCM Average Control D	elay		24.4	- H	ICM Lev	vel of Se	ervice		С	×		
HCM Volume to Capacit	y ratio		0.82	1								
Actuated Cycle Length (s)		110.0	S	Sum of le	ost time	(s)		8.0			
Intersection Capacity Uti	lization		87.3%	ŀ	CU Leve	el of Ser	vice		E			
Analysis Period (min)			15									
di Defecto Loff Long	Decede	11114h A 4	houst		a laft las							

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			7	ካ	ţ,	and the second	and the part of the	≜î ⊾			á î î.	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0	4.0			4.0			4.0	
Lane Util. Factor			1.00	1.00	1.00			0.95			0.95	
Frt			0.86	1.00	0.86			0.97			1.00	
Flt Protected			1.00	0.95	1.00			1.00			0.99	
Satd. Flow (prot)			1611	1770	1608			3413			3493	
Flt Permitted			1.00	0.95	1.00			0.91			0.48	
Satd. Flow (perm)			1611	1770	1608			3120			1694	
Volume (vph)	0	0	30	410	30	320	20	1230	380	210	1000	40
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	0	33	446	33	348	22	1337	413	228	1087	43
RTOR Reduction (vph)	0	0	32	0	46	0	0	15	0	0	1	0
Lane Group Flow (vph)	0	0	1	446	335	0	0	1757	0	0	1357	0
Turn Type		С	ustom	Prot	0.40 00000		Perm			Perm		
Protected Phases				3	8			2			6	
Permitted Phases			4				2			6		
Actuated Green, G (s)			5.1	30.0	38.1			105.9			105.9	
Effective Green, g (s)			4.1	29.0	37.1			104.9			104.9	
Actuated g/C Ratio			0.03	0.19	0.25			0.70			0.70	
Clearance Time (s)			3.0	3.0	3.0			3.0			3.0	
Vehicle Extension (s)			3.0	3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)			44	342	398			2182			1185	
v/s Ratio Prot				c0.25	c0.21							
v/s Ratio Perm			0.00					0.56			c0.80	
v/c Ratio			0.02	1.30	0.84			0.81			3.40dl	-
Uniform Delay, d1			71.0	60.5	53.7			15.5			22.5	
Progression Factor			1.00	1.00	1.00			0.92			1.00	
Incremental Delay, d2			0.2	156.6	14.8			2.9			75.6	
Delay (s)			71.2	217.1	68.5			17.1			98.1	1
Level of Service			E	F	E			В			F	~
Approach Delay (s)		71.2			148.6			17.1			98.1	
Approach LOS		Ε			F			В			F	
Intersection Summary							1. 2.16		12	_		
HCM Average Control D	elay		72.4	/ H	HCM Lev	vel of Se	ervice		E	1		
HCM Volume to Capacity	y ratio		1.15	/								
Actuated Cycle Length (s)		150.0	5	Sum of le	ost time	(s)		8.0			
Intersection Capacity Uti	lization	1	14.4%	- 1	CU Leve	el of Ser	vice		Н			
Analysis Period (min)			15		-							
d Defacto Left Lane. 8	Recode	with 1 t	hough	ane as	a left lai	ne.						

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis 13: KUHIO HIGHWAY &

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	٦	+	7	ኻኻ	Ť	7	٣	^	7	۲	† ₽	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	3433	1863	1583	1770	3539	1583	1770	3519	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.23	1.00	1.00	0.08	1.00	
Satd. Flow (perm)	1770	1863	1583	3433	1863	1583	433	3539	1583	156	3519	
Volume (vph)	20	30	30	410	30	320	20	1230	380	210	1000	40
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)	22	33	33	446	33	348	22	1337	413	228	1087	43
RTOR Reduction (vph)	0	0	31	0	0	178	0	0	212	0	2	0
Lane Group Flow (vph)	22	33	2	446	33	170	22	1337	201	228	1128	0
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	2.0	6.7	6.7	13.6	18.3	18.3	47.3	44.7	44.7	60.7	55.1	
Effective Green, g (s)	1.0	5.7	5.7	12.6	17.3	17.3	45.3	43.7	43.7	59.7	54.1	
Actuated g/C Ratio	0.01	0.06	0.06	0.14	0.19	0.19	0.50	0.49	0.49	0.66	0.60	
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0
Lane Grp Cap (vph)	20	118	100	481	358	304	242	1718	769	319	2115	
v/s Ratio Prot	0.01	0.02		c0.13	0.02		0.00	c0.38		c0.10	0.32	
v/s Ratio Perm			0.00			c0.11	0.04		0.13	0.38		
v/c Ratio	1.10	0.28	0.02	0.93	0.09	0.56	0.09	0.78	0.26	0.71	0.53	1
Uniform Delay, d1	44.5	40.2	39.5	38.2	29.9	32.9	11.3	19.1	13.6	21.2	10.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	234.8	1.3	0.1	24.0	0.1	2.4	0.2	3.6	0.8	7.4	1.0	1
Delay (s)	279.3	41.5	39.6	62.2	30.0	35.3	11.5	22.7	14.5	28.6	11.5	
Level of Service	F	D	D	E	С	D	В	С	В	С	В	/
Approach Delay (s)		100.2			49.6			20.6			14.4	
Approach LOS		F			D			С			В	
Intersection Summary						Line		-				1
HCM Average Control E	Delay		26.2	1	HCM Le	vel of S	ervice		С	1		
HCM Volume to Capaci	ty ratio		0.76	1								
Actuated Cycle Length ((s)		90.0	5	Sum of l	ost time	e (s)		12.0			
Intersection Capacity Ut	ilization		74.0%	1	CU Lev	el of Se	rvice		D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 13: KUHIO HIGHWAY &

6	3	0/	2	0	0	6

	۶	-	\mathbf{h}	-	←		•	1	1	\ \	ţ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	Ť	7	ሻሻ	Ť	7	*	**	7	ሻ	† 1>	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	3433	1863	1583	1770	3539	1583	1770	3514	
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	3433	1863	1583	1770	3539	1583	1770	3514	
Volume (vph)	20	30	30	410	30	320	20	980	380	210	800	40 -
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)	22	33	33	446	33	348	22	1065	413	228	870	43
RTOR Reduction (vph)	0	0	31	0	0	287	0	0	231	0	3	0
Lane Group Flow (vph)	22	33	2	446	33	61	22	1065	182	228	910	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	2.4	5.4	5.4	13.9	16.9	16.9	3.2	40.7	40.7	18.0	55.5	
Effective Green, g (s)	1.4	4.4	4.4	12.9	15.9	15.9	2.2	39.7	39.7	17.0	54.5	
Actuated g/C Ratio	0.02	0.05	0.05	0.14	0.18	0.18	0.02	0.44	0.44	0.19	0.61	
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	28	91	77	492	329	280	43	1561	698	334	2128	
v/s Ratio Prot	0.01	c0.02		c0.13	0.02		0.01	c0.30		c0.13	0.26	
v/s Ratio Perm			0.00			0.04			0.12			
v/c Ratio	0.79	0.36	0.02	0.91	0.10	0.22	0.51	0.68	0.26	0.68	0.43	
Uniform Delay, d1	44.2	41.4	40.7	38.0	31.1	31.7	43.4	20.1	15.9	34.0	9.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	82.7	2.5	0.1	20.1	0.1	0.4	9.9	2.4	0.9	5.7	0.6	
Delay (s)	126.9	43.9	40.9	58.1	31.2	32.1	53.3	22.5	16.8	39.7	10.1	
Level of Service	F	D	D	E	С	С	D	С	В	D	в	
Approach Delay (s)		63.5			46.1			21.4			16.0	
Approach LOS		E			D			С			В	
Intersection Summary					7.	Batt						
HCM Average Control E	Delay		26.5	- +	ICM Le	vel of Se	ervice		С	2		
HCM Volume to Capaci	ty ratio		0.70	/								
Actuated Cycle Length	(s)		90.0	S	Sum of l	ost time	(s)		16.0			
Intersection Capacity Ut	ilization	1	67.1%	10	CU Leve	el of Ser	vice		С			
Analysis Period (min)			15									
c Critical Lane Group												

#14. Abackini e Akalii





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TWO-WAY STOP CONTROL SUMMARY

General Information			Site I	nformati	ion			
Analyst				ection		Int 14 - Ex	ristina am	
Agency/Co.			Jurisd	iction			isting.am	
Date Performed	1/16/2000	ŝ	Analys	sis Year				
Analysis Time Period								
Project Description Line	ue Urban Core							
East/West Street: Ahukin	ni Road		North/S	South Stree	et: Akahi	Street		
Intersection Orientation:	East-West		Study	Period (hrs): 0.25			
Vehicle Volumes an	d Adjustme	ents						
Major Street		Eastbound				Westbour	nd	
Movement	1	2	3		4	5		6
	L	т	R		L	Τ		R
Volume	0	315	35		105	415		0
Peak-Hour Factor, PHF	0.92	0.92	0.92	2	0.92	0.92		0.92
Hourly Flow Rate, HFR	0	342	38		114	451		0
Percent Heavy Vehicles	0	-			0	-		-
Median Type				Undivide	d			
RT Channelized			0					0
Lanes	0	1	0		0	1		0
Configuration			TR		LT			
Upstream Signal		0				0		
Minor Street		Northbound				Southbou	nd	
Movement	7	8	9		10	11		12
	L	Т	R		L	т		R
Volume	25	0	20		0	0		0
Peak-Hour Factor, PHF	0.92	0.92	0.92	?	1.00	0.92		0.92
Hourly Flow Rate, HFR	27	0	21		0	0		0
Percent Heavy Vehicles	0	0	0		0	0		0
Percent Grade (%)		0				0		
Flared Approach		N				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	0	0		0	0		0
Configuration		LR						
Delay, Queue Length, ar	nd Level of Se	ervice						
Approach	EB	WB		Northboun	d	S	outhboun	d
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (vph)		114		48				
C (m) (vph)		1190		327				
V/c	•	0.10		0.15		+		1
95% queue length		0.32		0.51		1 1		-
Control Delay	* ** ** **	82		17.0				
		0.5 A		· · · · ·				
		А						
Approach Delay				17.9				
Approach LOS				С				

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TWO WAY STOD CONTROL SUMMARY

		1 44 (U-WAT STUP	CUNIR	UL SUN				
General Information Site Information									
Analyst				Interse	ection		Int 14 - Ba	aseline.an	า
Agency/Co.				Jurisd	iction				
Date Performed		1/16/2008	<u>}</u>	Analys	Analysis Year				
Analysis Time Period									
Project Description Li	hue Ui	rban Core							
East/West Street: Ahul	(ini Ro	ad		North/S	South Stre	et: Akahi	Street		
Intersection Orientation:	Eas	t-West		Study	Period (hr	rs): <i>0.25</i>			
Vehicle Volumes a	nd Ao	djustme	nts						
Major Street			Eastbound	_			Westbou	nd	
Movement	_		2	3		4	5		6
	_		T	R		L	T		<u></u>
Volume	-	0	510	40	<u>, </u>	140	590		0
Houring Flow Poto HEP		0.92	0.92	0.92		150	0.92		0.92
Percent Heavy Vehicles				43		152	047		0
Median Type		0		-	Undivíd				
RT Channelized	-			0		50			0
Lanes		0	1			0	1	0	
Configuration			· ·	TR		<u> </u>	, ,		0
Upstream Signal	+		0			<u> </u>	0		
Minor Street	_	,	Northbound				Southhou	Ind	
Movement		7	8	9		10	11		12
		L	T	R		L	T T		R
Volume		30	0	20		0	0		0
Peak-Hour Factor, PHF		0.92	0,92	0.92	2	1.00	0.92		0.92
Hourly Flow Rate, HFR		32	0	21		0	0		0
Percent Heavy Vehicles		0	0	0		0	0		0
Percent Grade (%)			0				0		
Flared Approach			N				N		
Storage			0				0		
RT Channelized				0					0
Lanes		0	0	0		0	0		0
Configuration			LR						
Delay, Queue Length, a	and Le	evel of Se	rvice	•	•			•	
Approach		EB	WB		Northbou	nd	S	outhbound	d
Movement		1	4	7	8	9	10	11	12
Lane Configuration			LT		LR				
v (vph)			152		53				1
C (m) (vph)			989		163				
v/c	×		0.15		0.33				
95% queue length			0.54		1.32				
Control Delay			9.3		37.4				
LOS			A	A <u>E</u>					
Approach Delay	37.4								
Approach LOS		-		E					

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TWO-WAY STOP CONTROL SUMMARY

		1000	J-WAT 510P								
General Informatio	n			Site I	nformat	ion					
Analyst				Inters	ection		Int 14 - N	letwork A	.am		
Agency/Co.				Jurisd	iction						
Date Performed		1/16/2006		Analy	sis Year		_				
Analysis Time Period		-									
Project Description Li	hue Ur	ban Core									
East/West Street: Ahul	kini Roa	əd		North/	South Stre	et: Akahi S	Street				
Intersection Orientation:	East	t-west		Study	Period (hr	s): 0.25					
Vehicle Volumes a	rid Ac	ljustme	nts								
Major Street			Eastbound				Westbou	und			
Movement	_	1	2	3		4	5		6		
		<u>L</u>	470			<u> </u>	500		<u> </u>		
Peak-Hour Factor PHE	_	0 0 0 0 0	470	00	, 	002	0.02		0 02		
Hourly Flow Rate HER		0.32	510	86	·	0.92	641		0.92		
Percent Heavy Vehicles						0	-				
Median Type		-			Undivide	ed					
RT Channelized				0					0		
Lanes		0	2	0		0	2		0		
Configuration			Т	TR			Т				
Upstream Signal			0				0				
Minor Street			Northbound				Southbo	und			
Movement		7	8	9		10	11	11 12			
		L	Т	R		L	Т		R		
Volume		0	0	180	180 0		0		0		
Peak-Hour Factor, PHF		0.92	0.92	0.92	2	1.00	0.92		0.92		
Hourly Flow Rate, HFR		0	0	195		0	0		0		
Percent Heavy Vehicles		0	0	0		0	0		0		
Percent Grade (%)			0				0				
Flared Approach			N				N				
Storage			0				0				
RT Channelized				0					0		
Lanes		0 –	0	1		0	0		0		
Configuration				R							
Delay, Queue Length, a	and Le	vel of Se	rvice	-							
Approach		EB	WB		Northbour	nd	5	Southbou	nd		
Movement		1	4	7	8	9	10	11	12		
Lane Configuration						R					
v (vph)						195					
C (m) (vph)						704					
v/c	•					0.28					
95% queue length						1.13					
Control Delay				_		12.1					
LOS	<u> </u>					В					
Approach Delav	12.1										
Approach LOS		- 1									

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TWO-WAY STOP CONTROL SUMMARY

General Informatio	n		Site I	nformati	on			
Analyst			Interse	ection		Int 14 - N	etwork B.a	im 🛛
Agency/Co.			Jurisdi	iction				
Date Performed	1/16/2000	5	Analys	sis Year				
Analysis Time Period								
Project Description Lil	hue Urban Core	è						
East/West Street: Ahuk	ini Road		North/S	South Stree	et: Akahi S	Street		
Intersection Orientation:	East-West		Study I	Period (hrs): 0.25			
Vehicle Volumes a	nd Adjustme	ents						
Major Street		Eastbound				Westbou	ınd	
Movement	1	2	3		4	5		6
	L	T	R		L	Т		R
Volume	0	470	80		0	590		0
Peak-Hour Factor, PHF	0.92	0.92	0.92	<u>}</u>	0.92	0.92		0.92
Hourly Flow Rate, HFR	0	510	86		0	641		0
Percent Heavy Vehicles	0			(1	0	-		
Median Type								
RTChannelized								0
Lanes	0	2			0			0
		1				/		
Opstream Signal		0						
Minor Street		Northbound			10	Southbou	und	40
Movement	/	8	9		10	11		12
		1	R		L			R
Volume Rock Hour Footor, DHE	0.02	002	180	>	1 00	0		0
Hourly Slow Pate HEP	0.92	0.92	105		1.00	0.92		0.92
Percent Heavy Vehicles	0	0	195		0			0
Percent Grade (%)					0	<u> </u>		0
Flared Approach								
Storoop	_	N 0	-			10		
Storage DT Charactized						<u>_</u>		0
			0		0			0
Lanes	0	0	1		0	0		0
			R					
Delay, Queue Length, a	and Level of Se	ervice	1					
Approach	EB	WB		Northbound		5	Southbound	
Movement	1	4	7	8	9	10	11	12
Lane Configuration					R			
v (vph)					195			
C (m) (vph)					704			
v/c					0.28			
95% queue length					1.13			
Control Delav					12.1			
LOS					В		1	
Approach Delay 12.1				<u> </u>				
Approach LOS								
				B				

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		TWO	O-WAY STOP	CONTR	OL SU	JM	MARY					
General Informatio	n			Site I	nform	atio	on					
Analyst				Interse	ection			Int 14 - E	xistin	a.pm		
Agency/Co.		*	• • •	Jurisd	iction					57		
Date Performed		1/16/2006	3	Analys	sis Year							
Analysis Time Period												
Project Description Li	hue Ui	rban Core										
East/West Street: Ahuk	ini Ro	ad		North/	South S	tree	t: Akahi S	street				
Intersection Orientation:	Eas	t-West		Study	Period (hrs)	: 0.25					
Vehicle Volumes a	nd A	djustme	nts									
Major Street			Eastbound					Westbo	und			
Movement		1	2	3			4	5			6	
		L	Т	R			L	Т			R	
Volume		9	385	35			125	405			20	
Peak-Hour Factor, PHF		0.92	0.92	0.92	?		0.92	0.92		0	.92	
Hourly Flow Rate, HFR		0	418	38			135	440			0	
Percent Heavy Vehicles		0					0	-			_	
Median Type					Undivi	idea	/					
RT Channelized				0				0				
Lanes		0	1	0			0	1			0	
Configuration				TR			LT					
Upstream Signal			0					0				
Minor Street			Northbound					Southbo	und_			
Movement		7	8	9	9		10	11			12	
		L	Т	R			L	Т			R	
Volume		30	11	40			11	5			15	
Peak-Hour Factor, PHF		0.92	0.92	0.92	2 0.92		0.92	0.92		0	.92	
Hourly Flow Rate, HFR		32	0	43			0	0			0	
Percent Heavy Vehicles		0	0	0			0	0			0	
Percent Grade (%)			0					0				
Flared Approach			N					N				
Storage			0					0				
RT Channelized				0							0	
Lanes		0	0	0			0	0			0	
Configuration			LR									
Delay, Queue Length, a	and Le	evel of Se	rvice									
Approach		EB	WB		Northbo	ounc	1		South	bound		
Movement		1	4	7	8		9	10		11	12	
Lane Configuration			LT		LR							
v (vph)			135		75							
C (m) (vph)			1115		322							
v/c	•		0.12		0.23	}						
95% queue length			0.41		0.89)						
Control Delay			8.7		19.5	5						
LOS			А		С							
Approach Delav	ach Delay 19.5											
Approach LOS					C							

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TWO-WAY STOP CONTROL SUMMARY

General Informatio	n		Site I	nformati	on			
Analyst	— <u> </u>		Interse	ection		Int 14 - Ba	selíne.pr	n
Agency/Co.			Jurisd	iction				
Date Performed	1/16/2006	6	Analys	sis Year				
Analysis Time Period								
Project Description Lil	hue Urban Core)						
East/West Street: Ahuk	ini Road		North/S	South Stree	et: Akahi	Street		
Intersection Orientation:	East-West		Study	Period (hrs): 0.25			
Vehicle Volumes a	nd Adjustme	ents						
Major Street		Eastbound				Westbour	nd	
Movement	1	2	3		4	5		6
	L	Т	R		L	Т		R
Volume	0	530	50		160	630		0
Peak-Hour Factor, PHF	0.92	0.92	0.92	?	0.92	0.92		0.92
Hourly Flow Rate, HFR	0	576	54		173	684		0
Percent Heavy Vehicles	0	-			0			-
Median Type				Undivide	d			
RT Channelized			0		_			0
Lanes		1	0		0	1		0
Configuration								
Upstream Signal		0				0		
Minor Street		Northbound				Southbou	nd	-
Movement	7	8	9		10	11		12
		Т	R		L	Т		R
Volume	40	0	50		0	0		0
Peak-Hour Factor, PHF	0.92	0.92	0.92	2	0.92	0.92		0.92
Hourly Flow Rate, HFR	43	0	54		0	0		0
Percent Heavy Vehicles		0	0		0	0		0
Percent Grade (%)		0				0		
Flared Approach		N				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	0	0		0	0		0
Configuration		LR						
Delay, Queue Length, a	and Level of Se	ervice						
Approach	EB	WB		Northboun	d	S	outhboun	d
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (vph)		173		97				
C (m) (vph)		962		170				
v/c		0.18		0.57				
95% queue lenath		0.65		3.00	1			
Control Delay		9.6		51.1				1
		Δ		F				1
Approach Dolay				51 1		┥		I
Approach LOC								
Approach LOS			1	<i>_</i>		1		

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		TWC	D-WAY STOP	CONTR	OLS	UMI	MARY					
General Information	ו			Site I	nforn	natio	on					
Analyst				Interse	ection			Int 14 - N	letwor	k A.pr	n	
Agency/Co.				Jurisd	iction							
Date Performed		1/16/2006		Analys	sis Yea	ar						
Analysis Time Period					_							
Project Description Lih	ue U	rban Core		ľ								
East/West Street: Ahuk	iní Ro	ad		North/S	South	Stree	t: Akahi S	Street				
Intersection Orientation:	Eas	st-West		Study	Period	(hrs)	: 0.25					
Vehicle Volumes ar	d A	djustme	nts									
Major Street			Eastbound					Westbou	Ind			
Movement		1	2	3			4	5			6	
		L	Т	R		Ĩ	L	Т			R	
Volume		0	480	100)		0	880			0	
Peak-Hour Factor, PHF		0.92	0.92	0.92	?		0.92	0.92		0	.92	
Hourly Flow Rate, HFR		0	521	108			0	956			0	
Percent Heavy Vehicles		0	-				0	-				
Median Type					Undí	videc	1		0			
RT Channelized				0					0 2 0 T			
Lanes		0	2	0			0	2			0	
Configuration			Т	TR				Т				
Upstream Signal			0					0				
Minor Street		•	Northbound					Southbo	und			
Movement		7	8	9			10	11			12	
		L	Т	R			L	Т			R	
Volume		0	0	160)		0	0			0	
Peak-Hour Factor, PHF		0.92	0.92	0.92	?		1.00	0.92		0	.92	
Hourly Flow Rate, HFR		0	0	173			0	0			0	
Percent Heavy Vehicles		0	0	0			0	0			0	
Percent Grade (%)			0					0				
Flared Approach			N					N				
Storage			0					0				
RT Channelized	-			0							0	
lanes		0	0	1			0	0			0	
Configuration	+	~		R			0				0	
Delay Queue Length a	_L	evel of Se										
Approach		FR	WB		Northh		1		Southh	nound		
Movement		1	4	7			9	10	1	1	12	
		·				, 	R	,,,,				
							173					
(vpn)							698					
ς (m) (νρπ)					<u> </u>		000	<u> </u>				
V/C	·						0.25					
95% queue length					 		0.99					
Control Delay							12.0					
LOS							В					
Approach Delay	pproach Delay 12.0											
Approach LOS	pproach LOS B											

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		TWO	-WAY STOP	CONTR	OL S	UMN	ARY				
General Information	1			Site I	nforn	natio	on				
Analyst				Interse	ection			Int 14 - N	letwork	B.pr	n
Agency/Co.				Jurisdi	iction						
Date Performed		1/16/2006		Analys	sis Yea	ar					
Analysis Time Period											
Project Description Lih	ue U	rban Core									
East/West Street: Ahuki	ni Ro	oad		North/S	South S	Stree	t: Akahi S	treet			
Intersection Orientation:	Eas	st-West		Study I	Period	(hrs)	: 0,25				
Vehicle Volumes an	d A	djustmer	nts			_					
Major Street		_	Eastbound					Westbou	und		
Movement		1	2	3			4	5			6
		L	T	R			Ĺ	Т			R
Volume		0	480	100			0	880			0
Peak-Hour Factor, PHF	_	0.92	0.92	0.92	}	<u> </u>	0.92	0.92		0	.92
Hourly Flow Rate, HFR	_	0	521	108		<u> </u>	0	956			0
Percent Heavy Vehicles	_	0	-	-			0				
Median Type	-		1		Undi	video		0			
	+			0		<u> </u>		0 2 0			
Lanes		0	2	0		<u> </u>	0	2 0 T			
Configuration	_		Ť	TR		<u> </u>		1			
Upstream Signal		•	0					0			
Minor Street			Northbound					Southbo	und		
Movement	_	7	8	9		<u> </u>	10	11			12
		L	Т	R			L	Τ			R
Volume		0	0	160			0	0			0
Peak-Hour Factor, PHF	_	0.92	0.92	0.92	2		1.00	0.92		0	.92
Hourly Flow Rate, HFR		0	0	173			0	0			0
Percent Heavy Vehicles		0	0	0			0	0			0
Percent Grade (%)			0					0			
Flared Approach			N					N			
Storage			0					0			
RT Channelized				0							0
Lanes		0	0	1			0	0			0
Configuration				R							
Delay, Queue Length, a	ոժ Լ	evel of Ser	vice								
Approach		EB	WB		Northb	oound	1	5	Southbo	ound	
Movement		1	4	7	8	3	9	10	11	1	12
Lane Configuration							R				
v (vph)							173				
C (m) (vph)							688				
v/c	•						0.25				
95% queue length							0.99				
Control Delay					<u> </u>		12.0		1		
					<u> </u>		B		-		
Approach Dalay					40	0	0				
Approach Delay					12.	.0				-	-
ADDOROACH LOS					В						

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TWO-WAY STOP CONTROL SUMMARY

General Information Site Information Analyst Intersection Int 16 - Existing am Agency/Co. Intersection Int 16 - Existing am Date Performed 1/16/2006 Analysis Time Period Intradiction Project Description Linue Urban Core East/West Street East-West Street Study Period (hrs): 0.25 Vehicle Volumes and Adjustments Major Street Eastbound Westbound 0 Major Street L T R L T R Volume 0 340 30 90 510 0 Percent Heavy Vehicles 0 - - 0 - - Volume 0 1 0 0 1 0 0 Percent Heavy Vehicles 0 - - 0 -		1 44	0-WAT 510P	CONTR	OL SUM				
Analysit Intersection Int 16 - Existing_am Date Performed 1/16/2006 Analysis Year Image: Section Int 16 - Existing_am Analysis Time Period 1/16/2006 Analysis Year Image: Section Ima	General Information	<u>n</u>		Site I	nformati	on			
Agency/Co. Unividation Date Performed 1/16/2006 Analysis Time Period Analysis Year Project Description Lihue Urban Core EastWest Street: Analysis Year Intersection Orientation: East-West Study Period (hrs): 0.25 Vehicle Volumes and Adjustments Westbound Major Street Eastbound U T R Volume 0 340 30 90 510 Peak-Hour Factor, PHF 0.92 0.92 0.92 Houry Filow Rate, HFR 0 369 32 97 554 0 Percent Heavy Vehicles 0 - - 0 - <td>Analyst</td> <td></td> <td></td> <td>Interse</td> <td>ection</td> <td></td> <td>Int 16 - E</td> <td>xisting.a</td> <td>m</td>	Analyst			Interse	ection		Int 16 - E	xisting.a	m
Date Performed 17/16/2006 Inhulysis Year Analysis Time Period	Agency/Co.		•	Jurisd	iction				
Pring Sime Period III III III III IIII IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Date Performed	1/16/2000	6	Analys	sis Year				
Project Description Linue Urban Core EastWest Street: Anukin Road North/South Street: Elua Street Intersection Orientation: East-West Study Period (hrs): 0.25 Vehicle Volumes and Adjustments Major Street Eastbound Westbound Movement 1 2 3 4 5 6 L T R L T R Volume 0 340 30 90 510 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Mounty Flow Rate, HFR 0 369 32 97 554 0 Configuration 0 1 0 0 1 0 Configuration 0 1 0 0 1 0 Configuration 0 1 0 0 1 0 Minor Street Northbound Southbound Movement 7 8 9 10 11 12 Volume 50 0 30 0 0 0 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 North Street Northbound 0 Movement 7 8 9 10 11 12 Volume 50 0 30 0 0 0 Percent Heavy Vehicles 0 0 Faced Name 50 0 30 0 0 Percent Heavy Vehicles 0 Minor Street Northbound 0 Movement 7 8 9 10 11 12 Volume 50 0 30 0 0 Percent Factor, PHF 0.92 0.92 0.92 0.92 0.92 North Factor, PHF 0.92 0.92 0.92 0.92 0.92 Percent Factor, PHF 0.92 0.92 0.92 0.92 0.92 Mounty Flow Rate, HFR 54 0 32 0 0 Percent Factor, PHF 0.92 0.92 0.92 0.92 0.92 Mounty Flow Rate, HFR 54 0 0 Configuration 0 Percent Factor, PHF 0.92 0.92 0.92 0.92 0.92 Percent Factor, PHF 0.92 0.92 0.92 0.92 0.92 Percent Factor, PHF 0.92 0.92 0.92 0.92 0.92 Mounty Flow Rate, HFR 54 0 0 C 0 Percent Factor, PHF 0.92 0.92 0.92 0.92 Percent Factor, PHF 0.92 0.92 0.92 0.92 0.92 Percent Fac	Analysis Time Period								
EastWest Street NonthrSouth Street Elua Street Major Street EastWooth Study Period (hrs): 0.25 Vehicle Volumes and Adjustments Westbound Major Street Eastbound Westbound Movement 1 2 3 4 5 6 Volume 0 340 30 90 510 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Houry Flow Rate, HFR 0 369 32 97 554 0 Percent Heavy Vehicles 0 - - 0 - - Median Type Undivided TR 1 0 0 1 0 Lanes 0 1 0 0 1 1 12 Minor Street Northbound Southbound Movement T R 1 12 Volume 50 0 30 0 0 0 0 <td>Project Description Lit</td> <td>nue Urban Core</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td>	Project Description Lit	nue Urban Core	•						-
Vehicle Volumes and Adjustments Study Period (hrs): 0.25 Weinde Volumes and Adjustments Westbound Westbound Movement 1 2 3 4 5 6 Volume 0 340 30 90 510 0 Peak-Hour Factor, PHF 0.92 </td <td>East/West Street: Ahuk</td> <td>ini Road</td> <td></td> <td>North/S</td> <td>South Stree</td> <td>et: Elua St</td> <td>treet</td> <td></td> <td></td>	East/West Street: Ahuk	ini Road		North/S	South Stree	et: Elua St	treet		
Vehicle Volumes and Adjustments Eastound Westbound Major Street L T R L T R Movement 1 2 3 4 5 6 Movement 1 2 3 4 5 6 Volume 0 340 30 90 510 0 Peak-Hour Factor, PHF 0.92	Intersection Orientation:	East-west		Study	Perioa (nrs	s): 0,25 _			
Major Street Eastbound Westbound Movement 1 2 3 4 5 6 Volume 0 340 30 90 510 0 Volume 0 340 30 90 510 0 Peace-tour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 0 369 32 97 554 0 Percent Heavy Vehicles 0 - - 0 -	Vehicle Volumes ar	<u>nd Adjustme</u>	ents						
Movement 1 2 3 4 5 6 Volume 0 340 30 90 510 0 Peak-Hour Factor, PHF 0.92	Major Street		Eastbound				Westbou	und	
Volume L I K L I K Peak-Hour Factor, PHF 0.92 0	Movement	1	2	3		4	5		6
Volume 00 340 30 90 370 0 Peak-Hour Factor, PHF 0.92 0 <	Volume		240	R 20		L	510		<u> </u>
Count Name Count	Peak-Hour Factor PHF	0.02	0.92	0.02	,	0.92	0.92		0.92
Name 0 0 0 0 0 0 Percent Heavy Vehicles 0 1 0 0 1 0 RT Channelized 0 1 0 0 1 0 Lanes 0 1 0 0 1 0 Configuration 0 1 0 0 1 0 Minor Street Northbound Southbound Southbound Movement 7 8 9 10 11 12 Movement 7 8 9 10 11 12 1 R L T R N N N N 1 12 1 1 12 1 1 12 1 1 12 1 1 12 1 1 12 1 1 12 1 1 12 1 1 1 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Hourly Flow Rate HER	0.92	369	32	·	97	554		0.02
Median Type Undivided RT Channelized 0 1 0 0 Lanes 0 1 0 0 1 0 Configuration TR LT 0 0 1 0 Minor Street Northbound Southbound 0 0 0 0 Minor Street Northbound Southbound 0 0 0 0 Minor Street Northbound Southbound Southbound 0 0 0 Minor Street Northbound Southbound 0 0 0 0 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 54 0 32 0 <td< td=""><td>Percent Heavy Vehicles</td><td>0</td><td></td><td></td><td></td><td>0</td><td>-</td><td></td><td></td></td<>	Percent Heavy Vehicles	0				0	-		
RT Channelized 0 0 0 1 0 0 1 0 Configuration 7 1 0 0 1 0 0 1 0 Minor Street Northbound Southbound 0 1 12 Minor Street Northbound Southbound 11 12 Volume 50 0 30 0 0 0 Peach-Hour Factor, PHF 0.92 0.92 0.25 0.92 0.92 Hourly Flow Rate, HFR 54 0 32 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 Percent Grade (%) 0 0 0 0 0 0 0 Storage 0 0 0 0 0 0 0 0 Lanes 0 0 0 0 0 0 0 0 Configuration LR 1 4 7 8 9 10 11 12	Median Type			1	Undivide	đ	1	I	
Lanes 0 1 0 0 1 0 Configuration 7 R LT 0 0 0 Minor Street Northbound Southbound 0 11 12 Minor Street Northbound Southbound Movement 7 8 9 10 11 12 Movement 7 8 9 10 11 12 R R N R N<	RT Channelized			0		-			0
Configuration TR LT 0 Upstream Signal 0 0 0 0 0 Minor Street Northbound Southbound 0 0 0 0 Movement 7 8 9 10 11 12 L T R L T R 0 0 0 Volume 50 0 30 0	Lanes	0	1	0		0	1		0
Upstream Signal 0 0 0 0 Minor Street Northbound Southbound Movement 7 8 9 10 11 12 Movement 7 8 9 10 11 12 Volume 50 0 30 0 0 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.25 0.92 0.92 Hourly Flow Rate, HFR 54 0 32 0 0 0 Percent Grade (%) 0 0 0 0 0 0 Percent Grade (%) 0 0 0 0 0 0 Storage 0 0 0 0 0 0 Canfiguration LR 0 0 0 0 0 Canfiguration LR 1 4 7 8 9 10 11 12 Lane Configuration LT LR 1<	Configuration			TR		LT			
Minor Street Northbound Southbound Movement 7 8 9 10 11 12 L T R L T R Valume 7 8 9 10 11 12 Volume 50 0 30 0	Upstream Signal		0	-			0		
Movement 7 8 9 10 11 12 L T R L T R L T R Volume 50 0 30 0 0 0 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.25 0.92 0.92 Hourly Flow Rate, HFR 54 0 32 0 0 0 0 Percent Heavy Vehicles 0	Minor Street		Northbound	•			Southbo	und	
L T R L T R Volume 50 0 30 0 0 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.25 0.92 0.92 Hourly Flow Rate, HFR 54 0 32 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 Percent Grade (%) 0 0 0 0 0 0 0 Flared Approach N 0 0 0 0 0 RT Channelized 0 0 0 0 0 0 0 0 Configuration LR 0 <td< td=""><td>Movement</td><td>7</td><td>8</td><td>9</td><td></td><td>10</td><td>11</td><td></td><td>12</td></td<>	Movement	7	8	9		10	11		12
Volume 50 0 30 0 0 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.25 0.92 0.92 Hourly Flow Rate, HFR 54 0 32 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 Percent Grade (%) 0 0 0 0 0 0 0 Flared Approach N 0 0 0 0 0 RT Channelized 0 0 0 0 0 0 0 0 Configuration LR 0		L	Т	R		L	Τ		R
Peak-Hour Factor, PHF 0.92 0.92 0.92 0.25 0.92 0.92 Hourly Flow Rate, HFR 54 0 32 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 Percent Grade (%) 0 0 0 0 0 0 0 Flared Approach N N 0 0 0 Storage 0	Volume	50	0	30		0	0		0
Hourly Flow Rate, HFR 54 0 32 0 0 0 Percent Heavy Vehicles 0 <t< td=""><td>Peak-Hour Factor, PHF</td><td>0.92</td><td>0.92</td><td>0.92</td><td>?</td><td>0.25</td><td>0.92</td><td></td><td>0.92</td></t<>	Peak-Hour Factor, PHF	0.92	0.92	0.92	?	0.25	0.92		0.92
Percent Heavy Vehicles 0	Hourly Flow Rate, HFR	54	0	32		0	0		0
Percent Grade (%)00Flared ApproachNNStorage00RT Channelized00Lanes00O00ConfigurationLRDelay, Queue Length, and Level of ServiceApproachEBWBNorthboundMovement147891011114789786C (m) (vph)11692781V(c0.080.31125% queue length0.271.281LOSAApproach LOSCC	Percent Heavy Vehicles	0	0	0		0	0		0
Flared ApproachNNStorage000RT Channelized000Lanes0000ConfigurationLR00Delay, Queue Length, and Level of ServiceApproachEBWBNorthboundMovement14789Lane ConfigurationLTLR1Lane ConfigurationLTLR1V (vph)9786111C (m) (vph)116927811Storage0.080.3111Synden Length0.271.2811LosAC11LOSAC11Approach LOS23.6	Percent Grade (%)		0				0		
Storage 0 0 0 RT Channelized 0	Flared Approach		N				N		
RT Channelized 0 0 0 0 Lanes 0 0 0 0 0 0 0 Configuration LR Image: configuration LR Image: configuration 0 0 0 0 Delay, Queue Length, and Level of Service Image: configuration Image: configuration Southbound Southbound Movement 1 4 7 8 9 10 11 12 Lane Configuration LT LR Image: configuration Image: configuratio	Storage		0				0		
Lanes 0 <td>RT Channelized</td> <td></td> <td></td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td>0</td>	RT Channelized			0					0
Configuration LR	Lanes	0	0	0		0	0		0
Delay, Queue Length, and Level of Service Approach EB WB Northbound Southbound Movement 1 4 7 8 9 10 11 12 Lane Configuration LT LR v (vph) 97 86 C (m) (vph) 1169 278 95% queue length 0.27 1.28 Control Delay 8.4 23.6 Approach Delay - - -	Configuration		LR						
Approach EB WB Northbound Southbound Movement 1 4 7 8 9 10 11 12 Lane Configuration LT LR v (vph) 97 86	Delay, Queue Length, a	nd Level of Se	ervice						
Movement 1 4 7 8 9 10 11 12 Lane Configuration LT LR <	Approach	EB	WB		Northboun	d		Southbou	ind
Lane Configuration LT LR Image: constraint of the structure of the	Movement	1	4	7	8	9	10	11	12
y (vph) 97 86 1 C (m) (vph) 1169 278 1 v/c 0.08 0.31 1 95% queue length 0.27 1.28 1 95% queue length 0.27 1.28 1 Control Delay 8.4 23.6 1 1 LOS A C 1 1 Approach Delay 23.6 1 1	Lane Configuration		LT		LR				
C (m) (vph) 1169 278	v (vph)		97		86				
v/c 0.08 0.31	C (m) (vph)		1169		278				
95% queue length 0.27 1.28 Control Delay 8.4 23.6 LOS A C Approach Delay -23.6 Approach LOS - C	v/c		0.08		0.31	,			
Control Delay 8.4 23.6	95% queue length		0.27		1.28				
LOS A C Image: Constraint of the second	Control Delay		8.4		23.6				
Approach Delay 23.6 Approach LOS C	LOS		A		С			1	
Approach LOS – C	Approach Delay				23.6			-	•
	Approach LOS	_			С		1		

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	4	WO	-WAT STUP	CONTR							
General Information	n			Site I	nform	atio	on				
Analyst				Interse	ection			Int 16 - E	Baseli	ne.am	
Agency/Co.				Jurisd	iction						
Date Performed	1/16/2	006		Analys	sis Yeai						
Analysis Time Period											
Project Description Lil	nue Urban C	ore									
East/West Street: Ahuk	ini Road			North/S	South S	tree	t: Elua St	reet			
Intersection Orientation:	East-West			Study	Period ((hrs)	: 0.25				
Vehicle Volumes ar	nd Adjust	men	ts								
Major Street			Eastbound					Westbo	und		
Movement	1	_	2	3			4	5			6
	L		Τ	R			L	Т			R
Volume	0		550	40			120	710			0
Peak-Hour Factor, PHF	0.92		0.92	0.92	2		0.92	0.92			0.92
Hourly Flow Rate, HFR	0		597	43			130	771		<u> </u>	0
Percent Heavy Vehicles	0						0				-
Median Type					Undiv	idec	1				
RT Channelized				0							0
Lanes	0		1	0			0	1			0
			-	18			LI			<u> </u>	
Upstream Signal			0					0			
Minor Street			Northbound					Southbo	ound		
Movement	7		8	9			10	11			12
			T	R				1		ļ	R
	60		0	40			0	0			0
Peak-Hour Factor, PHF	0.92		0.92	0.92	·		0.25	0.92			0.92
Hourly Flow Rate, HFR	65		0	43			0				0
Percent Heavy Venicles	0		0	0			0				0
Percent Grade (%)			<u>0</u>								
Flared Approach			N					N			
Storage			0					0			
RT Channelized				0							0
Lanes	0		0	0			0	0			0
Configuration			LR								
Delay, Queue Length, a	and Level of	Serv	vice								
Approach	EB		WB		Northbo	ound	ł		South	bound	1
Movement	1		4	7	8		9	10		11	12
Lane Configuration			LT		LR						
v (vph)			130		108						1
C (m) (vph)		+	954		140						
v/c	•	┢	0.14		0.77	7			1		
95% queue length		+	0.47		4.67	7			1		
Control Delay		+	94		86.0)					
		+	Δ		F						
Approach Dalay		-+	~		, I 980)					1
		-+								_	
Approach LOS				I	r			1			

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General Information			Cito I	aformati	00			
General mormation				normali	on			
Analyst			Interse			Int 16 - E,	xisting.pr	n
Agency/Co.	1/16/2006	<u>,</u>	Jurisol			_		
Analysis Time Period	1/10/2000	,						
Project Description Linu East/Mast Streat: Abukin	e Urban Core		North/	South Stree	t. Elua Ci	root		
Intersection Orientation:	Fast-West		Study	Dariad (bre	~ 0.25	1661		
Vahiele Valumas and		nto	loudy i	61100 (1113	, 0.20			_
Venicle volumes and	Aujustine	Fastbound				Meethou	und	
Movement	1	2	3		4	5		6
		<u> </u>	R			Т		R
Volume	0	395	35		35	525		0
Peak-Hour Factor, PHF	0.92	0.92	0.92		0.92	0.92		0.92
Hourly Flow Rate, HFR	0	429	38		38	570		0
Percent Heavy Vehicles	0		-		0			
Median Type			-	Undivideo	d			
RT Channelized			0					0
Lanes	0	1	0		0	1		0
Configuration			TR		LT			
Upstream Signal		0				0		
Minor Street		Northbound				Southbou		
Movement	7	8	9		10	11	12	
	Ĺ	T	R		L	Т		R
Volume	90	0	85		0	0		0
Peak-Hour Factor, PHF	0.92	0.92	0.92		0.92	0.92		0.92
Hourly Flow Rate, HFR	97	0	92		0	0		0
Percent Heavy Vehicles	0	0	0		0	0		0
Percent Grade (%)		0				0		
Flared Approach		N				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	0	0		0	0		0
Configuration		LR						
Delay, Queue Length, an	d Level of Se	rvice	-	· · ·		•	•	
Approach	EB	WB		Northboun	d	5	Southbou	nd
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (vph)		38		189				
C (m) (vph)		1105		332				
v/c		0.03		0.57				
95% queue length		0.11		3.34				
Control Delay		8.4		29.2				
LOS		A		D				
Approach Delay	~~			29.2			•	-

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TWO WAY STOD CONTROL

	1 11	O-WAY STOP	CONTR	OL SUM	MARY			
General Information	า		Site I	nformati	ion			
Analyst			Interse	ection		Int 16 - B	aseline.pr	n
Agency/Co.			Jurisdi	iction				
Date Performed	1/16/200	6	Anatys	sis Year				
Analysis Time Period								
Project Description Lih	ue Urban Cor	e						
East/West Street: Ahuk	ini Road		North/S	South Stre	et: Elua S	treet		
Intersection Orientation:	East-West		Study I	Period (hrs	s): 0.25			
Vehicle Volumes ar	d Adjustm	ents						
Major Street		Eastbound				Westbou	und	
Movement	1	2	3		4	5		6
	L	Т	R		L	Т		R
Volume	0	550	50		40	790		0
Peak-Hour Factor, PHF	0.92	0.92	0.92	, I	0,92	0.92		0.92
Hourly Flow Rate, HFR	0	597	54		43	858		0
Percent Heavy Vehicles	- 0							
Median Type	+	- 1		Undivide	d	1	-	^
RI Channelized	-		0					0
Lanes		1		0 0		1		0
			IR LI		<u>-</u>		_	
Upstream Signal		0				0		-
Minor Street		Northbound				Southboi	und	(0
Movement	/	8	9	9 10		11		12
	L		R					R
Volume	110	0	110		0	0		0
Peak-Hour Factor, PHF	0.92	- 0.92	0.92		0.92	0.92		0.92
Porcept Heavy Vehicles	119	0	119		0	0		0
Percent Grade (11)		^	0		U			0
		0						-
Flared Approach		N				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	0	0		0	0		0
Configuration		LR						-
Delay, Queue Length, a	nd Level of S	ervice				_		
Approach	EB	WB		Northboun	ld	5	Southboun	d
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (vph)		43		238				
C (m) (vph)		945		189				
v/c		0.05		1.26				
95% queue length		0.14		12.99				
Control Delay		9.0		201.5	1			
LOS		A		F				
Approach Delay	_		1	201.5	-			
Approach LOS				F				

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CASE 1.17 MM.





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Analyst Intersection Int 17 - Existing.am Agency/Co. Jurisdiction Intersection Int 17 - Existing.am Dale Performed Jurisdiction Intersection Intersection Analysis Time Period Intersection Intersection Intersection Project Description Like Urban Core Study Period (hrs): 0.25 Vehicle Volumes and Adjustments Marksis Year R L T Movement 1 2 3 4 5 6 Volume 0 346 25 / 159 // 484 // 0 25 Vehicle Volumes and Adjustments 0 346 25 // 159 // 484 // 0 26 0.92	General Information	 1		Site I	nformati	on				
Agency/Co. Jurisdiction Jurisdiction Jurisdiction Date Performed 1/16/2006 Analysis Year Analysis Tree Analysis Tree Project Description Linue Urban Core East/West Street North/South Street Image Street Baily Period North/South Street Study Period (hrs): 0.25 Vehicle Volumes and Adjustments Major Street T R L T R Major Street L T R L T R O Street Study Period (hrs): 0.92	Analyst			Interse	ection		Int 17 - E	xístina.am		
Date Performed 1/16/2006 Analysis Year Analysis Time Period Analysis Time Period Analysis Time Period Analysis Year East/West Street: Analysis Time Period North/South Street: Umi Street Intersection Orientation: East/West Study Period (hrs): 0.25 Vehicle Volumes and Adjustments Westbound Movement 1 2 3 4 5 6 Movement 1 2 3 4 5 6 0 Valume 0 346 25.5 159 484 0 0 9 0.92	Agency/Co.			Jurisd	iction			xioung.um		
Analysis Time Period Invertifian Linue Urban Core Project Description Linue Urban Core Study Period (hrs): 0.25 Vehicle Volumes and Adjustments Study Period (hrs): 0.25 Major Street Eastbound Westbound Movement 1 2 3 4 5 6 Movement L T R L T R Volume 0 346 25. 159 484 0 Peak-Hour Factor, PHF 0.92 0.	Date Performed	1/16/200	6	Analys	sis Year					
Project Description Linue Urban Core EastWest Street: Ahukhin Road North/South Street: Umi Street Intersection Orientation: East-Wead Study Period (hrs): 0.25 Vehicle Volumes and Adjustments Westbound Movement 1 2 3 4 5 6 Movement 1 2 3 4 5 6 Volume 0 346 25. 159. 484 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Plow Rate, HFR 0 376 27 172 526 0 Percent Heavy Vehicles 0	Analysis Time Period									
EastWest Street: Aukkni Road North/South Street: Umi Street Intersection Orientation: East-West Study Period (hrs): 0.25 Wehicle Volumes and Adjustments Eastbound Westbound Major Street Eastbound Westbound Movement 1 2 3 4 5 6 Volume 0 346 25. 159. 484. 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 0 376 27 172 526 0 Percent Heavy Vehicles 0 - - 0 - - Channelized 0 1 0 1 1 0 1 1 0 Configuration T TR L T R 1 1 1 1 Movement 7 8 9 10 11 1 1 0 0 <td>Project Description Lih</td> <td>ue Urban Core</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Project Description Lih	ue Urban Core								
Intersection Orientation: East-West Study Period (hrs): 0.25 Vehicle Volumes and Adjustments Eastbound Westbound Movement 1 2 3 4 5 6 Movement 1 2 3 4 5 6 Volume 0 346-25.' 159.' 484.' 0 Peak-Hour Factor, PHF 0.92	East/West Street: Ahuki	ní Road		North/	South Stree	et: Umi Sti	reet			
Vehicle Volumes and Adjustments Eastbound Wetsbound Mayerment 1 2 3 4 5 6 Novement 1 2 3 4 5 6 Volume 0 346 25./ 159.// 484.// 0 Peak-Hour Factor, PHF 0.92 <td>Intersection Orientation:</td> <td>East-West</td> <td></td> <td>Study</td> <td>Period (hrs</td> <td>): 0.25</td> <td></td> <td></td> <td></td>	Intersection Orientation:	East-West		Study	Period (hrs): 0.25				
Major Street Eastbound Westbound Movement 1 2 3 4 5 6 Volume 0 346 25 159 484 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 0 376 27 172 526 0 Percent Heavy Vehicles 0 - - 0 -	Vehicle Volumes an	d Adjustme	ents							
Movement 1 2 3 4 5 6 Volume L T R L T R Volume 0 346 25 159 484 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Percent Heavy Vehicles 0 0 Modian Type 0 - - - - - R Chanelized 0 1 1 0 -	Major Street		Eastbound				Westbou	und		
L T R L T R Volume 0 346 25 / 159 / 484 / 0 0 Peak-Hour Factor, PHF 0.92	Movement	1	2	3		4	5		6	
Volume 0 346 25./ 159 484*/ 0 Peak-Hour Factor, PHF 0.92		L	T	R			T		R	
Peak-Hour Factor, PHF 0.92	Volume	0	346	25	/	159 -	484		0	
Houry Prov Rate, HFR 0 376 27 17.2 526 0 Percent Heavy Vehicles 0 - 0 - 0 - 0 - - - - - - - - - <	Peak-Hour Factor, PHF	0.92	0.92	0.92	?	0.92	0.92		0.92	
Percent Heavy Venicles 0 - 0 - <td>Hourly Flow Rate, HFR</td> <td>0</td> <td>376</td> <td>27</td> <td></td> <td>172</td> <td>526</td> <td></td> <td>0</td>	Hourly Flow Rate, HFR	0	376	27		172	526		0	
Undwided Undwided RT Channelized 0 1 0 1 0 Lanes 0 1 0 1 1 0 Configuration 0 1 1 1 0 0 Minor Street Northbound Southbound 0 0 0 0 Movement 7 8 9 10 11 12 L T R L T R Volume 115 0 47 0 0 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 124 0 51 0 0 0 Percent Grade (%) 0 0 0 0 0 0 0 RT Channelized 0 1 0 1 0 0 0 0 Configuration L R 0 0	Percent Heavy Vehicles	0			<u> </u>	0			-	
RT Channelized 0 1 0 1 1 0 Lanes 0 1 0 1 1 0 Configuration TR L T T T T Upstream Signal 0 0 0 0 0 0 Minor Street Northbound Southbound 0 0 0 Movement 7 8 9 10 11 12 Volume 115 0 47 0 0 0 Peach-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 124 0 51 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 Flared Approach N N N N 0 0 Configuration L R 0 0 0 0 Lane Configuration L	Median Type			Undivided						
Lanes 0 1 0 1 1 1 0 Configuration TR L T R L T R L T R L T R L T R R L T R	RT Channelized			0			ļ		0	
Configuration IR L I Upstream Signal 0 0 0 Minor Street Northbound Southbound Movement 7 8 9 10 11 12 L T R L T R Volume 115 0 47 0 0 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 124 0 51 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 Percent Grade (%) 0 0 0 0 0 Storage 0 0 0 0 0 RT Channelized 0 1 0 0 0 Lanes 1 0 1 0 0 0 Configuration L L R 1 1 1		0	1	0		1	1		0	
Upstream Signal 0 0 0 Minor Street Northbound Southbound Movement 7 8 9 10 11 12 L T R L T R Volume 115 0 47 0 0 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 124 0 51 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 Flared Approach N 0 0 0 0 Storage 0 1 0 1 0 0 0 Configuration L R 0 0 0 0 0 Delay, Queue Length, and Level of Service Approach EB WB Northbound Southbound Movement 1 4 7 8		_				L	T			
Minor Street Northbound Southbound Movement 7 8 9 10 11 12 L T R L T R Volume 115 0 47 0 0 0 Peak-Hour Factor, PHF 0.92 0 0	Upstream Signal		0				0			
Movement 7 8 9 10 11 12 L T R L T R Volume 115 0 47 0 0 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 124 0 51 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 0 Percent Grade (%) 0 0 0 0 0 0 0 Storage 0 0 0 0 0 0 0 Lanes 1 0 1 0 0 0 0 Configuration L R 11 12 12 Approach EB WB Northbound Southbound Southbound Movement 1 4 7	Minor Street		Northbound				Southbou	und		
L T R L T R Volume 115 0 47 0 0 0 Peak-Hour Factor, PHF 0.92	Movement	7	8	9		10	11		12	
Volume 115 0 47 0 0 0 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 124 0 51 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 Flared Approach N 0 0 0 0 Storage 0 1 0 0 0 0 Lanes 1 0 1 0 0 0 Configuration L R 0 1 12 Delay, Queue Length, and Level of Service Northbound Southbound Movement 1 4 7 8 9 10 11 12 Lane Configuration L L R		Ĺ	T	R			Т		R	
Peak-Hour Factor, PHF 0.92	Volume	115	0	47	, r	0	0		0	
Houry Flow Rate, HFR 724 0 51 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 Percent Grade (%) 0 0 0 0 0 0 0 Flared Approach N N N 0 0 0 0 RT Channelized 0 1 0 0 0 0 0 0 Lanes 1 0 1 0 0 0 0 0 0 0 Delay, Queue Length, and Level of Service R 0 11 12 11 12 12 11 12 12 11 12 12 11 12 12 11 12 12 12 11 12 12 11 12 12 11 12 12 11 12 12 11 12 12 11 12 12 11 12 12 11 12 12 11 12 12 12 11 12	Peak-Hour Factor, PHF	0.92	0.92	0.92	?	0.92	0.92		0.92	
Percent Heavy Venicies 0 11	Houriy Flow Rate, HFR	124	0	51		0	0		0	
Percent Grade (%) 0 0 Flared Approach N N N Storage 0 0 0 RT Channelized 0 0 0 Lanes 1 0 1 0 0 Configuration L R 0 0 0 Delay, Queue Length, and Level of Service R 0 11 12 Approach EB WB Northbound Southbound Movement 1 4 7 8 9 10 11 12 Lane Configuration L L R 1 12 124 51 1 1 V(vph) 1167 162 663 1 </td <td>Percent Reavy Vehicles</td> <td>0</td> <td>0</td> <td>0</td> <td></td> <td>0</td> <td>0</td> <td></td> <td>0</td>	Percent Reavy Vehicles	0	0	0		0	0		0	
Hared ApproachNNStorage00RT Channelized00Lanes101 $Lanes$ 10Lanes10Lanes10Lanes10Lanes10Lanes10Lanes1Lanes1Lanes1Lanes1Lanes1Lanes1Lane ConfigurationLLane ConfigurationLLRLane Configuration11671167162663-V(vph)11671167162663-V/c0.150.770.0895% queue length0.524.850.25Control Delay8.676.610.9LOSAApproach LOS57.5Approach LOS-	Percent Grade (%)		0				0			
Storage 0 0 0 0 RT Channelized 0 11 12 12 11 12 12 12 12 12 12 12 12 12 12 12 12	Flared Approach		N	_			N			
RT Channelized 0 1	Storage		0				0			
Lanes 1 0 1 0 1 <td>RT Channelized</td> <td></td> <td></td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td>0</td>	RT Channelized			0					0	
Configuration L R Image: configuration L R Image: configuration Delay, Queue Length, and Level of Service Approach EB WB Northbound Southbound Movement 1 4 7 8 9 10 11 12 Lane Configuration L L R Image: configuration Image: configuration <t< td=""><td>Lanes</td><td>1</td><td>0</td><td>1</td><td></td><td>0</td><td>0</td><td></td><td>0</td></t<>	Lanes	1	0	1		0	0		0	
Delay, Queue Length, and Level of ServiceNorthboundSouthboundApproachEBWBNorthboundSouthboundMovement14789101112Lane ConfigurationLLRv (vph)17212451C (m) (vph)1167162663v/c0.150.770.0895% queue length0.524.850.25Control Delay8.676.610.9LOSAFBApproach LOS 57.5	Configuration	L		R						
ApproachEBWBNorthboundSouthboundMovement14789101112Lane Configuration L L R $ -$ <td>Delay, Queue Length, ar</td> <td>nd Level of Se</td> <td>ervice</td> <td>_</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Delay, Queue Length, ar	nd Level of Se	ervice	_						
Movement 1 4 7 8 9 10 11 12 Lane Configuration L L R 11 12 Lane Configuration L L L R	Approach	EB	WB		Northbound	d	S	Southbound	t	
Lane Configuration L L R Image: Configuration Image: Configuration Image: Configuration Image: Configuration	Movement	1	4	7	8	9	10	11	12	
v (vph) 172 124 51	Lane Configuration		L	L		R				
C (m) (vph) 1167 162 663 Image: constraint of the state o	v (vph)		172	124		51				
v/c 0.15 0.77 0.08 95% queue length 0.52 4.85 0.25 Control Delay 8.6 76.6 10.9	C (m) (vph)		1167	162		663				
95% queue length 0.52 4.85 0.25 Control Delay 8.6 76.6 10.9	v/c		0.15	0.77		0.08				
Control Delay 8.6 76.6 10.9 Image: Control Delay LOS A F B Image: Control Delay Image:	95% queue length		0.52	4.85		0.25	1			
LOS A F B Image: Constraint of the second se	Control Delay		8.6	76.6		10.9				
Approach Delay 57.5 Approach LOS F	LOS		A	F		В		1		
Approach LOS – – F	Approach Delay				57.5					
	Approach LOS	F				and the second sec				

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General Information	า		Site I	nformati	on			
Analyst			Interse	ection		Int 17 - B	aseline.ar	n
Agency/Co.			Jurisdi	iction				
Date Performed	1/16/2006	ĵ	Analys	sis Year				
Analysis Time Period								
Project Description Lik	ue Urban Core							
East/West Street: Ahuk	ini Road		North/S	South Stree	et: Umi Str	reet		
Intersection Orientation:	East-West		Study I	Period (hrs): 0.25			
Vehicle Volumes ar	d Adjustme	ents						
Major Street		Eastbound				Westbou	und	
Movement	1	2	3		4	5		6
	L	T	R		L	Т		R
Volume	0	560 🧹	30	/	200 1	680	~	0
Peak-Hour Factor, PHF	0.92	0.92	0.92	?	0.92	0.92		0.92
Hourly Flow Rate, HFR	0	608	32		217	739		0
Percent Heavy Vehicles	0			_	0			
Median Type				Undivide	d			
RT Channelized			0					0
Lanes	0	1	0		1	1		0
					L	1		
Upstream Signal		0				0		
Minor Street		Northbound				Southbo	und	10
Movement	7	8	9		10	11		12
	L	Ť	R		L			R
Volume	150	0	60	<u> </u>	0	0		0
Peak-Hour Factor, PHF	0.92	0.92	0.92	2	0.92	0.92		0.92
Percent Heavy Vahiclas	/03	0	05		0			0
Percent Grada (%)			0		0			0
Flared Approach		N						
Storage		0				0		
RT Channelized			0					0
Lanes	1	0	1		0	0		0
Configuration			R					
Delay, Queue Length, a	nd Level of Se	ervice				1		
Approach	EB	WB		Northboun	đ		Southbour	d
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L	L		R			
v (vph)		217	163		65			
C (m) (vph)		954	69		489			
v/c	•	0.23	2.36		0.13	1		
95% queue length		0.87	15.65		0.46	1		
Control Delay		9.9	750,2		13.5			
LOS		A	F		В			
Approach Delay				540.2	1			
			-	F				
Approach LOG				4		1		

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ካካ	11		ካካ	≜ î≁		۲	1.		ሻ	1.	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.92		1.00	0.92	
FIt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3512		3433	3503		1770	1710		1770	1723	
FIt Permitted	0.95	1.00		0.95	1.00		0.69	1.00		0.68	1.00	
Satd. Flow (perm)	3433	3512		3433	3503		1280	1710		1268	1723	
Volume (vph)	50	560	30	200	680	50	150	50	60	50	50	50
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)	54	609	33	217	739	54	163	54	65	54	54	54
RTOR Reduction (vph)	0	8	0	0	11	0	0	43	0	0	36	0
Lane Group Flow (vph)	54	634	0	217	782	0	163	76	0	54	72	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	1.5	15.0		4.5	18.0		16.4	16.4		16.4	16.4	
Effective Green, g (s)	1.5	15.0		4.5	18.0		16.4	16.4		16.4	16.4	
Actuated g/C Ratio	0.03	0.31		0.09	0.38		0.34	0.34		0.34	0.34	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	108	1100		323	1316		438	585		434	590	
v/s Ratio Prot	0.02	0.18		c0.06	c0.22			0.04			0.04	
v/s Ratio Perm							c0.13			0.04		
v/c Ratio	0.50	0.58		0.67	0.59		0.37	0.13		0.12	0.12	
Uniform Delay, d1	22.8	13.8		21.0	12.0		11.9	10.8		10.8	10.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.6	0.7		5.4	0.7		2.4	0.5		0.6	0.4	
Delay (s)	26.4	14.5		26.4	12.7		14.3	11.3		11.4	11.2	
Level of Service	С	В		С	В		В	В		В	В	
Approach Delay (s)		15.5			15.7			13.0			11.3	
Approach LOS		В			В			В			В	
Intersection Summary			11. 		100-000			-			a state	12
HCM Average Control D	elay		14.9	F	ICM Lev	vel of Se	ervice		В			
HCM Volume to Capacit	ý ratio		0.52				í					
Actuated Cycle Length (s)		47.9	5	Sum of la	ost time	(s)		12.0			
Intersection Capacity Ut	ilization		48.7%	STR.	CU Leve	el of Ser	vice		А			
Analysis Period (min)			15									
c Critical Lane Group												

General Information	1		Site	nformatio					
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Agency/Co			Jurisdi	iction			хізанд.рт		
Date Performed	1/16/2006	5	Analys	sis Year					
Analysis Time Period		-				+			
Project Description Lib	ue Urban Core								
East/West Street: Ahuk	ini Road		North/S	South Stree	t: Umi Str	eet			
Intersection Orientation:	East-West		Study I	Period (hrs)): 0.25				
Vehicle Volumes ar	nd Adjustme	ents							
Major Street		Eastbound				Westbou	Ind		
Movement	1	2	3		4	5		6	
	L	Τ	R		Letter,	Т		R	
Volume	0	439 <	55	/ /	93-83)	434	1	0	
Peak-Hour Factor, PHF	0.92	0.92	0.92	1	0.92	0.92		0.92	
Hourly Flow Rate, HFR	0	477	59		101	471		0	
Percent Heavy Vehicles	0	-			0	-		-	
Median Type		Undivided							
RT Channelized	_		0					0	
Lanes	0	1	0		1	1		0	
Configuration						T			
Upstream Signal		0				0			
Minor Street		Northbound				Southbo	und		
Movement	7	8	9		10	11		12	
	L	Ť	R		Ĺ	Τ		R	
Volume	125	0	160		0	0		0	
Peak-Hour Factor, PHF	0.92	0.92	0.92	,	0.92	0.92		0.92	
Hourly Flow Rate, HFR	135	0	173		0	0		0	
Percent Heavy Vehicles	0	0	0		0	0		0	
Percent Grade (%)		0				0			
Flared Approach		N	_			N			
Storage		0				0			
RT Channelized			0					0	
Lanes	1	0	1		0	0		0	
Configuration	L		R						
Del <mark>ay, Q</mark> ueue Length, a	nd Level of Se	rvice							
Approach	EΒ	WB		Northbound	ł	9	Southbound	ť	
Movement	1	4	7	8	9	10	11	12	
Lane Configuration		L	L		R				
v (vph)		101	135		173				
C (m) (vph)		1042	191		570				
v/c	•	0.10	0.71		0.30				
95% queue length		0.32	4.43		1.27				
Control Delay		8.8	59.6		14.0				
LOS		A	F		В			1	
Approach Delay				34.0				-	
Approach LOS	D								

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General Information Site Information Analysis Intersection Int 17 - Baseline.pm Agency/Co. Lurisdiction Int 17 - Baseline.pm Date Performed 1/16/2006 Analysis Year Intersection Analysis Time Prind Intersection Intersection Intersection Project Description Lihue Urban Core EastWest Study Period (trns): 0.25 Vehicle Volumes and Adjustments Morth/South Street Westbound Movement 1 2 3 4 5 6 Volume C 670 ' 70 ' 120 ' 670 ' 0 Percent Heavy Vehicles 0 - - - - - Morth Street 0 663 '76 '130 '728 '0 0 - - - Mortin Type 1 0 663 '76 '130 '728 '0 0 - - Marin Type 0 - - - 0 - - - - Mortin Street Northbound		1000	J-WAT 510P						
Analyst Int 7 - Baseline.pm Agency/Co. Uurdsiction Date Performed 1/16/2006 Analysis Time Period Analysis Year Project Description Linke Urban Core East/West Street: Analysis Year Intersection Orientation: East-West Vehicle Volumes and Adjustments Study Period (hrs): Major Street Eastbound Vehicle Volumes and Adjustments T Movement 1 2 3 4 5 6 Volume 0 610 ' 70 ' 120 ' 670 ' 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 Hedian Type Undivided - - - - RT Channelized 0 1 0 1 0 Configuration T R L T R Upstream Signal 0 1 1 0 0 Movement 7 8 9 <	General Information	n		Site I	nformati	on			
Agency/Co. Unrisdiction Date Performed 1/16/2006 Analysis Time Period Intersection Project Description Lihue Urban Core East/West Street: Manalysis Year Intersection Orientation: East-West Wein Cere: Aukin Road Major Street Westbound Movement 1 2 3 4 5 6 Volume 0 610 / 70 / 120 / 670 / 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 0 663 76 130 728 0 Percent Heavy Vehicles 0 - - 0 - - Main Type Undivided TR 1 0 0 0 Barse 0 1 0 1 1 0 Upstream Signal 0 1 1 0 0 Wortheret	Analyst			Interse	ection		Int 17 - B	aseline.pr	1
Date Performed Inalysis Year Analysis Time Period Inalysis Year Project Description Lihue Urban Core EastWest Street: North/South Street: Umi Street Intersoction Orientation: East-West Study Period (trs): 0.25 Vehicle Volumes and Adjustments Westbound Westbound Movement 1 2 3 4 5 6 Volume 0 610 70 120 670 0 Peak-Hour Factor, PHF 0.92 0	Agency/Co.			Jurisdi	iction				
Analysis Time Period Image: Street June Image: Street June June <thjune< th=""> June June</thjune<>	Date Performed	1/16/2006		Analys	sis Year		-		
Project Description Lihue Urban Core EastWest Street: Anukin Road North/South Street: Umi Street Street: Anukin Road Adjustments Major Street L	Analysis Time Period								
EastWest Street: Mukhin Road North/South Street Unreed Intersection Orientation: East-West Study Period (hrs): 0.25 Vehicle Volumes and Adjustments Westbound Westbound Movement 1 2 3 4 5 6 Velicle Volumes and Adjustments Iteraschows 70 ' 120 / 670 / 0 Movement 1 2 3 4 5 6 Volume 0 610 ' 70 ' 120 / 670 / 0 Percent Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Healtan Type 0 - - 0 - - - - - 0 1 0 1 1 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 <	Project Description Life	ue Urban Core							
Intersection Orientation: Last [Study Period (hrs): 0.25 Vehicle Volumes and Adjustments Eastbound Westbound Movement 1 2 3 4 5 6 Movement L T R L T R Volume 0 610 70 120 670 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 0 663 76 130 728 0 Percent Heavy Vehicles 0 - - 0 - - - 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 1 1 1 1 1 1 1 1 0 1	East/West Street: Ahuk	ini Road		North/S	South Stree	et: Umi Str	reet		
Vehicle Volumes and AdjustmentsMajor StreetEasiboundWestboundMovement123456LTRLTRVolume0610701206700Peak-Hour Factor, PHF0.920.920.920.920.920.92Hourly Flow Rate, HFR0663761307280Percent Heavy Vehicles0Median TypeUndivided0110Chanesized010110Lanes010110Configuration0778LT-Upstream Signal0778LTRVolume1600210000Percent Heavy Vehicles00000Percent Heavy Vehicles00000Mourne Tactor, PHF0.920.920.920.920.92Volume16000000Percent Heavy Vehicles00000Percent Heavy Vehicles00000Percent Heavy Vehicles00000Percent Heavy Vehicles00000RT ChannelizedNNNNNStorage0 <td>Intersection Orientation:</td> <td>East-West</td> <td></td> <td>Study</td> <td>Period (hrs</td> <td>): 0.25</td> <td></td> <td></td> <td></td>	Intersection Orientation:	East-West		Study	Period (hrs): 0.25			
Major StreetWestboundMovement123456LTRLTRVolume0610701206700Peak-Hour Factor, PHF0.920.920.920.920.920.92Median Type0663761307280Percent Heavy Vehicles00Median TypeUndividedRT Channelized0110Lanes010110Opstream Signal0101112Wowment789101112Upstream Signal0210000Minor StreetNorthboundSouthbound00Movement789101112Volume1600210000Percent Heavy Vehicles00000Movement789101112More Signal000000Percent Heavy Vehicles00000Percent Heavy Vehicles00000Percent Heavy Vehicles00000Percent Heavy Vehicles00000Percent Heavy Vehicles00 <td>Vehicle Volumes ar</td> <td><u>id Adjustme</u></td> <td>nts</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Vehicle Volumes ar	<u>id Adjustme</u>	nts						
Movement 1 2 3 4 5 6 L T R L T R L T R Volume 0 610 70 120 670 0 Peak-Hour Factor, PHF 0.92	Major Street		Eastbound				Westbou	Ind	
L I R L I R Volume 0 $670 - 70 - 120 - 670 - 0$ $670 - 0$ $670 - 0$ Peak-Hour Factor, PHF 0.92 <td>Movement</td> <td>1</td> <td>2</td> <td>3</td> <td></td> <td>4</td> <td>5</td> <td></td> <td>6</td>	Movement	1	2	3		4	5		6
Volume 0 610 70 720 670 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 0 663 76 130 728 0 Percent Heavy Vehicles 0 - - 0 - - Median Type Undivided T 0 - - 0 KT Channelized 0 1 1 0 0 - - Upstream Signal 0 1 1 1 0 - 0 - Minor Street Northbound Southbound - 0 - 0 - 0 - 0 - 0	Velvee	L		R 70					<u></u>
rear-hour Factor, PHF 0.32 0.32 0.32 0.32 0.32 0.32 Percent Heavy Vehicles 0 - - 0 - - - 0 - - - - 0 - - - - - - 0 - <t< td=""><td>Volume Rook Hour Factor, BHF</td><td>0 000</td><td>670</td><td>/0</td><td></td><td>120 7</td><td>6/01</td><td></td><td>0</td></t<>	Volume Rook Hour Factor, BHF	0 000	670	/0		120 7	6/01		0
Induity How Reavy Vehicles 0 - 0 - - - 0 -	Hourly Flow Pate HEP	0.92	662	76		130	728		0.92
Indian Tody (vendes) Image: Constraint of the constrain	Percent Heavy Vehicles	0		/0		0	720		
RT Channelized 0 1 0 1 1 0 Lanes 0 1 0 1 1 0 0 Configuration 7R L 7 0 0 0 0 Upstream Signal 0 7R L 7 0 0 0 0 Morement 7 8 9 10 11 12 12 L T R L T R Northbound 0<	Median Type	U			Undivider	4			
An only based O I O I I O I I O I I I O I I I O I I O I I I O I I I O I I O I I I O I I O I I I O I I O I I O I I I O I <thi< th=""> I <thi< th=""> <th< td=""><td>RT Channelized</td><td></td><td></td><td>0</td><td></td><td></td><td>1</td><td></td><td>0</td></th<></thi<></thi<>	RT Channelized			0			1		0
Delay Delay <th< td=""><td>Lanes</td><td></td><td>1</td><td>0</td><td></td><td>1</td><td>1</td><td></td><td>0</td></th<>	Lanes		1	0		1	1		0
Upstream Signal 0 0 0 Minor Street Northbound Southbound Movement 7 8 9 10 11 12 L T R L T R Volume 160 0 210 0 0 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 173 0 228 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 Percent Grade (%) 0 0 0 0 0 0 Flared Approach N N	Configuration			TR		L	T T		
Minor Street Northbound Southbound Movement 7 8 9 10 11 12 L T R L T R Volume 160 0 210 0 0 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 173 0 228 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 Percent Grade (%) 0 0 0 0 0 0 Flared Approach N N 0 0 0 Storage 0 1 0 0 0 0 0 Lanes 1 0 1 0 0 0 0 Delay, Queue Length, and Level of Service N 11 12 Lane Configuration L L	Upstream Signal		0			_	0		
Movement 7 8 9 10 11 12 L T R L T R Volume 160 0 210 0 0 0 Peak-Hour Factor, PHF 0.92 0.92 0.92 0.92 0.92 0.92 0.92 Hourly Flow Rate, HFR 173 0 228 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 Percent Grade (%) 0 0 0 0 0 0 Flared Approach N 0 0 0 0 Storage 0 1 0 0 0 0 0 Lanes 1 0 1 0 <t< td=""><td>Minor Street</td><td></td><td>Northbound</td><td></td><td></td><td></td><td>Southhou</td><td>und</td><td></td></t<>	Minor Street		Northbound				Southhou	und	
L T R L T R Volume 160 0 210 0 0 0 Peak-Hour Factor, PHF 0.92	Movement	7					11		12
Volume 160 0 210 0 0 0 Peak-Hour Factor, PHF 0.92			T	R			τ		R
Peak-Hour Factor, PHF 0.92 0.9	Volume	160	0	210		0	0		0
Hourly Flow Rate, HFR 173 0 228 0 0 0 Percent Heavy Vehicles 0 0 0 0 0 0 0 Percent Grade (%) 0 0 0 0 0 0 0 Flared Approach N 0 0 0 0 0 Storage 0 0 0 0 0 0 0 0 RT Channelized 0 1 0	Peak-Hour Factor, PHF	0.92	0.92	0.92	2	0.92	0.92		0.92
Percent Heavy Vehicles00000Percent Grade (%)0000Flared ApproachNNNStorage000RT Channelized000Lanes1010ConfigurationLR0Delay, Queue Length, and Level of ServiceApproachEBWBNorthboundMovement1478114789Lane ConfigurationLLR1V (vph)1301732281C (m) (vph)876894421V/c0.151.940.52195% queue length0.5214.862.891	Hourly Flow Rate, HFR	173	0	228		0	0		0
Percent Grade (%)00Flared ApproachNNStorage00Storage00RT Channelized00Lanes101OnfigurationLRDelay, Queue Length, and Level of ServiceApproachEBWBNorthboundMovement114789101112Lane ConfigurationLV (vph)1301301732281V (vph)87689442V/c0.1595% queue length0.5214.862.89	Percent Heavy Vehicles	0	0	0		0	0		0
Flared ApproachNNStorage000RT Channelized00Lanes1011010ConfigurationLRDelay, Queue Length, and Level of ServiceApproachEBWBNorthboundMovement1478911478910Lane ConfigurationLLR1V (vph)1301732281V (vph)876894421V/c0.151.940.52195% queue length0.5214.862.891	Percent Grade (%)		0	•			0		
Storage 0 0 0 RT Channelized 0	Flared Approach		N				N		
RT Channelized000Lanes10100ConfigurationLR00Delay, Queue Length, and Level of ServiceApproachEBWBNorthboundSouthboundMovement14789101112Lane ConfigurationLLR12V (vph)130173228C (m) (vph)8768944295% queue length0.5214.862.89	Storage		0				0		
Lanes101000ConfigurationLR000Delay, Queue Length, and Level of ServiceApproachEBWBNorthboundSouthboundMovement14789101112Lane ConfigurationLLR000v (vph)13017322800C (m) (vph)876894420095% queue length0.5214.862.8900	RT Channelized			0					0
ConfigurationLRImage: constraint of the serviceDelay, Queue Length, and Level of ServiceApproachEBWBNorthboundSouthboundMovement14789101112Lane ConfigurationLLRImage: constraint of the serviceImage: constraint of the servicev (vph)130173228Image: constraint of the servicev (vph)87689442Image: constraint of the servicev/c0.151.940.52Image: constraint of the service95% queue length0.5214.862.89Image: constraint of the service	Lanes	1	0	1		0	0		0
Delay, Queue Length, and Level of Service Approach EB WB Northbound Southbound Movement 1 4 7 8 9 10 11 12 Lane Configuration L L R v (vph) 130 173 228	Configuration	L		R					
Approach EB WB Northbound Southbound Movement 1 4 7 8 9 10 11 12 Lane Configuration L L R 11 12 12 12	Delay, Queue Length, a	Ind Level of Se	rvice	•	•		•	•	
Movement 1 4 7 8 9 10 11 12 Lane Configuration L L R 11 12 V (vph) 130 173 228 <td< td=""><td>Approach</td><td>EB</td><td>WB</td><td></td><td>Northboun</td><td>d</td><td>5</td><td>Southbound</td><td>d</td></td<>	Approach	EB	WB		Northboun	d	5	Southbound	d
Lane Configuration L R Image: Configuration Image: Conf	Movement	1	4	7	8	9	10	11	12
v (vph) 130 173 228 C (m) (vph) 876 89 442 v/c 0.15 1.94 0.52 95% queue length 0.52 14.86 2.89	Lane Configuration		L	L		R			
C (m) (vph) 876 89 442 v/c 0.15 1.94 0.52 95% queue length 0.52 14.86 2.89	v (vph)		130	173		228			
V/c 0.15 1.94 0.52 95% queue length 0.52 14.86 2.89	C (m) (vph)		876	89		442			
95% queue length 0.52 14.86 2.89	v/c	•	0.15	1.94		0.52			
	95% queue length		0.52	14.86		2.89			
Control Delay 9.8 541.5 21.5	Control Delay		9.8	541.5		21.5			
LOS A F C	LOS		А	F		С			
Approach Delay 245.8	Approach Delav				245.8		E		•
Approach LOS F	Approach LOS	F							

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	٦ [×]	†]-		ኻኻ	≜ ₽		٣	ĥ		ሻ	Ĥ	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.89		1.00	0.89	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3485		3433	3485		1770	1657		1770	1664	
Flt Permitted	0.95	1.00		0.95	1.00		0.68	1.00		0.49	1.00	
Satd. Flow (perm)	3433	3485		3433	3485		1272	1657		920	1664	
Volume (vph)	75	610	70	120	670	75	160	75	210	75	30	75
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)	82	663	76	130	728	82	174	82	228	82	33	82
RTOR Reduction (vph)	0	18	0	0	17	0	0	145	0	0	52	0
Lane Group Flow (vph)	82	721	0	130	793	0	174	165	0	82	63	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	2.2	14.8		3.8	16.4		17.4	17.4		17.4	17.4	
Effective Green, g (s)	2.2	14.8		3.8	16.4		17.4	17.4		17.4	17.4	
Actuated g/C Ratio	0.05	0.31		0.08	0.34		0.36	0.36		0.36	0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	157	1075		272	1191		461	601		334	603	
v/s Ratio Prot	0.02	0.21		c0.04	c0.23			0.10			0.04	
v/s Ratio Perm							c0.14			0.09		
v/c Ratio	0.52	0.67		0.48	0.67		0.38	0.27		0.25	0.10	
Uniform Delay, d1	22.4	14.5		21.2	13.5		11.3	10.8		10.7	10.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	1.7		1.3	1.4		2.3	1.1		1.7	0.3	
Delay (s)	25.5	16.1		22.5	14.9		13.6	12.0		12.5	10.5	
Level of Service	С	В		С	В		В	В		В	В	
Approach Delay (s)		17.1			15.9			12.6			11.3	
Approach LOS		В			В			В			В	
Intersection Summary		1. A.						100				
HCM Average Control D	elay		15.3	ł	ICM Lev	vel of Se	ervice		В			
HCM Volume to Capacit	y ratio		0.48									
Actuated Cycle Length (s)		48.0	5	Sum of le	ost time	(s)		8.0			
Intersection Capacity Ut	lization		58.6%	ŀ	CU Leve	el of Ser	vice		В			
Analysis Period (min)			15									
c Critical Lane Group												

18 Palai St. at Ahakimi Rd





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				CONTR		1.67	MADY		-		
Conoral Informati		1000	WAT STOP								
General Informati	on				ntorn	હા	on		-		<u> </u>
Analyst					ection			Int 18 - L	=xisting	i.am	
Agency/Co.		41461000	<u> </u>	JUriso		_					
Apolycic Time Period		1/10/2000	0	Analys	sis reat	<u>(</u>					———————————————————————————————————————
						<u> </u>					$- \neq$
Project Description	Linue	Urban Co	ore	N La vella //	Caulto C		AL Datat	Ctrin ed.			
East/West Street: An				INORTH Study	South S	otre /bro	et: reater	Street		_	
	<u>. c</u>	asi-wesi		piuuy	Felloa	(1118	5). 0.25				
Vehicle Volumes	and .	Adjustn	nents								
Major Street			Lastbound			_		Westbo	und		
		1	2	3			4	5 T			<u>8</u>
Volume		<u> </u>	246					570			<u>R</u>
Peak-Bour Factor, PHI		002	0.02	20			002	0/9		0	02
Hourly Flow Rate HER		0.92	376	27			92	629		0.	92 N
Percent Heavy Vehicle		0					<u> </u>	023			-
Median Type	.3	0			Undivi	der	<u> </u>				
RT Channelized				0					~		0
Lanes		0	1				0	1			0
Configuration			,	TR			ίτ	· ·			0
Upstream Signal			0					0			
Minor Street	-		Northbound			Southbo	und				
Movement	+	7	8	9			10	11			12
	+		τ	R			1	Т			R
Volume	_	46 /	0	37	/		0	0			0
Peak-Hour Factor, PH		0.92	0.92	0.92	· ·		0.25	0.92		0	92
Hourly Flow Rate, HFF	2	49	0	40			0	0 0.32			0
Percent Heavy Vehicle	s	0	0	0			0	0		-	0
Percent Grade (%)	-		0					0		-	
Flared Approach			N					N		-	
Storage	-		0					0	-	-	-
Diviage PT Channelized	_		0				-	0	-	-	^
	_	4					0		-	-	0
		1	0				0	0	-		0
		L		R			_		-	_	_
Delay, Queue Length	, and	Level of	Service				_				_
Approach		EB	WB	f	Vorthbo	und	1	5	Southbo	ound	
Movement		1	4	7	8		9	10	11		12
Lane Configuration			LT	L			R				
v (vph)			92	49			40				
C (m) (vph)			1167	190			663				
v/c			0.08	0.26			0.06				
95% queue lenath			0.26	0.99			0.19	-			-
Control Delay			8.3	30.4			10.8	1			
LOS	-		A	D	-		B			-	
Approach Delay	-				21.6			-	L	-	
Approach LOC					21.0						
Approach EUS				<u> </u>					1		

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1.

TWO-WAY STOP CONTROL SUMMARY										
General Informatio	n		Site I	nform	ation					
Analyst			Inters	ection		Int 18 - E	Baseline	.am		
Agency/Co.			Jurisd	iction						
Date Performed	1/16/200	6	Analy	sis Year						
Analysis Time Period										
Project Description Lil	hue Urban Co	ore								
East/West Street: Ahuk	ini Road		North/	South S	treet: Pa	ləi Street				
Intersection Orientation:	East-West		Study	Period ((hrs): 0.2	5				
Vehicle Volumes a	nd Adjustn	nents								
Major Street		Eastbound				Westbou	und			
Movement	1	2	3		4	5		6		
	L	T ORD (R	/	L	T		R		
Volume	0	620 -	30	<i>-</i>	110	810	20	0		
Peak-Hour Factor, PHF	0.92	0.92	0.92	-	0.92	0.92		0.92		
Houriy Flow Rate, HFR	0	6/3			119	880		0		
Median Type	0			Llodivia	0					
RT Chonnelized					Jeu					
KT Channelized		1	0		<u>^</u>			0		
Configuration	<u> </u>	/			<u> </u>	/		0		
		0			L1					
	1									
Minor Street	7	Northbound			40	Southbo	und	40		
	/	- <u>8</u>	9		10			<u> </u>		
	L		R FO		L					
Volume Book Hour Footor, DUE	0.02	0 0 0 0 0	0.02		0	0		0.02		
Hourly Claw Poto HEP	0.92	0.92	0.92					0.92		
Percent Heavy Vehicles	05	0	07		0			0		
Percent Grade (%)	0				U			0		
Flared Approach						//				
Storage		0				0				
RT Channelized			0					0		
Lanes	1	0	1		0	0		0		
Configuration	L									
Delay, Queue Length, a	and Level of	Service				_				
Approach	EB	VVB	۲ 			<u> </u>		ind 10		
Movement	1	4	1	8	9	10	11	12		
Lane Configuration			L			_				
v (vph)		119	65		54	_		_		
C (m) (vph)		902	76		449					
v/c		0.13	0.86		0.12		I			
95% queue length		0.45	4.30		0.41					
Control Delay		9.6	158.7		14.1					
LOS		A	F		В					
Approach Delay				93.1						
Approach LOS				F						

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	TWO-	WAY STOP	CONTR	OL SU	IM	MARY				
General Informatior			Site I	nform	atio	on				
Analyst			Interse	ection			Int 18 - N	letwo	ork A.a	am
Agency/Co.			Jurisd	Jurisdiction						
Date Performed	1/16/2006		Analys	Analysis Year						_
Analysis Time Period										
Project Description Lih	ue Urban Cor	те Т			_					
East/West Street: Ahuki	ni Road		North/S	South S	tree	t: Palai	Street			
Intersection Orientation:	East-West		Study	Period ((hrs)	: 0,25				
Vehicle Volumes an	d Adjustm	ents								
Major Street		Eastbound					Westbou	Ind		
Movement	1	2	3			4	5			6
la kura a	L	600	R 200				910			R
Volume Doold Hour Easter, DHE	0.02	0.02	30			02	010			0
Hourly Flow Rate HER	0.92	673	32			110	880	_		0
Percent Heavy Vehicles	0	0/3	52			0				-
Median Type	0			Undivid	ded	<u> </u>				
RT Channelized			0							0
Lanes	0	2	0			1	2			0
Configuration		τ	TR			L	T			
Upstream Signal		0					0			
Minor Street		Northbound					Southbo	und		
Movement	7	8	9			10	11			12
	L	T	R			L	Т			R
Volume	60	0	50			0	0			0
Peak-Hour Factor, PHF	0.92	0.92	0.92		0	0.25	0.92		0	.92
Hourly Flow Rate, HFR	65	0	54		0		0			0
Percent Heavy Vehicles	0	0	0			0	0			0
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0							0
Lanes	1	0	1			0	0			0
Configuration	L		R							
Delay, Queue Length, a	nd Level of S	Service								
Approach	EB	WB	1	lorthbo	und		S	outh	bound	1
Movement	1	4	7	8		9	10	1	11	12
Lane Configuration		L	L			R				
v (vph)		119	65			54				
C (m) (vph)		902	122			650				
v/c		0.13	0.53			0.08				
95% queue length		0.45	2.53			0.27				
Control Delay		9.6	64.0			11.0				
LOS		A	F			B				
Approach Delay	-	40.0								
Approach LOS		-		Е						

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	TWO	-WAY STOP	CONTR	OLS	SUM	MARY					
General Information	on		Site I	nforr	nat	ion					
Analyst			Inters	ection			Int 18 - E	Existin	ig.pm		
Agency/Co.			Jurisd	iction							
Date Performed	1/16/200	5	Analys	sis Ye	ar						
Analysis Time Period											
Project Description L	ihue Urban Co	nre									
East/West Street: Ahu	ukini Road		North/	South	Stre	et: Palai	Street				
Intersection Orientation	n: East-West		Study	Study Period (hrs): 0.25							
Vehicle Volumes	and Adjustn	nents									
Major Street		Eastbound					Westbou	Juq			
Movement	1	2	3			4	5			6	
V aluma a							E 600			к о	
Poak Hour Easter DH		0.02	2/			<u>31</u>	0.02	-		02	
Hourly Flow Bate HEF		594	20			33	573			0	
Percent Heavy Vehicle						0					
Median Type	3 0			Undi	 vided						
RT Channelized		1	0	0,701		-				0	
Lanes	0	1	0			0	1			0	
Configuration		,				LT				-	
Upstream Signal		0					0				
Minor Street		Northbound					Southbo	und			
Movement	7	all 8	9	1	1	10	11	<u> </u>		12	
	L	T	R	d		L	Т			R	
Volume	-35 10	0	35	60		0	0			0	
Peak-Hour Factor, PH	0.92	0.92	0.92		0.92		0.92		0	.92	
Hourly Flow Rate, HFF	38	0	38		0		0			0	
Percent Heavy Vehicle	s 0	0	0			0	0			0	
Percent Grade (%)		0					0				
Flared Approach		N					N				
Storage		0					0				
RT Channelized			0							0	
Lanes	1	0	1			0	0			0	
Configuration	L		R								
Delay, Queue Length,	and Level of	Service	•								
Approach	EB	WB	1	Vorthb	ound	1	S	outhb	ound		
Movement	1	4	7	8		9	10	1	1	12	
Lane Configuration		LT	L			R					
v (voh)		33	38			38					
$C(\mathbf{m})(\mathbf{m})$		968	186			499					
		0.03	0.20			0.08					
0E% augus longth		0.03	0.20			0,00					
95% queue lengui		0.77	20.74			120					
Control Delay		0.9	29.3			12.0		-	-		
LUS		A	D		-	В	-	-	-		
Approach Delay				21.	0						
Approach LOS	C										

HCS2000TM

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	TWO	-WAY STOP	CONTR	OL SU	MMARY				
General Informatio	n		Site	nforma	ation				
Analyst			Inters	ection		Int 18 - E	Baselin	e.pm	
Agency/Co.			Jurisc	liction					
Date Performed	1/16/200	6	Analy	sis Year					
Analysis Time Period									
Project Description Lil	nue Urban Co	ore							
East/West Street: Ahuk	ini Road		North/South Street: Palai Street						
Intersection Orientation:	East-West		Study	Period (I	nrs): 0.25				
Vehicle Volumes a	nd Adjustr	nents							
Major Street		Eastbound				Westbou	und		
Movement	1	2	3		4	5		6	
	L	T	R			Т		R	
	0	750 /	30	~	40	790	·*	0	
Peak-Hour Factor, PHF	0.92	0.92	0.92	<u> </u>	0.92	0.92		0.9	2
Hourly Flow Rate, HFR	0	875	32		43	858		0	
Medion Tune	0								
RT Channelized				Unaivia	ea	<u> </u>		0	
Ki Channelizeu			0		0	4	_	0	
Configuration	0	,				7		0	
			in			0			
Minor Street					10		und	10	<u> </u>
	1		9		01			 D	
Volume	<u> </u>			-			-+		
Peak-Hour Factor PHF	0.02	0.92	002	,	0 002	0.02		0	2
Hourly Flow Rate HER	0.92	0.92	54		0.92	0.92		0.9.	ζ
Percent Heavy Vehicles	0	0			0	0	\rightarrow	0	
Percent Grade (%)		0	·			0			
Flared Approach			<u> </u>			<u> </u>			
Storage			+						
Storage DT Channelized		0	<u> </u>			U			
	4							0	
Configuration	7	0	7		U	0		0	
			ĸ						
Delay, Queue Length, a	nd Level of	Service		1					
Approach	EB	VVB		Vorthoou	nơ	S		bund	
Movement	1	4	7	8	9	10	11		12
Lane Configuration		LT	L		R				
v (vph)		43	54		54				
C (m) (vph)		799	87		373				
v/c		0.05	0.62		0.14				
95% queue length		0.17	2.89		0.50				
Control Delay		9.8	98.3		16.3				
LOS		A	F		C				
Approach Delav	57.3								
Approach LOS									
				1		L			

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		TWO-	NAY STOP	CONTR	OLS	UM	MARY				
General Informati	on			Site I	nform	nati	on				
Analyst				Interse	ection			Int 18 - I	Netwo	ork A.	om
Agency/Co.				Jurisd	iction						
Date Performed	1/	16/2006		Analys	sis Yea	ır					
Analysis Time Period											
Project Description	ihue Uı	rban Core	e								
East/West Street: Ahu	ukini Ro	ad		North/S	South S	Stree	et: Palai	Street			
Intersection Orientation	n: Eas	st-West		Study	Study Period (hrs): 0.25						
Vehicle Volumes	and A	djustm	ents								
Major Street			Eastbound					Westbo	und		
Movement		1	2	3			4	5			6
Valuma	_	<u>L</u>	750	R 20			L 10	700			R
Peak-Hour Factor PHI	= 0	0	750	0.02			40	0.02		0	0
Hourly Flow Rate HFR		0	815	.32			43	858			0
Percent Heavy Vehicle	<u>,</u>	0					0				
Median Type	<u> </u>	0			Undiv	idea					
RT Channelized	-			0							0
Lanes	+	0	2	0			1	2			0
Configuration			T	TR			L	Т			
Upstream Signal			0					0			
Minor Street			Northbound					Southbo	und		
Movement		7	8	9			10	11			12
		L	Т	R			L	Т			R
Volume		50	0	50		0		0			0
Peak-Hour Factor, PH	= 0).92	0.92	0.92			0.92	0.92		0	.92
Hourly Flow Rate, HFF	2	54	0	54			0	0			0
Percent Heavy Vehicle	s	0	0	0			0	0			0
Percent Grade (%)			0					0			
Flared Approach			N		_			N			
Storage			0					0			
RT Channelized				0							0
Lanes		1	0	1			0	0			0
Configuration		L		R							
Delay, Queue Length	, and Le	evel of S	ervice								
Approach	E	в	WB	Ŷ	lorthba	ounc		5	South	bound	ł
Movement	1		4	7	8		9	10	1	11	12
Lane Configuration			L	L			R				
v (vph)			43	54			54				
C (m) (vph)			799	137			584		1		
v/c			0.05	0.39			0.09				
95% queve length			0.17	1.68			0,30				
Control Delay			9.8	47.4			11.8				
LOS			A	E		-	B		1	-	
Approach Delaw		-	-		20 6	5	-		-		
Approach LOS		29.0									
Approach LUS		-			U						

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	£	19- Kapule Hory as	+ Ahakini Rd
11 - 11 - 11 - 12 - 22 - 5 - 22 - 5 - 22 - 5			
CASE 1.19 And Existing	CASE Biseline	CASE NETWORK &	CASE Network B

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CASE 119 m	CASE Georgen	CASE Netostik A PM	CASE Netomike PM

HCM Signalized Intersection Capacity Analysis 19: Ahukini Road & Kapule Highway

1/14/2006

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	1	1	3	1	1	5	1	1	N.	4	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	171	116	83	100	110	41	88	320	129	116	520	541
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)	186	126	90	109	120	45	96	348	140	126	565	588
RTOR Reduction (vph)	0	0	79	0	0	40	0	0	91	0	0	350
Lane Group Flow (vph)	186	126	11	109	120	5	96	348	49	126	565	238
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	5.0	7.7	7.7	5.0	7.7	7.7	7.6	20.6	20.6	10.7	23.7	23.7
Effective Green, g (s)	4.0	6.7	6.7	4.0	6.7	6.7	6.6	19.6	19.6	9.7	22.7	22.7
Actuated g/C Ratio	0.07	0.12	0.12	0.07	0.12	0.12	0.12	0.35	0.35	0.17	0.41	0.41
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	126	223	189	126	223	189	209	652	554	307	755	642
v/s Ratio Prot	c0.11	c0.07		0.06	0.06		0.05	0.19		c0.07	c0.30	
v/s Ratio Perm			0.01			0.00			0.03			0.15
v/c Ratio	1.48	0.57	0.06	0.87	0.54	0.03	0.46	0.53	0.09	0.41	0.75	0.37
Uniform Delay, d1	26.0	23.3	21.8	25.7	23.2	21.8	23.0	14.5	12.2	20.6	14.2	11.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	252.0	3.3	0.1	42.0	2.5	0.1	1.6	3.1	0.3	0.9	6.7	1.6
Delay (s)	278.0	26.5	22.0	67.7	25.7	21.8	24.6	17.7	12.5	21.5	20.9	13.3
Level of Service	F	С	С	E	С	С	С	В	В	С	С	В
Approach Delay (s)		141.8			41.8			17.6			17.5	
Approach LOS		F			D			В			В	
Intersection Summary								and the second				2-2-1
HCM Average Control C	Delay		39.8		ICM Le	vel of Se	ervice		D	1		
HCM Volume to Capaci	ty ratio		0.75	1								
Actuated Cycle Length ((s)		56.0	9	Sum of L	ost time	(s)		16.0			
Intersection Capacity Ut	lilization	1	58.4%	le le	CU Leve	el of Ser	vice		B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 19: Ahukini Road & Kapule Highway

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ካ	1	1	ሻ	1	1	٦	1	1	۲	+	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	240	250	120	250	310	60	120	460	230	180	750	750
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)	261	272	130	272	337	65	130	500	250	196	815	815
RTOR Reduction (vph)	0	0	108	0	0	53	0	0	155	0	0	268
Lane Group Flow (vph)	261	272	22	272	337	12	130	500	95	196	815	547
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2	0 - 100	1	6	
Permitted Phases			4			8			2	-	15	6
Actuated Green, G (s)	16.0	18.0	18.0	17.0	19.0	19.0	9.0	38.9	38.9	14.1	44.0	44.0
Effective Green, q (s)	15.0	17.0	17.0	16.0	18.0	18.0	8.0	37.9	37.9	13.1	43.0	43.0
Actuated g/C Ratio	0.15	0.17	0.17	0.16	0.18	0.18	0.08	0.38	0.38	0.13	0.43	0.43
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	266	317	269	283	335	285	142	706	600	232	801	681
v/s Ratio Prot	0.15	0.15	i san shuri	c0.15	c0.18		0.07	0.27		c0.11	0.44	
v/s Ratio Perm			0.08			0.04			0.16	The state of the s		0.51
v/c Ratio	0.98	0.86	0.08	0.96	1.01	0.04	0.92	0.71	0.16	0.84	1.02	0.80
Uniform Delay, d1	42.4	40.3	34.9	41.7	41.0	33.9	45.7	26.4	20.5	42.5	28.5	24.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	49.7	19.9	0.1	42.7	50.7	0.1	50.5	5.9	0.6	23.5	36.2	9.7
Delay (s)	92.1	60.2	35.1	84.4	91.7	33.9	96.2	32.3	21.1	66.0	64.7	34.5
Level of Service	F	E	D	F	F	С	F	C	C	E	E	C
Approach Delay (s)		67.8	1000100	distant.	83.2	LO MOZO	100	38.5		-	51.4	
Approach LOS		E			F			D			D	
Intersection Summary												
HCM Average Control D	elay		56.6	/ 1	HCM Le	vel of Se	ervice		E	/		
HCM Volume to Capaci	ty ratio		1.06	1								
Actuated Cycle Length (s)		100.0	\$	Sum of I	ost time	(s)		12.0			
Intersection Capacity Ut	ilization		89.1%		CU Lev	el of Sei	vice		E			
Analysis Period (min)			15									
c Critical Lane Group												



HCM Signalized Intersection Capacity Analysis 19: AHUKINI ROAD & KAPULE HIGHWAY

1/21/2006

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻሻ	††	7	<u> </u>	^	7	٣	<u>^</u>	7	7	<u>†</u> †	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	240	250	120	250	310	60	120	460	230	180	750	750
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)	261	272	130	272	337	65	130	500	250	196	815	815
RTOR Reduction (vph)	0	0	115	0	0	54	0	0	156	0	0	268
Lane Group Flow (vph)	261	272	15	272	337	11	130	500	94	196	815	547
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	11.3	11.7	11.7	16.3	16.7	16.7	11.7	35.0	35.0	15.0	38.3	38.3
Effective Green, g (s)	10.3	10.7	10.7	15.3	15.7	15.7	10.7	34.0	34.0	14.0	37.3	37.3
Actuated g/C Ratio	0.11	0.12	0.12	0.17	0.17	0.17	0.12	0.38	0.38	0.16	0.41	0.41
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	393	421	188	301	617	276	210	1337	598	275	1467	656
v/s Ratio Prot	0.08	0.08		c0.15	c0.10		0.07	0.14		c0.11	0.23	
v/s Ratio Perm			0.01			0.01			0.06			c0.35
v/c Ratio	0.66	0.65	0.08	0.90	0.55	0.04	0.62	0.37	0.16	0.71	0.56	0.83
Uniform Delay, d1	38.2	37.8	35.3	36.6	33.9	30.9	37.7	20.3	18.5	36.1	20.0	23.6
Progression Factor	1.08	1.01	1.26	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.0	3.3	0.2	28.4	1.0	0.1	5.3	0.8	0.6	8.4	1.5	11.9
Delay (s)	45.5	41.6	44.8	65.1	34.9	31.0	43.1	21.1	19.1	44.5	21.6	35.5
Level of Service	D	D	D	E	С	С	D	С	В	D	С	D/
Approach Delay (s)		43.7			46.7			23.8			30.3	
Approach LOS		D			D			С			С	
Intersection Summary								-				
HCM Average Control D	elay		33.8	ŀ	ICM Le	vel of Se	ervice		С	÷.		
HCM Volume to Capacit	y ratio		0.78									
Actuated Cycle Length (s)		90.0	S	Sum of le	ost time	(s)		12.0			
Intersection Capacity Uti	lization		71.7%	l.	CU Leve	el of Ser	vice		С			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 19: AHUKINI ROAD & KAPULE HIGHWAY

1/21/2006

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	<u>.</u>	† †	1	ሻ	^	7	ኘ	*	7	ሻ	<u>^</u>	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	240	250	120	250	310	60	120	460	230	180	750	750
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)	261	272	130	272	337	65	130	500	250	196	815	815
RTOR Reduction (vph)	0	0	112	0	0	56	0	0	159	0	0	295
Lane Group Flow (vph)	261	272	18	272	337	9	130	500	91	196	815	520
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	16.2	13.4	13.4	16.3	13.5	13.5	10.5	33.7	33.7	14.6	37.8	37.8
Effective Green, g (s)	15.2	12.4	12.4	15.3	12.5	12.5	9.5	32.7	32.7	13.6	36.8	36.8
Actuated g/C Ratio	0.17	0.14	0.14	0.17	0.14	0.14	0.11	0.36	0.36	0.15	0.41	0.41
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	299	488	218	301	492	220	187	1286	575	267	1447	647
v/s Ratio Prot	0.15	0.08		c0.15	c0.10		0.07	0.14		c0.11	0.23	
v/s Ratio Perm			0.01			0.01			0.06			c0.33
v/c Ratio	0.87	0.56	0.08	0.90	0.68	0.04	0.70	0.39	0.16	0.73	0.56	0.80
Uniform Delay, d1	36.5	36.2	33.8	36.6	36.9	33.6	38.9	21.2	19.4	36.5	20.4	23.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.3	1.4	0.2	28.4	3.9	0.1	10.7	0.9	0.6	10.0	1.6	10.2
Delay (s)	59.7	37.6	34.0	65.1	40.8	33.6	49.5	22.1	19.9	46.5	22.0	33.6
Level of Service	E	D	С	E	D	С	D	С	В	D	С	C/
Approach Delay (s)		45.6			49.9			25.6			29.8	
Approach LOS		D			D			С			С	
Intersection Summary	211			1			Pile Pile			1		
HCM Average Control D	elay		34.8	/ +	ICM Le	vel of Se	ervice		С			
HCM Volume to Capacit	y ratio		0.74	1								
Actuated Cycle Length (s)		90.0	5	Sum of le	ost time	(s)		8.0			
Intersection Capacity Uti	lization		71.7%	ŀ	CU Leve	el of Ser	vice		С			
Analysis Period (min)			15									
c Critical Lane Group												

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	Ť	7	٦	1	7	۲		7	۲	↑	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	468	144	55	166	203	151	126	562	179	82	347	258
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)	509	157	60	180	221	164	137	611	195	89	377	280
RTOR Reduction (vph)	0	0	43	0	0	139	0	0	130	0	0	197
Lane Group Flow (vph)	509	157	17	180	221	25	137	611	65	89	377	83
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	25.0	25.8	25.8	13.8	14.6	14.6	10.6	31.0	31.0	7.4	27.8	27.8
Effective Green, g (s)	24.0	24.8	24.8	12.8	13.6	13.6	9.6	30.0	30.0	6.4	26.8	26.8
Actuated g/C Ratio	0.27	0.28	0.28	0.14	0.15	0.15	0.11	0.33	0.33	0.07	0.30	0.30
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	472	513	436	252	282	239	189	621	528	126	555	471
v/s Ratio Prot	c0.29	0.08		0.10	c0.12		c0.08	c0.33		0.05	0.20	
v/s Ratio Perm			0.01			0.02			0.04			0.05
v/c Ratio	1.08	0.31	0.04	0.71	0.78	0.10	0.72	0.98	0.12	0.71	0.68	0.18
Uniform Delay, d1	33.0	25.8	23.9	36.9	36.8	32.9	38.9	29.8	20.9	40.9	27.8	23.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	64.1	0.3	0.0	9.2	13.3	0.2	12.9	32.4	0.5	16.5	6,6	0.8
Delay (s)	97.1	26.1	23.9	46.1	50.1	33.1	51.8	62.1	21.3	57.4	34.4	24.2
Level of Service	F	С	С	D	D	С	D	E	С	E	С	С
Approach Delay (s)		75.7			43.9			52.2			33.3	
Approach LOS		E			D			D			С	
Intersection Summary	2								11-12			
HCM Average Control D	Delav		51.6	1	ICM Le	vel of Se	ervice		D	/		
HCM Volume to Capaci	ty ratio		0.97	1								
Actuated Cycle Length	(s)		90.0	5	Sum of I	ost time	(s)		16.0			
Intersection Canacity Ut	ilization		84.1%	i i	CU Lev	el of Sei	vice		E			
Analysis Period (min)			15	•			and the second sec					
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis 19: Ahukini Road & Kapule Highway

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	۲	1	1	۲	+	1	ሻ	+	7	5	Ť	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	660	390	80	270	330	220	170	800	360	130	490	340
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)	717	424	87	293	359	239	185	870	391	141	533	370
RTOR Reduction (vph)	0	0	54	0	0	121	0	0	118	0	0	183
Lane Group Flow (vph)	717	424	33	293	359	118	185	870	273	141	533	187
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	45.0	44.0	44.0	26.0	25.0	25.0	17.0	58.0	58.0	10.0	51.0	51.0
Effective Green, g (s)	44.0	43.0	43.0	25.0	24.0	24.0	16.0	57.0	57.0	9.0	50.0	50.0
Actuated g/C Ratio	0.29	0.29	0.29	0.17	0.16	0.16	0.11	0.38	0.38	0.06	0.33	0.33
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	519	534	454	295	298	253	189	708	602	106	621	528
v/s Ratio Prot	c0.41	0.23		0.17	c0.19		0.10	c0.47		c0.08	0.29	
v/s Ratio Perm			0.05			0.15			0.25			0.23
v/c Ratio	1.38	0.79	0.07	0.99	1.20	0.47	0.98	1.23	0.45	1.33	0.86	0.35
Uniform Delay, d1	53.0	49.4	39.0	62.4	63.0	57.2	66.8	46.5	34.8	70.5	46.7	37.8
Progression Factor	1.03	0.98	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	183.3	7.9	0.1	50.3	119.5	1.4	58.6	115.2	2.4	199.5	14.3	1.9
Delay (s)	238.0	56.3	39.3	112.7	182.5	58.6	125.4	161.7	37.3	270.0	61.0	39.6
Level of Service	F	E	D	F	F	E	F	F	D	F	E	D /
Approach Delay (s)		161.2			126.3			123.4			81.7	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control E	Delay		124.6	1 1	HCM Le	vel of Se	ervice		E	/		
HCM Volume to Capaci	ty ratio		1.28	1								
Actuated Cycle Length ((s)		150.0	5	Sum of I	ost time	(s)		16.0			
Intersection Capacity Ut	ilization	1	16.6%	1	CU Lev	el of Sei	rvice		Н			
Analysis Period (min)			15									
c Critical Lane Group												

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HCM Signalized Intersection Capacity Analysis 19: AHUKINI ROAD & KAPULE HIGHWAY

1/21/2006

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	ሻካ	**	7	٢	**	7	٣	**	۴	٦	**	۲	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583	
Volume (vph)	660	390	80	270	330	220	170	800	360	130	490	340	1
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)	717	424	87	293	359	239	185	870	391	141	533	370	
RTOR Reduction (vph)	0	0	71	0	0	186	0	0	271	0	0	265	
Lane Group Flow (vph)	717	424	16	293	359	53	185	870	120	141	533	105	
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm	
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases			4			8			2			6	
Actuated Green, G (s)	18.8	15.8	15.8	16.5	13.5	13.5	12.1	25.5	25.5	10.2	23.6	23.6	
Effective Green, g (s)	17.8	14.8	14.8	15.5	12.5	12.5	11.1	24.5	24.5	9.2	22.6	22.6	
Actuated g/C Ratio	0.22	0.18	0.18	0.19	0.16	0.16	0.14	0.31	0.31	0.12	0.28	0.28	
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	764	655	293	343	553	247	246	1084	485	204	1000	447	
v/s Ratio Prot	c0.21	c0.12		0.17	0.10		c0.10	c0.25		0.08	0.15		
v/s Ratio Perm			0.01			0.03			0.08			0.07	
v/c Ratio	0.94	0.65	0.05	0.85	0.65	0.22	0.75	0.80	0.25	0.69	0.53	0.23	-
Uniform Delay, d1	30.6	30.2	26.8	31.2	31.7	29.5	33.1	25.5	20.8	34.0	24.2	22.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	18.9	2.2	0.1	18.3	2.6	0.4	12.2	6.3	1.2	9.7	2.0	1.2	
Delay (s)	49.5	32.4	26.9	49.4	34.3	29.9	45.3	31.8	22.0	43.7	26.3	23.3	-
Level of Service	D	С	С	D	С	С	D	С	С	D	С	С	-
Approach Delay (s)		42.0			38.1			30.9			27.6		
Approach LOS		D			D			С			С		
Intersection Summary								1.16	The state				
HCM Average Control E)elay		34.5	1	ICM Le	vel of Se	ervice		С	1			
HCM Volume to Capaci	ty ratio		0.74	-									
Actuated Cycle Length ((s)		80.0	S	Sum of l	ost time	(s)		8.0				
Intersection Capacity Ut	ilization		70.6%	ŀ	CU Lev	el of Sei	rvice		С				
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis 19: AHUKINI ROAD & KAPULE HIGHWAY

1/21/2006

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT_	SBR
Lane Configurations	ሻሻ	**	7	¥	# #	1	ሻ	÷+	1	5	† †	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
FIt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	660	390	80	270	330	220	170	800	360	130	490	340
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)	717	424	87	293	359	239	185	870	391	141	533	370
RTOR Reduction (vph)	0	0	71	0	0	186	0	0	271	0	0	265
Lane Group Flow (vph)	717	424	16	293	359	53	185	870	120	141	533	105
Turn Type	Prot		Perm	Prot	DBN COMP	Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	18.8	15.8	15.8	16.5	13.5	13.5	12.1	25.5	25.5	10.2	23.6	23.6
Effective Green, g (s)	17.8	14.8	14.8	15.5	12.5	12.5	11.1	24.5	24.5	9.2	22.6	22.6
Actuated g/C Ratio	0.22	0.18	0.18	0.19	0.16	0.16	0.14	0.31	0.31	0.12	0.28	0.28
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	764	655	293	343	553	247	246	1084	485	204	1000	447
v/s Ratio Prot	c0.21	c0.12		0.17	0.10		c0.10	c0.25		0.08	0.15	
v/s Ratio Perm			0.01			0.03			0.08			0.07
v/c Ratio	0.94	0.65	0.05	0.85	0.65	0.22	0.75	0.80	0.25	0.69	0.53	0.23
Uniform Delay, d1	30.6	30.2	26.8	31.2	31.7	29.5	33.1	25.5	20.8	34.0	24.2	22.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.9	2.2	0.1	18.3	2.6	0.4	12.2	6.3	1.2	9.7	2.0	1.2
Delay (s)	49.5	32.4	26.9	49.4	34.3	29.9	45.3	31.8	22.0	43.7	26.3	23.3
Level of Service	D	С	С	D	С	С	D	С	С	D	С	С
Approach Delay (s)		42.0			38.1			30.9			27.6	
Approach LOS		D			D			С			С	
Intersection Summary			Caller,		-740		100	- Sec	AN LOW		- Ali	No.20E
HCM Average Control D	Delay		34.5	H	ICM Le	vel of S	ervice		С			
HCM Volume to Capaci	ty ratio		0.74									
Actuated Cycle Length ((s)		80.0	S	Sum of I	ost time	(s)		8.0			
Intersection Capacity Ut	ilization		70.6%	1	CU Leve	el of Sei	rvice		С			
Analysis Period (min)			15									
c Critical Lane Group												





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Movement	EBL	EBR	NBL	NBT	SBT	SBR	and the second
Lane Configurations	35	ŕ	ሻ	Ť	个	ก้	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.85	
Fit Protected	0.95	1.00	0.95	1.00	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	1863	1863	1583	
Volume (vph)	12	5	11	483	637	41	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	13	5	12	525	692	45	
RTOR Reduction (vph)	0	5	0	0	0	8	
Lane Group Flow (vph)	13	0	12	525	692	37	
Turn Type		Perm	Prot			Perm	
Protected Phases	4		5	2	6		
Permitted Phases		4				6	
Actuated Green, G (s)	2.8	2.8	1.6	83.0	77.4	77.4	
Effective Green, g (s)	2.8	2.8	1.6	83.0	77.4	77.4	
Actuated g/C Ratio	0.03	0.03	0.02	0.88	0.83	0.83	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	53	47	30	1648	1537	1306	
v/s Ratio Prot	c0.01		0.01	c0.28	c0.37		
v/s Ratio Perm		0.00				0.02	
v/c Ratio	0.25	0.00	0.40	0.32	0.45	0.03	
Uniform Delay, d1	44.5	44.1	45.6	0.9	2.3	1.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.4	0.0	8.5	0.5	1.0	0.0	
Delay (s)	46.9	44.2	54.2	1.4	3.2	1.5	
Level of Service	D	D	D	A	A	A	
Approach Delay (s)	46.1			2.6	3.1		
Approach LOS	D			А	А		
Intersection Summary							
HCM Average Control D	elay		3.5	F	ICM Le	vel of Ser	rvice A
HCM Volume to Capacit	ty ratio		0.45				
Actuated Cycle Length ((s)		93.8	S	Sum of le	ost time ((s) 12.0
Intersection Capacity Ut	ilization		43.5%	ŀ	CU Leve	el of Serv	vice A
Analysis Period (min)			15				
c Critical Lane Group							

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Movement	EBL	EBR	NBL	NBT	SBT	SBR					
Lane Configurations	٦	71	٦	4	4	*					
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900					
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0					
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00					
Frt	1.00	0.85	1.00	1.00	1.00	0.85					
Fit Protected	0.95	1.00	0.95	1.00	1.00	1.00					
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583					
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00					
Satd. Flow (perm)	1770	1583	1770	1863	1863	1583					
Volume (vph)	60	20	- 50	700	860	210					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92					
Adj. Flow (vph)	65	22	54	761	935	228					
RTOR Reduction (vph)	0	20	0	0	0	73					
Lane Group Flow (vph)	65	2	54	761	935	155					
Turn Type		Perm	Prot			Perm					_
Protected Phases	4		5	2	6						
Permitted Phases		4				6					
Actuated Green, G (s)	7.0	7.0	2.5	51.8	45.3	45.3					
Effective Green, g (s)	7.0	7.0	2.5	51.8	45.3	45.3					
Actuated g/C Ratio	0.10	0.10	0.04	0.78	0.68	0.68					
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0					
Lane Grp Cap (vph)	185	166	66	1445	1263	1074					
v/s Ratio Prot	c0.04		0.03	c0.41	c0.50						
v/s Ratio Perm		0.00				0.10					
v/c Ratio	0.35	0.01	0.82	0.53	0.74	0.14					
Uniform Delay, d1	27.8	26.8	31.9	2.8	6.9	3.8					
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00					
Incremental Delay, d2	1.2	0.0	52.2	1.4	3.9	0.3					
Delay (s)	28.9	26.8	84.1	4.2	10.9	4,1					
Level of Service	С	С	F	А	В	A					
Approach Delay (s)	28.4			9.5	9.6						
Approach LOS	С			A	А						
Intersection Summary						· · ·					
HCM Average Control E	Delay		10.3	F	ICM Le	vel of Serv	vice		В		
HCM Volume to Capaci	ty ratio		0.69								
Actuated Cycle Length	(s)		66.8	5	Sum of I	ost time (s	.)	1:	2.0		
Intersection Capacity UI	tilization		55.3%	1	CU Lev	el of Servi	ce		В		
Analysis Period (min)			15								
c Critical Lane Group											

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Movement	EBL	EBR	NBL	NBT	SBT	SBR		Sec.		The second second
Lane Configurations	ሻ	7	74	**	**	1			`	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0				
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00				
Frt	1.00	0.85	1.00	1.00	1.00	0.85				
Fit Protected	0.95	1.00	0.95	1.00	1.00	1.00				
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583				
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00				
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583				
Volume (vph)	60	20	210	700	860	50	100			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92				
Adj. Flow (vph)	65	22	228	761	935	54				
RTOR Reduction (vph)	0	20	0	0	0	25				
Lane Group Flow (vph)	65	2	228	761	935	29				
Turn Type		Perm	Prot			Perm				<i>n</i> =
Protected Phases	4		5	2	6					
Permitted Phases		4				6				
Actuated Green, G (s)	4.9	4.9	4.1	32.0	23.9	23.9				
Effective Green, g (s)	4.9	4.9	4.1	32.0	23.9	23.9				
Actuated g/C Ratio	0.11	0.11	0.09	0.71	0.53	0.53				
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		15		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	193	173	162	2522	1884	843				
v/s Ratio Prot	c0.04		c0.13	0.22	c0.26					
v/s Ratio Perm		0.00				0.02				
v/c Ratio	0.34	0.01	1.41	0.30	0.50	0.03				
Uniform Delay, d1	18.5	17.8	20.4	2.4	6.7	5.0				
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Incremental Delay, d2	1.0	0.0	215.9	0.3	0.9	0.1				
Delay (s)	19.5	17.9	236.3	2.7	7.6	5.1				
Level of Service	В	В	E	A	A	A				
Approach Delay (s)	19.1			56.5	7.5					
Approach LOS	В			ε	А					
Intersection Summary		1.1.1		7						
HCM Average Control D	Delay		31.5	F	ICM Le	vel of Serv	vice	(2	
HCM Volume to Capacit	ty ratio		0.59							
Actuated Cycle Length ((s)		44.9	5	Sum of le	ost time (s)	12.	C	
Intersection Capacity Ut	ilization		48.7%	[CU Leve	el of Servic	ce	1	A	
Analysis Period (min)			15							
c Critical Lane Group										

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Movement	EBL	EBR	NBL	NBT	SBT	SBR				
Lane Configurations	٣	กี	3	1	ŧ	7				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Frt	1.00	0.85	1.00	1.00	1.00	0.85				
Fit Protected	0.95	1.00	0.95	1.00	1.00	1.00				
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583				
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00				
Satd. Flow (perm)	1770	1583	1770	1863	1863	1583				
Volume (vph)	38	/ 17	10	893	560	. 14	6			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92				
Adj. Flow (vph)	41	18	11	971	609	15				
RTOR Reduction (vph)	0	17	0	0	0	3				
Lane Group Flow (vph)	41	1	11	971	609	12				
Turn Type		Perm	Prot			Perm				
Protected Phases	4		5	2	6					
Permitted Phases		4				6				
Actuated Green, G (s)	6.3	6.3	1.3	74.7	69.4	69.4				
Effective Green, g (s)	6.3	6.3	1.3	74.7	69.4	69.4				
Actuated g/C Ratio	0.07	0.07	0.01	0.84	0.78	0.78				
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	125	112	26	1564	1453	1234				
v/s Ratio Prot	c0.02		0.01	c0.52	0.33					
v/s Ratio Perm		0.00				0.01				
v/c Ratio	0.33	0.01	0.42	0.62	0.42	0.01				
Uniform Delay, d1	39.3	38.5	43.5	2.4	3.2	2.2				
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Incremental Delay, d2	1.5	0.0	10.7	1.9	0.9	0.0				
Delay (s)	40.9	38.5	54.2	4.3	4.1	2.2				
Level of Service	D	D	D	А	А	А				
Approach Delay (s)	40.1			4.8	4.1					
Approach LOS	D			А	А					
Intersection Summary								2		
HCM Average Control E	Delay		5.8	ŀ	ICM Le	vel of Ser	vice		A	
HCM Volume to Capaci	ty ratio		0.60							
Actuated Cycle Length ((s)		89.0	S	Sum of l	ost time (s)	8	3.0	
Intersection Capacity Ut	tilization		57.0%	10	CU Levi	el of Serv	ice		В	
Analysis Period (min)			15							
c Critical Lane Group										

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Movement	EBL	EBR	NBL	NBT	SBT	SBR			To have
Lane Configurations	٢	1	۲	1	1	7		an op in	an a
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900			
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.85	1.00	1.00	1.00	0.85			
Fit Protected	0.95	1.00	0.95	1.00	1.00	1.00			
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583			
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00			
Satd. Flow (perm)	1770	1583	1770	1863	1863	1583			
Volume (vph)	230	60	10	1190	800	20	2		1.1.2
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92			
Adj. Flow (vph)	250	65	11	1293	870	22			
RTOR Reduction (vph)	0	52	0	0	0	9			
Lane Group Flow (vph)	250	13	11	1293	870	13			
Turn Type		Perm	Prot			Perm			
Protected Phases	4		5	2	6				
Permitted Phases		4				6			
Actuated Green, G (s)	12.9	12.9	0.8	42.6	37.8	37.8			
Effective Green, g (s)	12.9	12.9	0.8	42.6	37.8	37.8			
Actuated g/C Ratio	0.20	0.20	0.01	0.67	0.60	0.60			
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	360	322	22	1250	1109	942			
v/s Ratio Prot	c0.14		0.01	c0.69	0.47				
v/s Ratio Perm		0.01				0.01			
v/c Ratio	0.69	0.04	0.50	1.03	0.78	0.01			
Uniform Delay, d1	23.5	20.3	31.2	10.4	9.8	5.2			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	5.7	0.1	16.8	34.8	5.6	0.0			
Delay (s)	29.2	20.4	47.9	45.2	15.3	5.3			
Level of Service	С	С	D	D	В	А			
Approach Delay (s)	27.4			45.2	15.1				
Approach LOS	С			D	В				
Intersection Summary						VI		5. 10 P	
HCM Average Control E	Delay		32.3	H	ICM Le	vel of Se	rvice	С	
HCM Volume to Capaci	ty ratio		0.96						
Actuated Cycle Length	(s)		63.5	S	Sum of I	ost time	(s)	8.0	
Intersection Capacity Ut	tilization		82.0%	10	CU Lev	el of Ser	vice	E	
Analysis Period (min)			15						
c Critical Lane Group									

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Movement	EBL	EBR	NBL	NBT	SBT	SBR				
Lane Configurations	×	*	۲	**	**	*				* *
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0				
Lane Util, Factor	1.00	1.00	1.00	0.95	0.95	1.00				
Frt	1.00	0.85	1.00	1.00	1.00	0.85				
Fit Protected	0.95	1.00	0.95	1.00	1.00	1.00				
Satd, Flow (prot)	1770	1583	1770	3539	3539	1583				
Fit Permitted	0.95	1.00	0.95	1.00	1.00	1.00				
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583				
Volume (vph)	230	60	10	1190	800	50	1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -			-
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92				
Adi, Flow (vph)	250	65	11	1293	870	54				
RTOR Reduction (vph)	0	51	0	0	0	25				
l ane Group Flow (vph)	250	14	11	1293	870	29				
Turn Type	200	Perm	Prot	1200	0.0	Perm				
Protected Phases	4	renn	5	2	6	I CIIII				
Permitted Phases	4	4	5	2	0	6				
Actuated Green G (c)	110	11 0	0.8	33.5	287	287				
Effective Green, G (s)	11.9	11.0	0.0	33.5	20.7	20.7				
Actuated g/C Patio	0.22	0.22	0.01	0.63	0.54	0.54				
Clearance Time (c)	1.0	1.0	4.0	1.05	4.0	1.0				
Vehicle Extension (s)	3.0	2.0	4.0	3.0	3.0	3.0				
Vehicle Extension (s)	3.0	3.0	3.0	0.0	1000	3.0				
Lane Grp Cap (vpn)	394	353	21	2220	1902	821				
V/s Ratio Prot	CU. 14	0.01	0.01	CU.37	0.25	0.00				
V/s Ratio Perm	0.00	0.01	0.14	0.50	0.40	0.02				
V/C Ratio	0.63	0.04	0.41	0.58	0.46	0.03				
Uniform Delay, d1	18.8	16.3	26.1	5.8	7.6	5.8				
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Incremental Delay, d2	3.3	0.0	9.7	1.1	0.8	0.1				
Delay (s)	22.1	16.3	35.8	7.0	8.4	5.9				
Level of Service	C	В	D	A	A	A				
Approach Delay (s)	20.9			7.2	8.2					
Approach LOS	С			A	A					
Intersection Summary		1.1							1. 35	-
HCM Average Control E	Delay		9.3	, H	ICM Le	vel of Serv	vice	A		
HCM Volume to Capaci	ty ratio		0.60							
Actuated Cycle Length	(s)		53.4	S	sum of h	ost time (s)	8.0		
Intersection Capacity Ut	tilization		52.3%	ŀ	CU Leve	el of Servic	ce	A		
Analysis Period (min)			15							
c Critical Lane Group										



COUNTY OF KAUAI PLANNING DEPARTMENT 4444 RICE STREET, SUITE A473 LIHUE, KAUAI, HAWAII 96766-1326

MEMORANDUM

DATE:	October 12, 2006
TO:	Planning Director Ian K. Costa
FROM:	Kauai Historic Preservation Review Commission
SUBJECT:	Lihue Mill Complex

This is to inform you that the Kauai Historic Preservation Review Commission (KHPRC) met in January 2006 to discuss the status of the Lihue Mill Complex in light of preliminary inquiries for demolition permits for certain buildings at this historic site and the report on development options produced by the Planning Department.

Discussion focused on a letter sent to the KHPRC and the Planning Department elaborating on the historical significance of the Lihue Mill Complex and the need for comprehensive historical research and documentation and preservation alternatives prior to permitting activities at this site.

Based on the information provided, the KHPRC made the following recommendation at its January 5, 2006 meeting:

"The Kaua'i Historic Preservation Review Commission recognizes the Lihue Plantation mill as one of the most historic properties on the island and the historic reason why the town was established and developed in its current location. As such, the following actions are recommended:

 \checkmark no demolition permits be granted for all or part of the mill without a comprehensive history first undertaken and all preservation alternatives reviewed,

 \checkmark the owner initiate a two-stage program: a Scope of Work document created with the assistance of a professional consultant, and a subsequent compilation of the site's history.

These recommendations follow a 2005 report by the County of Kaua'i Planning Department, which recognizes the site's historic importance. Page 3 of that report states:

The mill site itself is historical from the perspective that it was central to the development of Lihue as Kauai's capitol. Also, most of the mill buildings are more than fifty (50) years old.

The historical aspects of the mill will play a vital role in the eventual development of the site from preservation of buildings along with an interpretive program to ensure that the "history" of the project site is not lost.

Compiling the history of the site will require an extensive amount of time to research and develop. However, "history" will play a very vital role in the planning process for the development of the property. At this point, it is extremely vital to recognize the historical importance of the site and have it incorporated into the planning process for development that will eventually follow the completion of this plan. The compilation of the mill's history will remain as one of the important tasks ahead in the planning process for its development.

Also important for the mill, is the role that the mill played in the building of Lihue and the evolution of its role in relation to the development of the town. This part of the mill's history is significant from the perspective that it is not only a historical site in and of itself, but its importance to the overall town and island."

Thank you for your consideration of the KHPRC's concerns regarding development impacts and preservation issues pertaining to this important historical complex.