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STATE OF HAWAII
LAND USE COMMISSION

Traffic Impact Analysis Report
University of the Nations Master Plan

Kailua-Kona, Hawai'i

Tax Map Key Number (3)7-5-010:003 & 085, (3)7-5-017:006

DECEMBER 2006

Prepared for:
Group 70 International
925 Bethel Street, 5th Floor
Honolulu, Hawai'i 96813

Prepared by:

M&E Pacific, Inc.

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Hilo, Hawai'i 96720

PETITIONER'S EXHIBIT 5

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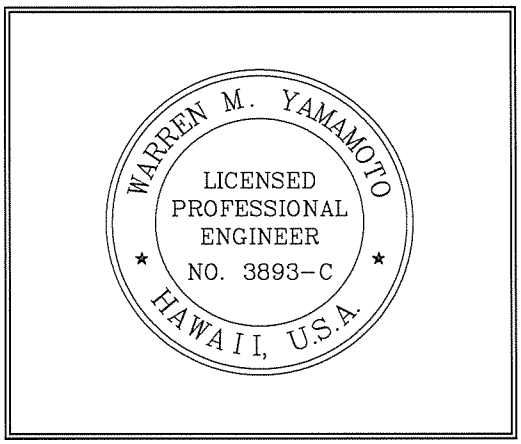

Expiration Date:
April 30, 2008

This work was prepared by me or under my direct supervision.

Signature
M & E Pacific, Inc.
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December 21, 2006
Date

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TRAFFIC IMPACT ANALYSIS REPORT
for the
UNIVERSITY of the NATIONS MASTER PLAN

A new master plan has been prepared for the University of the Nations in Kailua-Kona, Hawai'i. This report documents a study that was conducted to identify the traffic impacts of the proposed project and to recommend any mitigating measures. This report describes the proposed project, the study methodology, results of the analysis, forecast of traffic impacts, and recommendations for mitigating measures. This report updates the original report prepared in 2005 due to the change in the University's benefit corporation.

PROJECT DESCRIPTION

The University of the Nations (U of N-Kona) is a Christian, non-accredited institution granting Associate's, Bachelor's, and Master's degrees. There are currently about 400 students and 300 staff members each quarter. As part of the education experience, the great majority of students live in the dormitory village on campus with about one-fourth of the staff. Many of the remaining staff reside in apartments within walking distance of the campus. The University of the Nations is designed as a walking campus and only about 5% of the students have private vehicles.

The University has a current master plan for its original 41 acre site. The campus site is on tax map key parcel TMK (3)7-5-010:003, and is situated between Hualalai Road and Kuakini Highway. The primary access to this campus is through a roadway onto Kuakini Highway about 3,600 feet south of the Kuakini Highway/Hualalai Road intersection. There is no access to Hualalai Road. The location of the campus in relationship to the Kailua-Kona roadway system is shown on **Figure 1**.

The current master plan includes the following major facilities:

- Conference Center
- Counseling and Health Care Center
- Design Center
- Early Children Education Center – A learning laboratory for teachers whose pupils are primarily the children of staff.
- Ohana Court
- Hale Ohana (dining facility)
- Administration Building
- Village 1
- Villages 2, 3, and 4 - Each village unit would have 48 student units that could accommodate 232 students, 40 staff units and classrooms. The staff units could house one or two staff members, since both spouses living in a campus unit must work on campus.
- Resource Center
- Classroom Laboratory Center

The first seven facilities, Village 1, and approximately half of Village 2 have been developed to date. The balance of Village 2 is anticipated to be ready for occupancy in the spring of 2008. There is no definite development schedule for the balance of the current master plan since major improvements are made only as donations are received and funds become available. It is virtually impossible to forecast growth of any educational institution that is directly dependent upon demand. The uncertainty is even more severe for a Christian institution. The addition of new facilities is totally dependent upon philanthropy and the generosity of friends. To illustrate the above point, it was predicted in 1980 that the University of the Nations campus would be totally built out in about twenty years, by the year 2000. Now in the year 2006, the original campus master plan is close to one-half built out.

In 2000, the University of the Nations purchased the 68-acre agricultural property directly south of the campus from Mr. Gomes. Working through a benefit corporation

(Bencorp), extensive plans were prepared for development of the land, ostensibly to benefit the University financially. Early in the spring of 2004, the top administration of the University of the Nations decided to change direction in the planning for development of the former Gomes property. They decided it was a mistake to develop the land for primarily commercial purposes, including 400 condominium units (the Hualalai Village) and the Pacific Island Cultural Center. At that time, the Bencorp board renamed the benefit corporation "AEKO HAWAII", appointed new members, and all of the former Bencorp board members resigned.

A new master plan has been developed that incorporates the former Gomes property into the original campus master plan. The expanded campus site is on tax map key parcels TMK (3)7-5-010:085 and (3)7-5-017:006. The proposed master plan for the expanded campus is shown on **Figure 2**.

The new direction would complete only the first 103 units of Hualalai Village at the mauka end of the property. These units received separate zoning approval and are currently under construction. The first half of the project has been completed and is occupied. Access to the Hualalai Village is via a single roadway connecting to Hualalai Road about 1,100 feet northwest of the Queen Kaahumanu Highway Extension intersection. The project access point is shown in relation to the Kailua roadway system on **Figure 1**.

The remainder of the land would be preserved for the future growth of the University campus. The following facilities would be added on the remaining 62 acres:

- Student Village Apartments - Three Villages (5, 6, and 7) with the same design concept as the earlier Villages, which will provide approximately 250 - 300 central units.
- Low-cost Staff Housing Community - Eventually up to 100 family units would be available for staff to purchase, including studios, one-bedroom, two-bedroom, and three-bedroom condominiums. These would be similar to the Hualalai Village housing in character but would be much less in cost. They would be constructed as the need demands, slowly, over several years. The intended

market would be the more senior staff who have "settled down." These units would be located adjacent to the Hualalai Village with vehicular access around the edge of the Village.

- Single Family Homes – Up to six single family homes are planned to be available for purchase by U of N-Kona leaders.
- College of Arts and Communications – To include a performance theater to seat 800 - 1,000 people, plus a stage, studios and offices.
- College of Education – To include a Model Education Center with a teaching laboratory, library, science room, shop room, and administrative offices, as well as playground areas and green courtyards. Most of the students in the Model Education Center will be children of U of N-Kona staff, with a limited number of students from the community.
- Soccer, football, and softball fields, track, bleachers, tennis courts, volleyball courts, a walking or running "vita course" with exercise stations around the campus, and an Olympic swimming pool with showers and lockers.
- Commons Area with the Multi-Purpose Gymnasium – To include two courts, a stage, backstage, seating for approximately 1,200, classrooms, offices, lockers, restrooms, and lobbies. This facility would be open to the community for special events.

Vehicular access and parking for these proposed land uses would be via a mauka-makai service roadway on the south boundary of the property. The makai terminal of the roadway would intersect with Kuakini Highway about one-quarter mile south of the current University driveway. The mauka portion of the roadway would include one emergency access point, one controlled access point, and the main mauka entrance to the property, located near Phase 1A of the Hualalai Village.

The emergency access point would be between Hualalai Village and the Kona Hillcrest subdivision, which does not have mauka access to Hualalai Road. It would normally be closed and opened only during emergencies. When opened, Kona Hillcrest subdivision residents would have a direct route to Hualalai Road. The controlled access point

would intersect Hualalai Road near the Queen Kaahumanu Highway Extension intersection with a right turn in, right turn out design as approved by the State of Hawai'i Department of Transportation (State DOT) staff. The main mauka entrance to the property would allow the University students and staff residing on campus to access the mauka-makai service roadway and Kuakini Highway, but will not allow campus staff/students access to Hualalai Road. The roadway would be opened in times of emergency so that the general public on Kuakini Highway could have a secondary evacuation route. This roadway access is expected to be available by 2010.

Throughout this campus expansion, the University intends to maintain its design as a walking campus. The pedestrian oriented campus will be designed so that it would be possible to go anywhere on the campus without having to use an automobile, although vehicular circulation would be available throughout the campus.

A previous paragraph discussed the difficulty with preparing development schedules for the University. For the purposes of this study, a tentative schedule identifying the starting dates of various facilities based upon assumptions and best guesses available is shown below:

Tentative Schedule of Starting Dates

- ----- Completion of Village 2 – 2008
- 2007 – Soccer, football & softball fields, track, bleachers, and volleyball courts
- 2007 – Village 4
- 2008 – Village 3
- 2008 – Staff Housing Community
- 2008 – Construction of mauka-makai service road
- 2008 – College of Education
- 2008 – Tennis courts and walking course
- 2008 – Olympic pool
- 2010 – Village 5
- 2010 – Multi-Purpose Gymnasium
- 2014 – Village 6
- 2014 – College of Arts and Communications
- 2015 – Village 7

The number of staff units available in the Student Villages and Staff Housing Community (excluding the six single family homes) based on the tentative schedule is summarized below. Based on the 2004 staff level of 250, of which about 75 lived in the Villages, there were about 175 staff members who did not live in the Villages. This assumes that there are 1.5 staff members per staff unit. To determine the future number of commuting and non-commuting staff, it is assumed that the total number of staff would increase by 40 each time a Village opened, and by 20 per year in those years Villages were not initially opened.

YEAR	VILLAGE	STAFF UNITS WITHIN VILLAGES – CUMULATIVE UNITS	STAFF HOUSING COMMUNITY - CUMULATIVE UNITS	TOTAL CUMULATIVE STAFF UNITS
2004	One	50	---	50
2008	Two	90	---	90
2009	Four	130	0	130
2010	Three	170	50	220
2012	Five	210	75	285
2015	Six	250	100	350
2016	Seven	290	100	390

Based on the proposed development schedule and the above assumptions, the cumulative student and staff (by Village, Staff Housing Community, and non-resident) populations are summarized below:

		STAFFING POPULATION			
YEAR	STUDENTS	VILLAGE	STAFF HOUSING	NON-RESIDENT	TOTAL
2004	300	75	0	175	250
2008	502	135	0	165	300
2009	562	195	0	175	370
2010	629	255	75	100	430
2012	788	315	110	65	490
2015	1,108	375	150	25	550
2016	1,241	435	150	25	610

The development schedule assumes that University student and staff population will peak in 2016. The number of non-resident staff is forecast to remain steady to 2008, and then begin decreasing as more Villages and staff housing are built, to a level one-seventh the current population. This implies that the University would be "self-sufficient" by about 2012, with only a very small portion of the staff living off-campus.

STUDY METHODOLOGY

The first task is to identify the study area and time frame. Based on the location of the project and previous TIARs performed for the site, the four major intersections which would be utilized by drivers to the project site are identified on **Figure 1** and listed below:

- Queen Kaahumanu Highway Extension at Nani Kailua Drive
- Queen Kaahumanu Highway Extension at Hualalai Road
- Kuakini Highway at Hualalai Road
- Kuakini Highway at Oni Oni Street/Walua Road

Two future analysis years were selected based on the development schedules for the original and proposed master plan projects. The first analysis year is 2010 to coincide with completion of the original master plan. The second analysis year is 2016 when Village Seven is scheduled to be completed. The student population was not considered to be a factor in trip generation since the students are expected to remain on campus and not have cars, while the number of external trips would change with staff size and housing. The academic and athletic facilities proposed for the new campus were not considered in the timetable since they are not expected to be external trip generators. These facilities are primarily resources for use by the University staff and students, who would already be on campus, and will be available to the greater community for special events only.

EXISTING CONDITIONS

A survey of the existing roadway and traffic conditions was made in April 2004 and January 2005.

Existing Roadways

The roadways of interest in the study area include the Queen Kaahumanu Highway Extension (a.k.a. Hawai'i Belt Road), Kuakini Highway, Hualalai Road, Nani Kailua Drive, Oni Oni Street and Walua Road.

Queen Kaahumanu Highway Extension is the major north-south arterial passing through Kailua. It is a continuation of Queen Kaahumanu Highway that extends from Kawaihae Road in the north to the merge with Kuakini Highway in the south. The highway and extension are part of State Routes 11 and 19 that form part of the circle island route. Queen Kaahumanu Highway Extension is a two-lane highway but has two south bound lanes in the vicinity of Henry Street. There are traffic signals and separate turning lanes at major intersections along this route. The highway is posted for 35 miles per hour speed limit north of Nani Kailua Drive and 45 miles per hour south of Nani Kailua Drive. The State DOT has jurisdiction over this roadway.

Kuakini Highway is a two-lane highway under the jurisdiction of the County of Hawai'i and is the middle of three north-south routes through Kailua-Kona. The highway previously served as the island's north-south highway until the completion of the Queen Kaahumanu Highway Extension. Kuakini Highway has a 24-foot pavement width and has a 35 miles-per-hour posted speed limit.

Hualalai Road is a two-lane collector roadway that provides mauka-makai access from Ali'i Drive to Queen Kaahumanu Highway Extension and points mauka. Nani Kailua Drive is another two-lane collector road that provides access through the Pines subdivision between Queen Kaahumanu Highway Extension and Hualalai Road. It also serves the Kailua View Estates subdivision mauka of the highway extension. Oni Oni Street is a two-lane local road that is the only access into the Kona Hillcrest subdivision.

Walua Road is a two-lane collector road that provides mauka-makai access between Ali'i Drive and Kuakini Highway. These roadways are identified on **Figure 1**.

Two of the study intersections are on Queen Kaahumanu Highway Extension. The Nani Kailua Drive intersection has four approaches and is signalized. There are single through lanes and separate left and right turn lanes on each of the highway approaches, while both Nani Kailua Drive approaches have a through/left turn lane and a separate right turn lane. The mauka and makai approaches of Hualalai Road to the highway are offset by several hundred yards from each other so that they operate as separate T-intersections. Only the makai approach was analyzed in this study. The Hualalai Road intersection is unsignalized with separate turning lanes on all approaches.

The Kuakini Highway/Hualalai Road intersection is the southernmost signalized intersection on Kuakini Highway in Kailua-Kona. Both of the Kuakini Highway approaches have separate left turn lanes. The Hualalai Road approaches have different lane configurations. The mauka bound approach has a separate left turn lane while the makai bound approach has a separate right turn lane.

Oni Oni Street and Walua Road intersect Kuakini Highway directly across from each other. Oni Oni Street intersects Kuakini Highway from mauka and has a one lane approach. Walua Road intersects from makai and has a through/left turn lane and a separate right turn lane. Both approaches of Kuakini Highway do not have left turn lanes. The intersection is not signalized and both side street approaches are stop sign controlled.

Traffic Volumes

The University of the Nations is expected to generate its peak traffic during the morning and afternoon commuter hours. Traffic counts taken at the four study intersections on Queen Kaahumanu Highway Extension and Kuakini Highway in 2004 during the morning and afternoon peaks for other proposed projects in the area were utilized. These counts, although two years old, are applicable to this study because of the long forecast time frames (6 and 12 years) of this study. Traffic counts were taken on Queen

Kaahumanu Highway Extension on Tuesday and Wednesday, April 13 and 14. The traffic counts on Kuakini Highway were taken on Tuesday and Thursday, April 6 and 8.

Traffic turning movement counts require workers to station themselves by each study intersection and record each vehicle movement as through or turning movements by 15 minute intervals. The worksheets for the traffic counts are included in **Appendix A**.

The resultant peak hour movements are summarized on **Figure 3**, with traffic volumes over five vehicles per hour (vph) rounded to the nearest five. The predominant direction of travel on Queen Kaahumanu Highway Extension is north bound in the morning peak and south bound in the afternoon peak, although the afternoon north bound volumes are almost equal to the south bound volumes. The volumes of left turns at the Nani Kailua Drive intersection on the makai bound, south bound and mauka bound approaches are almost equal in the morning peak, and are highest on the south bound and mauka bound approaches in the afternoon.

The volume of left turns from Hualalai Road into Queen Kaahumanu Highway Extension is low, 1 vph in the morning peak and 5 vph in the afternoon peak. These small volumes indicate the level of difficulty in making this movement and show these turns are easier made at the nearby signal-controlled intersection at Nani Kailua Drive.

The dominant traffic volumes on Kuakini Highway are north bound in the morning and south bound in the afternoon. The Kuakini Highway/Hualalai Road intersection shows relatively high left turn movements on three of the four approaches: the north bound, south bound and mauka bound approaches. The north and south bound approaches have leading left turn traffic signal phases while the mauka bound approach has a leading green phase to accommodate the high volumes of left turns.

The 2004 traffic volumes are compared to the 2002 volumes counted for the "Traffic Impact Analysis Report for the U of N Bencorp Development" (First Revision, August 2003) by M&E Pacific, Inc., on **Figure 4**. The top graphic of each figure shows the 2002 volumes while the bottom graphic repeats the 2004 volumes shown on **Figure 3**. The bottom figure also shows the combined volumes on each approach, the change in

volume between the two years, and the percent change.

The results for the two main north-south routes are mixed. For the morning peak volumes shown on **Figure 4A**, the north bound approach of Queen Kaahumanu Highway Extension increased 3% at Hualalai Road while decreasing 6% at Nani Kailua Drive. The north bound volumes on Kuakini Highway remained unchanged at Walua Road while increasing 24% at Hualalai road. During the afternoon peak, the south bound approach volumes on Queen Kaahumanu Highway Extension were relatively unchanged, decreasing 1% at Nani Kailua Drive while increasing 1% at Hualalai Road. The south bound volumes on Kuakini Highway showed larger changes, decreasing 6% at Hualalai Road while increasing 11% at Walua Road. The north bound volumes at both intersections showed large decreases in traffic.

The results are also mixed for the mauka-makai side streets. Traffic on the makai bound approach of Nani Kailua Drive at Queen Kaahumanu Highway Extension increased 9% in the morning but decreased 21% in the afternoon. The mauka bound approach traffic volumes decreased 5% in the morning and increased 28% in the afternoon. The mauka bound approach traffic volumes of Walua Road at Kuakini Highway increased 27% in the morning but decreased 8% in the afternoon. Likewise, traffic volumes on the makai bound approach of Hualalai Road increased 7% in the morning but decreased 18% in the afternoon.

A traffic turning movement count was taken at the entrance to the University of the Nations on Kuakini Highway on January 13, 2005. The traffic volumes are shown on **Figure 5** with volumes over five vph rounded to the nearest five. The inbound and outbound volumes are very low for what can be expected for a campus with 300 students and 250 staff. This is because the great majority of students live on campus and much of the staff live either on campus or within walking distance. The traffic counts showed a higher volume of inbound than outbound trips in the afternoon peak period, while the opposite should have been expected. University officials attributed this to resident staff returning to campus from personal errands and non-resident staff returning for dinner with the other staff and students.

Figure 5 also compares the morning and afternoon peak hour counts with similar counts taken in 2000. The right graphic also shows the combined approach volume for the campus roadway, and the volume change and percentage change. For the Kuakini Highway approaches, only the left and right turn volumes into the campus are compared. The comparison shows that traffic volumes into and out of the campus has changed only slightly in five years. During the morning peak, inbound traffic has increased from 95 vph in 2000 to 100 vph in 2005. Outbound traffic increased from 35 to 45 vph. Although the latter represents a 29% increase, there was only an increase of 10 vph. During the afternoon peak, inbound traffic increased from 45 vph to 70 vph, which is only a 25 vph increase. Outbound traffic volumes remained the same at 55 vph. During this five year period, the enrollment remained the same at about 300 students. By comparison, peak hour, peak direction through traffic on Kuakini Highway increased by 200 vph (55%) in the morning and 65 vph (17%) in the afternoon.

The State DOT takes traffic counts every two years at selected roadway sections on Hawai'i. Two of these count stations, the Queen Kaahumanu Highway Extension/Hualalai Road intersection and the Kuakini Highway/Hualalai Road intersection, are at the study intersections. The data shown on **Figure 6** gives the historical trend of daily traffic on these roadways.

Daily two-way traffic volumes for the four approaches of the Kuakini Highway/Hualalai Road intersection are shown for 1992 to 2002. Traffic has increased 39% on the south leg of Kuakini Highway in ten years, with all of the growth in the last two year period. Traffic has remained constant on the west leg of Hualalai Road, dropped 33% on the east leg of Hualalai Road, and decreased 20% on the north leg of Kuakini Highway. Speculative reasons for the stable/decreasing traffic on the three approaches could be laid on the stagnant visitor market following the 9/11 incident. The increase on the south approach in the last two years could be attributed to the development of two commercial centers to the south of Hualalai Road with large parking lots fronting Kuakini Highway.

The traffic volumes on Queen Kaahumanu Highway from 1994 to 2004 shows constant growth, with an annual growth rate of 3.8% on the south leg and 2.7% on the north leg, and an average growth rate of 3.2%. The daily two way traffic volumes on Hualalai Road have declined 12% in the ten year interval.

PROPOSED ROADWAY IMPROVEMENTS

The State DOT and the County of Hawai'i each have roadway improvements planned in the study area. The State DOT is currently widening Queen Kaahumanu Highway to a four lane divided highway north of Henry Street. This phase of the widening project is expected to be completed by mid-2008. This change is not expected to affect traffic patterns in the study area. They also expect to initiate planning studies for the widening of Queen Kaahamanu Highway Extension and Kuakini Highway from Henry Street to Kamehameha III Road soon to determine the feasibility of this project. The State does not have a start date for the construction of this project.

The County of Hawai'i has begun widening Kuakini Highway to four lanes between Palani Road and Hualalai Road and improving the traffic signals. These improvements would significantly increase the capacity of Kuakini Highway and add more lanes to Kuakini Highway at the Hualalai Road intersection. The northbound approach would have two through lanes in addition to the left turn and right turn lanes. A right turn lane would be added to the southbound approach. These improvements are expected to significantly improve the traffic operations at this intersection. As will be discussed later, these improvements in themselves would not change the traffic patterns in the study area, but combined with increased traffic congestion on Queen Kaahumanu Highway Extension and completion of the Kahului to Keauhou Parkway, some traffic diversion from Queen Kaahumanu Highway Extension to Kuakini Highway can be expected.

The County was planning to begin construction of the Kahului to Keauhou Parkway (f.k.a. Ali'i Highway) between the Queen Kaahumanu Highway Extension and Keauhou in 2004. This new two lane roadway is intended to divert traffic from the Queen Kaahumanu Highway Extension, Kuakini Highway and Ali'i Drive to improve their traffic

operations. The first segment between Lako Street extension and Keauhou was scheduled for completion by 2007. The second segment to Queen Kaahumanu Highway Extension was expected to be complete by 2009. However, litigation has delayed start of construction indefinitely and County officials cannot provide any revised completion dates.

When completed, this roadway improvement project can be expected to cause shifts in traffic between Queen Kaahumanu Highway Extension, Kuakini Highway and Ali'i Drive in the study area. The "Kahului to Keauhou Parkway Traffic Analysis Report" (August 2000) prepared by Julian Ng, Inc., developed traffic forecasts for eight scenarios on roadway segments south of where the parkway would intersect Queen Kaahumanu Highway Extension. Comparison of "build" and "no build" traffic volumes showed that traffic would decrease 22% on Queen Kaahumanu Highway Extension, 47% on Kuakini Highway and 15% on Ali'i Drive with the parkway built. The Ng report did not address changes in traffic volumes on roadway segments north of the parkway intersection.

Due to the uncertainties associated with the Kahului to Keauhou Parkway and the widening of Queen Kaahumanu Highway Extension south of Henry Street, three different scenarios of roadway improvements were analyzed:

- Scenario 1 assumes that neither proposed roadway improvement would be built, so that this would represent the no-build case.
- Scenario 2 assumes that the Parkway would be built by 2010.
- Scenario 3 assumes that both the Parkway and the highway widening would be constructed by 2016. The highway widening project realistically could not be completed by 2010.

In all, there would be five combinations of three scenarios and two forecast years:

1. Scenario 1, no improvements, 2010
2. Scenario 1, no improvements, 2016
3. Scenario 2, parkway only, 2010
4. Scenario 2, parkway only, 2016
5. Scenario 3, parkway and highway widening, 2016.

TRAFFIC FORECAST

The Student Villages, Staff Housing Community, and expanded educational and recreational facilities are all components that impact student enrollment and staff levels, and are expected to be completed by 2016. As previously stated, this study analyzed traffic conditions for 2010 and 2016.

The traffic forecasting methodology consisted of three steps. The first step was to forecast ambient traffic representing traffic growth on the area roadways with the current campus in place. The second step was to forecast the traffic volumes that would be generated from the master plan elements in each of the two analysis years. The last step was to combine the ambient traffic with the project generated traffic to obtain the total with project traffic forecasts for the two analysis years. The traffic operations with the ambient and total with project forecasts were compared to identify traffic impacts, as described in the next section.

Ambient Traffic Forecast

Ambient traffic on the study area roadways can be expected to increase due to regional growth and new projects in the area. Ambient traffic forecasts were first prepared for 2010 and 2016 scenarios 1, and then adjusted to obtain the 2010 and 2016 scenarios 2 (with parkway) and 2016 scenario 3 (with parkway and 4 lane Hawai'i Belt Highway) forecasts.

The 2010 scenario 1 forecast analysis year was calculated first. Traffic growth to 2010 was assumed to come from known future projects and general area growth. Ambient traffic forecasts at the four study intersections for the year 2006 were obtained from the "Traffic Impact Analysis Report Kona Oasis Condominium" (April 2004) and "Traffic Impact Analysis Report Kona Hale Alii" (May 2004), both prepared by M&E Pacific, Inc. The 2006 forecasts were calculated by increasing 2004 volumes (from **Figure 3**) by 5% (2-1/2%/year) on Kuakini Highway and 4% (2%/year) on Queen Kaahumanu Highway. The traffic that would be generated by the following new projects in the area (identified with the assistance of County staff) was added to these volumes.

- Pualani residential subdivision on Hawai'i Belt Road – 400 units in 2010.
- Hualalai Village on Hualalai Road – 103 condominium units that are under construction and are part of the new master plan.
- Pua'a elderly housing on Hualalai Road – 126 units.
- Apartment building on Hualalai Road – 164 units.
- Kona Hawaiian Village on Ali'i Drive and Kuakini Highway – 270 time share units.
- Kona Sea Ridge on Ali'i Drive – 137 multi-family units.
- Ali'i Cove on Ali'i Drive and Walua Road – 200 multi-family units.
- Lava on Kuakini Highway – 212 multi-family units.
- 100 other units on Ali'i Drive (assumed to include Kona Sea Villas).
- Hotel on Walua Road – 80-90 rooms.
- Commercial lots on Walua Road – 40,000 square feet of retail floor area assumed.

Traffic generated by the first four projects was assigned to Queen Kaahumanu Highway Extension and Kuakini Highway. Traffic from the remaining projects was assigned to Kuakini Highway via Hualalai Road and Walua Road. Traffic forecasts from traffic impact analysis reports were utilized when available. Otherwise, the traditional trip generation, distribution and assignment procedure was used to forecast the additional volume of trips on the study area roadways.

The resultant 2006 traffic forecast was then extended to 2010 by increasing by 8% (2%/year) on Queen Kaahumanu Highway Extension and Kuakini Highway, and 4% (1%/year) on all other roadways. Traffic volumes into and from Oni Oni Street were not increased since it serves a stable neighborhood. The resultant 2010 scenario 1 ambient traffic forecast is shown on **Figure 7** with volumes over five vph rounded to the nearest five. The 2010 traffic forecast was then extended to 2016 by increasing by 12% (2%/year) on Queen Kaahumanu Highway Extension and Kuakini Highway, and 6% (1%/year) on all other roadways. The resultant 2016 scenario 1 ambient traffic forecast is shown on **Figure 8** with volumes over five vph rounded to the nearest five.

For the scenarios 2 and 3 forecasts, it was assumed that through traffic volumes on Queen Kaahumanu Highway Extension and Kuakini Highway would change while traffic volumes into and from the side streets would remain unchanged. The changes would be relative to the ambient traffic volumes for scenario 1. The aforementioned "Kahului to Keauhou Parkway Traffic Analysis Report" shows AM and PM peak hour traffic volumes on Queen Kaahumanu Highway Extension, Kuakini Highway, Ali'i Drive and the proposed parkway with various combinations of roadway improvements for 2020. The following scenarios from the report correspond to this study's scenarios 1, 2, and 3, respectively:

- No-Build 1 (Exhibit 3)
- Build 1 with proposed parkway (Exhibit 7)
- Build 2 with proposed parkway and 4 lane Hawai'i Belt Hwy (Exhibit 8)

The peak hour traffic volumes for the 2020 no-build scenario from the parkway report are shown on **Figure 9**, for the 2020 build 1 scenario on **Figure 10**, and for the 2020 build 2 scenario on **Figure 11**. The Ng study did not forecast traffic volumes north of the parkway's intersection with Queen Kaahumanu Highway Extension and Kuakini Highway. Therefore, the traffic volumes on these roadways north of the parkway were extrapolated from the reported volumes and are shown as derived volumes on **Figures 10** and **11**. For the build 2 scenario which corresponds to this study's scenario 3, the volume of traffic on Kuakini Highway was thought to be too high; therefore, a portion of this traffic between the parkway and the Queen Kaahumanu Highway/Kuakini Highway junction was diverted to Queen Kaahumanu Highway. These adjusted volumes are shown as derived volumes on **Figure 11**.

By comparing the traffic volumes on **Figures 10** and **11** with those on **Figure 9**, it was possible to estimate the relative changes in traffic on the two roadway facilities. The relative changes for scenarios 2 and 3 for 2020 are shown on **Figures 10** and **11** as "Change from No build scenario" and are summarized in the following table.

RELATIVE CHANGES FOR 2020	SCENARIO 2		SCENARIO 3	
	AM	PM	AM	PM
Queen Kaahumanu Highway Northbound	-95	-120	+380	+190
Queen Kaahumanu Highway Southbound	-100	-155	+330	+420
Kuakini Highway Northbound	+150	+150	+290	+250
Kuakini Highway Southbound	+120	+165	-55	+350

These changes to 2020 traffic forecasts were then adjusted to this study's analysis years of 2010 and 2106, respectively. To develop these adjustment factors, the first step was to determine the change in traffic volumes from 2004 to 2010 relative to the change from 2004 to 2020 traffic volumes for scenario 1. This ratio was the growth ratio from 2004 to 2010. Likewise, the ratio of change from 2004 to 2016 over the change from 2004 to 2020 traffic volumes was calculated to obtain the growth ratios from 2004 to 2016. These growth ratios were calculated for both directions of each highway in the AM and PM peak hours and found to be similar for both directions; therefore, one growth ratio was used for each highway. The following growth ratios were obtained:

	2010		2016	
	AM	PM	AM	PM
Queen Kaahumanu Highway	34%	35%	66%	67%
Kuakini Highway	45%	48%	72%	74%

The positive volume changes in traffic were multiplied by the above growth ratios to obtain the change in traffic volumes for the year, scenario, and analysis peak hour. The negative volumes changes were multiplied by the difference of 1 less the growth ratio, implying that traffic would decrease. The resultant relative change volumes for 2010 are shown in the following table:

RELATIVE CHANGES FOR 2010	SCENARIO 2	
	AM	PM
Queen Kaahumanu Highway Northbound	-72	-78
Queen Kaahumanu Highway Southbound	-76	-101
Kuakini Highway Northbound	+68	+53
Kuakini Highway Southbound	+54	+58

The resultant relative change volumes for 2016 are shown below.

RELATIVE CHANGES FOR 2016	SCENARIO 2		SCENARIO 3	
	AM	PM	AM	PM
Queen Kaahumanu Highway Northbound	-32	-40	+230	+125
Queen Kaahumanu Highway Southbound	-34	-51	+200	+280
Kuakini Highway Northbound	+108	+111	+210	+185
Kuakini Highway Southbound	+87	+122	-15	+260

The relative changes in volumes for scenario 2 show negative values on Queen Kaahumanu Highway Extension and positive values on Kuakini Highway. The relative change volumes for scenario 3 show generally positive values except for Kuakini Highway southbound in the AM peak hour.

These relative changes in volumes were then added to their respective through volumes on Queen Kaahumanu Highway Extension and Kuakini Highway for scenario 1 to obtain the adjusted ambient volumes for scenarios 2 and 3. The results are shown on **Figure 12** for 2010 scenario 2, **Figure 13** for 2016 scenario 2, and **Figure 14** for 2016 scenario 3, with volumes over five vph rounded to the nearest five.

Project Generated Traffic

The traditional procedure of trip generation, distribution, and assignment was used to forecast the number of trips that would be generated by the proposed projects, the distribution of these trips, and the specific intersection turning movements at the study intersections that would be utilized.

The trip generation step forecasts the volume of vehicle trips that would be generated by the proposed projects during the two analysis periods. Due to the near self-sufficient nature of the University, the traditional trip generation rates from the Institute of Transportation Engineers' Trip Generation (Seventh Edition, 2003) were not applicable to forecast AM and PM peak hour trips that would be generated by the University. Rather, the existing traffic volumes entering and exiting the University were categorized into four components: commuting staff, resident staff trips, non-resident students, and

deliveries. The estimated composition of current trips is shown on **Table 1** based on the traffic count taken at the University driveway to Kuakini Highway in January 2005.

To calculate the volume of trips that would be generated in 2010 and 2016, the different trip components were adjusted proportionally with their change in population. The number of trips by non-resident staff would decrease with the decline in their population. The non-resident student trips would disappear when non-residents are not permitted. The number of trips by the resident staff was based on trip generation rates: 0.4 in the AM peak and 0.5 in the PM peak hour. These rates are lower than conventional rates for townhouses, as discussed below. The proportion of inbound and outbound trips by resident staff in the PM peak hour is expected to become more balanced to 60% in the future rather than the current 83%. The number of deliveries in both peak hours is not expected to increase with the student population, since larger delivery vehicles or more non-peak hour trips could be utilized. The six single family homes were not included in the analysis since their locations and timetables have not been determined, and they represent a very small number of trips. The 2010 and 2016 trip generation analysis for the University of the Nations is summarized on **Table 1**. The volume of inbound trips in the AM peak hour is expected to decline while the volume of outbound trips is expected to increase. During the PM peak hour, the volumes of inbound and outbound trips are forecast to increase slightly.

The forecast number of trips generated by the resident staff per staff residential unit (both Village and Staff Housing) is compared to the rates forecast for the Hualalai Village, Phase 1 below. The rates for the residential staff units are lower than a comparable multi-family unit since staff would not have to commute.

	TRIP GENERATION RATES	
	AM PEAK	**PM PEAK**
Staff Housing Units	0.40	0.50
Hualalai Village	0.51	0.61

The trip distribution step divides the generated trips by directions of travel to/from the project site. The trip distribution factors were based on the existing distribution of traffic entering and leaving the University of the Nations driveway as shown on **Figure 5**, and updated for the future years. The results of this analysis are shown on **Table 1**.

The trip assignment step assigns the distributed trips as turning movements to the study intersections. The project generated trips were assigned to the north and south project driveways based on whether they were from the north campus or south campus. Trips from the Villages and staff housing were assumed to access Kuakini Highway. Trips from the Hualalai Village that originally access Kuakini Highway via Hualalai Road were diverted to the mauka-makai service road. These diverted trips are shown negative values on the trip assignments figures. The trips were then assigned to the turning movements at the adjoining intersections based on the current distribution of turning movements at these intersections. One trip assignment was made for 2010 and assumed applicable to scenarios 1 and 2 and is shown on **Figure 15**. The 2016 trip assignment was applicable for all three scenarios and is shown on **Figure 16**. The traffic volumes are not rounded.

Total Forecast Volumes

The 2010 project generated volumes from **Figure 15** were added to the 2010 ambient traffic forecasts for scenarios 1 and 2 from **Figures 7** and **12**, respectively, to obtain the total with project traffic forecasts on **Figures 17** and **19**. Likewise, the 2016 project generated volumes from **Figure 16** were added to the 2016 ambient traffic forecasts for scenarios 1, 2 and 3 from **Figures 8**, **13** and **14**, respectively, to obtain the total with project traffic forecasts on **Figures 18**, **20** and **21**. Traffic volumes over five vph are rounded to the nearest five.

LEVEL OF SERVICE ANALYSIS

The concept of level of service is used to quantify the quality of traffic flow on roadway facilities. The Transportation Research Board has developed procedures to calculate level of service value(s) by measuring traffic volumes against the capacities of different types of roadway facilities. Their Highway Capacity Manual (2000) describes the various procedures developed for freeways, highways, signalized and unsignalized intersections, etc. A comparison of levels of service for the different forecast scenarios can give an indication of the traffic impacts of ambient traffic growth and the proposed project. The levels of service for the total with project forecasts were compared to the levels of service for the corresponding ambient forecasts to determine if the proposed project would have an adverse traffic impact. A change in level of service to unacceptable levels would be one indication of an adverse traffic impact.

Unsignalized Intersection Analysis

The procedure used for analyzing unsignalized intersections calculates vehicle delays and levels of service based on the distribution of gaps in traffic on the major street and driver judgment in selecting gaps through which to execute turns. For two-way stop intersections where only the minor street approaches are controlled by a stop sign, levels of service are calculated for the critical turning movements including outbound movements from the stop-controlled approach, and left turns from the main road to the minor street. The procedure does not calculate an overall intersection level of service nor does it identify when the through traffic on the main road is over capacity.

The Highway Capacity Manual defines the relationship between level of service and delay (in seconds/vehicle) for unsignalized intersections as shown in the following table. Levels of service A to E are considered acceptable for unsignalized intersections. Level of service F (with average delays longer than 50 seconds) is considered undesirable and would indicate the probable need for mitigation. However, level of service F conditions may be tolerated for certain conditions when delays are not excessive and there are no real feasible mitigating measures.

LEVEL OF SERVICE	DELAY (Seconds/Vehicle)
A	< 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	> 50.1

Table 2 shows the levels of service for each critical turning movement at the unsignalized intersections for the AM and PM peak hours, for the existing, ambient and total with project forecast volumes. Scenario 1 analyses include the 2004 existing volumes, and 2010 and 2016 forecast volumes; scenario 2 includes the 2010 and 2016 forecasts; and scenario 3 only has the 2016 forecast.

The Queen Kaahumanu Highway Extension/Hualalai Road intersection currently shows a problem on one turning movement in both AM and PM analysis periods. The eastbound left turn movement from Hualalai Road is already at level of service F and would remain so for all forecast conditions. This poor level of service reflects the difficulty in making this movement and is the reason for the low volumes of these turns counted in both peak periods.

The levels of service on the other two intersection movements are currently at acceptable levels and would remain unchanged during the morning peak hour for the ambient and total with project forecasts for 2010 and 2016 scenarios 1 and 2. With the widening of Queen Kaahumanu Highway Extension for scenario 3, the Hualalai Road right turn would improve to level of service B while the left turn from the highway into Hualalai Road would decline to level C in 2016. Level of service C is not acceptable for this left turn movement based on traffic observations. This would indicate that unsignalized intersection control would not be acceptable for scenario 3 in 2016.

During the afternoon peak, the northbound left turn from Queen Kaahumanu Highway Extension into Hualalai Road is currently at level of service B and is forecast to remain

at that level for the 2010 scenario 1 and the 2010 and 2016 scenario 2 forecasts. However, it would change to an unacceptable level of service C for the 2016 scenarios 1 and 3 forecasts. The right turn from Hualalai Road is forecast to change to level of service E for the 2010 scenario 1 and 2016 scenario 2 forecasts, and to level F for the 2016 scenario 1 forecasts. This change is primarily due to the higher traffic volumes on the highway and less due to increases in traffic on Hualalai Road. Even if there were no increase in traffic from Hualalai Road, increased traffic volumes on the highway would cause the levels of service for the side street movements to decrease.

The above analysis indicates that mitigating measures would be needed at this intersection by 2016 due to increased ambient traffic volumes. The signalization of the intersection and widening of the highway (scenario 3) would be two long-term measures. The impact of signalizing the intersection is discussed in the next section. If the intersection remains unsignalized, the left turn movement from Hualalai Road onto Queen Kaahumanu Highway Extension should eventually be eliminated for traffic safety. The proposed project is expected to generate few trips through this intersection and is not expected to have any adverse impact upon its traffic operations.

Levels of service at the Oni Oni Street/Walua Road intersection on Kuakini Highway are currently at acceptable levels; although the mauka bound through/left turn movement from Walua Road is already at level of service D in both peak periods. With the traffic increases forecast with all three scenarios, the latter movement would change to level of service F by 2010 for all three scenarios due to the increases in traffic on both Kuakini Highway and Walua Road. A review of the level of service calculation worksheets shows that traffic delays and queues on Walua Road would be considerable, indicating that this problem would require some form of mitigation. The 2016 forecast conditions were not analyzed since it was determined that unsignalized operations would not be feasible by this date.

This analysis indicates the eventual need for mitigation at the Kuakini Highway/Oni Oni Street/Walua Road intersection with or without the proposed project. Traffic signalization when warranted would mitigate the through/left turn problem from Walua

Road and also help the residents using Oni Oni Street. The impact of signalizing the intersection is discussed in the next section. Separate left turn lanes on Kuakini Highway should be considered to facilitate the higher through traffic volumes on the highway. When installed, this traffic signal should be coordinated with the proposed traffic signals at the Kuakini Highway/ Kahului to Keauhou Parkway intersection.

In addition, the traffic forecast volumes on Kuakini Highway for the 2016 scenarios 2 and 3 are near the capacity of a two lane urban highway. This would imply that Kuakini Highway should be widened to four lanes if the Kahului to Keauhou Parkway is built or the Queen Kaahumanu Highway Extension is widened to four lanes. Rather than recommend widening the Kuakini Highway for these scenarios, this study recommends that new traffic forecasts be prepared to determine the impacts of both roadway improvement projects on Kuakini Highway, and if the portion of Kuakini Highway between Hualalai Road and the parkway should be widened.

The outbound and inbound left turn movements at the current (north) University driveway on Kuakini Highway are forecast to have acceptable levels of service for both forecast years and three forecast scenarios. No mitigating measures are required but a separate south bound left turn lane on Kuakini Highway should be provided for enhanced traffic operations and safety.

The movements to the new (south) driveway that would serve the proposed mauka-makai service road are also forecast to operate at acceptable levels of service in 2010 and 2016 for all three scenarios. Mitigating measures other than the previously described separate left turn are not required.

As stated for the Kuakini Highway/Walua Road/Oni Oni Street intersection, the traffic volumes forecast for Kuakini Highway with the 2016 scenarios 2 and 3 are near the capacity of a two lane highway. New traffic forecasts are recommended to determine the impact building the parkway or widening the Queen Kaahumanu Highway would have on Kuakini Highway traffic, and if the portion of Kuakini Highway between Hualalai Road and the parkway should be widened.

Signalized Intersection Analysis

The methodology for analyzing signalized intersections calculates the levels of service for individual approaches and the intersection as a whole based on the average stopped delay per vehicle. The results range from level of service A (best with average delays less than ten seconds) to F (worst with average delays longer than 80 seconds), described as shown on the following table.

LEVEL OF SERVICE	COUNTS DELAY PER VEHICLE (Seconds/Vehicle)
A	< 10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	> 80.1

Many jurisdictions consider levels of service A to D as acceptable for areas like Kailua, with level of service F indicating the need for mitigating measures. A level of service E, although considered undesirable, can be tolerated for minor movements such as left turns. The County of Hawai'i recommends a minimum level of service C for proposed projects, while recognizing that many of their signalized intersections are already at level of service D.

Table 3 shows the level of service for the overall intersection and for each approach at the signalized intersections for the AM and PM peak hours, for the existing, ambient and total with project forecast volumes. Scenario 1 analyses include the 2004 existing volumes, and 2010 and 2016 forecast volumes; scenario 2 includes the 2010 and 2016 forecasts; and scenario 3 only has the 2016 forecast. In addition to the current signalized intersections at Kuakini Highway/Hualalai Road and Queen Kaahumanu Highway Extension/Nani Kailua Drive, the currently unsignalized Queen Kaahumanu Highway Extension/Hualalai Road and Kuakini Highway/Walua Road/Oni Oni Street intersections were also analyzed since traffic signals were recommended as mitigating measures.

The Kuakini Highway/Hualalai Road intersection is currently at level of service C in both peak hours with the current design. It is forecast to remain at level of service C in the AM peak hour for all three scenarios with the improved roadway design. The additional capacity that would be brought about by the current widening of Kuakini Highway would offset the higher forecast volumes, resulting in the same level of service. These results imply that the proposed project would not have an adverse traffic impact during the AM peak hour.

The current and future PM peak hour volumes are higher than their corresponding AM peak hour volumes. As a result, the level of service during the PM peak hour would change from C to D for the total with project forecast for the 2016 scenario 1. Although this change in level of service could be attributed to the proposed project, it is not considered an adverse impact since level of service D is still considered acceptable. The levels of service for both ambient and total with project 2016 scenario 2 forecasts would be at D. The levels of service for both 2016 scenario 3 forecasts would be E. This indicates that the higher south bound through volumes on Kuakini Highway forecast for scenario 3 would require some form of mitigation with or without the proposed project.

One possible mitigating measure is to convert the southbound right turn only lane into a shared through/right turn lane and build a second receiving lane on the south side of the intersection. This second through lane would only need to be extended so that southbound traffic could merge together further downstream, since southbound traffic volumes decrease considerably. But as previously noted, this study recommends a new traffic forecast to determine the impact building the parkway or widening the Queen Kaahumanu Highway Extension would have on Kuakini Highway traffic, and if Kuakini Highway would have to be widened.

The intersection at Queen Kaahumanu Highway Extension and Nani Kailua Drive is currently at level of service C in both the morning and afternoon peak hours. The intersection levels of service would remain at C in 2010 and decrease to D in 2016 for scenarios 1 and 2 in the AM peak, which assumed no widening for Queen Kaahumanu

Highway Extension. For both scenarios in 2016, the Nani Kailua Drive approaches would be at level of service F, indicating unacceptable conditions. The intersection would remain at level of service C for the 2016 scenario 3 due to the widening of Queen Kaahumanu Highway Extension.

During the afternoon peak hour, the intersection level of service with scenario 1 would decline to D in 2010 and to E in 2016 for both ambient and total with project forecasts. For scenario 2, the intersection level of service would remain at C in 2010 and decline to E in 2016. As in the AM peak, the Nani Kailua Drive approaches would be at level of service F for both scenarios in 2016, indicating unacceptable conditions. The intersection would remain at level of service C for the 2016 scenario 3 due to the widening of Queen Kaahumanu Highway Extension.

The above analysis indicates that mitigation is required by 2016, with or without the proposed project. The widening of Queen Kaahumanu Highway to four lanes would mitigate the problems forecast with scenarios 1 and 2. This finding corroborates the findings in the "Keahole to Honaunau Regional Circulation Plan" (February 2003) by Townscape, Inc., which stated, "Thus, by 2020, peak hour volumes per lane will be similar to existing conditions even with the completion of the Mamalahoa Bypass and the Parkway as 2-lane roads. Construction of the two-lane Ke Aka o Keauhou (Ali'i Parkway) and Mamalahoa Bypass will thus alleviate traffic congestion over the next 10 to 20 years but will not accommodate 2020 needs for the region." The proposed project is expected to generate few trips through this intersection and is not expected to have any adverse impact upon its traffic operations.

The Queen Kaahumanu Highway Extension/Hualalai Road intersection is currently unsignalized but widening of the highway and traffic signals were recommended as mitigating measures by 2016. With traffic signals, the intersection would remain at level of service C during the AM peak hour for 2010 and 2016 scenario 1. With scenario 2, the intersection would be at level of service B in 2010 and C in 2016. With the highway widening for scenario 3 in 2016, the intersection level of service would be at B. Signalizing the intersection would also make the east bound left turn easier to make and

would divert vehicles from the Nani Kailua Drive intersection; thereby, helping to improve the level of service at the latter intersection.

The growth in ambient traffic would have a greater impact during the PM peak hour at this intersection. The intersection would be at level of service C in 2010 and D in 2016 with scenario 1, but the Hualalai Road approach would be at an unacceptable level of service E. With scenario 2, the intersection would be at level of service B in 2010 and C in 2016, but the Hualalai Road approach would be at an unacceptable level of service E. With the highway widening for scenario 3 in 2016, the intersection level of service would be at B. The analysis of PM peak hour conditions indicates that a two lane Queen Kaahumanu Highway would not be sufficient by 2016, and that widening to four lanes would be a mitigating measure. This finding corroborates the findings for the Queen Kaahumanu Highway Extension/Nani Kailua Drive intersection that widening the highway to four lanes would be required by 2016.

The Kuakini Highway/Walua Road/Oni Oni Street intersection is currently unsignalized but traffic signals were recommended as a mitigating measure by 2010, or when warranted. With traffic signals and left turn lanes on Kuakini Highway, the intersection levels of service for both AM and PM peak hours in 2010 and 2016, and for all three scenarios would be at acceptable levels of C or better. This indicates that traffic signals and left turn lanes would be sufficient to mitigate the traffic problems forecast with the unsignalized intersection. The project generated trips passing through this intersection are not expected to have any adverse impact upon its traffic operations since there is no change between the ambient and total with project levels of service.

CONCLUSIONS

This study determined that the existing transportation network in the study region would need to be improved to accommodate future regional traffic growth. The current widening of Kuakini Highway between Palani Road and Hualalai Road and improvement of traffic signals will significantly improve traffic operations and provide additional north-south capacity that should accommodate traffic growth on that section of roadway beyond the 2016 study year.

The status of two other roadway improvement projects is uncertain at this time. Litigation has stopped the commencement of construction of the Kahului to Keauhou Parkway. The State DOT has only begun the planning process for the widening of Queen Kaahumanu Highway Extension to four lanes between Henry Street and Kamehameha III Road and there is no definite start of construction date. Three different forecast scenarios were evaluated to consider the uncertainty with implementing these two projects:

- Scenario 1 – No highway improvements, neither project is implemented in 2010 or 2016.
- Scenario 2 – The Kahului to Keauhou Parkway is implemented by 2010.
- Scenario 3 – Both the Parkway and the Queen Kaahumanu Highway widening are implemented by 2016.

The proposed master plan for the University of the Nations would result in very few additional trips being generated. The large projected increase in student enrollment would not increase traffic since the students would live on campus and have very few cars. The accompanying staff increase would be accommodated by a large increase in staff housing so that most of the staff would live on campus, either in the Student Villages or in the Staff Housing Community. Although the staff is forecast to increase from the current 300 to 600+ in 2016, the number of non-resident staff who will have to commute will decrease from 175 to about 25. Several other actions will also serve to reduce the number of external trips. These actions include serving of communal meals

for students and staff, providing preschool and elementary schools for children of staff, and maintaining a pedestrian friendly campus. The number of current and forecast external trips is summarized in the following table.

YEAR	DIRECTION OF TRAVEL	AM PEAK	PM PEAK
2005	Inbound	100	70
	Outbound	45	55
2010	Inbound	100	90
	Outbound	65	80
2016	Inbound	100	130
	Outbound	90	95

Since this traffic would be split between two driveways in the future, the volumes at each would be at reasonable levels and would not require traffic signals. The traffic generated by this proposed project is not expected to have an adverse impact on traffic operations at the study intersections.

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5. *Traffic Impact Analysis Report Kona Hale Alii*, M&E Pacific, Inc., May 2004.

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7. *Traffic Impact Analysis Report for the U of N Bencorp Development*, M&E Pacific, Inc., First Revision, August 2003.

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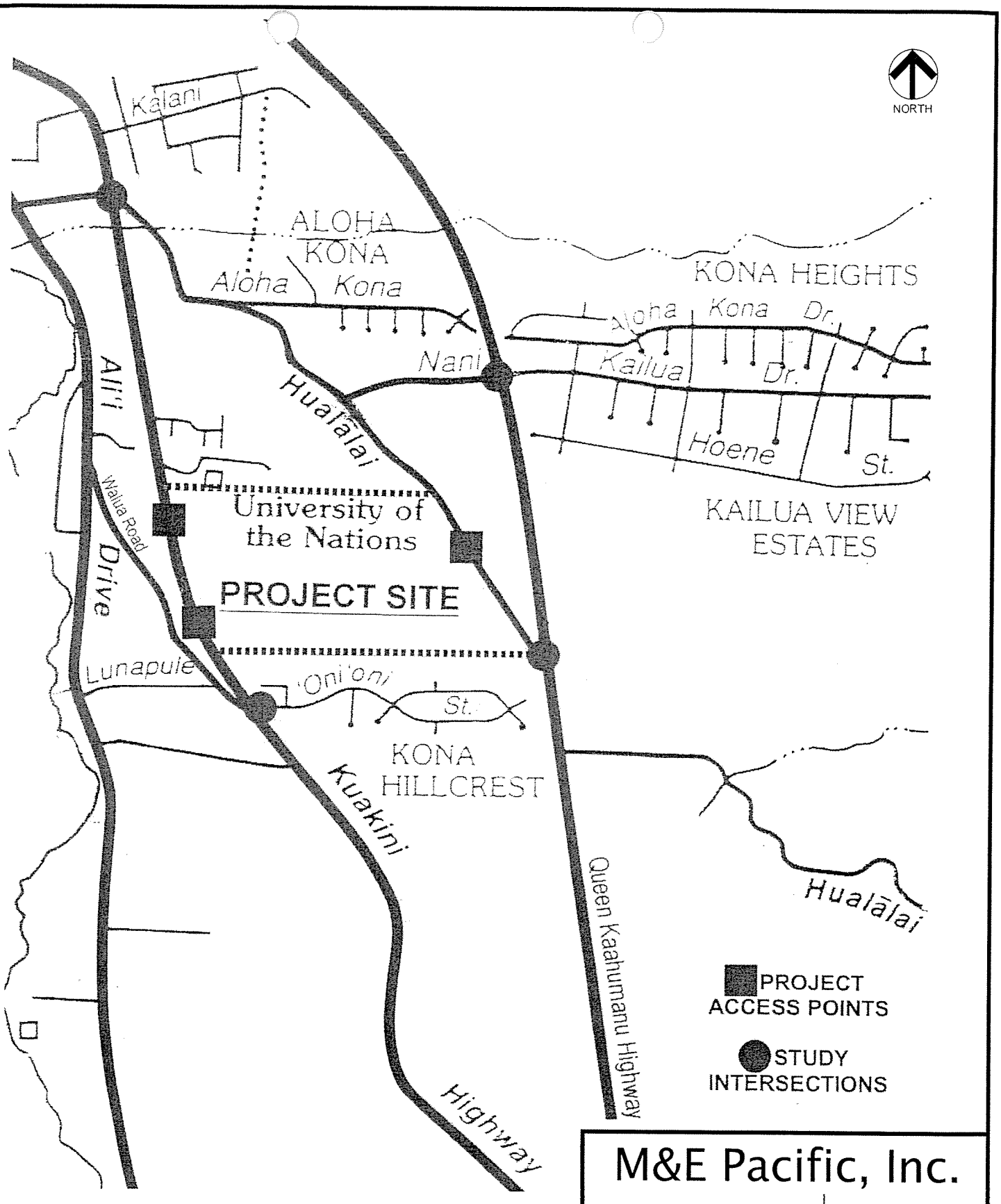
Figures



SITE LOCATION & ROADWAY NETWORK

NOT TO SCALE

M&E Pacific, Inc.

METCALF & EDDY | AECOM

DAVIES PACIFIC CTR, STE 1900 · 841 BISHOP ST, HONOLULU, HAWAII 96813

Figure 1
Site Location & Roadway Network
Traffic Impact Analysis Report
University of the Nations
December 2006

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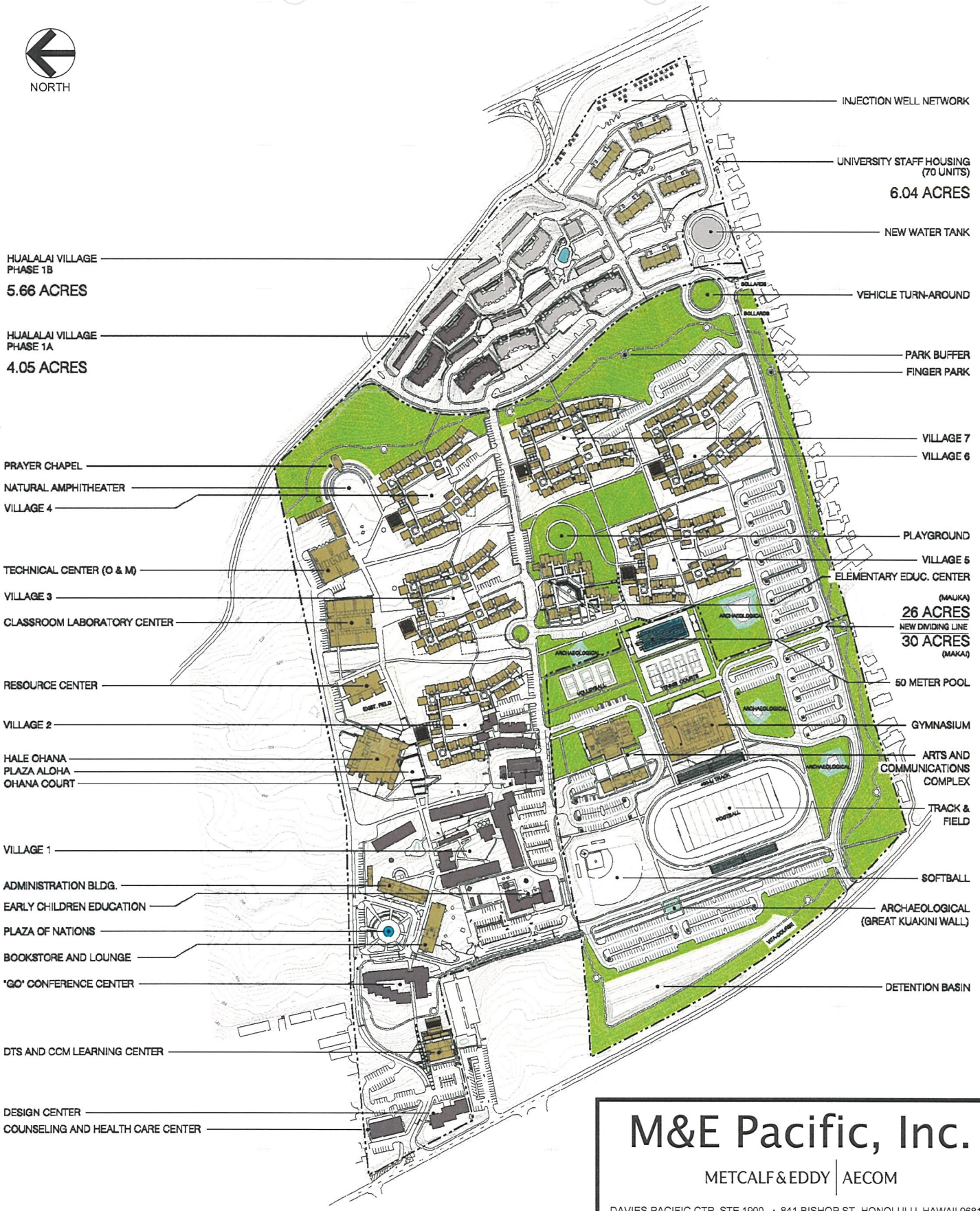

SITE PLAN

NOT TO SCALE

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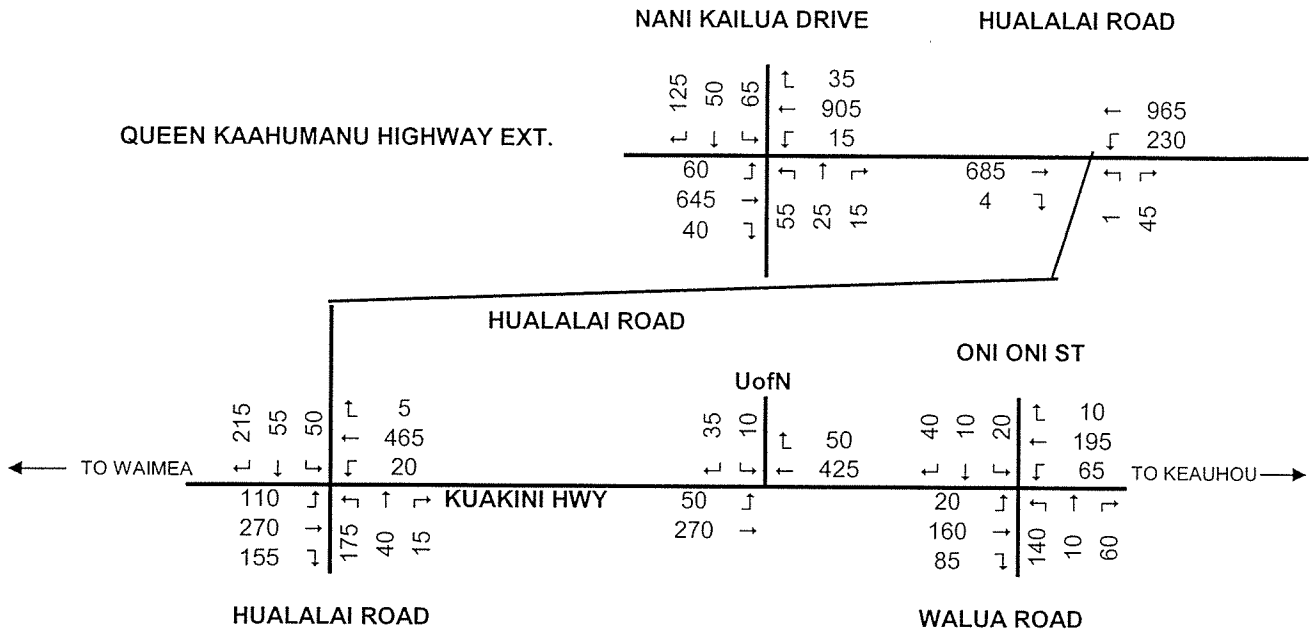
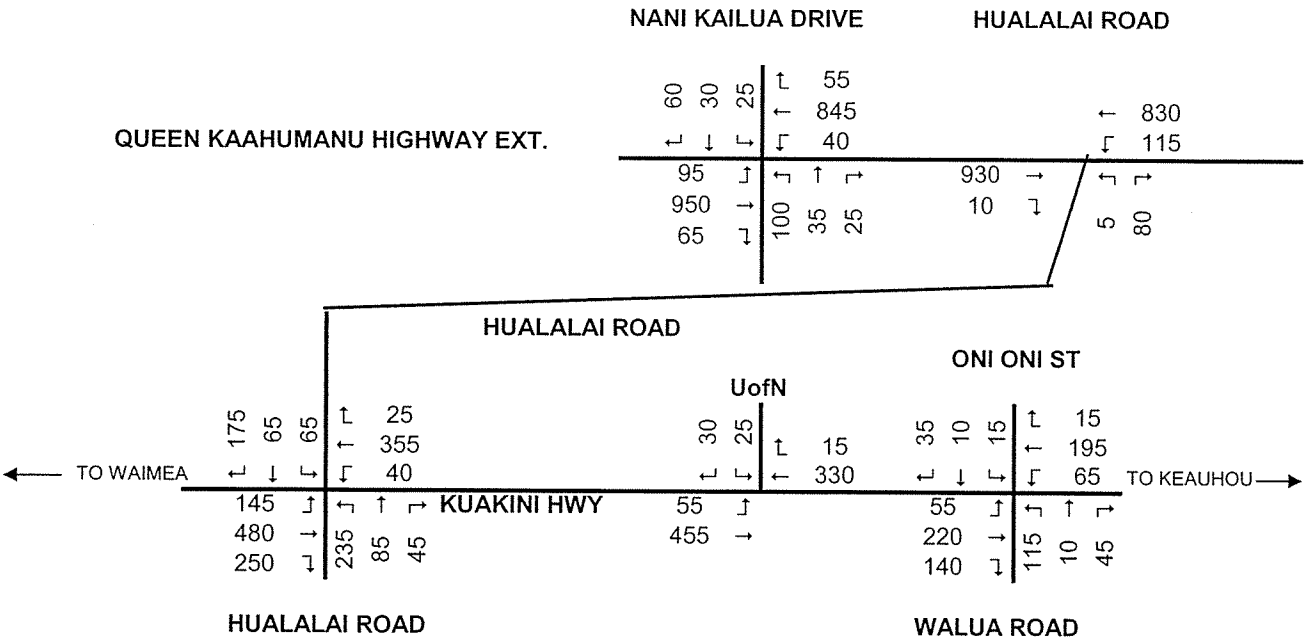
Figure 2
Site Plan
Traffic Impact Analysis Report
University of the Nations
December 2006



AM PEAK HOUR

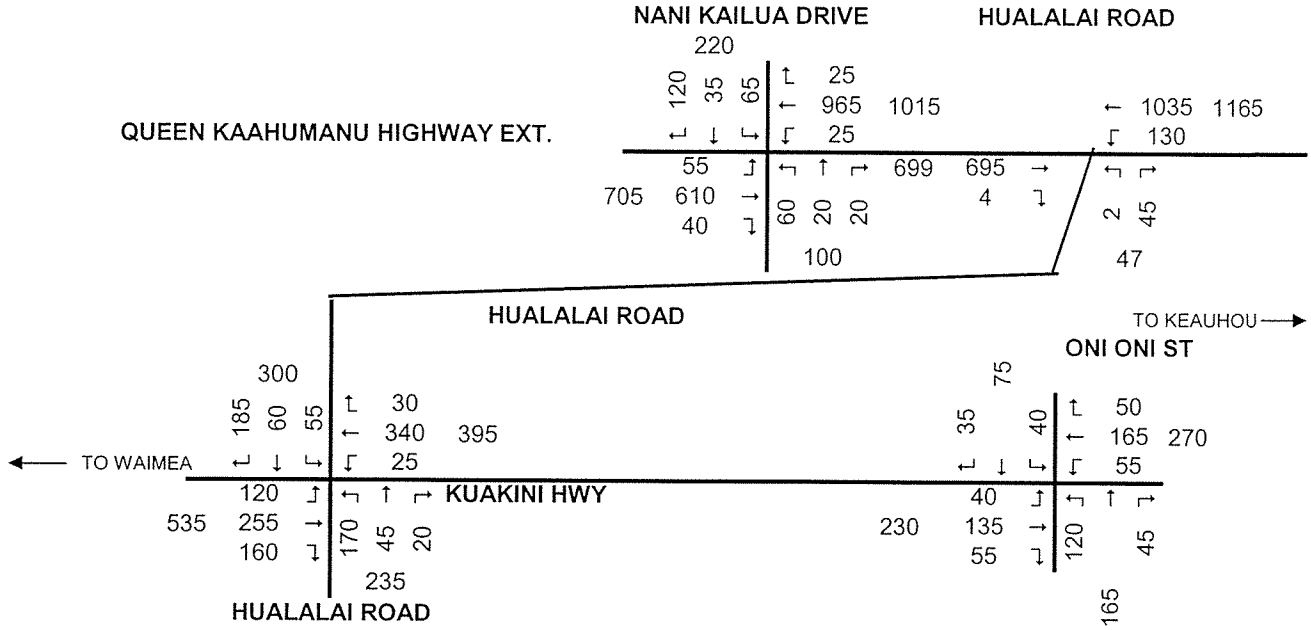


PM PEAK HOUR

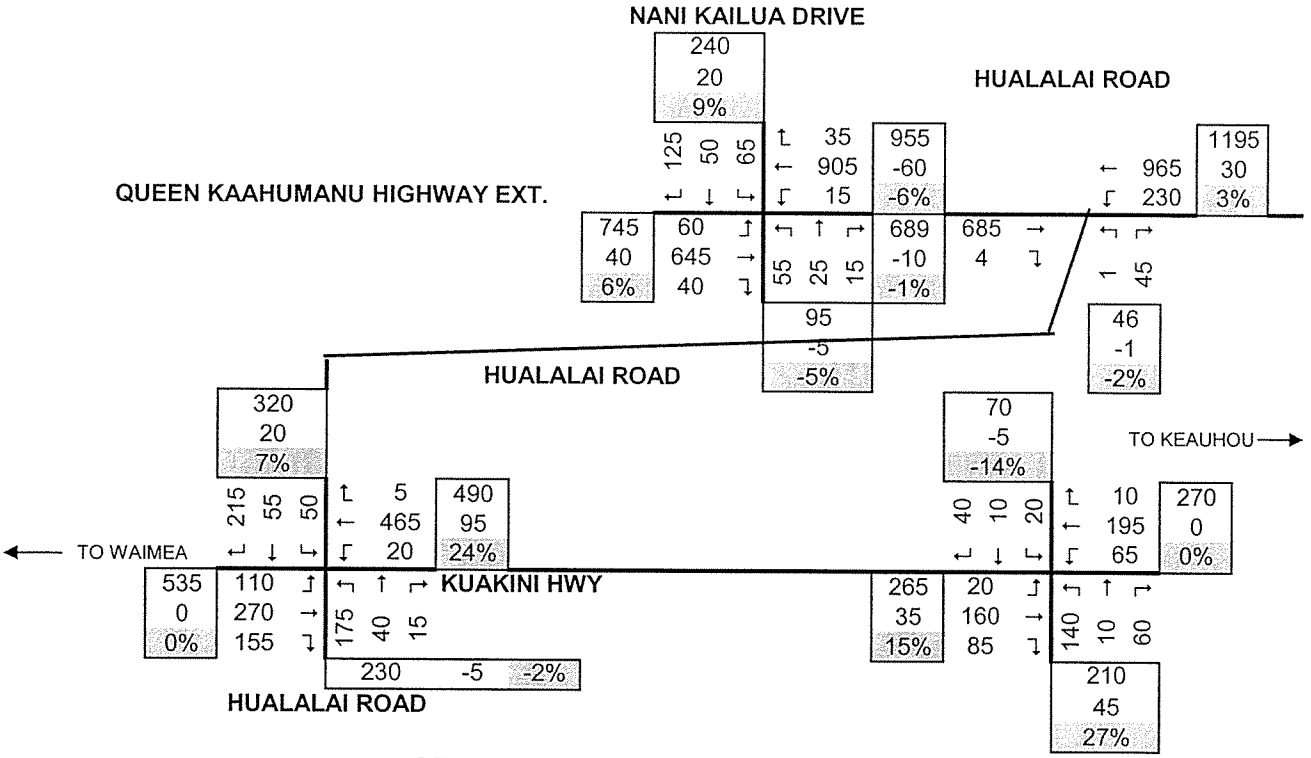
Not to Scale

EXISTING 2004 TRAFFIC VOLUMES

FIGURE 3



SEPTEMBER 2002 TRAFFIC COUNTS



APRIL 2004 TRAFFIC COUNTS

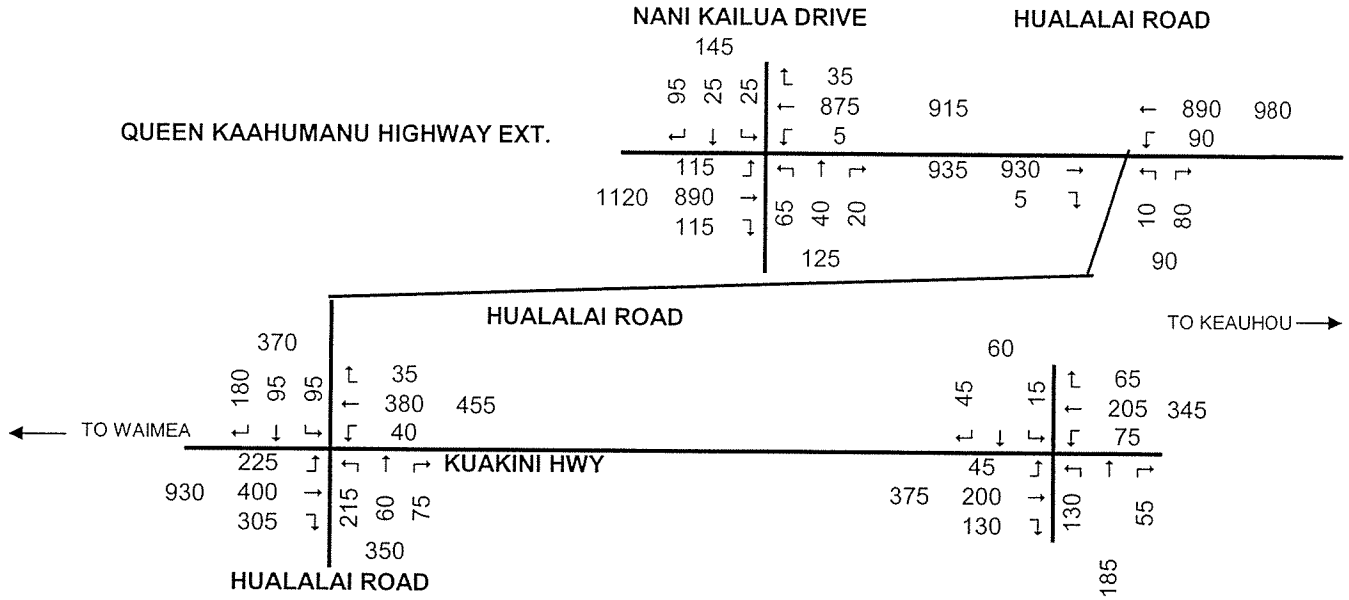
AM PEAK HOUR

Not to Scale

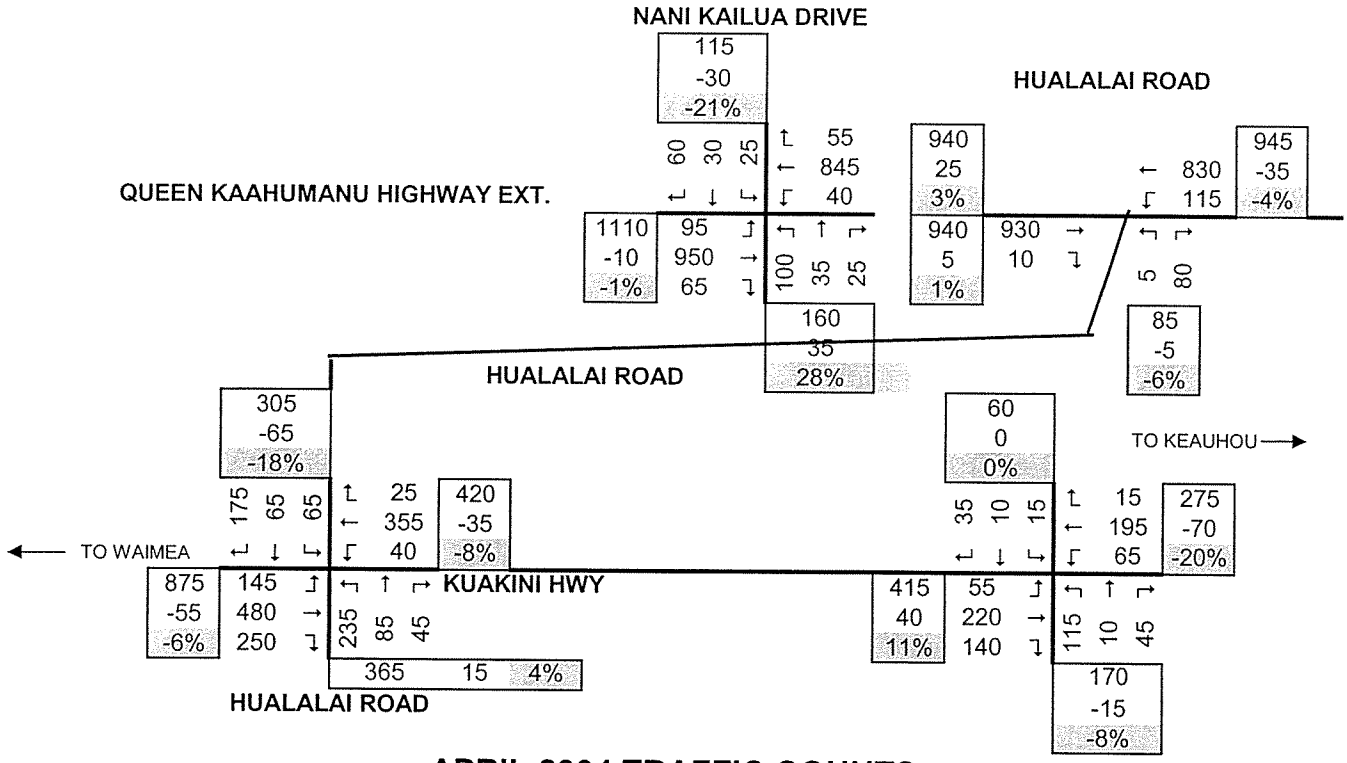
LEGEND

490	Combined approach volume
95	Volume change from 2002 to 2004
24%	Percent change from 2002 to 2004

COMPARISON OF 2002 AND 2004 TRAFFIC VOLUMES
FIGURE 4A



SEPTEMBER 2002 TRAFFIC COUNTS



APRIL 2004 TRAFFIC COUNTS

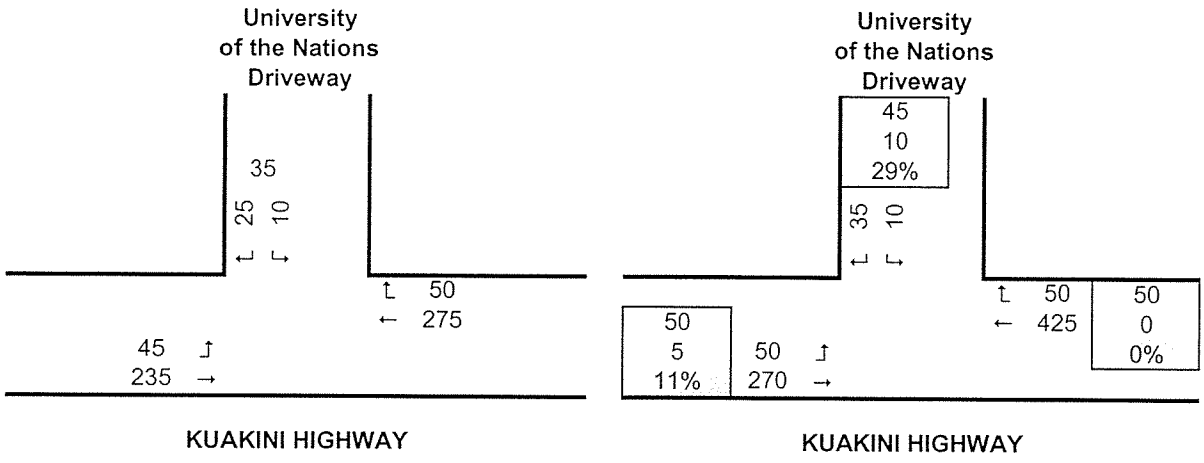
PM PEAK HOUR

Not to Scale

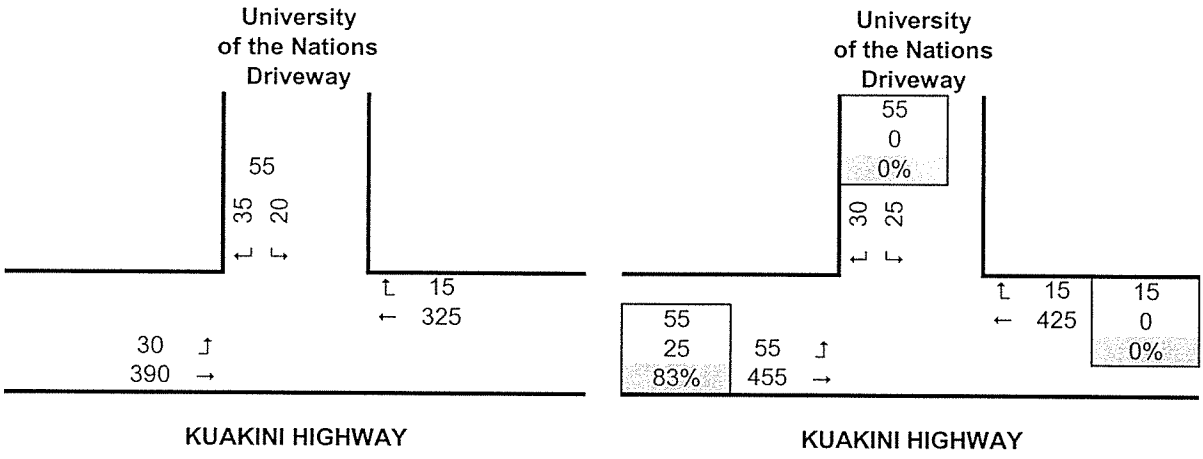
LEGEND

490	Combined approach volume
95	Volume change from 2002 to 2004
24%	Percent change from 2002 to 2004

COMPARISON OF 2002 AND 2004 TRAFFIC VOLUMES
FIGURE 4B



AM PEAK HOUR



PM PEAK HOUR

LEGEND	
490	Movement/Combined approach volume
95	Volume change from 2000 to 2005
24%	Percent change from 2000 to 2005

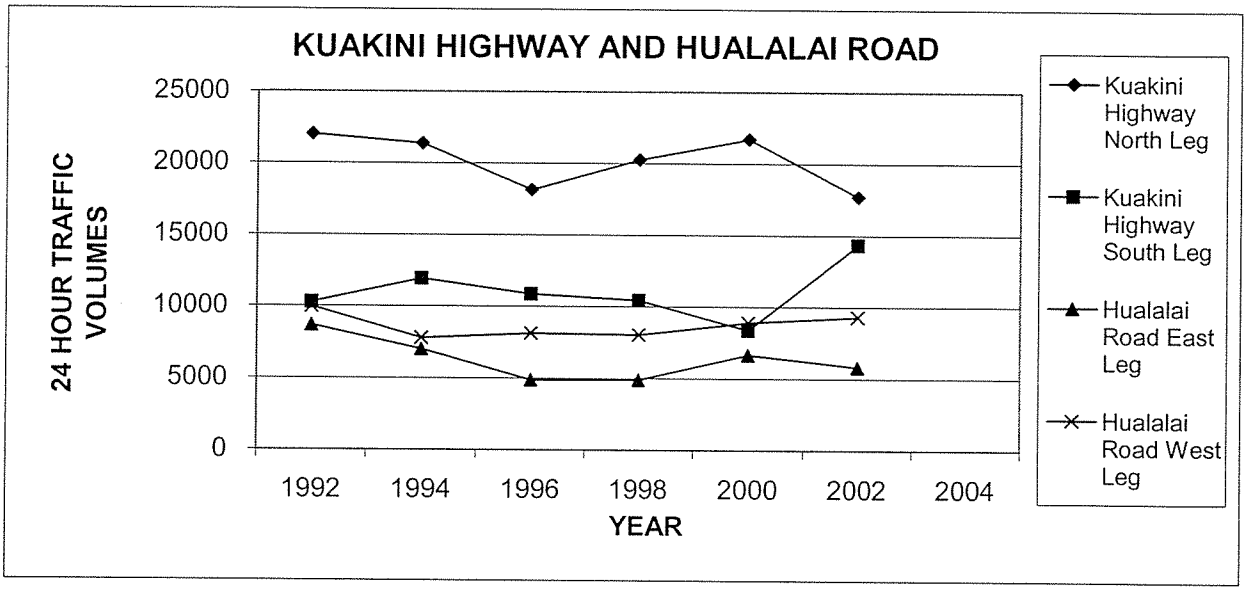
COMPARISON OF 2000 TO 2005 TRAFFIC COUNTS AT UNIVERSITY OF THE NATIONS ENTRANCE

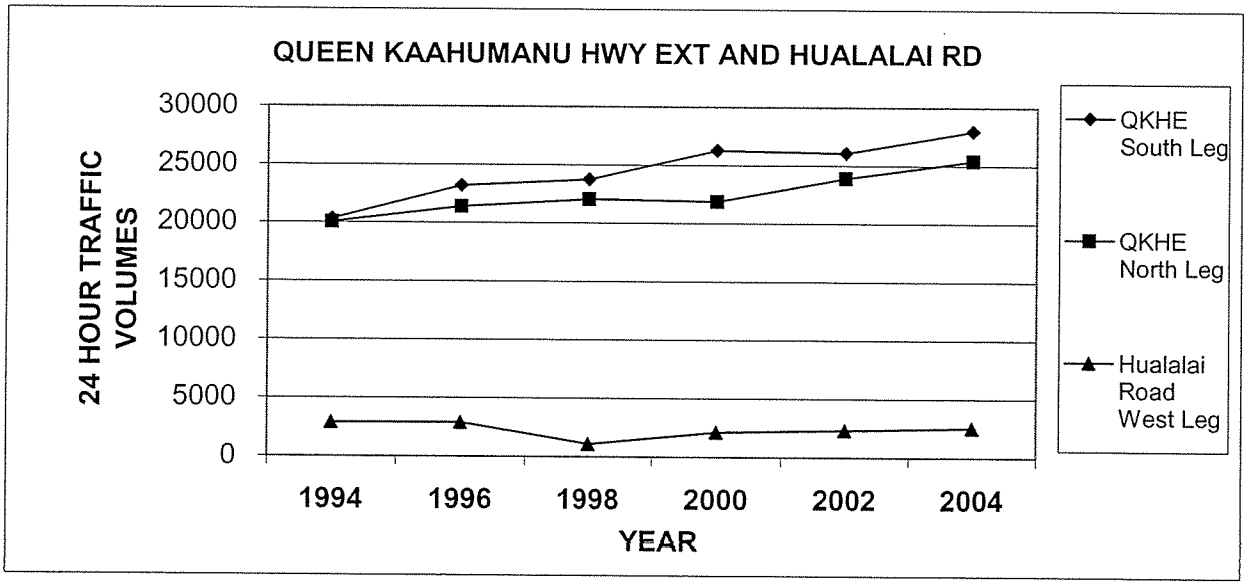
FIGURE 5

24 HOUR TWO WAY TRAFFIC VOLUMES

	STATION 8-K				STATION 9-BB			
	KUAKINI HIGHWAY		HUALALAI ROAD		HIGHWAY EXTENSION		HUALALAI ROAD	
YEAR	NORTH	SOUTH	EAST	WEST	SOUTH	NORTH	WEST	
1992	22022	10281	8660	9952				
1994	21360	11930	6996	7781	20301	20043	2874	
1996	18129	10848	4856	8105	23201	21371	2875	
1998	20254	10436	4884	8016	23732	22027	1079	
2000	21702	8345	6631	8890	26278	21887	2116	
2002	17698	14324	5794	9290	26072	23903	2317	
2004					27981	25419	2532	

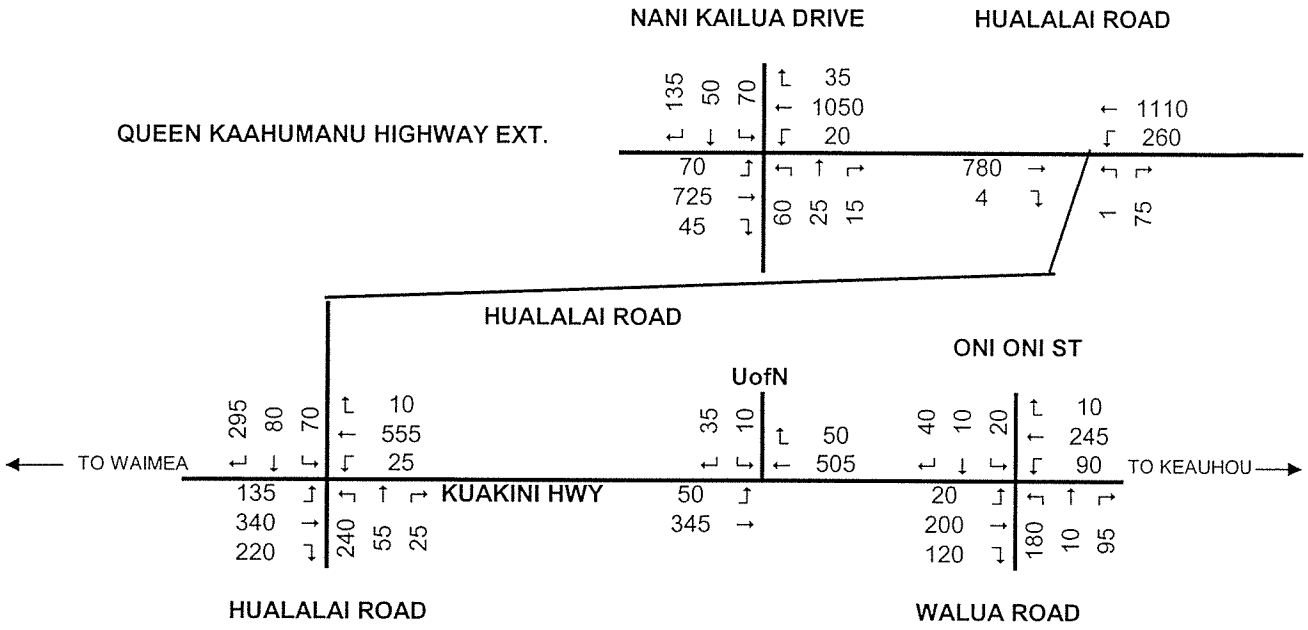
Source: State of Hawaii Department of Transportation



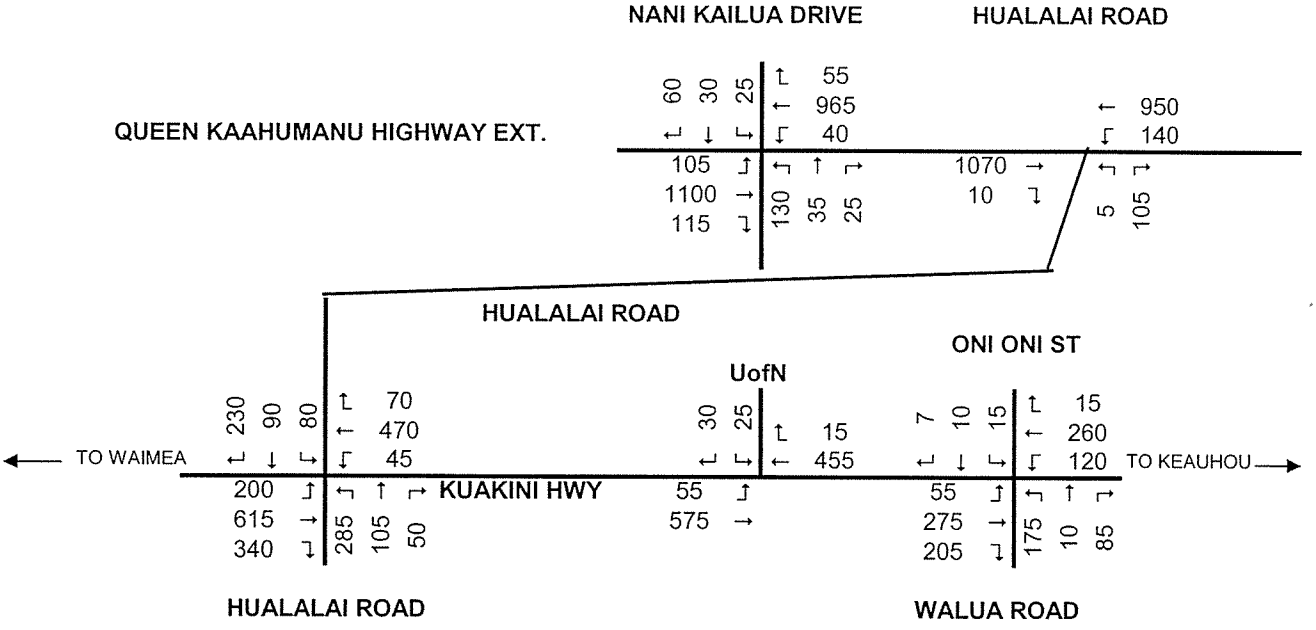


HISTORICAL TREND IN DAILY TRAFFIC VOLUMES

FIGURE 6



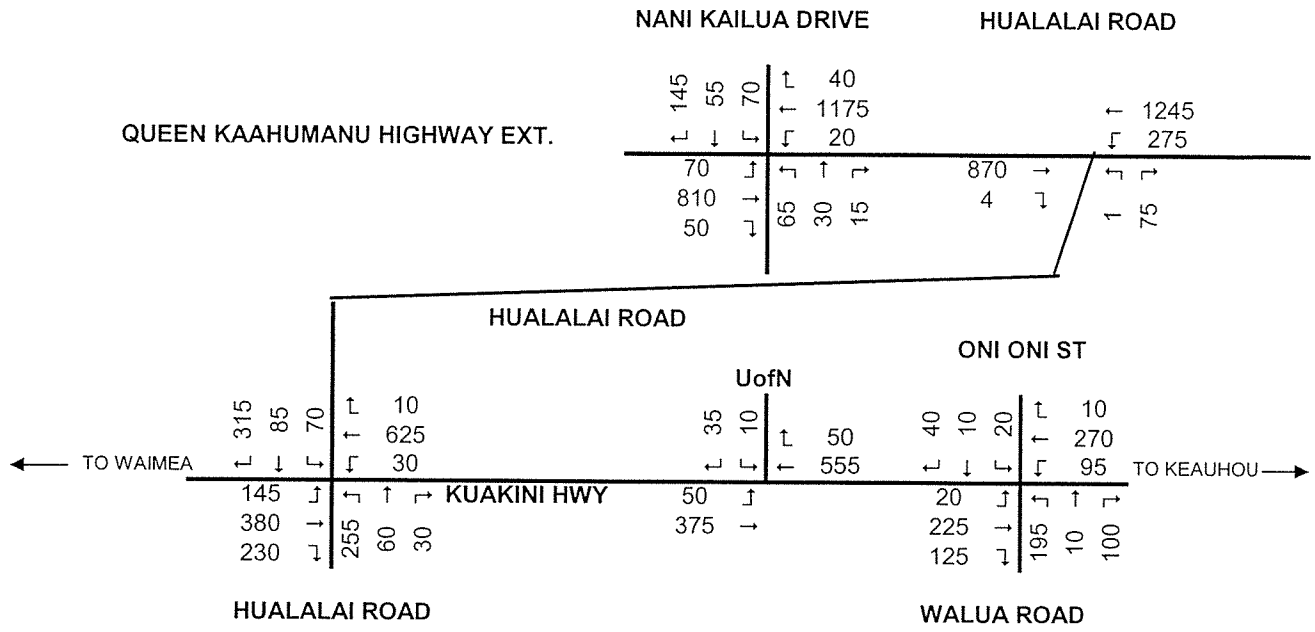
AM PEAK HOUR



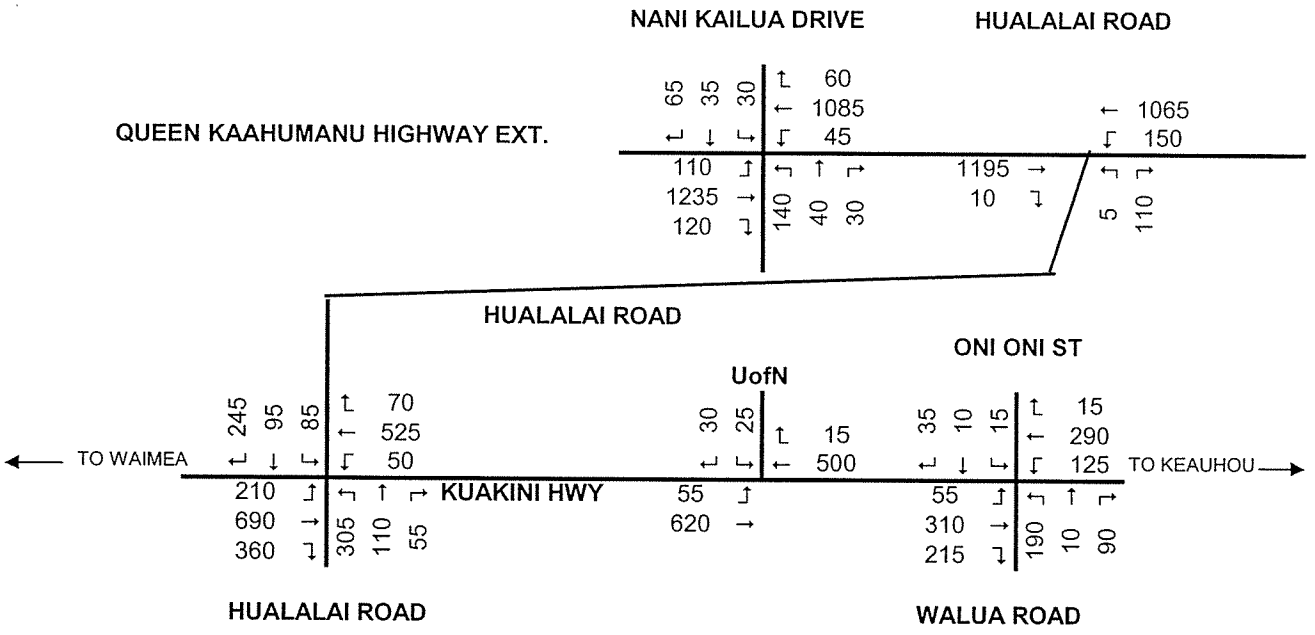
PM PEAK HOUR

Not to Scale

AMBIENT TRAFFIC FORECAST
2010 SCENARIO 1- NO HIGHWAY IMPROVEMENTS
FIGURE 7



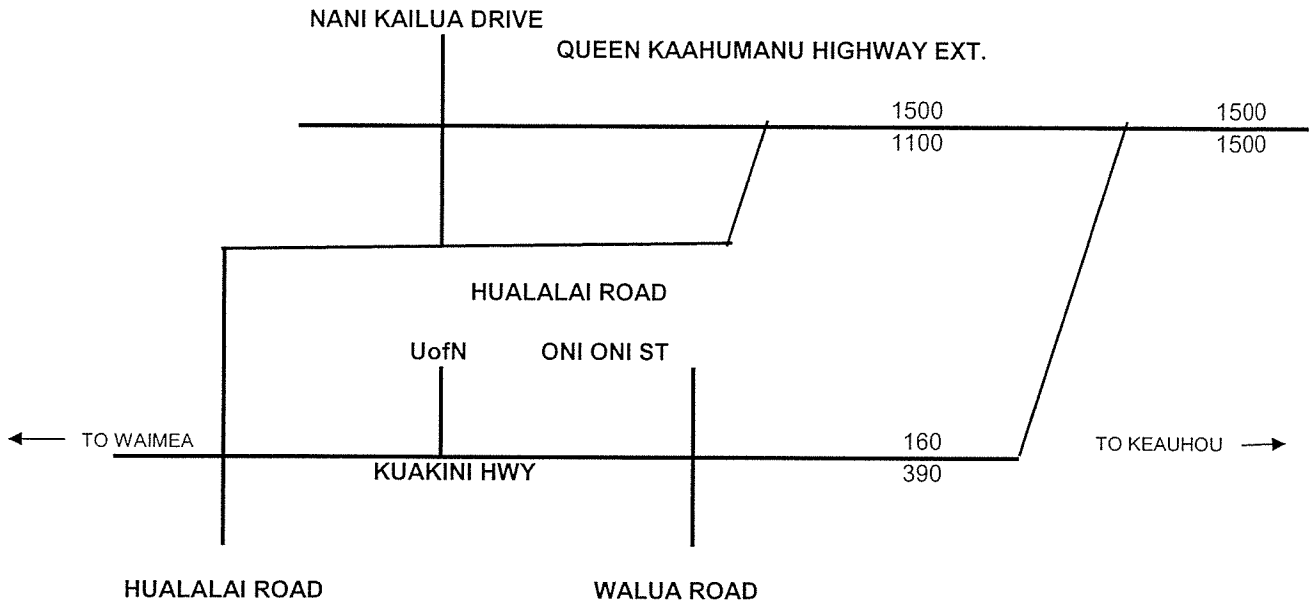
AM PEAK HOUR



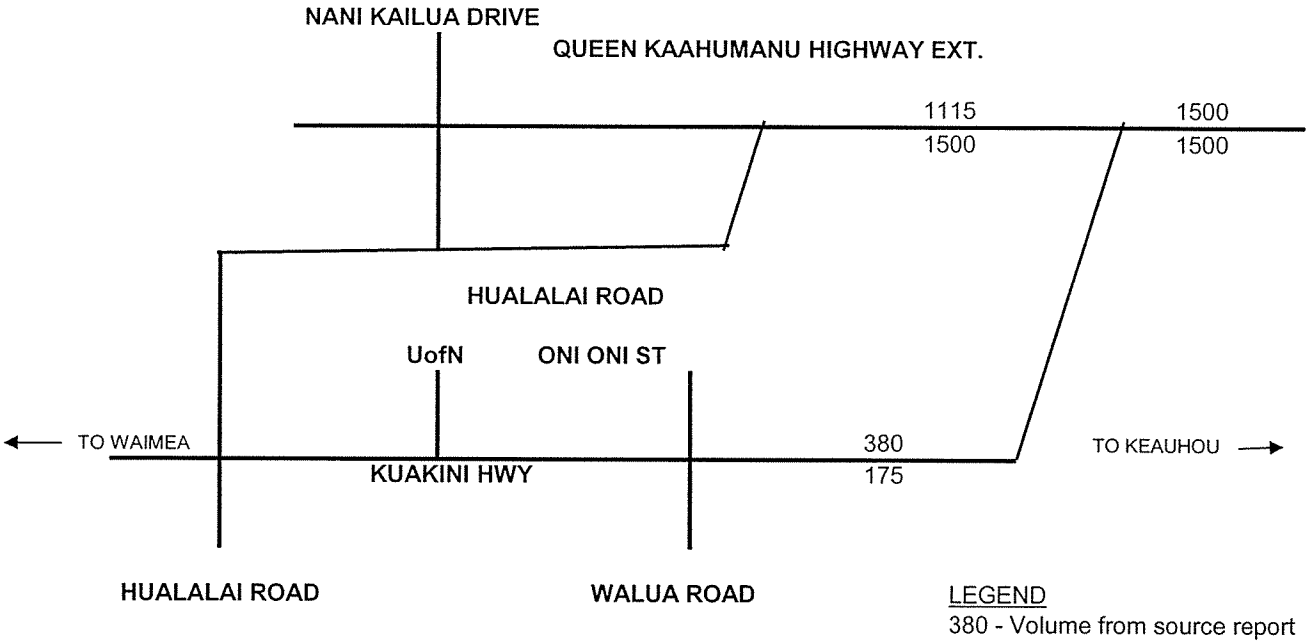
PM PEAK HOUR

Not to Scale

AMBIENT TRAFFIC FORECAST
2016 SCENARIO 1- NO HIGHWAY IMPROVEMENTS
FIGURE 8



AM PEAK HOUR

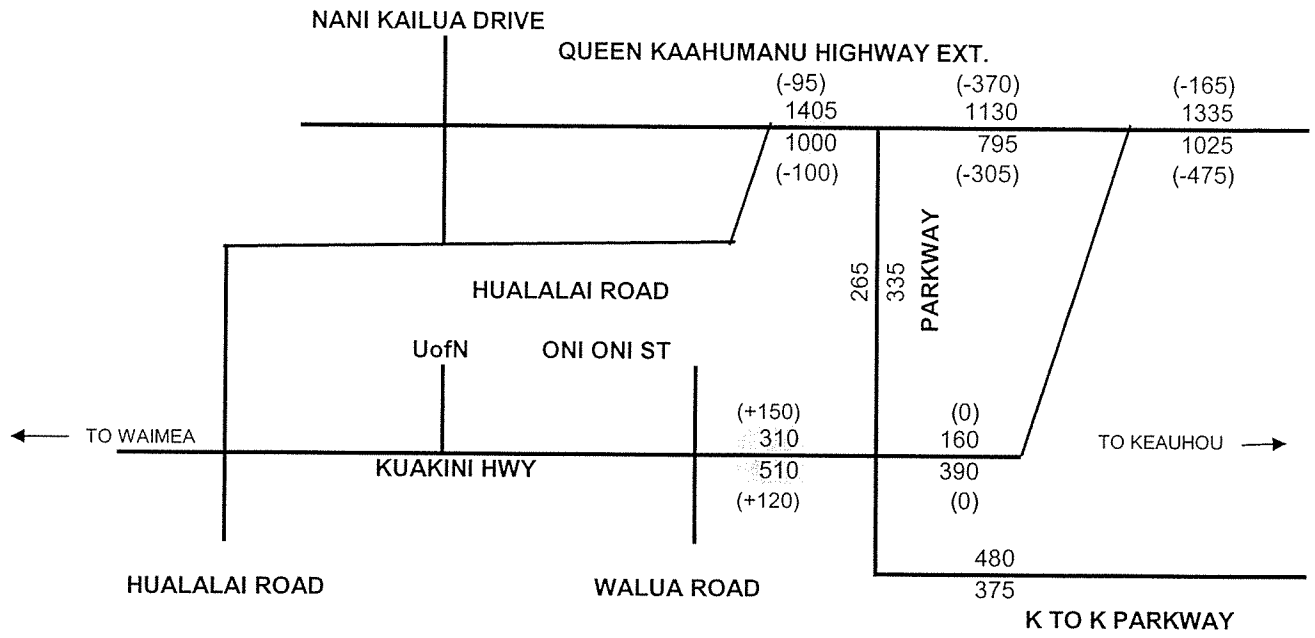


Not to Scale

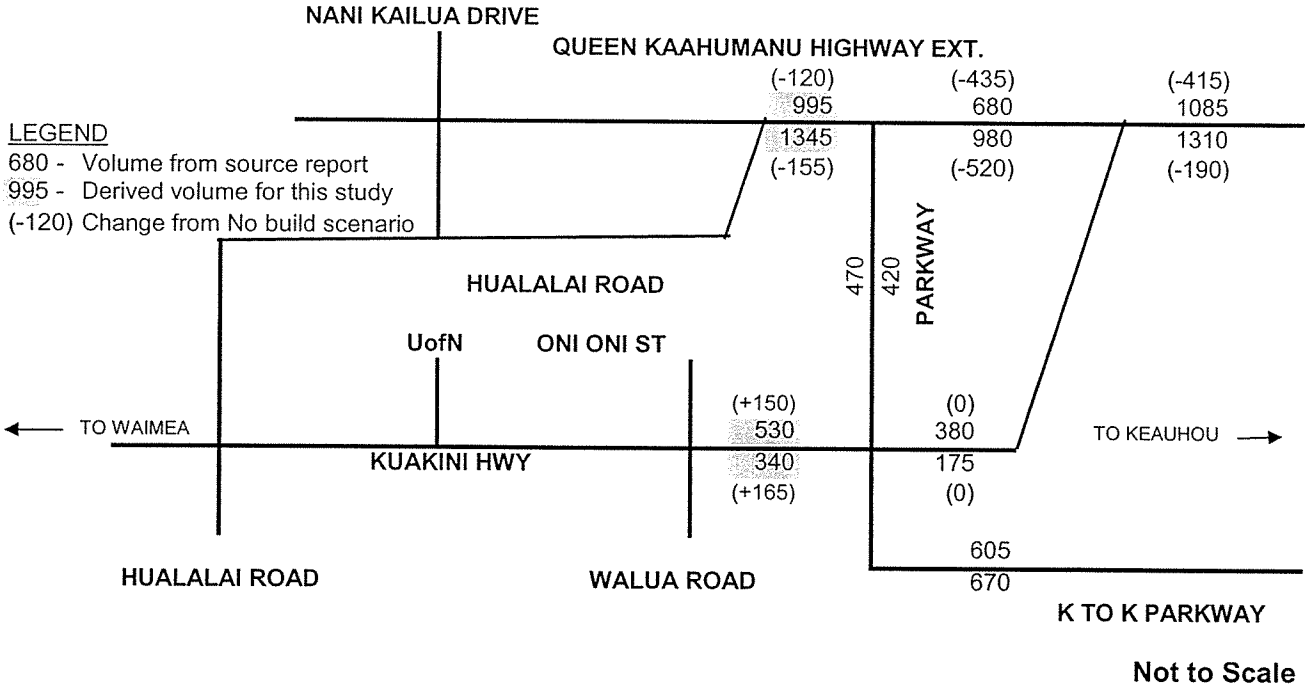
PM PEAK HOUR

Source: Kahalui to Keauhou Parkway Traffic Analysis Report (August 2000) by Julian Ng, Inc.

DERIVATION OF TRAFFIC FORECASTS FOR SCENARIO 1
2020 NO BUILD 1- NO HIGHWAY IMPROVEMENTS (EXHIBIT 3)
FIGURE 9



AM PEAK HOUR

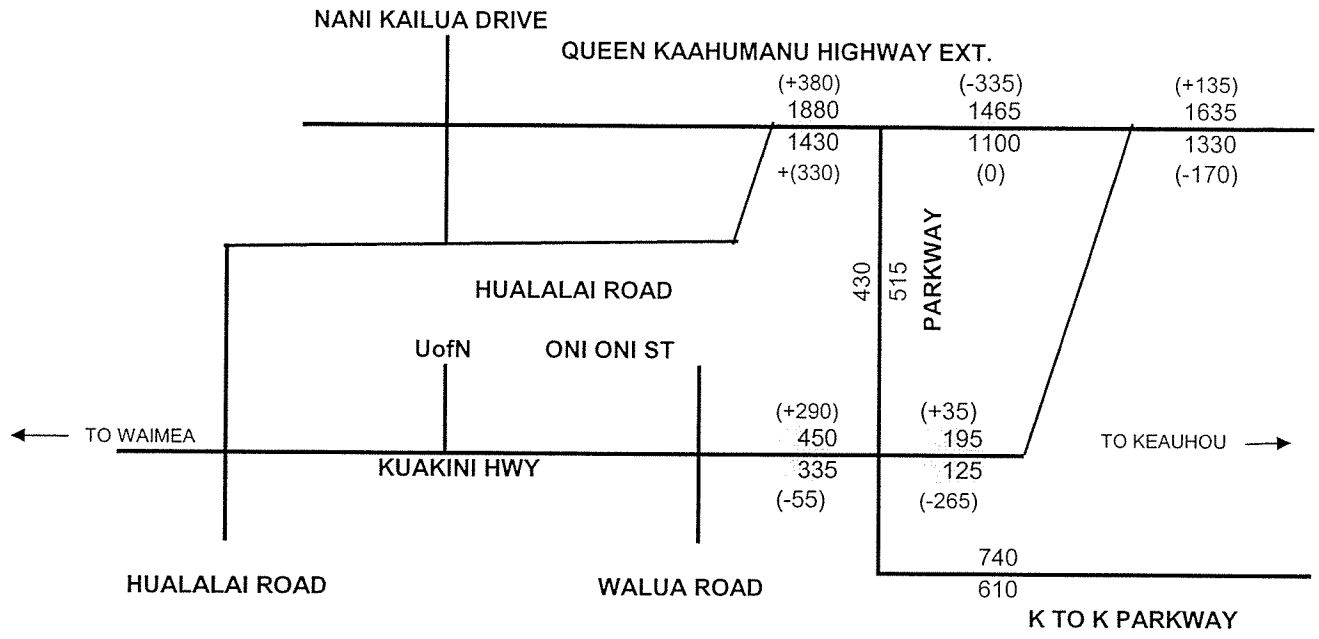


Not to Scale

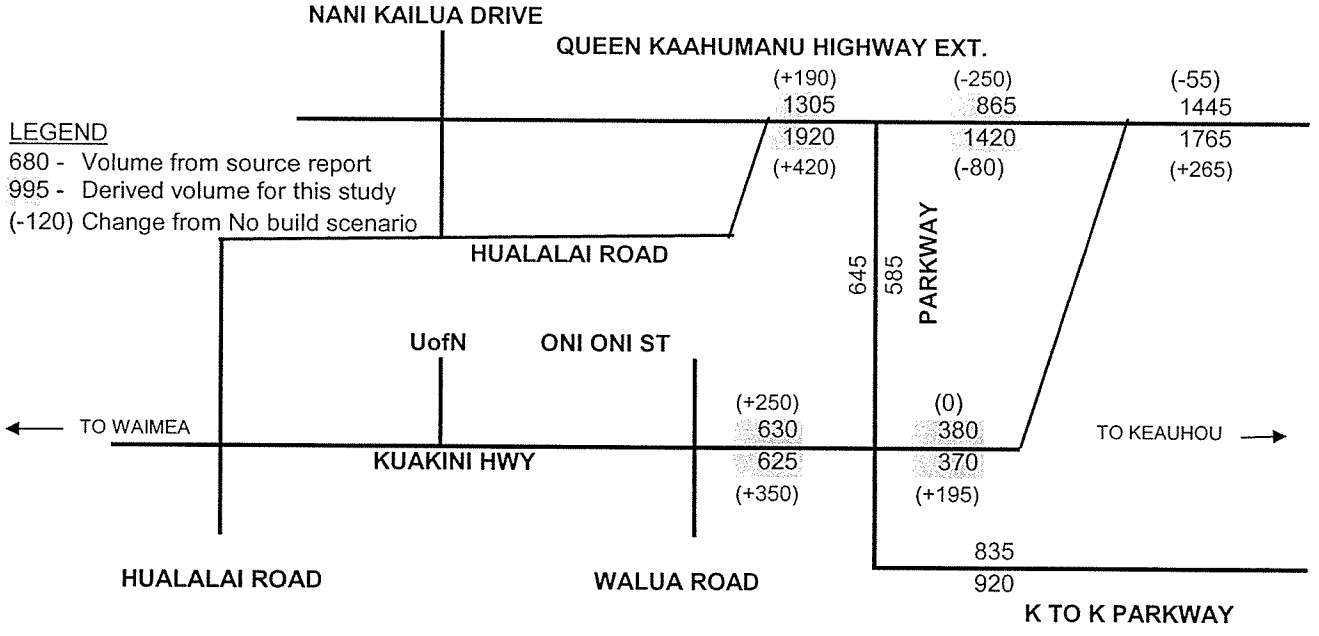
PM PEAK HOUR

Source: Kahalui to Keauhou Parkway Traffic Analysis Report (August 2000) by Julian Ng, Inc.

DERIVATION OF TRAFFIC FORECASTS FOR SCENARIO 2
2020 BUILD 1- WITH KAHALUI TO KEAUHOU PARKWAY (EXHIBIT 7)
FIGURE 10



AM PEAK HOUR

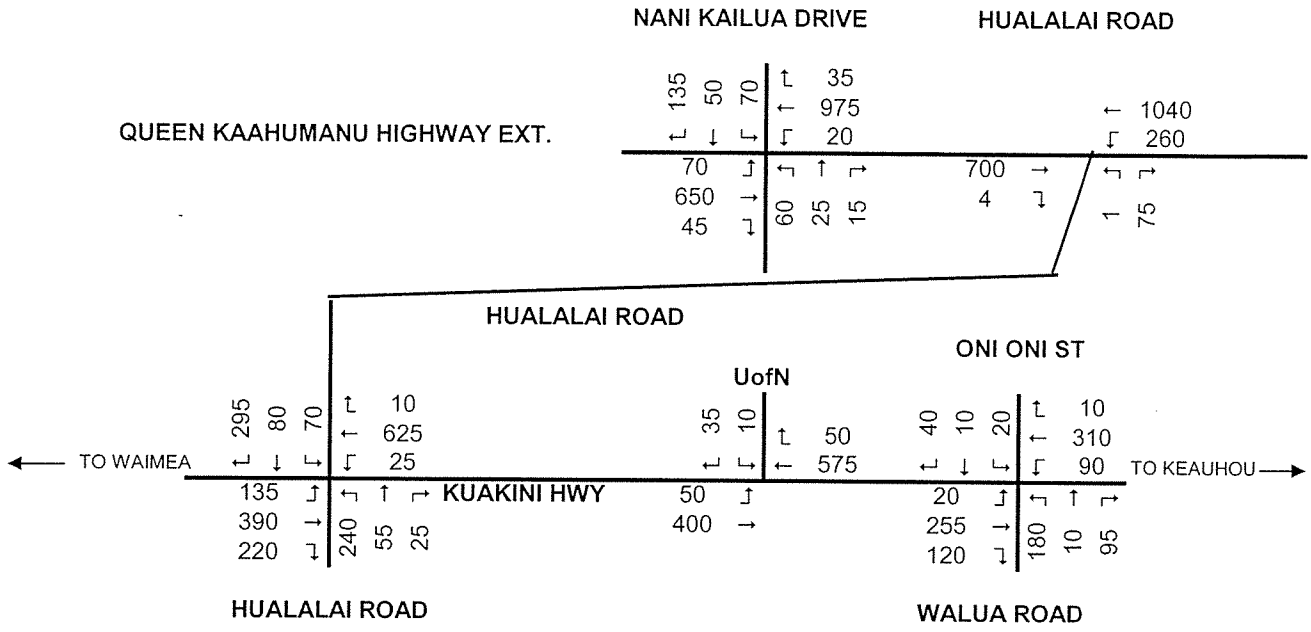


Not to Scale

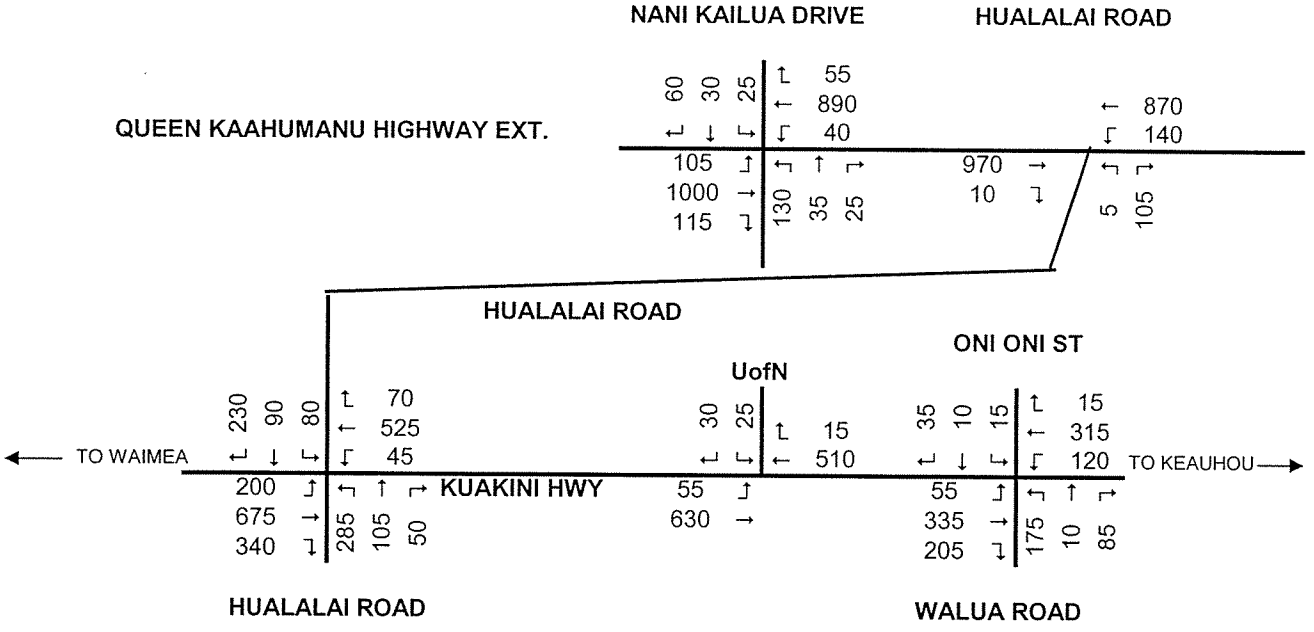
PM PEAK HOUR

Source: Kahalui to Keauhou Parkway Traffic Analysis Report (August 2000) by Julian Ng, Inc.

DERIVATION OF TRAFFIC FORECASTS FOR SCENARIO 3
2020 BUILD 2- WITH PARKWAY AND 4 LANE BELT HIGHWAY (EXHIBIT 8)
FIGURE 11



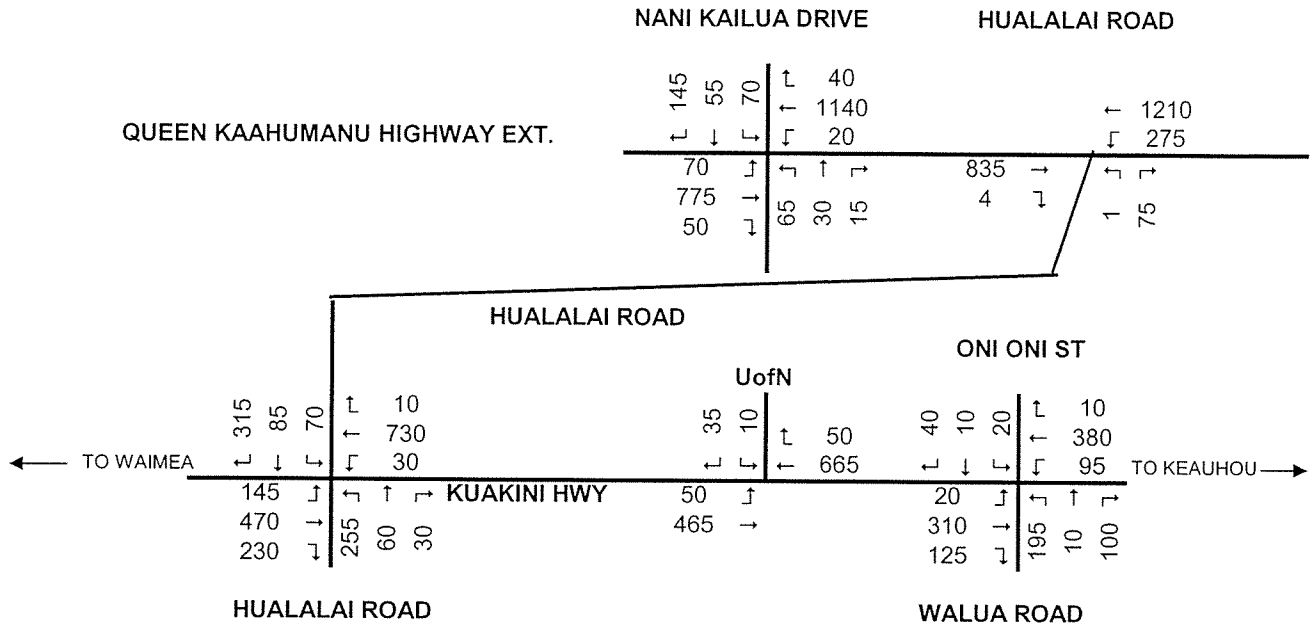
AM PEAK HOUR



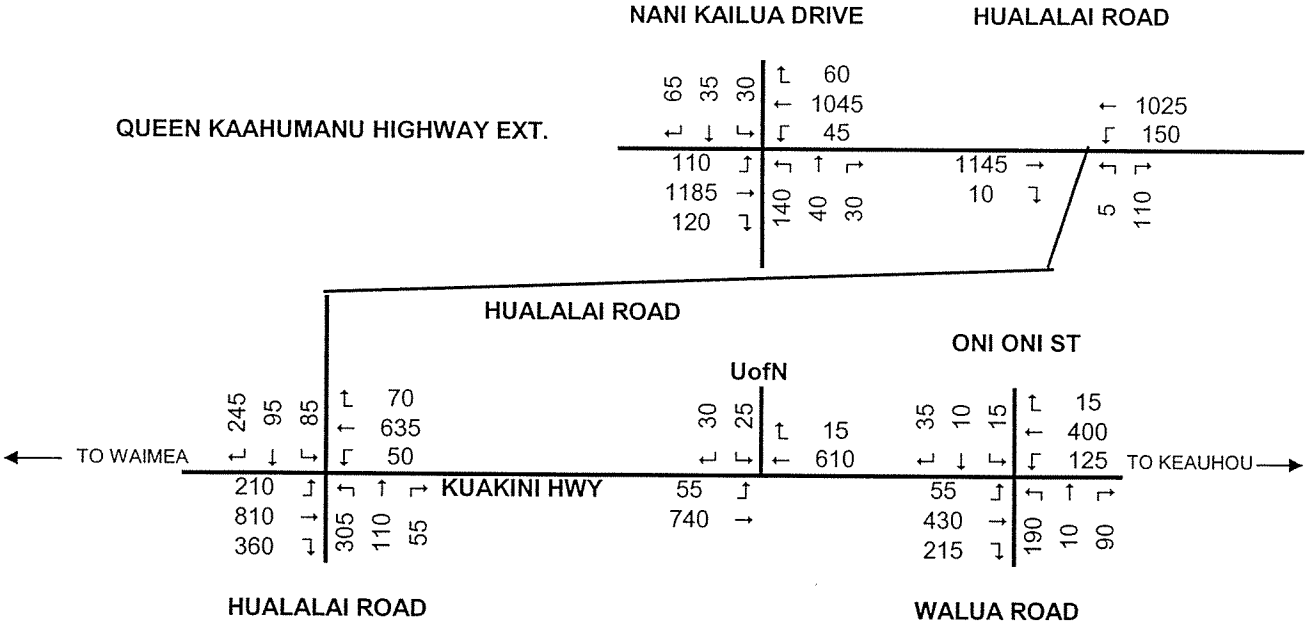
PM PEAK HOUR

Not to Scale

AMBIENT TRAFFIC FORECAST
2010 SCENARIO 2- WITH K TO K PARKWAY
FIGURE 12



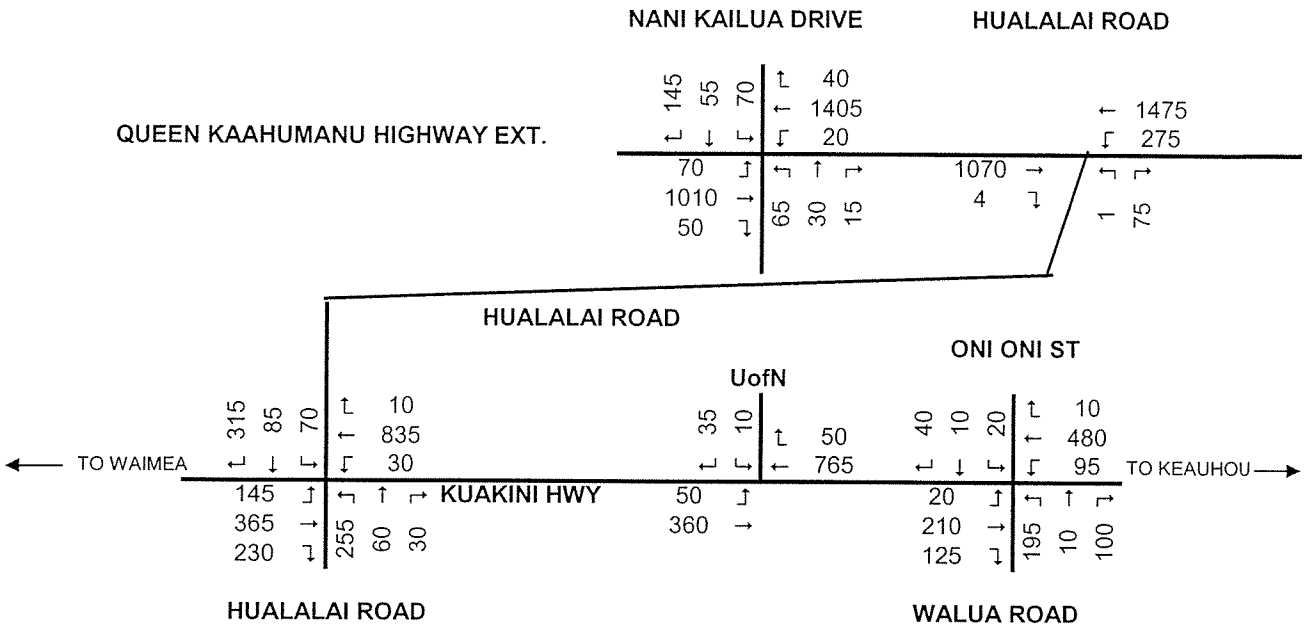
AM PEAK HOUR



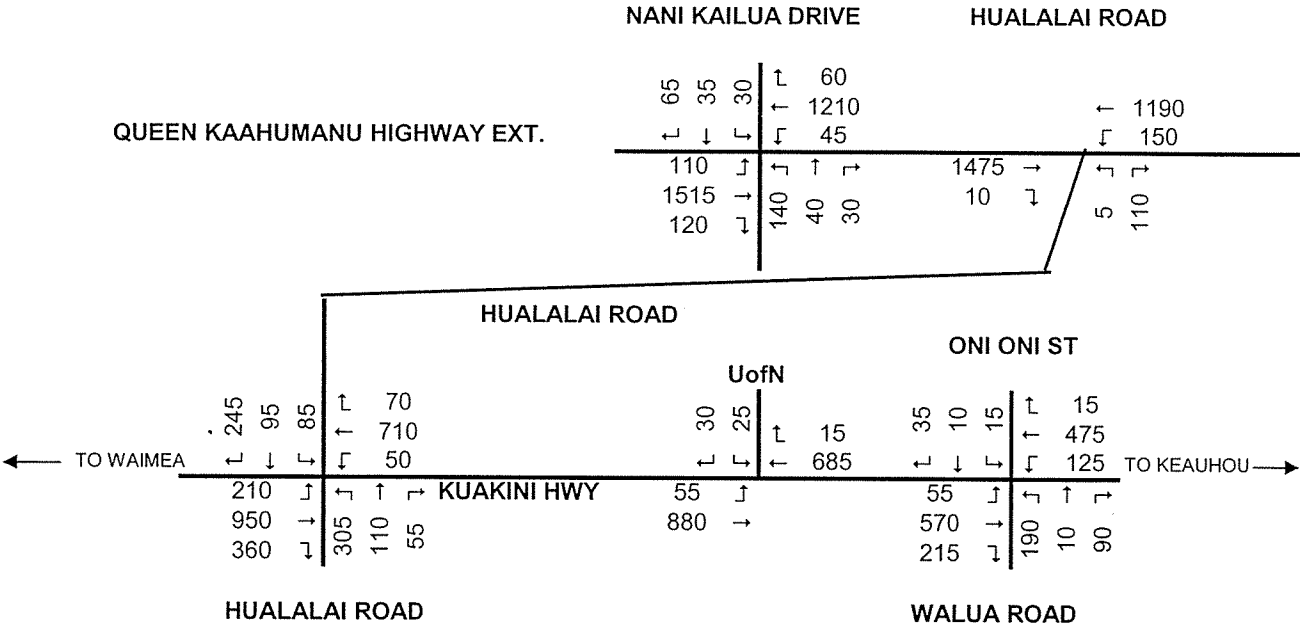
PM PEAK HOUR

Not to Scale

AMBIENT TRAFFIC FORECAST
2016 SCENARIO 2- WITH K TO K PARKWAY
FIGURE 13



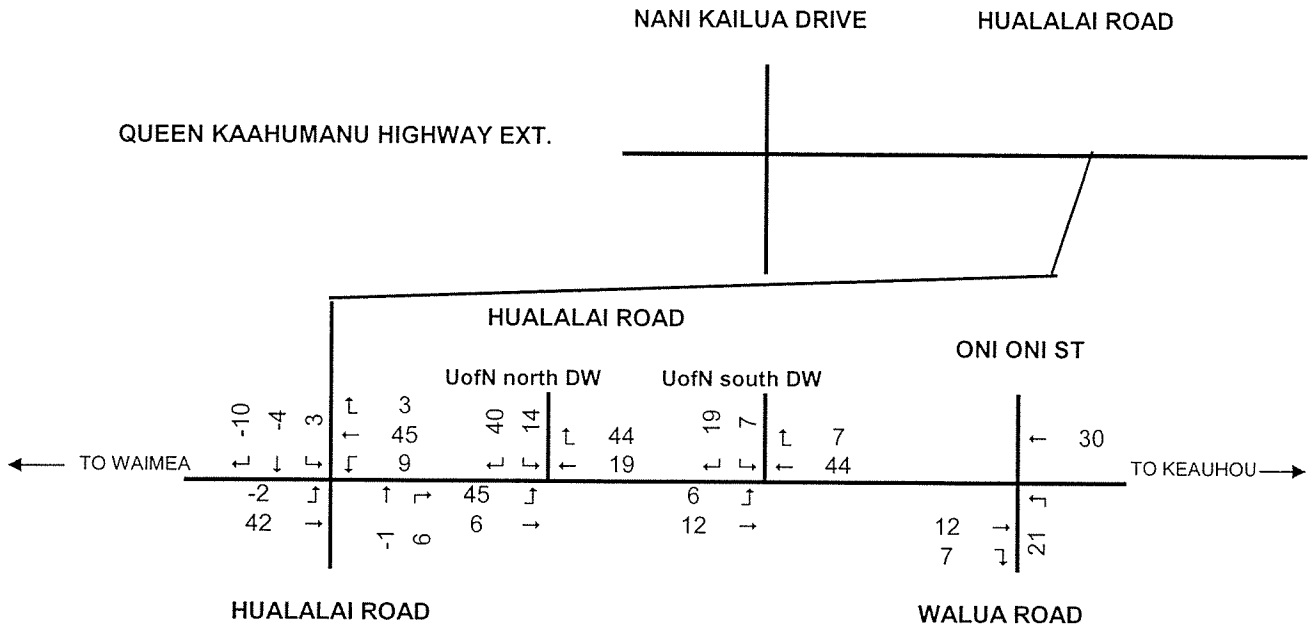
AM PEAK HOUR



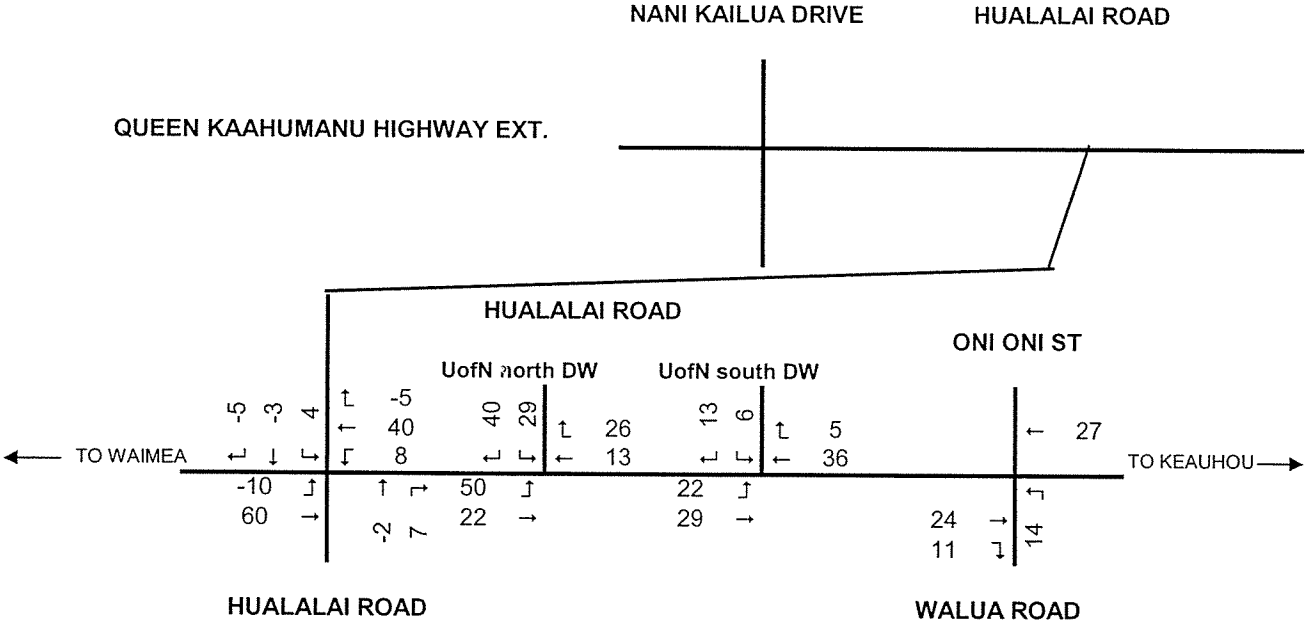
PM PEAK HOUR

Not to Scale

AMBIENT TRAFFIC FORECAST
2016 SCENARIO 3- PARKWAY & 4 LANE HI BELT HWY
FIGURE 14



AM PEAK HOUR

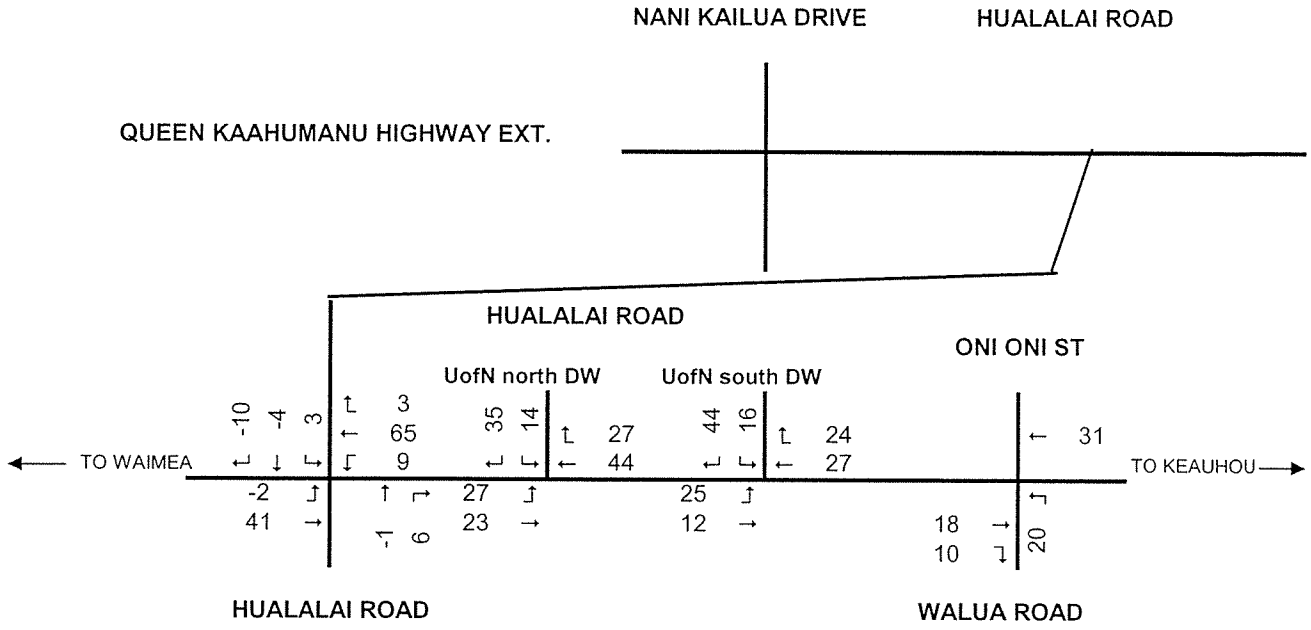


PM PEAK HOUR

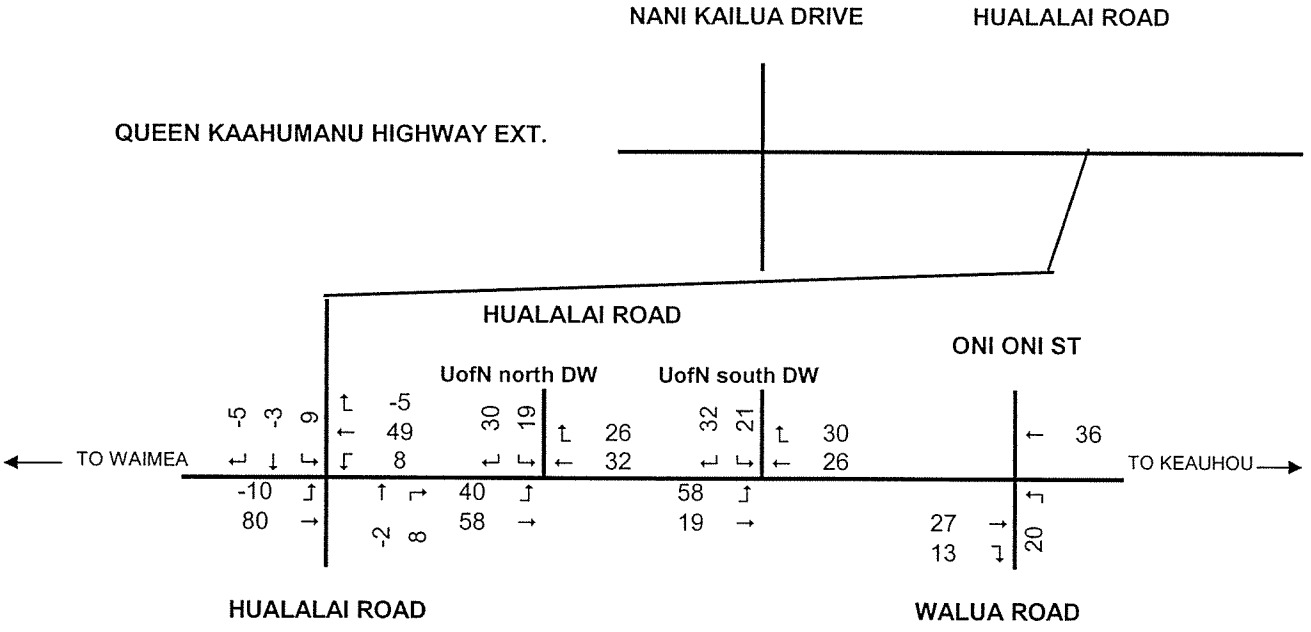
Not to Scale

2010 TRIP ASSIGNMENT FORECAST

FIGURE 15



AM PEAK HOUR

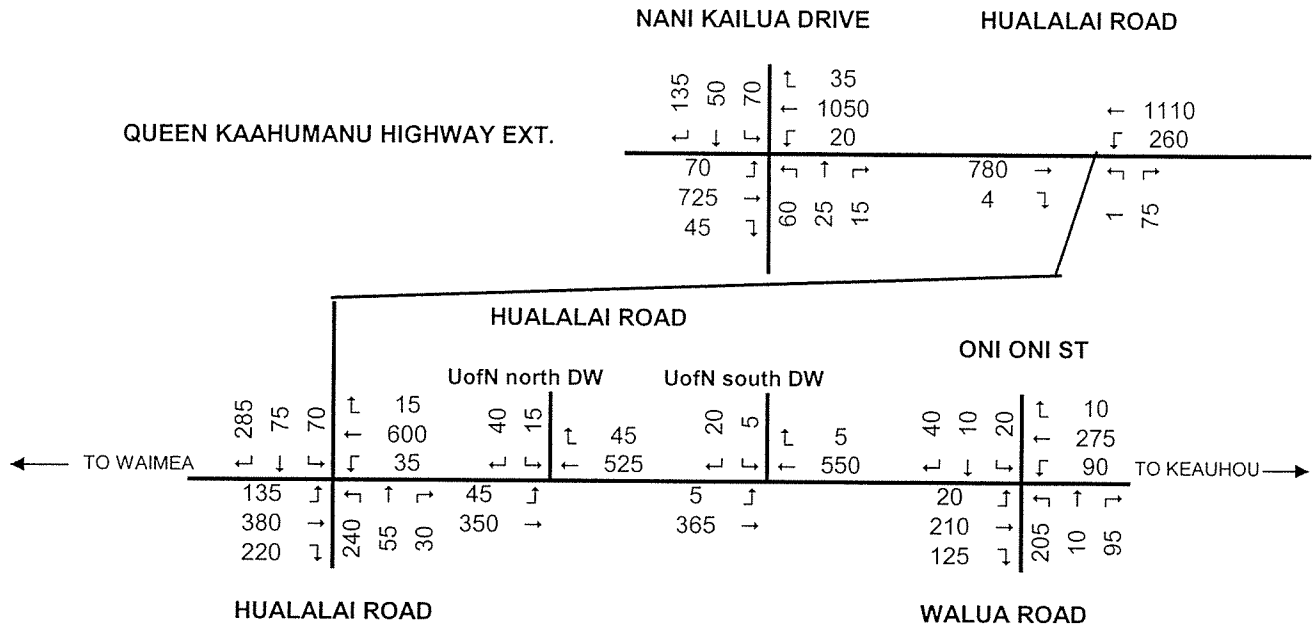


PM PEAK HOUR

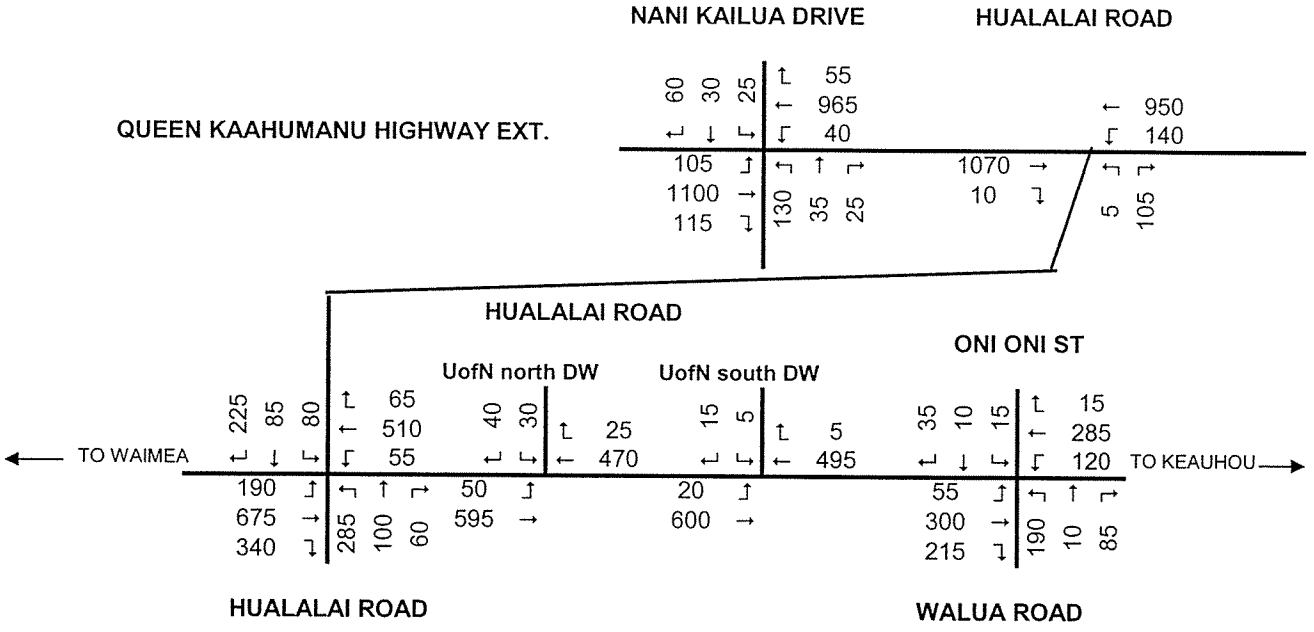
Not to Scale

2016 TRIP ASSIGNMENT FORECAST

FIGURE 16



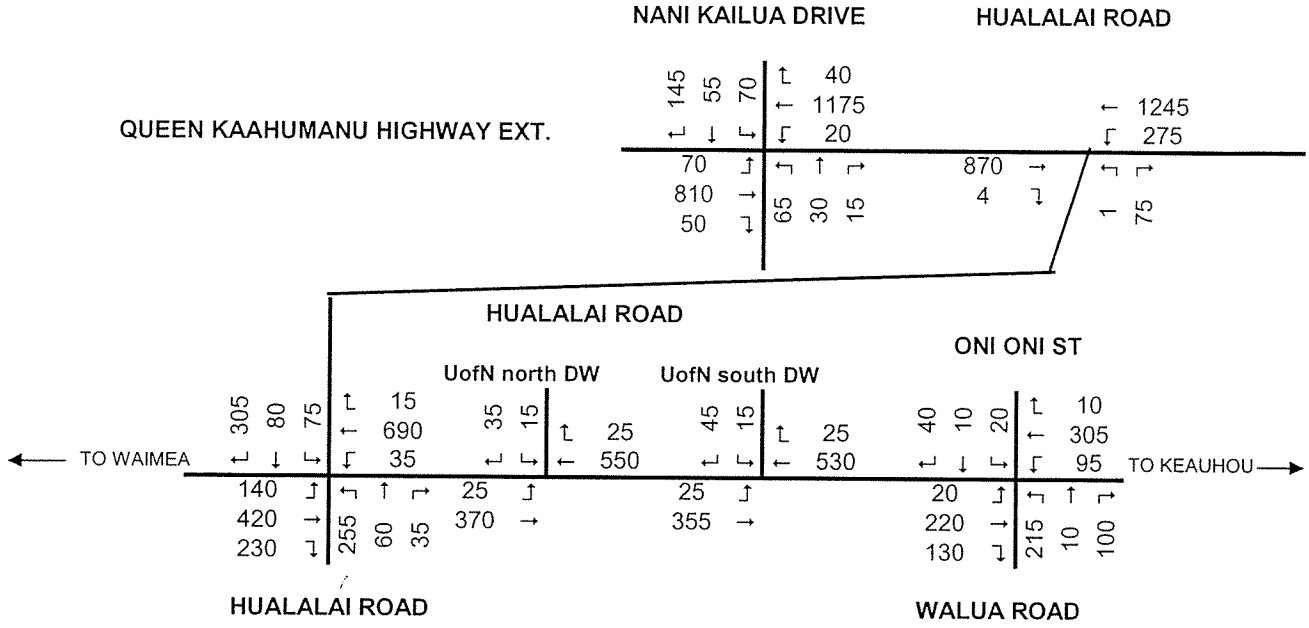
AM PEAK HOUR



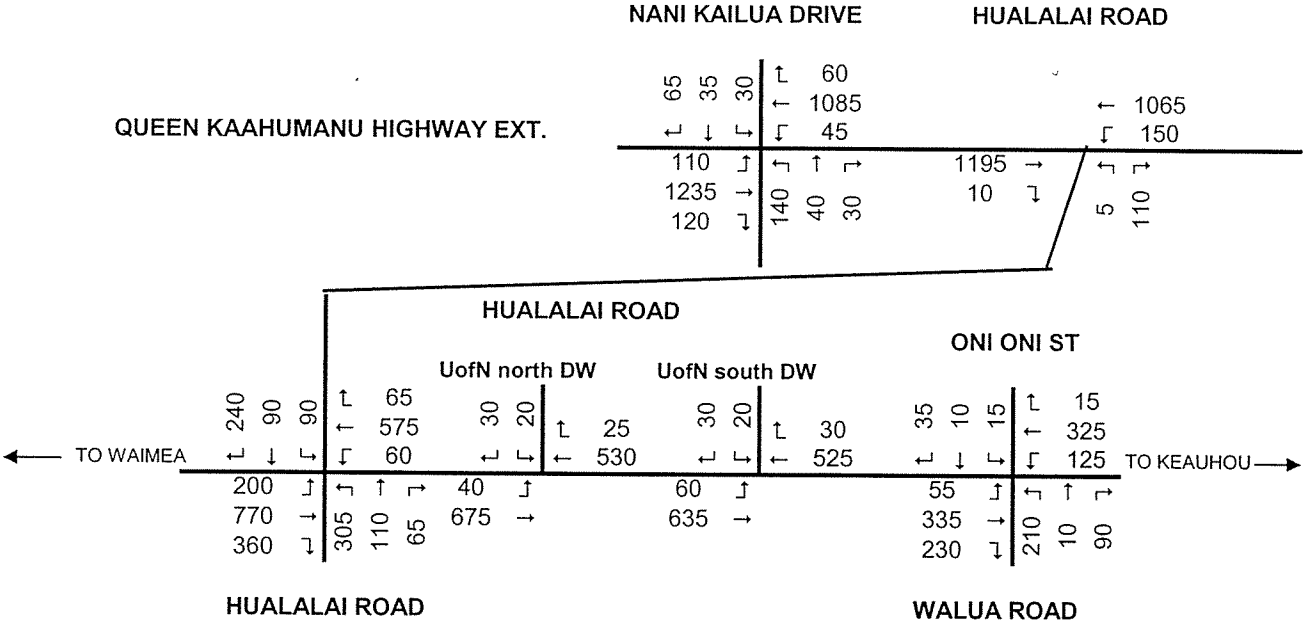
PM PEAK HOUR

Not to Scale

TOTAL TRAFFIC FORECAST
2010 SCENARIO 1- NO HIGHWAY IMPROVEMENTS
FIGURE 17



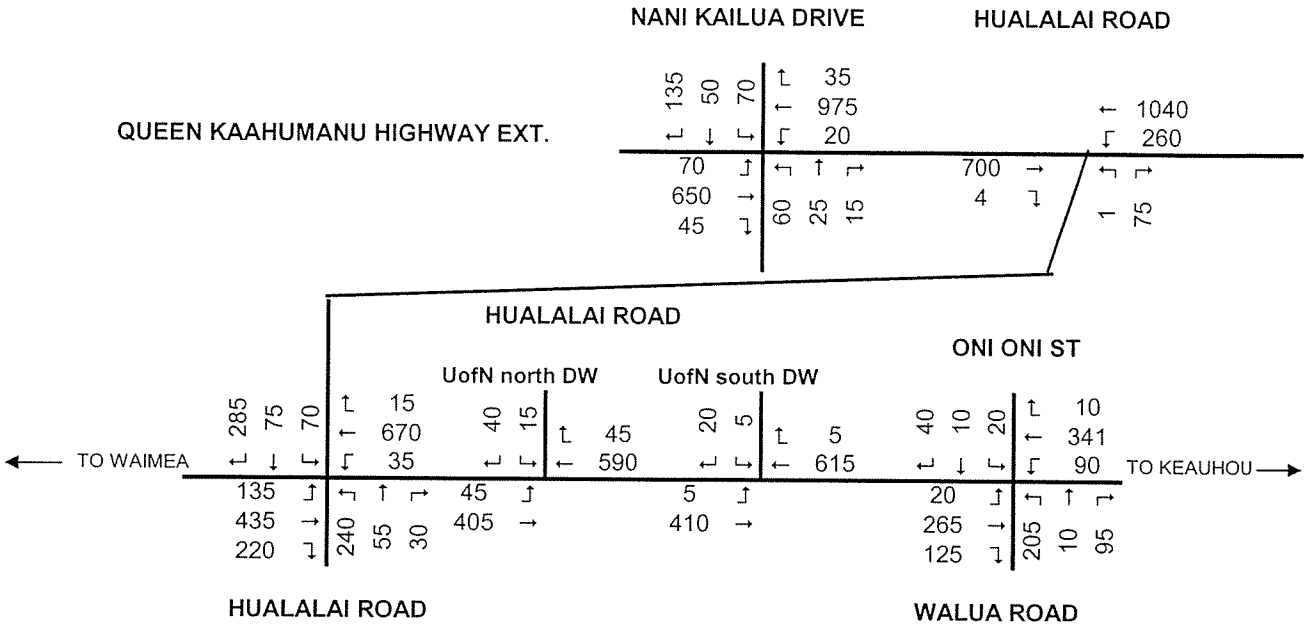
AM PEAK HOUR



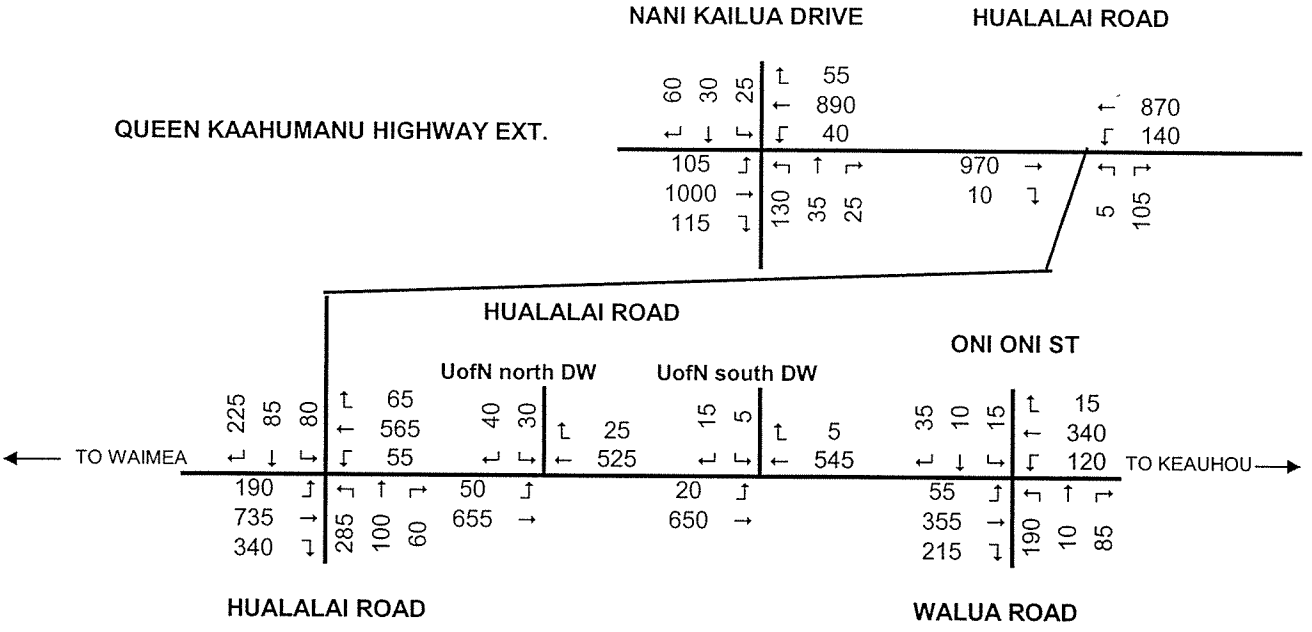
PM PEAK HOUR

Not to Scale

TOTAL TRAFFIC FORECAST
2016 SCENARIO 1- NO HIGHWAY IMPROVEMENTS
FIGURE 18



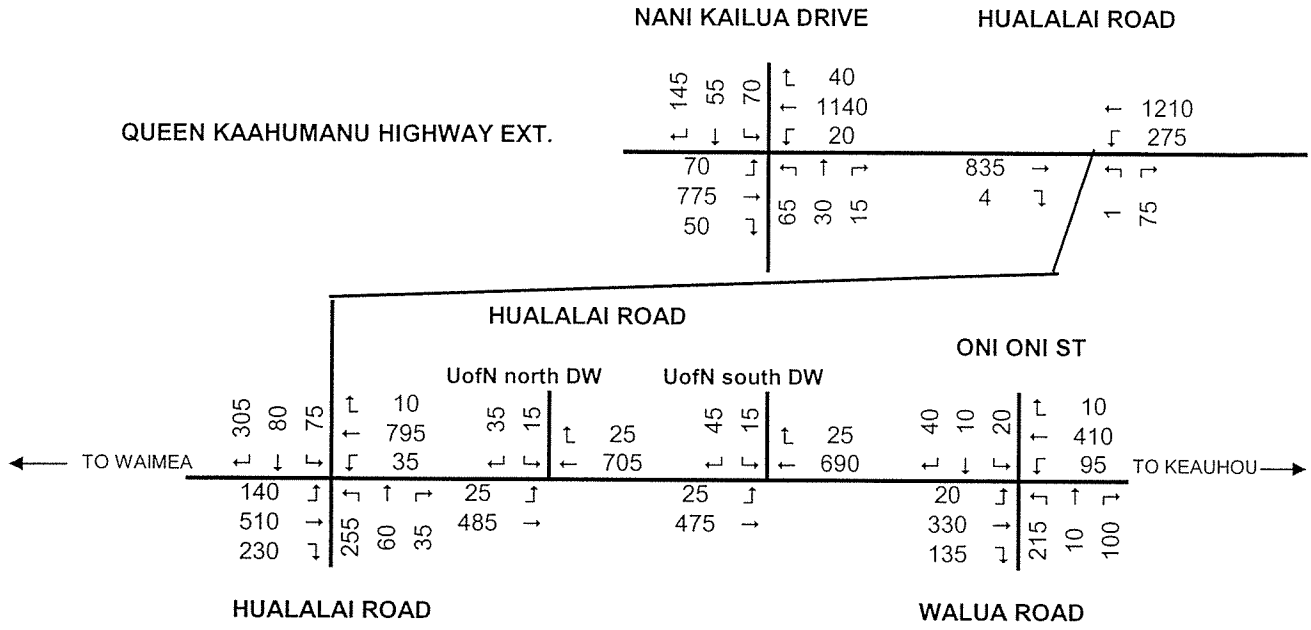
AM PEAK HOUR



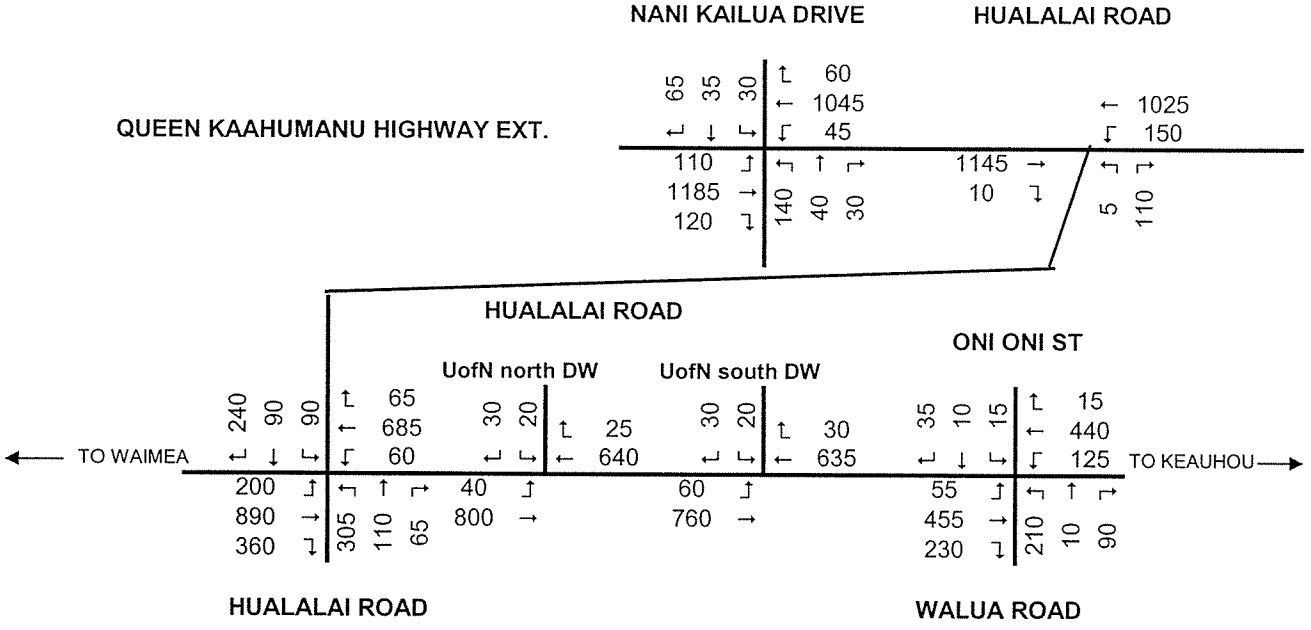
PM PEAK HOUR

Not to Scale

TOTAL TRAFFIC FORECAST
2010 SCENARIO 2- WITH K TO K PARKWAY
FIGURE 19



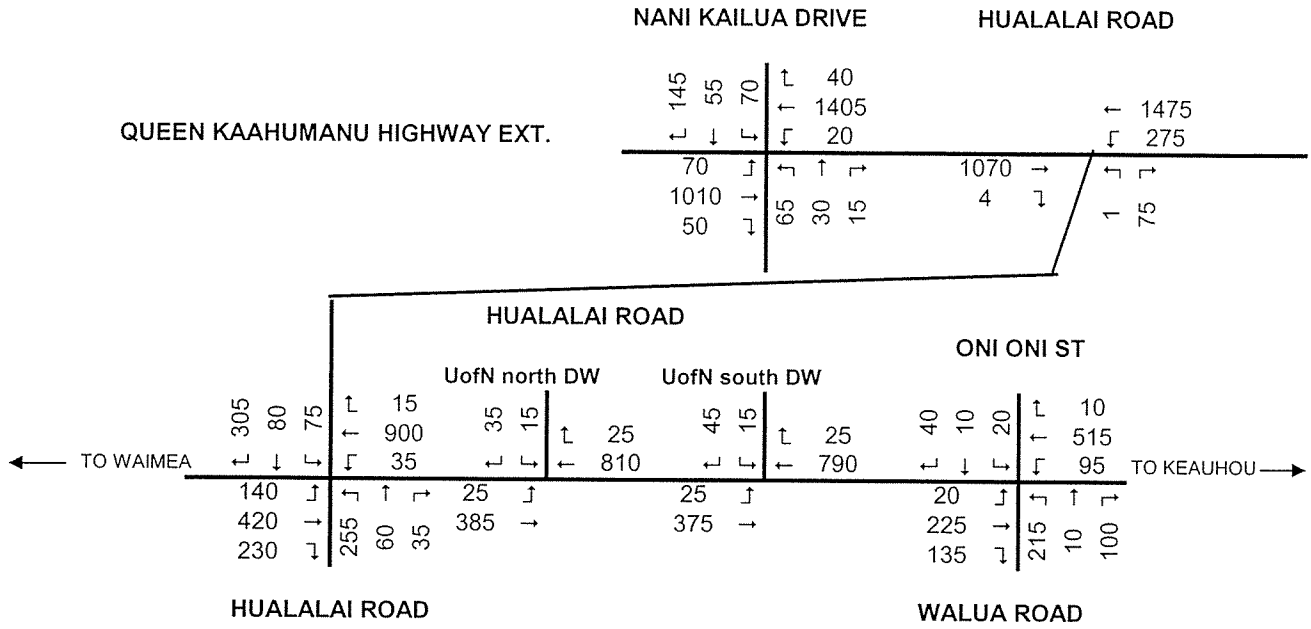
AM PEAK HOUR



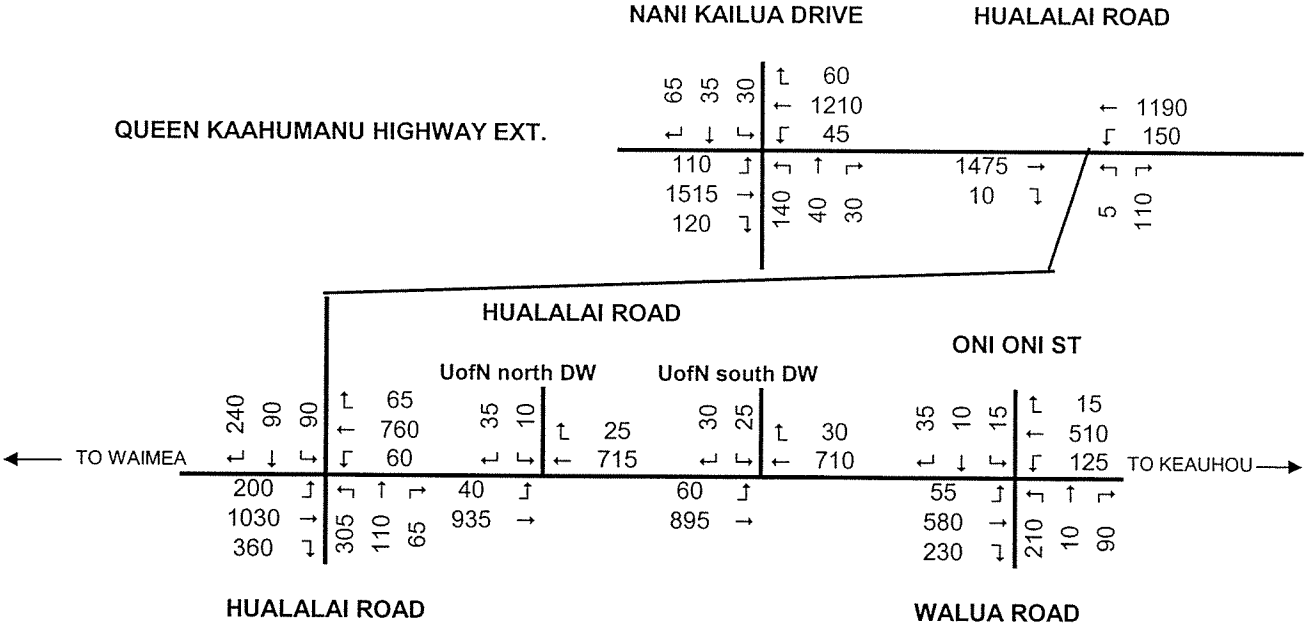
PM PEAK HOUR

Not to Scale

TOTAL TRAFFIC FORECAST
2016 SCENARIO 2- WITH K TO K PARKWAY
FIGURE 20



AM PEAK HOUR



PM PEAK HOUR

Not to Scale

TOTAL TRAFFIC FORECAST
2016 SCENARIO 3- PARKWAY & 4 LANE HI BELT HWY
FIGURE 21

Tables

TABLE 1
TRIP GENERATION AND DISTRIBUTION ANALYSIS

FORECAST YEAR TRIP COMPONENT	UNITS	AM PEAK HOUR		PM PEAK HOUR	
		INBOUND	OUTBOUND	INBOUND	OUTBOUND
2005					
TRIP GENERATION ANALYSIS					
Non-resident staff	175	60	15	25	30
Resident staff	75	10	10	25	5
Non-resident students	20	0	10	10	10
Deliveries		10	10	10	10
Total		100	45	70	55
TRIP DISTRIBUTION ANALYSIS					
North		50	35	55	30
South		50	10	15	25
2010					
TRIP GENERATION ANALYSIS					
Non-resident staff	100	45	10	15	25
Resident staff	220	45	45	65	45
Non-resident students	0	0	0	0	0
Deliveries		10	10	10	10
Total		100	65	90	80
TRIP DISTRIBUTION ANALYSIS					
North		50	45	60	45
South		50	20	30	35
2016					
TRIP GENERATION ANALYSIS					
Non-resident staff	25	10	5	5	5
Resident staff	390	75	80	115	80
Non-resident students	0	0	0	0	0
Deliveries		10	10	10	10
Total		95	95	130	95
TRIP DISTRIBUTION ANALYSIS					
North		48	65	85	55
South		47	30	45	40

TABLE 2
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE ANALYSIS

	AM PEAK HOUR					PM PEAK HOUR				
INTERSECTION	2004	2010		2016		2004	2010		2016	
Approach/Movement	EXST	AMB	TOT	AMB	TOT	EXST	AMB	TOT	AMB	TOT
QUEEN KAAHUMANU HWY/HUALALAI RD	(SCENARIO 1, NO HIGHWAY IMPROVMENTS)									
Hualalai Rd EB RT	C	C	C	C	C	C	E	E	F	F
Hualalai Rd EB LT	F	F	F	F	F	F	F	F	F	F
Queen Kaahumanu Hwy NB LT	B	B	B	B	B	B	B	B	C	C
QUEEN KAAHUMANU HWY/HUALALAI RD	(SCENARIO 2, WITH KAHALUU TO KEAUHOU PARKWAY)									
Hualalai Rd EB RT		C	C	C	C		D	D	E	E
Hualalai Rd EB LT		F	F	F	F		F	F	F	F
Queen Kaahumanu Hwy NB LT		B	B	B	B		B	B	B	B
QUEEN KAAHUMANU HWY/HUALALAI RD	(SCENARIO 3, WITH PARKWAY AND 4 LANE HI BELT RD)									
Hualalai Rd EB RT				B	B				C	C
Hualalai Rd EB LT				F	F				F	F
Queen Kaahumanu Hwy NB LT				C	C				C	C
KUAKINI HIGHWAY/WALUA RD/ONIONI ST	(SCENARIO 1, NO HIGHWAY IMPROVMENTS)									
Walua Rd EB RT	A	B	B	NA	NA	B	B	B	NA	NA
Walua Rd EB LTTH	D	F	F			D	F	F		
OniOni St WB	A	A	A			A	A	A		
Kuakini Hwy SB LT	A	A	A			A	A	A		
Kuakini Hwy NB LT	A	A	A			A	A	A		
KUAKINI HIGHWAY/WALUA RD/ONIONI ST	(SCENARIO 2, WITH KAHALUU TO KEAUHOU PARKWAY)									
Walua Rd EB RT		B	B	NA	NA		B	B	NA	NA
Walua Rd EB LTTH		F	F				F	F		
OniOni St WB		A	A				A	A		
Kuakini Hwy SB LT		A	A				A	A		
Kuakini Hwy NB LT		A	A				A	A		
KUAKINI HIGHWAY/WALUA RD/ONIONI ST	(SCENARIO 3, WITH PARKWAY AND 4 LANE HI BELT RD)									
Walua Rd EB RT				NA	NA				NA	NA
Walua Rd EB LTTH										
OniOni St WB										
Kuakini Hwy SB LT										
Kuakini Hwy NB LT										

TABLE 2
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE ANALYSIS

INTERSECTION	AM PEAK HOUR					PM PEAK HOUR				
	2004	2010		2016		2004	2010		2016	
Approach/Movement	EXST	AMB	TOT	AMB	TOT	EXST	AMB	TOT	AMB	TOT
KUAKINI HWY/UOFN NORTH DRIVEWAY	(SCENARIO 1, NO HIGHWAY IMPROVMENTS)									
UofN WB driveway	B	B	B	C	B	B	C	C	C	C
Kuakini Hwy SB LT	A	A	A	A	A	A	A	A	A	A
KUAKINI HWY/UOFN NORTH DRIVEWAY	(SCENARIO 2, WITH KAHALUU TO KEAUHOU PARKWAY)									
UofN WB driveway		C	C	C	C		C	C	C	C
Kuakini Hwy SB LT		A	A	A	A		A	A	A	A
KUAKINI HWY/UOFN NORTH DRIVEWAY	(SCENARIO 3, WITH PARKWAY AND 4 LANE HI BELT RD)									
UofN WB driveway				C	C				D	E
Kuakini Hwy SB LT				B	B				A	A
KUAKINI HWY/UOFN SOUTH DRIVEWAY	(SCENARIO 1, NO HIGHWAY IMPROVMENTS)									
UofN WB driveway			B		B			C		D
Kuakini Hwy SB LT			A		A			A		A
KUAKINI HWY/UOFN SOUTH DRIVEWAY	(SCENARIO 2, WITH KAHALUU TO KEAUHOU PARKWAY)									
UofN WB driveway			C		C			C		C
Kuakini Hwy SB LT			A		A			A		A
KUAKINI HWY/UOFN SOUTH DRIVEWAY	(SCENARIO 3, WITH PARKWAY AND 4 LANE HI BELT RD)									
UofN WB driveway					C					E
Kuakini Hwy SB LT					A					A

Delay measured in seconds/vehicle

LEGEND

NB = northbound
SB = southbound
EB = eastbound
WB = westbound
LT = left turn
RT = right turn
TH = through movement

EXST = Existing traffic conditions
AMB = Ambient traffic forecast conditions
TOT = Total with project traffic forecast conditions
NA = Not appropriate since unsignalized conditions are infeasible

TABLE 3
SIGNALIZED INTERSECTION LEVEL OF SERVICE ANALYSIS

INTERSECTION	AM PEAK HOUR					PM PEAK HOUR				
	2004	2010		2016		2004	2010		2016	
Approach/Movement	EXST	AMB	TOT	AMB	TOT	EXST	AMB	TOT	AMB	TOT
(SCENARIO 1, NO HIGHWAY IMPROVMENTS)										
KUAKINI HWY/HUALALAI RD	C	C	C	C	C	C	C	C	C	D
Hualalai Rd EB	B	C	C	C	C	C	C	D	D	D
Hualalai Rd WB	D	C	C	C	C	C	C	D	D	D
Kuakini Hwy NB	C	B	B	B	C	B	C	C	C	C
Kuakini Hwy SB	B	B	B	B	C	B	C	C	C	D
(SCENARIO 2, WITH KAHALUU TO KEAUHOU PARKWAY)										
KUAKINI HWY/HUALALAI RD		C	C	C	C		C	C	D	D
Hualalai Rd EB		C	C	C	C		C	D	D	E
Hualalai Rd WB		C	C	C	C		D	D	D	E
Kuakini Hwy NB		B	C	C	C		C	C	C	C
Kuakini Hwy SB		B	C	C	C		C	C	D	D
(SCENARIO 3, WITH PARKWAY AND 4 LANE HI BELT RD)										
KUAKINI HWY/HUALALAI RD				C	C				E	E
Hualalai Rd EB				C	C				E	F
Hualalai Rd WB				C	C				E	F
Kuakini Hwy NB				C	C				D	C
Kuakini Hwy SB				C	C				E	E
(SCENARIO 1, NO HIGHWAY IMPROVMENTS)										
QUEEN KAAHUMANU HWY/NANI KAILUA DR	C	C	C	D	D	C	D	D	E	E
Nani Kailua Dr EB	D	D	D	F	F	C	D	D	F	F
Nani Kailua Dr WB	D	D	D	F	F	C	D	D	F	F
Queen Kaahumanu Hwy NB	C	C	C	C	C	B	D	D	C	C
Queen Kaahumanu Hwy SB	B	B	B	B	B	C	D	D	C	C
(SCENARIO 2, WITH KAHALUU TO KEAUHOU PARKWAY)										
QUEEN KAAHUMANU HWY/NANI KAILUA DR		C	C	D	D		C	C	E	E
Nani Kailua Dr EB		D	D	F	F		D	D	F	F
Nani Kailua Dr WB		D	D	F	F		D	D	F	F
Queen Kaahumanu Hwy NB		C	C	C	C		C	C	C	C
Queen Kaahumanu Hwy SB		B	B	B	B		C	C	C	C
(SCENARIO 3, WITH PARKWAY AND 4 LANE HI BELT RD)										
QUEEN KAAHUMANU HWY/NANI KAILUA DR				C	C				C	C
Nani Kailua Dr EB				D	D				D	D
Nani Kailua Dr WB				D	D				D	D
Queen Kaahumanu Hwy NB				B	B				C	C
Queen Kaahumanu Hwy SB				B	B				B	B

TABLE 3
SIGNALIZED INTERSECTION LEVEL OF SERVICE ANALYSIS

INTERSECTION	AM PEAK HOUR					PM PEAK HOUR				
	2004	2010		2016		2004	2010		2016	
Approach/Movement	EXST	AMB	TOT	AMB	TOT	EXST	AMB	TOT	AMB	TOT
	(SCENARIO 1, NO HIGHWAY IMPROVMENTS)									
KUAKINI HWY/WALUA RD/ONIONI ST		B	B	B	B		B	B	B	B
Walua Rd EB		D	D	D	D		D	D	D	D
OniOni St WB		C	C	C	C		C	C	C	C
Kuakini Hwy NB		A	A	A	B		A	A	A	B
Kuakini Hwy SB		B	B	B	B		B	B	B	B
	(SCENARIO 2, WITH KAHALUU TO KEAUHOU PARKWAY)									
KUAKINI HWY/WALUA RD/ONIONI ST		B	B	B	C		B	B	B	C
Walua Rd EB		D	D	D	D		D	D	D	D
OniOni St WB		C	C	C	C		C	C	C	C
Kuakini Hwy NB		A	B	B	B		B	B	B	B
Kuakini Hwy SB		B	B	B	B		B	B	B	B
	(SCENARIO 3, WITH PARKWAY AND 4 LANE HI BELT RD)									
KUAKINI HWY/WALUA RD/ONIONI ST				B	C				C	C
Walua Rd EB				D	D				D	D
OniOni St WB				C	C				C	C
Kuakini Hwy NB				B	B				B	B
Kuakini Hwy SB				B	B				C	C
	(SCENARIO 1, NO HIGHWAY IMPROVMENTS)									
QUEEN KAAHUMANU HWY/HUALALAI RD		C	C	C	C		C	C	D	D
Hualalai Rd EB		C	C	D	D		D	D	E	E
Queen Kaahumanu Hwy NB		C	C	C	C		B	B	C	C
Queen Kaahumanu Hwy NB LT		C	C	B	B		B	B	B	B
Queen Kaahumanu Hwy SB		C	C	C	C		D	D	D	D
	(SCENARIO 2, WITH KAHALUU TO KEAUHOU PARKWAY)									
QUEEN KAAHUMANU HWY/HUALALAI RD		B	B	C	C		B	B	C	C
Hualalai Rd EB		C	C	D	D		D	D	E	E
Queen Kaahumanu Hwy NB		B	B	C	C		A	A	B	B
Queen Kaahumanu Hwy NB LT		B	B	B	B		A	A	B	B
Queen Kaahumanu Hwy SB		B	B	B	B		C	C	C	C
	(SCENARIO 3, WITH PARKWAY AND 4 LANE HI BELT RD)									
QUEEN KAAHUMANU HWY/HUALALAI RD				B	B				B	B
Hualalai Rd EB				D	D				D	D
Queen Kaahumanu Hwy NB				B	B				B	B
Queen Kaahumanu Hwy NB LT				C	C				D	D
Queen Kaahumanu Hwy SB				C	C				C	C

Delay measured in seconds/vehicle

LEGEND

NB = northbound
SB = southbound
EB = eastbound
WB = westbound
LT = left turn

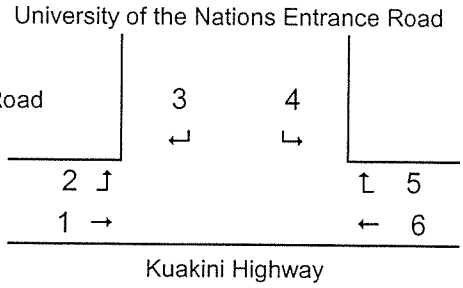
EXST = Existing traffic conditions
AMB = Ambient traffic forecast conditions
TOT = Total with project traffic forecast conditions

Appendix A

Traffic Turning Movement Counts

TRAFFIC TURNING MOVEMENT COUNT
UNIVERSITY OF THE NATIONS

LOCATION: Kuakini Highway/University of the Nations Access Road
DATE: January 13, 2005, Thursday
TIME: 6:30a.m.-8:30a.m./3:30p.m.-5:30p.m.
WEATHER: Sunshine, Mixed with Few Clouds
RECORDER: Thomas Lemanski

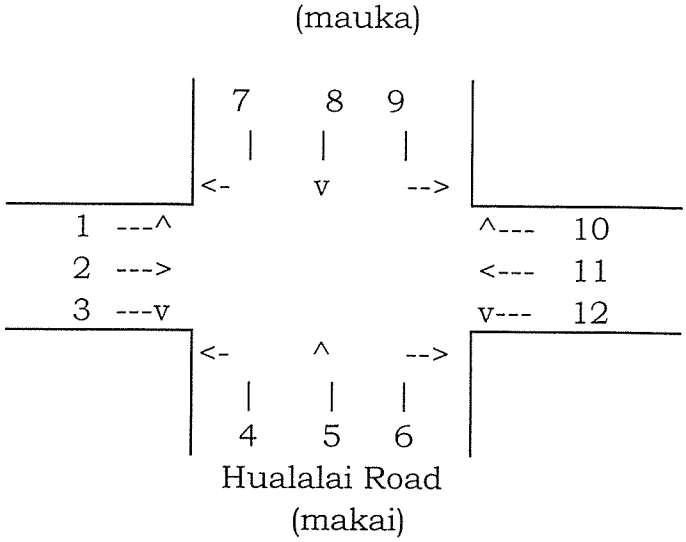


TIME PERIOD	MOVEMENT NUMBER 1	2	3	4	5	6	TOTAL
6:30-6:45a	20	3	3	0	3	43	72
6:45-7:00a	45	6	3	2	2	56	114
7:00-7:15a	37	5	5	1	3	77	128
7:15-7:30a	42	4	2	0	3	79	130
7:30-7:45a	65	16	5	1	8	95	190
7:45-8:00a	72	12	8	2	22	131	247
8:00-8:15a	68	10	14	5	14	117	228
8:15-8:30a	66	10	8	2	6	80	172
6:30-8:30a	415	66	48	13	61	678	1281
7:30-8:30a	271	48	35	10	50	423	444
PHF	0.95				0.77		

TIME PERIOD	MOVEMENT NUMBER 1	2	3	4	5	6	TOTAL
3:30-3:45p	115	8	13	2	3	89	230
3:45-4:00p	128	8	7	5	3	104	255
4:00-4:15p	103	3	4	6	2	77	195
4:15-4:30p	99	11	3	1	6	80	200
4:30-4:45p	130	12	7	7	3	93	252
4:45-5:00p	110	14	11	13	5	74	227
5:00-5:15p	117	19	8	4	2	84	234
5:15-5:30p	70	13	10	8	2	53	156
3:30p-5:30p	872	88	63	46	26	654	1749
4:15p-5:15p	456	56	29	25	16	331	913
PHF	0.98				0.90		

TRAFFIC TURNING MOVEMENT COUNT

LOCATION: Kuakini Hwy/Hualalai Rd
DATE: April 8, 2004, Thursday
TIME: 6:30a-8:30a/3:30p-5:30p
WEATHER: partly cloudy
RECORDER: R. Alberts, T. Lemanski

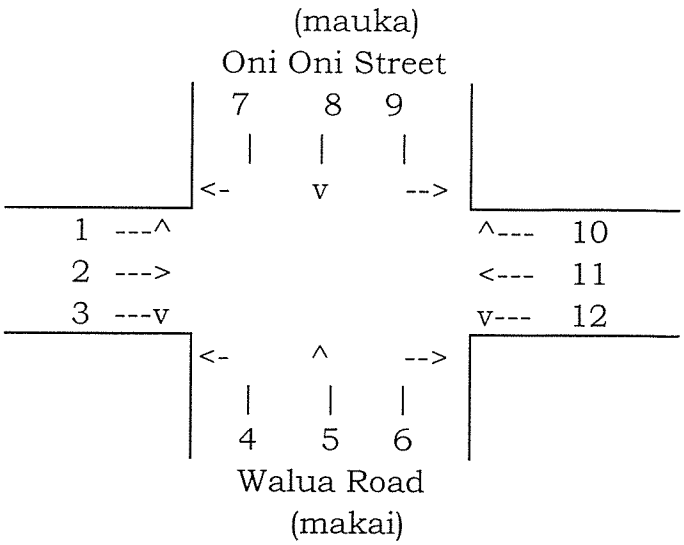


TIME	MOVEMENT NUMBER												
PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
6:30-6:45	6	28	16	24	3	0	14	6	3	1	69	2	172
6:45-7:00	23	46	32	23	4	5	22	9	4	1	57	0	226
7:00-7:15	16	51	35	37	4	1	37	5	6	5	60	5	262
7:15-7:30	26	46	20	41	7	8	26	3	8	1	78	3	267
7:30-7:45	35	55	32	49	7	5	45	8	8	2	97	3	346
7:45-8:00	34	75	44	41	16	3	62	12	21	1	115	2	426
8:00-8:15	23	79	48	40	8	5	58	21	8	1	144	5	440
8:15-8:30	16	62	33	44	9	3	52	12	15	2	108	9	365
6:30-8:30	179	442	260	299	58	30	316	76	73	14	728	29	2504
7:30-8:30	108	271	157	174	40	16	217	53	52	6	464	19	1577
PHF	0.89			0.96			0.85			0.82			

TIME	MOVEMENT NUMBER												
PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
3:30-3:45	37	151	100	95	39	15	45	16	15	10	113	12	648
3:45-4:00	39	105	53	49	16	10	42	18	18	5	96	14	465
4:00-4:15	45	133	47	47	13	9	50	18	17	6	80	7	472
4:15-4:30	25	92	50	43	15	9	40	13	16	3	66	5	377
4:30-4:45	29	104	55	40	11	7	44	22	17	4	100	8	441
4:45-5:00	22	118	56	39	11	6	48	21	13	6	109	19	468
5:00-5:15	25	131	57	38	15	9	39	25	20	2	115	8	484
5:15-5:30	13	114	62	29	9	7	38	12	16	8	104	8	420
3:30-5:30	235	948	480	380	129	72	346	145	132	44	783	81	3775
3:30-4:30	146	481	250	234	83	43	177	65	66	24	355	38	1962
PHF	0.76			0.6			0.91			0.77			

TRAFFIC TURNING MOVEMENT COUNT

LOCATION: Kuakini Hwy/Walua Rd/Oni Oni St.
DATE: April 6, 2004, Tuesday
TIME: 6:30a-8:30a/3:30p-5:30p
WEATHER: partly cloudy
RECORDER: R. Alberts, T. Lemanski

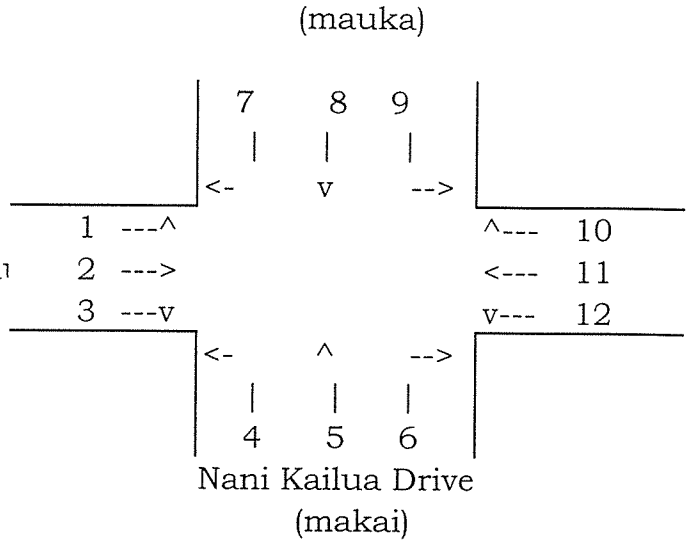


TIME PERIOD	MOVEMENT NUMBER 1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
6:30-6:45	3	21	9	15	2	9	13	0	2	2	24	9	109
6:45-7:00	1	43	24	22	0	7	8	6	9	1	30	14	165
7:00-7:15	2	35	18	24	1	17	14	2	6	1	32	9	161
7:15-7:30	8	34	12	24	2	9	14	3	2	2	44	11	165
7:30-7:45	6	49	18	29	0	18	14	4	2	3	48	16	207
7:45-8:00	4	34	24	46	6	17	11	2	8	2	46	22	222
8:00-8:15	6	32	16	35	2	11	9	4	6	2	48	16	187
8:15-8:30	4	45	27	29	1	13	8	1	3	4	54	11	200
6:30-8:30	34	293	148	224	14	101	91	22	38	17	326	108	1416
7:30-8:30	20	160	85	139	9	59	42	11	19	11	196	65	816
PHF	0.87			0.75			0.9			0.97			

TIME PERIOD	MOVEMENT NUMBER 1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
3:30-3:45	11	43	38	24	3	17	6	5	1	5	42	19	214
3:45-4:00	12	51	38	35	5	10	10	3	7	3	53	21	248
4:00-4:15	14	68	29	37	4	16	6	2	1	4	48	14	243
4:15-4:30	15	41	27	21	3	10	7	4	3	3	39	23	196
4:30-4:45	14	62	47	20	0	9	13	2	4	3	56	9	239
4:45-5:00	10	47	39	34	5	6	8	3	0	10	54	19	235
5:00-5:15	6	58	47	25	1	18	11	2	4	4	46	10	232
5:15-5:30	10	46	47	12	3	7	8	0	3	9	37	13	195
3:30-5:30	92	416	312	208	24	93	69	21	23	41	375	128	1802
3:45-4:45	55	222	141	113	12	45	36	11	15	13	196	67	926
PHF	0.85			0.75			0.82			0.9			

TRAFFIC TURNING MOVEMENT COUNT

LOCATION: Queen Kaahumanu Hwy Ext/Nani Kailua Dr
DATE: April 13, 2004, Tuesday
TIME: 6:30a-8:30a/3:30p-5:30p
WEATHER: cloudy
RECORDER: R. Alberts, T. Lemanski

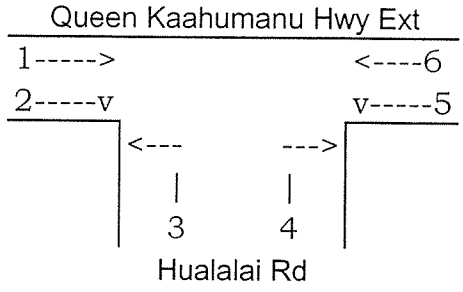


TIME	MOVEMENT NUMBER												
PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
6:30-6:45	2	97	1	6	4	2	18	5	4	1	202	2	344
6:45-7:00	2	132	6	3	7	1	26	8	17	6	234	6	448
7:00-7:15	20	133	3	10	4	2	24	7	20	9	244	3	479
7:15-7:30	13	161	4	7	3	3	31	6	20	8	233	5	494
7:30-7:45	9	188	16	20	4	4	32	13	14	10	226	6	542
7:45-8:00	22	142	15	10	9	4	32	20	16	4	221	2	497
8:00-8:15	18	155	6	20	7	3	31	10	15	14	225	4	508
8:15-8:30	14	148	19	6	2	4	27	18	8	6	209	8	469
6:30-8:30	100	1156	70	82	40	23	221	87	114	58	1794	36	3781
7:15-8:15	62	646	41	57	23	14	126	49	65	36	905	17	2041
PHF	0.88			0.78			0.88			0.99			

TIME	MOVEMENT NUMBER												
PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
3:30-3:45	19	196	40	21	8	10	26	2	6	20	235	13	596
3:45-4:00	25	246	13	17	11	7	12	8	8	20	222	15	604
4:00-4:15	19	245	15	29	6	6	8	8	6	15	213	7	577
4:15-4:30	21	211	24	28	8	3	22	7	9	7	177	8	525
4:30-4:45	31	249	11	25	11	8	19	7	2	11	233	10	617
4:45-5:00	28	219	10	20	7	7	15	7	8	7	183	7	518
5:00-5:15	31	230	13	23	10	17	18	3	5	7	192	5	554
5:15-5:30	13	175	14	12	11	4	16	2	5	9	159	2	422
3:30-5:30	187	1771	140	175	72	62	136	44	49	96	1614	67	4413
3:45-4:45	96	951	63	99	36	24	61	30	25	53	845	40	2323
PHF	0.98			0.97			0.76			0.92			

TRAFFIC TURNING MOVEMENT COUNT

LOCATION: Queen Kaahumanu Hwy Ext/Hualalai Rd
DATE: April 14, 2004, Wednesday
TIME: 6:30a-8:30a/3:30p-5:30p
WEATHER: cloudy
RECORDER: L. Harris



TIME PERIOD	MOVEMENT NUMBER 1	2	3	4	5	6	TOTAL
6:30-6:45a	127	1	0	10	15	230	383
6:45-7:00a	128	0	0	19	22	222	391
7:00-7:15a	146	1	0	11	21	218	397
7:15-7:30a	192	0	1	11	43	246	493
7:30-7:45a	188	0	0	10	52	244	494
7:45-8:00a	146	3	0	8	76	247	480
8:00-8:15a	159	1	0	16	57	226	459
8:15-8:30a	176	0	0	12	28	217	433
6:30-8:30a	1262	6	1	97	314	1850	3530
7:15-8:15a	685	4	1	45	228	963	1866
PHF	0.90				0.92		
3:30-3:45p	231	3	0	16	28	239	517
3:45-4:00p	197	3	4	15	31	217	467
4:00-4:15p	254	1	1	24	29	186	495
4:15-4:30p	246	1	1	25	25	186	484
4:30-4:45p	251	0	3	23	17	189	483
4:45-5:00p	239	0	1	24	22	194	480
5:00-5:15p	256	1	1	32	8	167	465
5:15-5:30p	222	1	1	17	16	183	440
3:30-5:30p	1896	10	12	176	176	1561	3831
3:30-4:30p	928	8	6	80	113	828	1963
PHF	0.92				0.88		

Appendix B

Traffic Calculations
Signalized and Unsignalized Intersection
Level of Service (LOS) Calculations

Traffic Calculations
Signalized Intersection
Level of Service (LOS) Calculations

CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: EXISTING AM 2004
Comment: 2004 EXISTING AM

Site Information

Jurisdiction/Date: 4/22/04
EB/WB Street: HUALALAI R
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	175	40	15	50	55	215	20	465	5	110	270	155
RTOR volume (veh/h)			5			30			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB		LTRP						
NB			L	LTRP				
SB			L	LTRP				
Green (s)	7	14	5	29				
Yellow + All red (s)	5	5	5	5				

Cycle (s): 75 Lost time per cycle (s): 20 Critical v/c Ratio: .77

Intersection Performance

	EB			WB		NB			SB		
Lane group configuration	L	TR		LT	R	L	T	R	L	T	R
No. of lanes	1	1		1	1	1	1	1	1	1	1
Flow rate (veh/h)	184	53		111	195	21	489	-5	116	284	132
Capacity (veh/h)	355	615		279	254	481	720	568	320	720	568
Adjusted saturation flow (veh/h)	1770	1767		1497	1361	1770	1863	1469	1770	1863	1469
v/c ratio	.519	.086		.396	.767	.044	.68	-.009	.362	.395	.232
g/C ratio	.347	.347		.187	.187	.52	.387	.387	.52	.387	.387
Average back of queue (veh)	3.3	.8		2.2	4.7	.2	9.6	-.1	1.5	4.6	2
Uniform delay (s)	18.3	16.5		26.8	29	9.2	19.1	14.1	11.5	16.6	15.5
Incremental delay (s)	1.4	0		.2	14.3	0	2.6	0	0	.1	0
Initial queue delay (s)	0	0		0	0	0	0	0	0	0	0
Delay (s)	19.7	16.5		27	43.3	9.2	21.7	14.1	11.5	16.7	15.5
LOS	B	B		C	D	A	C	B	B	B	B
Approach delay (s)/LOS	19 / B			37.4 / D		21.3 / C			15.3 / B		
Intersection delay (s)/ LOS	22 / C										

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB1 AM 2010
Comment: 2010 AMB AM SCEN1 W/NO IMPROVEMENTS

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	239	57	26	68	78	296	26	556	11	135	340	218
RTOR volume (veh/h)			5			30			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB		LTRP						
NB			L	LTRP				
SB			L	LTRP				
Green (s)	5	21	5	29				
Yellow + All red (s)	5	5	5	5				

Cycle (s): 80 Lost time per cycle (s): 20 Critical v/c Ratio: .673

Intersection Performance

	EB			WB		NB			SB		
Lane group configuration	L	TR		LT	R	L	T	R	L	T	R
No. of lanes	1	1		1	1	1	2	1	1	1	1
Flow rate (veh/h)	252	82		154	280	27	585	1	142	358	198
Capacity (veh/h)	366	675		393	389	380	1286	530	345	675	530
Adjusted saturation flow (veh/h)	1770	1743		1497	1481	1770	3547	1463	1770	1863	1463
v/c ratio	.687	.122		.391	.72	.072	.455	.002	.412	.53	.373
g/C ratio	.388	.388		.263	.263	.488	.363	.363	.488	.363	.363
Average back of queue (veh)	5	1.2		3	6.6	.3	5.6	0	2.1	6.8	3.5
Uniform delay (s)	21.1	15.7		24.2	26.8	11.7	19.5	16.3	12.3	20.1	18.8
Incremental delay (s)	5.5	0		.1	6.6	0	.2	0	.3	.8	0
Initial queue delay (s)	0	0		0	0	0	0	0	0	0	0
Delay (s)	26.6	15.7		24.3	33.4	11.7	19.7	16.3	12.6	20.9	18.8
LOS	C	B		C	C	B	B	B	B	C	B
Approach delay (s)/LOS	23.9 / C			30.2 / C		19.3 / B			18.6 / B		
Intersection delay (s)/ LOS	22.1 / C										

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: TOT1 AM 2010
Comment: 2010 TOT AM SCEN1 W/NO IMPROVEMENTS

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	239	56	32	71	74	296	35	601	14	133	382	218
RTOR volume (veh/h)			5			30			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB		LTRP						
NB			L	LTRP				
SB			L	LTRP				
Green (s)	5	21	5	29				
Yellow + All red (s)	5	5	5	5				

Cycle (s): 80 Lost time per cycle (s): 20 Critical v/c Ratio: .707

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	TR		LT	R	L	T	R	L	T	R	
No. of lanes	1	1		1	1	1	2	1	1	1	1	
Flow rate (veh/h)	252	87		153	280	37	633	4	140	402	198	
Capacity (veh/h)	367	667		387	389	345	1286	530	325	675	530	
Adjusted saturation flow (veh/h)	1770	1721		1474	1481	1770	3547	1463	1770	1863	1463	
v/c ratio	.686	.131		.395	.72	.107	.492	.008	.431	.595	.373	
g/C ratio	.388	.388		.263	.263	.488	.363	.363	.488	.363	.363	
Average back of queue (veh)	5	1.3		3	6.6	.5	6.2	.1	2.1	8	3.5	
Uniform delay (s)	21.1	15.8		24.3	26.8	12.1	19.8	16.3	12.4	20.7	18.8	
Incremental delay (s)	5.4	0		.2	6.6	0	.3	0	.5	1.4	0	
Initial queue delay (s)	0	0		0	0	0	0	0	0	0	0	
Delay (s)	26.5	15.8		24.5	33.4	12.1	20.1	16.3	12.9	22.1	18.8	
LOS	C	B		C	C	B	C	B	B	C	B	
Approach delay (s)/LOS	23.7	/	C	30.3	/	C	19.6	/	B	19.5	/	B
Intersection delay (s)/ LOS	22.3		/		C							

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB1 AM 2016
Comment: 2016 AMB AM SCEN1 W/NO IMPROVEMENTS

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	253	60	28	72	83	314	28	623	12	143	381	231
RTOR volume (veh/h)			5			90			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB		LTRP						
NB			L	LTRP				
SB			L	LTRP				
Green (s)	5	21	5	29				
Yellow + All red (s)	5	5	5	5				

Cycle (s): 80 Lost time per cycle (s): 15 Critical v/c Ratio: .671

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	TR		LT	R	L	T	R	L	T	R	
No. of lanes	1	1		1	1	1	2	1	1	1	1	
Flow rate (veh/h)	266	87		163	236	29	656	2	151	401	212	
Capacity (veh/h)	358	674		391	389	346	1286	530	315	675	530	
Adjusted saturation flow (veh/h)	1770	1740		1489	1481	1770	3547	1463	1770	1863	1463	
v/c ratio	.745	.13		.417	.606	.085	.51	.004	.477	.594	.399	
g/C ratio	.388	.388		.263	.263	.488	.363	.363	.488	.363	.363	
Average back of queue (veh)	5.6	1.3		3.3	5.2	.4	6.5	0	2.4	8	3.8	
Uniform delay (s)	21.9	15.8		24.4	25.9	12.1	19.9	16.3	12.6	20.7	19	
Incremental delay (s)	8.7	0		.3	2.7	0	.3	0	1	1.4	1	
Initial queue delay (s)	0	0		0	0	0	0	0	0	0	0	
Delay (s)	30.6	15.8		24.7	28.6	12.1	20.2	16.3	13.6	22.1	19.1	
LOS	C	B		C	C	B	C	B	B	C	B	
Approach delay (s)/LOS	26.9	/	C	27	/	C	19.9	/	B	19.6	/	B
Intersection delay (s)/ LOS	22.2		/		C							

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: HUALALAI R
Analysis Period/Year: TOT1 AM 2016 | NB/SB Street: KUAKINI HW
Comment: 2016 TOT AM SCEN1 W/NO IMPROVEMENTS

Intersection Data

Area type: Other | Analysis period: 1 h | Signal type: Actuated-Field | % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	253	59	34	75	79	304	36	688	15	141	422	231
RTOR volume (veh/h)			5			90			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB		LTRP						
NB			L	LTRP				
SB			L	LTRP				
Green (s)	5	21	5	29				
Yellow + All red (s)	5	5	5	5				

Cycle (s): 80 | Lost time per cycle (s): 15 | Critical v/c Ratio: .699

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	TR		LT	R		L	T	R	L	T	R
No. of lanes	1	1		1	1		1	2	1	1	1	1
Flow rate (veh/h)	266	93		162	225		38	724	5	148	444	212
Capacity (veh/h)	359	666		385	389		313	1286	530	288	675	530
Adjusted saturation flow (veh/h)	1770	1720		1467	1481		1770	3547	1463	1770	1863	1463
v/c ratio	.743	.139		.421	.579		.121	.563	.01	.515	.658	.399
g/C ratio	.388	.388		.263	.263		.488	.363	.363	.488	.363	.363
Average back of queue (veh)	5.6	1.4		3.2	4.9		.5	7.4	.1	2.4	9.2	3.8
Uniform delay (s)	21.8	15.9		24.5	25.7		12.6	20.4	16.3	12.9	21.3	19
Incremental delay (s)	8.5	0		.3	2.2		0	.6	0	1.6	2.4	.1
Initial queue delay (s)	0	0		0	0		0	0	0	0	0	0
Delay (s)	30.3	15.9		24.8	27.9		12.6	21	16.3	14.5	23.7	19.1
LOS	C	B		C	C		B	C	B	B	C	B
Approach delay (s)/LOS	26.6	/	C	26.6	/	C	20.6	/	C	20.8	/	C
Intersection delay (s)/ LOS	22.6		/	C								

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: HUALALAI R
Analysis Period/Year: AMB2 AM 2010 | NB/SB Street: KUAKINI HW
Comment: 2010 AMB AM SCEN2 W/ PARKWAY

Intersection Data

Area type: Other | Analysis period: 1 h | Signal type: Actuated-Field | % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	239	57	26	68	78	296	26	624	11	135	394	218
RTOR volume (veh/h)			5			30			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB		LTRP						
NB			L	LTRP				
SB			L	LTRP				
Green (s)	5	21	5	29				
Yellow + All red (s)	5	5	5	5				

Cycle (s): 80 | Lost time per cycle (s): 20 | Critical v/c Ratio: .716

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	TR		LT	R		L	T	R	L	T	R
No. of lanes	1	1		1	1		1	2	1	1	1	1
Flow rate (veh/h)	252	82		154	280		27	657	1	142	415	198
Capacity (veh/h)	366	675		393	389		336	1286	530	315	675	530
Adjusted saturation flow (veh/h)	1770	1743		1497	1481		1770	3547	1463	1770	1863	1463
v/c ratio	.687	.122		.391	.72		.082	.511	.002	.451	.614	.373
g/C ratio	.388	.388		.263	.263		.488	.363	.363	.488	.363	.363
Average back of queue (veh)	5	1.2		3	6.6		.3	6.5	0	2.2	8.4	3.5
Uniform delay (s)	21.1	15.7		24.2	26.8		12.2	20	16.3	12.6	20.9	18.8
Incremental delay (s)	5.5	0		.1	6.6		0	.3	0	.7	1.7	0
Initial queue delay (s)	0	0		0	0		0	0	0	0	0	0
Delay (s)	26.6	15.7		24.3	33.4		12.2	20.3	16.3	13.3	22.6	18.8
LOS	C	B		C	C		B	C	B	B	C	B
Approach delay (s)/LOS	23.9	/	C	30.2	/	C	19.9	/	B	19.9	/	B
Intersection delay (s)/ LOS	22.5		/	C								

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: TOT2 AM / 2010
Comment: 2010 TOT AM SCEN2 W/ PARKWAY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other | Analysis period: 1 h | Signal type: Actuated-Field | % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	239	56	32	71	74	286	35	669	14	133	436	218
RTOR volume (veh/h)			5			30			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB		LTRP						
NB			L	LTRP				
SB			L	LTRP				
Green (s)	5	21	5	29				
Yellow + All red (s)	5	5	5	5				

Cycle (s): 80 | Lost time per cycle (s): 20 | Critical v/c Ratio: .738

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	TR		LT	R	L	T	R	L	T	R	
No. of lanes	1	1		1	1	1	2	1	1	1	1	
Flow rate (veh/h)	252	87		153	269	37	704	4	140	459	198	
Capacity (veh/h)	367	667		387	389	302	1286	530	296	675	530	
Adjusted saturation flow (veh/h)	1770	1721		1474	1481	1770	3547	1463	1770	1863	1463	
v/c ratio	.686	.131		.395	.693	.122	.548	.008	.473	.68	.373	
g/C ratio	.388	.388		.263	.263	.488	.363	.363	.488	.363	.363	
Average back of queue (veh)	5	1.3		3	6.2	.5	7.2	.1	2.2	9.7	3.5	
Uniform delay (s)	21.1	15.8		24.3	26.6	12.7	20.3	16.3	12.8	21.6	18.8	
Incremental delay (s)	5.4	0		.2	5.4	0	.5	0	1	2.8	0	
Initial queue delay (s)	0	0		0	0	0	0	0	0	0	0	
Delay (s)	26.5	15.8		24.5	32	12.7	20.8	16.3	13.8	24.4	18.8	
LOS	C	B		C	C	B	C	B	B	C	B	
Approach delay (s)/LOS	23.7	/	C	29.3	/	C	20.4	/	C	21.1	/	C
Intersection delay (s)/ LOS	22.8	/	C									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB2 AM / 2016
Comment: 2016 AMB AM SCEN2 W/ PARKWAY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other | Analysis period: 1 h | Signal type: Actuated-Field | % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	253	60	28	72	83	314	28	731	12	143	468	231
RTOR volume (veh/h)			5			90			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB		LTRP						
NB			L	LTRP				
SB			L	LTRP				
Green (s)	5	21	5	29				
Yellow + All red (s)	5	5	5	5				

Cycle (s): 80 | Lost time per cycle (s): 15 | Critical v/c Ratio: .731

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	TR		LT	R	L	T	R	L	T	R	
No. of lanes	1	1		1	1	1	2	1	1	1	1	
Flow rate (veh/h)	266	87		163	236	29	769	2	151	493	212	
Capacity (veh/h)	358	674		391	389	276	1286	530	272	675	530	
Adjusted saturation flow (veh/h)	1770	1740		1489	1481	1770	3547	1463	1770	1863	1463	
v/c ratio	.745	.13		.417	.606	.107	.599	.004	.554	.73	.399	
g/C ratio	.388	.388		.263	.263	.488	.363	.363	.488	.363	.363	
Average back of queue (veh)	5.6	1.3		3.3	5.2	.4	8.1	0	2.6	10.8	3.8	
Uniform delay (s)	21.9	15.8		24.4	25.9	13.1	20.8	16.3	13.2	22.1	19	
Incremental delay (s)	8.7	0		3	2.7	0	.8	0	2.5	4.1	1	
Initial queue delay (s)	0	0		0	0	0	0	0	0	0	0	
Delay (s)	30.6	15.8		24.7	28.6	13.1	21.6	16.3	15.7	26.2	19.1	
LOS	C	B		C	C	B	C	B	B	C	B	
Approach delay (s)/LOS	26.9	/	C	27	/	C	21.2	/	C	22.6	/	C
Intersection delay (s)/ LOS	23.5	/	C									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: TOT2 AM 2016
Comment: 2016 TOT AM SCEN2 W/ PARKWAY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	253	59	34	75	79	304	36	796	9	141	509	231
RTOR volume (veh/h)			5			90			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB		LTRP						
NB			L	LTRP				
SB			L	LTRP				
Green (s)	5	21	5	29				
Yellow + All red (s)	5	5	5	5				

Cycle (s): 80 Lost time per cycle (s): 15 Critical v/c Ratio: .759

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	TR		LT	R	L	T	R	L	T	R	
No. of lanes	1	1		1	1	1	2	1	1	1	1	
Flow rate (veh/h)	266	93		162	225	38	838	-1	148	536	212	
Capacity (veh/h)	359	666		385	389	244	1286	530	248	675	530	
Adjusted saturation flow (veh/h)	1770	1720		1467	1481	1770	3547	1463	1770	1863	1463	
v/c ratio	.743	.139		.421	.579	.155	.652	-.002	.599	.793	.399	
g/C ratio	.388	.388		.263	.263	.488	.363	.363	.488	.363	.363	
Average back of queue (veh)	5.6	1.4		3.2	4.9	.5	9.1	0	2.6	12.6	3.8	
Uniform delay (s)	21.8	15.9		24.5	25.7	13.8	21.3	16.2	13.7	22.8	19	
Incremental delay (s)	8.5	0		.3	2.2	0	1.2	0	4.1	6.8	.1	
Initial queue delay (s)	0	0		0	0	0	0	0	0	0	0	
Delay (s)	30.3	15.9		24.8	27.9	13.8	22.5	16.2	17.8	29.6	19.1	
LOS	C	B		C	C	B	C	B	B	C	B	
Approach delay (s)/LOS	26.6	/	C	26.6	/	C	22.1	/	C	25.2	/	C
Intersection delay (s)/ LOS	24.5	/	C									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB3 AM 2016
Comment: 2016 AMB AM SCEN3 W/ PKWY &4LHWY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	253	60	28	72	83	314	28	833	12	143	366	231
RTOR volume (veh/h)			5			90			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB		LTRP						
NB			L	LTRP				
SB			L	LTRP				
Green (s)	5	21	5	20				
Yellow + All red (s)	5	5	5	5				

Cycle (s): 80 Lost time per cycle (s): 15 Critical v/c Ratio: .71

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	TR		LT	R	L	T	R	L	T	R	
No. of lanes	1	1		1	1	1	2	1	1	1	1	
Flow rate (veh/h)	266	87		163	236	29	877	2	151	385	212	
Capacity (veh/h)	358	674		391	389	358	1286	530	235	675	530	
Adjusted saturation flow (veh/h)	1770	1740		1489	1481	1770	3547	1463	1770	1863	1463	
v/c ratio	.745	.13		.417	.606	.082	.682	.004	.641	.571	.399	
g/C ratio	.388	.388		.263	.263	.488	.363	.363	.488	.363	.363	
Average back of queue (veh)	5.6	1.3		3.3	5.2	.4	9.7	0	2.8	7.6	3.8	
Uniform delay (s)	21.9	15.8		24.4	25.9	11.9	21.6	16.3	14	20.5	19	
Incremental delay (s)	8.7	0		.3	2.7	0	1.5	0	6	1.2	.1	
Initial queue delay (s)	0	0		0	0	0	0	0	0	0	0	
Delay (s)	30.6	15.8		24.7	28.6	11.9	23.1	16.3	20	21.7	19.1	
LOS	C	B		C	C	B	C	B	B	C	B	
Approach delay (s)/LOS	26.9	/	C	27	/	C	22.7	/	C	20.6	/	C
Intersection delay (s)/ LOS	23.4	/	C									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: TOT3 AM 2016
Comment: 2016 TOT AM SCEN3 W/ FKWY &4LHWY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	253	59	34	75	79	304	36	898	15	141	422	231
RTOR volume (veh/h)			5			90			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB		LTRP						
NB			L	LTRP				
SB			L	LTRP				
Green (s)	5	21	5	29				
Yellow + All red (s)	5	5	5	5				

Cycle (s): 80 Lost time per cycle (s): 15 Critical v/c Ratio: .733

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	TR		LT	R		L	T	R	L	T	R
No. of lanes	1	1		1	1		1	2	1	1	1	1
Flow rate (veh/h)	266	93		162	225		38	945	5	148	444	212
Capacity (veh/h)	359	666		385	389		313	1286	530	213	675	530
Adjusted saturation flow (veh/h)	1770	1720		1467	1481		1770	3547	1463	1770	1863	1463
v/c ratio	.743	.139		.421	.579		.121	.735	.01	.695	.658	.399
g/C ratio	.388	.388		.263	.263		.488	.363	.363	.488	.363	.363
Average back of queue (veh)	5.6	1.4		3.2	4.9		.5	11	.1	2.9	9.2	3.8
Uniform delay (s)	21.8	15.9		24.5	25.7		12.6	22.2	16.3	14.7	21.3	19
Incremental delay (s)	8.5	0		.3	2.2		0	2.3	0	9.9	2.4	1
Initial queue delay (s)	0	0		0	0		0	0	0	0	0	0
Delay (s)	30.3	15.9		24.8	27.9		12.6	24.5	16.3	24.6	23.7	19.1
LOS	C	B		C	C		B	C	B	C	C	B
Approach delay (s)/LOS	26.6	/	C	26.6	/	C	24	/	C	22.7	/	C
Intersection delay (s)/ LOS	24.3		/		C							

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: EXISTING PM 2004
Comment: 2004 EXISTING PM

Site Information

Jurisdiction/Date: 4/22/04
EB/WB Street: HUALALAI R
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	235	85	45	65	65	175	40	355	25	145	480	250
RTOR volume (veh/h)			5			30			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB		LTRP						
NB			L	LTRP				
SB			L	LTRP				
Green (s)	6	16	5	29				
Yellow + All red (s)	5	5	5	5				

Cycle (s): 76 Lost time per cycle (s): 15 Critical v/c Ratio: .706

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	TR		LT	R		L	T	R	L	T	R
No. of lanes	1	1		1	1		1	1	1	1	1	1
Flow rate (veh/h)	247	132		137	153		42	374	16	153	505	232
Capacity (veh/h)	337	611		297	291		299	711	560	400	711	560
Adjusted saturation flow (veh/h)	1770	1720		1411	1384		1770	1863	1468	1770	1863	1468
v/c ratio	.733	.215		.461	524		.141	526	.028	.381	.711	.413
g/C ratio	.355	355		.211	.211		.513	382	.382	.513	.382	.382
Average back of queue (veh)	5.1	2.1		2.8	3.2		.5	6.7	.2	2.1	10.3	3.9
Uniform delay (s)	20.8	17.1		26.2	26.6		11.5	18.2	14.7	11	19.9	17.3
Incremental delay (s)	8.4	0		.8	1.7		0	.7	0	.1	3.4	.2
Initial queue delay (s)	0	0		0	0		0	0	0	0	0	0
Delay (s)	29.2	17.1		27	28.3		11.5	18.9	14.7	11.1	23.3	17.5
LOS	C	B		C	C		B	B	B	B	C	B
Approach delay (s)/LOS	25	/	C	27.7	/	C	18	/	B	19.7	/	B
Intersection delay (s)/ LOS	21.5		/		C							

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB1 PM 2010
Comment: 2010 AMB SCEN1 W/NO IMPROVEMENTS

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	286	104	52	78	88	229	47	470	68	198	616	338
RTOR volume (veh/h)			5			50			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB	R	LTRP						
NB			L		LTRP			
SB			L	LTRP	LTRP			
Green (s)	15	24	8	5	37			
Yellow + All red (s)	5	5	5	5	5			

Cycle (s): 114 Lost time per cycle (s): 25 Critical v/c Ratio: .81

Intersection Performance

	EB			WB		NB			SB		
Lane group configuration	L	TR		LT	R	L	T	R	L	T	R
No. of lanes	1	1		1	1	1	2	1	1	1	1
Flow rate (veh/h)	301	159		175	188	49	495	61	208	648	324
Capacity (veh/h)	388	666		295	563	409	1151	471	501	768	608
Adjusted saturation flow (veh/h)	1770	1726		1404	1459	1770	3547	1450	1770	1863	1476
v/c ratio	.776	.239		.591	.335	.121	.43	.13	.416	.844	.533
g/C ratio	.386	.386		.211	.386	.439	.325	.325	.526	.412	.412
Average back of queue (veh)	9.5	3.6		5.5	4.5	1	6.9	1.4	4.3	22	8.4
Uniform delay (s)	27.1	23.7		40.6	24.7	18.5	30.2	27.1	15.5	30.2	25.2
Incremental delay (s)	10.2	0		3.2	0	0	.1	0	.2	9.3	.9
Initial queue delay (s)	0	0		0	0	0	0	0	0	0	0
Delay (s)	37.3	23.7		43.8	24.7	18.5	30.3	27.1	15.7	39.5	26.1
LOS	D	C		D	C	B	C	C	B	D	C
Approach delay (s)/LOS	32.6	/	C	33.9	/	C	29	/	C	31.6	/	C
Intersection delay (s)/ LOS	31.5	/	C									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: TOT1 PM 2010
Comment: 2010 TOT SCEN1 W/NO IMPROVEMENTS

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	286	102	59	82	85	224	55	510	63	188	676	338
RTOR volume (veh/h)			5			50			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB	R	LTRP						
NB			L		LTRP			
SB			L	LTRP	LTRP			
Green (s)	15	24	5	8	40			
Yellow + All red (s)	5	5	5	5	5			

Cycle (s): 117 Lost time per cycle (s): 25 Critical v/c Ratio: .852

Intersection Performance

	EB			WB		NB			SB		
Lane group configuration	L	TR		LT	R	L	T	R	L	T	R
No. of lanes	1	1		1	1	1	2	1	1	1	1
Flow rate (veh/h)	301	164		176	183	58	537	56	198	712	324
Capacity (veh/h)	373	644		284	548	356	1213	498	492	844	672
Adjusted saturation flow (veh/h)	1770	1712		1382	1456	1770	3547	1456	1770	1863	1484
v/c ratio	.807	.255		.62	.334	.163	.443	.112	.402	.843	.482
g/C ratio	.376	.376		.205	.376	.427	.342	.342	.538	.453	.453
Average back of queue (veh)	10.1	3.9		5.8	4.5	1.2	7.6	1.3	4	24.2	8
Uniform delay (s)	28.7	25.2		42.3	26.1	19.8	29.9	26.3	15.2	28.3	22.4
Incremental delay (s)	13.5	0		4.2	0	0	.2	0	.2	8.4	.5
Initial queue delay (s)	0	0		0	0	0	0	0	0	0	0
Delay (s)	42.2	25.2		46.5	26.1	19.8	30.1	26.3	15.4	36.7	22.9
LOS	D	C		D	C	B	C	C	B	D	C
Approach delay (s)/LOS	36.2	/	D	36.1	/	D	28.8	/	C	29.7	/	C
Intersection delay (s)/ LOS	31.4	/	C									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB1 PM 2016
Comment: 2016 AMB SCEN1 W/NO IMPROVEMENTS

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other | Analysis period: 1 h | Signal type: Actuated-Field | % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	303	110	55	83	93	243	50	526	72	210	690	358
RTOR volume (veh/h)			5			50			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB	R	LTRP						
NB			L		LTRP			
SB			L	LTRP	LTRP			
Green (s)	19	24	5	12	44			
Yellow + All red (s)	5	5	5	5	5			

Cycle (s): 129 | Lost time per cycle (s): 25 | Critical v/c Ratio: .868

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	TR		LT	R		L	T	R	L	T	R
No. of lanes	1	1		1	1		1	2	1	1	1	1
Flow rate (veh/h)	319	168		185	203		53	554	65	221	726	345
Capacity (veh/h)	372	642		259	537		342	1210	497	510	881	704
Adjusted saturation flow (veh/h)	1770	1725		1393	1444		1770	3547	1456	1770	1863	1488
v/c ratio	.857	.262		.715	.378		.154	.458	.131	.433	.825	.491
g/C ratio	.372	.372		.186	.372		.419	.341	.341	.55	.473	.473
Average back of queue (veh)	12.6	4.4		7.2	5.7		1.2	8.7	1.7	5	26.1	9.2
Uniform delay (s)	32.5	28.2		49.3	29.6		22.5	33.2	29.3	16.3	29.4	23.3
Incremental delay (s)	20.7	0		9.5	.1		0	.2	0	.3	6.8	.5
Initial queue delay (s)	0	0		0	0		0	0	0	0	0	0
Delay (s)	53.2	28.2		58.8	29.7		22.5	33.4	29.3	16.6	36.2	23.8
LOS	D	C		E	C		C	C	C	B	D	C
Approach delay (s)/LOS	44.6	/	D	43.6	/	D	32.1	/	C	29.5	/	C
Intersection delay (s)/ LOS	34.6		/			C						

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: TOT1 PM 2016
Comment: 2016 TOT SCEN1 W/NO IMPROVEMENTS

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other | Analysis period: 1 h | Signal type: Actuated-Field | % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	303	108	63	92	90	238	58	575	67	200	770	358
RTOR volume (veh/h)			5			50			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB	R	LTRP						
NB			L		LTRP			
SB			L	LTRP	LTRP			
Green (s)	21	24	5	12	48			
Yellow + All red (s)	5	5	5	5	5			

Cycle (s): 135 | Lost time per cycle (s): 25 | Critical v/c Ratio: .94

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	TR		LT	R		L	T	R	L	T	R
No. of lanes	1	1		1	1		1	2	1	1	1	1
Flow rate (veh/h)	319	175		192	198		61	605	60	211	811	345
Capacity (veh/h)	371	633		242	533		327	1261	519	488	897	717
Adjusted saturation flow (veh/h)	1770	1710		1362	1438		1770	3547	1461	1770	1863	1489
v/c ratio	.86	.276		.791	.371		.187	.48	.116	.432	.904	.481
g/C ratio	.37	.37		.178	.37		.43	.356	.356	.556	.481	.481
Average back of queue (veh)	13.3	4.8		8.2	5.8		1.5	9.9	1.6	4.9	34.6	9.4
Uniform delay (s)	34.3	29.8		53.1	31		22.7	33.8	29.2	16.9	32.1	23.6
Incremental delay (s)	21.5	0		18.1	0		0	.2	0	.3	14.8	.4
Initial queue delay (s)	0	0		0	0		0	0	0	0	0	0
Delay (s)	55.8	29.8		71.2	31		22.7	34	29.2	17.2	46.9	24
LOS	E	C		E	C		C	C	C	B	D	C
Approach delay (s)/LOS	46.6	/	D	50.8	/	D	32.7	/	C	36.6	/	D
Intersection delay (s)/ LOS	39.1		/			D						

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		EB/WB Street	HUALALAI R
Analysis Period/Year	AMB2 PM 2010	NB/SB Street	KUAKINI HW
Comment	2010 AMB SCEN2 W/ PARKWAY		

Intersection Data

Area type: Other | Analysis period: 1 h | Signal type: Actuated-Field | % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	286	104	52	78	88	229	47	523	68	198	674	338
RTOR volume (veh/h)			5			50			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB	R	LTRP						
NB			L		LTRP			
SB			L	LTRP	LTRP			
Green (s)	15	24	5	10	37			
Yellow + All red (s)	5	5	5	5	5			

Cycle (s): 116 | Lost time per cycle (s): 25 | Critical v/c Ratio: .845

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	TR		LT	R		L	T	R	L	T	R
No. of lanes	1	1		1	1		1	2	1	1	1	1
Flow rate (veh/h)	301	159		175	188		49	551	61	208	709	324
Capacity (veh/h)	378	655		290	553		341	1131	462	497	835	665
Adjusted saturation flow (veh/h)	1770	1726		1403	1457		1770	3547	1448	1770	1863	1483
v/c ratio	.795	.243		.602	.341		.145	.487	.132	.42	.85	.488
g/C ratio	.379	.379		.207	.379		.405	.319	.319	.534	.448	.448
Average back of queue (veh)	9.9	3.7		5.7	4.6		1	8.1	1.5	4.3	24.2	8
Uniform delay (s)	28.1	24.6		41.7	25.7		21.1	31.8	28.1	15.6	28.5	22.6
Incremental delay (s)	12.2	0		3.5	0		0	.3	0	.2	9	.5
Initial queue delay (s)	0	0		0	0		0	0	0	0	0	0
Delay (s)	40.3	24.6		45.2	25.7		21.1	32.1	28.1	15.8	37.5	23.1
LOS	D	C		D	C		C	C	C	B	D	C
Approach delay (s)/LOS	34.9	/	C	35.1	/	D	30.9	/	C	30.1	/	C
Intersection delay (s)/ LOS	31.8	/	C									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		EB/WB Street	HUALALAI R
Analysis Period/Year	TOT2 PM 2010	NB/SB Street	KUAKINI HW
Comment	2010 TOT SCEN2 W/ PARKWAY		

Intersection Data

Area type: Other | Analysis period: 1 h | Signal type: Actuated-Field | % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	286	102	59	82	85	224	55	563	63	188	734	338
RTOR volume (veh/h)			5			50			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB	R	LTRP						
NB			L		LTRP			
SB			L	LTRP	LTRP			
Green (s)	15	24	5	10	41			
Yellow + All red (s)	5	5	5	5	5			

Cycle (s): 120 | Lost time per cycle (s): 20 | Critical v/c Ratio: .854

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	TR		LT	R		L	T	R	L	T	R
No. of lanes	1	1		1	1		1	2	1	1	1	1
Flow rate (veh/h)	301	164		176	183		58	593	56	198	773	324
Capacity (veh/h)	360	627		276	533		338	1212	497	490	869	694
Adjusted saturation flow (veh/h)	1770	1711		1381	1453		1770	3547	1456	1770	1863	1487
v/c ratio	.836	.262		.636	.344		.171	.489	.112	.404	.889	.467
g/C ratio	.367	.367		.2	.367		.425	.342	.342	.55	.467	.467
Average back of queue (veh)	10.8	4.1		6	4.7		1.2	8.8	1.3	4.1	28.9	7.9
Uniform delay (s)	30.7	26.6		44	27.5		20.5	31.2	27	15.2	29.2	21.8
Incremental delay (s)	17.9	0		4.9	0		0	.3	0	.2	12.9	.4
Initial queue delay (s)	0	0		0	0		0	0	0	0	0	0
Delay (s)	48.6	26.6		48.9	27.5		20.5	31.5	27	15.4	42.1	22.2
LOS	D	C		D	C		C	C	C	B	D	C
Approach delay (s)/LOS	40.9	/	D	38	/	D	30.3	/	C	33	/	C
Intersection delay (s)/ LOS	34.3	/	C									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB2 PM 2016
Comment: 2016 AMB PM SCEN2 W/ PARKWAY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	303	110	55	83	93	243	50	637	72	210	812	358
RTOR volume (veh/h)			5			50			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		50			50			50			50	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB	R	LTRP						
NB			L		LTRP			
SB			L	LTRP	LTRP			
Green (s)	19	24	5	12	45			
Yellow + All red (s)	5	5	5	5	5			

Cycle (s): 130 Lost time per cycle (s): 25 Critical v/c Ratio: .951

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	TR		LT	R	L	T	R	L	T	R	
No. of lanes	1	1		1	1	1	2	1	1	1	1	
Flow rate (veh/h)	319	168		185	203	53	671	65	221	855	345	
Capacity (veh/h)	368	637		257	533	314	1228	505	466	888	710	
Adjusted saturation flow (veh/h)	1770	1724		1393	1443	1770	3547	1458	1770	1863	1489	
v/c ratio	.866	.265		.72	.381	.168	.546	.129	.475	.962	.486	
g/C ratio	.369	.369		.185	.369	.423	.346	.346	.554	.477	.477	
Average back of queue (veh)	12.9	4.5		7.2	5.7	1.2	11	1.7	5.2	41.7	9.2	
Uniform delay (s)	33.1	28.7		49.8	30.1	22.3	34.3	29.1	17.1	32.9	23.2	
Incremental delay (s)	22.8	0		10	.1	0	.5	0	.6	32.7	.5	
Initial queue delay (s)	0	0		0	0	0	0	0	0	0	0	
Delay (s)	55.9	28.7		59.8	30.2	22.3	34.8	29.1	17.7	65.6	23.7	
LOS	E	C		E	C	C	C	C	B	E	C	
Approach delay (s)/LOS	46.5	/	D	44.3	/	D	33.5	/	C	47.9	/	D
Intersection delay (s)/ LOS	43.6			/			D					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: TOT2 PM 2016
Comment: 2016 TOT PM SCEN2 W/ PARKWAY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	303	108	63	92	90	238	58	686	67	200	892	358
RTOR volume (veh/h)			5			50			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		50			50			50			50	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB	R	LTRP						
NB			L		LTRP			
SB			L	LTRP	LTRP			
Green (s)	28	30	5	12	75			
Yellow + All red (s)	5	5	5	5	5			

Cycle (s): 175 Lost time per cycle (s): 25 Critical v/c Ratio: .972

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	TR		LT	R	L	T	R	L	T	R	
No. of lanes	1	1		1	1	1	2	1	1	1	1	
Flow rate (veh/h)	319	175		192	198	61	722	60	211	939	345	
Capacity (veh/h)	369	615		233	516	321	1520	634	436	979	787	
Adjusted saturation flow (veh/h)	1770	1709		1361	1434	1770	3547	1479	1770	1863	1496	
v/c ratio	.863	.284		.821	.383	.19	.475	.095	.483	.959	.439	
g/C ratio	.36	.36		.171	.36	.486	.429	.429	.583	.526	.526	
Average back of queue (veh)	17.1	6.4		10.8	7.6	1.7	14	1.8	6.3	57.6	11	
Uniform delay (s)	45.6	39.9		69.9	41.6	24	35.9	29.8	20.2	39.7	25.6	
Incremental delay (s)	22.2	0		23.7	1	0	.2	0	.7	28.8	.2	
Initial queue delay (s)	0	0		0	0	0	0	0	0	0	0	
Delay (s)	67.8	39.9		93.6	41.7	24	36.1	29.8	20.9	68.5	25.8	
LOS	E	D		F	D	C	D	C	C	E	C	
Approach delay (s)/LOS	58	/	E	67.2	/	E	34.8	/	C	51.9	/	D
Intersection delay (s)/ LOS	50.2			/			D					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB3 PM 2016
Comment: 2016 AMB PM SCEN23W/ PKWY &4LHWY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	303	110	55	83	93	243	50	711	72	210	950	358
RTOR volume (veh/h)			5			50			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		50			50			50			50	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB	R	LTRP						
NB			L		LTRP			
SB			L	LTRP	LTRP			
Green (s)	27	36	5	12	85			
Yellow + All red (s)	5	5	5	5	5			

Cycle (s): 190 Lost time per cycle (s): 25 Critical v/c Ratio: .965

Intersection Performance

	EB			WB		NB			SB		
Lane group configuration	L	TR		LT	R	L	T	R	L	T	R
No. of lanes	1	1		1	1	1	2	1	1	1	1
Flow rate (veh/h)	319	168		185	203	53	748	65	221	1000	345
Capacity (veh/h)	367	617		264	518	288	1587	664	423	1000	804
Adjusted saturation flow (veh/h)	1770	1723		1392	1447	1770	3547	1483	1770	1863	1498
v/c ratio	.87	.273		.703	.392	.183	.472	.098	.522	1	.429
g/C ratio	.358	.358		.189	.358	.5	.447	.447	.589	.537	.537
Average back of queue (veh)	18.5	6.6		10.3	8.5	1.6	15.4	2.1	7.4	76	11.7
Uniform delay (s)	49.6	43.4		72	45.6	24.7	36.8	30.3	21.6	44	26.5
Incremental delay (s)	23.8	0		8.5	.1	0	.2	0	1.2	56.9	.2
Initial queue delay (s)	0	0		0	0	0	0	0	0	0	0
Delay (s)	73.4	43.4		80.5	45.7	24.7	37	30.3	22.8	100.9	26.7
LOS	E	D		F	D	C	D	C	C	F	C
Approach delay (s)/LOS	63	/	E	62.3	/	E	35.7	/	D	73.5	/	E
Intersection delay (s)/ LOS	60.8		/		E							

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: TOT3 PM 2016
Comment: 2016 TOT PM SCEN23W/ PKWY &4LHWY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	303	108	63	92	90	238	58	760	67	200	1030	358
RTOR volume (veh/h)			5			50			10			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		50			50			50			50	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTR	LTRP						
WB	R	LTRP						
NB			L		LTRP			
SB			L	LTRP	LTRP			
Green (s)	27	36	5	12	105			
Yellow + All red (s)	5	5	5	5	5			

Cycle (s): 210 Lost time per cycle (s): 20 Critical v/c Ratio: 1.039

Intersection Performance

	EB			WB		NB			SB		
Lane group configuration	L	TR		LT	R	L	T	R	L	T	R
No. of lanes	1	1		1	1	1	2	1	1	1	1
Flow rate (veh/h)	319	175		192	198	61	800	60	211	1084	345
Capacity (veh/h)	314	552		233	464	285	1773	746	427	1082	873
Adjusted saturation flow (veh/h)	1770	1704		1357	1434	1770	3547	1492	1770	1863	1503
v/c ratio	1.014	.317		.824	.426	.214	.451	.08	.493	1.002	.395
g/C ratio	.324	.324		.171	.324	.548	.5	.5	.629	.581	.581
Average back of queue (veh)	28.5	8.1		12.8	9.6	1.9	16.7	1.9	7	89.3	11.6
Uniform delay (s)	63.4	53.5		83.9	55.7	22.6	33.9	27.3	20	44	23.9
Incremental delay (s)	115.8	0		24.3	.3	0	1	0	.9	56.5	.1
Initial queue delay (s)	0	0		0	0	0	0	0	0	0	0
Delay (s)	179.2	53.5		108.2	56	22.6	34	27.3	20.9	100.5	24
LOS	F	D		F	E	C	C	C	C	F	C
Approach delay (s)/LOS	134.7	/	F	81.7	/	F	32.8	/	C	74.2	/	E
Intersection delay (s)/ LOS	72.6		/		E							

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: EXISTING AM 2004
Comment: 2004 EXISTING AM

Site Information

Jurisdiction/Date: 2/21/05
EB/WB Street: NANI KAILU
NB/SB Street: QUEEN KAAH

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	55	25	15	125	50	65	15	905	35	60	645	40
RTOR volume (veh/h)			10			40			10			20
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	10			10			10			10		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	21	3	64					
Yellow + All red (s)	5.4	3.8	4.8					

Cycle (s): 102 Lost time per cycle (s): 14 Critical v/c Ratio: .83

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LT	R	L	T	R	L	T	R
No. of lanes		1	1		1	1	1	1	1	1	1	1
Flow rate (veh/h)		87	5		190	27	16	984	27	65	701	22
Capacity (veh/h)		170	318		247	318	376	1169	986	181	1169	986
Adjusted saturation flow (veh/h)		826	1545		1199	1545	1770	1863	1571	1770	1863	1571
v/c ratio		.512	.017		.77	.085	.043	.842	.028	.361	.6	.022
g/C ratio		.206	.206		.206	.206	.704	.627	.627	.704	.627	.627
Average back of queue (veh)		2.5	.1		6.1	.7	.1	26.2	.3	.8	13.1	.2
Uniform delay (s)		35.9	32.3		38.2	32.7	7.5	15	7.2	16.2	11.4	7.2
Incremental delay (s)		2.6	0		15.1	0	0	6	0	0	.9	0
Initial queue delay (s)		0	0		0	0	0	0	0	0	0	0
Delay (s)		38.5	32.3		53.3	32.7	7.5	21	7.2	16.2	12.3	7.2
LOS		D	C		D	C	A	C	A	B	B	A
Approach delay (s)/LOS	38.2 / D			50.8 / D			20.4 / C			12.4 / B		
Intersection delay (s)/ LOS	21.3 / C											

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB1 AM 2010
Comment: 2010 AMB AM&TOT SCEN1 W/NO IMPS

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: NANI KAILU
NB/SB Street: QUEEN KAAH

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	62	26	16	68	52	135	21	1048	36	68	724	47
RTOR volume (veh/h)			10			40			10			20
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	10			10			10			10		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	24	4	83					
Yellow + All red (s)	5.4	3.8	5.8					

Cycle (s): 126 Lost time per cycle (s): 15 Critical v/c Ratio: .831

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LT	R	L	T	R	L	T	R
No. of lanes		1	1		1	1	1	1	1	1	1	1
Flow rate (veh/h)		93	6		126	100	22	1103	27	72	762	28
Capacity (veh/h)		182	294		223	294	375	1227	1035	140	1227	1035
Adjusted saturation flow (veh/h)		955	1542		1169	1542	1770	1863	1571	1770	1863	1571
v/c ratio		.509	.022		.567	.341	.059	.899	.026	.512	.621	.027
g/C ratio		.19	.19		.19	.19	.737	.659	.659	.737	.659	.659
Average back of queue (veh)		3.2	.2		4.5	3.2	.2	39.9	.4	1.2	17	.4
Uniform delay (s)		45.7	41.5		46.3	44.1	8.5	18	7.5	26	12.4	7.5
Incremental delay (s)		2.4	0		3.4	0	0	10.4	0	3.2	1	0
Initial queue delay (s)		0	0		0	0	0	0	0	0	0	0
Delay (s)		48.1	41.5		49.7	44.1	8.5	28.4	7.5	29.2	13.4	7.5
LOS		D	D		D	D	A	C	A	C	B	A
Approach delay (s)/LOS	47.7 / D			47.2 / D			27.5 / C			14.5 / B		
Intersection delay (s)/ LOS	25.5 / C											

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: NANI KAILU
Analysis Period/Year: AMB1 AM 2016 | NB/SB Street: QUEEN KAAH
Comment: 2016 AMB&TOT AM SCEN1 W/NO IMPS

Intersection Data

Area type: Other | Analysis period: 1 h | Signal type: Actuated-Field | % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	66	28	17	72	55	143	22	1174	38	72	811	50
RTOR volume (veh/h)			10			40			10			20
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	10			10			10			10		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	35	5	180					
Yellow + All red (s)	5.4	3.8	5.8					

Cycle (s): 235 | Lost time per cycle (s): 13 | Critical v/c Ratio: .884

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LT	R	L	T	R	L	T	R
No. of lanes		1	1		1	1	1	1	1	1	1	1
Flow rate (veh/h)		99	7		134	108	23	1236	29	76	854	32
Capacity (veh/h)		103	228		139	228	411	1427	1205	162	1427	1205
Adjusted saturation flow (veh/h)		695	1530		935	1530	1770	1863	1573	1770	1863	1573
v/c ratio		956	.032		.96	.476	.056	.866	.024	.467	.598	.026
g/C ratio		.149	.149		.149	.149	.812	.766	.766	.812	.766	.766
Average back of queue (veh)		9.4	.4		12.5	6.9	.3	65.1	.5	1.6	26.3	.5
Uniform delay (s)		99.2	85.5		99.3	91.6	9.6	19.1	6.6	41.5	11.9	6.6
Incremental delay (s)		132.4	0		113.4	1.3	0	6.3	0	1.6	.7	0
Initial queue delay (s)		0	0		0	0	0	0	0	0	0	0
Delay (s)		231.6	85.5		212.7	92.9	9.6	25.4	6.6	43.1	12.6	6.6
LOS		F	F		F	F	A	C	A	D	B	A
Approach delay (s)/LOS	221.5 / F			159.1 / F			24.7 / C			14.8 / B		
Intersection delay (s)/ LOS	41.6 / D											

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: NANI KAILU
Analysis Period/Year: AMB2 AM 2010 | NB/SB Street: QUEEN KAAH
Comment: 2010 AMB AM&TOT SCEN2 W/ PARKWAY

Intersection Data

Area type: Other | Analysis period: 1 h | Signal type: Actuated-Field | % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	62	26	16	68	52	135	21	976	36	68	648	47
RTOR volume (veh/h)			10			40			10			20
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	10			10			10			10		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	24	4	83					
Yellow + All red (s)	5.4	3.8	5.8					

Cycle (s): 126 | Lost time per cycle (s): 15 | Critical v/c Ratio: .785

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LT	R	L	T	R	L	T	R
No. of lanes		1	1		1	1	1	1	1	1	1	1
Flow rate (veh/h)		93	6		126	100	22	1027	27	72	682	28
Capacity (veh/h)		182	294		223	294	431	1227	1035	193	1227	1035
Adjusted saturation flow (veh/h)		955	1542		1169	1542	1770	1863	1571	1770	1863	1571
v/c ratio		.509	.022		.567	.341	.051	.837	.026	.37	.556	.027
g/C ratio		.19	.19		.19	.19	.737	.659	.659	.737	.659	.659
Average back of queue (veh)		3.2	.2		4.5	3.2	.2	32.1	.4	1	14	.4
Uniform delay (s)		45.7	41.5		46.3	44.1	7.2	16.4	7.5	19.5	11.6	7.5
Incremental delay (s)		2.4	0		3.4	0	0	5.5	0	.1	.6	0
Initial queue delay (s)		0	0		0	0	0	0	0	0	0	0
Delay (s)		48.1	41.5		49.7	44.1	7.2	21.9	7.5	19.6	12.2	7.5
LOS		D	D		D	D	A	C	A	B	B	A
Approach delay (s)/LOS	47.7 / D			47.2 / D			21.2 / C			12.7 / B		
Intersection delay (s)/ LOS	22 / C											

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB2 AM / 2016
Comment: 2016 AMB&TOT AM SCEN2 W/ PARKWAY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: NANI KAILU
NB/SB Street: QUEEN KAAH

Intersection Data

Area type: Other | Analysis period: 1 h | Signal type: Actuated-Field | % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	66	28	17	72	55	143	22	1142	38	72	777	50
RTOR volume (veh/h)			10			40			10			20
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		10			10			10			10	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	35	5	180					
Yellow + All red (s)	5.4	3.8	5.8					

Cycle (s): 235 | Lost time per cycle (s): 15 | Critical v/c Ratio: .865

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LT	R	L	T	R	L	T	R
No. of lanes		1	1		1	1	1	1	1	1	1	1
Flow rate (veh/h)		99	7		134	108	23	1202	29	76	818	32
Capacity (veh/h)		103	228		139	228	434	1427	1205	186	1427	1205
Adjusted saturation flow (veh/h)		695	1530		935	1530	1770	1863	1573	1770	1863	1573
v/c ratio		.956	.032		.96	.476	.053	.843	.024	.408	.573	.026
g/C ratio		.149	.149		.149	.149	.812	.766	.766	.812	.766	.766
Average back of queue (veh)		9.4	.4		12.5	6.9	.3	59.4	.5	1.5	24.3	.5
Uniform delay (s)		99.2	85.5		99.3	91.6	8.8	18.1	6.6	35.4	11.5	6.6
Incremental delay (s)		132.4	0		113.4	1.3	0	5	0	.5	.6	0
Initial queue delay (s)		0	0		0	0	0	0	0	0	0	0
Delay (s)		231.6	85.5		212.7	92.9	8.8	23.1	6.6	35.9	12.1	6.6
LOS		F	F		F	F	A	C	A	D	B	A
Approach delay (s)/LOS	221.5 / F			159.1 / F			22.5 / C			13.8 / B		
Intersection delay (s)/ LOS	40.8 / D											

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB3AM / 2016
Comment: 2016 AMB&TOT AM SCEN3 W/ PKWY &4LH

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: NANI KAILU
NB/SB Street: QUEEN KAAH

Intersection Data

Area type: Other | Analysis period: 1 h | Signal type: Actuated-Field | % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	66	28	17	72	55	143	22	1404	38	72	1011	50
RTOR volume (veh/h)			10			40			10			20
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		10			10			10			10	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	35	5	90					
Yellow + All red (s)	5.4	3.8	5.8					

Cycle (s): 145 | Lost time per cycle (s): 15 | Critical v/c Ratio: .622

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LT	R	L	T	R	L	T	R
No. of lanes		1	1		1	1	1	2	1	1	2	1
Flow rate (veh/h)		99	7		134	108	23	1478	29	76	1064	32
Capacity (veh/h)		263	377		303	377	307	2201	975	185	2201	975
Adjusted saturation flow (veh/h)		1088	1564		1256	1564	1770	3547	1571	1770	3547	1571
v/c ratio		.377	.02		.441	.287	.075	.671	.03	.41	.483	.032
g/C ratio		.241	.241		.241	.241	.695	.621	.621	.695	.621	.621
Average back of queue (veh)		3.6	.2		4.9	3.8	.3	22.4	.5	1.4	13.1	.5
Uniform delay (s)		45.9	41.9		46.7	44.8	9	17.9	10.6	14.8	14.9	10.6
Incremental delay (s)		1	0		.6	0	0	.8	0	.5	.1	0
Initial queue delay (s)		0	0		0	0	0	0	0	0	0	0
Delay (s)		46	41.9		47.3	44.8	9	18.7	10.6	15.3	15	10.6
LOS		D	D		D	D	A	B	B	B	B	B
Approach delay (s)/LOS	45.7 / D			46.2 / D			18.4 / B			14.9 / B		
Intersection delay (s)/ LOS	20.2 / C											

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: EXISTING PM / 2004
Comment: 2004 EXISTING PM

Site Information

Jurisdiction/Date: / 2/21/05
EB/WB Street: NANI KAILU
NB/SB Street: QUEEN KAAH

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	100	35	25	25	30	60	40	845	55	95	950	95
RTOR volume (veh/h)			10			30			15			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		10			10			10			10	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	19	5	55					
Yellow + All red (s)	5.4	3.8	5.8					

Cycle (s): 94 Lost time per cycle (s): 15 Critical v/c Ratio: .826

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LT	R	L	T	R	L	T	R
No. of lanes		1	1		1	1	1	1	1	1	1	1
Flow rate (veh/h)		142	16		58	32	42	889	42	100	1000	68
Capacity (veh/h)		276	312		297	312	173	1090	919	244	1090	919
Adjusted saturation flow (veh/h)		1364	1544		1469	1544	1770	1863	1570	1770	1863	1570
v/c ratio		.516	.051		.195	.101	.243	.816	.046	.409	.918	.074
g/C ratio		.202	.202		.202	.202	.7	.585	.585	.7	.585	.585
Average back of queue (veh)		3.7	.4		1.3	.7	.5	21.6	.5	1.2	30.5	.8
Uniform delay (s)		33.4	30.2		31.1	30.5	17.9	15.5	8.3	13.7	17.5	8.5
Incremental delay (s)		1.7	0		0	0	0	5.1	0	.4	14.6	0
Initial queue delay (s)		0	0		0	0	0	0	0	0	0	0
Delay (s)		35.1	30.2		31.1	30.5	17.9	20.6	8.3	14.1	32.1	8.5
LOS		D	C		C	C	B	C	A	B	C	A
Approach delay (s)/LOS	34.6	/	C	30.9	/	C	19.9	/	B	29.1	/	C
Intersection delay (s)/ LOS	25.8	/	C									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB1 PM / 2010
Comment: 2010 AMB&TOT PM SCEN1 W/NO IMPS

Site Information

Jurisdiction/Date: / 3/7/05
EB/WB Street: NANI KAILU
NB/SB Street: QUEEN KAAH

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	130	36	26	26	31	62	42	967	57	104	1102	114
RTOR volume (veh/h)			10			30			15			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		10			10			10			10	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	P	LTRP				
SB		L	LTRP	LTRP				
Green (s)	32	3	6	83				
Yellow + All red (s)	5.4	3.8	3.8	5.8				

Cycle (s): 142.8 Lost time per cycle (s): 18.8 Critical v/c Ratio: .901

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LT	R	L	T	R	L	T	R
No. of lanes		1	1		1	1	1	1	1	1	1	1
Flow rate (veh/h)		175	17		60	34	44	1018	44	109	1160	88
Capacity (veh/h)		283	347		306	347	337	1083	912	117	1211	1021
Adjusted saturation flow (veh/h)		1263	1548		1366	1548	1770	1863	1570	1770	1863	1571
v/c ratio		.617	.049		.196	.097	.131	.94	.048	.932	.958	.087
g/C ratio		.224	.224		.224	.224	.643	.581	.581	.711	.65	.65
Average back of queue (veh)		6.9	.5		2	1.1	.7	48.4	.8	5	57.5	1.4
Uniform delay (s)		49.9	43.5		45	43.9	9.3	27.6	12.9	32.8	23.2	9.3
Incremental delay (s)		4.1	0		0	0	0	20	0	102.6	24.2	0
Initial queue delay (s)		0	0		0	0	0	0	0	0	0	0
Delay (s)		54	43.5		45	43.9	9.3	47.6	12.9	135.4	47.4	9.3
LOS		D	D		D	D	A	D	B	F	D	A
Approach delay (s)/LOS	53.1	/	D	44.6	/	D	44.7	/	D	52	/	D
Intersection delay (s)/ LOS	48.9	/	D									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB1 PM 2016
Comment: 2016 AMB&TOT PM SCEN1 W/NO IMPS

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: NANI KAILU
NB/SB Street: QUEEN KAAH

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	138	38	28	28	33	66	45	1083	60	110	1234	121
RTOR volume (veh/h)			10			30			15			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		10			10			10			10	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	P	LTRP				
SB		L	LTRP	LTRP				
Green (s)	32	3	6	170				
Yellow + All red (s)	5.4	3.8	3.8	5.8				

Cycle (s): 229.8 Lost time per cycle (s): 18.8 Critical v/c Ratio: .968

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LT	R	L	T	R	L	T	R
No. of lanes		1	1		1	1	1	1	1	1	1	1
Flow rate (veh/h)		185	19		64	38	47	1140	47	116	1299	96
Capacity (veh/h)		145	213		88	213	346	1378	1163	199	1457	1231
Adjusted saturation flow (veh/h)		1039	1526		630	1526	1770	1863	1573	1770	1863	1573
v/c ratio		1.28	.089		.732	.178	.137	.827	.041	.581	.891	.078
g/C ratio		.139	.139		.139	.139	.778	.74	.74	.821	.782	.782
Average back of queue (veh)		33.7	1.1		4.7	2.2	.8	55.5	.9	2.7	70.5	1.5
Uniform delay (s)		98.9	86.2		94.8	87.3	5.8	20.1	8	34.3	18	5.8
Incremental delay (s)		555.9	0		30.6	0	0	4.5	0	4.3	8.1	0
Initial queue delay (s)		0	0		0	0	0	0	0	0	0	0
Delay (s)		654.8	86.2		125.4	87.3	5.8	24.6	8	38.6	26.1	5.8
LOS		F	F		F	F	A	C	A	D	C	A
Approach delay (s)/LOS	602 / F			111.3 / F			23.2 / C			25.7 / C		
Intersection delay (s)/ LOS	66.1 / E											

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB2 PM 2010
Comment: 2010 AMB&TOT PM SCEN2 W/ PARKWAY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: NANI KAILU
NB/SB Street: QUEEN KAAH

Intersection Data

Area type: Other Analysis period: 1 h Signal type: Actuated-Field % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	130	36	26	26	31	62	42	889	57	104	1001	114
RTOR volume (veh/h)			10			30			15			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		10			10			10			10	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	P	LTRP				
SB		L	LTRP	LTRP				
Green (s)	32	3	6	83				
Yellow + All red (s)	5.4	3.8	3.8	5.8				

Cycle (s): 142.8 Lost time per cycle (s): 18.8 Critical v/c Ratio: .835

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LT	R	L	T	R	L	T	R
No. of lanes		1	1		1	1	1	1	1	1	1	1
Flow rate (veh/h)		175	17		60	34	44	936	44	109	1054	88
Capacity (veh/h)		283	347		306	347	369	1083	912	178	1211	1021
Adjusted saturation flow (veh/h)		1263	1548		1366	1548	1770	1863	1570	1770	1863	1571
v/c ratio		.617	.049		.196	.097	.12	.864	.048	.614	.87	.087
g/C ratio		.224	.224		.224	.224	.643	.581	.581	.711	.65	.65
Average back of queue (veh)		6.9	5		2	1.1	7	36.9	.8	2.4	40	1.4
Uniform delay (s)		49.9	43.5		45	43.9	9.3	25.2	12.9	24.3	20.2	9.3
Incremental delay (s)		4.1	0		0	0	0	8.1	0	6.3	7.7	0
Initial queue delay (s)		0	0		0	0	0	0	0	0	0	0
Delay (s)		54	43.5		45	43.9	9.3	33.3	12.9	30.6	27.9	9.3
LOS		D	D		D	D	A	C	B	C	C	A
Approach delay (s)/LOS	53.1 / D			44.6 / D			31.3 / C			26.8 / C		
Intersection delay (s)/ LOS	31.2 / C											

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		EB/WB Street	NANI KAILU
Analysis Period/Year	AMB2 PM 2016	NB/SB Street	QUEEN KAAH
Comment	2016 AMB&TOT PM SCEN2 W/ PARKWAY		

Intersection Data

Area type: Other | Analysis period: 1 h | Signal type: Actuated-Field | % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	138	38	28	28	33	66	45	1043	60	110	1183	121
RTOR volume (veh/h)			10			30			15			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		10			10			10			10	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	P	LTRP				
SB		L	LTRP	LTRP				
Green (s)	32	3	6	170				
Yellow + All red (s)	5.4	3.8	3.8	5.8				

Cycle (s): 229.8 | Lost time per cycle (s): 18.8 | Critical v/c Ratio: .936

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LT	R	L	T	R	L	T	R
No. of lanes		1	1		1	1	1	1	1	1	1	1
Flow rate (veh/h)		185	19		64	38	47	1098	47	116	1245	96
Capacity (veh/h)		145	213		88	213	363	1378	1163	228	1457	1231
Adjusted saturation flow (veh/h)		1039	1526		630	1526	1770	1863	1573	1770	1863	1573
v/c ratio		1.28	.089		.732	.178	.13	.797	.041	.508	.854	.078
g/C ratio		.139	.139		.139	.139	.778	.74	.74	.821	.782	.782
Average back of queue (veh)		33.7	1.1		4.7	2.2	.8	49.9	.9	2.4	60.4	1.5
Uniform delay (s)		98.9	86.2		94.8	87.3	5.8	18.9	8	28.5	16.4	5.8
Incremental delay (s)		555.9	0		30.6	0	0	3.5	0	1.9	5.5	0
Initial queue delay (s)		0	0		0	0	0	0	0	0	0	0
Delay (s)		654.8	86.2		125.4	87.3	5.8	22.4	8	30.4	21.9	5.8
LOS		F	F		F	F	A	C	A	C	C	A
Approach delay (s)/LOS	602 / F			111.3 / F			21.2 / C			21.5 / C		
Intersection delay (s)/ LOS	64.6 / E											

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		EB/WB Street	NANI KAILU
Analysis Period/Year	AMB3 PM 2016	NB/SB Street	QUEEN KAAH
Comment	2016 AMB&TOT PM SC3 W/ PKWY &4LHW		

Intersection Data

Area type: Other | Analysis period: 1 h | Signal type: Actuated-Field | % Back of queue: 70

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	138	38	28	28	33	66	45	1208	60	110	1514	121
RTOR volume (veh/h)			10			30			15			30
Peak-hour factor	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		10			10			10			10	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	P	LTRP				
SB		L	LTRP	LTRP				
Green (s)	40	3	6	90				
Yellow + All red (s)	5.4	3.8	3.8	5.8				

Cycle (s): 157.8 | Lost time per cycle (s): 18.8 | Critical v/c Ratio: .699

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LT	R	L	T	R	L	T	R
No. of lanes		1	1		1	1	1	2	1	1	2	1
Flow rate (veh/h)		185	19		64	38	47	1272	47	116	1594	96
Capacity (veh/h)		320	397		355	397	212	2023	895	203	2243	993
Adjusted saturation flow (veh/h)		1261	1565		1401	1565	1770	3547	1569	1770	3547	1571
v/c ratio		.58	.048		.181	.096	.223	.629	.053	.57	.71	.096
g/C ratio		.253	.253		.253	.253	.626	.57	.57	.688	.632	.632
Average back of queue (veh)		7.8	.7		2.3	1.3	9	21.3	1	2.8	27.1	1.7
Uniform delay (s)		51.5	44.5		46.1	45.1	11.3	22.7	15	17.6	19.4	11.4
Incremental delay (s)		2.7	0		0	0	0	.6	0	3.8	1.1	0
Initial queue delay (s)		0	0		0	0	0	0	0	0	0	0
Delay (s)		54.2	44.5		46.1	45.1	11.3	23.3	15	21.4	20.5	11.4
LOS		D	D		D	D	B	C	B	C	C	B
Approach delay (s)/LOS	53.3 / D			45.7 / D			22.6 / C			20 / B		
Intersection delay (s)/ LOS	23.8 / C											

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: WALUA RD/O
Analysis Period/Year: AMB1 AM 2010 | NB/SB Street: KUAKINI HW
Comment: 2010 AMB AM SCEN1 W/NO IMPROVEMENTS

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	182	10	94	20	10	40	88	243	10	20	200	120
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		50			50			50			50	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	25	3	60					
Yellow + All red (s)	5	4	5					

Cycle (s): 102 | Lost time per cycle (s): 14 | Critical v/c Ratio: .471

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		209	102		76		96	275		22	348	
Capacity (veh/h)		294	346		331		600	1079		663	1010	
Adjusted saturation flow (veh/h)		1198	1411		1349		1770	1834		1770	1716	
v/c ratio		.711	.295		.23		.159	.255		.033	.344	
g/C ratio		.245	.245		.245		.667	.588		.667	.588	
Average back of queue (veh)		6.2	2.5		1.8		1	4		.2	5.5	
Uniform delay (s)		35.2	31.3		30.8		6.5	10.2		6	10.8	
Incremental delay (s)		7.8	0		0		0	0		0	0	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		43	31.3		30.8		6.5	10.2		6	10.8	
LOS		D	C		C		A	B		A	B	
Approach delay (s)/LOS	39.2	/	D	30.8	/	C	9.2	/	A	10.6	/	B
Intersection delay (s)/ LOS	19.4	/	B									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: WALUA RD/O
Analysis Period/Year: TOT1 AM 2010 | NB/SB Street: KUAKINI HW
Comment: 2010 TOT AM SCEN1 W/NO IMPROVEMENTS

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	203	10	94	20	10	40	88	273	10	20	212	127
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		50			50			50			50	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	25	3	55					
Yellow + All red (s)	5	4	5					

Cycle (s): 97 | Lost time per cycle (s): 14 | Critical v/c Ratio: .514

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		232	102		76		96	308		22	368	
Capacity (veh/h)		307	366		347		562	1041		613	973	
Adjusted saturation flow (veh/h)		1192	1419		1347		1770	1836		1770	1716	
v/c ratio		.753	.279		.219		17	.296		.035	.379	
g/C ratio		.258	.258		.258		.649	.567		649	.567	
Average back of queue (veh)		6.7	2.4		1.7		1	4.6		.2	5.9	
Uniform delay (s)		33.2	28.8		28.3		7	10.9		6.4	11.6	
Incremental delay (s)		10.1	0		0		0	0		0	0	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		43.3	28.8		28.3		7	10.9		6.4	11.6	
LOS		D	C		C		A	B		A	B	
Approach delay (s)/LOS	38.8	/	D	28.3	/	C	10	/	A	11.3	/	B
Intersection delay (s)/ LOS	19.6	/	B									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: WALUA RD/O
Analysis Period/Year: AMB1 AM 2016 | NB/SB Street: KUAKINI HW
Comment: 2016 AMB AM SCEN1 W/NO IMPROVEMENTS

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	195	10	100	20	10	40	93	272	10	20	224	127
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		50			50			50			50	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	25	3	60					
Yellow + All red (s)	5	4	5					

Cycle (s): 102 | Lost time per cycle (s): 14 | Critical v/c Ratio: .307

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		223	109		76		101	307		22	382	
Capacity (veh/h)		293	346		320		572	1080		635	1012	
Adjusted saturation flow (veh/h)		1196	1411		1307		1770	1836		1770	1721	
v/c ratio		.76	.314		.237		.177	.284		.034	.377	
g/C ratio		.245	.245		.245		.667	.588		.667	.588	
Average back of queue (veh)		6.9	2.7		1.8		1.1	4.6		.2	6.2	
Uniform delay (s)		35.7	31.5		30.9		6.7	10.4		6.1	11.1	
Incremental delay (s)		11	0		0		0	0		0	0	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		46.7	31.5		30.9		6.7	10.4		6.1	11.1	
LOS		D	C		C		A	B		A	B	
Approach delay (s)/LOS	41.7	/	D	30.9	/	C	9.5	/	A	10.8	/	B
Intersection delay (s)/ LOS	20			/			B					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: WALUA RD/O
Analysis Period/Year: TOT1 AM 2016 | NB/SB Street: KUAKINI HW
Comment: 2016 TOT AM SCEN1 W/NO IMPROVEMENTS

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	213	10	100	20	10	40	93	303	10	20	218	130
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		50			50			50			50	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	26	3	55					
Yellow + All red (s)	5	4	5					

Cycle (s): 98 | Lost time per cycle (s): 14 | Critical v/c Ratio: .54

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		242	109		76		101	340		22	378	
Capacity (veh/h)		316	378		358		545	1031		577	963	
Adjusted saturation flow (veh/h)		1193	1423		1351		1770	1837		1770	1716	
v/c ratio		766	.288		.212		.185	.33		.038	.393	
g/C ratio		.265	265		.265		.643	.561		.643	.561	
Average back of queue (veh)		7.2	2.5		1.7		1.1	5.4		.2	6.3	
Uniform delay (s)		33.2	28.6		28		7.4	11.6		6.9	12.1	
Incremental delay (s)		10.7	0		0		0	0		0	1	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		43.9	28.6		28		7.4	11.6		6.9	12.2	
LOS		D	C		C		A	B		A	B	
Approach delay (s)/LOS	39.2	/	D	28	/	C	10.6	/	B	11.9	/	B
Intersection delay (s)/ LOS	20			/			B					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB2 AM 2010
Comment: 2010 AMB AM SCEN2 W/ PARKWAY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: WALUA RD/O
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	182	10	94	20	10	40	88	311	10	20	254	120
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	25	3	60					
Yellow + All red (s)	5	4	5					

Cycle (s): 102 | Lost time per cycle (s): 14 | Critical v/c Ratio: .508

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		209	102		76		96	349		22	407	
Capacity (veh/h)		294	346		331		552	1081		599	1021	
Adjusted saturation flow (veh/h)		1198	1411		1349		1770	1837		1770	1735	
v/c ratio		.711	.295		.23		.173	.323		.036	.398	
g/C ratio		.245	.245		.245		.667	.588		.667	.588	
Average back of queue (veh)		6.2	2.5		1.8		1	5.4		.2	6.7	
Uniform delay (s)		35.2	31.3		30.8		6.8	10.7		6.2	11.3	
Incremental delay (s)		7.8	0		0		0	0		0	.1	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		43	31.3		30.8		6.8	10.7		6.2	11.4	
LOS		D	C		C		A	B		A	B	
Approach delay (s)/LOS	39.2	/	D	30.8	/	C	9.8	/	A	11.1	/	B
Intersection delay (s)/ LOS	18.8		/	B								

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: TOT2 AM 2010
Comment: 2010 TOT AM SCEN2 W/ PARKWAY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: WALUA RD/O
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	203	10	94	20	10	40	88	341	10	20	266	127
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	25	3	58					
Yellow + All red (s)	5	4	5					

Cycle (s): 100 | Lost time per cycle (s): 14 | Critical v/c Ratio: .547

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		232	102		76		96	382		22	427	
Capacity (veh/h)		299	353		327		527	1066		564	1006	
Adjusted saturation flow (veh/h)		1194	1414		1308		1770	1838		1770	1734	
v/c ratio		.775	.289		.233		.182	.358		.039	.425	
g/C ratio		.25	.25		.25		.66	.58		.66	.58	
Average back of queue (veh)		7.1	2.5		1.8		1.1	6		.2	7.2	
Uniform delay (s)		34.9	30.3		29.9		7.1	11.1		6.5	11.7	
Incremental delay (s)		12.1	0		0		0	0		0	.1	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		47	30.3		29.9		7.1	11.1		6.5	11.8	
LOS		D	C		C		A	B		A	B	
Approach delay (s)/LOS	41.9	/	D	29.9	/	C	10.3	/	B	11.5	/	B
Intersection delay (s)/ LOS	19.7		/	B								

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: WALUA RD/O
Analysis Period/Year: AMB2 AM 2016 | NB/SB Street: KUAKINI HW
Comment: 2016 AMB AM SCEN2 W/ PARKWAY

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	195	10	100	20	10	40	93	380	10	20	311	127
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		50			50			50			50	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	25	3	60					
Yellow + All red (s)	5	4	5					

Cycle (s): 102 Lost time per cycle (s): 14 Critical v/c Ratio: .366

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		223	109		76		101	424		22	476	
Capacity (veh/h)		293	346		320		496	1082		538	1027	
Adjusted saturation flow (veh/h)		1196	1411		1307		1770	1839		1770	1746	
v/c ratio		.76	.314		.237		.204	.392		.04	.464	
g/C ratio		.245	.245		.245		.667	.588		.667	.588	
Average back of queue (veh)		6.9	2.7		1.8		1.1	6.9		.2	8.3	
Uniform delay (s)		35.7	31.5		30.9		7.3	11.2		6.6	11.9	
Incremental delay (s)		11	0		0		0	.1		0	.2	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		46.7	31.5		30.9		7.3	11.3		6.6	12.1	
LOS		D	C		C		A	B		A	B	
Approach delay (s)/LOS	41.7	/	D	30.9	/	C	10.6	/	B	11.8	/	B
Intersection delay (s)/ LOS	19.3	/	B									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: WALUA RD/O
Analysis Period/Year: TOT2 AM 2016 | NB/SB Street: KUAKINI HW
Comment: 2016 TOT AM SCEN W/ PARKWAY

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	213	10	100	20	10	40	93	411	10	20	379	130
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		50			50			50			50	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	25	3	60					
Yellow + All red (s)	5	4	5					

Cycle (s): 102 Lost time per cycle (s): 14 Critical v/c Ratio: .634

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		242	109		76		101	458		22	553	
Capacity (veh/h)		293	346		307		437	1082		511	1034	
Adjusted saturation flow (veh/h)		1195	1411		1251		1770	1840		1770	1758	
v/c ratio		.828	.314		.248		.231	.423		.043	.535	
g/C ratio		.245	.245		.245		.667	.588		.667	.588	
Average back of queue (veh)		7.9	2.7		1.9		1.2	7.7		.2	10.3	
Uniform delay (s)		36.5	31.5		30.9		7.9	11.5		6.8	12.6	
Incremental delay (s)		17.6	0		0		0	.1		0	.5	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		54.1	31.5		30.9		7.9	11.6		6.8	13.1	
LOS		D	C		C		A	B		A	B	
Approach delay (s)/LOS	47.1	/	D	30.9	/	C	10.9	/	B	12.9	/	B
Intersection delay (s)/ LOS	20.8	/	C									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: WALUA RD/O
Analysis Period/Year: AMB3AM 2016 | NB/SB Street: KUAKINI HW
Comment: 2016 AMB AM SCEN3 W/ PKWY &4LHWY

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	195	10	100	20	10	40	93	482	10	20	209	127
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		50			50			50			50	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	25	3	60					
Yellow + All red (s)	5	4	5					

Cycle (s): 102 | Lost time per cycle (s): 14 | Critical v/c Ratio: .587

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		223	109		76		101	535		22	365	
Capacity (veh/h)		293	346		320		586	1083		451	1009	
Adjusted saturation flow (veh/h)		1196	1411		1307		1770	1841		1770	1715	
v/c ratio		.76	.314		.237		.173	.494		.048	.362	
g/C ratio		.245	.245		.245		.667	.588		.667	.588	
Average back of queue (veh)		6.9	2.7		1.8		1.1	9.5		.2	5.8	
Uniform delay (s)		35.7	31.5		30.9		6.6	12.2		7.3	11	
Incremental delay (s)		11	0		0		0	.3		0	0	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		46.7	31.5		30.9		6.6	12.5		7.3	11	
LOS		D	C		C		A	B		A	B	
Approach delay (s)/LOS	41.7	/	D	30.9	/	C	11.6	/	B	10.8	/	B
Intersection delay (s)/ LOS	19.4	/	B									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: WALUA RD/O
Analysis Period/Year: TOT3 AM 2016 | NB/SB Street: KUAKINI HW
Comment: 2016 TOT AM SCEN3 W/ PKWY &4LHWY

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	213	10	100	20	10	40	93	513	10	20	227	137
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		50			50			50			50	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	25	3	60					
Yellow + All red (s)	5	4	5					

Cycle (s): 102 | Lost time per cycle (s): 14 | Critical v/c Ratio: .627

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		242	109		76		101	568		22	396	
Capacity (veh/h)		293	346		307		561	1083		426	1009	
Adjusted saturation flow (veh/h)		1195	1411		1251		1770	1841		1770	1716	
v/c ratio		.828	.314		.248		.18	.525		.051	.392	
g/C ratio		.245	.245		.245		.667	.588		.667	.588	
Average back of queue (veh)		7.9	2.7		1.9		1.1	10.4		.2	6.5	
Uniform delay (s)		36.5	31.5		30.9		6.8	12.5		7.6	11.2	
Incremental delay (s)		17.6	0		0		0	.5		0	.1	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		54.1	31.5		30.9		6.8	13		7.6	11.3	
LOS		D	C		C		A	B		A	B	
Approach delay (s)/LOS	47.1	/	D	30.9	/	C	12.1	/	B	11.1	/	B
Intersection delay (s)/ LOS	20.9	/	C									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: WALUA RD/O
Analysis Period/Year: AMB1 PM 2010 | NB/SB Street: KUAKINI HW
Comment: 2010 AMB PM SCEN1 W/NO IMPROVEMENTS

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	180	10	85	15	10	35	120	260	15	55	275	205
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	25	3	60					
Yellow + All red (s)	5	4	5					

Cycle (s): 102 | Lost time per cycle (s): 14 | Critical v/c Ratio: .591

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		207	92		65		130	299		60	522	
Capacity (veh/h)		292	346		351		461	1076		642	999	
Adjusted saturation flow (veh/h)		1192	1411		1431		1770	1829		1770	1698	
v/c ratio		.707	.267		.186		.283	.278		.093	.522	
g/C ratio		.245	.245		.245		.667	.588		.667	.588	
Average back of queue (veh)		6.1	2.3		1.6		1.6	4.5		.6	9.6	
Uniform delay (s)		35.2	31.1		30.5		7.8	10.3		6.2	12.5	
Incremental delay (s)		7.6	0		0		0	0		0	.5	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		42.8	31.1		30.5		7.8	10.3		6.2	13	
LOS		D	C		C		A	B		A	B	
Approach delay (s)/LOS	39.2 / D			30.5 / C			9.6 / A			12.3 / B		
Intersection delay (s)/ LOS	18.1 / B											

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: WALUA RD/O
Analysis Period/Year: TOT1 PM 2010 | NB/SB Street: KUAKINI HW
Comment: 2010 TOT PM SCEN1 W/NO IMPROVEMENTS

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	191	10	85	15	10	35	120	287	15	55	299	214
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	25	3	60					
Yellow + All red (s)	5	4	5					

Cycle (s): 102 | Lost time per cycle (s): 14 | Critical v/c Ratio: .627

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		218	92		65		130	328		60	558	
Capacity (veh/h)		292	346		350		434	1077		617	1001	
Adjusted saturation flow (veh/h)		1190	1411		1428		1770	1831		1770	1702	
v/c ratio		.749	.267		.186		.301	.305		.097	.557	
g/C ratio		.245	.245		.245		.667	.588		.667	.588	
Average back of queue (veh)		6.7	2.3		1.6		1.6	5		6	10.6	
Uniform delay (s)		35.6	31.1		30.5		8.2	10.5		6.3	12.9	
Incremental delay (s)		10.3	0		0		0	0		0	7	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		45.9	31.1		30.5		8.2	10.5		6.3	13.6	
LOS		D	C		C		A	B		A	B	
Approach delay (s)/LOS	41.5 / D			30.5 / C			9.9 / A			12.9 / B		
Intersection delay (s)/ LOS	18.8 / B											

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: WALUA RD/O
Analysis Period/Year: AMB1 PM 2016 | NB/SB Street: KUAKINI HW
Comment: 2016 AMB PM SCEN1 W/NO IMPROVEMENTS

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	185	10	88	15	10	35	127	291	15	55	308	215
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	25	3	60					
Yellow + All red (s)	5	4	5					

Cycle (s): 102 | Lost time per cycle (s): 14 | Critical v/c Ratio: .627

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		212	96		65		138	333		60	568	
Capacity (veh/h)		292	346		350		426	1077		613	1002	
Adjusted saturation flow (veh/h)		1191	1411		1430		1770	1831		1770	1704	
v/c ratio		.726	.277		.186		.324	.309		.097	.567	
g/C ratio		.245	.245		.245		.667	.588		.667	.588	
Average back of queue (veh)		6.4	2.3		1.6		1.7	5.1		.6	10.9	
Uniform delay (s)		35.4	31.2		30.5		8.4	10.6		6.3	13	
Incremental delay (s)		8.7	0		0		0	0		0	.8	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		44.1	31.2		30.5		8.4	10.6		6.3	13.8	
LOS		D	C		C		A	B		A	B	
Approach delay (s)/LOS	40.1	/	D	30.5	/	C	9.9	/	A	13.1	/	B
Intersection delay (s)/ LOS	18.5	/	B									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: WALUA RD/O
Analysis Period/Year: TOT1 PM 2016 | NB/SB Street: KUAKINI HW
Comment: 2016 TOT PM SCEN1 W/NO IMPROVEMENTS

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	208	10	88	15	10	35	127	327	15	55	335	228
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	25	3	58					
Yellow + All red (s)	5	4	5					

Cycle (s): 100 | Lost time per cycle (s): 14 | Critical v/c Ratio: .684

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		237	96		65		138	372		60	612	
Capacity (veh/h)		297	353		350		385	1063		572	989	
Adjusted saturation flow (veh/h)		1188	1414		1401		1770	1833		1770	1706	
v/c ratio		.798	.271		.186		.358	.35		.105	.619	
g/C ratio		.25	.25		.25		.66	.58		.66	.58	
Average back of queue (veh)		7.4	2.3		1.5		1.8	5.8		.6	12.3	
Uniform delay (s)		35.1	30.2		29.5		9.1	11.1		6.6	13.8	
Incremental delay (s)		14.2	0		0		0	0		0	1.2	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		49.3	30.2		29.5		9.1	11.1		6.6	15	
LOS		D	C		C		A	B		A	B	
Approach delay (s)/LOS	43.8	/	D	29.5	/	C	10.5	/	B	14.2	/	B
Intersection delay (s)/ LOS	19.9	/	B									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB 2PM 2010
Comment: 2010 AMB PM SCEN2 W/ PARKWAY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: WALUA RD/O
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other Analysis period: .25 h Signal type: Actuated-Field % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	180	10	85	15	10	35	120	313	15	55	333	205
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		50			50			50			50	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	25	3	60					
Yellow + All red (s)	5	4	5					

Cycle (s): 102 Lost time per cycle (s): 14 Critical v/c Ratio: .63

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		207	92		65		130	357		60	585	
Capacity (veh/h)		292	346		351		414	1078		593	1008	
Adjusted saturation flow (veh/h)		1192	1411		1431		1770	1832		1770	1714	
v/c ratio		.707	.267		.186		.315	.331		.101	.58	
g/C ratio		.245	.245		.245		.667	.588		.667	.588	
Average back of queue (veh)		6.1	2.3		1.6		1.6	5.5		.6	11.4	
Uniform delay (s)		35.2	31.1		30.5		8.5	10.7		6.4	13.1	
Incremental delay (s)		7.6	0		0		0	0		0	.8	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		42.8	31.1		30.5		8.5	10.7		6.4	13.9	
LOS		D	C		C		A	B		A	B	
Approach delay (s)/LOS	39.2	/	D	30.5	/	C	10.1	/	B	13.2	/	B
Intersection delay (s)/ LOS	18.2	/	B									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: TOT2 PM 2010
Comment: 2010 TOT PM SCEN2 W/ PARKWAY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: WALUA RD/O
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other Analysis period: .25 h Signal type: Actuated-Field % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	191	10	85	15	10	35	120	340	15	55	357	214
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		50			50			50			50	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	25	3	60					
Yellow + All red (s)	5	4	5					

Cycle (s): 102 Lost time per cycle (s): 14 Critical v/c Ratio: .666

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		218	92		65		130	386		60	621	
Capacity (veh/h)		292	346		350		387	1078		569	1010	
Adjusted saturation flow (veh/h)		1190	1411		1428		1770	1833		1770	1717	
v/c ratio		.749	.267		.186		.337	.358		.105	.615	
g/C ratio		.245	.245		.245		.667	.588		.667	.588	
Average back of queue (veh)		6.7	2.3		1.6		1.7	6.1		.6	12.5	
Uniform delay (s)		35.6	31.1		30.5		9	11		6.6	13.5	
Incremental delay (s)		10.3	0		0		0	0		0	1.1	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		45.9	31.1		30.5		9	11		6.6	14.6	
LOS		D	C		C		A	B		A	B	
Approach delay (s)/LOS	41.5	/	D	30.5	/	C	10.5	/	B	13.9	/	B
Intersection delay (s)/ LOS	18.9	/	B									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

eneral Information | **Site Information**

ıalyst	WY	Jurisdiction/Date	3/7/05
ɔency or Company		EB/WB Street	WALUA RD/O
ıalysis Period/Year	AMB2 PM 2016	NB/SB Street	KUAKINI HW
ɔmment	2016 AMB PM SCEN2 W/ PARKWAY		

ıtersection Data

ea type Other Analysis period .25 h Signal type Actuated-Field % Back of queue 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
ɔlume (veh/h)	185	10	88	15	10	35	127	402	15	55	430	215
TOR volume (veh/h)			0			0			0			0
ɔak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
ɔavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
ɔart-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
ɔtension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
ɔrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
ɔpproach pedestrian volume (p/h)		50			50			50			50	
ɔpproach bicycle volume (bic/h)		0			0			0			0	
ɔft/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

ɔignal Phasing Plan

LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
3	LTRP							
B	LTRP							
B		L	LTRP					
B		L	LTRP					
reen (s)	25	3	60					
ellow + All red (s)	5	4	5					

ycle (s) 102 Lost time per cycle (s) 14 Critical v/c Ratio .71

ıtersection Performance

	EB			WB			NB			SB		
ane group configuration		LT	R		LTR		L	TR		L	TR	
o. of lanes		1	1		1		1	1		1	1	
ɔw rate (veh/h)		212	96		65		138	453		60	701	
ɔapacity (veh/h)		292	346		350		329	1080		514	1018	
ɔdjusted saturation flow (veh/h)		1191	1411		1430		1770	1835		1770	1731	
ɔc ratio		.726	.277		.186		.419	.42		.116	.689	
ɔC ratio		.245	.245		.245		.667	.588		.667	.588	
ɔverage back of queue (veh)		6.4	2.3		1.6		1.9	7.6		.6	15.3	
ɔniform delay (s)		35.4	31.2		30.5		10.5	11.5		6.9	14.5	
ɔcremental delay (s)		8.7	0		0		.4	.1		0	2	
ɔitial queue delay (s)		0	0		0		0	0		0	0	
ɔelay (s)		44.1	31.2		30.5		10.9	11.6		6.9	16.5	
ɔOS		D	C		C		B	B		A	B	
ɔpproach delay (s)/LOS	40.1	/	D	30.5	/	C	11.4	/	B	15.8	/	B
ɔtersection delay (s)/ LOS	19.2	/	B									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		EB/WB Street	WALUA RD/O
Analysis Period/Year	TOT2 PM 2016	NB/SB Street	KUAKINI HW
Comment	2016 TOT PM SCEN2 W/ PARKWAY		

Intersection Data

Area type Other Analysis period .25 h Signal type Actuated-Field % Back of queue 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	208	10	88	15	10	35	127	438	15	55	457	228
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		50			50			50			50	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	25	3	60					
Yellow + All red (s)	5	4	5					

Cycle (s) 102 Lost time per cycle (s) 14 Critical v/c Ratio .764

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		237	96		65		138	492		66	745	
Capacity (veh/h)		291	346		337		299	1080		484	1018	
Adjusted saturation flow (veh/h)		1188	1411		1375		1770	1836		1770	1731	
v/c ratio		.814	.277		.194		.462	.456		.124	.731	
g/C ratio		.245	.245		.245		.667	.588		.667	.588	
Average back of queue (veh)		7.6	2.3		1.6		2	8.5		.6	17.2	
Uniform delay (s)		36.3	31.2		30.5		11.5	11.8		7.2	15.2	
Incremental delay (s)		16.1	0		0		.8	.2		0	2.7	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		52.4	31.2		30.5		12.3	12		7.2	17.9	
LOS		D	C		C		B	B		A	B	
Approach delay (s)/LOS	46.3	/	D	30.5	/	C	12.1	/	B	17.1	/	B
Intersection delay (s)/ LOS	21.1	/	C									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB3 PM 2016
Comment: 2016 AMB PM SCEN3 W/ PKWY & 4LHWY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: WALUA RD/O
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other Analysis period: .25 h Signal type: Actuated-Field % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	185	10	88	15	10	35	127	476	15	55	568	215
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	25	3	60					
Yellow + All red (s)	5	4	5					

Cycle (s): 102 Lost time per cycle (s): 14 Critical v/c Ratio: .804

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		212	96		65		138	534		60	851	
Capacity (veh/h)		292	346		350		225	1081		452	1030	
Adjusted saturation flow (veh/h)		1191	1411		1430		1770	1837		1770	1751	
v/c ratio		.726	.277		.186		.614	.494		.132	.826	
g/C ratio		.245	.245		.245		.667	.588		.667	.588	
Average back of queue (veh)		6.4	2.3		1.6		2.4	9.5		.6	22.5	
Uniform delay (s)		35.4	31.2		30.5		15	12.2		7.5	16.8	
Incremental delay (s)		8.7	0		0		4.9	.3		0	5.6	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		44.1	31.2		30.5		19.9	12.5		7.5	22.4	
LOS		D	C		C		B	B		A	C	
Approach delay (s)/LOS	40.1	/	D	30.5	/	C	14	/	B	21.4	/	C
Intersection delay (s)/ LOS	22.1	/	C									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: TOT3 PM 2016
Comment: 2016 TOT PM SCEN3 W/ PKWY & 4LHWY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: WALUA RD/O
NB/SB Street: KUAKINI HW

Intersection Data

Area type: Other Analysis period: .25 h Signal type: Actuated-Field % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	208	10	88	15	10	35	127	512	15	55	581	228
RTOR volume (veh/h)			0			0			0			0
Peak-hour factor	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92	.92
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)	50			50			50			50		
Approach bicycle volume (bic/h)	0			0			0			0		
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	LTRP							
WB	LTRP							
NB		L	LTRP					
SB		L	LTRP					
Green (s)	25	3	60					
Yellow + All red (s)	5	4	5					

Cycle (s): 102 Lost time per cycle (s): 14 Critical v/c Ratio: .848

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration		LT	R		LTR		L	TR		L	TR	
No. of lanes		1	1		1		1	1		1	1	
Flow rate (veh/h)		237	96		65		138	573		60	879	
Capacity (veh/h)		291	346		337		205	1081		423	1029	
Adjusted saturation flow (veh/h)		1188	1411		1375		1770	1838		1770	1749	
v/c ratio		.814	.277		.194		.673	.53		.141	.855	
g/C ratio		.245	.245		.245		.667	.588		.667	.588	
Average back of queue (veh)		7.6	2.3		1.6		2.6	10.6		.6	24.3	
Uniform delay (s)		36.3	31.2		30.5		16.3	12.6		7.9	17.4	
Incremental delay (s)		16.1	0		0		8.3	.5		0	7.2	
Initial queue delay (s)		0	0		0		0	0		0	0	
Delay (s)		52.4	31.2		30.5		24.6	13.1		7.9	24.6	
LOS		D	C		C		C	B		A	C	
Approach delay (s)/LOS	46.3	/	D	30.5	/	C	15.3	/	B	23.5	/	C
Intersection delay (s)/ LOS	24.6	/	C									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: HUALALAI R
Analysis Period/Year: AMB1 AM 2010 | NB/SB Street: QUEEN KAAH
Comment: 2010 AMB AM SCEN1 W/NO IMPROVEMENTS

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	1		73				260	1111			778	4
RTOR volume (veh/h)			0						0			0
Peak-hour factor	.92		.92				.92	.92			.92	.92
Heavy vehicles (%)	2		2				2	2			2	2
Start-up lost time, l_1 (s)	2		2				2	2			2	2
Extension of effective green, e (s)	2		2				2	2			2	2
Arrival type, AT	3		3				3	3			3	3
Approach pedestrian volume (p/h)	0						0			0		
Approach bicycle volume (bic/h)	0						0			0		
Left/right parking (Y or N)	N	/	N		/		N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB			LR					
WB								
NB	LT	LT						
SB		TR						
Green (s)	5	55	20					
Yellow + All red (s)	5	5	5					

Cycle (s): 95 | Lost time per cycle (s): 10 | Critical v/c Ratio: .781

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L		R				L	T			T	R
No. of lanes	1		1				1	1			1	1
Flow rate (veh/h)	1		79				283	1208			846	4
Capacity (veh/h)	369		330				359	1275			1078	917
Adjusted saturation flow (veh/h)	1752		1567				1770	1863			1863	1583
v/c ratio	.003		.24				.787	.948			.784	.005
g/C ratio	.211		.211				.684	.684			.579	.579
Average back of queue (veh)	0		1.9				5.7	36.3			19.7	.1
Uniform delay (s)	29.6		31.2				11.3	13.5			15.4	8.4
Incremental delay (s)	0		0				11.1	14.5			3.9	0
Initial queue delay (s)	0		0				0	0			0	0
Delay (s)	29.6		31.2				22.4	28			19.3	8.4
LOS	C		C				C	C			B	A
Approach delay (s)/LOS	31.2	/	C		/		26.9	/	C	19.3	/	B
Intersection delay (s)/ LOS	24.4			/			C					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: HUALALAI R
Analysis Period/Year: AMB1 AM 2016 | NB/SB Street: QUEEN KAAH
Comment: 2016 AMB AM SCEN1 W/NO IMPROVEMENTS

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	1		77				276	1244			871	4
RTOR volume (veh/h)			0						0			0
Peak-hour factor	.92		.92				.92	.92			.92	.92
Heavy vehicles (%)	2		2				2	2			2	2
Start-up lost time, l_1 (s)	2		2				2	2			2	2
Extension of effective green, e (s)	2		2				2	2			2	2
Arrival type, AT	3		3				3	3			3	3
Approach pedestrian volume (p/h)	0						0			0		
Approach bicycle volume (bic/h)	0						0			0		
Left/right parking (Y or N)	N	/	N		/		N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB			LR					
WB								
NB	LT	LT						
SB		TR						
Green (s)	10	95	25					
Yellow + All red (s)	5	5	5					

Cycle (s): 145 | Lost time per cycle (s): 10 | Critical v/c Ratio: .837

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L		R				L	T			T	R
No. of lanes	1		1				1	1			1	1
Flow rate (veh/h)	1		84				300	1352			947	4
Capacity (veh/h)	302		270				425	1413			1220	1037
Adjusted saturation flow (veh/h)	1752		1567				1770	1863			1863	1583
v/c ratio	.004		.31				.706	.957			.776	.004
g/C ratio	.172		.172				.759	.759			.655	.655
Average back of queue (veh)	0		3.1				6.9	58.5			30	.1
Uniform delay (s)	49.7		52.5				9.7	15.4			17.5	8.6
Incremental delay (s)	0		0				5.3	14.9			3.2	0
Initial queue delay (s)	0		0				0	0			0	0
Delay (s)	49.7		52.5				15	30.3			20.7	8.6
LOS	D		D				B	C			C	A
Approach delay (s)/LOS	52.4	/	D		/		27.5	/	C	20.7	/	C
Intersection delay (s)/ LOS	25.9			/			C					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB2 AM 2010
Comment: 2010 AMB AM SCEN2 W/ PARKWAY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: QUEEN KAAH

Intersection Data

Area type: Other Analysis period: .25 h Signal type: Actuated-Field % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	1		73				260	1039			702	4
RTOR volume (veh/h)			0						0			0
Peak-hour factor	.92		.92				.92	.92			.92	.92
Heavy vehicles (%)	2		2				2	2			2	2
Start-up lost time, l_1 (s)	2		2				2	2			2	2
Extension of effective green, e (s)	2		2				2	2			2	2
Arrival type, AT	3		3				3	3			3	3
Approach pedestrian volume (p/h)	0						0			0		
Approach bicycle volume (bic/h)	0						0			0		
Left/right parking (Y or N)	N	/	N		/		N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB			LR					
WB								
NB	LT	LT						
SB		TR						
Green (s)	5	55	20					
Yellow + All red (s)	5	5	5					

Cycle (s): 95 Lost time per cycle (s): 10 Critical v/c Ratio: .734

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L		R				L	T			T	R
No. of lanes	1		1				1	1			1	1
Flow rate (veh/h)	1		79				283	1129			763	4
Capacity (veh/h)	369		330				392	1275			1078	917
Adjusted saturation flow (veh/h)	1752		1567				1770	1863			1863	1583
v/c ratio	.003		.24				.721	.886			.708	.005
g/C ratio	.211		.211				.684	.684			.579	.579
Average back of queue (veh)	0		1.9				5.1	28.9			16.1	.1
Uniform delay (s)	29.6		31.2				10.3	12			14.3	8.4
Incremental delay (s)	0		0				6.4	7.8			2.2	0
Initial queue delay (s)	0		0				0	0			0	0
Delay (s)	29.6		31.2				16.7	19.8			16.5	8.4
LOS	C		C				B	B			B	A
Approach delay (s)/LOS	31.2	/	C		/		19.2	/	B	16.4	/	B
Intersection delay (s)/ LOS	18.7	/	B									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB2 AM 2016
Comment: 2016 AMB AM SCEN 2 W/ PARKWAY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: QUEEN KAAH

Intersection Data

Area type: Other Analysis period: .25 h Signal type: Actuated-Field % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	1		77				276	1212			837	4
RTOR volume (veh/h)			0						0			0
Peak-hour factor	.92		.92				.92	.92			.92	.92
Heavy vehicles (%)	2		2				2	2			2	2
Start-up lost time, l_1 (s)	2		2				2	2			2	2
Extension of effective green, e (s)	2		2				2	2			2	2
Arrival type, AT	3		3				3	3			3	3
Approach pedestrian volume (p/h)	0						0			0		
Approach bicycle volume (bic/h)	0						0			0		
Left/right parking (Y or N)	N	/	N		/		N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB			LR					
WB								
NB	LT	LT						
SB		TR						
Green (s)	10	95	25					
Yellow + All red (s)	5	5	5					

Cycle (s): 145 Lost time per cycle (s): 10 Critical v/c Ratio: .817

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L		R				L	T			T	R
No. of lanes	1		1				1	1			1	1
Flow rate (veh/h)	1		84				300	1317			910	4
Capacity (veh/h)	302		270				439	1413			1220	1037
Adjusted saturation flow (veh/h)	1752		1567				1770	1863			1863	1583
v/c ratio	.004		.31				.684	.932			.745	.004
g/C ratio	.172		.172				.759	.759			.655	.655
Average back of queue (veh)	0		3.1				6.6	52.7			27.5	.1
Uniform delay (s)	49.7		52.5				9.3	14.4			16.9	8.6
Incremental delay (s)	0		0				4.4	11.4			2.5	0
Initial queue delay (s)	0		0				0	0			0	0
Delay (s)	49.7		52.5				13.7	25.8			19.4	8.6
LOS	D		D				B	C			B	A
Approach delay (s)/LOS	52.4	/	D		/		23.6	/	C	19.3	/	B
Intersection delay (s)/ LOS	23	/	C									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB3AM 2016
Comment: 2016 AMB AM SC3 W/ PKWY & 4LHWY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: QUEEN KAAH

Intersection Data

Area type: Other Analysis period: .25 h Signal type: Actuated-Field % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	1		77				276	1474			1071	4
RTOR volume (veh/h)			0						0			0
Peak-hour factor	.92		.92				.92	.92			.92	.92
Heavy vehicles (%)	2		2				2	2			2	2
Start-up lost time, l_1 (s)	2		2				2	2			2	2
Extension of effective green, e (s)	2		2				2	2			2	2
Arrival type, AT	3		3				3	3			3	3
Approach pedestrian volume (p/h)	0						0			0		
Approach bicycle volume (bic/h)	0						0			0		
Left/right parking (Y or N)	N	/	N		/		N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB			LR					
WB								
NB	LT	LT						
SB		TR						
Green (s)	20	60	25					
Yellow + All red (s)	5	5	5					

Cycle (s): 120 Lost time per cycle (s): 15 Critical v/c Ratio: .627

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L		R				L	T			T	R
No. of lanes	1		1				1	2			2	1
Flow rate (veh/h)	1		84				300	1602			1164	4
Capacity (veh/h)	365		327				424	2512			1773	792
Adjusted saturation flow (veh/h)	1752		1567				1770	3547			3547	1583
v/c ratio	.003		.256				.707	.638			.656	.005
g/C ratio	.208		.208				.708	.708			.5	.5
Average back of queue (veh)	0		2.5				6.7	16.6			16.6	.1
Uniform delay (s)	37.6		39.7				21.2	9.1			22.3	15
Incremental delay (s)	0		0				5.4	.5			.9	0
Initial queue delay (s)	0		0				0	0			0	0
Delay (s)	37.6		39.7				26.6	9.4			23.2	15
LOS	D		D				C	A			C	B
Approach delay (s)/LOS	39.7	/	D		/		12.5	/	B	23.2	/	C
Intersection delay (s)/ LOS	17.2	/	B									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB1 PM 2010
Comment: 2010 AMB PM SCEN 1 W/NO IMPS

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: QUEEN KAAH

Intersection Data

Area type: Other Analysis period: .25 h Signal type: Actuated-Field % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	5		104				140	950			1069	10
RTOR volume (veh/h)			0						0			0
Peak-hour factor	.92		.92				.92	.92			.92	.92
Heavy vehicles (%)	2		2				2	2			2	2
Start-up lost time, l_1 (s)	2		2				2	2			2	2
Extension of effective green, e (s)	2		2				2	2			2	2
Arrival type, AT	3		3				3	3			3	3
Approach pedestrian volume (p/h)	0						0			0		
Approach bicycle volume (bic/h)	0						0			0		
Left/right parking (Y or N)	N	/	N		/		N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB			LR					
WB								
NB	LT	LT						
SB		TR						
Green (s)	5	70	20					
Yellow + All red (s)	5	5	5					

Cycle (s): 110 Lost time per cycle (s): 15 Critical v/c Ratio: .858

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L		R				L	T			T	R
No. of lanes	1		1				1	1			1	1
Flow rate (veh/h)	5		113				152	1033			1162	11
Capacity (veh/h)	319		285				296	1355			1185	1008
Adjusted saturation flow (veh/h)	1752		1567				1770	1863			1863	1583
v/c ratio	.017		.397				.513	.762			.98	.011
g/C ratio	.182		.182				.727	.727			.636	.636
Average back of queue (veh)	1		3.3				2.2	22.1			44.1	.1
Uniform delay (s)	36.9		39.7				8.9	9.2			19.3	7.3
Incremental delay (s)	0		.2				1.5	2.6			21.4	0
Initial queue delay (s)	0		0				0	0			0	0
Delay (s)	36.9		39.9				10.4	11.8			40.7	7.3
LOS	D		D				B	B			D	A
Approach delay (s)/LOS	39.7	/	D		/		11.6	/	B	40.4	/	D
Intersection delay (s)/ LOS	26.6	/	C									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB1 PM 2016
Comment: 2016 AMB PM SCEN1 W/NO IMPROVEMENTS

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: QUEEN KAAH

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	5		110				148	1064			1197	10
RTOR volume (veh/h)			0						0			0
Peak-hour factor	.92		.92				.92	.92			.92	.92
Heavy vehicles (%)	2		2				2	2			2	2
Start-up lost time, l_1 (s)	2		2				2	2			2	2
Extension of effective green, e (s)	2		2				2	2			2	2
Arrival type, AT	3		3				3	3			3	3
Approach pedestrian volume (p/h)	0						0			0		
Approach bicycle volume (bic/h)	0						0			0		
Left/right parking (Y or N)	N	/	N		/		N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB			LR					
WB								
NB	LT	LT						
SB		TR						
Green (s)	5	140	40					
Yellow + All red (s)	5	5	5					

Cycle (s): 200 | Lost time per cycle (s): 15 | Critical v/c Ratio: .865

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L		R				L	T			T	R
No. of lanes	1		1				1	1			1	1
Flow rate (veh/h)	5		120				161	1157			1301	11
Capacity (veh/h)	350		314				274	1397			1304	1108
Adjusted saturation flow (veh/h)	1752		1567				1770	1863			1863	1583
v/c ratio	.016		.381				.587	.828			.998	.01
g/C ratio	.2		.2				.75	.75			.7	.7
Average back of queue (veh)	.3		6.1				4.2	47.9			86.3	.2
Uniform delay (s)	64.2		69.3				12.1	16.5			29.8	9.1
Incremental delay (s)	0		.1				3.3	4.3			24.4	0
Initial queue delay (s)	0		0				0	0			0	0
Delay (s)	64.2		69.4				15.4	20.8			54.2	9.1
LOS	E		E				B	C			D	A
Approach delay (s)/LOS	69.2	/	E		/		20.1	/	C	53.9	/	D
Intersection delay (s)/ LOS	38.4			/			D					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company:
Analysis Period/Year: AMB2 PM 2010
Comment: 2010 AMB PM SCEN2 W/ PARKWAY

Site Information

Jurisdiction/Date: 3/7/05
EB/WB Street: HUALALAI R
NB/SB Street: QUEEN KAAH

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	5		104				140	872			968	10
RTOR volume (veh/h)			0						0			0
Peak-hour factor	.92		.92				.92	.92			.92	.92
Heavy vehicles (%)	2		2				2	2			2	2
Start-up lost time, l_1 (s)	2		2				2	2			2	2
Extension of effective green, e (s)	2		2				2	2			2	2
Arrival type, AT	3		3				3	3			3	3
Approach pedestrian volume (p/h)	0						0			0		
Approach bicycle volume (bic/h)	0						0			0		
Left/right parking (Y or N)	N	/	N		/		N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB			LR					
WB								
NB	LT	LT						
SB		TR						
Green (s)	5	70	20					
Yellow + All red (s)	5	5	5					

Cycle (s): 110 | Lost time per cycle (s): 15 | Critical v/c Ratio: .79

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L		R				L	T			T	R
No. of lanes	1		1				1	1			1	1
Flow rate (veh/h)	5		113				152	948			1052	11
Capacity (veh/h)	319		285				329	1355			1185	1008
Adjusted saturation flow (veh/h)	1752		1567				1770	1863			1863	1583
v/c ratio	.017		.397				.462	.7			.888	.011
g/C ratio	.182		.182				.727	.727			.636	.636
Average back of queue (veh)	1		3.3				2.1	18.2			32.1	.1
Uniform delay (s)	36.9		39.7				8.1	8.3			16.7	7.3
Incremental delay (s)	0		.2				.8	1.6			8.5	0
Initial queue delay (s)	0		0				0	0			0	0
Delay (s)	36.9		39.9				8.9	9.9			25.2	7.3
LOS	D		D				A	A			C	A
Approach delay (s)/LOS	39.7	/	D		/		9.8	/	A	25	/	C
Intersection delay (s)/ LOS	18.4			/			B					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: HUALALAI R
Analysis Period/Year: AMB2 PM 2016 | NB/SB Street: QUEEN KAAH
Comment: 2016 AMB PM SCEN2 W/ PARKWAY

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	5		110				148	1024			1146	10
RTOR volume (veh/h)			0						0			0
Peak-hour factor	.92		.92				.92	.92			.92	.92
Heavy vehicles (%)	2		2				2	2			2	2
Start-up lost time, l_1 (s)	2		2				2	2			2	2
Extension of effective green, e (s)	2		2				2	2			2	2
Arrival type, AT	3		3				3	3			3	3
Approach pedestrian volume (p/h)		0						0			0	
Approach bicycle volume (bic/h)		0						0			0	
Left/right parking (Y or N)	N	/	N		/		N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB			LR					
WB								
NB	LT	LT						
SB		TR						
Green (s)	5	130	30					
Yellow + All red (s)	5	5	5					

Cycle (s): 180 | Lost time per cycle (s): 15 | Critical v/c Ratio: .843

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L		R				L	T			T	R
No. of lanes	1		1				1	1			1	1
Flow rate (veh/h)	5		120				161	1113			1246	11
Capacity (veh/h)	292		261				310	1449			1345	1144
Adjusted saturation flow (veh/h)	1752		1567				1770	1863			1863	1583
v/c ratio	.019		.458				.52	.768			.926	.01
g/C ratio	.167		.167				.778	.778			.722	.722
Average back of queue (veh)	.2		5.8				3.2	34.7			61.3	.2
Uniform delay (s)	62.7		67.7				8.7	11			21	7
Incremental delay (s)	0		.9				1.6	2.6			11.1	0
Initial queue delay (s)	0		0				0	0			0	0
Delay (s)	62.7		68.6				10.3	13.6			32.1	7
LOS	E		E				B	B			C	A
Approach delay (s)/LOS	68.3	/	E		/		13.2	/	B	31.8	/	C
Intersection delay (s)/ LOS	24.6		/		C							

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 3/7/05
Agency or Company: | EB/WB Street: HUALALAI R
Analysis Period/Year: AMB3 PM 2016 | NB/SB Street: QUEEN KAAH
Comment: 2016 AMB PM SC3 W/PKWY & 4LHWY

Intersection Data

Area type: Other | Analysis period: 25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	5		110				148	1189			1477	10
RTOR volume (veh/h)			0						0			0
Peak-hour factor	.92		.92				.92	.92			.92	.92
Heavy vehicles (%)	2		2				2	2			2	2
Start-up lost time, l_1 (s)	2		2				2	2			2	2
Extension of effective green, e (s)	2		2				2	2			2	2
Arrival type, AT	3		3				3	3			3	3
Approach pedestrian volume (p/h)		0						0			0	
Approach bicycle volume (bic/h)		0						0			0	
Left/right parking (Y or N)	N	/	N		/		N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB			LR					
WB								
NB	LT	LT						
SB		TR						
Green (s)	10	60	25					
Yellow + All red (s)	5	5	5					

Cycle (s): 110 | Lost time per cycle (s): 15 | Critical v/c Ratio: .718

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L		R				L	T			T	R
No. of lanes	1		1				1	2			2	1
Flow rate (veh/h)	5		120				161	1292			1605	11
Capacity (veh/h)	398		356				229	2418			1935	864
Adjusted saturation flow (veh/h)	1752		1567				1770	3547			3547	1583
v/c ratio	.014		.336				.704	.534			.83	.013
g/C ratio	.227		.227				.682	.682			.545	.545
Average back of queue (veh)	1		3.3				3.6	11.4			24.7	.2
Uniform delay (s)	32.9		35.6				27.6	8.8			20.8	11.4
Incremental delay (s)	0		0				9.4	.2			3.2	0
Initial queue delay (s)	0		0				0	0			0	0
Delay (s)	32.9		35.6				37	9			24	11.4
LOS	C		D				D	A			C	B
Approach delay (s)/LOS	35.4	/	D		/		12.1	/	B	23.9	/	C
Intersection delay (s)/ LOS	19		/		B							

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Traffic Calculations
Unsignalized Intersection
Level of Service (LOS) Calculations

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	2/21/05
Agency or Company		Major Street	QUEEN KAAHUMANU HWY EXT
Analysis Period/Year	EXISTING AM 2004	Minor Street	HUALALAI RD
Comment	2004 EXISTING AM		

Site Information

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		R			T			R				
Lane 2		T			L			L				
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)		685	4	230	965		1		45			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		761	4	256	1072		1		50			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	50	404	.124	<1	15.2	C	20.2
	2	L	2	28	.073	<1	145.6	F	
	3								C
WB	1								
	2								
	3								
		①							
		④	256	843	.303	1	11.1	B	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	QUEEN KAAHUMANU HWY EXT
Analysis Period/Year	AMB1 AM 2010	Minor Street	HUALALAI RD
Comment	2010 AMBIENT AM SCEN 1W/NO IMPS		

Site Information

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		R			T			R				
Lane 2		T			L			L				
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)		778	4	260	1111		1		73			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		864	4	289	1234		1		81			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	81	352	.23	1	18.3	C	24.5
	2	L	2	15	.132	<1	278.1	F	
	3								C
WB	1								
	2								
	3								
		①							
		④	289	771	.375	2	12.5	B	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	QUEEN KAAHUMANU HWY EXT
Analysis Period/Year	AMB1 AM 2016	Minor Street	HUALALAI RD
Comment	2016 AMB AM SCEN 1 W/ NO IMPS		

Site Information

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		R			T			R				
Lane 2		T			L			L				
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)		871	4	276	1244		1		77			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		968	4	307	1382		1		86			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	86	307	.28	1	21.3	C	32.6
	2	L	2	9	.225	1	517.8	F	
	3								D
WB	1								
	2								
	3								
		①							
		④	307	705	.435	2	14	B	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	QUEEN KAAHUMANU HWY EXT
Analysis Period/Year	AMB2 AM 2010	Minor Street	HUALALAI RD
Comment	2010 AMB AM SCEN2 W/ PARKWAY		

Site Information

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		R			T			R				
Lane 2		T			L			L				
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)		702	4	260	1039		1		73			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		780	4	289	1154		1		81			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	81	394	.206	1	16.5	C	21
	2	L	2	20	.099	<1	203.2	F	
	3								C
WB	1								
	2								
	3								
		①							
		④	289	830	.348	2	11.7	B	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	QUEEN KAAHUMANU HWY EXT
Analysis Period/Year	AMB2 AM 2016	Minor Street	HUALALAI RD
Comment	2016 AMB AM SCEN2 W/PARKWAY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		R			T			R				
Lane 2		T			L			L				
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)		837	4	276	1212		1		77			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		930	4	307	1347		1		86			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	86	323	.267	1	20.2	C	29.7
	2	L	2	10	.196	1	439.8	F	
	3								D
WB	1								
	2								
	3								
		①							
		④	307	729	.421	2	13.5	B	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	QUEEN KAAHUMANU HWY EXT
Analysis Period/Year	AMB3 AM 2016	Minor Street	HUALALAI RD
Comment	2016 AMB AM SCEN 3 W/PKWY &4L HWY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		R			T			R				
Lane 2		T			T			L				
Lane 3		T			L							
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)		1071	4	276	1474		1		77			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		1190	4	307	1638		1		86			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	86	445	.193	1	15	B	26.4
	2	L	2	9	.223	1	514.8	F	
	3								D
WB	1								
	2								
	3								
		①							
		④	307	575	.534	3	18.4	C	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	2/21/05
Agency or Company		Major Street	QUEEN KAAHUMANU HWY EXT
Analysis Period/Year	EXISTING PM 2004	Minor Street	HUALALAI RD
Comment	2004 EXISTING PM		

Site Information

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		R			T			R				
Lane 2		T			L			L				
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)		930	10	115	830		5		80			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		1033	11	128	922		6		89			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	89	281	.317	1	23.7	C	35.8
	2	L	11	39	.283	1	133.4	F	
	3								E
WB	1								
	2								
	3								
		①							
		④	128	662	.193	1	11.7	B	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	QUEEN KAAHUMANU HWY EXT
Analysis Period/Year	AMB1 PM 2010	Minor Street	HUALALAI RD
Comment	2010 AMB PM SCEN1 W/NO IMPROVEMENTS		

Site Information

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		R			T			R				
Lane 2		T			L			L				
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)		1069	10	140	950		5		104			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		1188	11	156	1056		6		116			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	116	228	.508	3	36.8	E	62.1
	2	L	11	21	.518	2	329.3	F	
	3								F
WB	1								
	2								
	3								
		①							
		④	156	579	.269	1	13.5	B	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY
Agency or Company	
Analysis Period/Year	AMB1 PM 2016
Comment	2016 AMB PM SCEN1 W/NO IMPROVEMENTS

Site Information

Jurisdiction/Date	3/7/05
Major Street	QUEEN KAAHUMANU HWY EXT
Minor Street	HUALALAI RD

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		R			T			R				
Lane 2		T			L			L				
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)		1197	11	148	1064		5		110			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		1330	12	164	1182		6		122			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	122	188	.648	5	57.6	F	121.3
	2	L	11	13	.857	4	827.1	F	
	3								F
WB	1								
	2								
	3								
		①							
		④	164	510	.322	1	15.4	C	

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY
Agency or Company	
Analysis Period/Year	AMB2 PM 2010
Comment	2010 AMB PM SCEN 2 W/PKWY IMSP

Site Information

Jurisdiction/Date	3/7/05
Major Street	QUEEN KAAHUMANU HWY EXT
Minor Street	HUALALAI RD

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		R			T			R				
Lane 2		T			L			L				
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)		968	10	140	872		5		104			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		1076	11	156	969		6		116			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	116	265	.437	2	29	D	43.4
	2	L	11	29	.374	2	195.9	F	
	3								E
WB	1								
	2								
	3								
		①							
		④	156	638	.244	1	12.5	B	

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information		Site Information	
Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	QUEEN KAAHUMANU HWY EXT
Analysis Period/Year	AMB2 PM 2016	Minor Street	HUALALAI RD
Comment	2016 AMB PM SCEN 2 W/PKWY IMPS		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		R			T			R				
Lane 2		T			L			L				
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)		1146	11	148	1024		5		110			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		1273	12	164	1138		6		122			
Flare storage (# of vehs)									0			
Median storage (# of vehs)								0				

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	122	203	.6	4	48.4	E	93.7
	2	L	11	15	.72	3	596.2	F	
	3								F
WB	1								
	2								
	3								
		①							
		④	164	536	.307	1	14.7	B	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information		Site Information	
Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	QUEEN KAAHUMANU HWY EXT
Analysis Period/Year	AMB3 PM 2016	Minor Street	HUALALAI RD
Comment	2016 AMB PM SC3 W/PKWY &4L HWY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		R			T			R				
Lane 2		T			T			L				
Lane 3		T			L							
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)		1477	11	148	1189		5		110			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		1641	12	164	1321		6		122			
Flare storage (# of vehs)									0			
Median storage (# of vehs)								0				

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	122	316	.386	2	23.5	C	52.6
	2	L	6	11	.553	2	642.5	F	
	3								F
WB	1								
	2								
	3								
		①							
		④	164	382	.431	2	21.5	C	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information			Site Information		
Analyst	WY		Jurisdiction/Date		4/22/04
Agency or Company			Major Street	KUAKINI HWY	
Analysis Period/Year	EXISTING AM	2004	Minor Street	WALUA/ONIONI	
Comment	2004 EXISTING AM				

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)	LTR			LTR			R			LTR		
Lane 2							LT					
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	20	160	85	65	195	10	140	10	60	20	10	40
PHF	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	22	178	94	72	217	11	156	11	67	22	11	44
Flare storage (# of vehs)									0			1
Median storage (# of vehs)							0			0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	67	812	.083	<1	9.8	A	21.5
	2	LT	156	322	.484	3	26.5	D	
	3								C
WB	1	LTR	77	1463	.053	<1	7.6	A	7.6
	2								
	3								A
		①	22	1335	.017	<1	7.7	A	
		④	72	1285	.056	<1	8	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information			Site Information		
Analyst	WY		Jurisdiction/Date		3/7/05
Agency or Company			Major Street	KUAKINI HWY	
Analysis Period/Year	AMB1 AM	2010	Minor Street	WALUA/ONI ONI	
Comment	2010 AMB AM SCEN1 W/NO IMPROVMENTS				

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)	LTR			LTR			R			LTR		
Lane 2							LT					
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	20	200	120	88	243	10	182	10	94	20	10	40
PHF	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	22	222	133	98	270	11	202	11	104	22	11	44
Flare storage (# of vehs)									0			1
Median storage (# of vehs)							0			0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	106	748	.142	<1	10.6	B	58.8
	2	LT	200	238	.839	10	84.4	F	
	3								F
WB	1	LTR	99	1224	.081	<1	8.2	A	8.2
	2								
	3								A
		①	22	1276	.017	<1	7.9	A	
		④	98	1198	.082	<1	8.3	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	TOT1 AM 2010	Minor Street	WALUA/ONI ONI
Comment	2010 TOT AM SCEN1 W/NO IMPROVMENTS		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)	LTR			LTR			R			LTR		
Lane 2							LT					
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	20	212	127	88	273	10	182	10	94	20	10	40
PHF	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	22	236	141	98	303	11	202	11	104	22	11	44
Flare storage (# of vehs)									0			1
Median storage (# of vehs)							0			0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	106	731	.145	1	10.8	B	86.9
	2	LT	200	218	.916	13	127.2	F	
	3								F
WB	1	LTR	99	1155	.086	<1	8.4	A	8.4
	2								
	3								A
		①	22	1240	.018	<1	8	A	
		④	98	1176	.083	<1	8.3	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	AMB2 AM 2010	Minor Street	WALUA/ONI ONI
Comment	2010 AMB AM SCEN2 W/PARKWAY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)	LTR			LTR			R			LTR		
Lane 2							LT					
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	20	254	120	88	311	10	182	10	94	20	10	40
PHF	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	22	282	133	98	346	11	202	11	104	22	11	44
Flare storage (# of vehs)									0			1
Median storage (# of vehs)							0			0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	104	692	.15	1	11.1	B	186.8
	2	LT	200	188	1.061	20	278.2	F	
	3								F
WB	1	LTR	99	1063	.093	<1	8.7	A	8.7
	2								
	3								A
		①	22	1196	.019	<1	8.1	A	
		④	98	1138	.086	<1	8.5	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	TOT2 AM 2010	Minor Street	WALUA/ONI ONI
Comment	2010 TOT AM SCEN2 W/PARKWAY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)	LTR			LTR			R			LTR		
Lane 2							LT					
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	20	266	127	88	341	10	203	10	94	20	10	40
PHF	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	22	296	141	98	379	11	226	11	104	22	11	44
Flare storage (# of vehs)									0			1
Median storage (# of vehs)							0			0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	104	677	.154	1	11.3	B	459.4
	2	LT	226	172	1.313	36	665.6	F	
	3								F
WB	1	LTR	99	1004	.099	<1	9	A	9
	2								
	3								A
		①	22	1163	.019	<1	8.2	A	
		④	98	1118	.087	<1	8.5	A	

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	2/21/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	EXISTING PM 2004	Minor Street	WALUA/ ONI ONI
Comment	2004 EXISTING PM		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)	LTR			LTR			R			LTR		
Lane 2							LT					
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	55	220	140	15	195	65	115	10	45	15	10	35
PHF	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	61	244	156	17	217	72	128	11	50	17	11	39
Flare storage (# of vehs)									0			1
Median storage (# of vehs)							0			0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	61	716	.085	<1	10.5	B	22.6
	2	LT	128	281	.456	2	28.4	D	
	3								C
WB	1	LTR	83	1346	.062	<1	7.9	A	7.9
	2								
	3								A
		①	61	1267	.048	<1	8	A	
		④	17	1153	.014	<1	8.2	A	

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	AMB1 PM 2010	Minor Street	WALUA/ ONI ONI
Comment	2010 AMB PM SCEN1 W/NO IMPROVEMENTS		

Site Information

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)	LTR			LTR			R			LTR		
Lane 2							LT					
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	55	275	203	120	260	15	177	10	85	15	10	35
PHF	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	61	306	226	133	289	17	197	11	94	17	11	39
Flare storage (# of vehs)									0			1
Median storage (# of vehs)							0			0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	94	633	.149	1	11.7	B	670.9
	2	LT	200	135	1.485	40	980.8	F	
	3								F
WB	1	LTR	94	998	.094	<1	9	A	9
	2								
	3								A
		①	61	1250	.049	<1	8	A	
		④	133	1031	.129	<1	9	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	TOT1 PM 2010	Minor Street	WALUA/ ONI ONI
Comment	2010 TOT PM SCEN1 W/NO IMPROVEMENTS		

Site Information

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)	LTR			LTR			R			LTR		
Lane 2							LT					
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	55	299	214	120	287	15	191	10	83	15	10	35
PHF	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	61	332	238	133	319	17	212	11	92	17	11	39
Flare storage (# of vehs)									0			1
Median storage (# of vehs)							0			0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	94	606	.155	1	12	B	1037.6
	2	LT	212	120	1.773	52	1492.3	F	
	3								F
WB	1	LTR	94	943	1	<1	9.2	A	9.2
	2								
	3								A
		①	61	1218	.05	<1	8.1	A	
		④	133	997	.134	<1	9.2	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	AMB2 PM 2010	Minor Street	WALUA/ ONI ONI
Comment	2010 AMB PM SCEN 2 W/PARKWAY		

Site Information

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)	LTR			LTR			R			LTR		
Lane 2							LT					
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	55	333	203	120	313	15	177	10	83	15	10	35
PHF	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	61	370	226	133	348	17	197	11	92	17	11	39
Flare storage (# of vehs)									0			1
Median storage (# of vehs)							0			0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	92	582	.158	1	12.4	B	1153.5
	2	LT	200	107	1.872	52	1678.4	F	F
	3								
WB	1	LTR	94	894	.105	<1	9.5	A	9.5
	2								A
	3								
		①	61	1189	.051	<1	8.2	A	
		④	133	976	.137	<1	9.3	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	TOT2 PM 2010	Minor Street	WALUA/ ONI ONI
Comment	2010 TOT PM SCEN 2 W/PARKWAY		

Site Information

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)	LTR			LTR			R			LTR		
Lane 2							LT					
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	55	357	214	120	340	15	191	10	83	15	10	35
PHF	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	61	397	238	133	378	17	212	11	92	17	11	39
Flare storage (# of vehs)									0			1
Median storage (# of vehs)							0			0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) 1

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1	R	92	557	165	1	12.7	B	1641.8
	2	LT	212	94	2.244	64	2348.7	F	F
	3								
WB	1	LTR	94	845	111	<1	9.8	A	9.8
	2								A
	3								
		①	61	1159	.053	<1	8.3	A	
		④	133	944	.141	<1	9.4	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	2/28/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	EXISTING AM 2004	Minor Street	UOFN NORTH DRIVEWAY
Comment	2004 EXISTING AM		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR							R
Lane 2												L
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	50	270			425	50				10		35
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	56	300			472	56				11		39
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	39	569	.069	<1	11.8	B	13.1
	2	L	10	287	.035	<1	18	C	
	3								B
		①	56	1034	.054	<1	8.7	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	AMBI AM 2010	Minor Street	UOFN NORTH DRIVEWAY
Comment	2010 AMB AM SCENI W/NO IMPROVEMENTS		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR							R
Lane 2												L
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	50	345			425	50				10		35
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	56	383			472	56				11		39
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	39	569	.069	<1	11.8	B	13.4
	2	L	10	256	.039	<1	19.6	C	
	3								B
		①	56	1034	.054	<1	8.7	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information			Site Information		
Analyst	WY		Jurisdiction/Date		3/7/05
Agency or Company			Major Street	KUAKINI HWY	
Analysis Period/Year	TOT1 AM	2010	Minor Street	UOFN NORTH DRIVEWAY	
Comment	2010 TOT AM SCEN1 W/NO IMPROVEMENTS				

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR							R
Lane 2												L
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	45	351			524	44				14		40
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	50	390			582	49				16		44
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	44	495	.089	<1	13	B	14.6
	2	L	10	222	.045	<1	21.9	C	
	3								B
		①	50	947	.053	<1	9	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information			Site Information		
Analyst	WY		Jurisdiction/Date		3/7/05
Agency or Company			Major Street	KUAKINI HWY	
Analysis Period/Year	AMB1 AM	2016	Minor Street	UOFN NORTH DRIVEWAY	
Comment	2016 AMB AM SCEN1 W/NO IMPROVEMENTS				

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR							R
Lane 2												L
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	50	376			595	50				10		35
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	56	418			661	56				11		39
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	39	444	.088	<1	13.9	B	16.2
	2	L	10	186	.054	<1	25.5	D	
	3								C
		①	56	879	.063	<1	9.4	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	TOT1 AM 2016	Minor Street	UOFN NORTH DRIVEWAY
Comment	2016 TOT AM SCEN1 W/NO IMPROVEMENTS		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR						R	
Lane 2											L	
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	27	368			549	27				10		35
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	30	409			610	30				11		39
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	39	483	.081	<1	13.1	B	14.8
	2	L	10	228	.044	<1	21.5	C	
	3								B
		①	30	939	.032	<1	9	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	AMB2 AM 2010	Minor Street	UOFN NORTH DRIVEWAY
Comment	2010 AMB AM SCEN2 W/ PARKWAY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR						R	
Lane 2											L	
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	50	399			573	50				10		35
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	56	443			637	56				11		39
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	39	459	085	<1	13.6	B	16
	2	L	10	186	054	<1	25.5	D	
	3								C
		①	56	898	062	<1	9.3	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	TOT2 AM 2010	Minor Street	UOFN NORTH DRIVEWAY
Comment	2010 TOT AM SCEN2 W/ PARKWAY		

Site Information

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR						R	
Lane 2											L	
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	45	405			592	44				14		40
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	50	450			658	49				16		44
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	44	448	.098	<1	13.9	B	16.1
	2	L	10	184	.054	<1	25.7	D	
	3								C
		①	50	887	.056	<1	9.3	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	AMB2AM 2016	Minor Street	UOFN NORTH DRIVEWAY
Comment	2016 AMB AM SCEN2 W/ PARKWAY		

Site Information

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR						R	
Lane 2											L	
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	50	463			663	50				10		35
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	56	514			737	56				11		39
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	39	402	.097	<1	14.9	B	18.3
	2	L	10	146	.069	<1	31.5	D	
	3								C
		①	56	824	.067	<1	9.7	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information		Site Information	
Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	TOT2 AM 2016	Minor Street	UOFN NORTH DRIVEWAY
Comment	2016 TOT AM SCEN1 W/ PARKWAY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR						R	
Lane 2											L	
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	27	486			707	27				14		35
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	30	540			786	30				16		39
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	39	383	.102	<1	15.5	C	18.6
	2	L	10	148	.068	<1	31.1	D	
	3								C
		①	30	808	.037	<1	9.6	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information		Site Information	
Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	AMB3AM 2016	Minor Street	UOFN NORTH DRIVEWAY
Comment	2016 AMB AM SCEN3 W/PKWY & 4LHWY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR						R	
Lane 2											L	
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	50	361			765	50				10		35
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	56	401			850	56				11		39
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	39	346	.113	<1	16.7	C	19.8
	2	L	10	144	.069	<1	31.8	D	
	3								C
		①	56	747	.074	<1	10.2	B	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	TOT3AM 2016	Minor Street	UOFN NORTH DRIVEWAY
Comment	2016 TOT AM SCEN3 W/PKWY & 4LHWY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)	LT			TR						R		
Lane 2										L		
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	50	361			765	50				10		35
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	56	401			850	56				11		39
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	39	346	.113	<1	16.7	C	19.8
	2	L	10	144	.069	<1	31.8	D	
	3								C
		①	56	747	.074	<1	10.2	B	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	2/28/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	EXISTING PM 2004	Minor Street	UOFN NORTH DRIVEWAY
Comment	2004 EXISTING PM		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)	LT			TR						R		
Lane 2										L		
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	55	455			330	15				25		30
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	61	506			367	17				28		33
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	33	669	.049	<1	10.7	B	12.8
	2	L	10	253	.039	<1	19.8	C	
	3								B
		①	61	1170	.052	<1	8.2	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	AMB1 PM 2010	Minor Street	UOFN NORTH DRIVEWAY
Comment	2010 AMB PM SCEN1 W/NO IMPROVMENTS		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR							R
Lane 2												L
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	55	573			470	15				25		30
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	61	637			522	17				28		33
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	33	547	.06	<1	12	B	15.6
	2	L	10	169	.059	<1	27.6	D	
	3								C
		①	61	1024	.06	<1	8.7	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	TOT1 PM 2010	Minor Street	UOFN NORTH DRIVEWAY
Comment	2010 TOT PM SCEN1 W/NO IMPROVMENTS		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR							R
Lane 2												L
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	50	595			470	26				29		40
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	56	661			522	29				32		44
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	44	542	.081	<1	12.2	B	15.2
	2	L	10	165	.061	<1	28.2	D	
	3								C
		①	56	1014	.055	<1	8.8	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY
Agency or Company	
Analysis Period/Year	AMB1 PM 2016
Comment	2016 AMB PM SCEN1 W/NO IMPROVMENTS

Site Information

Jurisdiction/Date	3/7/05
Major Street	KUAKINI HWY
Minor Street	UOFN NORTH DRIVEWAY

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR						R	
Lane 2											L	
Lane 3												

	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	55	618			530	15				25		30
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	61	687			589	17				28		33
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	33	501	.066	<1	12.7	B	17.2
	2	L	10	143	.07	<1	32.1	D	
	3								C
		①	61	968	.063	<1	9	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY
Agency or Company	
Analysis Period/Year	TOT1 PM 2016
Comment	2016 TOT PM SCEN1 W/NO IMPROVMENTS

Site Information

Jurisdiction/Date	3/7/05
Major Street	KUAKINI HWY
Minor Street	UOFN NORTH DRIVEWAY

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR						R	
Lane 2											L	
Lane 3												

	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	40	676			530	26				19		30
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	44	751			589	29				21		33
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	33	497	.066	<1	12.8	B	17.5
	2	L	10	138	.072	<1	33.1	D	
	3								C
		①	44	957	.046	<1	8.9	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information		Site Information	
Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	AMB2 PM 2010	Minor Street	UOFN NORTH DRIVEWAY
Comment	2010 AMB PM SCEN2 W/ PARKWAY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR							R
Lane 2												L
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	55	631			555	15				25		30
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	61	701			617	17				28		33
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	33	483	.068	<1	13	B	17.9
	2	L	10	134	.074	<1	33.9	D	
	3								C
		①	61	945	.065	<1	9.1	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information		Site Information	
Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	TOT2 PM 2010	Minor Street	UOFN NORTH DRIVEWAY
Comment	2010 TOT PM SCEN2 W/ PARKWAY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR							R
Lane 2												L
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	50	653			523	26				29		40
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	56	726			581	29				32		44
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	44	502	.088	<1	12.9	B	16.6
	2	L	10	139	.072	<1	33	D	
	3								C
		①	56	964	.058	<1	9	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	AMB2 PM 2016	Minor Street	UOFN NORTH DRIVEWAY
Comment	2016 AMB PM SCEN1 W/ PARKWAY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR							R
Lane 2												L
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	55	740			610	15				25		30
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	61	822			678	17				28		33
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	33	446	.074	<1	13.7	B	20.6
	2	L	10	104	.097	<1	43.5	E	
	3								C
		①	61	896	.068	<1	9.3	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	TOT2 PM 2016	Minor Street	UOFN NORTH DRIVEWAY
Comment	2016 TOT PM SCEN1 W/ PARKWAY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR							R
Lane 2												L
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	40	798			642	26				19		30
PHF	.9	.9			.9	9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	44	887			713	29				21		33
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	33	422	.078	<1	14.3	B	21.9
	2	L	10	95	105	<1	47.3	E	
	3								C
		①	44	860	.052	<1	9.4	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information		Site Information	
Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	AMB3 PM 2016	Minor Street	UOFN NORTH DRIVEWAY
Comment	20 AMB PM SC3 W/ PKWY & 4 LANE HWY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR						R	
Lane 2											L	
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	55	878			684	15				25		30
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	61	976			760	17				28		33
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	33	400	.083	<1	14.8	B	25.7
	2	L	10	74	.136	<1	61.5	F	
	3								D
		①	61	835	.073	<1	9.7	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information		Site Information	
Analyst	WY	Jurisdiction/Date	3/7/05
Agency or Company		Major Street	KUAKINI HWY
Analysis Period/Year	TOT3 PM 2016	Minor Street	UOFN NORTH DRIVEWAY
Comment	20 TOT PM SC3 W/ PKWY & 4 LANE HWY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		LT			TR						R	
Lane 2											L	
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	40	936			716	26				19		30
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	44	1040			796	29				21		33
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	33	378	.087	<1	15.4	C	40.9
	2	L	21	67	.311	1	80.8	F	
	3								E
		①	44	801	.055	<1	9.8	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/8/05
Agency or Company		Major Street	U OF N SOUTH DRIVEWAY
Analysis Period/Year	TOT1 AM 2010	Minor Street	KUAKINI HWY
Comment	2010 TOT AM SCEN 1 W/ NO IMPS		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		T			R						R	
Lane 2		L			T						L	
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	6	365			549	7				7		19
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	7	406			610	8				8		21
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	21	493	.043	<1	12.6	B	14.3
	2	L	7	256	.027	<1	19.5	C	
	3								B
		①	7	957	.007	<1	8.8	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/8/05
Agency or Company		Major Street	U OF N SOUTH DRIVEWAY
Analysis Period/Year	TOT1 AM 2016	Minor Street	KUAKINI HWY
Comment	2016 TOT AM SCEN 1 W/ NO IMPS		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		T			R						R	
Lane 2		L			T						L	
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	25	357			532	24				16		44
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	28	397			591	27				18		49
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	49	505	.097	<1	12.9	B	14.8
	2	L	16	245	.065	<1	20.7	C	
	3								B
		①	28	957	.029	<1	8.9	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/8/05
Agency or Company		Major Street	U OF N SOUTH DRIVEWAY
Analysis Period/Year	TOT2 AM 2010	Minor Street	KUAKINI HWY
Comment	2010 TOT AM SCEN 2 W/ PARKWAY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		T			R						R	
Lane 2		L			T						L	
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	6	441			617	7				7		19
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	7	490			686	8				8		21
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	21	446	.047	<1	13.5	B	15.9
	2	L	7	205	.034	<1	23.2	C	
	3								C
		①	7	897	.007	<1	9	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/8/05
Agency or Company		Major Street	U OF N SOUTH DRIVEWAY
Analysis Period/Year	TOT2 AM 2016	Minor Street	KUAKINI HWY
Comment	2016 TOT AM SCEN 2 W/ PARKWAY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		T			R						R	
Lane 2		L			T						L	
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	25	475			690	24				16		44
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	28	528			767	27				18		49
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	49	401	.122	<1	15.2	C	18.9
	2	L	16	160	.1	<1	30.1	D	
	3								C
		①	28	823	.034	<1	9.5	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information | **Site Information**

Analyst	WY	Jurisdiction/Date	3/8/05
Agency or Company		Major Street	U OF N SOUTH DRIVEWAY
Analysis Period/Year	TOT3 AM 2016	Minor Street	KUAKINI HWY
Comment	2016 TOT AM SCEN 3 W/ PKWY & 4LHWY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		T			R							R
Lane 2		L			T							L
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	25	373			792	24				16		44
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	28	414			880	27				18		49
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	49	345	.142	<1	17.2	C	20.4
	2	L	16	159	.101	<1	30.2	D	
	3								C
		①	28	746	.037	<1	10	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information | **Site Information**

Analyst	WY	Jurisdiction/Date	3/8/05
Agency or Company		Major Street	U OF N SOUTH DRIVEWAY
Analysis Period/Year	TOT1 PM 2010	Minor Street	KUAKINI HWY
Comment	2010 TOT PM SCEN 1 W/ NO IMPS		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		T			R							R
Lane 2		L			T							L
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	22	602			493	5				6		13
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	24	669			548	6				7		14
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	14	534	.026	<1	11.9	B	16.5
	2	L	7	181	.039	<1	25.7	D	
	3								C
		①	24	1012	.024	<1	8.6	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/8/05
Agency or Company		Major Street	U OF N SOUTH DRIVEWAY
Analysis Period/Year	TOT2 PM 2016	Minor Street	KUAKINI HWY
Comment	2016 TOT PM SCEN 2 W/ PARKWAY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		T			R							R
Lane 2		L			T							L
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	58	759			636	30				21		32
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	64	843			707	33				23		36
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	36	434	.083	<1	14	B	28.3
	2	L	21	96	.219	1	52.7	F	
	3								D
		①	64	862	.075	<1	9.5	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/8/05
Agency or Company		Major Street	U OF N SOUTH DRIVEWAY
Analysis Period/Year	TOT2 PM 2010	Minor Street	KUAKINI HWY
Comment	2010 TOT PM SCEN 2 W/ PARKWAY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		T			R							R
Lane 2		L			T							L
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	22	650			546	5				6		13
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	24	722			607	6				7		14
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	14	495	028	<1	12.5	B	18.1
	2	L	7	155	.045	<1	29.4	D	
	3								C
		①	24	962	.025	<1	8.8	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/8/05
Agency or Company		Major Street	U OF N SOUTH DRIVEWAY
Analysis Period/Year	TOT1 PM 2016	Minor Street	KUAKINI HWY
Comment	2016 TOT PM SCEN 1 W/ NO IMPS		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		T			R							R
Lane 2		L			T							L
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	58	637			525	30				21		32
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	64	708			583	33				23		36
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	36	510	.071	<1	12.6	B	21
	2	L	21	140	.15	1	35.3	E	
	3								C
		①	64	958	.067	<1	9	A	
		④							

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	3/8/05
Agency or Company		Major Street	U OF N SOUTH DRIVEWAY
Analysis Period/Year	TOT3 PM 2016	Minor Street	KUAKINI HWY
Comment	2016 TOT PM SCEN 3 W/ PKWY & 4L HWY		

Input Data

Lane Configuration	SB			NB			EB			WB		
Lane 1 (curb)		T			R							R
Lane 2		L			T							L
Lane 3												
	SB			NB			EB			WB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	58	897			710	30				21		32
PHF	.9	.9			.9	.9				.9		.9
Proportion of heavy vehicles, HV	3	3			3	3				3		3
Flow rate	64	997			789	33				23		36
Flare storage (# of vehs)												0
Median storage (# of vehs)										0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
EB	1								
	2								
	3								
WB	1	R	36	389	.093	<1	15.2	C	39
	2	L	21	68	.309	1	79.9	F	
	3								E
		①	64	803	.08	<1	9.9	A	
		④							

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BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of U of N BENCORP To Amend the Agricultural Land Use District to the Urban Land Use District for Approximately 62 acres, Tax Map Key Nos.: (3) 7-5-10:85 and 7-5-17:06 situate at Waiaha 1st, North Kona, Island County and State of Hawaii.	DOCKET NO. A02-737 CERTIFICATE OF SERVICE

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the Motion to Amend Findings of Fact, Conclusions of Law, and Decision and Order; Memorandum in Support of Motion to Amend Findings of Fact, Conclusions of Law and Decision and Order; Verification of Jennifer A. Benck; Exhibits "1" to "5" was duly served by certified mail, via the United States mail, postage prepaid, upon the parties listed below at their last known addresses on the date indicated below.

.

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