Grover Beach Lodge Transportation Impact Analysis Report

Draft Report

Prepared for:

SWCA Environmental Consultants

Prepared by:

omni · means
ENGINEERS · PLANNERS

GROVER BEACH LODGE
TRANSPORTATION IMPACT ANALYSIS REPORT

PREPARED FOR:
SWCA ENVIRONMENTAL CONSULTANTS
1422 MONTEREY STREET, SUITE C200
SAN LUIS OBISPO, CA 93401

PREPARED BY:
OMNI-MEANS, LTD.
ENGINEERS & PLANNERS
943 RESERVE DRIVE, SUITE 100
ROSEVILLE, CA 95678
916.782.8688

OCTOBER 2010

25-6236-06
R1466TIA001.DOC

TABLE OF CONTENTS

Introduction 1
Existing Conditions 4
Existing Transportation System 4
Existing Pedestrian And Bicycle Facilities 4
Existing Transit Services 5
Existing Traffic Volumes 5
Traffic Analysis Parameters 6
Intersection LOS Methodologies 6
Roadway LOS Methodologies 6
Applicable LOS Policies 8
Traffic Signal Warrants 8
Technical Analysis Parameters 8
Significance And Mitigation Thresholds 9
Existing Traffic Operations 10
Project Description 13
Project Trip Generation 13
Hybrid Hotel Rate 14
Project Trip Distribution And Assignment 14
Project Site Access And Driveway Intersections 14
Existing Plus Project Traffic Operations 19
Cumulative Conditions 21
Cumulative "No Project" Traffic Operations 21
Cumulative Plus Project Traffic Operations 23
Project Impacts and Proposed Mitigation Measures 25
Existing Plus Project Conditions 25
Cumulative Plus Project Conditions 26

LIST OF FIGURES

Figure 1 – Project Location and Vicinity 2
Figure 2 – Project Site Plan 3
Figure 3 – Existing Intersection Lane Geometrics and Control 11
Figure 4 – Existing Traffic Volumes 12
Figure 5A – Inbound Project Trip Distribution 16
Figure 5B – Outbound Project Trip Distribution 17
Figure 6 – Project Only Traffic Volumes 18
Figure 7 – Existing Plus Project Traffic Volumes 20
Figure 8 – Cumulative No Project Traffic Volumes 22
Figure 9 – Cumulative Plus Project Traffic Volumes 24

LIST OF TABLES

Table 1 LOS Criteria and Definitions for Intersections 6
Table 2 LOS Criteria For Roadway Segments 7
Table 3A Existing Conditions: Intersection Levels-Of-Service 10
Table 3B Existing Conditions: Roadway Levels-Of-Service 10
Table 4 Project Trip Generation 14
Table 5A Existing Plus Project Conditions: Intersection Levels-Of-Service 19

Table 5B Existing Plus Project Conditions: Roadway Levels-Of-Service 19
Table 6A Cumulative Conditions: Intersection Levels-Of-Service 21
Table 6B Cumulative Conditions: Roadway Levels-Of-Service 21
Table 7A Cumulative Plus Project Conditions: Intersection Levels-Of-Service 23
Table 7B Cumulative Plus Project Conditions: Roadway Levels-Of-Service 23
Table 8A Existing Plus Project Conditions: Mitigated Levels-Of-Service..... 26
Table 8B Cumulative Plus Project Conditions: Mitigated Levels-Of-Service 27

APPENDIX

Appendix 1: Westbound Grand Avenue Striping and Signage
Appendix 2: Level-Of-Service Worksheets
Appendix 3: MUTCD Signal Warrants

INTRODUCTION

This report has been prepared in order to present the results of a transportation impact analysis report (TIAR) performed by OMNI-MEANS for the proposed *Grover Beach Lodge* in the City of Grover Beach, California. The project consists of a 150 room beach resort/conference area with improvements to beach facilities, parking access, and landscaping in the project vicinity. The proposed site is geographically located in the northwest quadrant of the Highway 1 and Grand Avenue intersection next to Pismo State Beach.

Figure 1 illustrates the project location and vicinity map. Figure 2 presents the tentative *Grover Beach Lodge* site plan.

The background data and assumptions used in this analysis include the following:

- Observed existing AM and PM peak hours hour operations at key intersections identified through consultation with the City;
- Trip generation rates and trip distribution patterns for the *Grover Beach Lodge*;
- Projected City build-out peak hour intersection volumes

The following scenarios are analyzed as a part of this report:

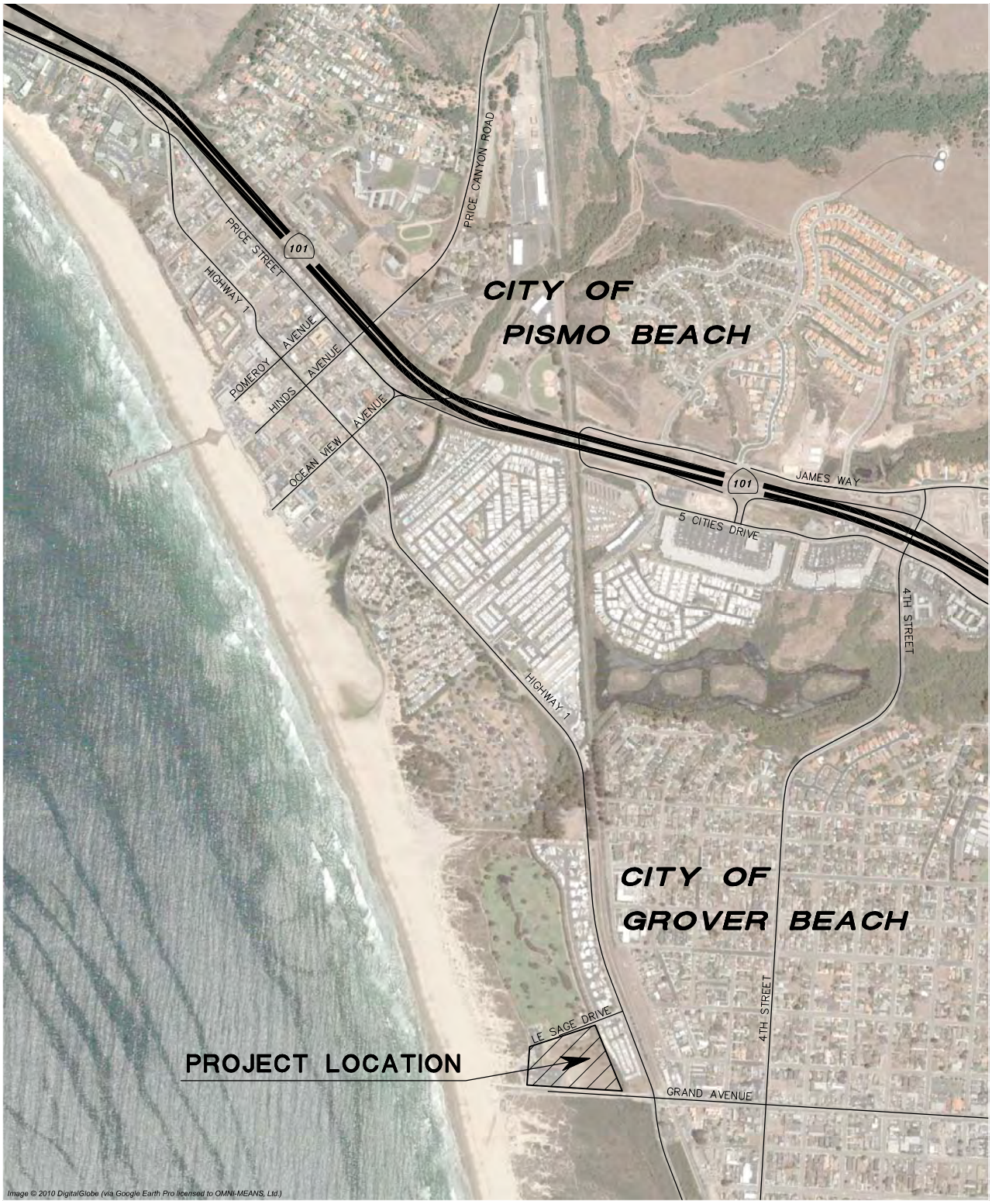
- *Existing* conditions
- *Existing "Plus Project"* conditions
- *Cumulative "No Project"* conditions
- *Cumulative "Plus Project"* conditions

The *Existing* condition analysis investigates current traffic operations within the study area. Traffic counts were taken at all study locations from July 15th to July 17th, 2010, in order to simulate typical weekday conditions during the AM, PM, and Saturday peak hours. *Existing "Plus Project"* conditions build upon existing conditions by superimposing project-generated trips through study intersections.

Cumulative "No Project" conditions project traffic operations upon build out of the current City General Plan Land Use Element, minus the proposed project. Traffic projections for *Cumulative "No Project"* conditions were developed using the City of Grover Beach Travel Demand Model in conjunction with Caltrans growth rates on Highway 1 and U.S. 101 ramp terminals. The growth rates on state facilities were developed by calculating the annualized growth between 1993 and 2007, according to Caltrans AADT volumes for those years, and projecting out to 2025.

Cumulative "Plus Project" conditions build upon *Cumulative "No Project"* conditions by superimposing project-generated trips as they are distributed through study locations over the projected traffic volumes. The Cumulative *"Plus Project"* conditions are consistent with build-out of the City General Plan Land Use Element.

Adverse project impacts and improvements identified to mitigate project impacts will be detailed in the final section of this report. These discussions are based on quantitative analysis, and the corresponding level-of-service and warrant worksheets can be found in the Appendix.



Grover Beach Lodge TIAR

Figure 1

Project Location and Vicinity Map

K:\PRJ\1466\T1466\T1466TG001.dwg 11/3/2010 4:10:27 PM PDT

Grover Beach Lodge TIAR

Figure 2

Project Site Plan

K:\PRJ\1466\T1466\T1466TG001.dwg 11/3/2010 4:10:27 PM PDT

EXISTING CONDITIONS

The City of Grover Beach is a costal community in San Luis Obispo County near the Highway 1 and US 101 junction. Grover Beach is roughly 2.25 square miles in size and a member of the 5 Cities Metropolitan Area. It is bounded by the communities of Arroyo Grande to the east and Pismo Beach to the north. In 2000, the City's population was approximately 13,000.

EXISTING TRANSPORTATION SYSTEM

The following roadways provide primary circulation within the City of Grover Beach and in the vicinity of the proposed *Grover Beach Lodge*.

> ***Highway 1*** also known as *State Route 1* is a California highway that runs in the north-south direction from Mendocino County to Orange County along the Pacific coast. The highway merges with US 101 several times along the central California coast and serves as a two-lane arterial in the City of Grover Beach.
>
> ***US Route 101*** is a major north-south U.S. highway that runs through the states of California, Oregon, and Washington along the West Coast of the United States. The highway's alignment along the southern and central California coast approximates the old trail which linked Spanish missions, pueblos, and presidios. Within Grover Beach, US 101 is a four-lane highway and merges with California State Route 1 north of the City.
>
> ***Grand Avenue*** is a four-lane east-west arterial that spans from US Route 101 in Arroyo Grande to the Pacific Ocean at Pismo State Beach. This road provides project access to the south for beach, equestrian, and restaurant parking.
>
> ***Fourth Street*** is a two-lane collector that runs from James Way and US Route 101 in the north all the way to State Route 1 in the south. This street intersects with Grand Avenue just east of the proposed Grover Beach Lodge.
>
> ***Pomeroy Avenue*** is a two-lane collector in the City of Pismo Beach that extends between Price Street and the Pacific Ocean. The facility runs in one direction to the south and is signalized when it intersects State Route 1.
>
> ***Ocean View Avenue*** is a two-lane collector that spans from Price Street to the Pacific Ocean in Pismo Beach. This roadway is stop controlled when it intersects with State Route 1.
>
> ***Hinds Avenue*** is a two-lane collector that spans from the Pacific Ocean to US Route 101 in the City of Pismo Beach. The facility turns into Price Canyon Road after it intersects with Bello Street to the north.

EXISTING PEDESTRIAN AND BICYCLE FACILITIES

Pedestrian facilities are well established on most of the arterial and collector streets in Grover Beach. Near the project site, Grand Avenue and Le Sage Drive provide crosswalks and sidewalks for pedestrians to access Pismo State Beach and the adjacent golf course. Pedestrian facilities are not present on Highway 1.

The 2010 *City of Grover Beach Bicycle Master Plan* identifies several roadways that provide existing bicycle access in the City. Near the project site, existing Class II bike facilities are established along Highway 1, Grand Avenue, and 4th Street. Bike lanes along Grand Avenue are currently not striped but will be added in the future.

EXISTING TRANSIT SERVICES

The San Luis Obispo Regional Transit Authority provides transit service for Grover Beach residents and visitors with their RTA and SCAT bus routes. These fixed routes operate on a weekly basis and link commuters to the cities of San Luis Obispo, Arroyo Grande, and Pismo Beach. Near the study area, SCAT Route 21 and 24 both offer bus stops at the Highway 1 and Le Sage Drive intersection while SCAT Route 23 services the Grand Avenue and 4th Street intersection. Detailed information regarding the routes, bus-stops, and schedules are available at the San Luis Obispo Regional Transit Authority website (http://www.slorta.org).

Rail service for Grover Beach is provided by Amtrak's Pacific Surfliner route which runs daily along the southern California coast between San Luis Obispo and San Diego. The Amtrak rail station in Grover Beach is located next to the proposed project in the southeast corner of the Highway 1 / Grand Avenue intersection.

EXISTING TRAFFIC VOLUMES

The following locations have been identified as the critical study intersections and roadways in this analysis:

Intersections:

1. Highway 1/Price Street
2. Highway 1/Pomeroy Avenue
3. Highway 1/Hinds Avenue
4. Highway 1/Ocean View Avenue
5. Highway 1/Le Sage Drive
6. Highway 1/Grand Avenue
7. Grand Avenue/4th Street
8. 4th Street/5 Cities Drive
9. 4th Street/US 101 Northbound Ramps

Roadways:

1. Grand Avenue west of Highway 1
2. Le Sage Drive west of Highway 1

New weekday peak-hour intersection and daily roadway traffic counts were conducted by OMNI-MEANS for three days on July 15th to July 17th, 2010, at all study locations. The AM peak-hour is defined as the once continuous hour of peak traffic flow counted between 7:00 AM and 9:00 AM, and the PM peak-hour is defined as the one continuous hour of peak traffic flow counted between 4:00 PM and 6:00 PM under typical weekday conditions. Average Daily Traffic (ADT) in this study is defined as the average, two-way 24-hour traffic volume forecasted across a study roadway section.

TRAFFIC ANALYSIS PARAMETERS

The following section outlines the methodology and analysis parameters used to quantify existing and projected operations at critical study locations.

INTERSECTION LOS METHODOLOGIES

Intersection level-of-service (LOS) has been calculated for all control types using the methods documented in the Transportation Research Board publications *Highway Capacity Manual, Fourth Edition, 2000*. Traffic operations have been quantified through the determination of LOS. LOS determinations are presented on a letter grade scale from "A" to "F", whereby LOS "A" represents free-flow operating conditions and LOS "F" represents over-capacity conditions. For a signalized or all-way stop-controlled (AWSC) intersection, an LOS determination is based on the calculated average delay for all approaches and movements. For a two-way stop-controlled (TWSC) intersection, an LOS determination is based upon the calculated average delay for all movements of the worst-performing approach. LOS definitions for different types of intersection controls are presented in Table 1.

ROADWAY LOS METHODOLOGIES

Roadway segments have estimated maximum capacities that are based on the roadway type (e.g. freeway, arterial, and collector) and number of lanes. LOS is calculated based on the ratio of volume to capacity (V/C). Table 2 presents the roadway segment LOS V/C thresholds and estimated daily volume capacities based on those thresholds for a set of roadway types.

TABLE 1
LOS CRITERIA AND DEFINITIONS FOR INTERSECTIONS

Level of Service	Type of Flow	Delay	Maneuverability	Stopped Delay/Vehicle		
				Signalized	Un signalized	All-Way Stop
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	< 10.0	< 10.0	< 10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel some what restricted within groups of vehicles.	>10.0 and < 20.0	>10.0 and < 15.0	>10.0 and < 15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted	>20.0 and < 35.0	>15.0 and < 25.0	>15.0 and < 25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35.0 and < 55.0	>25.0 and < 35.0	>25.0 and < 35.0

E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55.0 and < 80.0	>35.0 and < 50.0	>35.0 and < 50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent move-ment. Volumes may vary widely, depending prin-cipally on the downstream back-up conditions.	> 80.0	> 50.0	> 50.0

References: 2000 Highway Capacity Manual

TABLE 2
LOS CRITERIA FOR ROADWAY SEGMENTS

	LOS "A"	**LOS "B"**	**LOS "C"**	**LOS "D"**	**LOS "E"**
All Facilities (Volume-to-Capacity Ratio (V/C))	<0.6	0.6-0.7	0.7-0.8	0.8-0.9	0.9-1.0
Roadway Segment Type	**Maximum Average Daily Traffic (ADT) For Given Service Level**				
	LOS "A"	**LOS "B"**	**LOS "C"**	**LOS "D"**	**LOS "E"**
6-Lane Major Arterial	28,800	33,600	38,400	43,200	48,000
4-Lane Major Arterial	19,200	22,400	25,600	28,800	32,000
4-Lane Minor Arterial	16,800	19,600	22,400	25,200	28,000
2-Lane Minor Arterial	8,400	9,800	11,200	12,600	14,000
4-Lane Collector	14,400	16,800	19,200	21,600	24,000
2-Lane Collector	7,200	8,400	9,600	10,800	12,000
2-Lane Residential	3,300	3,850	4,400	4,950	5,500

Note: 1. Based on "Highway Capacity Manual", Transportation Research Board, 2000 peak hour capacities. Daily capacities in the study area are assumed as nine times the peak hour capacity.

2. All volumes are approximate and assume ideal roadway characteristics. Actual threshold volumes for each Level of Service listed above may vary depending on a variety of factors including (but not limited to) roadway curvature and grade, intersection or interchange spacing, driveway spacing, percentage of trucks and other heavy vehicles, travel lane widths, signal timing characteristics, on-street parking, volume of cross traffic and pedestrians, etc.

APPLICABLE LOS POLICIES

The *City of Grover Beach General Plan Circulation Element* contains the following policy pertaining to LOS standards in the City:

> *"Program 1.2.3:*
> *The City shall maintain a minimum traffic operating Level of Service of "C" on all City transportation facilities."*

The *City of Pismo Beach General Plan Circulation Element* contains the following policy pertaining to LOS standards in the City:

> *"Principle P-1 b. Local Traffic:*
> *Local streets should be designed to operate at Level C or better during peak hours. A lower standard may be used for the downtown area."*

Consistent with both City policies, this study considers LOS "C" as the standard acceptable threshold for all intersections and roadway segments.

TRAFFIC SIGNAL WARRANTS

A supplemental traffic signal warrant analysis has been completed to determine whether unsignalized study intersections may require or benefit from the installation of a traffic signal. The term "signal warrant" refers to any of the eight established methods used by Caltrans to quantify the need for a traffic signal at an unsignalized intersection. The eight signal warrant methods are described in the latest edition of the California *Manual on Uniform Traffic Control Devices* (MUTCD).

The California MUTCD indicates that the installation of a traffic signal should be considered only if one or more of the eight signal warrants are met. This TIAR has performed the peak-hour volume-based Warrant 3 on study intersections projected to operate at LOS "D" or worse. The results of the included signal warrant analyses may indicate that a traffic signal could be beneficial to the operations of an intersection. The final decision to install a traffic signal should, however, be based upon further studies utilizing additional warrants as presented in the California MUTCD. Because Warrant 3 analysis was only applied to intersections operating at LOS "D" or worse, it is possible that unsignalized study intersections operating at LOS "C" or better that also meet Warrant 3 go unidentified in this TIAR.

TECHNICAL ANALYSIS PARAMETERS

This TIAR provides a "planning level" evaluation of traffic condition, which is considered sufficient for CEQA/NEPA clearance purposes. The "planning level" evaluation incorporates appropriate heavy vehicle adjustment factors, peak hour factors, and signal lost-time factors. LOS operations will be determined using HCM-2000 methodologies for determining intersection delay, incorporating the aforementioned factors. A standard PHF of 0.92 will be applied to all analysis scenarios, except in during existing conditions where recorded traffic counts indicate a greater than 0.92 observed PHF.

A minimum traffic signal cycle length of 90 seconds will be used at signalized intersection locations, with 4 seconds of "lost time" per critical signal phase. At all study intersections, a standard 2% of existing and projected traffic volumes has been assigned to heavy-vehicles and/or trucks.

The *Synchro Version 7* software suite by Trafficware will be used to implement the HCM-2000 analysis methodologies. A "design level" evaluation (including queuing on intersection lane groups, stacking length requirements, coordinated signal operations analyses, etc.) will not be included in this "planning level" TIAR.

SIGNIFICANCE AND MITIGATION THRESHOLDS

The following thresholds of significance were used to determine if an impact is significant and requires mitigation:

Signalized Intersections:
The project is considered to have a significant impact if it would:

- Result in a signalized intersection that will operate at an acceptable LOS in the *No Project* condition to deteriorate to an unacceptable LOS in the *Plus Project* condition; or,
- Increase the delay by more than 5 seconds at a signalized intersection that will operate at an unacceptable LOS in the *No Project* condition.

Unsignalized Intersections:
The project is considered to have a significant impact if it would:

- Result in an unsignalized intersection that will operate at an acceptable LOS in the *No Project* condition to deteriorate to an unacceptable LOS in the *Plus Project* condition; or,
- Increase the delay by more than 5 seconds at an unsignalized intersection that is already operating or will already operate at an unacceptable LOS in the *No Project* condition.

Roadways:
The project is considered to have a significant impact if it would:

- Result in a roadway that will operate at an acceptable LOS in the *No Project* condition to deteriorate to an unacceptable LOS in the *Plus Project* condition; or,
- Increase the V/C ratio by more than 5% at a roadway that will operate at an unacceptable LOS in the *No Project* condition.

EXISTING TRAFFIC OPERATIONS

Existing AM and PM peak hour intersection traffic operations were quantified utilizing the existing intersection lane geometrics and the existing traffic volumes shown in Figure 3 and Figure 4. Table 3A and Table 3B present the existing intersection and roadway LOS conditions respectively.

TABLE 3A
EXISTING CONDITIONS: INTERSECTION LEVELS-OF-SERVICE

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour		SAT Peak Hour	
				Delay	LOS	Delay	LOS	Delay	LOS
1	**Highway 1 / Price Street**	**AWSC**	**C**	9.1	A	15.6	C	**33.6**	**D**
2	Highway 1 / Pomeroy Avenue	Signal	C	5.5	A	8.5	A	11.6	B
3	Highway 1 / Hinds Avenue	Signal	C	6.5	A	10.1	B	11.0	B
4	**Highway 1 / Ocean View Avenue**	**TWSC**	**C**	14.2	B	**67.1**	**F**	**96.6**	**F**
5	Highway 1 / Le Sage Drive	TWSC	C	11.7	B	17.8	C	20.9	C
6	Highway 1 / Grand Avenue	Signal	C	13.3	B	18.8	B	19.0	B
7	4th Street / Grand Avenue	Signal	C	12.3	B	15.4	B	14.9	B
8	4th Street / 5 Cities Drive	Signal	C	22.4	C	25.9	C	25.9	C
9	4th Street / U.S. 101 NB Ramps	Signal	C	20.2	C	18.0	B	24.0	C

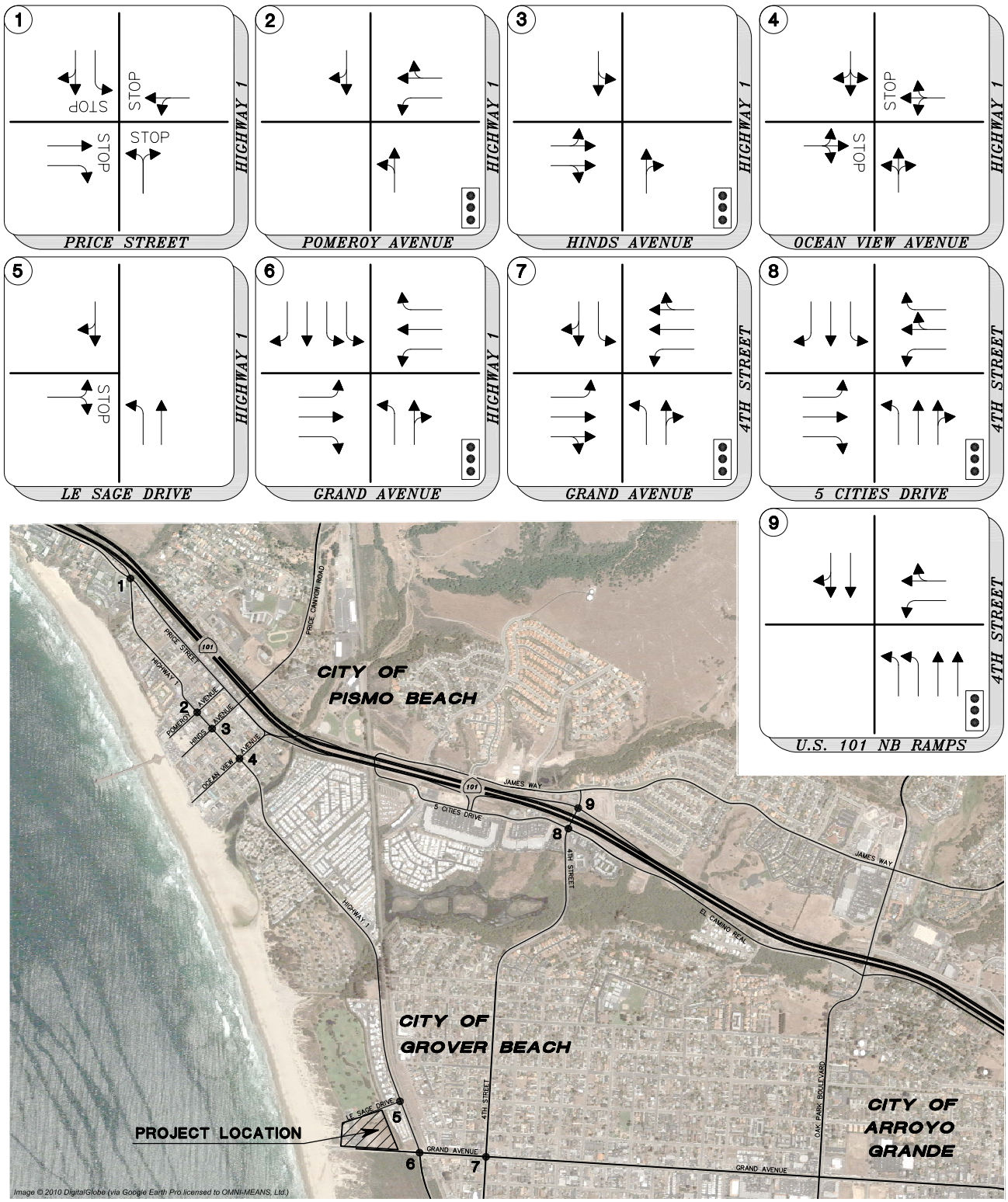
Notes:
1. TWSC = Two Way Stop Control, AWSC = All Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average delay for AWSC and Signals

As shown in Table 3A, all study intersections are operating at or below target LOS conditions with the exception of Highway 1 / Price Street and Highway 1 / Ocean View Avenue. During the PM and Saturday Midday peak hours, the Highway 1 / Ocean View Avenue intersection operates at a LOS F. This intersection is stop-controlled on the minor street approaches, and during peak travel periods on Highway 1, vehicles on minor approaches are often unable to find suitable gaps in traffic and intersection delays subsequently increase. For Highway 1 / Price Street, the all-way-stop intersection operates at LOS D during the Saturday Midday peak hour. Northbound and eastbound movements at this intersection experience significant delay.

TABLE 3B
EXISTING CONDITIONS: ROADWAY LEVELS-OF-SERVICE

Roadway Segment	Capacity Configuration	Target LOS	Daily Traffic	LOS
Grand Avenue, west of Highway 1	2-Lane Collector	C	3,545	A
Le Sage Drive, west of Highway 1	2-Lane Collector	C	6,724	A

All roadway segments presented in Table 3B are currently found to be operating at acceptable LOS.

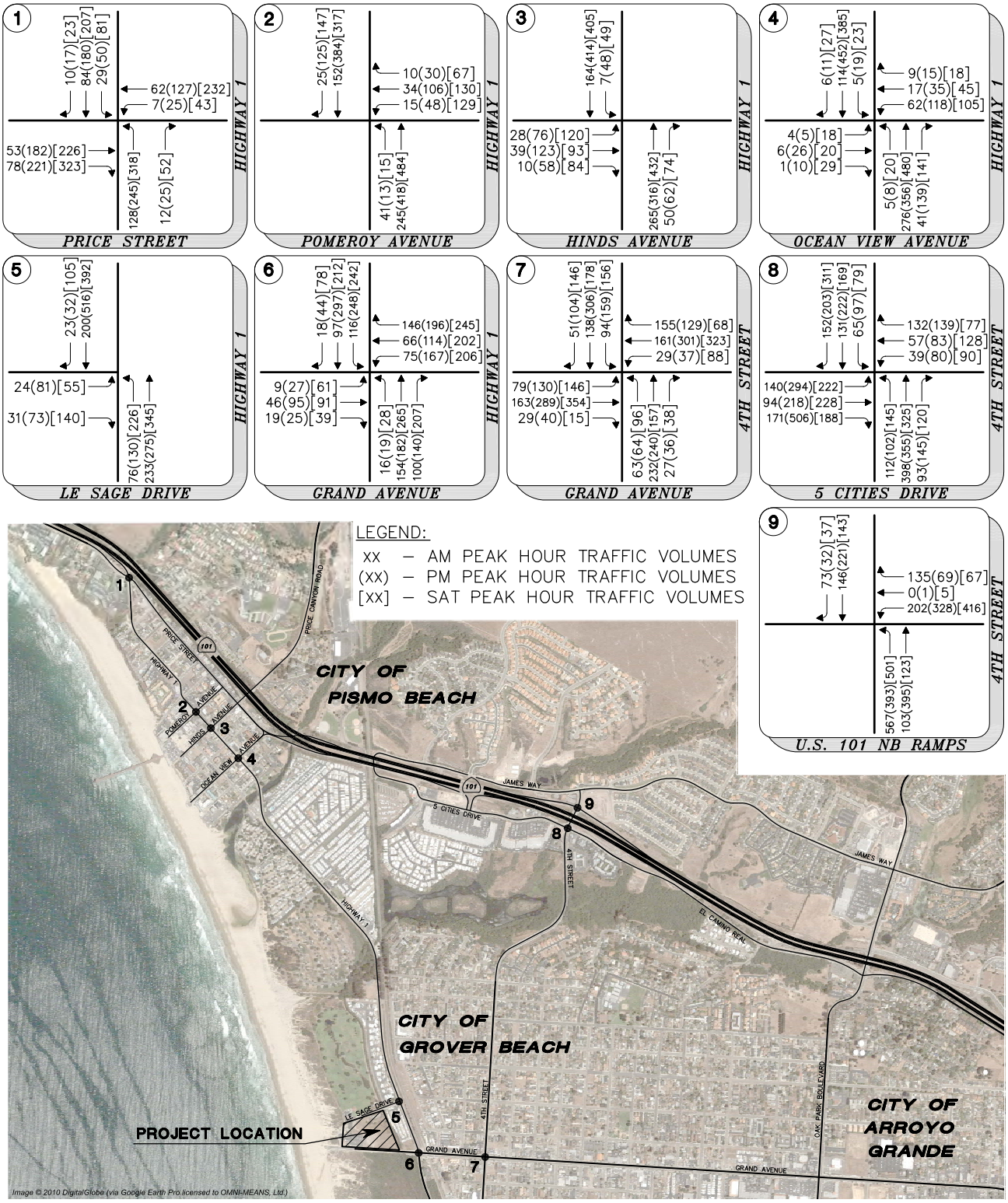


Grover Beach Lodge TIAR

Figure 3

Existing Intersection Lane Geometrics

K:\PRJ\1466\T1466\T1466TG001.dwg 11/3/2010 4:15:40 PM PDT



Grover Beach Lodge TIAR

Figure 4

Existing Peak Hour Traffic Volumes

K:\PRJ\1466\T1466\T1466TG001.dwg 11/3/2010 4:15:40 PM PDT

PROJECT DESCRIPTION

The proposed project is located at the end of Grand Avenue, within the Pismo State Beach area in the City of Grover Beach (Figure 1). The project site encompasses portions of the Pismo State Beach Golf Course located north of Le Sage Drive, an existing beach parking and drop-off area, Fin's Seafood restaurant site, the State Park sanitary dump station, and undeveloped land west of Meadow Creek, located between West Grand Avenue and Le Sage Drive, which is currently used for equestrian staging.

The proposed project is a beach resort and includes three main buildings with 150 rooms totaling 374,922 square feet of property (Figure 2). Additional project components would include landscaping, parking areas (425 spaces total), public amenities including a plaza, picnic area, walkways, restroom and shower facilities, beach drop-off area, a new golf course practice green, and beach concessions area. The project also includes new outdoor seating areas. The golf pro-shop and the special events tent area will remain. However, the project proposes to relocate the existing equestrian parking and sanitary dump station areas to a location immediately south of Grand Avenue. The project also proposes dune restoration areas integrated within the project site.

PROJECT TRIP GENERATION

Project trip generation forecasts were derived using the Institute of Transportation Engineers (ITE) studies on typical land use trip generation rates contained in the *ITE Trip Generation Manual (8th Edition)*. A hybrid trip generation was created for this project using a combination of hotel and resort hotel land uses. This hybrid trip generation was derived to provide a reasonable forecast of potential new trips during all analysis scenarios.

Hotel

The following excerpt from the ITE Trip Generation Manual describes the land use category for a hotel (ITE 310):

> *"Hotels are places of lodging that provide sleeping accommodations and supporting facilities such as restaurants; cocktail lounges; meeting and banquet rooms or conventional facilities; limited recreational facilities (pool, fitness room); and/or other retail and service shops."*

Since the proposed Grover Beach Lodge will also feature a public convention facility, trip generation rates for a hotel will be considered in the project trip generation.

Resort Hotel

The following excerpt from the ITE Trip Generation Manual describes the land use category for a resort hotel (ITE 330):

> *"Resort hotels are similar to hotels in that they provide sleeping accommodations, restaurants, cocktail lounges, retail shops and guest services. The primary difference is that resort hotels cater to the tourist and vacation industry, often providing a wide variety of recreational facilities/programs (golf courses, tennis courts, beach access, or other amenities) rather than convention and meeting business. Resort hotels are normally located in suburban or outlying locations on larger sites than conventional hotels."*

Given the project's description and intended use, it is also appropriate to assign trip generation rates for a resort hotel. Because "Resort Hotel" does not include a convention facility, a hybrid trip generation rate was developed.

Hybrid Hotel Rate

The hybrid trip generation combines the trip generation rates from the ITE "Hotel" and "Resort Hotel" land uses. Weekday peak hour AM and PM trips will use the "Hotel" trip rates because the inclusion of a conference center will generate more weekday trips than a typical "Resort Hotel". However, Saturday Midday peak hour rates for the project will use "Resort Hotel" trip generation rates since that rate accounts for increased recreational use on the weekends. Daily analysis will be performed using Saturday trip generation rates from "Resort Hotel". Using this hybrid rate will provide a reasonable, conservative analysis for the project.

The estimated trip generation for the proposed project is presented in Table 4.

TABLE 4
PROJECT TRIP GENERATION

Land Use Category (ITE Code)	Unit[1]	Daily Trip Rate/Unit[2]	Weekday AM Peak Hour Trip Rate/Unit[2]			Weekday PM Peak Hour Trip Rate/Unit[2]			Saturday MD Peak Hour Trip Rate/Unit[2]		
			Total	In %	Out %	Total	In %	Out %	Total	In %	Out %
Hybrid Rate	Rooms	11.51	0.56	61%	39%	0.59	53%	47%	1.06	50%	50%
Project Name (ITE Code)	**Quantity (Units)**	**Daily Trips**	**AM Peak Hour Trips**			**PM Peak Hour Trips**			**SAT Mid-Day Peak Hour**		
			Total	In	Out	Total	In	Out	Total	In	Out
Grover Beach Lodge	150	1,727	84	51	33	89	47	42	159	80	80

Notes:

1. Rooms = Hotel Rooms

2. Trip rates based on ITE Trip Generation Manual 8th edition average rates. Daily trip rate based on "Saturday" trip rate, which will generally be higher than weekdays.

As presented in Table 4, the proposed project is estimated to generate 1,727 new daily vehicular trips based on Saturday trip rates. During the weekday, 84 AM and 89 PM peak hour vehicular trips are projected. New vehicular trips for Saturday Midday peak hour are expected to reach 159 trips.

PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

Project trip distribution estimates were developed using existing traffic count data, including daily directional volume and peak hour turning movements, the City of Grover Beach travel demand model, and existing knowledge of the surrounding area such as travel patterns and nearby land uses. The proposed inbound and outbound project trip distribution is presented in Figures 5A and 5B respectively. Project only traffic volumes for study intersections are shown on Figure 6.

Inbound and outbound project trips along Grand Avenue and Le Sage Drive west of Highway 1 were distributed based on the tentative Grover Beach Lodge site plan presented in Figure 2. From the preliminary site plan, 60 percent of project generated trips were modeled to access the driveway via Grand Avenue while the remaining 40 percent would access the driveway via Le Sage Drive.

PROJECT SITE ACCESS AND DRIVEWAY INTERSECTIONS

Site access and internal circulation for the proposed Grover Beach Lodge (Figure 2) raises some specific concerns in regards to parking use and accessibility. These concerns are summarized below.

Grand Avenue Site Access

The primary project access is provided through the Highway 1 / Grand Avenue intersection. East of 2nd Street, there is poor striping in the westbound direction. The inside through lane drops into a left turn lane to southbound Highway 1. The outside through lane leads to a through lane to the State Park and project site and a right turn lane to northbound Highway 1. A proposed striping and signage plan prepared by OMNI-MEANS is included in Appendix 1.

The draft Grand Avenue Master Plan, which is not yet adopted by the City, also proposes a potential roundabout at this intersection. Either the striping and signage proposed in the Appendix or the installation of a roundabout at this location will sufficiently address this issue.

The site plan also appears to encroach into the existing Grand Avenue right-of-way. It is important that Grand Avenue remain wide enough to stripe a center turn lane from the State Park beach entrance to Highway 1. This center turn lane will provide refuge for vehicles turning in and out of the project driveways. This is especially important for parking at the equestrian site, where long trailers will use the center turn refuge lane to wait for acceptable gaps in oncoming traffic without blocking the westbound traffic to the State Park and Fin's restaurant.

Cross-Lot Access

The proposed parking layout currently lacks adequate cross access for vehicles to circulate within the project site. Some of the parking lots appear to be isolated facilities that are only accessed by a single driveway. Unless drivers want to navigate the circuitous hotel parking and drop-off areas, vehicles will be forced to re-enter Grand Avenue in order to access adjacent parking facilities. This may create additional traffic on Highway 1 and at the Le Sage and Grand Avenue project access driveways.

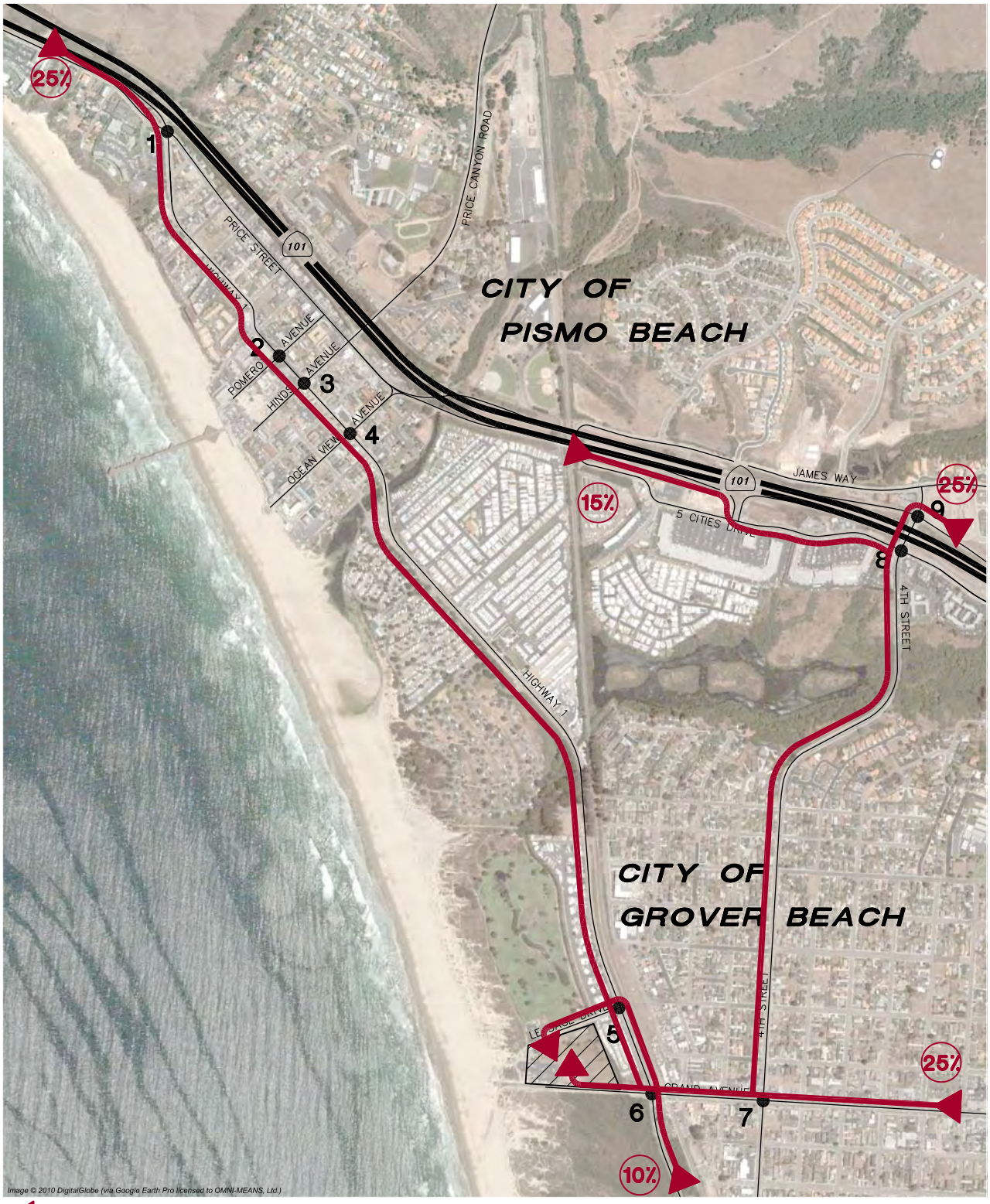
Parking Lot Locations and Designations

According to the site plan, the parking lot adjacent to Fin's Seafood restaurant is intended for restaurant patrons. However, as designated public parking, beach visitors will also likely use this parking lot as it is closer to the beach front and this may force restaurant patrons to park in other lots, intended for hotel guests and beach visitors. Neighboring parking lots do not effectively link up to Fin's restaurant because patrons would need to traverse across hotel property before reaching the restaurant. Beach visitors will likely seek the closest available parking to their destination, which could affect available parking for Fin's patrons as well as resort guests on busy weekends or holidays.

Parking Maneuverability

Individual lot designs presented on the site plan included many dead ends which prevent vehicles from maneuvering in and out of the facility. Several designated hotel lots for instance are narrow and only have a single access point. It will be difficult if not impossible to turn around at the end of a full parking lot when guests are looking for spaces. Since there is no room to turn around, vehicles that cannot find parking after entering the lot will be forced to drive in reverse in order to exit and try another lot.

Based on the concerns mentioned above, a re-evaluation of the parking lot design is recommended, which addresses maneuverability within and between parking lots, and if feasible, locates some beach visitor parking closer to the beach front in a shared lot for Fin's restaurant.



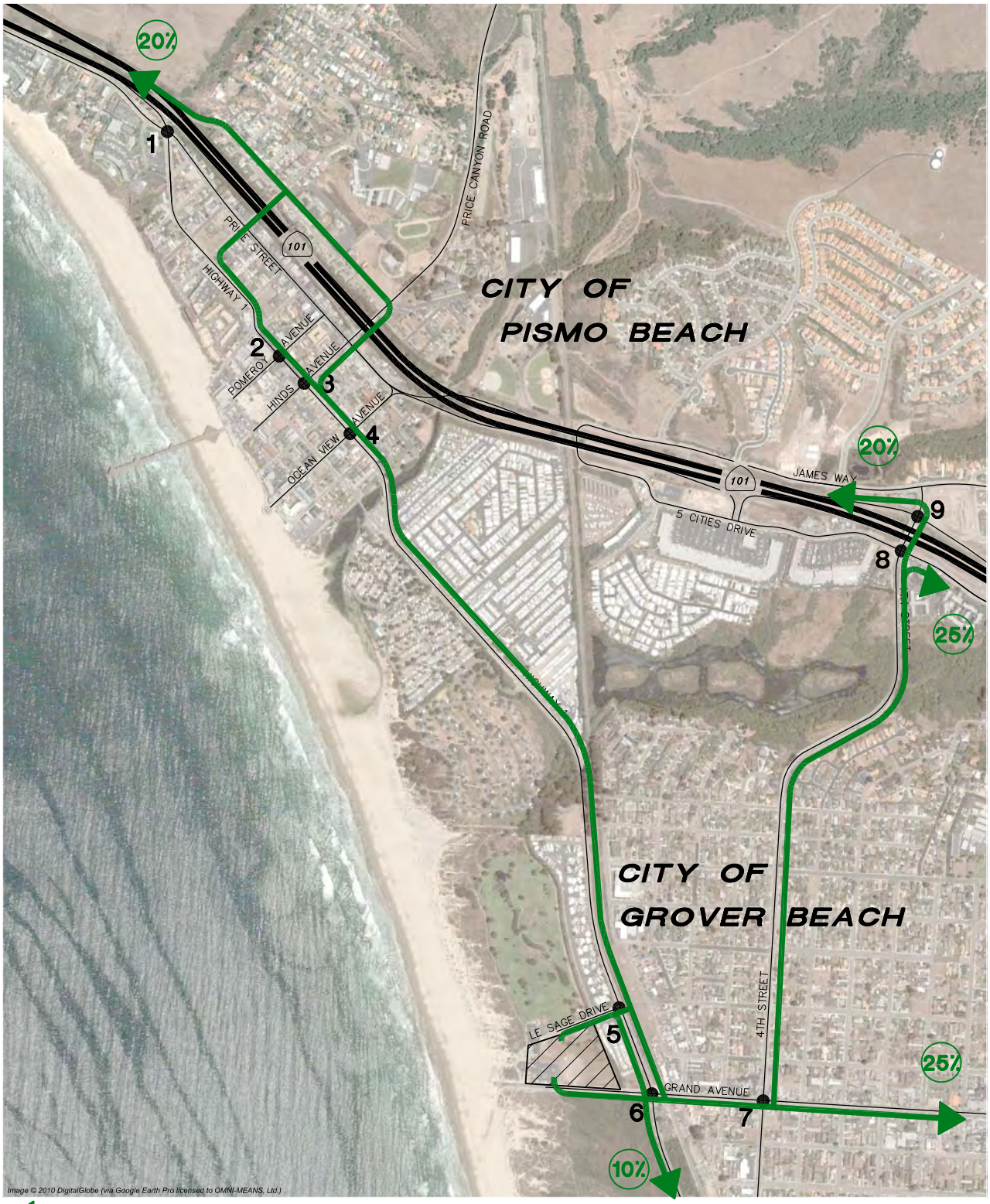
– INBOUND

Grover Beach Lodge TIAR

Figure 5A

Project Trip Distribution

K:\PRJ\1466\T1466\T1466TG001.dwg 11/3/2010 4:15:40 PM PDT



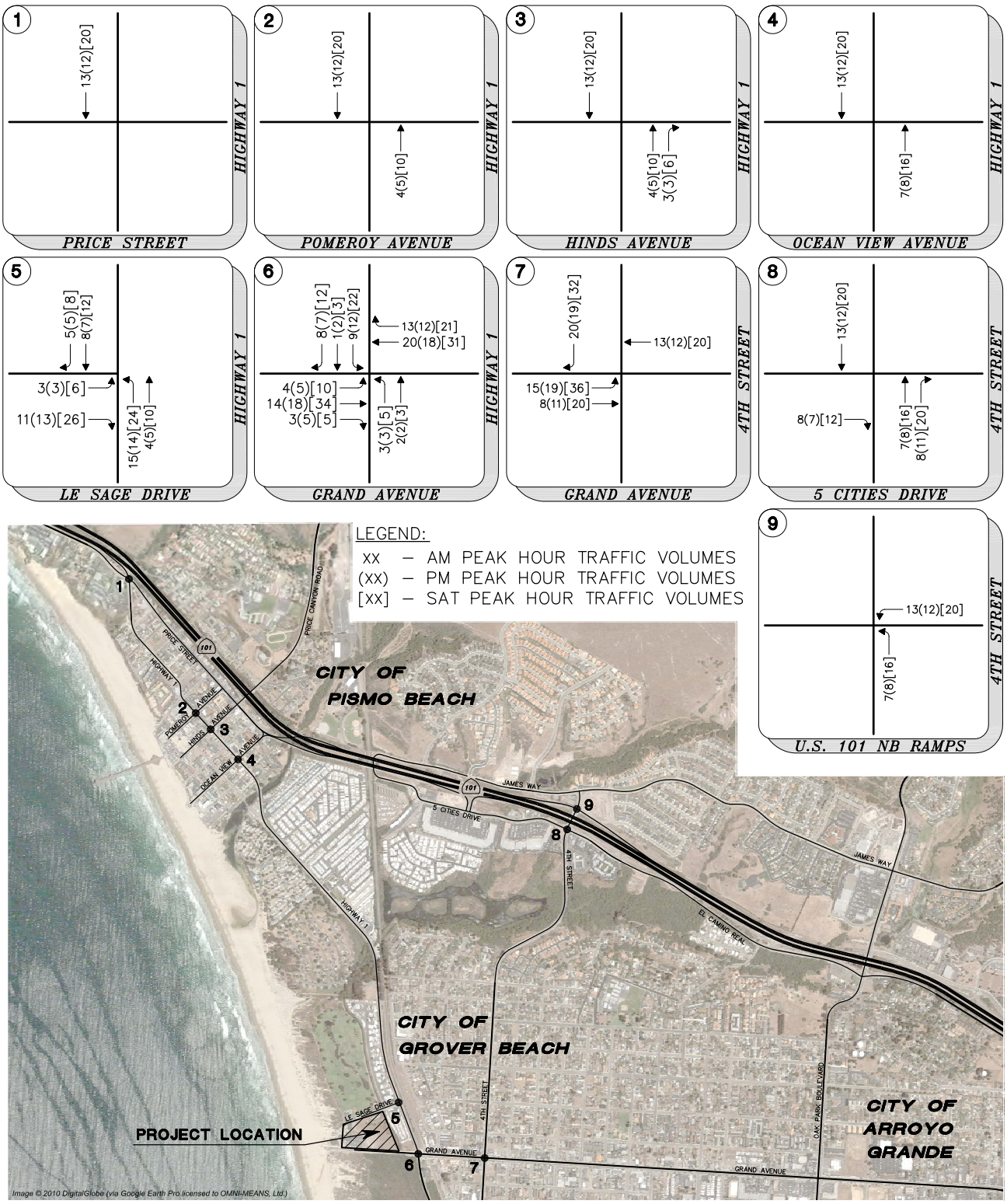
– OUTBOUND

Grover Beach Lodge TIAR

Figure 5B

Project Trip Distribution

K:\PRJ\1466\T1466\T1466TG001.dwg 11/3/2010 4:21:22 PM PDT



Grover Beach Lodge TIAR

Figure 6

Project Only Traffic Volumes

K:\PRJ\1466\T1466\T1466TG001.dwg 11/3/2010 4:21:22 PM PDT

EXISTING PLUS PROJECT TRAFFIC OPERATIONS

Existing "Plus Project" conditions were developed by superimposing proposed AM and PM peak hour project-generated trips (Table 4) using the proposed project trip distribution (Figure 5A and 5B) onto existing traffic volumes. The resulting *Existing "Plus Project"* traffic volumes are presented in Figure 6. Intersection analysis was performed assuming the existing intersection lane geometrics and control types. Table 5A and 5B presents the results of the *Existing "Plus Project"* conditions analysis.

TABLE 5A
EXISTING PLUS PROJECT CONDITIONS: INTERSECTION LEVELS-OF-SERVICE

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour		SAT Peak Hour	
				Delay	LOS	Delay	LOS	Delay	LOS
1	**Highway 1 / Price Street**	**AWSC**	**C**	9.1	A	15.9	C	**35.6**	**E**
2	Highway 1 / Pomeroy Avenue	Signal	C	5.4	A	8.5	A	11.6	B
3	Highway 1 / Hinds Avenue	Signal	C	6.4	A	10.0	A	10.9	B
4	**Highway 1 / Ocean View Avenue**	**TWSC**	**C**	14.6	B	**74.2**	**F**	**115.4**	**F**
5	**Highway 1 / Le Sage Drive**	**TWSC**	**C**	12.1	B	19.2	C	**25.8**	**D**
6	Highway 1 / Grand Avenue	Signal	C	13.9	B	20.4	C	19.9	B
7	4th Street / Grand Avenue	Signal	C	13.2	B	16.3	B	16.3	B
8	4th Street / 5 Cities Drive	Signal	C	22.2	C	25.9	C	25.9	C
9	4th Street / U.S. 101 NB Ramps	Signal	C	20.4	C	18.3	B	24.7	C

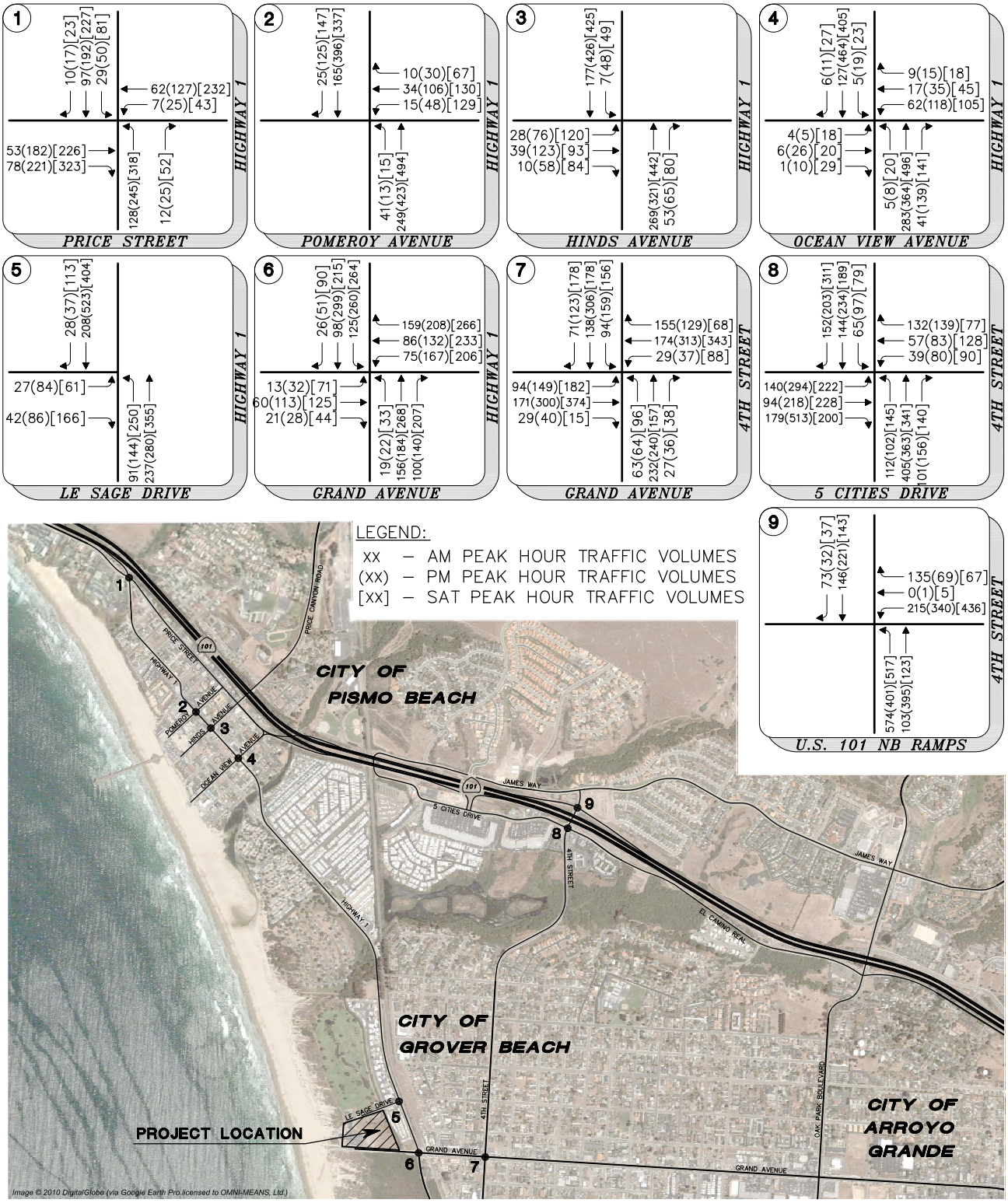
Notes:
1. TWSC = Two Way Stop Control, AWSC = All Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average delay for AWSC and Signals
3. Warrant = Based on California MUTCD Warrant 3

As shown in Table 5A, three intersection deficiencies have been identified for the *Existing "Plus Project"* scenario at the intersections of Highway 1 / Price Street, Highway 1 / Ocean View Avenue, and Highway 1 / Le Sage Drive. During the PM and Saturday Midday peak hours, the Highway 1 / Ocean View Avenue intersection will operate at a LOS F. This intersection is stop-controlled on the minor street approaches, and during peak travel periods on Highway 1, vehicles on minor approaches are often unable to find suitable gaps in traffic and intersection delays subsequently increase. The vehicle delay on minor street approaches is also apparent for the Highway 1 / Le Sage Drive intersection which is expected to operate at a LOS D. For Highway 1 / Price Street, the all-way-stop intersection will operate at LOS E during the Saturday Midday peak hour where northbound and eastbound movements at this intersection experience significant delay.

TABLE 5B
EXISTING PLUS PROJECT CONDITIONS: ROADWAY LEVELS-OF-SERVICE

Roadway Segment	Capacity Configuration	Target LOS	Daily Traffic	LOS
Grand Avenue, west of Highway 1	2-Lane Collector	C	4,581	A
Le Sage Drive, west of Highway 1	2-Lane Collector	C	7,415	B

The roadway segments presented in Table 5B are expected to operate at acceptable LOS.



Grover Beach Lodge TIAR

Figure 7

Existing Plus Project Traffic Volumes

K:\PRJ\1466\T1466\T1466TG001.dwg 11/3/2010 4:21:22 PM PDT

CUMULATIVE CONDITIONS

For the purposes of this study, *Cumulative* conditions refer to analysis scenarios in which build out of the adopted City of Grover Beach General Plan is accounted for in level-of-service quantifications. Two scenarios will be analyzed under these conditions. The *Cumulative "No Project"* scenario includes the increased traffic projected by the City of Grover Beach Travel Demand Model, minus the proposed project, in conjunction with applied Caltrans growth rates on state facilities.

The *Cumulative "Plus Project"* scenario subsequently adds trips generated by the proposed *Grover Beach Lodge*, consistent with the General Plan Land Use Element, to *Cumulative "No Project"* traffic volumes. No roadway network improvements were assumed in place during *Cumulative* conditions as there are no programmed or funded improvements in the project vicinity.

CUMULATIVE "NO PROJECT" TRAFFIC OPERATIONS

Cumulative "No Project" conditions traffic volumes are presented in Figure 8. The resulting *Cumulative* AM, PM, and Saturday peak hour intersection traffic volumes are presented in Figure 8. Table 6A and 6B contains a summary of the resulting intersection and roadway LOS conditions.

TABLE 6A
CUMULATIVE CONDITIONS: INTERSECTION LEVELS-OF-SERVICE

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour		SAT Peak Hour	
				Delay	LOS	Delay	LOS	Delay	LOS
1	**Highway 1 / Price Street**	**AWSC**	**C**	9.1	A	18.4	C	**74.8**	**F**
2	Highway 1 / Pomeroy Avenue	Signal	C	5.7	A	9.3	A	12.7	B
3	Highway 1 / Hinds Avenue	Signal	C	6.9	A	10.7	B	12.0	B
4	**Highway 1 / Ocean View Avenue**	**TWSC**	**C**	16.7	C	**OVR**	**F**	**OVR**	**F**
5	**Highway 1 / Le Sage Drive**	**TWSC**	**C**	11.7	B	**26.1**	**D**	**35.8**	**E**
6	Highway 1 / Grand Avenue	Signal	C	14.5	B	19.4	B	27.9	C
7	4th Street / Grand Avenue	Signal	C	16.2	B	26.0	C	27.3	C
8	**4th Street / 5 Cities Drive**	**Signal**	**C**	26.1	C	**35.9**	**D**	34.4	C
9	4th Street / U.S. 101 NB Ramps	Signal	C	21.0	C	20.8	C	28.4	C

Notes:
1. TWSC = Two Way Stop Control, AWSC = All Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average delay for AWSC and Signals

As presented in Table 6A, a number of study intersections are expected to exceed LOS thresholds for the *Cumulative "No Project"* scenario. During the PM peak hour, the intersections at Highway 1 / Ocean View Avenue, Highway 1 / Le Sage Drive, and 4th Street / 5 Cities Drive are expected to exceed LOS standards in the City. Along Highway 1, the stop controlled intersections at Price Street, Ocean Avenue, and Le Sage Drive are anticipated to operate at LOS E/F for Saturday peak hour conditions.

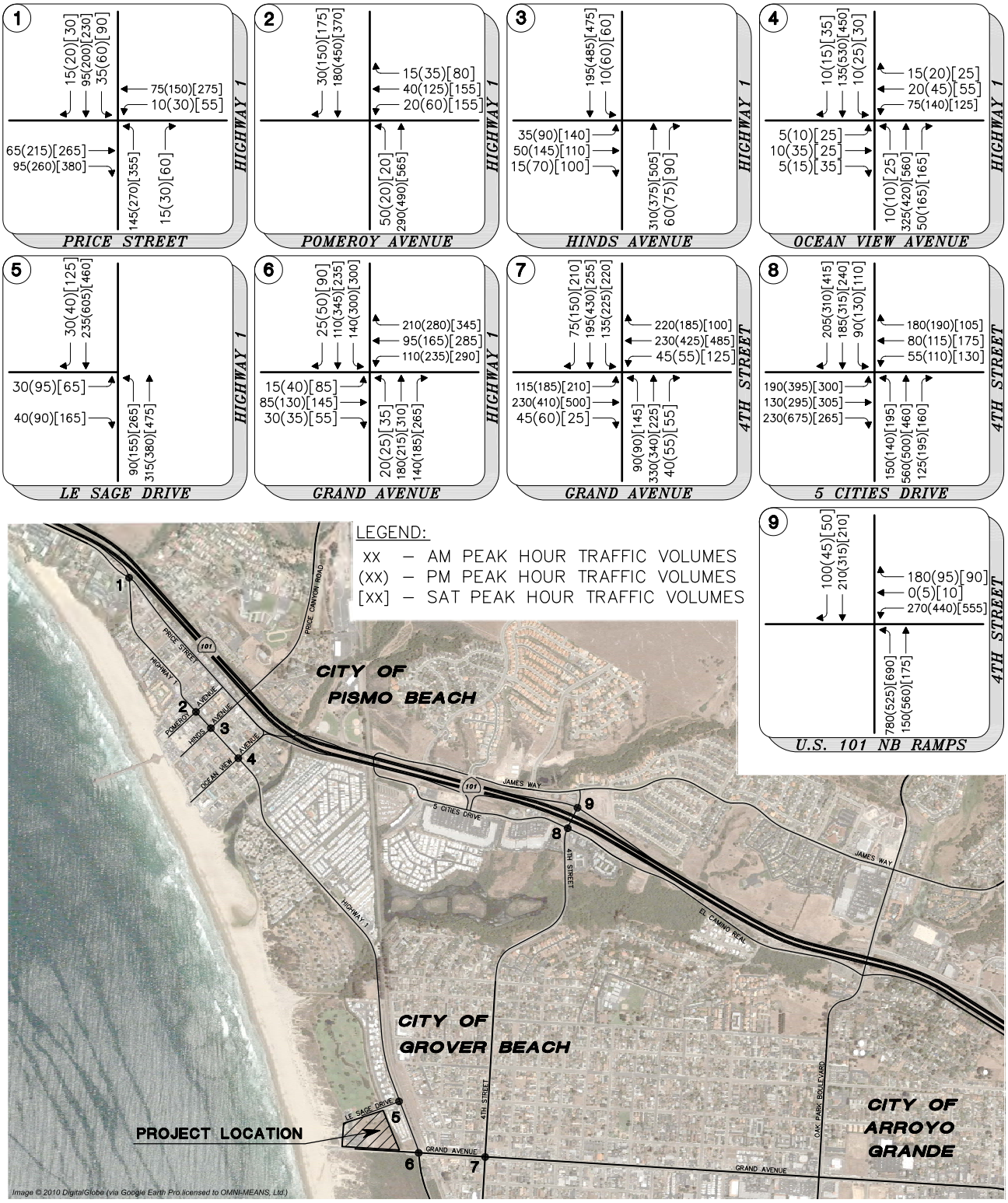
Queuing on U.S. 101 Southbound Ramp at Price Street

Under *Cumulative "No Project*" conditions, the U.S. 101 southbound off ramp at Price Street has a 95th percentile queue of 404 feet for the through-right movement and 247 feet for the left turn movement. These queues do not extend into U.S. 101 but they extend the majority of the off-ramp lane length.

TABLE 6B
CUMULATIVE CONDITIONS: ROADWAY LEVELS-OF-SERVICE

Roadway Segment	Capacity Configuration	Target LOS	Daily Traffic	LOS
Grand Avenue, west of Highway 1	2-Lane Collector	C	4,675	A
Le Sage Drive, west of Highway 1	2-Lane Collector	C	7,845	C

All roadway segments presented in Table 6B are predicted to operate at acceptable LOS.



Grover Beach Lodge TIAR

Figure 8

Cumulative No Project Traffic Volumes

K:\PRJ\1466\T1466\T1466TG001.dwg 11/11/2010 11:19:07 AM PST

CUMULATIVE PLUS PROJECT TRAFFIC OPERATIONS

Cumulative "Plus Project" conditions were developed by adding proposed project volumes to *Cumulative "No Project"* intersection traffic volumes (Figure 8). Figure 9 presents the resulting *Cumulative "Plus Project"* AM, PM, and Saturday peak hour intersection traffic volumes. Table 7A and 7B presents the results of the *Cumulative "Plus Project"* conditions analysis.

TABLE 7A
CUMULATIVE PLUS PROJECT CONDITIONS: INTERSECTION LEVELS-OF-SERVICE

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour		SAT Peak Hour	
				Delay	LOS	Delay	LOS	Delay	LOS
1	**Highway 1 / Price Street**	**AWSC**	**C**	9.1	A	18.9	C	**78.7**	**F**
2	Highway 1 / Pomeroy Avenue	Signal	C	5.6	A	9.3	A	12.7	B
3	Highway 1 / Hinds Avenue	Signal	C	6.7	A	10.6	B	11.9	B
4	**Highway 1 / Ocean View Avenue**	**TWSC**	**C**	17.2	C	**OVR**	**F**	**OVR**	**F**
5	**Highway 1 / Le Sage Drive**	**TWSC**	**C**	12.1	B	**29.7**	**D**	**53.9**	**F**
6	Highway 1 / Grand Avenue	Signal	C	15.3	B	20.3	C	30.3	C
7	4th Street / Grand Avenue	Signal	C	16.7	B	27.5	C	30.5	C
8	**4th Street / 5 Cities Drive**	**Signal**	**C**	26.1	C	**36.4**	**D**	34.2	C
9	4th Street / U.S. 101 NB Ramps	Signal	C	21.3	C	21.1	C	30.3	C

Notes:
1. TWSC = Two Way Stop Control, AWSC = All Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average delay for AWSC and Signals

Several study intersections are anticipated to operate at unacceptable peak hour LOS for the *Cumulative "Plus Project"* scenario illustrated in Table 7A. All intersection deficiencies have been identified during the PM and Saturday peak hour. Intersections along Highway 1 / Le Sage Drive and 4th Street / 5 Cities Drive are anticipated to operate at LOS D. Along Highway 1, stop controlled intersections at Price Street, Ocean View Avenue, and Le Sage Drive are expected to perform at unacceptable LOS F during the *Cumulative "Plus Project"* scenario. Mitigation measures that address the LOS deficiencies are discussed in a subsequent section of this report.

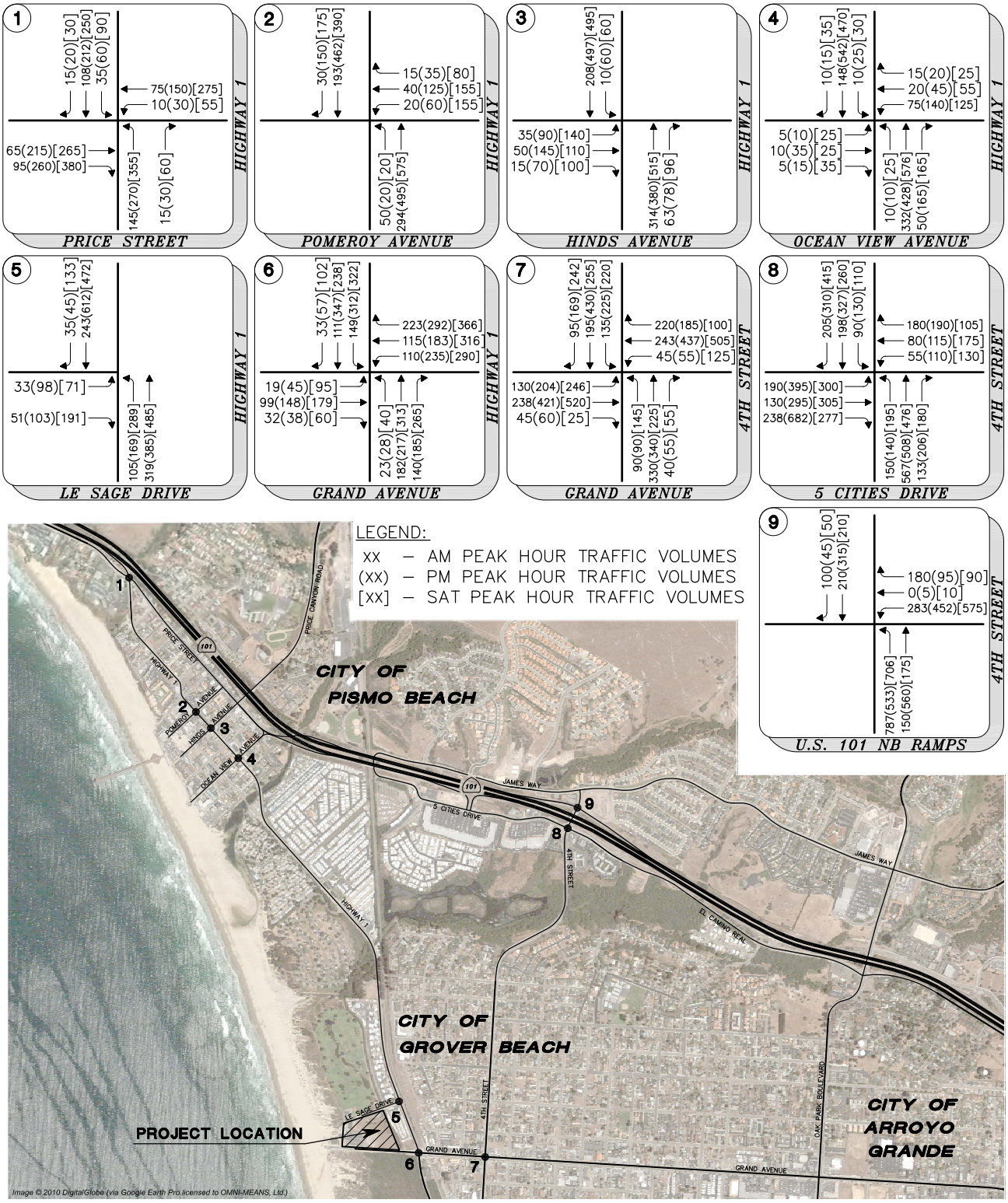
Queuing on U.S. 101 Southbound Ramp at Price Street

Under *Cumulative "Plus Project"* conditions, the U.S. 101 southbound off ramp at Price Street has a 95th percentile queue of 486 feet for the through-right movement and 320 feet for the left turn movement. These queues do not extend into U.S. 101 but they extend the majority of the off-ramp lane length.

TABLE 7B
CUMULATIVE PLUS PROJECT CONDITIONS: ROADWAY LEVELS-OF-SERVICE

Roadway Segment	Capacity Configuration	Target LOS	Daily Traffic	LOS
Grand Avenue, west of Highway 1	2-Lane Collector	C	5,711	A
Le Sage Drive, west of Highway 1	2-Lane Collector	C	8,536	C

The roadway segments presented in Table 7B are expected to operate at acceptable LOS.



Grover Beach Lodge TIAR

Figure 9

Cumulative Plus Project Traffic Volumes

K:\PRJ\1466\T1466\T1466TG001.dwg 11/11/2010 11:19:07 AM PST

PROJECT IMPACTS AND PROPOSED MITIGATION MEASURES

This section summarizes significant project impacts to the local circulation system and presents recommended improvements that mitigate intersection deficiencies at these locations. Significant impacts have been identified for the following analysis scenarios.

PROJECT ACCESS IMPROVEMENTS

Highway 1 / Grand Avenue

The westbound lanes east of 2nd Street, approach the Highway 1 / Grand Avenue intersection, currently have poor striping and can be confusing to drivers attempting to enter the State Park and project area from Grand Avenue. The project should restripe the westbound approaching lanes. The inside lane will be identified as "Highway 1 Southbound Only" as it drops into a left turn lane at the Highway 1 intersection. The outside lane will provide access to the Sate Park and project site as well as the right turn pocket to Highway 1. Signage for through traffic to merge right is also proposed between 2nd Street and Highway 1. The striping and signage plan is presented in Appendix 1 of this report.

Center Left Turn Lane on Grand Avenue

Between Highway 1 and the State Park entrance, Grand Avenue should be a three-lane cross section, feature a through lane in each direction and a center left turn lane. This center lane will provide a refuge area for vehicles entering and exiting all the project parking lots and for trailers entering and exiting the equestrian facility. This center lane will provide refuge for turning vehicles while they wait for gaps in oncoming traffic so as to not block the travel lanes in either direction on Grand Avenue.

EXISTING PLUS PROJECT CONDITIONS

Highway 1 / Price Street

Impact:

The City of Pismo Beach General Plan is not specific as to what the LOS threshold for the downtown area is, other than stating that a threshold lower than C may be used. It is therefore not clear whether a project impact is created or whether a mitigation measure is required.

If the intersection is analyzed assuming an LOS C threshold, the project creates a significant impact at this stop-controlled intersection by degrading LOS from D to E during the Saturday Midday peak hour.

Recommended Improvement:

If the impact is determined to be significant, it is recommended to restripe the Highway 1 northbound approach into two separate lanes for left and right turn movements to reduce the project impact to less than significant. This improvement would extend to Bay Street and would reduce the average delay to below *Existing* conditions, improving intersection operations to LOS D.

To achieve LOS C, this intersection could be widened and signalized. However, consideration of a traffic signal at this location should only occur after careful review of the effects of signalization on the U.S. 101 ramp terminal queuing and operations and review of multiple traffic signal warrants. Ultimately, consideration of a traffic signal on a state facility is contingent on Caltrans approval. MUTCD Warrant 3 signal warrants are met at this location during the *Existing "Plus Project"* Saturday peak hour. Warrant worksheets are provided in the appendix.

Highway 1 / Ocean View Avenue

Impact:

The City of Pismo Beach General Plan is not specific as to what the LOS threshold for the downtown area is, other than stating that a threshold lower than C may be used. It is therefore not clear whether a project impact is created or whether a mitigation measure is required.

If the intersection is analyzed assuming an LOS C threshold, the project creates a significant impact in the PM and Saturday Midday peak hour by increasing approach delay at an intersection already operating at LOS F in the *Existing* condition by more than five seconds.

Recommended Improvement and Significance:
If the impact is determined to be significant, it is recommended to widen the roadway along Ocean View Avenue and stripe a left turn pocket for the westbound approach to reduce the project impact to less than significant. This improvement may not be found feasible, as it will likely require right-of-way takes from private property, although no buildings would be affected.

Highway 1 / Le Sage Drive
Impact:
For the Saturday Midday peak hour, the project significantly impacts this stop-controlled intersection by degrading LOS from C to D.

Recommended Improvement and Significance:
It is recommended to restripe the Le Sage Drive eastbound approach by adding a left turn pocket. This mitigation would reduce average delay for the minor approach and improve intersection operations. The City of Grover Beach LOS C goal is met with this improvement and the project impact is mitigated. MUTCD Warrant 3 signal warrants are met at this location during the *Existing "Plus Project"* Saturday peak hour, but signalization is not required with the construction of this improvement. Warrant worksheets are provided in the appendix.

Table 8A presents the mitigated intersection LOS results for *Existing "Plus Project"* conditions.

TABLE 8A
EXISTING PLUS PROJECT CONDITIONS: MITIGATED LEVELS-OF-SERVICE

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour		SAT Peak Hour	
				Delay	LOS	Delay	LOS	Delay	LOS
1	**Highway 1 / Price Street**	**AWSC**	**C**					**26.8**	**D**
4	**Highway 1 / Ocean View Avenue**	**TWSC**	**C**			**44.8**	**E**	**55.0**	**F**
5	Highway 1 / Le Sage Drive	TWSC	C					17.4	C

Notes:
1. TWSC = Two Way Stop Control, AWSC = All Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average delay for AWSC and Signals

CUMULATIVE PLUS PROJECT CONDITIONS

Highway 1 / Ocean View Avenue
Impact:
The City of Pismo Beach General Plan is not specific as to what the LOS threshold for the downtown area is, other than stating that a threshold lower than C may be used. It is therefore not clear whether a project impact is created or whether a mitigation measure is required.

If the intersection is analyzed assuming an LOS C threshold, the project creates a significant impact in the PM and Saturday Midday peak hour by increasing approach delay by more than five seconds at an intersection already operating at LOS F during the *Cumulative "No Project"* condition.

Recommended Improvement and Significance:
If the impact is determined to be significant, it is recommended to install a traffic signal at this intersection to mitigate the project impact and obtain LOS C operations. MUTCD Warrant 3 signal warrants are met at this location during the *Cumulative "Plus Project"* PM and Saturday peak hours. Warrant worksheets are provided in the appendix.

Highway 1 / Le Sage Drive

Impact:

For Saturday Midday peak hour, the project significantly impacts this stop-controlled intersection by degrading LOS from E to F.

Recommended Improvement and Significance:

It is recommended to restripe the Le Sage Drive eastbound approach by adding a left turn pocket. This mitigation would reduce average delay for the minor approach and improve intersection operations. The City of Grover Beach LOS C goal is met with this improvement and the project impact is mitigated. MUTCD Warrant 3 signal warrants are met at this location during the *Cumulative "Plus Project"* Saturday peak hour, but signalization is not required with the construction of this improvement. Warrant worksheets are provided in the appendix.

Table 8B presents the mitigated intersection LOS results for *Cumulative "Plus Project"* conditions.

TABLE 8B
CUMULATIVE PLUS PROJECT CONDITIONS: MITIGATED LEVELS-OF-SERVICE

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour		SAT Peak Hour	
				Delay	LOS	Delay	LOS	Delay	LOS
4	Highway 1 / Ocean View Avenue	Signal	C			10.4	B	11.4	B
5	Highway 1 / Le Sage Drive	TWSC	C					23.3	C

Notes:

1. TWSC = Two Way Stop Control, AWSC = All Way Stop Control

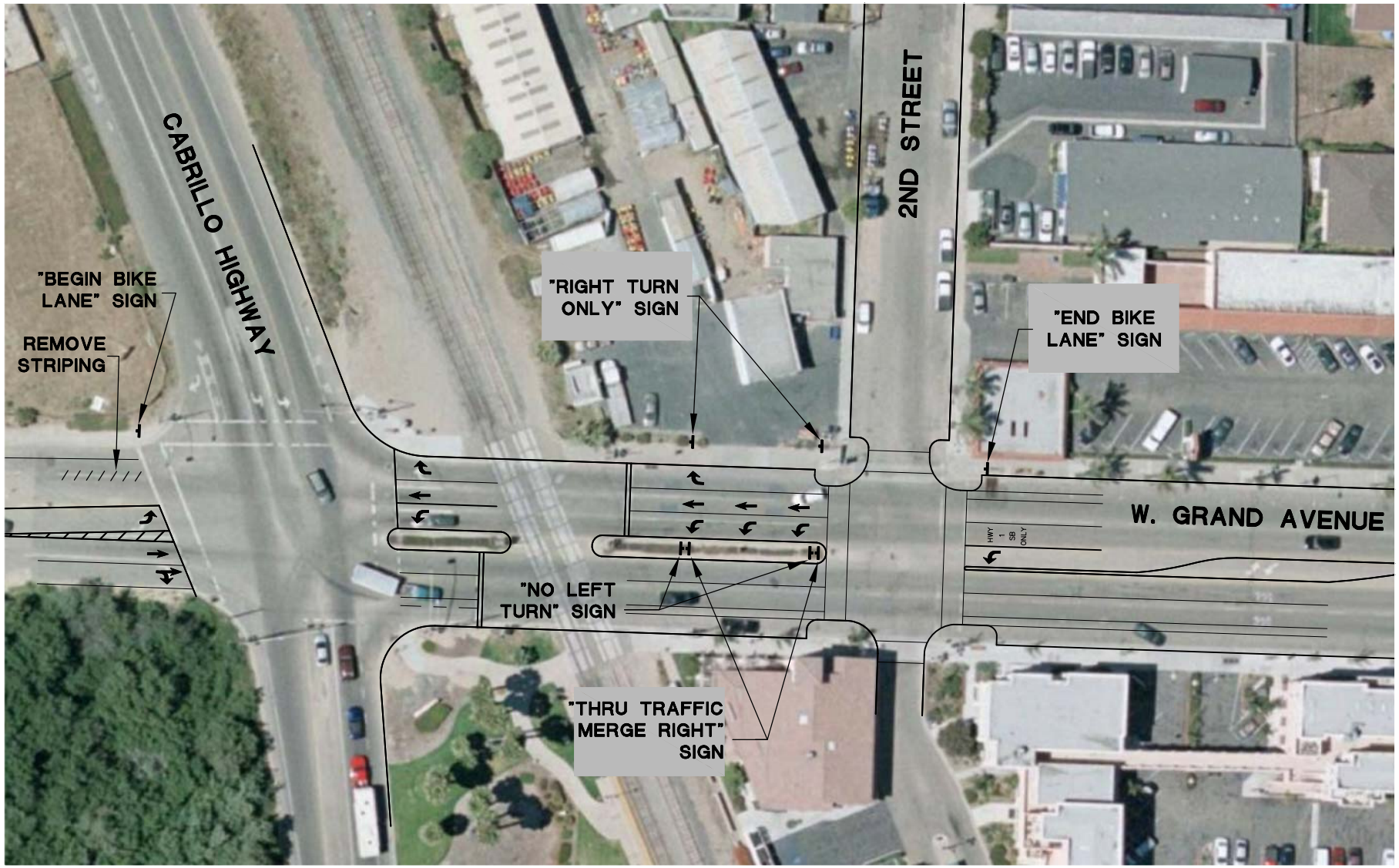
2. LOS = Delay based on worst minor street approach for TWSC intersections, average delay for AWSC and Signals

APPENDIX 1: WESTBOUND GRAND AVENUE STRIPING AND SIGNAGE PLAN

APPENDIX 2: LEVEL-OF-SERVICE WORKSHEETS

APPENDIX 3: MUTCD SIGNAL WARRANTS

APPENDIX 1



Grover Beach Lodge TIAR

Appendix Figure 1

Westbound Grand Avenue Striping and Signage

APPENDIX 2

HCM Unsignalized Intersection Capacity Analysis
1: PRICE & U.S. 101 SB OFF RAMP

Existing AM
10/28/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	53	78	7	62	0	128	0	12	29	84	10
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	67	99	9	78	0	162	0	15	37	106	13

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	67	99	87	177	37	119
Volume Left (vph)	0	0	9	162	37	0
Volume Right (vph)	0	99	0	15	0	13
Hadj (s)	0.07	-0.63	0.09	0.20	0.57	-0.01
Departure Headway (s)	5.6	4.9	5.7	5.6	6.0	5.4
Degree Utilization, x	0.10	0.13	0.14	0.28	0.06	0.18
Capacity (veh/h)	600	686	584	616	571	634
Control Delay (s)	8.1	7.5	9.7	10.7	8.1	8.3
Approach Delay (s)	7.7		9.7	10.7	8.3	
Approach LOS	A		A	B	A	

Intersection Summary			
Delay		9.1	
HCM Level of Service		A	
Intersection Capacity Utilization		30.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
2: POMEROY & HIGHWAY 1

Existing AM
10/28/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	15	34	10	41	245	0	0	152	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0			4.0			4.0	
Lane Util. Factor				1.00	1.00			1.00			1.00	
Frt				1.00	0.96			1.00			0.98	
Flt Protected				0.95	1.00			0.99			1.00	
Satd. Flow (prot)				1719	1746			1797			1775	
Flt Permitted				0.95	1.00			0.93			1.00	
Satd. Flow (perm)				1719	1746			1687			1775	
Peak-hour factor, PHF	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Adj. Flow (vph)	0	0	0	20	46	14	55	331	0	0	205	34
RTOR Reduction (vph)	0	0	0	0	13	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	0	0	20	47	0	0	386	0	0	235	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Prot			Perm					
Protected Phases				3	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)				6.6	6.6			65.4			65.4	
Effective Green, g (s)				6.6	6.6			65.4			65.4	
Actuated g/C Ratio				0.08	0.08			0.82			0.82	
Clearance Time (s)				4.0	4.0			4.0			4.0	
Vehicle Extension (s)				3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)				142	144			1379			1451	
v/s Ratio Prot				0.01	c0.03						0.13	
v/s Ratio Perm								c0.23				
v/c Ratio				0.14	0.33			0.28			0.16	
Uniform Delay, d1				34.1	34.6			1.7			1.5	
Progression Factor				1.00	1.00			0.67			1.00	
Incremental Delay, d2				0.5	1.3			0.5			0.2	
Delay (s)				34.5	35.9			1.7			1.8	
Level of Service				C	D			A			A	
Approach Delay (s)		0.0			35.6			1.7			1.8	
Approach LOS		A			D			A			A	

Intersection Summary				
HCM Average Control Delay	5.5	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	38.0%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: HINDS & HIGHWAY 1

Existing AM
10/28/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	39	10	0	0	0	0	265	50	7	164	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		0.98						0.98			1.00	
Flt Protected		0.98						1.00			1.00	
Satd. Flow (prot)		3343						1788			1823	
Flt Permitted		0.98						1.00			0.99	
Satd. Flow (perm)		3343						1788			1801	
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Adj. Flow (vph)	36	51	13	0	0	0	0	344	65	9	213	0
RTOR Reduction (vph)	0	12	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	88	0	0	0	0	0	405	0	0	222	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm									Perm		
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		6.4						65.6			65.6	
Effective Green, g (s)		6.4						65.6			65.6	
Actuated g/C Ratio		0.08						0.82			0.82	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		267						1466			1477	
v/s Ratio Prot								c0.23				
v/s Ratio Perm		0.03									0.12	
v/c Ratio		0.33						0.28			0.15	
Uniform Delay, d1		34.8						1.7			1.5	
Progression Factor		1.00						1.00			0.85	
Incremental Delay, d2		0.7						0.5			0.2	
Delay (s)		35.5						2.1			1.5	
Level of Service		D						A			A	
Approach Delay (s)		35.5			0.0			2.1			1.5	
Approach LOS		D			A			A			A	

Intersection Summary				
HCM Average Control Delay	6.5	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	27.0%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
4: OCEAN VIEW & HIGHWAY 1

Existing AM
10/28/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	6	1	62	17	9	5	276	41	5	114	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	4	7	1	70	19	10	6	310	46	6	128	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											635	
pX, platoon unblocked												
vC, conflicting volume	507	510	131	492	490	333	135			356		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	507	510	131	492	490	333	135			356		
tC, single (s)	7.2	6.6	6.2	7.2	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	100	85	96	99	100			100		
cM capacity (veh/h)	447	458	910	473	470	702	1431			1186		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	12	99	362	140
Volume Left	4	70	6	6
Volume Right	1	10	46	7
cSH	475	489	1431	1186
Volume to Capacity	0.03	0.20	0.00	0.00
Queue Length 95th (ft)	2	19	0	0
Control Delay (s)	12.8	14.2	0.2	0.4
Lane LOS	B	B	A	A
Approach Delay (s)	12.8	14.2	0.2	0.4
Approach LOS	B	B		

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	34.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: LE SAGE & HIGHWAY 1

Existing AM
10/28/2010

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	24	31	76	233	200	23
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	32	41	101	311	267	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)				863		
pX, platoon unblocked						
vC, conflicting volume	795	282	297			
vC1, stage 1 conf vol	282					
vC2, stage 2 conf vol	513					
vCu, unblocked vol	795	282	297			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4	2.3			
p0 queue free %	94	94	92			
cM capacity (veh/h)	498	745	1236			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	73	101	311	297
Volume Left	32	101	0	0
Volume Right	41	0	0	31
cSH	612	1236	1700	1700
Volume to Capacity	0.12	0.08	0.18	0.17
Queue Length 95th (ft)	10	7	0	0
Control Delay (s)	11.7	8.2	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	11.7	2.0		0.0
Approach LOS	B			

Intersection Summary				
Average Delay		2.2		
Intersection Capacity Utilization		29.5%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
6: GRAND & HIGHWAY 1

Existing AM
10/28/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	46	19	75	66	146	16	154	100	116	97	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	1810	1538	1719	1810	1538	1719	1703		3335	1810	1538
Flt Permitted	0.70	1.00	1.00	0.72	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1275	1810	1538	1303	1810	1538	1719	1703		3335	1810	1538
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	11	57	23	93	81	180	20	190	123	143	120	22
RTOR Reduction (vph)	0	0	18	0	0	145	0	31	0	0	0	11
Lane Group Flow (vph)	11	57	5	93	81	35	20	282	0	143	120	11
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						6
Actuated Green, G (s)	8.8	8.8	8.8	8.8	8.8	8.8	0.9	17.9		6.0	23.0	23.0
Effective Green, g (s)	8.8	8.8	8.8	8.8	8.8	8.8	0.9	17.9		6.0	23.0	23.0
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.20	0.20	0.02	0.40		0.13	0.51	0.51
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	251	356	303	257	356	303	35	682		448	931	791
v/s Ratio Prot		0.03			0.04		0.01	c0.17		c0.04	0.07	
v/s Ratio Perm	0.01		0.00	c0.07		0.02						0.01
v/c Ratio	0.04	0.16	0.01	0.36	0.23	0.12	0.57	0.41		0.32	0.13	0.01
Uniform Delay, d1	14.5	14.9	14.5	15.5	15.1	14.8	21.7	9.6		17.5	5.6	5.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.0	0.9	0.3	0.2	20.6	0.4		0.4	0.1	0.0
Delay (s)	14.6	15.1	14.5	16.4	15.4	14.9	42.3	10.0		17.9	5.7	5.3
Level of Service	B	B	B	B	B	B	D	B		B	A	A
Approach Delay (s)		14.9			15.4			12.0			11.8	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	13.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	44.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	38.4%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	79	163	29	29	161	155	63	232	27	94	138	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.93		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	3360		1719	3185		1719	1781		1719	1736	
Flt Permitted	0.95	1.00		0.95	1.00		0.62	1.00		0.52	1.00	
Satd. Flow (perm)	1719	3360		1719	3185		1128	1781		945	1736	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	90	185	33	33	183	176	72	264	31	107	157	58
RTOR Reduction (vph)	0	18	0	0	130	0	0	6	0	0	19	0
Lane Group Flow (vph)	90	200	0	33	229	0	72	289	0	107	196	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	4.4	13.7		1.1	10.4		12.7	12.7		12.7	12.7	
Effective Green, g (s)	4.4	13.7		1.1	10.4		12.7	12.7		12.7	12.7	
Actuated g/C Ratio	0.11	0.35		0.03	0.26		0.32	0.32		0.32	0.32	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	191	1165		48	839		363	573		304	558	
v/s Ratio Prot	c0.05	c0.06		0.02	c0.07			c0.16			0.11	
v/s Ratio Perm							0.06			0.11		
v/c Ratio	0.47	0.17		0.69	0.27		0.20	0.50		0.35	0.35	
Uniform Delay, d1	16.5	9.0		19.0	11.6		9.7	10.9		10.3	10.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.1		33.8	0.2		0.3	0.7		0.7	0.4	
Delay (s)	18.3	9.0		52.8	11.7		10.0	11.6		11.0	10.6	
Level of Service	B	A		D	B		A	B		B	B	
Approach Delay (s)		11.7			15.2			11.2			10.7	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	12.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	39.5	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	46.2%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	94	171	39	57	132	112	398	93	65	131	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	1810	1538	1719	1609	1461	1719	3341		1719	1810	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1719	1810	1538	1719	1609	1461	1719	3341		1719	1810	1538
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	163	109	199	45	66	153	130	463	108	76	152	177
RTOR Reduction (vph)	0	0	150	0	36	90	0	21	0	0	0	108
Lane Group Flow (vph)	163	109	49	45	79	14	130	550	0	76	152	69
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	12.2	19.5	19.5	3.6	10.9	10.9	9.6	33.3		7.6	31.3	31.3
Effective Green, g (s)	12.2	19.5	19.5	3.6	10.9	10.9	9.6	33.3		7.6	31.3	31.3
Actuated g/C Ratio	0.15	0.24	0.24	0.04	0.14	0.14	0.12	0.42		0.10	0.39	0.39
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	262	441	375	77	219	199	206	1391		163	708	602
v/s Ratio Prot	c0.09	0.06		0.03	c0.05		c0.08	c0.16		c0.04	0.08	
v/s Ratio Perm			0.03			0.01						0.05
v/c Ratio	0.62	0.25	0.13	0.58	0.36	0.07	0.63	0.40		0.47	0.21	0.12
Uniform Delay, d1	31.7	24.3	23.6	37.5	31.4	30.1	33.5	16.3		34.3	16.2	15.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.80	0.32	0.25
Incremental Delay, d2	4.5	0.3	0.2	10.8	1.0	0.2	6.2	0.8		2.0	0.7	0.4
Delay (s)	36.3	24.6	23.8	48.3	32.4	30.3	39.7	17.2		29.5	5.8	4.3
Level of Service	D	C	C	D	C	C	D	B		C	A	A
Approach Delay (s)		28.3			34.3			21.3			9.6	
Approach LOS		C			C			C			A	

Intersection Summary				
HCM Average Control Delay	22.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	42.0%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
9: U.S. 101 NB RAMPS & 4TH

Existing AM
10/28/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	202	0	135	567	103	0	0	146	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor				1.00	1.00		0.97	0.95			0.95	
Frt				1.00	0.85		1.00	1.00			0.95	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1736	1553		3367	3471			3298	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1736	1553		3367	3471			3298	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	0	0	230	0	153	644	117	0	0	166	83
RTOR Reduction (vph)	0	0	0	0	123	0	0	0	0	0	57	0
Lane Group Flow (vph)	0	0	0	230	30	0	644	117	0	0	192	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type				Prot			Prot					
Protected Phases				3	8		5	2			6	
Permitted Phases												
Actuated Green, G (s)				15.8	15.8		27.0	56.2			25.2	
Effective Green, g (s)				15.8	15.8		27.0	56.2			25.2	
Actuated g/C Ratio				0.20	0.20		0.34	0.70			0.32	
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				343	307		1136	2438			1039	
v/s Ratio Prot				c0.13	0.02		c0.19	0.03			c0.06	
v/s Ratio Perm												
v/c Ratio				0.67	0.10		0.57	0.05			0.18	
Uniform Delay, d1				29.7	26.3		21.7	3.7			19.9	
Progression Factor				1.00	1.00		0.74	0.62			1.00	
Incremental Delay, d2				5.1	0.1		0.6	0.0			0.4	
Delay (s)				34.8	26.4		16.6	2.3			20.3	
Level of Service				C	C		B	A			C	
Approach Delay (s)		0.0			31.4			14.4			20.3	
Approach LOS		A			C			B			C	

Intersection Summary			
HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
1: PRICE & U.S. 101 SB OFF RAMP

Existing PM
10/28/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	182	221	25	127	0	245	0	25	50	180	17
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	207	251	28	144	0	278	0	28	57	205	19

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	207	251	173	307	57	224
Volume Left (vph)	0	0	28	278	57	0
Volume Right (vph)	0	251	0	28	0	19
Hadj (s)	0.05	-0.65	0.08	0.18	0.55	-0.01
Departure Headway (s)	7.0	6.3	7.6	7.2	7.7	7.2
Degree Utilization, x	0.40	0.44	0.36	0.62	0.12	0.45
Capacity (veh/h)	487	542	424	473	433	462
Control Delay (s)	13.5	13.0	14.8	21.1	10.6	14.6
Approach Delay (s)	13.2		14.8	21.1	13.8	
Approach LOS	B		B	C	B	

Intersection Summary			
Delay	15.6		
HCM Level of Service	C		
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	48	106	30	13	418	0	0	384	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0			4.0			4.0	
Lane Util. Factor				1.00	1.00			1.00			1.00	
Frt				1.00	0.97			1.00			0.97	
Flt Protected				0.95	1.00			1.00			1.00	
Satd. Flow (prot)				1752	1784			1842			1784	
Flt Permitted				0.95	1.00			0.98			1.00	
Satd. Flow (perm)				1752	1784			1814			1784	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	52	114	32	14	449	0	0	413	134
RTOR Reduction (vph)	0	0	0	0	15	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	0	0	52	131	0	0	463	0	0	537	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type				Prot			Perm					
Protected Phases				3	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)				11.1	11.1			60.9			60.9	
Effective Green, g (s)				11.1	11.1			60.9			60.9	
Actuated g/C Ratio				0.14	0.14			0.76			0.76	
Clearance Time (s)				4.0	4.0			4.0			4.0	
Vehicle Extension (s)				3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)				243	248			1381			1358	
v/s Ratio Prot				0.03	c0.07						c0.30	
v/s Ratio Perm								0.26				
v/c Ratio				0.21	0.53			0.34			0.40	
Uniform Delay, d1				30.6	32.0			3.1			3.3	
Progression Factor				1.00	1.00			0.82			1.00	
Incremental Delay, d2				0.4	2.0			0.6			0.9	
Delay (s)				31.0	34.1			3.1			4.1	
Level of Service				C	C			A			A	
Approach Delay (s)		0.0			33.3			3.1			4.1	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	123	58	0	0	0	0	316	62	48	414	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		0.97						0.98			1.00	
Flt Protected		0.99						1.00			0.99	
Satd. Flow (prot)		3337						1804			1835	
Flt Permitted		0.99						1.00			0.93	
Satd. Flow (perm)		3337						1804			1719	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	81	131	62	0	0	0	0	336	66	51	440	0
RTOR Reduction (vph)	0	39	0	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	235	0	0	0	0	0	396	0	0	491	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm									Perm		
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		10.9						61.1			61.1	
Effective Green, g (s)		10.9						61.1			61.1	
Actuated g/C Ratio		0.14						0.76			0.76	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		455						1378			1313	
v/s Ratio Prot								0.22				
v/s Ratio Perm		0.07									c0.29	
v/c Ratio		0.52						0.29			0.37	
Uniform Delay, d1		32.1						2.9			3.1	
Progression Factor		1.00						1.00			0.61	
Incremental Delay, d2		1.0						0.5			0.8	
Delay (s)		33.1						3.4			2.7	
Level of Service		C						A			A	
Approach Delay (s)		33.1			0.0			3.4			2.7	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM Average Control Delay	10.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	26	10	118	35	15	8	356	139	19	452	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	5	27	10	122	36	15	8	367	143	20	466	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											635	
pX, platoon unblocked	0.96	0.96	0.96	0.96	0.96		0.96					
vC, conflicting volume	999	1038	472	990	972	439	477			510		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	980	1020	433	970	952	439	438			510		
tC, single (s)	7.2	6.6	6.2	7.2	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	88	98	37	85	97	99			98		
cM capacity (veh/h)	184	219	594	193	241	612	1065			1040		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	42	173	519	497
Volume Left	5	122	8	20
Volume Right	10	15	143	11
cSH	252	215	1065	1040
Volume to Capacity	0.17	0.81	0.01	0.02
Queue Length 95th (ft)	15	146	1	1
Control Delay (s)	22.1	67.3	0.2	0.6
Lane LOS	C	F	A	A
Approach Delay (s)	22.1	67.3	0.2	0.6
Approach LOS	C	F		

Intersection Summary				
Average Delay		10.5		
Intersection Capacity Utilization		57.7%	ICU Level of Service	B
Analysis Period (min)		15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	81	73	130	275	516	32
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	87	78	140	296	555	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)				863		
pX, platoon unblocked						
vC, conflicting volume	1147	572	589			
vC1, stage 1 conf vol	572					
vC2, stage 2 conf vol	575					
vCu, unblocked vol	1147	572	589			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	78	85	86			
cM capacity (veh/h)	395	516	976			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	166	140	296	589
Volume Left	87	140	0	0
Volume Right	78	0	0	34
cSH	444	976	1700	1700
Volume to Capacity	0.37	0.14	0.17	0.35
Queue Length 95th (ft)	43	12	0	0
Control Delay (s)	17.8	9.3	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	17.8	3.0		0.0
Approach LOS	C			

Intersection Summary				
Average Delay		3.6		
Intersection Capacity Utilization		55.3%	ICU Level of Service	B
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	95	25	167	114	196	19	182	140	248	297	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1708		3367	1827	1553
Flt Permitted	0.68	1.00	1.00	0.69	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1244	1827	1553	1267	1827	1553	1736	1708		3367	1827	1553
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	28	98	26	172	118	202	20	188	144	256	306	45
RTOR Reduction (vph)	0	0	19	0	0	151	0	36	0	0	0	19
Lane Group Flow (vph)	28	98	7	172	118	51	20	296	0	256	306	26
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						6
Actuated Green, G (s)	13.3	13.3	13.3	13.3	13.3	13.3	0.5	18.2		9.6	27.3	27.3
Effective Green, g (s)	13.3	13.3	13.3	13.3	13.3	13.3	0.5	18.2		9.6	27.3	27.3
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25	0.25	0.01	0.34		0.18	0.51	0.51
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	312	458	389	317	458	389	16	585		609	939	798
v/s Ratio Prot		0.05			0.06		0.01	c0.17		c0.08	0.17	
v/s Ratio Perm	0.02		0.00	c0.14		0.03						0.02
v/c Ratio	0.09	0.21	0.02	0.54	0.26	0.13	1.25	0.51		0.42	0.33	0.03
Uniform Delay, d1	15.3	15.8	15.0	17.3	15.9	15.4	26.3	13.9		19.3	7.5	6.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.0	1.9	0.3	0.2	314.0	0.7		0.5	0.2	0.0
Delay (s)	15.4	16.0	15.0	19.2	16.2	15.6	340.3	14.6		19.8	7.7	6.4
Level of Service	B	B	B	B	B	B	F	B		B	A	A
Approach Delay (s)		15.7			17.0			33.1			12.7	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	53.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	289	40	37	301	129	64	240	36	159	306	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	3441		1752	3347		1752	1808		1752	1774	
Flt Permitted	0.95	1.00		0.95	1.00		0.34	1.00		0.51	1.00	
Satd. Flow (perm)	1752	3441		1752	3347		633	1808		950	1774	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	133	295	41	38	307	132	65	245	37	162	312	106
RTOR Reduction (vph)	0	12	0	0	56	0	0	8	0	0	18	0
Lane Group Flow (vph)	133	324	0	38	383	0	65	274	0	162	400	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.5	19.7		1.8	14.0		18.2	18.2		18.2	18.2	
Effective Green, g (s)	7.5	19.7		1.8	14.0		18.2	18.2		18.2	18.2	
Actuated g/C Ratio	0.15	0.38		0.03	0.27		0.35	0.35		0.35	0.35	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	254	1311		61	906		223	636		334	625	
v/s Ratio Prot	c0.08	0.09		0.02	c0.11			0.15			c0.23	
v/s Ratio Perm							0.10			0.17		
v/c Ratio	0.52	0.25		0.62	0.42		0.29	0.43		0.49	0.64	
Uniform Delay, d1	20.4	10.9		24.6	15.5		12.1	12.8		13.1	14.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	0.1		18.1	0.3		0.7	0.5		1.1	2.2	
Delay (s)	22.4	11.0		42.8	15.8		12.8	13.3		14.2	16.2	
Level of Service	C	B		D	B		B	B		B	B	
Approach Delay (s)		14.3			18.0			13.2			15.6	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	51.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	294	218	506	80	83	139	102	355	145	97	222	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1691	1504	1770	3386		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1691	1504	1770	3386		1770	1863	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	303	225	522	82	86	143	105	366	149	100	229	237
RTOR Reduction (vph)	0	0	375	0	21	93	0	47	0	0	0	156
Lane Group Flow (vph)	303	225	147	82	101	14	105	468	0	100	229	81
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	17.8	21.7	21.7	6.9	10.8	10.8	8.0	27.5		7.9	27.4	27.4
Effective Green, g (s)	17.8	21.7	21.7	6.9	10.8	10.8	8.0	27.5		7.9	27.4	27.4
Actuated g/C Ratio	0.22	0.27	0.27	0.09	0.14	0.14	0.10	0.34		0.10	0.34	0.34
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	394	505	429	153	228	203	177	1164		175	638	542
v/s Ratio Prot	c0.17	c0.12		0.05	0.06		c0.06	c0.14		0.06	0.12	
v/s Ratio Perm			0.09			0.01						0.05
v/c Ratio	0.77	0.45	0.34	0.54	0.44	0.07	0.59	0.40		0.57	0.36	0.15
Uniform Delay, d1	29.2	24.2	23.4	35.0	31.8	30.2	34.4	20.0		34.4	19.7	18.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.05	0.45	0.99
Incremental Delay, d2	8.8	0.6	0.5	3.6	1.4	0.1	5.2	1.0		4.2	1.5	0.5
Delay (s)	37.9	24.8	23.9	38.6	33.2	30.4	39.7	21.0		40.5	10.4	18.6
Level of Service	D	C	C	D	C	C	D	C		D	B	B
Approach Delay (s)		28.1			33.7			24.2			19.1	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	328	1	69	393	395	0	0	221	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor				1.00	1.00		0.97	0.95			0.95	
Frt				1.00	0.85		1.00	1.00			0.98	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1752	1572		3400	3505			3438	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1752	1572		3400	3505			3438	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	0	338	1	71	405	407	0	0	228	33
RTOR Reduction (vph)	0	0	0	0	53	0	0	0	0	0	12	0
Lane Group Flow (vph)	0	0	0	338	19	0	405	407	0	0	249	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type				Prot			Prot					
Protected Phases				3	8		5	2			6	
Permitted Phases												
Actuated Green, G (s)				20.8	20.8		18.0	51.2			29.2	
Effective Green, g (s)				20.8	20.8		18.0	51.2			29.2	
Actuated g/C Ratio				0.26	0.26		0.22	0.64			0.36	
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				456	409		765	2243			1255	
v/s Ratio Prot				c0.19	0.01		c0.12	0.12			c0.07	
v/s Ratio Perm												
v/c Ratio				0.74	0.05		0.53	0.18			0.20	
Uniform Delay, d1				27.1	22.2		27.3	5.9			17.4	
Progression Factor				1.00	1.00		0.70	0.51			1.00	
Incremental Delay, d2				6.4	0.0		0.6	0.2			0.4	
Delay (s)				33.5	22.2		19.6	3.1			17.7	
Level of Service				C	C		B	A			B	
Approach Delay (s)		0.0			31.5			11.3			17.7	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM Average Control Delay	18.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1: PRICE & U.S. 101 SB OFF RAMP

Existing Saturday
10/28/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	226	323	43	232	0	318	0	52	81	207	23
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	235	336	45	242	0	331	0	54	84	216	24

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	235	336	286	385	84	240
Volume Left (vph)	0	0	45	331	84	0
Volume Right (vph)	0	336	0	54	0	24
Hadj (s)	0.05	-0.65	0.08	0.14	0.55	-0.02
Departure Headway (s)	8.6	7.8	9.1	8.7	9.5	8.9
Degree Utilization, x	0.56	0.73	0.72	0.93	0.22	0.59
Capacity (veh/h)	399	442	390	407	371	391
Control Delay (s)	20.7	28.1	32.4	58.4	13.9	22.7
Approach Delay (s)	25.0		32.4	58.4	20.4	
Approach LOS	D		D	F	C	

Intersection Summary				
Delay		33.6		
HCM Level of Service		D		
Intersection Capacity Utilization		72.9%	ICU Level of Service	C
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
2: POMEROY & HIGHWAY 1

Existing Saturday
10/28/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	129	130	67	15	484	0	0	317	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0			4.0			4.0	
Lane Util. Factor				1.00	1.00			1.00			1.00	
Frt				1.00	0.95			1.00			0.96	
Flt Protected				0.95	1.00			1.00			1.00	
Satd. Flow (prot)				1752	1750			1842			1766	
Flt Permitted				0.95	1.00			0.98			1.00	
Satd. Flow (perm)				1752	1750			1815			1766	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	136	137	71	16	509	0	0	334	155
RTOR Reduction (vph)	0	0	0	0	27	0	0	0	0	0	16	0
Lane Group Flow (vph)	0	0	0	136	181	0	0	525	0	0	473	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type				Prot			Perm					
Protected Phases				3	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)				13.4	13.4			58.6			58.6	
Effective Green, g (s)				13.4	13.4			58.6			58.6	
Actuated g/C Ratio				0.17	0.17			0.73			0.73	
Clearance Time (s)				4.0	4.0			4.0			4.0	
Vehicle Extension (s)				3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)				293	293			1329			1294	
v/s Ratio Prot				0.08	c0.10						0.27	
v/s Ratio Perm								c0.29				
v/c Ratio				0.46	0.62			0.40			0.37	
Uniform Delay, d1				30.1	30.9			4.0			3.9	
Progression Factor				1.00	1.00			0.75			1.00	
Incremental Delay, d2				1.2	3.9			0.8			0.8	
Delay (s)				31.2	34.8			3.9			4.7	
Level of Service				C	C			A			A	
Approach Delay (s)		0.0			33.4			3.9			4.7	
Approach LOS		A			C			A			A	

Intersection Summary				
HCM Average Control Delay		11.6	HCM Level of Service	B
HCM Volume to Capacity ratio		0.44		
Actuated Cycle Length (s)		80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization		55.2%	ICU Level of Service	B
Analysis Period (min)		15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	93	84	0	0	0	0	432	74	49	405	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		0.96						0.98			1.00	
Flt Protected		0.98						1.00			0.99	
Satd. Flow (prot)		3322						1826			1853	
Flt Permitted		0.98						1.00			0.91	
Satd. Flow (perm)		3322						1826			1703	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	125	97	88	0	0	0	0	450	77	51	422	0
RTOR Reduction (vph)	0	60	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	250	0	0	0	0	0	522	0	0	473	0
Turn Type	Perm									Perm		
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		11.2						60.8			60.8	
Effective Green, g (s)		11.2						60.8			60.8	
Actuated g/C Ratio		0.14						0.76			0.76	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		465						1388			1294	
v/s Ratio Prot								c0.29				
v/s Ratio Perm		0.08									0.28	
v/c Ratio		0.54						0.38			0.37	
Uniform Delay, d1		32.0						3.2			3.2	
Progression Factor		1.00						1.00			1.05	
Incremental Delay, d2		1.2						0.8			0.8	
Delay (s)		33.2						4.0			4.1	
Level of Service		C						A			A	
Approach Delay (s)		33.2			0.0			4.0			4.1	
Approach LOS		C			A			A			A	

Intersection Summary				
HCM Average Control Delay	11.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	70.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	20	29	105	45	18	20	480	141	23	385	27
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	18	20	30	107	46	18	20	490	144	23	393	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											635	
pX, platoon unblocked												
vC, conflicting volume	1097	1128	407	1096	1070	562	420			634		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1097	1128	407	1096	1070	562	420			634		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	90	95	34	78	96	98			98		
cM capacity (veh/h)	147	195	642	161	211	525	1133			945		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	68	171	654	444
Volume Left	18	107	20	23
Volume Right	30	18	144	28
cSH	248	187	1133	945
Volume to Capacity	0.28	0.92	0.02	0.02
Queue Length 95th (ft)	27	178	1	2
Control Delay (s)	24.9	96.6	0.5	0.7
Lane LOS	C	F	A	A
Approach Delay (s)	24.9	96.6	0.5	0.7
Approach LOS	C	F		

Intersection Summary			
Average Delay	14.1		
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: LE SAGE & HIGHWAY 1

Existing Saturday
10/28/2010

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	55	140	226	345	392	105
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	60	154	248	379	431	115
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)				863		
pX, platoon unblocked						
vC, conflicting volume	1364	488	546			
vC1, stage 1 conf vol	488					
vC2, stage 2 conf vol	876					
vCu, unblocked vol	1364	488	546			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4	2.3			
p0 queue free %	78	73	75			
cM capacity (veh/h)	275	567	994			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	214	248	379	546
Volume Left	60	248	0	0
Volume Right	154	0	0	115
cSH	437	994	1700	1700
Volume to Capacity	0.49	0.25	0.22	0.32
Queue Length 95th (ft)	66	25	0	0
Control Delay (s)	20.9	9.8	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	20.9	3.9		0.0
Approach LOS	C			

Intersection Summary				
Average Delay		5.0		
Intersection Capacity Utilization		61.2%	ICU Level of Service	B
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
6: GRAND & HIGHWAY 1

Existing Saturday
10/28/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	61	91	39	206	202	245	28	265	207	242	212	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1707		3367	1827	1553
Flt Permitted	0.55	1.00	1.00	0.70	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1005	1827	1553	1272	1827	1553	1736	1707		3367	1827	1553
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	63	94	40	212	208	253	29	273	213	249	219	80
RTOR Reduction (vph)	0	0	30	0	0	187	0	37	0	0	0	38
Lane Group Flow (vph)	63	94	10	212	208	66	29	449	0	249	219	42
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						6
Actuated Green, G (s)	16.4	16.4	16.4	16.4	16.4	16.4	1.6	24.4		9.7	32.5	32.5
Effective Green, g (s)	16.4	16.4	16.4	16.4	16.4	16.4	1.6	24.4		9.7	32.5	32.5
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26	0.26	0.03	0.39		0.16	0.52	0.52
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	264	479	408	334	479	408	44	666		523	950	808
v/s Ratio Prot		0.05			0.11		0.02	c0.26		c0.07	0.12	
v/s Ratio Perm	0.06		0.01	c0.17		0.04						0.03
v/c Ratio	0.24	0.20	0.03	0.63	0.43	0.16	0.66	0.67		0.48	0.23	0.05
Uniform Delay, d1	18.1	17.9	17.1	20.4	19.2	17.8	30.2	15.8		24.1	8.2	7.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	0.0	3.9	0.6	0.2	30.4	2.7		0.7	0.1	0.0
Delay (s)	18.6	18.1	17.1	24.3	19.8	17.9	60.5	18.5		24.8	8.3	7.4
Level of Service	B	B	B	C	B	B	E	B		C	A	A
Approach Delay (s)		18.1			20.5			20.8			15.7	
Approach LOS		B			C			C			B	

Intersection Summary				
HCM Average Control Delay		19.0	HCM Level of Service	B
HCM Volume to Capacity ratio		0.62		
Actuated Cycle Length (s)		62.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization		63.0%	ICU Level of Service	B
Analysis Period (min)		15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	146	354	15	88	323	68	96	157	38	156	178	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	3450		1736	3380		1736	1773		1736	1703	
Flt Permitted	0.95	1.00		0.95	1.00		0.42	1.00		0.62	1.00	
Satd. Flow (perm)	1736	3450		1736	3380		776	1773		1133	1703	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	152	369	16	92	336	71	100	164	40	162	185	152
RTOR Reduction (vph)	0	4	0	0	22	0	0	12	0	0	41	0
Lane Group Flow (vph)	152	381	0	92	385	0	100	192	0	162	296	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	8.0	16.2		4.9	13.1		15.2	15.2		15.2	15.2	
Effective Green, g (s)	8.0	16.2		4.9	13.1		15.2	15.2		15.2	15.2	
Actuated g/C Ratio	0.17	0.34		0.10	0.27		0.31	0.31		0.31	0.31	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	288	1157		176	917		244	558		357	536	
v/s Ratio Prot	c0.09	c0.11		0.05	c0.11			0.11			c0.17	
v/s Ratio Perm							0.13			0.14		
v/c Ratio	0.53	0.33		0.52	0.42		0.41	0.34		0.45	0.55	
Uniform Delay, d1	18.4	12.0		20.6	14.5		13.0	12.7		13.2	13.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.2		2.8	0.3		1.1	0.4		0.9	1.2	
Delay (s)	20.2	12.2		23.4	14.8		14.1	13.1		14.1	15.0	
Level of Service	C	B		C	B		B	B		B	B	
Approach Delay (s)		14.4			16.4			13.4			14.7	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	14.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	48.3	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	56.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	222	228	188	90	128	77	145	325	120	79	169	311
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1720	1475	1736	3331		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1720	1475	1736	3331		1736	1827	1553
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	249	256	211	101	144	87	163	365	135	89	190	349
RTOR Reduction (vph)	0	0	157	0	3	66	0	41	0	0	0	253
Lane Group Flow (vph)	249	256	54	101	150	12	163	459	0	89	190	96
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	15.4	20.5	20.5	7.7	12.8	12.8	13.8	28.4		7.4	22.0	22.0
Effective Green, g (s)	15.4	20.5	20.5	7.7	12.8	12.8	13.8	28.4		7.4	22.0	22.0
Actuated g/C Ratio	0.19	0.26	0.26	0.10	0.16	0.16	0.17	0.36		0.09	0.28	0.28
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	334	468	398	167	275	236	299	1183		161	502	427
v/s Ratio Prot	c0.14	c0.14		0.06	0.09		c0.09	0.14		c0.05	c0.10	
v/s Ratio Perm			0.03			0.01						0.06
v/c Ratio	0.75	0.55	0.14	0.60	0.54	0.05	0.55	0.39		0.55	0.38	0.22
Uniform Delay, d1	30.5	25.7	22.9	34.7	30.9	28.5	30.2	19.3		34.7	23.5	22.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.93	0.62	0.71
Incremental Delay, d2	8.7	1.3	0.2	6.1	2.2	0.1	2.0	1.0		3.4	1.8	1.0
Delay (s)	39.2	27.0	23.1	40.8	33.1	28.6	32.3	20.3		35.7	16.3	17.0
Level of Service	D	C	C	D	C	C	C	C		D	B	B
Approach Delay (s)		30.1			34.4			23.2			19.4	
Approach LOS		C			C			C			B	

Intersection Summary				
HCM Average Control Delay	25.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	51.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
9: U.S. 101 NB RAMPS & 4TH

Existing Saturday
10/28/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	416	5	67	501	123	0	0	143	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor				1.00	1.00		0.97	0.95			0.95	
Frt				1.00	0.86		1.00	1.00			0.97	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1770	1603		3433	3539			3430	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1770	1603		3433	3539			3430	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	484	6	78	583	143	0	0	166	43
RTOR Reduction (vph)	0	0	0	0	52	0	0	0	0	0	27	0
Lane Group Flow (vph)	0	0	0	484	32	0	583	143	0	0	182	0
Turn Type				Prot			Prot					
Protected Phases				3	8		5	2			6	
Permitted Phases												
Actuated Green, G (s)				26.5	26.5		19.0	45.5			22.5	
Effective Green, g (s)				26.5	26.5		19.0	45.5			22.5	
Actuated g/C Ratio				0.33	0.33		0.24	0.57			0.28	
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				586	531		815	2013			965	
v/s Ratio Prot				c0.27	0.02		c0.17	0.04			c0.05	
v/s Ratio Perm												
v/c Ratio				0.83	0.06		0.72	0.07			0.19	
Uniform Delay, d1				24.6	18.3		28.0	7.8			21.8	
Progression Factor				1.00	1.00		0.69	0.57			1.00	
Incremental Delay, d2				9.3	0.0		2.7	0.1			0.4	
Delay (s)				33.9	18.3		22.0	4.5			22.3	
Level of Service				C	B		C	A			C	
Approach Delay (s)		0.0			31.6			18.5			22.3	
Approach LOS		A			C			B			C	

Intersection Summary			
HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1: PRICE & U.S. 101 SB OFF RAMP

Existing AM Plus Project
10/28/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	53	78	7	62	0	128	0	12	29	97	10
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	67	99	9	78	0	162	0	15	37	123	13

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	67	99	87	177	37	135
Volume Left (vph)	0	0	9	162	37	0
Volume Right (vph)	0	99	0	15	0	13
Hadj (s)	0.07	-0.63	0.09	0.20	0.57	0.00
Departure Headway (s)	5.6	4.9	5.8	5.6	6.0	5.4
Degree Utilization, x	0.11	0.14	0.14	0.28	0.06	0.20
Capacity (veh/h)	594	679	577	613	571	633
Control Delay (s)	8.1	7.5	9.7	10.7	8.2	8.6
Approach Delay (s)	7.8		9.7	10.7	8.5	
Approach LOS	A		A	B	A	

Intersection Summary			
Delay	9.1		
HCM Level of Service	A		
Intersection Capacity Utilization	30.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	15	34	10	41	249	0	0	165	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0			4.0			4.0	
Lane Util. Factor				1.00	1.00			1.00			1.00	
Frt				1.00	0.96			1.00			0.98	
Flt Protected				0.95	1.00			0.99			1.00	
Satd. Flow (prot)				1719	1746			1797			1777	
Flt Permitted				0.95	1.00			0.93			1.00	
Satd. Flow (perm)				1719	1746			1684			1777	
Peak-hour factor, PHF	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Adj. Flow (vph)	0	0	0	20	46	14	55	336	0	0	223	34
RTOR Reduction (vph)	0	0	0	0	13	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	0	0	20	47	0	0	391	0	0	253	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Prot			Perm					
Protected Phases				3	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)				6.6	6.6			65.4			65.4	
Effective Green, g (s)				6.6	6.6			65.4			65.4	
Actuated g/C Ratio				0.08	0.08			0.82			0.82	
Clearance Time (s)				4.0	4.0			4.0			4.0	
Vehicle Extension (s)				3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)				142	144			1377			1453	
v/s Ratio Prot				0.01	c0.03						0.14	
v/s Ratio Perm								c0.23				
v/c Ratio				0.14	0.33			0.28			0.17	
Uniform Delay, d1				34.1	34.6			1.7			1.6	
Progression Factor				1.00	1.00			0.67			1.00	
Incremental Delay, d2				0.5	1.3			0.5			0.3	
Delay (s)				34.5	35.9			1.7			1.8	
Level of Service				C	D			A			A	
Approach Delay (s)		0.0			35.6			1.7			1.8	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM Average Control Delay	5.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	38.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	39	10	0	0	0	0	269	53	7	177	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		0.98						0.98			1.00	
Flt Protected		0.98						1.00			1.00	
Satd. Flow (prot)		3343						1786			1823	
Flt Permitted		0.98						1.00			0.99	
Satd. Flow (perm)		3343						1786			1803	
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Adj. Flow (vph)	36	51	13	0	0	0	0	349	69	9	230	0
RTOR Reduction (vph)	0	12	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	88	0	0	0	0	0	413	0	0	239	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm									Perm		
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		6.4						65.6			65.6	
Effective Green, g (s)		6.4						65.6			65.6	
Actuated g/C Ratio		0.08						0.82			0.82	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		267						1465			1478	
v/s Ratio Prot								c0.23				
v/s Ratio Perm		0.03									0.13	
v/c Ratio		0.33						0.28			0.16	
Uniform Delay, d1		34.8						1.7			1.5	
Progression Factor		1.00						1.00			0.85	
Incremental Delay, d2		0.7						0.5			0.2	
Delay (s)		35.5						2.2			1.5	
Level of Service		D						A			A	
Approach Delay (s)		35.5			0.0			2.2			1.5	
Approach LOS		D			A			A			A	

Intersection Summary			
HCM Average Control Delay	6.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	27.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	6	1	62	17	9	5	283	41	5	127	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	4	7	1	70	19	10	6	318	46	6	143	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											635	
pX, platoon unblocked												
vC, conflicting volume	529	533	146	514	513	341	149			364		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	529	533	146	514	513	341	149			364		
tC, single (s)	7.2	6.6	6.2	7.2	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	100	85	96	99	100			100		
cM capacity (veh/h)	432	445	893	457	456	695	1414			1178		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	12	99	370	155
Volume Left	4	70	6	6
Volume Right	1	10	46	7
cSH	461	474	1414	1178
Volume to Capacity	0.03	0.21	0.00	0.00
Queue Length 95th (ft)	2	19	0	0
Control Delay (s)	13.0	14.6	0.2	0.3
Lane LOS	B	B	A	A
Approach Delay (s)	13.0	14.6	0.2	0.3
Approach LOS	B	B		

Intersection Summary				
Average Delay		2.7		
Intersection Capacity Utilization		34.9%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	27	42	91	237	208	28
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	36	56	121	316	277	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)				863		
pX, platoon unblocked						
vC, conflicting volume	855	296	315			
vC1, stage 1 conf vol	296					
vC2, stage 2 conf vol	559					
vCu, unblocked vol	855	296	315			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4	2.3			
p0 queue free %	92	92	90			
cM capacity (veh/h)	466	732	1218			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	92	121	316	315
Volume Left	36	121	0	0
Volume Right	56	0	0	37
cSH	598	1218	1700	1700
Volume to Capacity	0.15	0.10	0.19	0.19
Queue Length 95th (ft)	14	8	0	0
Control Delay (s)	12.1	8.3	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.1	2.3		0.0
Approach LOS	B			

Intersection Summary				
Average Delay		2.5		
Intersection Capacity Utilization		31.8%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	60	21	75	86	159	19	156	100	125	98	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	1810	1538	1719	1810	1538	1719	1704		3335	1810	1538
Flt Permitted	0.69	1.00	1.00	0.71	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1246	1810	1538	1283	1810	1538	1719	1704		3335	1810	1538
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	16	74	26	93	106	196	23	193	123	154	121	32
RTOR Reduction (vph)	0	0	21	0	0	156	0	31	0	0	0	16
Lane Group Flow (vph)	16	74	5	93	106	40	23	285	0	154	121	16
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						6
Actuated Green, G (s)	9.2	9.2	9.2	9.2	9.2	9.2	0.9	17.5		6.1	22.7	22.7
Effective Green, g (s)	9.2	9.2	9.2	9.2	9.2	9.2	0.9	17.5		6.1	22.7	22.7
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21	0.21	0.02	0.39		0.14	0.51	0.51
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	256	372	316	263	372	316	35	666		454	917	779
v/s Ratio Prot		0.04			0.06		0.01	c0.17		c0.05	0.07	
v/s Ratio Perm	0.01		0.00	c0.07		0.03						0.01
v/c Ratio	0.06	0.20	0.02	0.35	0.28	0.13	0.66	0.43		0.34	0.13	0.02
Uniform Delay, d1	14.3	14.7	14.2	15.3	15.0	14.5	21.8	10.0		17.5	5.8	5.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.3	0.0	0.8	0.4	0.2	36.6	0.4		0.4	0.1	0.0
Delay (s)	14.4	15.0	14.2	16.1	15.4	14.7	58.4	10.4		18.0	5.9	5.5
Level of Service	B	B	B	B	B	B	E	B		B	A	A
Approach Delay (s)		14.8			15.2			13.7			11.9	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	13.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	44.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	94	171	29	29	174	155	63	232	27	94	138	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.93		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	3363		1719	3195		1719	1781		1719	1717	
Flt Permitted	0.95	1.00		0.95	1.00		0.60	1.00		0.52	1.00	
Satd. Flow (perm)	1719	3363		1719	3195		1091	1781		939	1717	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	107	194	33	33	198	176	72	264	31	107	157	81
RTOR Reduction (vph)	0	17	0	0	130	0	0	6	0	0	26	0
Lane Group Flow (vph)	107	210	0	33	244	0	72	289	0	107	212	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	4.7	14.3		1.0	10.6		12.9	12.9		12.9	12.9	
Effective Green, g (s)	4.7	14.3		1.0	10.6		12.9	12.9		12.9	12.9	
Actuated g/C Ratio	0.12	0.36		0.02	0.26		0.32	0.32		0.32	0.32	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	201	1196		43	842		350	572		301	551	
v/s Ratio Prot	c0.06	c0.06		0.02	c0.08			c0.16			0.12	
v/s Ratio Perm							0.07			0.11		
v/c Ratio	0.53	0.18		0.77	0.29		0.21	0.51		0.36	0.38	
Uniform Delay, d1	16.7	8.9		19.5	11.8		9.9	11.1		10.5	10.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.7	0.1		56.1	0.2		0.3	0.7		0.7	0.4	
Delay (s)	19.4	9.0		75.6	12.0		10.2	11.8		11.2	11.0	
Level of Service	B	A		E	B		B	B		B	B	
Approach Delay (s)		12.3			17.2			11.5			11.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	13.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	40.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	94	179	39	57	132	112	405	101	65	144	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	1810	1538	1719	1609	1461	1719	3335		1719	1810	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1719	1810	1538	1719	1609	1461	1719	3335		1719	1810	1538
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	163	109	208	45	66	153	130	471	117	76	167	177
RTOR Reduction (vph)	0	0	157	0	36	90	0	23	0	0	0	108
Lane Group Flow (vph)	163	109	51	45	79	14	130	565	0	76	167	69
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	12.2	19.5	19.5	3.6	10.9	10.9	9.6	33.3		7.6	31.3	31.3
Effective Green, g (s)	12.2	19.5	19.5	3.6	10.9	10.9	9.6	33.3		7.6	31.3	31.3
Actuated g/C Ratio	0.15	0.24	0.24	0.04	0.14	0.14	0.12	0.42		0.10	0.39	0.39
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	262	441	375	77	219	199	206	1388		163	708	602
v/s Ratio Prot	c0.09	0.06		0.03	c0.05		c0.08	c0.17		c0.04	0.09	
v/s Ratio Perm			0.03			0.01						0.05
v/c Ratio	0.62	0.25	0.14	0.58	0.36	0.07	0.63	0.41		0.47	0.24	0.12
Uniform Delay, d1	31.7	24.3	23.7	37.5	31.4	30.1	33.5	16.4		34.3	16.3	15.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.79	0.32	0.24
Incremental Delay, d2	4.5	0.3	0.2	10.8	1.0	0.2	6.2	0.9		2.0	0.7	0.4
Delay (s)	36.3	24.6	23.8	48.3	32.4	30.3	39.7	17.3		29.1	6.0	4.0
Level of Service	D	C	C	D	C	C	D	B		C	A	A
Approach Delay (s)		28.2			34.3			21.4			9.4	
Approach LOS		C			C			C			A	

Intersection Summary				
HCM Average Control Delay	22.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	42.4%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	215	0	135	574	103	0	0	146	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor				1.00	1.00		0.97	0.95			0.95	
Frt				1.00	0.85		1.00	1.00			0.95	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1736	1553		3367	3471			3298	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1736	1553		3367	3471			3298	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	0	0	244	0	153	652	117	0	0	166	83
RTOR Reduction (vph)	0	0	0	0	122	0	0	0	0	0	57	0
Lane Group Flow (vph)	0	0	0	244	31	0	652	117	0	0	192	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type				Prot			Prot					
Protected Phases				3	8		5	2			6	
Permitted Phases												
Actuated Green, G (s)				16.3	16.3		27.0	55.7			24.7	
Effective Green, g (s)				16.3	16.3		27.0	55.7			24.7	
Actuated g/C Ratio				0.20	0.20		0.34	0.70			0.31	
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				354	316		1136	2417			1018	
v/s Ratio Prot				c0.14	0.02		c0.19	0.03			c0.06	
v/s Ratio Perm												
v/c Ratio				0.69	0.10		0.57	0.05			0.19	
Uniform Delay, d1				29.5	25.9		21.8	3.8			20.3	
Progression Factor				1.00	1.00		0.74	0.61			1.00	
Incremental Delay, d2				5.5	0.1		0.7	0.0			0.4	
Delay (s)				35.0	26.0		16.7	2.4			20.7	
Level of Service				D	C		B	A			C	
Approach Delay (s)		0.0			31.5			14.5			20.7	
Approach LOS		A			C			B			C	

Intersection Summary				
HCM Average Control Delay	20.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	44.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
1: PRICE & U.S. 101 SB OFF RAMP

Existing PM Plus Project
10/28/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	182	221	25	127	0	245	0	25	50	192	17
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	207	251	28	144	0	278	0	28	57	218	19

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	207	251	173	307	57	238
Volume Left (vph)	0	0	28	278	57	0
Volume Right (vph)	0	251	0	28	0	19
Hadj (s)	0.05	-0.65	0.08	0.18	0.55	-0.01
Departure Headway (s)	7.1	6.4	7.6	7.3	7.8	7.2
Degree Utilization, x	0.41	0.44	0.37	0.62	0.12	0.47
Capacity (veh/h)	483	526	420	469	433	462
Control Delay (s)	13.7	13.2	15.0	21.5	10.6	15.3
Approach Delay (s)	13.4		15.0	21.5	14.4	
Approach LOS	B		C	C	B	

Intersection Summary			
Delay		15.9	
HCM Level of Service		C	
Intersection Capacity Utilization		57.2%	ICU Level of Service B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
2: POMEROY & HIGHWAY 1

Existing PM Plus Project
10/28/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	48	106	30	13	423	0	0	396	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0			4.0			4.0	
Lane Util. Factor				1.00	1.00			1.00			1.00	
Frt				1.00	0.97			1.00			0.97	
Flt Protected				0.95	1.00			1.00			1.00	
Satd. Flow (prot)				1752	1784			1842			1785	
Flt Permitted				0.95	1.00			0.98			1.00	
Satd. Flow (perm)				1752	1784			1814			1785	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	52	114	32	14	455	0	0	426	134
RTOR Reduction (vph)	0	0	0	0	15	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	0	0	52	131	0	0	469	0	0	550	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type				Prot			Perm					
Protected Phases				3	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)				11.1	11.1			60.9			60.9	
Effective Green, g (s)				11.1	11.1			60.9			60.9	
Actuated g/C Ratio				0.14	0.14			0.76			0.76	
Clearance Time (s)				4.0	4.0			4.0			4.0	
Vehicle Extension (s)				3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)				243	248			1381			1359	
v/s Ratio Prot				0.03	c0.07						c0.31	
v/s Ratio Perm								0.26				
v/c Ratio				0.21	0.53			0.34			0.41	
Uniform Delay, d1				30.6	32.0			3.1			3.3	
Progression Factor				1.00	1.00			0.82			1.00	
Incremental Delay, d2				0.4	2.0			0.7			0.9	
Delay (s)				31.0	34.1			3.2			4.2	
Level of Service				C	C			A			A	
Approach Delay (s)		0.0			33.3			3.2			4.2	
Approach LOS		A			C			A			A	

Intersection Summary				
HCM Average Control Delay	8.5	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	46.8%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	123	58	0	0	0	0	321	65	48	426	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		0.97						0.98			1.00	
Flt Protected		0.99						1.00			0.99	
Satd. Flow (prot)		3337						1803			1835	
Flt Permitted		0.99						1.00			0.93	
Satd. Flow (perm)		3337						1803			1720	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	81	131	62	0	0	0	0	341	69	51	453	0
RTOR Reduction (vph)	0	39	0	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	235	0	0	0	0	0	404	0	0	504	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm									Perm		
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		10.9						61.1			61.1	
Effective Green, g (s)		10.9						61.1			61.1	
Actuated g/C Ratio		0.14						0.76			0.76	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		455						1377			1314	
v/s Ratio Prot								0.22				
v/s Ratio Perm		0.07									c0.29	
v/c Ratio		0.52						0.29			0.38	
Uniform Delay, d1		32.1						2.9			3.2	
Progression Factor		1.00						1.00			0.59	
Incremental Delay, d2		1.0						0.5			0.8	
Delay (s)		33.1						3.4			2.7	
Level of Service		C						A			A	
Approach Delay (s)		33.1			0.0			3.4			2.7	
Approach LOS		C			A			A			A	

Intersection Summary				
HCM Average Control Delay	10.0	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	63.4%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	26	10	118	35	15	8	364	139	19	464	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	5	27	10	122	36	15	8	375	143	20	478	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											635	
pX, platoon unblocked	0.96	0.96	0.96	0.96	0.96		0.96					
vC, conflicting volume	1020	1058	484	1010	992	447	490			519		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	999	1039	439	989	970	447	445			519		
tC, single (s)	7.2	6.6	6.2	7.2	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	87	98	35	85	97	99			98		
cM capacity (veh/h)	177	212	586	186	233	605	1053			1032		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	42	173	527	509
Volume Left	5	122	8	20
Volume Right	10	15	143	11
cSH	244	207	1053	1032
Volume to Capacity	0.17	0.84	0.01	0.02
Queue Length 95th (ft)	15	155	1	1
Control Delay (s)	22.8	74.2	0.2	0.5
Lane LOS	C	F	A	A
Approach Delay (s)	22.8	74.2	0.2	0.5
Approach LOS	C	F		

Intersection Summary			
Average Delay	11.4		
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	84	86	144	280	523	37
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	90	92	155	301	562	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)				863		
pX, platoon unblocked						
vC, conflicting volume	1193	582	602			
vC1, stage 1 conf vol	582					
vC2, stage 2 conf vol	611					
vCu, unblocked vol	1193	582	602			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	76	82	84			
cM capacity (veh/h)	376	509	966			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	183	155	301	602
Volume Left	90	155	0	0
Volume Right	92	0	0	40
cSH	434	966	1700	1700
Volume to Capacity	0.42	0.16	0.18	0.35
Queue Length 95th (ft)	51	14	0	0
Control Delay (s)	19.2	9.4	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	19.2	3.2		0.0
Approach LOS	C			

Intersection Summary				
Average Delay		4.0		
Intersection Capacity Utilization		57.7%	ICU Level of Service	B
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	113	28	167	132	208	22	184	140	260	299	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1709		3367	1827	1553
Flt Permitted	0.67	1.00	1.00	0.68	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1224	1827	1553	1247	1827	1553	1736	1709		3367	1827	1553
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	33	116	29	172	136	214	23	190	144	268	308	53
RTOR Reduction (vph)	0	0	22	0	0	160	0	36	0	0	0	22
Lane Group Flow (vph)	33	116	7	172	136	54	23	298	0	268	308	31
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						6
Actuated Green, G (s)	13.7	13.7	13.7	13.7	13.7	13.7	0.5	18.4		9.8	27.7	27.7
Effective Green, g (s)	13.7	13.7	13.7	13.7	13.7	13.7	0.5	18.4		9.8	27.7	27.7
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25	0.25	0.01	0.34		0.18	0.51	0.51
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	311	464	395	317	464	395	16	583		612	939	798
v/s Ratio Prot		0.06			0.07		0.01	c0.17		c0.08	0.17	
v/s Ratio Perm	0.03		0.00	c0.14		0.04						0.02
v/c Ratio	0.11	0.25	0.02	0.54	0.29	0.14	1.44	0.51		0.44	0.33	0.04
Uniform Delay, d1	15.4	16.0	15.1	17.4	16.2	15.5	26.7	14.2		19.6	7.7	6.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.3	0.0	1.9	0.4	0.2	385.6	0.8		0.5	0.2	0.0
Delay (s)	15.6	16.3	15.1	19.3	16.6	15.7	412.3	14.9		20.1	7.9	6.5
Level of Service	B	B	B	B	B	B	F	B		C	A	A
Approach Delay (s)		16.0			17.1			40.5			13.0	
Approach LOS		B			B			D			B	

Intersection Summary				
HCM Average Control Delay		20.4	HCM Level of Service	C
HCM Volume to Capacity ratio		0.50		
Actuated Cycle Length (s)		53.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization		54.2%	ICU Level of Service	A
Analysis Period (min)		15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	300	40	37	313	129	64	240	36	159	306	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	3443		1752	3351		1752	1808		1752	1765	
Flt Permitted	0.95	1.00		0.95	1.00		0.33	1.00		0.52	1.00	
Satd. Flow (perm)	1752	3443		1752	3351		608	1808		953	1765	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	152	306	41	38	319	132	65	245	37	162	312	126
RTOR Reduction (vph)	0	12	0	0	54	0	0	8	0	0	21	0
Lane Group Flow (vph)	152	335	0	38	397	0	65	274	0	162	417	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	8.0	20.6		1.8	14.4		20.1	20.1		20.1	20.1	
Effective Green, g (s)	8.0	20.6		1.8	14.4		20.1	20.1		20.1	20.1	
Actuated g/C Ratio	0.15	0.38		0.03	0.26		0.37	0.37		0.37	0.37	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	257	1301		58	885		224	667		351	651	
v/s Ratio Prot	c0.09	0.10		0.02	c0.12			0.15			c0.24	
v/s Ratio Perm							0.11			0.17		
v/c Ratio	0.59	0.26		0.66	0.45		0.29	0.41		0.46	0.64	
Uniform Delay, d1	21.7	11.7		26.0	16.7		12.2	12.8		13.1	14.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.6	0.1		23.6	0.4		0.7	0.4		1.0	2.2	
Delay (s)	25.3	11.8		49.6	17.1		12.9	13.2		14.0	16.4	
Level of Service	C	B		D	B		B	B		B	B	
Approach Delay (s)		15.9			19.6			13.2			15.7	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	16.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	54.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	61.5%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	294	218	513	80	83	139	102	363	156	97	234	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1691	1504	1770	3379		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1691	1504	1770	3379		1770	1863	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	303	225	529	82	86	143	105	374	161	100	241	237
RTOR Reduction (vph)	0	0	367	0	21	93	0	52	0	0	0	156
Lane Group Flow (vph)	303	225	162	82	101	14	105	483	0	100	241	81
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	17.8	21.7	21.7	6.9	10.8	10.8	8.0	27.5		7.9	27.4	27.4
Effective Green, g (s)	17.8	21.7	21.7	6.9	10.8	10.8	8.0	27.5		7.9	27.4	27.4
Actuated g/C Ratio	0.22	0.27	0.27	0.09	0.14	0.14	0.10	0.34		0.10	0.34	0.34
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	394	505	429	153	228	203	177	1162		175	638	542
v/s Ratio Prot	c0.17	c0.12		0.05	0.06		c0.06	c0.14		0.06	0.13	
v/s Ratio Perm			0.10			0.01						0.05
v/c Ratio	0.77	0.45	0.38	0.54	0.44	0.07	0.59	0.42		0.57	0.38	0.15
Uniform Delay, d1	29.2	24.2	23.7	35.0	31.8	30.2	34.4	20.1		34.4	19.9	18.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.07	0.47	0.98
Incremental Delay, d2	8.8	0.6	0.6	3.6	1.4	0.1	5.2	1.1		4.1	1.6	0.5
Delay (s)	37.9	24.8	24.2	38.6	33.2	30.4	39.7	21.2		41.0	10.9	18.4
Level of Service	D	C	C	D	C	C	D	C		D	B	B
Approach Delay (s)		28.3			33.7			24.2			19.2	
Approach LOS		C			C			C			B	

Intersection Summary				
HCM Average Control Delay	25.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	58.5%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
9: U.S. 101 NB RAMPS & 4TH

Existing PM Plus Project
10/28/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	340	1	69	401	395	0	0	221	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor				1.00	1.00		0.97	0.95			0.95	
Frt				1.00	0.85		1.00	1.00			0.98	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1752	1572		3400	3505			3438	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1752	1572		3400	3505			3438	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	0	351	1	71	413	407	0	0	228	33
RTOR Reduction (vph)	0	0	0	0	52	0	0	0	0	0	12	0
Lane Group Flow (vph)	0	0	0	351	20	0	413	407	0	0	249	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type				Prot			Prot					
Protected Phases				3	8		5	2			6	
Permitted Phases												
Actuated Green, G (s)				21.3	21.3		18.0	50.7			28.7	
Effective Green, g (s)				21.3	21.3		18.0	50.7			28.7	
Actuated g/C Ratio				0.27	0.27		0.22	0.63			0.36	
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				466	419		765	2221			1233	
v/s Ratio Prot				c0.20	0.01		c0.12	0.12			c0.07	
v/s Ratio Perm												
v/c Ratio				0.75	0.05		0.54	0.18			0.20	
Uniform Delay, d1				26.9	21.8		27.3	6.1			17.7	
Progression Factor				1.00	1.00		0.70	0.50			1.00	
Incremental Delay, d2				6.8	0.0		0.7	0.2			0.4	
Delay (s)				33.7	21.9		19.7	3.2			18.1	
Level of Service				C	C		B	A			B	
Approach Delay (s)		0.0			31.7			11.5			18.1	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM Average Control Delay	18.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
1: PRICE & U.S. 101 SB OFF RAMP

Existing Saturday Plus Project
10/28/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	226	323	43	232	0	318	0	52	81	227	23
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	235	336	45	242	0	331	0	54	84	236	24

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	235	336	286	385	84	260
Volume Left (vph)	0	0	45	331	84	0
Volume Right (vph)	0	336	0	54	0	24
Hadj (s)	0.05	-0.65	0.08	0.14	0.55	-0.01
Departure Headway (s)	8.7	8.0	9.2	8.8	9.5	8.9
Degree Utilization, x	0.57	0.74	0.74	0.95	0.22	0.65
Capacity (veh/h)	393	435	382	402	371	391
Control Delay (s)	21.3	29.6	33.9	62.1	14.1	25.7
Approach Delay (s)	26.2		33.9	62.1	22.9	
Approach LOS	D		D	F	C	

Intersection Summary			
Delay	35.6		
HCM Level of Service	E		
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	129	130	67	15	494	0	0	337	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0			4.0			4.0	
Lane Util. Factor				1.00	1.00			1.00			1.00	
Frt				1.00	0.95			1.00			0.96	
Flt Protected				0.95	1.00			1.00			1.00	
Satd. Flow (prot)				1752	1750			1842			1769	
Flt Permitted				0.95	1.00			0.98			1.00	
Satd. Flow (perm)				1752	1750			1815			1769	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	136	137	71	16	520	0	0	355	155
RTOR Reduction (vph)	0	0	0	0	27	0	0	0	0	0	14	0
Lane Group Flow (vph)	0	0	0	136	181	0	0	536	0	0	496	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type				Prot			Perm					
Protected Phases				3	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)				13.4	13.4			58.6			58.6	
Effective Green, g (s)				13.4	13.4			58.6			58.6	
Actuated g/C Ratio				0.17	0.17			0.73			0.73	
Clearance Time (s)				4.0	4.0			4.0			4.0	
Vehicle Extension (s)				3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)				293	293			1329			1296	
v/s Ratio Prot				0.08	c0.10						0.28	
v/s Ratio Perm								c0.30				
v/c Ratio				0.46	0.62			0.40			0.38	
Uniform Delay, d1				30.1	30.9			4.1			4.0	
Progression Factor				1.00	1.00			0.76			1.00	
Incremental Delay, d2				1.2	3.9			0.9			0.9	
Delay (s)				31.2	34.8			3.9			4.8	
Level of Service				C	C			A			A	
Approach Delay (s)		0.0			33.4			3.9			4.8	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	93	84	0	0	0	0	442	80	49	425	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		0.96						0.98			1.00	
Flt Protected		0.98						1.00			0.99	
Satd. Flow (prot)		3322						1824			1853	
Flt Permitted		0.98						1.00			0.92	
Satd. Flow (perm)		3322						1824			1705	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	125	97	88	0	0	0	0	460	83	51	443	0
RTOR Reduction (vph)	0	60	0	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	250	0	0	0	0	0	537	0	0	494	0
Turn Type	Perm									Perm		
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		11.2						60.8			60.8	
Effective Green, g (s)		11.2						60.8			60.8	
Actuated g/C Ratio		0.14						0.76			0.76	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		465						1386			1296	
v/s Ratio Prot								c0.29				
v/s Ratio Perm		0.08									0.29	
v/c Ratio		0.54						0.39			0.38	
Uniform Delay, d1		32.0						3.3			3.2	
Progression Factor		1.00						1.00			1.08	
Incremental Delay, d2		1.2						0.8			0.8	
Delay (s)		33.2						4.1			4.3	
Level of Service		C						A			A	
Approach Delay (s)		33.2			0.0			4.1			4.3	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	20	29	105	45	18	20	496	141	23	405	27
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	18	20	30	107	46	18	20	506	144	23	413	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											635	
pX, platoon unblocked	0.99	0.99	0.99	0.99	0.99		0.99					
vC, conflicting volume	1134	1165	427	1133	1107	578	441			650		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1131	1162	417	1129	1103	578	431			650		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	89	95	29	77	96	98			97		
cM capacity (veh/h)	137	184	628	151	200	514	1113			931		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	68	171	670	464
Volume Left	18	107	20	23
Volume Right	30	18	144	28
cSH	234	175	1113	931
Volume to Capacity	0.29	0.98	0.02	0.03
Queue Length 95th (ft)	29	194	1	2
Control Delay (s)	26.6	115.4	0.5	0.7
Lane LOS	D	F	A	A
Approach Delay (s)	26.6	115.4	0.5	0.7
Approach LOS	D	F		

Intersection Summary				
Average Delay		16.2		
Intersection Capacity Utilization		64.0%	ICU Level of Service	C
Analysis Period (min)		15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	61	166	250	355	404	113
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	67	182	275	390	444	124
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)				863		
pX, platoon unblocked						
vC, conflicting volume	1446	506	568			
vC1, stage 1 conf vol	506					
vC2, stage 2 conf vol	940					
vCu, unblocked vol	1446	506	568			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4	2.3			
p0 queue free %	73	67	72			
cM capacity (veh/h)	247	555	975			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	249	275	390	568
Volume Left	67	275	0	0
Volume Right	182	0	0	124
cSH	416	975	1700	1700
Volume to Capacity	0.60	0.28	0.23	0.33
Queue Length 95th (ft)	95	29	0	0
Control Delay (s)	25.8	10.1	0.0	0.0
Lane LOS	D	B		
Approach Delay (s)	25.8	4.2		0.0
Approach LOS	D			

Intersection Summary				
Average Delay		6.2		
Intersection Capacity Utilization		65.6%	ICU Level of Service	C
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	125	44	206	233	266	33	268	207	264	215	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1708		3367	1827	1553
Flt Permitted	0.50	1.00	1.00	0.67	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	905	1827	1553	1232	1827	1553	1736	1708		3367	1827	1553
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	73	129	45	212	240	274	34	276	213	272	222	93
RTOR Reduction (vph)	0	0	33	0	0	201	0	36	0	0	0	45
Lane Group Flow (vph)	73	129	12	212	240	73	34	453	0	272	222	48
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						6
Actuated Green, G (s)	16.8	16.8	16.8	16.8	16.8	16.8	1.6	24.6		9.9	32.9	32.9
Effective Green, g (s)	16.8	16.8	16.8	16.8	16.8	16.8	1.6	24.6		9.9	32.9	32.9
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27	0.27	0.03	0.39		0.16	0.52	0.52
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	240	485	412	327	485	412	44	664		527	950	807
v/s Ratio Prot		0.07			0.13		0.02	c0.27		c0.08	0.12	
v/s Ratio Perm	0.08		0.01	c0.17		0.05						0.03
v/c Ratio	0.30	0.27	0.03	0.65	0.49	0.18	0.77	0.68		0.52	0.23	0.06
Uniform Delay, d1	18.6	18.4	17.2	20.6	19.7	17.9	30.7	16.1		24.5	8.3	7.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.3	0.0	4.4	0.8	0.2	57.0	2.9		0.9	0.1	0.0
Delay (s)	19.3	18.7	17.2	25.0	20.5	18.1	87.7	19.0		25.4	8.4	7.6
Level of Service	B	B	B	C	C	B	F	B		C	A	A
Approach Delay (s)		18.6			20.9			23.5			16.1	
Approach LOS		B			C			C			B	

Intersection Summary			
HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	63.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	182	374	15	88	343	68	96	157	38	156	178	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.97		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	3451		1736	3385		1736	1773		1736	1690	
Flt Permitted	0.95	1.00		0.95	1.00		0.38	1.00		0.61	1.00	
Satd. Flow (perm)	1736	3451		1736	3385		700	1773		1119	1690	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	190	390	16	92	357	71	100	164	40	162	185	185
RTOR Reduction (vph)	0	3	0	0	21	0	0	12	0	0	49	0
Lane Group Flow (vph)	190	403	0	92	407	0	100	192	0	162	321	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	9.1	18.2		4.9	14.0		17.4	17.4		17.4	17.4	
Effective Green, g (s)	9.1	18.2		4.9	14.0		17.4	17.4		17.4	17.4	
Actuated g/C Ratio	0.17	0.35		0.09	0.27		0.33	0.33		0.33	0.33	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	301	1196		162	903		232	588		371	560	
v/s Ratio Prot	c0.11	0.12		0.05	c0.12			0.11			c0.19	
v/s Ratio Perm							0.14			0.14		
v/c Ratio	0.63	0.34		0.57	0.45		0.43	0.33		0.44	0.57	
Uniform Delay, d1	20.1	12.7		22.8	16.0		13.7	13.2		13.7	14.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	0.2		4.5	0.4		1.3	0.3		0.8	1.4	
Delay (s)	24.4	12.9		27.3	16.4		15.0	13.5		14.5	15.9	
Level of Service	C	B		C	B		B	B		B	B	
Approach Delay (s)		16.5			18.3			14.0			15.5	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	52.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	222	228	200	90	128	77	145	341	140	79	189	311
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1720	1475	1736	3320		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1720	1475	1736	3320		1736	1827	1553
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	249	256	225	101	144	87	163	383	157	89	212	349
RTOR Reduction (vph)	0	0	167	0	3	66	0	48	0	0	0	253
Lane Group Flow (vph)	249	256	58	101	150	12	163	492	0	89	212	96
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	15.4	20.5	20.5	7.7	12.8	12.8	13.8	28.4		7.4	22.0	22.0
Effective Green, g (s)	15.4	20.5	20.5	7.7	12.8	12.8	13.8	28.4		7.4	22.0	22.0
Actuated g/C Ratio	0.19	0.26	0.26	0.10	0.16	0.16	0.17	0.36		0.09	0.28	0.28
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	334	468	398	167	275	236	299	1179		161	502	427
v/s Ratio Prot	c0.14	c0.14		0.06	0.09		c0.09	0.15		c0.05	c0.12	
v/s Ratio Perm			0.04			0.01						0.06
v/c Ratio	0.75	0.55	0.14	0.60	0.54	0.05	0.55	0.42		0.55	0.42	0.22
Uniform Delay, d1	30.5	25.7	23.0	34.7	30.9	28.5	30.2	19.5		34.7	23.8	22.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.96	0.62	0.71
Incremental Delay, d2	8.7	1.3	0.2	6.1	2.2	0.1	2.0	1.1		3.3	2.1	1.0
Delay (s)	39.2	27.0	23.1	40.8	33.1	28.6	32.3	20.6		36.6	16.9	17.0
Level of Service	D	C	C	D	C	C	C	C		D	B	B
Approach Delay (s)		30.0			34.4			23.3			19.7	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	436	5	67	517	123	0	0	143	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor				1.00	1.00		0.97	0.95			0.95	
Frt				1.00	0.86		1.00	1.00			0.97	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1770	1603		3433	3539			3430	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1770	1603		3433	3539			3430	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	507	6	78	601	143	0	0	166	43
RTOR Reduction (vph)	0	0	0	0	51	0	0	0	0	0	27	0
Lane Group Flow (vph)	0	0	0	507	33	0	601	143	0	0	182	0
Turn Type				Prot			Prot					
Protected Phases				3	8		5	2			6	
Permitted Phases												
Actuated Green, G (s)				27.2	27.2		19.0	44.8			21.8	
Effective Green, g (s)				27.2	27.2		19.0	44.8			21.8	
Actuated g/C Ratio				0.34	0.34		0.24	0.56			0.27	
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				602	545		815	1982			935	
v/s Ratio Prot				c0.29	0.02		c0.18	0.04			c0.05	
v/s Ratio Perm												
v/c Ratio				0.84	0.06		0.74	0.07			0.19	
Uniform Delay, d1				24.4	17.8		28.2	8.1			22.4	
Progression Factor				1.00	1.00		0.69	0.56			1.00	
Incremental Delay, d2				10.4	0.0		3.2	0.1			0.5	
Delay (s)				34.8	17.8		22.5	4.6			22.8	
Level of Service				C	B		C	A			C	
Approach Delay (s)		0.0			32.4			19.1			22.8	
Approach LOS		A			C			B			C	

Intersection Summary			
HCM Average Control Delay	24.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
1: PRICE & U.S. 101 SB OFF RAMP

Cumulative AM
11/11/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	65	95	10	75	0	145	0	15	35	95	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	71	103	11	82	0	158	0	16	38	103	16

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	71	103	92	174	38	120
Volume Left (vph)	0	0	11	158	38	0
Volume Right (vph)	0	103	0	16	0	16
Hadj (s)	0.07	-0.63	0.09	0.19	0.57	-0.03
Departure Headway (s)	5.6	4.9	5.7	5.6	6.0	5.4
Degree Utilization, x	0.11	0.14	0.15	0.27	0.06	0.18
Capacity (veh/h)	600	686	583	612	567	631
Control Delay (s)	8.1	7.5	9.7	10.7	8.2	8.4
Approach Delay (s)	7.7		9.7	10.7	8.3	
Approach LOS	A		A	B	A	

Intersection Summary				
Delay		9.1		
HCM Level of Service		A		
Intersection Capacity Utilization	33.4%		ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
2: POMEROY & HIGHWAY 1

Cumulative AM
11/11/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	20	40	15	50	290	0	0	180	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0			4.0			4.0	
Lane Util. Factor				1.00	1.00			1.00			1.00	
Frt				1.00	0.96			1.00			0.98	
Flt Protected				0.95	1.00			0.99			1.00	
Satd. Flow (prot)				1719	1736			1796			1774	
Flt Permitted				0.95	1.00			0.93			1.00	
Satd. Flow (perm)				1719	1736			1688			1774	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	22	43	16	54	315	0	0	196	33
RTOR Reduction (vph)	0	0	0	0	15	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	0	0	22	44	0	0	369	0	0	225	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Prot			Perm					
Protected Phases				3	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)				5.3	5.3			66.7			66.7	
Effective Green, g (s)				5.3	5.3			66.7			66.7	
Actuated g/C Ratio				0.07	0.07			0.83			0.83	
Clearance Time (s)				4.0	4.0			4.0			4.0	
Vehicle Extension (s)				3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)				114	115			1407			1479	
v/s Ratio Prot				0.01	c0.03						0.13	
v/s Ratio Perm								c0.22				
v/c Ratio				0.19	0.38			0.26			0.15	
Uniform Delay, d1				35.3	35.8			1.4			1.3	
Progression Factor				1.00	1.00			0.66			1.00	
Incremental Delay, d2				0.8	2.1			0.4			0.2	
Delay (s)				36.2	37.9			1.4			1.5	
Level of Service				D	D			A			A	
Approach Delay (s)		0.0			37.4			1.4			1.5	
Approach LOS		A			D			A			A	

Intersection Summary				
HCM Average Control Delay	5.7		HCM Level of Service	A
HCM Volume to Capacity ratio	0.27			
Actuated Cycle Length (s)	80.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.7%		ICU Level of Service	A
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	50	15	0	0	0	0	310	60	10	195	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		0.98						0.98			1.00	
Flt Protected		0.98						1.00			1.00	
Satd. Flow (prot)		3335						1787			1822	
Flt Permitted		0.98						1.00			0.98	
Satd. Flow (perm)		3335						1787			1794	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	54	16	0	0	0	0	337	65	11	212	0
RTOR Reduction (vph)	0	15	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	93	0	0	0	0	0	397	0	0	223	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm									Perm		
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		6.5						65.5			65.5	
Effective Green, g (s)		6.5						65.5			65.5	
Actuated g/C Ratio		0.08						0.82			0.82	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		271						1463			1469	
v/s Ratio Prot								c0.22				
v/s Ratio Perm		0.03									0.12	
v/c Ratio		0.34						0.27			0.15	
Uniform Delay, d1		34.7						1.7			1.5	
Progression Factor		1.00						1.00			0.87	
Incremental Delay, d2		0.8						0.5			0.2	
Delay (s)		35.5						2.1			1.5	
Level of Service		D						A			A	
Approach Delay (s)		35.5			0.0			2.1			1.5	
Approach LOS		D			A			A			A	

Intersection Summary				
HCM Average Control Delay	6.9	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	30.0%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	10	5	75	20	15	10	325	50	10	135	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	11	5	82	22	16	11	353	54	11	147	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											635	
pX, platoon unblocked												
vC, conflicting volume	603	603	152	587	582	380	158			408		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	603	603	152	587	582	380	158			408		
tC, single (s)	7.2	6.6	6.2	7.2	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	97	99	80	95	98	99			99		
cM capacity (veh/h)	375	402	886	400	414	660	1404			1135		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	120	418	168
Volume Left	5	82	11	11
Volume Right	5	16	54	11
cSH	456	426	1404	1135
Volume to Capacity	0.05	0.28	0.01	0.01
Queue Length 95th (ft)	4	28	1	1
Control Delay (s)	13.3	16.7	0.3	0.6
Lane LOS	B	C	A	A
Approach Delay (s)	13.3	16.7	0.3	0.6
Approach LOS	B	C		

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: LE SAGE & HIGHWAY 1

Cumulative AM
11/11/2010

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	30	40	90	315	235	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	43	98	342	255	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)				863		
pX, platoon unblocked						
vC, conflicting volume	810	272	288			
vC1, stage 1 conf vol	272					
vC2, stage 2 conf vol	538					
vCu, unblocked vol	810	272	288			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4	2.3			
p0 queue free %	93	94	92			
cM capacity (veh/h)	489	755	1246			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	76	98	342	288
Volume Left	33	98	0	0
Volume Right	43	0	0	33
cSH	613	1246	1700	1700
Volume to Capacity	0.12	0.08	0.20	0.17
Queue Length 95th (ft)	11	6	0	0
Control Delay (s)	11.7	8.1	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	11.7	1.8		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
6: GRAND & HIGHWAY 1

Cumulative AM
11/11/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	85	30	110	95	210	20	180	140	140	110	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	1810	1538	1719	1810	1538	1719	1691		3335	1810	1538
Flt Permitted	0.69	1.00	1.00	0.70	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1249	1810	1538	1262	1810	1538	1719	1691		3335	1810	1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	92	33	120	103	228	22	196	152	152	120	27
RTOR Reduction (vph)	0	0	26	0	0	176	0	39	0	0	0	14
Lane Group Flow (vph)	16	92	7	120	103	52	22	309	0	152	120	13
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						6
Actuated Green, G (s)	10.4	10.4	10.4	10.4	10.4	10.4	0.8	17.6		5.8	22.6	22.6
Effective Green, g (s)	10.4	10.4	10.4	10.4	10.4	10.4	0.8	17.6		5.8	22.6	22.6
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.23	0.23	0.02	0.38		0.13	0.49	0.49
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	284	411	349	287	411	349	30	650		422	893	759
v/s Ratio Prot		0.05			0.06		0.01	c0.18		c0.05	0.07	
v/s Ratio Perm	0.01		0.00	c0.10		0.03						0.01
v/c Ratio	0.06	0.22	0.02	0.42	0.25	0.15	0.73	0.48		0.36	0.13	0.02
Uniform Delay, d1	13.9	14.4	13.7	15.1	14.5	14.2	22.4	10.6		18.3	6.3	5.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.3	0.0	1.0	0.3	0.2	63.0	0.6		0.5	0.1	0.0
Delay (s)	13.9	14.7	13.8	16.1	14.8	14.4	85.4	11.2		18.8	6.4	5.9
Level of Service	B	B	B	B	B	B	F	B		B	A	A
Approach Delay (s)		14.4			14.9			15.6			12.7	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	45.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	230	45	45	230	220	90	330	40	135	195	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.93		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	3354		1719	3186		1719	1780		1719	1734	
Flt Permitted	0.95	1.00		0.95	1.00		0.50	1.00		0.37	1.00	
Satd. Flow (perm)	1719	3354		1719	3186		914	1780		668	1734	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	250	49	49	250	239	98	359	43	147	212	82
RTOR Reduction (vph)	0	19	0	0	177	0	0	6	0	0	21	0
Lane Group Flow (vph)	125	280	0	49	312	0	98	396	0	147	273	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.3	18.6		1.8	13.1		17.9	17.9		17.9	17.9	
Effective Green, g (s)	7.3	18.6		1.8	13.1		17.9	17.9		17.9	17.9	
Actuated g/C Ratio	0.15	0.37		0.04	0.26		0.36	0.36		0.36	0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	249	1240		62	830		325	633		238	617	
v/s Ratio Prot	c0.07	0.08		0.03	c0.10			c0.22			0.16	
v/s Ratio Perm							0.11			0.22		
v/c Ratio	0.50	0.23		0.79	0.38		0.30	0.62		0.62	0.44	
Uniform Delay, d1	19.8	10.9		24.1	15.3		11.7	13.4		13.4	12.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	0.1		48.2	0.3		0.5	1.9		4.7	0.5	
Delay (s)	21.4	11.0		72.3	15.5		12.2	15.3		18.1	12.9	
Level of Service	C	B		E	B		B	B		B	B	
Approach Delay (s)		14.1			20.7			14.7			14.6	
Approach LOS		B			C			B			B	

Intersection Summary				
HCM Average Control Delay	16.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	50.3	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	60.4%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	130	230	55	80	180	150	560	125	90	185	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	1810	1538	1719	1613	1461	1719	3344		1719	1810	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1719	1810	1538	1719	1613	1461	1719	3344		1719	1810	1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	207	141	250	60	87	196	163	609	136	98	201	223
RTOR Reduction (vph)	0	0	181	0	34	117	0	21	0	0	0	159
Lane Group Flow (vph)	207	141	69	60	114	18	163	724	0	98	201	64
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	15.5	22.1	22.1	4.2	10.8	10.8	14.8	30.4		7.3	22.9	22.9
Effective Green, g (s)	15.5	22.1	22.1	4.2	10.8	10.8	14.8	30.4		7.3	22.9	22.9
Actuated g/C Ratio	0.19	0.28	0.28	0.05	0.14	0.14	0.18	0.38		0.09	0.29	0.29
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	333	500	425	90	218	197	318	1271		157	518	440
v/s Ratio Prot	c0.12	0.08		0.03	c0.07		0.09	c0.22		c0.06	0.11	
v/s Ratio Perm			0.04			0.01						0.04
v/c Ratio	0.62	0.28	0.16	0.67	0.52	0.09	0.51	0.57		0.62	0.39	0.15
Uniform Delay, d1	29.6	22.7	21.9	37.2	32.2	30.3	29.4	19.6		35.0	22.9	21.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.56	0.52	1.54
Incremental Delay, d2	3.6	0.3	0.2	17.1	2.3	0.2	1.4	1.9		6.7	1.9	0.6
Delay (s)	33.1	23.0	22.1	54.3	34.5	30.5	30.7	21.5		26.4	13.8	33.4
Level of Service	C	C	C	D	C	C	C	C		C	B	C
Approach Delay (s)		26.2			36.4			23.1			24.5	
Approach LOS		C			D			C			C	

Intersection Summary				
HCM Average Control Delay	26.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	56.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
9: U.S. 101 NB RAMPS & 4TH

Cumulative AM
11/11/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	270	0	180	780	150	0	0	210	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor				1.00	1.00		0.97	0.95			0.95	
Frt				1.00	0.85		1.00	1.00			0.95	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1736	1553		3367	3471			3303	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1736	1553		3367	3471			3303	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	293	0	196	848	163	0	0	228	109
RTOR Reduction (vph)	0	0	0	0	151	0	0	0	0	0	67	0
Lane Group Flow (vph)	0	0	0	293	45	0	848	163	0	0	270	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type				Prot			Prot					
Protected Phases				3	8		5	2			6	
Permitted Phases												
Actuated Green, G (s)				18.2	18.2		28.0	53.8			21.8	
Effective Green, g (s)				18.2	18.2		28.0	53.8			21.8	
Actuated g/C Ratio				0.23	0.23		0.35	0.67			0.27	
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				395	353		1178	2334			900	
v/s Ratio Prot				c0.17	0.03		c0.25	0.05			c0.08	
v/s Ratio Perm												
v/c Ratio				0.74	0.13		0.72	0.07			0.30	
Uniform Delay, d1				28.7	24.6		22.6	4.5			23.1	
Progression Factor				1.00	1.00		0.69	0.56			1.00	
Incremental Delay, d2				7.3	0.2		1.9	0.1			0.9	
Delay (s)				36.1	24.7		17.4	2.5			23.9	
Level of Service				D	C		B	A			C	
Approach Delay (s)		0.0			31.5			15.0			23.9	
Approach LOS		A			C			B			C	

Intersection Summary			
HCM Average Control Delay	21.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
1: PRICE & U.S. 101 SB OFF RAMP

Cumulative PM
11/11/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	215	260	30	150	0	270	0	30	60	200	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	234	283	33	163	0	293	0	33	65	217	22

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	234	283	196	326	65	239
Volume Left (vph)	0	0	33	293	65	0
Volume Right (vph)	0	283	0	33	0	22
Hadj (s)	0.05	-0.65	0.08	0.17	0.55	-0.01
Departure Headway (s)	7.4	6.7	8.0	7.6	8.2	7.6
Degree Utilization, x	0.48	0.52	0.44	0.69	0.15	0.51
Capacity (veh/h)	464	505	404	450	410	437
Control Delay (s)	15.8	15.6	17.1	26.1	11.4	16.9
Approach Delay (s)	15.7		17.1	26.1	15.8	
Approach LOS	C		C	D	C	

Intersection Summary			
Delay	18.4		
HCM Level of Service	C		
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	60	125	35	20	490	0	0	450	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0			4.0			4.0	
Lane Util. Factor				1.00	1.00			1.00			1.00	
Frt				1.00	0.97			1.00			0.97	
Flt Protected				0.95	1.00			1.00			1.00	
Satd. Flow (prot)				1752	1784			1841			1782	
Flt Permitted				0.95	1.00			0.97			1.00	
Satd. Flow (perm)				1752	1784			1789			1782	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	65	136	38	22	533	0	0	489	163
RTOR Reduction (vph)	0	0	0	0	14	0	0	0	0	0	11	0
Lane Group Flow (vph)	0	0	0	65	160	0	0	555	0	0	641	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type				Prot			Perm					
Protected Phases				3	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)				12.4	12.4			59.6			59.6	
Effective Green, g (s)				12.4	12.4			59.6			59.6	
Actuated g/C Ratio				0.16	0.16			0.74			0.74	
Clearance Time (s)				4.0	4.0			4.0			4.0	
Vehicle Extension (s)				3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)				272	277			1333			1328	
v/s Ratio Prot				0.04	c0.09						c0.36	
v/s Ratio Perm								0.31				
v/c Ratio				0.24	0.58			0.42			0.48	
Uniform Delay, d1				29.7	31.4			3.8			4.1	
Progression Factor				1.00	1.00			0.77			1.00	
Incremental Delay, d2				0.5	2.9			0.9			1.3	
Delay (s)				30.1	34.3			3.8			5.3	
Level of Service				C	C			A			A	
Approach Delay (s)		0.0			33.2			3.8			5.3	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM Average Control Delay	9.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	145	70	0	0	0	0	375	75	60	485	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		0.97						0.98			1.00	
Flt Protected		0.99						1.00			0.99	
Satd. Flow (prot)		3335						1803			1835	
Flt Permitted		0.99						1.00			0.91	
Satd. Flow (perm)		3335						1803			1679	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	158	76	0	0	0	0	408	82	65	527	0
RTOR Reduction (vph)	0	38	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	294	0	0	0	0	0	483	0	0	592	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm									Perm		
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		12.4						59.6			59.6	
Effective Green, g (s)		12.4						59.6			59.6	
Actuated g/C Ratio		0.16						0.74			0.74	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		517						1343			1251	
v/s Ratio Prot								0.27				
v/s Ratio Perm		0.09									c0.35	
v/c Ratio		0.57						0.36			0.47	
Uniform Delay, d1		31.3						3.6			4.0	
Progression Factor		1.00						1.00			0.59	
Incremental Delay, d2		1.4						0.8			1.2	
Delay (s)		32.8						4.3			3.6	
Level of Service		C						A			A	
Approach Delay (s)		32.8			0.0			4.3			3.6	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM Average Control Delay	10.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	35	15	140	45	20	10	420	165	25	530	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	38	16	152	49	22	11	457	179	27	576	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											635	
pX, platoon unblocked	0.91	0.91	0.91	0.91	0.91		0.91					
vC, conflicting volume	1253	1296	584	1242	1215	546	592			636		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1227	1275	490	1215	1185	546	499			636		
tC, single (s)	7.2	6.6	6.2	7.2	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	73	97	0	70	96	99			97		
cM capacity (veh/h)	99	143	519	106	162	532	952			933		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	65	223	647	620
Volume Left	11	152	11	27
Volume Right	16	22	179	16
cSH	160	125	952	933
Volume to Capacity	0.41	1.78	0.01	0.03
Queue Length 95th (ft)	45	428	1	2
Control Delay (s)	42.1	443.1	0.3	0.8
Lane LOS	E	F	A	A
Approach Delay (s)	42.1	443.1	0.3	0.8
Approach LOS	E	F		

Intersection Summary				
Average Delay		65.7		
Intersection Capacity Utilization		67.2%	ICU Level of Service	C
Analysis Period (min)		15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	95	90	155	380	605	40
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	103	98	168	413	658	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)				863		
pX, platoon unblocked						
vC, conflicting volume	1429	679	701			
vC1, stage 1 conf vol	679					
vC2, stage 2 conf vol	750					
vCu, unblocked vol	1429	679	701			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	67	78	81			
cM capacity (veh/h)	313	448	887			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	201	168	413	701
Volume Left	103	168	0	0
Volume Right	98	0	0	43
cSH	367	887	1700	1700
Volume to Capacity	0.55	0.19	0.24	0.41
Queue Length 95th (ft)	79	17	0	0
Control Delay (s)	26.1	10.0	0.0	0.0
Lane LOS	D	B		
Approach Delay (s)	26.1	2.9		0.0
Approach LOS	D			

Intersection Summary				
Average Delay		4.7		
Intersection Capacity Utilization		63.6%	ICU Level of Service	B
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	130	35	235	165	280	25	215	185	300	345	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1700		3367	1827	1553
Flt Permitted	0.61	1.00	1.00	0.67	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1118	1827	1553	1219	1827	1553	1736	1700		3367	1827	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	141	38	255	179	304	27	234	201	326	375	54
RTOR Reduction (vph)	0	0	27	0	0	213	0	40	0	0	0	18
Lane Group Flow (vph)	43	141	11	255	179	91	27	395	0	326	375	36
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						6
Actuated Green, G (s)	19.1	19.1	19.1	19.1	19.1	19.1	1.6	22.6		10.4	31.4	31.4
Effective Green, g (s)	19.1	19.1	19.1	19.1	19.1	19.1	1.6	22.6		10.4	31.4	31.4
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.30	0.30	0.02	0.35		0.16	0.49	0.49
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	333	544	463	363	544	463	43	599		546	895	761
v/s Ratio Prot		0.08			0.10		0.02	c0.23		c0.10	0.21	
v/s Ratio Perm	0.04		0.01	c0.21		0.06						0.02
v/c Ratio	0.13	0.26	0.02	0.70	0.33	0.20	0.63	0.66		0.60	0.42	0.05
Uniform Delay, d1	16.4	17.1	15.9	20.0	17.5	16.8	31.0	17.5		24.9	10.5	8.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.3	0.0	6.0	0.4	0.2	25.3	2.6		1.8	0.3	0.0
Delay (s)	16.6	17.4	15.9	26.0	17.9	17.0	56.2	20.1		26.7	10.8	8.6
Level of Service	B	B	B	C	B	B	E	C		C	B	A
Approach Delay (s)		17.0			20.3			22.2			17.5	
Approach LOS		B			C			C			B	

Intersection Summary			
HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	64.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	185	410	60	55	425	185	90	340	55	225	430	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	3438		1752	3345		1752	1806		1752	1773	
Flt Permitted	0.95	1.00		0.95	1.00		0.17	1.00		0.36	1.00	
Satd. Flow (perm)	1752	3438		1752	3345		316	1806		668	1773	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	201	446	65	60	462	201	98	370	60	245	467	163
RTOR Reduction (vph)	0	12	0	0	57	0	0	9	0	0	18	0
Lane Group Flow (vph)	201	499	0	60	606	0	98	421	0	245	612	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	11.3	24.9		3.8	17.4		30.0	30.0		30.0	30.0	
Effective Green, g (s)	11.3	24.9		3.8	17.4		30.0	30.0		30.0	30.0	
Actuated g/C Ratio	0.16	0.35		0.05	0.25		0.42	0.42		0.42	0.42	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	280	1211		94	823		134	766		283	752	
v/s Ratio Prot	c0.11	0.15		0.03	c0.18			0.23			0.35	
v/s Ratio Perm							0.31			c0.37		
v/c Ratio	0.72	0.41		0.64	0.74		0.73	0.55		0.87	0.81	
Uniform Delay, d1	28.2	17.4		32.8	24.5		17.0	15.3		18.5	17.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.5	0.2		13.4	3.4		18.5	0.9		23.0	6.7	
Delay (s)	36.7	17.6		46.1	28.0		35.4	16.1		41.6	24.6	
Level of Service	D	B		D	C		D	B		D	C	
Approach Delay (s)		23.0			29.5			19.7			29.4	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	26.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	70.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	395	295	675	110	115	190	140	500	195	130	315	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1694	1504	1770	3390		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1694	1504	1770	3390		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	429	321	734	120	125	207	152	543	212	141	342	337
RTOR Reduction (vph)	0	0	279	0	19	133	0	50	0	0	0	247
Lane Group Flow (vph)	429	321	455	120	156	24	152	705	0	141	342	90
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	22.4	26.8	26.8	7.8	12.2	12.2	8.0	21.0		8.4	21.4	21.4
Effective Green, g (s)	22.4	26.8	26.8	7.8	12.2	12.2	8.0	21.0		8.4	21.4	21.4
Actuated g/C Ratio	0.28	0.34	0.34	0.10	0.15	0.15	0.10	0.26		0.11	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	496	624	530	173	258	229	177	890		186	498	423
v/s Ratio Prot	0.24	0.17		0.07	c0.09		0.09	c0.21		0.08	c0.18	
v/s Ratio Perm			c0.29			0.02						0.06
v/c Ratio	0.86	0.51	0.86	0.69	0.61	0.10	0.86	0.79		0.76	0.69	0.21
Uniform Delay, d1	27.4	21.4	24.8	34.9	31.7	29.2	35.4	27.5		34.8	26.3	22.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.79	0.56	1.63
Incremental Delay, d2	14.5	0.7	13.0	11.4	4.0	0.2	31.4	7.2		13.7	6.3	1.0
Delay (s)	41.9	22.1	37.8	46.3	35.6	29.4	66.9	34.6		41.1	20.9	38.1
Level of Service	D	C	D	D	D	C	E	C		D	C	D
Approach Delay (s)		35.6			36.3			40.0			31.5	
Approach LOS		D			D			D			C	

Intersection Summary				
HCM Average Control Delay	35.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	74.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	440	5	95	525	560	0	0	315	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor				1.00	1.00		0.97	0.95			0.95	
Frt				1.00	0.86		1.00	1.00			0.98	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1752	1581		3400	3505			3439	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1752	1581		3400	3505			3439	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	478	5	103	571	609	0	0	342	49
RTOR Reduction (vph)	0	0	0	0	69	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	0	0	478	39	0	571	609	0	0	378	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type				Prot			Prot					
Protected Phases				3	8		5	2			6	
Permitted Phases												
Actuated Green, G (s)				26.4	26.4		19.0	45.6			22.6	
Effective Green, g (s)				26.4	26.4		19.0	45.6			22.6	
Actuated g/C Ratio				0.33	0.33		0.24	0.57			0.28	
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				578	522		808	1998			972	
v/s Ratio Prot				c0.27	0.02		c0.17	0.17			c0.11	
v/s Ratio Perm												
v/c Ratio				0.83	0.07		0.71	0.30			0.39	
Uniform Delay, d1				24.7	18.4		27.9	9.0			23.1	
Progression Factor				1.00	1.00		0.76	0.66			1.00	
Incremental Delay, d2				9.5	0.1		1.8	0.3			1.2	
Delay (s)				34.1	18.5		23.2	6.2			24.3	
Level of Service				C	B		C	A			C	
Approach Delay (s)		0.0			31.3			14.4			24.3	
Approach LOS		A			C			B			C	

Intersection Summary				
HCM Average Control Delay	20.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	59.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1: PRICE & U.S. 101 SB OFF RAMP

Cumulative Saturday
11/11/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	265	380	55	275	0	355	0	60	90	230	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	288	413	60	299	0	386	0	65	98	250	33

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	288	413	359	451	98	283
Volume Left (vph)	0	0	60	386	98	0
Volume Right (vph)	0	413	0	65	0	33
Hadj (s)	0.05	-0.65	0.08	0.14	0.55	-0.03
Departure Headway (s)	9.2	8.5	9.5	9.8	10.1	9.5
Degree Utilization, x	0.74	0.97	0.95	1.23	0.27	0.75
Capacity (veh/h)	382	413	373	371	350	370
Control Delay (s)	32.6	65.9	65.8	155.0	15.7	34.5
Approach Delay (s)	52.2		65.8	155.0	29.7	
Approach LOS	F		F	F	D	

Intersection Summary				
Delay		74.8		
HCM Level of Service		F		
Intersection Capacity Utilization		82.0%	ICU Level of Service	E
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
2: POMEROY & HIGHWAY 1

Cumulative Saturday
11/11/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	155	155	80	20	565	0	0	370	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0			4.0			4.0	
Lane Util. Factor				1.00	1.00			1.00			1.00	
Frt				1.00	0.95			1.00			0.96	
Flt Protected				0.95	1.00			1.00			1.00	
Satd. Flow (prot)				1752	1750			1841			1765	
Flt Permitted				0.95	1.00			0.98			1.00	
Satd. Flow (perm)				1752	1750			1799			1765	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	168	168	87	22	614	0	0	402	190
RTOR Reduction (vph)	0	0	0	0	26	0	0	0	0	0	17	0
Lane Group Flow (vph)	0	0	0	168	229	0	0	636	0	0	575	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type				Prot			Perm					
Protected Phases				3	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)				15.5	15.5			56.5			56.5	
Effective Green, g (s)				15.5	15.5			56.5			56.5	
Actuated g/C Ratio				0.19	0.19			0.71			0.71	
Clearance Time (s)				4.0	4.0			4.0			4.0	
Vehicle Extension (s)				3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)				339	339			1271			1247	
v/s Ratio Prot				0.10	c0.13						0.33	
v/s Ratio Perm								c0.35				
v/c Ratio				0.50	0.68			0.50			0.46	
Uniform Delay, d1				28.8	29.9			5.3			5.1	
Progression Factor				1.00	1.00			0.72			1.00	
Incremental Delay, d2				1.1	5.3			1.3			1.2	
Delay (s)				29.9	35.2			5.1			6.3	
Level of Service				C	D			A			A	
Approach Delay (s)		0.0			33.1			5.1			6.3	
Approach LOS		A			C			A			A	

Intersection Summary				
HCM Average Control Delay		12.7	HCM Level of Service	B
HCM Volume to Capacity ratio		0.54		
Actuated Cycle Length (s)		80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization		65.6%	ICU Level of Service	C
Analysis Period (min)		15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	110	100	0	0	0	0	505	90	60	475	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		0.96						0.98			1.00	
Flt Protected		0.98						1.00			0.99	
Satd. Flow (prot)		3321						1825			1852	
Flt Permitted		0.98						1.00			0.89	
Satd. Flow (perm)		3321						1825			1650	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	120	109	0	0	0	0	549	98	65	516	0
RTOR Reduction (vph)	0	59	0	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	322	0	0	0	0	0	641	0	0	581	0
Turn Type	Perm									Perm		
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		13.0						59.0			59.0	
Effective Green, g (s)		13.0						59.0			59.0	
Actuated g/C Ratio		0.16						0.74			0.74	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		540						1346			1217	
v/s Ratio Prot								0.35				
v/s Ratio Perm		0.10									c0.35	
v/c Ratio		0.60						0.48			0.48	
Uniform Delay, d1		31.1						4.2			4.3	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		1.8						1.2			1.2	
Delay (s)		32.9						5.5			5.5	
Level of Service		C						A			A	
Approach Delay (s)		32.9			0.0			5.5			5.5	
Approach LOS		C			A			A			A	

Intersection Summary				
HCM Average Control Delay	12.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	80.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	25	35	125	55	25	25	560	165	30	450	35
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	27	38	136	60	27	27	609	179	33	489	38
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											635	
pX, platoon unblocked	0.94	0.94	0.94	0.94	0.94		0.94					
vC, conflicting volume	1383	1416	508	1378	1345	698	527			788		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1375	1410	441	1369	1335	698	461			788		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	59	77	93	0	55	94	97			96		
cM capacity (veh/h)	67	121	575	85	134	439	1025			827		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	92	223	815	560
Volume Left	27	136	27	33
Volume Right	38	27	179	38
cSH	132	105	1025	827
Volume to Capacity	0.70	2.11	0.03	0.04
Queue Length 95th (ft)	98	476	2	3
Control Delay (s)	79.4	597.6	0.7	1.1
Lane LOS	F	F	A	A
Approach Delay (s)	79.4	597.6	0.7	1.1
Approach LOS	F	F		

Intersection Summary			
Average Delay	83.8		
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	65	165	265	475	460	125
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	179	288	516	500	136
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)				863		
pX, platoon unblocked						
vC, conflicting volume	1660	568	636			
vC1, stage 1 conf vol	568					
vC2, stage 2 conf vol	1092					
vCu, unblocked vol	1660	568	636			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4	2.3			
p0 queue free %	65	65	69			
cM capacity (veh/h)	201	511	919			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	250	288	516	636
Volume Left	71	288	0	0
Volume Right	179	0	0	136
cSH	356	919	1700	1700
Volume to Capacity	0.70	0.31	0.30	0.37
Queue Length 95th (ft)	128	34	0	0
Control Delay (s)	35.8	10.7	0.0	0.0
Lane LOS	E	B		
Approach Delay (s)	35.8	3.8		0.0
Approach LOS	E			

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	145	55	290	285	345	35	310	265	300	235	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1701		3367	1827	1553
Flt Permitted	0.41	1.00	1.00	0.63	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	757	1827	1553	1155	1827	1553	1736	1701		3367	1827	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	158	60	315	310	375	38	337	288	326	255	98
RTOR Reduction (vph)	0	0	41	0	0	255	0	40	0	0	0	49
Lane Group Flow (vph)	92	158	19	315	310	120	38	585	0	326	255	49
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						6
Actuated Green, G (s)	23.9	23.9	23.9	23.9	23.9	23.9	3.3	30.7		8.2	35.6	35.6
Effective Green, g (s)	23.9	23.9	23.9	23.9	23.9	23.9	3.3	30.7		8.2	35.6	35.6
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32	0.32	0.04	0.41		0.11	0.48	0.48
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	242	584	496	369	584	496	77	698		369	870	739
v/s Ratio Prot		0.09			0.17		0.02	c0.34		c0.10	0.14	
v/s Ratio Perm	0.12		0.01	c0.27		0.08						0.03
v/c Ratio	0.38	0.27	0.04	0.85	0.53	0.24	0.49	0.84		0.88	0.29	0.07
Uniform Delay, d1	19.7	19.0	17.5	23.8	20.9	18.8	34.9	19.8		32.8	11.9	10.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.0	0.3	0.0	17.2	0.9	0.3	4.9	8.7		21.3	0.2	0.0
Delay (s)	20.7	19.2	17.6	41.0	21.8	19.0	39.8	28.5		54.1	12.1	10.6
Level of Service	C	B	B	D	C	B	D	C		D	B	B
Approach Delay (s)		19.3			26.8			29.2			32.1	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM Average Control Delay	27.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	74.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	500	25	125	485	100	145	225	55	220	255	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	3446		1736	3382		1736	1773		1736	1703	
Flt Permitted	0.95	1.00		0.95	1.00		0.23	1.00		0.47	1.00	
Satd. Flow (perm)	1736	3446		1736	3382		429	1773		853	1703	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	543	27	136	527	109	158	245	60	239	277	228
RTOR Reduction (vph)	0	4	0	0	21	0	0	13	0	0	44	0
Lane Group Flow (vph)	228	566	0	136	615	0	158	292	0	239	461	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	12.6	22.0		7.6	17.0		24.0	24.0		24.0	24.0	
Effective Green, g (s)	12.6	22.0		7.6	17.0		24.0	24.0		24.0	24.0	
Actuated g/C Ratio	0.19	0.34		0.12	0.26		0.37	0.37		0.37	0.37	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	333	1156		201	876		157	649		312	623	
v/s Ratio Prot	c0.13	0.16		0.08	c0.18			0.16			0.27	
v/s Ratio Perm							c0.37			0.28		
v/c Ratio	0.68	0.49		0.68	0.70		1.01	0.45		0.77	0.74	
Uniform Delay, d1	24.7	17.3		27.8	22.0		20.8	15.8		18.3	18.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.7	0.3		8.7	2.6		73.5	0.5		10.7	4.7	
Delay (s)	30.4	17.7		36.5	24.6		94.3	16.3		29.0	22.8	
Level of Service	C	B		D	C		F	B		C	C	
Approach Delay (s)		21.3			26.7			42.9			24.8	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM Average Control Delay	27.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	65.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	305	265	130	175	105	195	460	160	110	240	415
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1721	1475	1736	3337		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1721	1475	1736	3337		1736	1827	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	326	332	288	141	190	114	212	500	174	120	261	451
RTOR Reduction (vph)	0	0	212	0	2	86	0	41	0	0	0	341
Lane Group Flow (vph)	326	332	76	141	199	17	212	633	0	120	261	110
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	18.1	21.0	21.0	10.6	13.5	13.5	12.8	24.6		7.8	19.6	19.6
Effective Green, g (s)	18.1	21.0	21.0	10.6	13.5	13.5	12.8	24.6		7.8	19.6	19.6
Actuated g/C Ratio	0.23	0.26	0.26	0.13	0.17	0.17	0.16	0.31		0.10	0.25	0.25
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	393	480	408	230	290	249	278	1026		169	448	380
v/s Ratio Prot	c0.19	c0.18		0.08	c0.12		c0.12	c0.19		0.07	0.14	
v/s Ratio Perm			0.05			0.01						0.07
v/c Ratio	0.83	0.69	0.19	0.61	0.68	0.07	0.76	0.62		0.71	0.58	0.29
Uniform Delay, d1	29.5	26.6	22.9	32.8	31.2	28.0	32.1	23.7		35.0	26.6	24.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.12	0.58	1.98
Incremental Delay, d2	13.5	4.3	0.2	4.8	6.5	0.1	11.7	2.8		9.0	3.7	1.3
Delay (s)	43.0	30.9	23.1	37.5	37.8	28.1	43.8	26.5		48.2	19.1	49.9
Level of Service	D	C	C	D	D	C	D	C		D	B	D
Approach Delay (s)		32.7			35.5			30.6			40.0	
Approach LOS		C			D			C			D	

Intersection Summary			
HCM Average Control Delay	34.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
9: U.S. 101 NB RAMPS & 4TH

Cumulative Saturday
11/11/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	555	10	90	690	175	0	0	210	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor				1.00	1.00		0.97	0.95			0.95	
Frt				1.00	0.87		1.00	1.00			0.97	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1770	1612		3433	3539			3438	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1770	1612		3433	3539			3438	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	603	11	98	750	190	0	0	228	54
RTOR Reduction (vph)	0	0	0	0	62	0	0	0	0	0	25	0
Lane Group Flow (vph)	0	0	0	603	47	0	750	190	0	0	257	0
Turn Type				Prot			Prot					
Protected Phases				3	8		5	2			6	
Permitted Phases												
Actuated Green, G (s)				29.6	29.6		19.8	42.4			18.6	
Effective Green, g (s)				29.6	29.6		19.8	42.4			18.6	
Actuated g/C Ratio				0.37	0.37		0.25	0.53			0.23	
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				655	596		850	1876			799	
v/s Ratio Prot				c0.34	0.03		c0.22	0.05			c0.07	
v/s Ratio Perm												
v/c Ratio				0.92	0.08		0.88	0.10			0.32	
Uniform Delay, d1				24.1	16.4		29.0	9.3			25.5	
Progression Factor				1.00	1.00		0.57	0.83			1.00	
Incremental Delay, d2				18.4	0.1		8.4	0.1			1.1	
Delay (s)				42.4	16.4		24.9	7.8			26.5	
Level of Service				D	B		C	A			C	
Approach Delay (s)		0.0			38.5			21.4			26.5	
Approach LOS		A			D			C			C	

Intersection Summary			
HCM Average Control Delay	28.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1: PRICE & U.S. 101 SB OFF RAMP

Cumulative AM Plus Project
11/11/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	65	95	10	75	0	145	0	15	35	108	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	71	103	11	82	0	158	0	16	38	117	16

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	71	103	92	174	38	134
Volume Left (vph)	0	0	11	158	38	0
Volume Right (vph)	0	103	0	16	0	16
Hadj (s)	0.07	-0.63	0.09	0.19	0.57	-0.02
Departure Headway (s)	5.6	4.9	5.8	5.6	6.0	5.4
Degree Utilization, x	0.11	0.14	0.15	0.27	0.06	0.20
Capacity (veh/h)	595	679	576	609	567	630
Control Delay (s)	8.2	7.6	9.8	10.7	8.2	8.6
Approach Delay (s)	7.8		9.8	10.7	8.5	
Approach LOS	A		A	B	A	

Intersection Summary			
Delay	9.1		
HCM Level of Service	A		
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	20	40	15	50	294	0	0	193	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0			4.0			4.0	
Lane Util. Factor				1.00	1.00			1.00			1.00	
Frt				1.00	0.96			1.00			0.98	
Flt Protected				0.95	1.00			0.99			1.00	
Satd. Flow (prot)				1719	1736			1797			1776	
Flt Permitted				0.95	1.00			0.93			1.00	
Satd. Flow (perm)				1719	1736			1686			1776	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	22	43	16	54	320	0	0	210	33
RTOR Reduction (vph)	0	0	0	0	15	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	0	0	22	44	0	0	374	0	0	240	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Prot			Perm					
Protected Phases				3	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)				5.3	5.3			66.7			66.7	
Effective Green, g (s)				5.3	5.3			66.7			66.7	
Actuated g/C Ratio				0.07	0.07			0.83			0.83	
Clearance Time (s)				4.0	4.0			4.0			4.0	
Vehicle Extension (s)				3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)				114	115			1406			1481	
v/s Ratio Prot				0.01	c0.03						0.13	
v/s Ratio Perm								c0.22				
v/c Ratio				0.19	0.38			0.27			0.16	
Uniform Delay, d1				35.3	35.8			1.4			1.3	
Progression Factor				1.00	1.00			0.66			1.00	
Incremental Delay, d2				0.8	2.1			0.5			0.2	
Delay (s)				36.2	37.9			1.4			1.5	
Level of Service				D	D			A			A	
Approach Delay (s)		0.0			37.4			1.4			1.5	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM Average Control Delay	5.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	50	15	0	0	0	0	314	63	10	208	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		0.98						0.98			1.00	
Flt Protected		0.98						1.00			1.00	
Satd. Flow (prot)		3335						1786			1823	
Flt Permitted		0.98						1.00			0.98	
Satd. Flow (perm)		3335						1786			1795	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	54	16	0	0	0	0	341	68	11	226	0
RTOR Reduction (vph)	0	15	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	93	0	0	0	0	0	404	0	0	237	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm									Perm		
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		6.5						65.5			65.5	
Effective Green, g (s)		6.5						65.5			65.5	
Actuated g/C Ratio		0.08						0.82			0.82	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		271						1462			1470	
v/s Ratio Prot								c0.23				
v/s Ratio Perm		0.03									0.13	
v/c Ratio		0.34						0.28			0.16	
Uniform Delay, d1		34.7						1.7			1.5	
Progression Factor		1.00						1.00			0.87	
Incremental Delay, d2		0.8						0.5			0.2	
Delay (s)		35.5						2.2			1.6	
Level of Service		D						A			A	
Approach Delay (s)		35.5			0.0			2.2			1.6	
Approach LOS		D			A			A			A	

Intersection Summary			
HCM Average Control Delay	6.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	30.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	10	5	75	20	15	10	332	50	10	148	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	11	5	82	22	16	11	361	54	11	161	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											635	
pX, platoon unblocked												
vC, conflicting volume	625	625	166	609	603	388	172			415		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	625	625	166	609	603	388	172			415		
tC, single (s)	7.2	6.6	6.2	7.2	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	97	99	79	95	98	99			99		
cM capacity (veh/h)	363	390	870	387	402	654	1387			1128		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	120	426	183
Volume Left	5	82	11	11
Volume Right	5	16	54	11
cSH	443	413	1387	1128
Volume to Capacity	0.05	0.29	0.01	0.01
Queue Length 95th (ft)	4	30	1	1
Control Delay (s)	13.5	17.2	0.3	0.6
Lane LOS	B	C	A	A
Approach Delay (s)	13.5	17.2	0.3	0.6
Approach LOS	B	C		

Intersection Summary				
Average Delay		3.4		
Intersection Capacity Utilization		43.0%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	33	51	105	319	243	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	55	114	347	264	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)				863		
pX, platoon unblocked						
vC, conflicting volume	858	283	302			
vC1, stage 1 conf vol	283					
vC2, stage 2 conf vol	575					
vCu, unblocked vol	858	283	302			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4	2.3			
p0 queue free %	92	93	91			
cM capacity (veh/h)	464	744	1231			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	91	114	347	302
Volume Left	36	114	0	0
Volume Right	55	0	0	38
cSH	602	1231	1700	1700
Volume to Capacity	0.15	0.09	0.20	0.18
Queue Length 95th (ft)	13	8	0	0
Control Delay (s)	12.1	8.2	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.1	2.0		0.0
Approach LOS	B			

Intersection Summary				
Average Delay		2.4		
Intersection Capacity Utilization		35.7%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	99	32	110	115	223	23	182	140	149	111	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	1810	1538	1719	1810	1538	1719	1692		3335	1810	1538
Flt Permitted	0.68	1.00	1.00	0.69	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1225	1810	1538	1244	1810	1538	1719	1692		3335	1810	1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	108	35	120	125	242	25	198	152	162	121	36
RTOR Reduction (vph)	0	0	27	0	0	185	0	39	0	0	0	19
Lane Group Flow (vph)	21	108	8	120	125	57	25	311	0	162	121	17
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						6
Actuated Green, G (s)	10.9	10.9	10.9	10.9	10.9	10.9	0.8	17.2		5.9	22.3	22.3
Effective Green, g (s)	10.9	10.9	10.9	10.9	10.9	10.9	0.8	17.2		5.9	22.3	22.3
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.24	0.24	0.02	0.37		0.13	0.48	0.48
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	290	429	364	295	429	364	30	633		428	877	746
v/s Ratio Prot		0.06			0.07		0.01	c0.18		c0.05	0.07	
v/s Ratio Perm	0.02		0.01	c0.10		0.04						0.01
v/c Ratio	0.07	0.25	0.02	0.41	0.29	0.16	0.83	0.49		0.38	0.14	0.02
Uniform Delay, d1	13.6	14.2	13.5	14.8	14.4	13.9	22.5	11.0		18.4	6.5	6.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.3	0.0	0.9	0.4	0.2	95.9	0.6		0.6	0.1	0.0
Delay (s)	13.7	14.6	13.5	15.7	14.8	14.1	118.4	11.6		18.9	6.6	6.2
Level of Service	B	B	B	B	B	B	F	B		B	A	A
Approach Delay (s)		14.2			14.7			18.8			12.8	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	46.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	238	45	45	243	220	90	330	40	135	195	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.93		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	3356		1719	3193		1719	1780		1719	1721	
Flt Permitted	0.95	1.00		0.95	1.00		0.48	1.00		0.37	1.00	
Satd. Flow (perm)	1719	3356		1719	3193		865	1780		672	1721	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	141	259	49	49	264	239	98	359	43	147	212	103
RTOR Reduction (vph)	0	18	0	0	178	0	0	6	0	0	26	0
Lane Group Flow (vph)	141	290	0	49	325	0	98	396	0	147	289	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.7	19.1		1.8	13.2		18.6	18.6		18.6	18.6	
Effective Green, g (s)	7.7	19.1		1.8	13.2		18.6	18.6		18.6	18.6	
Actuated g/C Ratio	0.15	0.37		0.03	0.26		0.36	0.36		0.36	0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	257	1245		60	818		312	643		243	622	
v/s Ratio Prot	c0.08	0.09		0.03	c0.10			c0.22			0.17	
v/s Ratio Perm							0.11			0.22		
v/c Ratio	0.55	0.23		0.82	0.40		0.31	0.62		0.60	0.47	
Uniform Delay, d1	20.3	11.2		24.7	15.9		11.9	13.5		13.4	12.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	0.1		55.6	0.3		0.6	1.8		4.2	0.6	
Delay (s)	22.7	11.3		80.3	16.2		12.4	15.3		17.7	13.2	
Level of Service	C	B		F	B		B	B		B	B	
Approach Delay (s)		14.8			21.9			14.7			14.6	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	51.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	130	238	55	80	180	150	567	133	90	198	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	1810	1538	1719	1613	1461	1719	3340		1719	1810	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1719	1810	1538	1719	1613	1461	1719	3340		1719	1810	1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	207	141	259	60	87	196	163	616	145	98	215	223
RTOR Reduction (vph)	0	0	187	0	34	117	0	22	0	0	0	159
Lane Group Flow (vph)	207	141	72	60	114	18	163	739	0	98	215	64
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	15.5	22.1	22.1	4.2	10.8	10.8	14.8	30.4		7.3	22.9	22.9
Effective Green, g (s)	15.5	22.1	22.1	4.2	10.8	10.8	14.8	30.4		7.3	22.9	22.9
Actuated g/C Ratio	0.19	0.28	0.28	0.05	0.14	0.14	0.18	0.38		0.09	0.29	0.29
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	333	500	425	90	218	197	318	1269		157	518	440
v/s Ratio Prot	c0.12	0.08		0.03	c0.07		0.09	c0.22		c0.06	0.12	
v/s Ratio Perm			0.05			0.01						0.04
v/c Ratio	0.62	0.28	0.17	0.67	0.52	0.09	0.51	0.58		0.62	0.42	0.15
Uniform Delay, d1	29.6	22.7	22.0	37.2	32.2	30.3	29.4	19.7		35.0	23.1	21.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.56	0.52	1.53
Incremental Delay, d2	3.6	0.3	0.2	17.1	2.3	0.2	1.4	2.0		6.6	2.1	0.6
Delay (s)	33.1	23.0	22.2	54.3	34.5	30.5	30.7	21.7		26.3	14.1	33.2
Level of Service	C	C	C	D	C	C	C	C		C	B	C
Approach Delay (s)		26.1			36.4			23.3			24.3	
Approach LOS		C			D			C			C	

Intersection Summary				
HCM Average Control Delay	26.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	56.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	283	0	180	787	150	0	0	210	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor				1.00	1.00		0.97	0.95			0.95	
Frt				1.00	0.85		1.00	1.00			0.95	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1736	1553		3367	3471			3303	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1736	1553		3367	3471			3303	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	308	0	196	855	163	0	0	228	109
RTOR Reduction (vph)	0	0	0	0	150	0	0	0	0	0	67	0
Lane Group Flow (vph)	0	0	0	308	46	0	855	163	0	0	270	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type				Prot			Prot					
Protected Phases				3	8		5	2			6	
Permitted Phases												
Actuated Green, G (s)				18.6	18.6		28.0	53.4			21.4	
Effective Green, g (s)				18.6	18.6		28.0	53.4			21.4	
Actuated g/C Ratio				0.23	0.23		0.35	0.67			0.27	
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				404	361		1178	2317			884	
v/s Ratio Prot				c0.18	0.03		c0.25	0.05			c0.08	
v/s Ratio Perm												
v/c Ratio				0.76	0.13		0.73	0.07			0.30	
Uniform Delay, d1				28.6	24.3		22.7	4.6			23.4	
Progression Factor				1.00	1.00		0.68	0.56			1.00	
Incremental Delay, d2				8.3	0.2		2.0	0.1			0.9	
Delay (s)				36.9	24.4		17.4	2.7			24.3	
Level of Service				D	C		B	A			C	
Approach Delay (s)		0.0			32.1			15.1			24.3	
Approach LOS		A			C			B			C	

Intersection Summary				
HCM Average Control Delay	21.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	57.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
1: PRICE & U.S. 101 SB OFF RAMP

Cumulative PM Plus Project
11/11/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	215	260	30	150	0	270	0	30	60	212	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	234	283	33	163	0	293	0	33	65	230	22

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	234	283	196	326	65	252
Volume Left (vph)	0	0	33	293	65	0
Volume Right (vph)	0	283	0	33	0	22
Hadj (s)	0.05	-0.65	0.08	0.17	0.55	-0.01
Departure Headway (s)	7.5	6.7	8.1	7.7	8.2	7.6
Degree Utilization, x	0.48	0.53	0.44	0.70	0.15	0.54
Capacity (veh/h)	460	501	400	447	410	438
Control Delay (s)	16.1	15.9	17.3	26.6	11.4	17.9
Approach Delay (s)	16.0		17.3	26.6	16.6	
Approach LOS	C		C	D	C	

Intersection Summary			
Delay		18.9	
HCM Level of Service		C	
Intersection Capacity Utilization		63.4%	ICU Level of Service B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
2: POMEROY & HIGHWAY 1

Cumulative PM Plus Project
11/11/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	60	125	35	20	495	0	0	462	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0			4.0			4.0	
Lane Util. Factor				1.00	1.00			1.00			1.00	
Frt				1.00	0.97			1.00			0.97	
Flt Protected				0.95	1.00			1.00			1.00	
Satd. Flow (prot)				1752	1784			1841			1784	
Flt Permitted				0.95	1.00			0.97			1.00	
Satd. Flow (perm)				1752	1784			1788			1784	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	65	136	38	22	538	0	0	502	163
RTOR Reduction (vph)	0	0	0	0	14	0	0	0	0	0	11	0
Lane Group Flow (vph)	0	0	0	65	160	0	0	560	0	0	654	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type				Prot			Perm					
Protected Phases				3	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)				12.4	12.4			59.6			59.6	
Effective Green, g (s)				12.4	12.4			59.6			59.6	
Actuated g/C Ratio				0.16	0.16			0.74			0.74	
Clearance Time (s)				4.0	4.0			4.0			4.0	
Vehicle Extension (s)				3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)				272	277			1332			1329	
v/s Ratio Prot				0.04	c0.09						c0.37	
v/s Ratio Perm								0.31				
v/c Ratio				0.24	0.58			0.42			0.49	
Uniform Delay, d1				29.7	31.4			3.8			4.1	
Progression Factor				1.00	1.00			0.77			1.00	
Incremental Delay, d2				0.5	2.9			0.9			1.3	
Delay (s)				30.1	34.3			3.8			5.4	
Level of Service				C	C			A			A	
Approach Delay (s)		0.0			33.2			3.8			5.4	
Approach LOS		A			C			A			A	

Intersection Summary				
HCM Average Control Delay	9.3	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	57.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	145	70	0	0	0	0	380	78	60	497	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		0.97						0.98			1.00	
Flt Protected		0.99						1.00			0.99	
Satd. Flow (prot)		3335						1802			1835	
Flt Permitted		0.99						1.00			0.91	
Satd. Flow (perm)		3335						1802			1680	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	158	76	0	0	0	0	413	85	65	540	0
RTOR Reduction (vph)	0	38	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	294	0	0	0	0	0	491	0	0	605	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm									Perm		
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		12.4						59.6			59.6	
Effective Green, g (s)		12.4						59.6			59.6	
Actuated g/C Ratio		0.16						0.74			0.74	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		517						1342			1252	
v/s Ratio Prot								0.27				
v/s Ratio Perm		0.09									c0.36	
v/c Ratio		0.57						0.37			0.48	
Uniform Delay, d1		31.3						3.6			4.1	
Progression Factor		1.00						1.00			0.58	
Incremental Delay, d2		1.4						0.8			1.2	
Delay (s)		32.8						4.3			3.6	
Level of Service		C						A			A	
Approach Delay (s)		32.8			0.0			4.3			3.6	
Approach LOS		C			A			A			A	

Intersection Summary				
HCM Average Control Delay	10.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	73.1%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	35	15	140	45	20	10	428	165	25	542	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	38	16	152	49	22	11	465	179	27	589	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											635	
pX, platoon unblocked	0.90	0.90	0.90	0.90	0.90		0.90					
vC, conflicting volume	1274	1318	597	1264	1236	555	605			645		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1249	1298	497	1237	1207	555	506			645		
tC, single (s)	7.2	6.6	6.2	7.2	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	72	97	0	69	96	99			97		
cM capacity (veh/h)	94	138	510	100	156	526	939			926		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	65	223	655	633
Volume Left	11	152	11	27
Volume Right	16	22	179	16
cSH	154	119	939	926
Volume to Capacity	0.42	1.88	0.01	0.03
Queue Length 95th (ft)	47	443	1	2
Control Delay (s)	44.7	486.1	0.3	0.8
Lane LOS	E	F	A	A
Approach Delay (s)	44.7	486.1	0.3	0.8
Approach LOS	E	F		

Intersection Summary			
Average Delay	71.0		
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	98	103	169	385	612	45
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	107	112	184	418	665	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)				863		
pX, platoon unblocked						
vC, conflicting volume	1476	690	714			
vC1, stage 1 conf vol	690					
vC2, stage 2 conf vol	786					
vCu, unblocked vol	1476	690	714			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	64	75	79			
cM capacity (veh/h)	297	442	877			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	218	184	418	714
Volume Left	107	184	0	0
Volume Right	112	0	0	49
cSH	357	877	1700	1700
Volume to Capacity	0.61	0.21	0.25	0.42
Queue Length 95th (ft)	97	20	0	0
Control Delay (s)	29.7	10.2	0.0	0.0
Lane LOS	D	B		
Approach Delay (s)	29.7	3.1		0.0
Approach LOS	D			

Intersection Summary				
Average Delay		5.5		
Intersection Capacity Utilization		66.0%	ICU Level of Service	C
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	148	38	235	183	292	28	217	185	312	347	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1701		3367	1827	1553
Flt Permitted	0.58	1.00	1.00	0.64	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1056	1827	1553	1166	1827	1553	1736	1701		3367	1827	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	161	41	255	199	317	30	236	201	339	377	62
RTOR Reduction (vph)	0	0	29	0	0	222	0	39	0	0	0	20
Lane Group Flow (vph)	49	161	12	255	199	95	30	398	0	339	377	42
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						6
Actuated Green, G (s)	19.6	19.6	19.6	19.6	19.6	19.6	1.6	22.8		11.0	32.2	32.2
Effective Green, g (s)	19.6	19.6	19.6	19.6	19.6	19.6	1.6	22.8		11.0	32.2	32.2
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.30	0.30	0.02	0.35		0.17	0.49	0.49
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	316	548	465	349	548	465	42	593		566	900	765
v/s Ratio Prot		0.09			0.11		0.02	c0.23		c0.10	0.21	
v/s Ratio Perm	0.05		0.01	c0.22		0.06						0.03
v/c Ratio	0.16	0.29	0.03	0.73	0.36	0.20	0.71	0.67		0.60	0.42	0.05
Uniform Delay, d1	16.8	17.6	16.2	20.5	18.0	17.1	31.7	18.1		25.2	10.6	8.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.3	0.0	7.7	0.4	0.2	44.2	3.0		1.7	0.3	0.0
Delay (s)	17.0	17.9	16.2	28.2	18.4	17.3	75.9	21.1		26.9	10.9	8.7
Level of Service	B	B	B	C	B	B	E	C		C	B	A
Approach Delay (s)		17.4			21.2			24.6			17.7	
Approach LOS		B			C			C			B	

Intersection Summary				
HCM Average Control Delay		20.3	HCM Level of Service	C
HCM Volume to Capacity ratio		0.68		
Actuated Cycle Length (s)		65.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization		65.8%	ICU Level of Service	C
Analysis Period (min)		15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	204	421	60	55	437	185	90	340	55	225	430	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	3440		1752	3349		1752	1806		1752	1766	
Flt Permitted	0.95	1.00		0.95	1.00		0.16	1.00		0.36	1.00	
Satd. Flow (perm)	1752	3440		1752	3349		288	1806		672	1766	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	222	458	65	60	475	201	98	370	60	245	467	184
RTOR Reduction (vph)	0	12	0	0	55	0	0	9	0	0	20	0
Lane Group Flow (vph)	222	511	0	60	621	0	98	421	0	245	631	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	11.7	25.4		3.8	17.5		30.9	30.9		30.9	30.9	
Effective Green, g (s)	11.7	25.4		3.8	17.5		30.9	30.9		30.9	30.9	
Actuated g/C Ratio	0.16	0.35		0.05	0.24		0.43	0.43		0.43	0.43	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	284	1212		92	813		123	774		288	757	
v/s Ratio Prot	c0.13	0.15		0.03	c0.19			0.23			0.36	
v/s Ratio Perm							0.34			c0.36		
v/c Ratio	0.78	0.42		0.65	0.76		0.80	0.54		0.85	0.83	
Uniform Delay, d1	29.0	17.8		33.5	25.4		17.9	15.4		18.5	18.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.1	0.2		15.4	4.3		29.0	0.8		20.7	7.8	
Delay (s)	42.0	18.0		48.9	29.7		46.9	16.1		39.2	26.2	
Level of Service	D	B		D	C		D	B		D	C	
Approach Delay (s)		25.2			31.2			21.8			29.7	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	27.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	72.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	80.5%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	395	295	682	110	115	190	140	508	206	130	327	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1694	1504	1770	3386		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1694	1504	1770	3386		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	429	321	741	120	125	207	152	552	224	141	355	337
RTOR Reduction (vph)	0	0	274	0	19	133	0	53	0	0	0	248
Lane Group Flow (vph)	429	321	467	120	156	24	152	723	0	141	355	89
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	22.7	27.1	27.1	7.8	12.2	12.2	8.0	20.9		8.2	21.1	21.1
Effective Green, g (s)	22.7	27.1	27.1	7.8	12.2	12.2	8.0	20.9		8.2	21.1	21.1
Actuated g/C Ratio	0.28	0.34	0.34	0.10	0.15	0.15	0.10	0.26		0.10	0.26	0.26
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	502	631	536	173	258	229	177	885		181	491	418
v/s Ratio Prot	0.24	0.17		0.07	c0.09		0.09	c0.21		0.08	c0.19	
v/s Ratio Perm			c0.29			0.02						0.06
v/c Ratio	0.85	0.51	0.87	0.69	0.61	0.10	0.86	0.82		0.78	0.72	0.21
Uniform Delay, d1	27.1	21.1	24.8	34.9	31.7	29.2	35.4	27.8		35.0	26.8	23.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.80	0.56	1.62
Incremental Delay, d2	13.3	0.6	14.3	11.4	4.0	0.2	31.4	8.2		15.8	7.4	1.0
Delay (s)	40.4	21.8	39.1	46.3	35.6	29.4	66.9	36.0		44.0	22.4	38.2
Level of Service	D	C	D	D	D	C	E	D		D	C	D
Approach Delay (s)		35.8			36.3			41.1			32.4	
Approach LOS		D			D			D			C	

Intersection Summary				
HCM Average Control Delay	36.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	75.5%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
9: U.S. 101 NB RAMPS & 4TH

Cumulative PM Plus Project
11/11/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	452	5	95	533	560	0	0	315	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor				1.00	1.00		0.97	0.95			0.95	
Frt				1.00	0.86		1.00	1.00			0.98	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1752	1581		3400	3505			3439	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1752	1581		3400	3505			3439	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	491	5	103	579	609	0	0	342	49
RTOR Reduction (vph)	0	0	0	0	68	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	0	0	491	40	0	579	609	0	0	378	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type				Prot			Prot					
Protected Phases				3	8		5	2			6	
Permitted Phases												
Actuated Green, G (s)				26.8	26.8		19.0	45.2			22.2	
Effective Green, g (s)				26.8	26.8		19.0	45.2			22.2	
Actuated g/C Ratio				0.34	0.34		0.24	0.57			0.28	
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				587	530		808	1980			954	
v/s Ratio Prot				c0.28	0.02		c0.17	0.17			c0.11	
v/s Ratio Perm												
v/c Ratio				0.84	0.07		0.72	0.31			0.40	
Uniform Delay, d1				24.6	18.1		28.0	9.2			23.5	
Progression Factor				1.00	1.00		0.76	0.66			1.00	
Incremental Delay, d2				10.0	0.1		2.0	0.3			1.2	
Delay (s)				34.6	18.2		23.3	6.3			24.7	
Level of Service				C	B		C	A			C	
Approach Delay (s)		0.0			31.7			14.6			24.7	
Approach LOS		A			C			B			C	

Intersection Summary			
HCM Average Control Delay	21.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
1: PRICE & U.S. 101 SB OFF RAMP

Cumulative Saturday Plus Project
11/11/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	265	380	55	275	0	355	0	60	90	250	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	288	413	60	299	0	386	0	65	98	272	33

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	288	413	359	451	98	304
Volume Left (vph)	0	0	60	386	98	0
Volume Right (vph)	0	413	0	65	0	33
Hadj (s)	0.05	-0.65	0.08	0.14	0.55	-0.02
Departure Headway (s)	9.3	8.6	9.6	10.0	10.1	9.5
Degree Utilization, x	0.74	0.99	0.96	1.25	0.27	0.81
Capacity (veh/h)	378	413	370	366	350	371
Control Delay (s)	33.7	69.5	68.8	162.9	15.7	41.0
Approach Delay (s)	54.8		68.8	162.9	34.9	
Approach LOS	F		F	F	D	

Intersection Summary			
Delay	78.7		
HCM Level of Service	F		
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	155	155	80	20	575	0	0	390	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0			4.0			4.0	
Lane Util. Factor				1.00	1.00			1.00			1.00	
Frt				1.00	0.95			1.00			0.96	
Flt Protected				0.95	1.00			1.00			1.00	
Satd. Flow (prot)				1752	1750			1842			1768	
Flt Permitted				0.95	1.00			0.97			1.00	
Satd. Flow (perm)				1752	1750			1799			1768	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	168	168	87	22	625	0	0	424	190
RTOR Reduction (vph)	0	0	0	0	26	0	0	0	0	0	16	0
Lane Group Flow (vph)	0	0	0	168	229	0	0	647	0	0	598	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type				Prot			Perm					
Protected Phases				3	8			2			6	
Permitted Phases							2					
Actuated Green, G (s)				15.5	15.5			56.5			56.5	
Effective Green, g (s)				15.5	15.5			56.5			56.5	
Actuated g/C Ratio				0.19	0.19			0.71			0.71	
Clearance Time (s)				4.0	4.0			4.0			4.0	
Vehicle Extension (s)				3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)				339	339			1271			1249	
v/s Ratio Prot				0.10	c0.13						0.34	
v/s Ratio Perm								c0.36				
v/c Ratio				0.50	0.68			0.51			0.48	
Uniform Delay, d1				28.8	29.9			5.4			5.2	
Progression Factor				1.00	1.00			0.73			1.00	
Incremental Delay, d2				1.1	5.3			1.3			1.3	
Delay (s)				29.9	35.2			5.3			6.5	
Level of Service				C	D			A			A	
Approach Delay (s)		0.0			33.1			5.3			6.5	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	110	100	0	0	0	0	515	96	60	495	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		0.96						0.98			1.00	
Flt Protected		0.98						1.00			0.99	
Satd. Flow (prot)		3321						1823			1853	
Flt Permitted		0.98						1.00			0.89	
Satd. Flow (perm)		3321						1823			1652	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	120	109	0	0	0	0	560	104	65	538	0
RTOR Reduction (vph)	0	59	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	322	0	0	0	0	0	657	0	0	603	0
Turn Type	Perm									Perm		
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		13.0						59.0			59.0	
Effective Green, g (s)		13.0						59.0			59.0	
Actuated g/C Ratio		0.16						0.74			0.74	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		540						1344			1218	
v/s Ratio Prot								0.36				
v/s Ratio Perm		0.10									c0.36	
v/c Ratio		0.60						0.49			0.50	
Uniform Delay, d1		31.1						4.3			4.3	
Progression Factor		1.00						1.00			1.01	
Incremental Delay, d2		1.8						1.3			1.3	
Delay (s)		32.9						5.6			5.7	
Level of Service		C						A			A	
Approach Delay (s)		32.9			0.0			5.6			5.7	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM Average Control Delay	11.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	25	35	125	55	25	25	576	165	30	470	35
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	27	38	136	60	27	27	626	179	33	511	38
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											635	
pX, platoon unblocked	0.92	0.92	0.92	0.92	0.92		0.92					
vC, conflicting volume	1422	1455	530	1417	1384	716	549			805		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1416	1451	451	1410	1375	716	471			805		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	54	76	93	0	52	94	97			96		
cM capacity (veh/h)	59	112	561	77	125	429	1003			815		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	92	223	833	582
Volume Left	27	136	27	33
Volume Right	38	27	179	38
cSH	120	97	1003	815
Volume to Capacity	0.77	2.31	0.03	0.04
Queue Length 95th (ft)	110	499	2	3
Control Delay (s)	97.9	690.8	0.7	1.1
Lane LOS	F	F	A	A
Approach Delay (s)	97.9	690.8	0.7	1.1
Approach LOS	F	F		

Intersection Summary				
Average Delay		94.9		
Intersection Capacity Utilization		73.0%	ICU Level of Service	C
Analysis Period (min)		15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	71	191	289	485	472	133
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	77	208	314	527	513	145
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)				863		
pX, platoon unblocked						
vC, conflicting volume	1741	585	658			
vC1, stage 1 conf vol	585					
vC2, stage 2 conf vol	1155					
vCu, unblocked vol	1741	585	658			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4	2.3			
p0 queue free %	57	58	65			
cM capacity (veh/h)	179	500	902			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	285	314	527	658
Volume Left	77	314	0	0
Volume Right	208	0	0	145
cSH	336	902	1700	1700
Volume to Capacity	0.85	0.35	0.31	0.39
Queue Length 95th (ft)	190	39	0	0
Control Delay (s)	53.9	11.1	0.0	0.0
Lane LOS	F	B		
Approach Delay (s)	53.9	4.1		0.0
Approach LOS	F			

Intersection Summary				
Average Delay		10.6		
Intersection Capacity Utilization		74.6%	ICU Level of Service	D
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	179	60	290	316	366	40	313	265	322	238	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1701		3367	1827	1553
Flt Permitted	0.37	1.00	1.00	0.58	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	684	1827	1553	1054	1827	1553	1736	1701		3367	1827	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	195	65	315	343	398	43	340	288	350	259	111
RTOR Reduction (vph)	0	0	44	0	0	268	0	38	0	0	0	54
Lane Group Flow (vph)	103	195	21	315	343	130	43	590	0	350	259	57
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						6
Actuated Green, G (s)	25.3	25.3	25.3	25.3	25.3	25.3	3.4	30.8		9.1	36.5	36.5
Effective Green, g (s)	25.3	25.3	25.3	25.3	25.3	25.3	3.4	30.8		9.1	36.5	36.5
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.33	0.04	0.40		0.12	0.47	0.47
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	224	599	509	345	599	509	76	679		397	864	734
v/s Ratio Prot		0.11			0.19		0.02	c0.35		c0.10	0.14	
v/s Ratio Perm	0.15		0.01	c0.30		0.08						0.04
v/c Ratio	0.46	0.33	0.04	0.91	0.57	0.26	0.57	0.87		0.88	0.30	0.08
Uniform Delay, d1	20.5	19.5	17.7	24.9	21.5	19.0	36.2	21.3		33.5	12.5	11.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5	0.3	0.0	27.5	1.3	0.3	9.3	11.4		19.9	0.2	0.0
Delay (s)	22.0	19.8	17.7	52.4	22.8	19.3	45.5	32.7		53.4	12.7	11.2
Level of Service	C	B	B	D	C	B	D	C		D	B	B
Approach Delay (s)		20.1			30.3			33.5			32.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	30.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	77.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	246	520	25	125	505	100	145	225	55	220	255	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	3447		1736	3385		1736	1773		1736	1693	
Flt Permitted	0.95	1.00		0.95	1.00		0.21	1.00		0.47	1.00	
Satd. Flow (perm)	1736	3447		1736	3385		384	1773		860	1693	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	267	565	27	136	549	109	158	245	60	239	277	263
RTOR Reduction (vph)	0	4	0	0	19	0	0	13	0	0	49	0
Lane Group Flow (vph)	267	588	0	136	639	0	158	292	0	239	491	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	13.6	23.3		7.8	17.5		26.5	26.5		26.5	26.5	
Effective Green, g (s)	13.6	23.3		7.8	17.5		26.5	26.5		26.5	26.5	
Actuated g/C Ratio	0.20	0.33		0.11	0.25		0.38	0.38		0.38	0.38	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	339	1154		195	851		146	675		327	645	
v/s Ratio Prot	c0.15	0.17		0.08	c0.19			0.16			0.29	
v/s Ratio Perm							c0.41			0.28		
v/c Ratio	0.79	0.51		0.70	0.75		1.08	0.43		0.73	0.76	
Uniform Delay, d1	26.6	18.6		29.8	24.0		21.5	16.0		18.5	18.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.5	0.4		10.4	3.8		98.2	0.4		8.2	5.3	
Delay (s)	38.1	18.9		40.1	27.8		119.7	16.4		26.6	24.1	
Level of Service	D	B		D	C		F	B		C	C	
Approach Delay (s)		24.9			29.9			51.7			24.9	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM Average Control Delay	30.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	69.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	305	277	130	175	105	195	476	180	110	260	415
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1721	1475	1736	3328		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1721	1475	1736	3328		1736	1827	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	326	332	301	141	190	114	212	517	196	120	283	451
RTOR Reduction (vph)	0	0	222	0	2	86	0	46	0	0	0	341
Lane Group Flow (vph)	326	332	79	141	199	17	212	667	0	120	283	110
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	18.1	21.0	21.0	10.6	13.5	13.5	12.8	24.6		7.8	19.6	19.6
Effective Green, g (s)	18.1	21.0	21.0	10.6	13.5	13.5	12.8	24.6		7.8	19.6	19.6
Actuated g/C Ratio	0.23	0.26	0.26	0.13	0.17	0.17	0.16	0.31		0.10	0.25	0.25
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	393	480	408	230	290	249	278	1023		169	448	380
v/s Ratio Prot	c0.19	c0.18		0.08	c0.12		c0.12	c0.20		0.07	0.15	
v/s Ratio Perm			0.05			0.01						0.07
v/c Ratio	0.83	0.69	0.19	0.61	0.68	0.07	0.76	0.65		0.71	0.63	0.29
Uniform Delay, d1	29.5	26.6	22.9	32.8	31.2	28.0	32.1	24.0		35.0	27.0	24.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.11	0.57	1.92
Incremental Delay, d2	13.5	4.3	0.2	4.8	6.5	0.1	11.7	3.2		8.5	4.2	1.2
Delay (s)	43.0	30.9	23.2	37.5	37.8	28.1	43.8	27.2		47.5	19.7	48.3
Level of Service	D	C	C	D	D	C	D	C		D	B	D
Approach Delay (s)		32.6			35.5			31.0			38.7	
Approach LOS		C			D			C			D	

Intersection Summary			
HCM Average Control Delay	34.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	575	10	90	706	175	0	0	210	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor				1.00	1.00		0.97	0.95			0.95	
Frt				1.00	0.87		1.00	1.00			0.97	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1770	1612		3433	3539			3438	
Flt Permitted				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)				1770	1612		3433	3539			3438	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	625	11	98	767	190	0	0	228	54
RTOR Reduction (vph)	0	0	0	0	61	0	0	0	0	0	25	0
Lane Group Flow (vph)	0	0	0	625	48	0	767	190	0	0	257	0
Turn Type				Prot			Prot					
Protected Phases				3	8		5	2			6	
Permitted Phases												
Actuated Green, G (s)				30.1	30.1		19.7	41.9			18.2	
Effective Green, g (s)				30.1	30.1		19.7	41.9			18.2	
Actuated g/C Ratio				0.38	0.38		0.25	0.52			0.23	
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				666	607		845	1854			782	
v/s Ratio Prot				c0.35	0.03		c0.22	0.05			c0.07	
v/s Ratio Perm												
v/c Ratio				0.94	0.08		0.91	0.10			0.33	
Uniform Delay, d1				24.1	16.0		29.3	9.6			25.8	
Progression Factor				1.00	1.00		0.57	0.82			1.00	
Incremental Delay, d2				20.9	0.1		10.5	0.1			1.1	
Delay (s)				44.9	16.1		27.1	8.0			26.9	
Level of Service				D	B		C	A			C	
Approach Delay (s)		0.0			40.6			23.3			26.9	
Approach LOS		A			D			C			C	

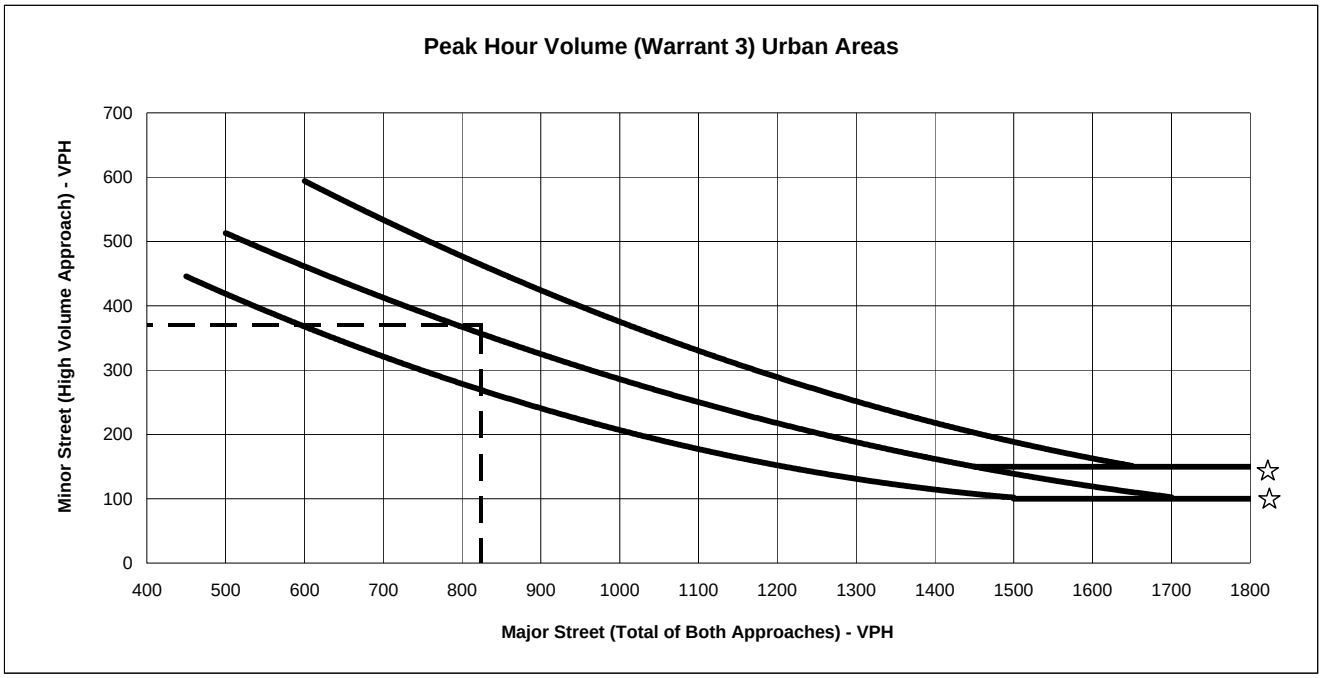
Intersection Summary			
HCM Average Control Delay	30.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX 3

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

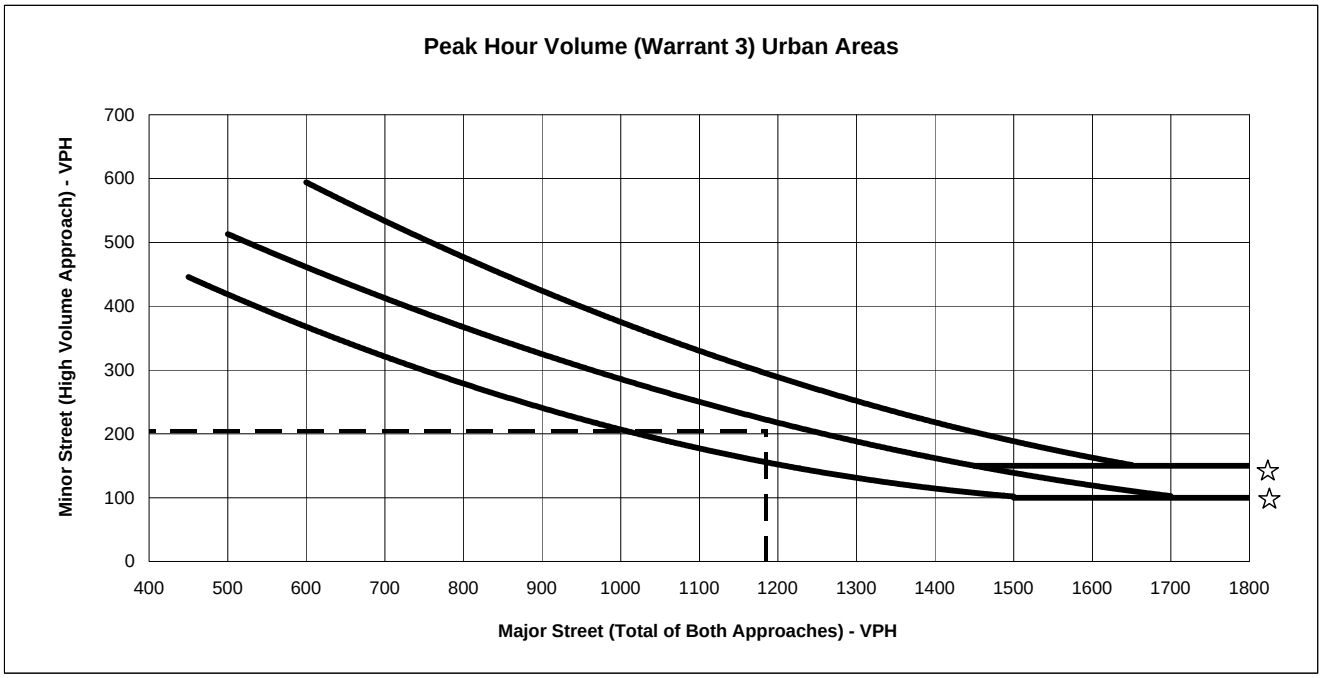
Existing Plus Project

		Number of Lanes	Scenario
Major Approach	Highway 1	1	Saturday
Minor Approach	Price Street	1	

Major St. Volume:	824
Minor St. Volume:	370
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

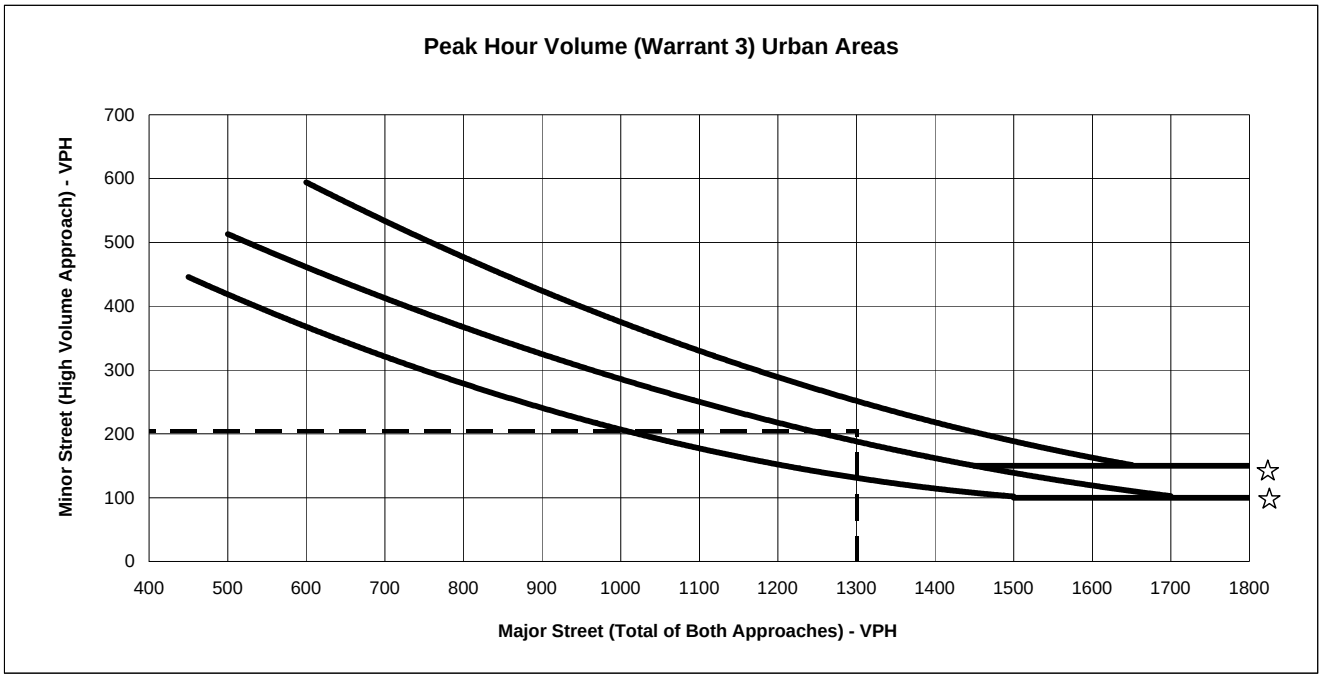
Cumulative Plus Project

		Number of Lanes	Scenario
Major Approach	Highway 1	1	PM
Minor Approach	Ocean View Avenue	1	

Major St. Volume:	1185
Minor St. Volume:	205
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

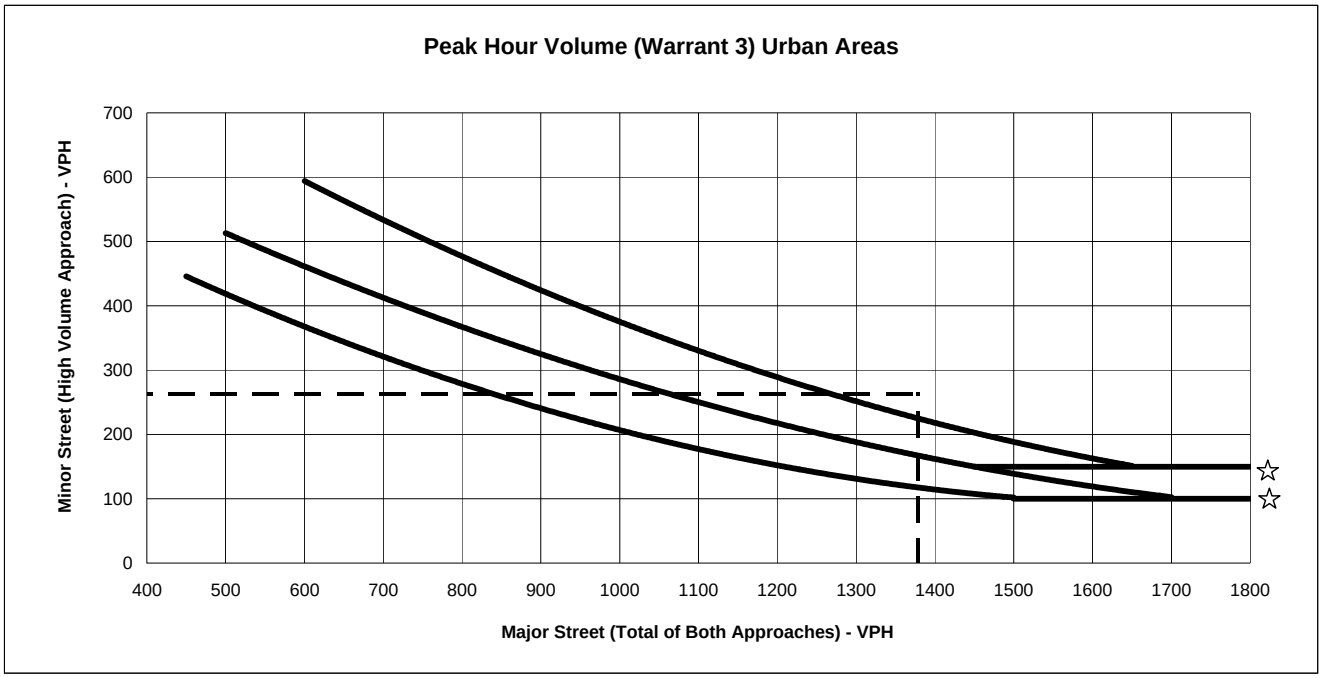
Cumulative Plus Project

		Number of Lanes	Scenario
Major Approach	Highway 1	1	Saturday
Minor Approach	Ocean View Avenue	1	

Major St. Volume:	1301
Minor St. Volume:	205
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Cumulative Plus Project

		Number of Lanes	Scenario
Major Approach	Highway 1	1	Saturday
Minor Approach	Le Sage Drive	1	

Major St. Volume:	1379
Minor St. Volume:	262
Warrant Met?:	Yes