Exhibit B7
PUD-81-30-87D
Received April 9, 2013

HEXAGON TRANSPORTATION CONSULTANTS, INC.

Memorandum

Date:	January 7, 2013
To:	Mr. Mike Tassano
From:	Brett Walinski, P.E. Matt Nelson
Subject:	Traffic Impact Analysis for Anton Hacienda Apartment Project

Introduction

Hexagon Transportation Consultants, Inc. has completed this traffic impact analysis for the proposed Anton Hacienda Apartment project located at 5725 West Las Positas Boulevard in Pleasanton, California. The proposed project would consist of 168 apartment units (64 one bedroom units, 88 two bedroom units, and 16 three bedroom units). Primary access to the project site would be provided by one full-access driveway on West Las Positas Boulevard, and additional access would be provided by one full-access driveway on Stoneridge Drive as part of a reciprocal access agreement with the adjacent medical office site. The project location and study intersections are shown on Figure 1, and the project site plan is shown on Figure 2.

Existing Site and Project Site

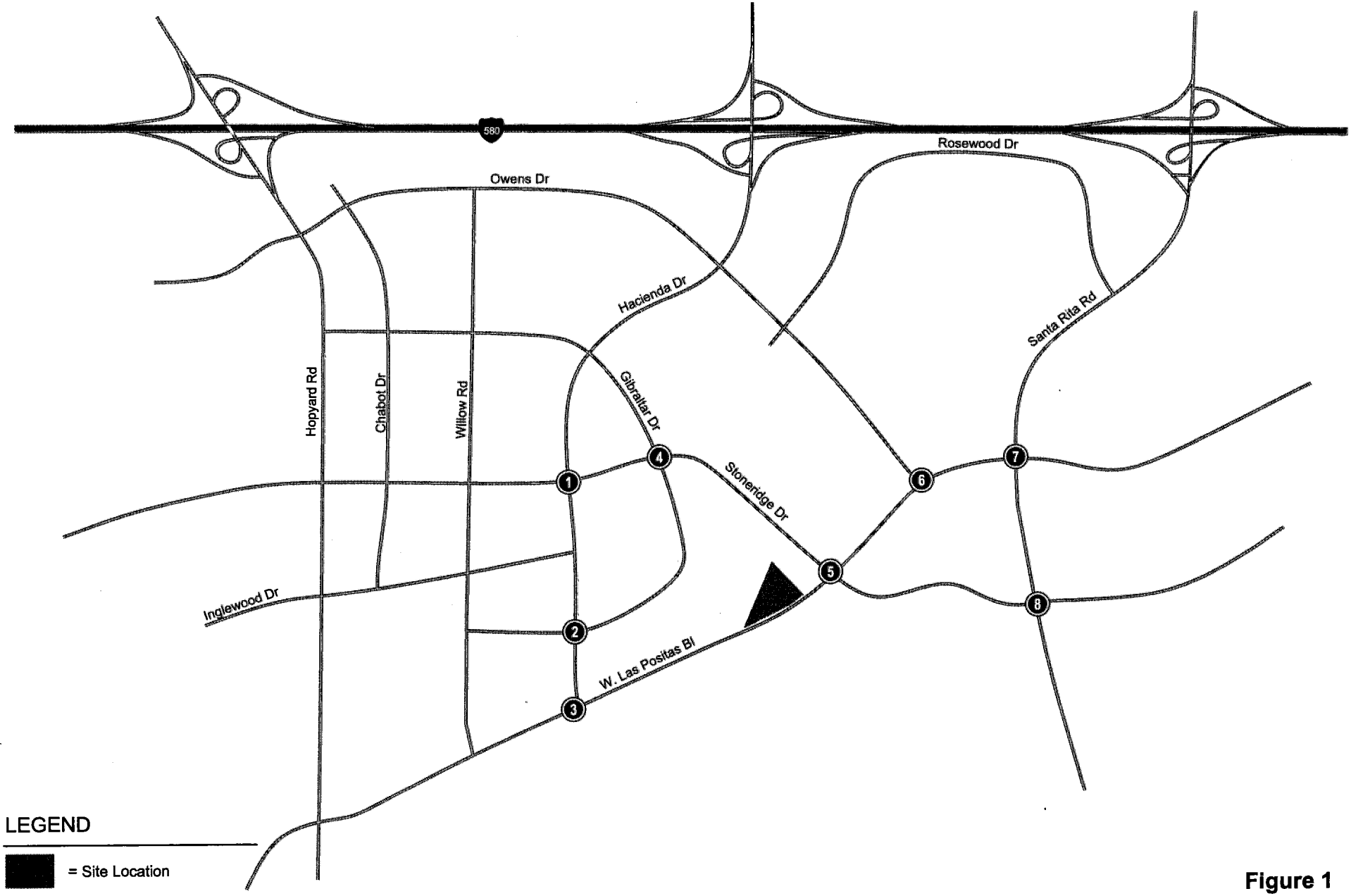
For purposes of clarity, a distinction is made between the "existing site" and the "project site." The existing site refers to the entire 10-acre triangular-shaped parcel bounded by Stoneridge Drive, West Las Positas Boulevard, and Tassajara Creek. This site is currently occupied entirely by Valleycare - hereafter referred to as the medical center.

The proposed 168-unit apartment complex is to occupy 5.6 acres on the southwest portion of this existing 10-acre site. This 5.6-acre piece will be referred to as the project site. After the project is completed, the 10-acre parcel will consist of the 5.6-acre project site and what remains (4.4 acres) of the medical center site.

Scope of Study

This study was conducted for the purpose of identifying the potential off-site traffic impacts and potential impacts on site access, on-site circulation, and parking. The potential impacts of the project were evaluated in accordance with the standards set forth by the City of Pleasanton. The traffic analysis was based on peak-hour levels of service for eight signalized intersections. The study intersections are identified below.

1. Hacienda Drive and Stoneridge Drive
2. Hacienda Drive and Gibraltar Drive
3. Hacienda Drive and West Las Positas Boulevard
4. Gibraltar Drive and Stoneridge Drive
5. Stoneridge Drive and West Las Positas Boulevard
6. Owens Drive and West Las Positas Boulevard
7. Santa Rita Road and West Las Positas Boulevard
8. Santa Rita Road and Stoneridge Drive



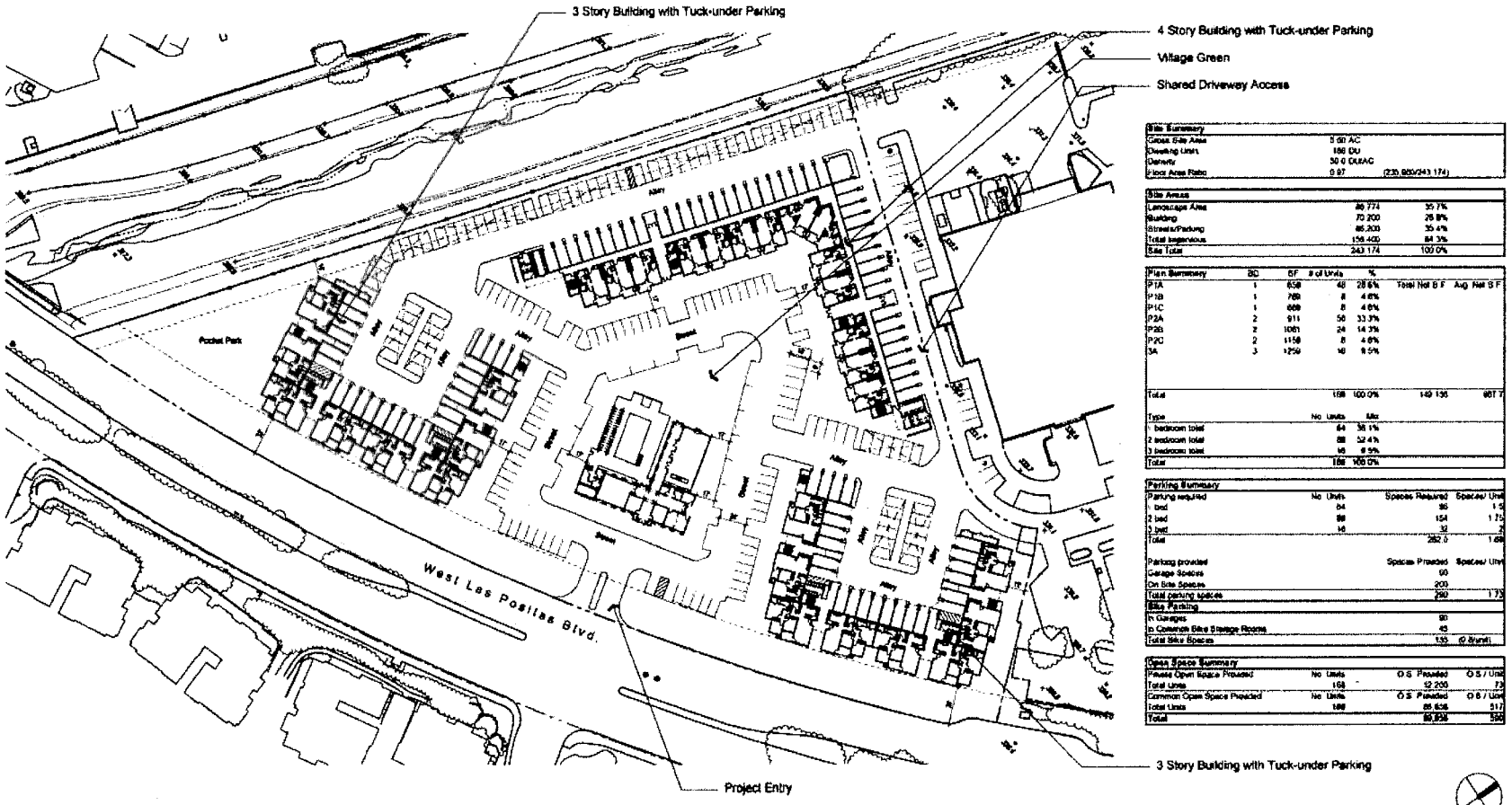
LEGEND

= Site Location

= Study Intersection

Figure 1

Site Location and Study Intersections



Site Summary		
Gross Site Area	5.60 AC	
Dwelling Units	168 DU	
Density	30.0 DU/AC	
Floor Area Ratio	0.97	(235,805/243,174)

Site Areas		
Landscape Area	86,774	35.7%
Building	70,200	28.9%
Streets/Parking	86,200	35.4%
Total Impervious	156,400	64.3%
Site Total	243,174	100.0%

Plan Summary	BD	SF	# of Units	%	Total Net S.F.	Avg. Net S.F.
P1A	1	658	48	28.6%		
P1B	1	769	8	4.8%		
P1C	1	809	8	4.8%		
P2A	2	911	56	33.3%		
P2B	2	1061	24	14.3%		
P2C	2	1158	8	4.8%		
3A	3	1250	16	9.5%		
Total			168	100.0%	149,136	887.7

Type	No. Units	Mix
1 bedroom total	64	38.1%
2 bedroom total	88	52.4%
3 bedroom total	16	9.5%
Total	168	100.0%

Parking Summary			
Parking required	No. Units	Spaces Required	Spaces/ Unit
1 bed	64	96	1.5
2 bed	88	154	1.75
3 bed	16	32	2
Total		282.0	1.68
Parking provided		Spaces Provided	Spaces/ Unit
Garage Spaces		90	
On Site Spaces		200	
Total parking spaces		290	1.73
Bike Parking			
In Garages		90	
In Common Bike Storage Rooms		45	
Total Bike Spaces		135	(0.8/unit)

Open Space Summary			
Private Open Space Provided	No. Units	O.S. Provided	O.S./Unit
Total Units	168	12,200	73
Common Open Space Provided	No. Units	O.S. Provided	O.S./Unit
Total Units	168	86,636	517
Total		86,636	590

0 20 40 80

ANTON HACIENDA

CONCEPTUAL SITE PLAN

A1.1

St·Anton PARTNERS
St. Anton Partners
1801 I Street, Suite 200
Sacramento, California 95811
916.400.2072

PLEASANTON, CALIFORNIA

KTGY Group, Inc.
Architecture+Planning
17922 Fitch
Irvine, CA 92614
949.851.2133
ktgy.com

Figure 2
Site Plan

Traffic conditions at the study intersections were analyzed for the weekday AM and PM peak hours of traffic. The AM peak hour is typically between 7:00 and 9:00 AM and the PM peak hour is typically between 4:00 and 6:00 PM. It is during these periods that the most congested traffic conditions occur on an average day. The operations of the study intersections were evaluated for the following scenarios:

Scenario 1: *Existing Conditions.* Existing traffic volumes are based on traffic counts from the year 2012 and obtained from the City of Pleasanton's Synchro database.

Scenario 2: *Existing Plus Project Conditions.* Existing plus project conditions were estimated by adding to existing traffic volumes the additional traffic generated by the project. Existing plus project conditions were evaluated relative to existing conditions in order to determine potential project impacts.

Scenario 3: *Existing Plus Approved Conditions.* Traffic volumes were obtained from the City of Pleasanton Synchro database. The City of Pleasanton Synchro database reflects all approved development in the city, including the Housing Element update (which includes the proposed project). Therefore, the existing plus approved traffic volumes supplied by the City include the proposed project. The existing plus approved without project conditions were estimated by subtracting the traffic generated by the project from the existing plus approved traffic volumes. Existing plus approved with project conditions were evaluated relative to existing plus approved without project conditions in order to determine potential near-term project impacts.

Scenario 4: *Buildout Conditions.* Buildout conditions represent buildout of both the General Plan and the City's Housing Element. Traffic volumes were obtained from the City of Pleasanton Synchro database. The buildout traffic volumes supplied by the City also include the proposed project. The buildout without project conditions were estimated by subtracting the traffic generated by the project from the buildout traffic volumes. Buildout with project conditions were evaluated relative to buildout without project conditions in order to determine potential far-term project impacts.

The study intersections were evaluated for each scenario using level of service (LOS). Level of service is a qualitative measure of traffic operations, ranging from LOS A (free-flow conditions) to LOS F (congested conditions). All of the study intersections are located in the City of Pleasanton and are therefore subject to the City of Pleasanton level of service standards. The City of Pleasanton evaluates level of service at signalized intersections based on the 2000 Highway Capacity Manual (HCM) level of service methodology using the Synchro software. The 2000 HCM method evaluates signalized intersection operations on the basis of average control delay time for all vehicles at the intersection. The City of Pleasanton level of service standard for signalized intersections is LOS D. There are a few exceptions to the LOS standard within the Downtown Area and the City of Pleasanton gateway intersections. These intersections may have a level of service worse than the LOS D standard if no reasonable mitigation exists or if the necessary mitigation is contrary to other goals and policies of the City. However, none of the study intersections are within the Downtown Area or considered gateway intersections. Table 1 shows the level of service definitions for signalized intersections.

Table 1
Signalized Intersection Level of Service Definitions Based on Delay

Level of Service	Description	Average Control Delay Per Vehicle (sec.)
A	Signal progression is extremely favorable. Most vehicles arrive during the green phase and do not stop at all. Short cycle lengths may also contribute to the very low vehicle delay.	10.0 or less
B	Operations characterized by good signal progression and/or short cycle lengths. More vehicles stop than with LOS A, causing higher levels of average vehicle delay.	10.1 to 20.0
C	Higher delays may result from fair signal progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, though may still pass through the intersection without stopping.	20.1 to 35.0
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable signal progression, long cycle lenghts, or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	This is considered to be the limit of acceptable delay. These high delay values generally indicate poor signal progression, long cycle lengths, and high volume-to-capacity (V/C) ratios. Individual cycle failures occur frequently.	55.1 to 80.0
F	This level of delay is considered unacceptable by most drivers. This condition often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. Poor progression and long cycle lengths may also be major contributing causes of such delay levels.	greater than 80.0

Source: Transportation Research Board, *2000 Highway Capacity Manual* (Washington, D.C., 2000) p10-16.

The project is said to create a significant impact if 1) it would cause the intersection LOS to degrade below its level of service standard or 2) it would add 10 or more project trips to an intersection that is operating below its level of service standard under no project conditions.

Existing Transportation Setting

Local access to the site is provided by West Las Positas Boulevard, Stoneridge Drive, Hacienda Drive and Santa Rita Road. These roadways are described below.

West Las Positas Boulevard is a major arterial that extends from Foothill Road in the west to Kirkcaldy Street east of Santa Rita Road. It extends in a predominantly east-west direction, though at the project site it runs southwest to northeast. It is two-lanes wide from Foothill Road to I-680, four-lanes wide from I-680 to Hopyard Road, five-lanes wide (three lanes eastbound and two lanes westbound) from Willow Road to Hacienda Drive, six-lanes wide from Hopyard Road to Willow Road and Hacienda Drive to Santa Rita Road, and two-lanes wide east of Santa Rita Road. West Las Positas Boulevard provides direct access to the project site.

Stoneridge Drive is a major arterial that extends from Foothill Road in the west to Trevor Parkway east of Santa Rita Road. The Stoneridge Drive extension is currently under construction and will extend Stoneridge Drive east from Trevor Parkway to El Charro Road. Stoneridge Drive is predominantly an east-west roadway, though at the project site it runs northwest to southeast. It is four-lanes wide from Foothill Road to Stoneridge Mall Road, primarily six-lanes wide from Stoneridge Mall Road to Chabot Drive, five-lanes wide (three lanes westbound and two lanes eastbound) from Chabot Drive to Las Positas Boulevard,

and four-lanes wide east of Las Positas Boulevard. Stoneridge Drive provides direct access to the project site.

Hacienda Drive is a major arterial that extends in a north-south direction from Gleason Drive in the City of Dublin to West Las Positas Boulevard in the south. Within the City of Dublin, it is three-lanes wide (two lanes northbound and one lane southbound) from Gleason Drive to Central Parkway, five lanes wide (two lanes northbound and three lanes southbound) from Central Parkway to Hacienda Crossings, and six lanes wide from Hacienda Crossings to I-580. Within the City of Pleasanton, it is six lanes wide from I-580 to West Las Positas Boulevard.

Santa Rita Road is a major arterial that extends in a north-south direction from I-580 in the north to Stanley Boulevard, where it becomes Main Street and continues into downtown Pleasanton. It is six-lanes wide from I-580 to Valley Avenue, and four-lanes wide from Valley Avenue to Stanley Boulevard.

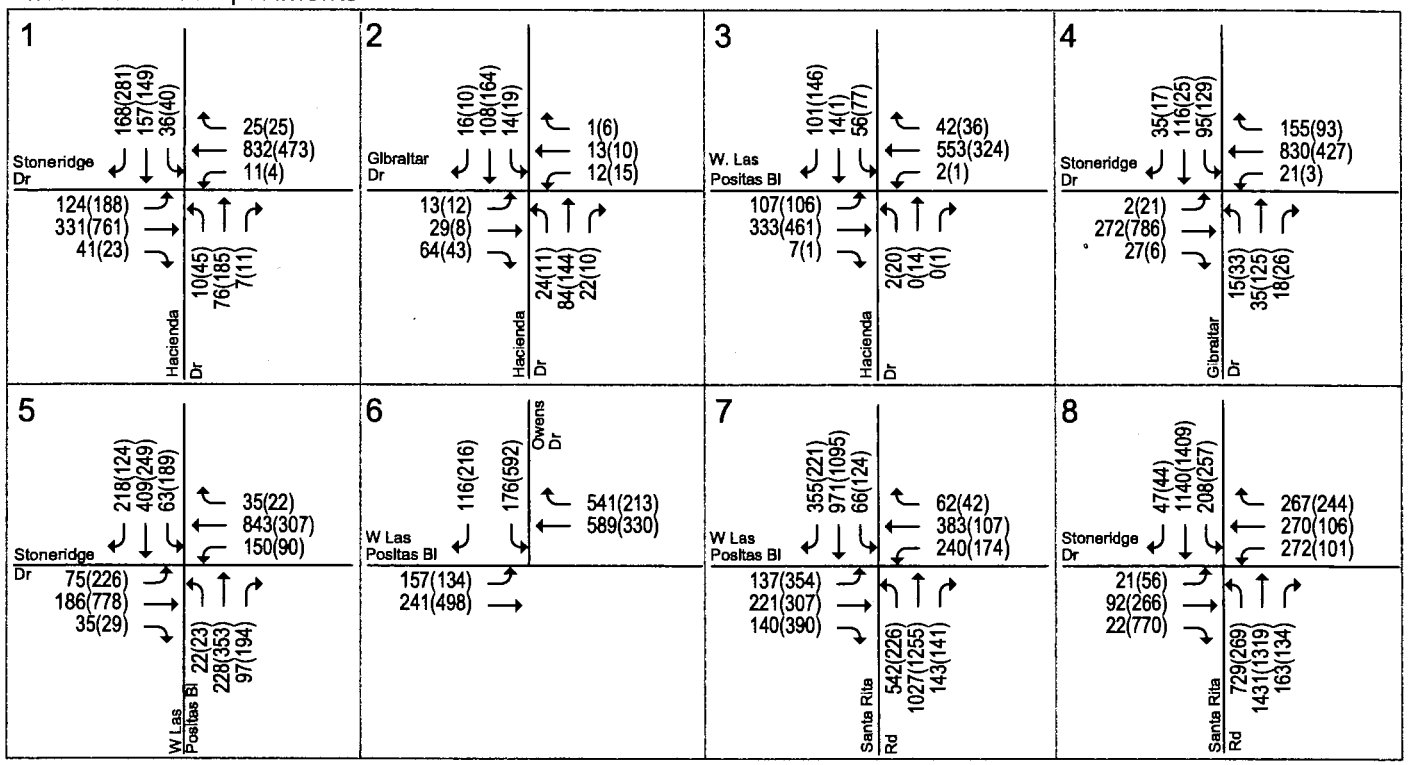
Existing Intersection Analysis

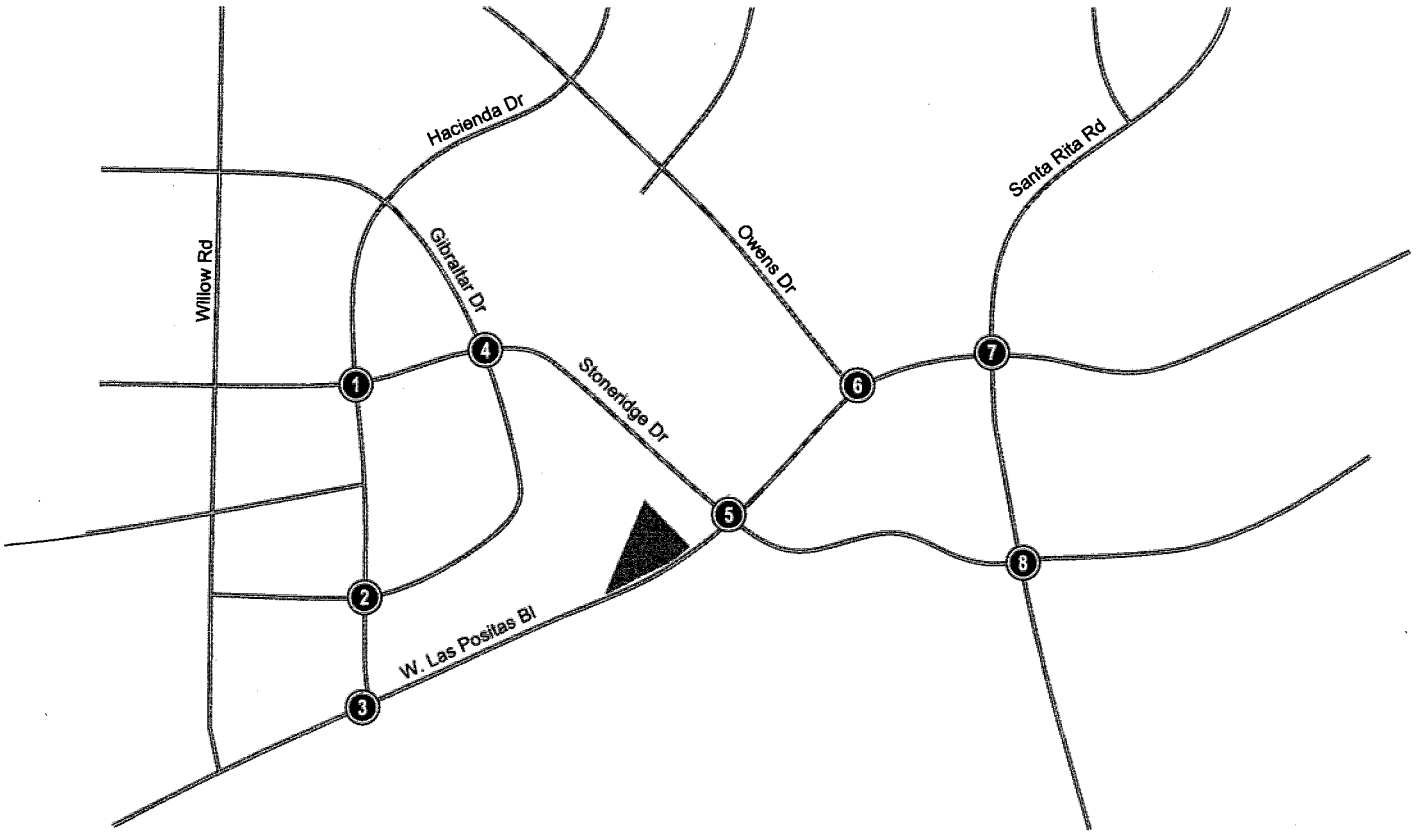
The existing traffic volumes at the study intersections were obtained from the City of Pleasanton Synchro database. Traffic operations at the study intersections were evaluated using Synchro software to determine level of service for the AM and PM peak hours. The results show that, measured against City of Pleasanton standards, all of the signalized study intersections currently operate at acceptable levels of service during the AM and PM peak hours. The results of the intersection level of service analysis under existing conditions are summarized in Table 2. The existing intersection traffic volumes are shown on Figure 3. The level of service calculation sheets are included in the Appendix.

Table 2
Existing Intersection Levels of Service

Study Number	Intersection	Traffic Control	Peak Hour	Existing Delay (in seconds)[1]	Existing LOS[1]
#1	Hacienda Drive and Stoneridge Drive	Signal	AM	22.1	C
			PM	26.7	C
#2	Hacienda Drive and Gibraltar Drive	Signal	AM	8.0	A
			PM	6.4	A
#3	Hacienda Drive and West Las Positas Boulevard	Signal	AM	15.8	B
			PM	18.0	B
#4	Gibraltar Drive and Stoneridge Drive	Signal	AM	8.5	A
			PM	9.4	A
#5	Stoneridge Drive and West Las Positas Boulevard	Signal	AM	17.6	B
			PM	23.1	C
#6	Owens Drive and West Las Positas Boulevard	Signal	AM	11.6	B
			PM	12.6	B
#7	Santa Rita Road and West Las Positas Boulevard	Signal	AM	33.9	C
			PM	28.0	C
#8	Santa Rita Road and Stoneridge Drive	Signal	AM	41.6	D
			PM	33.7	C

[1] Signalized intersection levels of service and delays reported are for overall average delay.





LEGEND

= Project Site Location

(X) = Study Intersection

XX(XX) =AM(PM) Peak-Hour Traffic Volumes

Figure 3
Existing Traffic Volumes

NORTH
Not to Scale

Observed Existing Traffic Conditions

Traffic conditions in the field were observed in order to identify any existing operational deficiencies and to confirm the accuracy of calculated levels of service. The purpose of this effort was (1) to identify any existing traffic problems that may not be directly related to intersection level of service, and (2) to identify any locations where the level of service calculation does not accurately reflect level of service in the field.

Overall, the study intersections operate adequately during the weekday AM and PM peak hours, and the level of service analysis appears to accurately reflect actual existing traffic conditions. However, field observations showed that an operational problem currently occurs at the intersection of Santa Rita Road and Stoneridge Drive. During the AM peak hour, there were occasions when westbound left-turn vehicles waited more than one cycle. This appeared to be the result of a very short green phase for the movement. It did not appear to be indicative of poor traffic conditions at the intersection as a whole.

Project Traffic Estimates

The magnitude of traffic produced by a new development and the locations where that traffic would appear are estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. In determining project trip generation, the magnitude of traffic entering and exiting the site is estimated for the AM and PM peak hours. As part of the project trip distribution, an estimate is made of the directions to and from which the project trips would travel. In the project trip assignment, the project trips are assigned to specific streets and intersections. These procedures are described further in the following sections.

Through empirical research, data have been collected that correlate to common land uses their propensity for producing traffic. Thus, for the most common land uses there are standard trip generation rates that can be applied to help predict the future traffic increases that would result from a new development. The magnitude of traffic added to the roadway system by a particular development is estimated by multiplying the applicable trip generation rates to the size of the development. The standard trip generation rates are published in the Institute of Transportation Engineers (ITE) manual entitled *Trip Generation,* 9th Edition, 2012. Based on ITE's trip generation rates for apartments, the project would generate 1,117 daily vehicle trips, with 86 trips occurring during the AM peak hour and 104 trips occurring during the PM peak hour. The trip generation estimates are shown in Table 3.

Table 3
Project Trip Generation Estimates

				AM Peak Hour				PM Peak Hour			
Land Use	Size	Daily Rate	Daily Trips	Rate	Total Trips	In	Out	Rate	Total Trips	In	Out
Apartments	168 units	6.65	1,117	0.51	86	17	69	0.62	104	68	36

Note: Rates based on ITE *Trip Generation, 9th Edition* , 2012: average rates for Apartments (ITE 220).

The trip distribution pattern for the proposed project was estimated based on a select-zone analysis from the Pleasanton Travel Demand Forecast model. The new peak-hour trips generated by the proposed project (the project trips) were added to the roadway network in accordance with the project trip generation and distribution described above. In addition to adding traffic to the roadway network, the project would result in some redistribution of existing traffic at the site's access driveways and the intersection of Stoneridge Drive and West Las Positas Boulevard. With construction of the proposed project, existing vehicles that access the medical center via the West Las Positas driveway may find it quicker to access the medical center via the existing Stoneridge Drive driveway, rather than their current route. The project trip distribution and assignment are shown on Figures 4 and 5, respectively. The redistribution of existing traffic is shown separately in the Appendix.

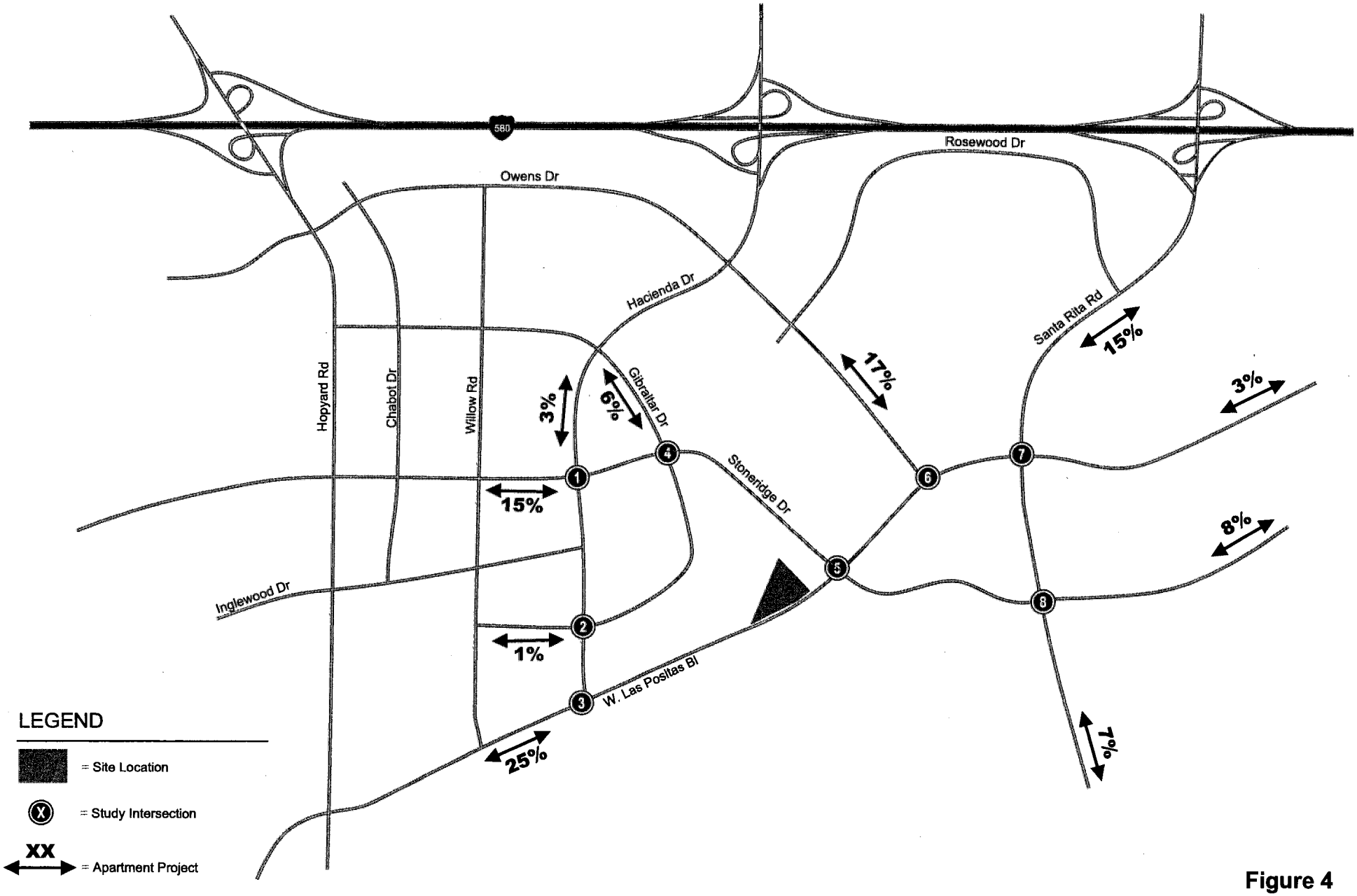
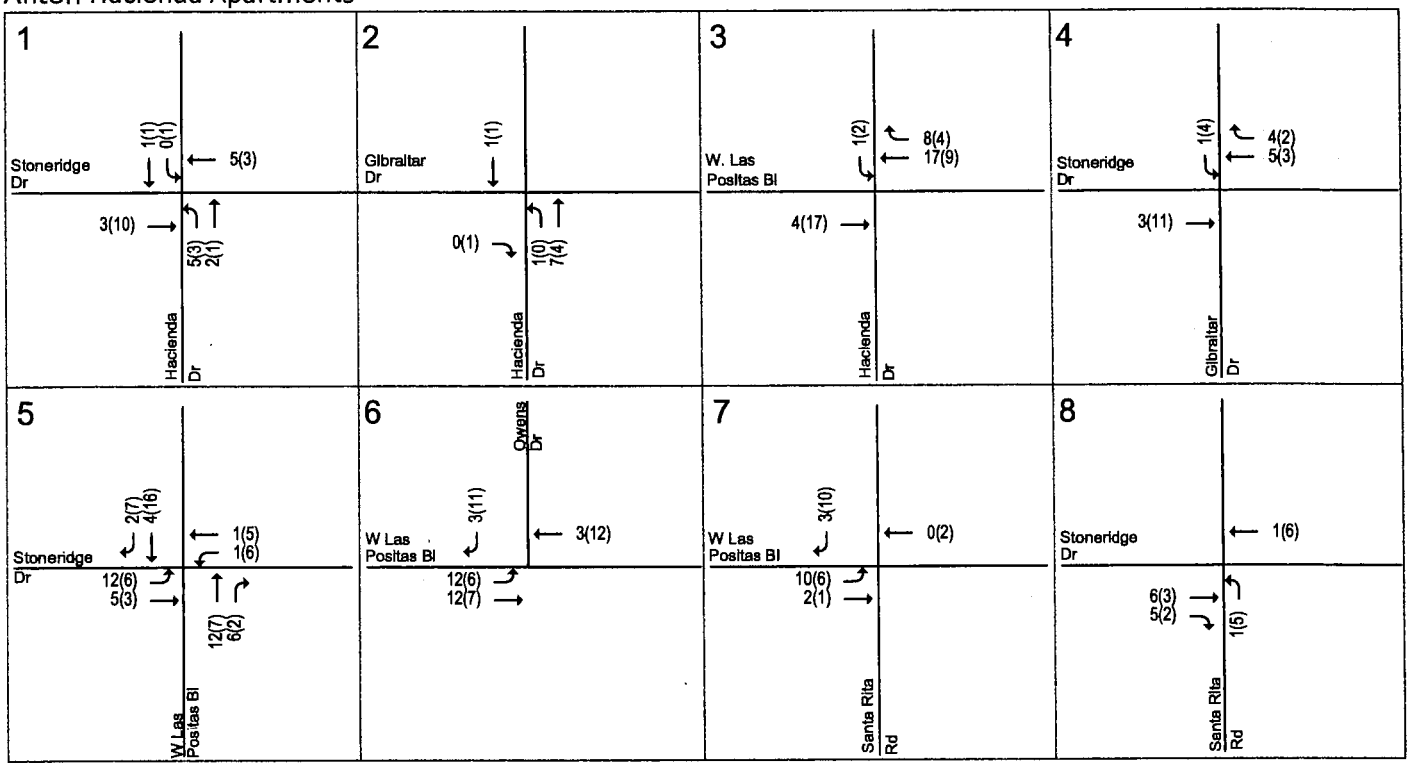
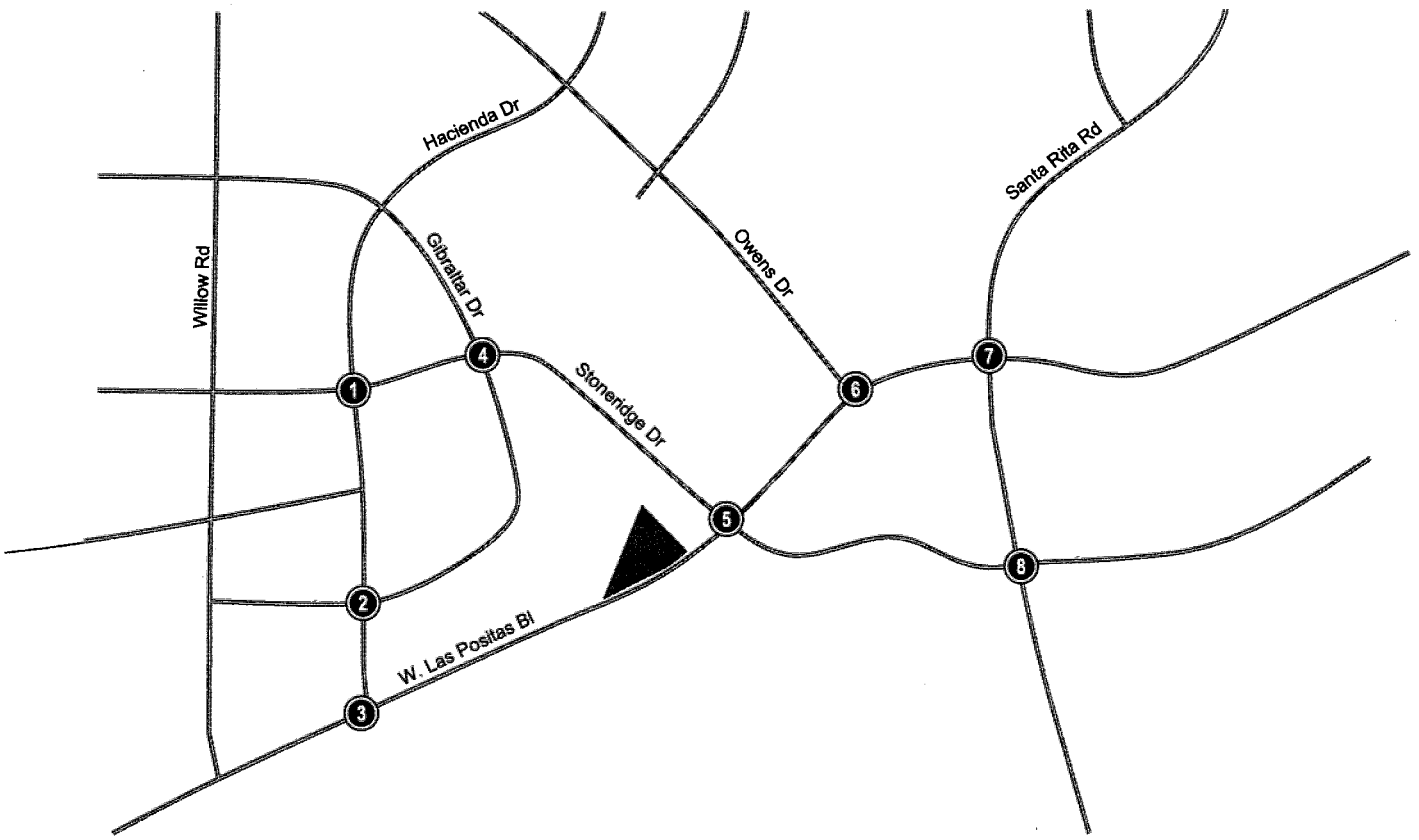


Figure 4
Project Trip Distribution

Anton Hacienda Apartments





LEGEND

= Project Site Location

(X) = Study Intersection

XX(XX) =AM(PM) Peak-Hour Traffic Volumes

Figure 5
Project Trip Assigment

HEXAGON TRANSPORTATION CONSULTANTS, INC.

NORTH

Intersection Level of Service Analysis

Traffic operations at the study intersections were evaluated using Synchro software to determine level of service with and without the project for the AM and PM peak hours under existing, existing plus approved, and buildout conditions. The Synchro calculation sheets are included in the attached appendix.

Existing Plus Project Conditions Intersection Analysis

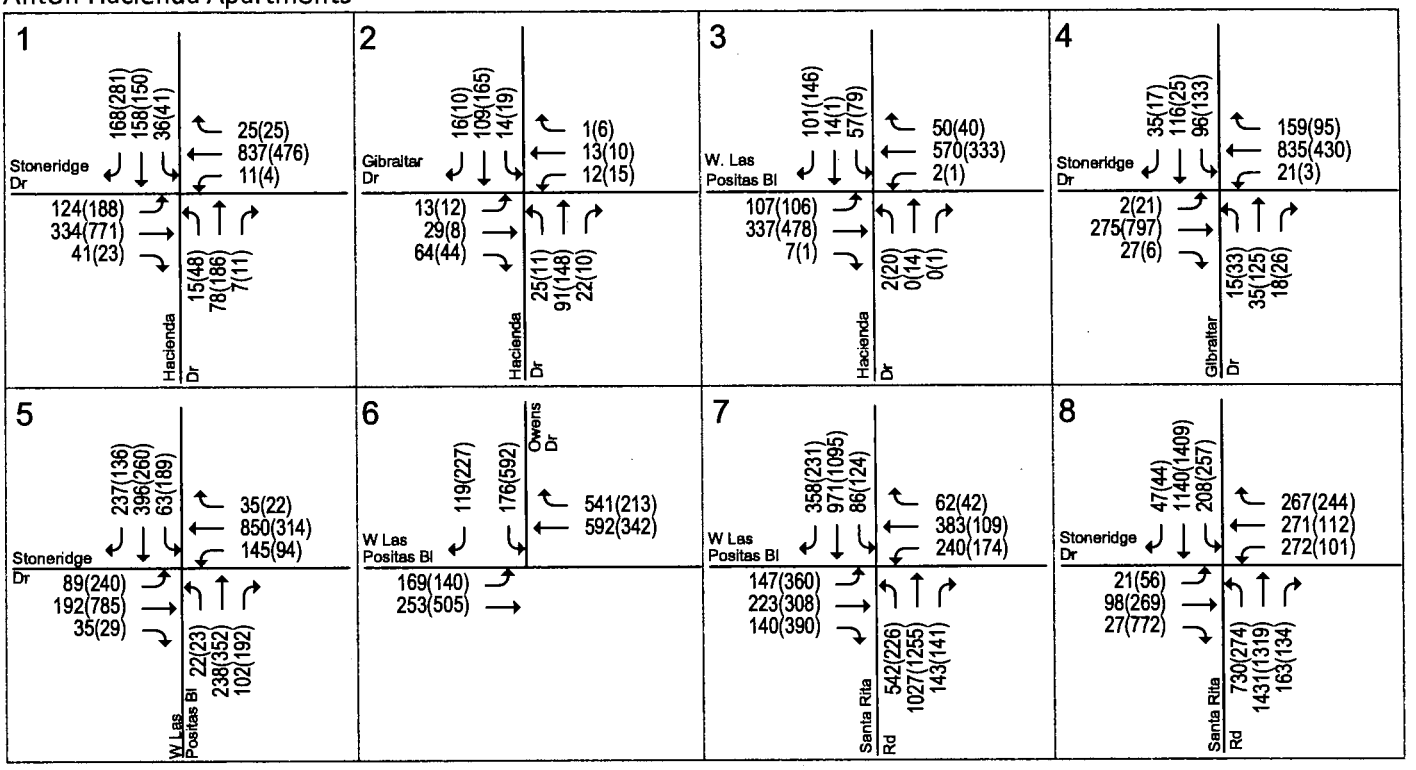
Existing plus project conditions are defined as existing traffic volumes plus the addition of project traffic. The results show that, measured against City of Pleasanton standards, all of the study intersections would continue to operate at acceptable levels of service during the AM and PM peak hours under existing plus project conditions. The level of service results for the existing plus project scenario is summarized in Table 4. Figure 6 presents the existing plus project traffic volumes at the study intersections.

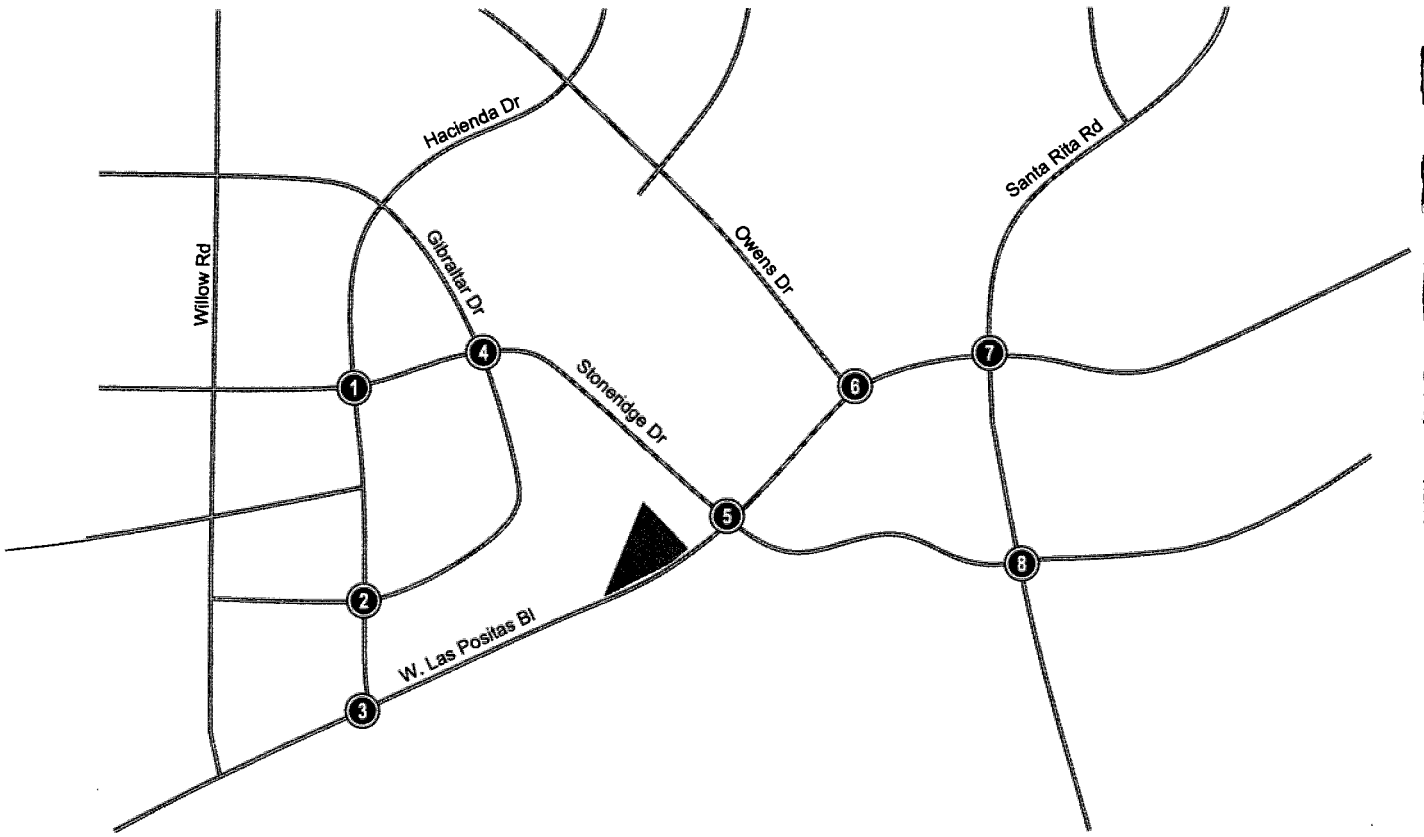
Table 4
Existing Plus Project Intersection Levels of Service Summary

Study Number	Intersection	Traffic Control	Peak Hour	Existing Delay (in seconds)[1]	Existing LOS[1]	Existing + Project Delay (in seconds)[1]	Existing + Project LOS[1]
#1	Hacienda Drive and Stoneridge Drive	Signal	AM	22.1	C	22.3	C
			PM	26.7	C	26.7	C
#2	Hacienda Drive and Gibraltar Drive	Signal	AM	8.0	A	8.0	A
			PM	6.4	A	6.4	A
#3	Hacienda Drive and West Las Positas Boulevard	Signal	AM	15.8	B	15.7	B
			PM	18.0	B	17.9	B
#4	Gibraltar Drive and Stoneridge Drive	Signal	AM	8.5	A	8.5	A
			PM	9.4	A	9.5	A
#5	Stoneridge Drive and West Las Positas Boulevard	Signal	AM	17.6	B	18.4	B
			PM	23.1	C	23.2	C
#6	Owens Drive and West Las Positas Boulevard	Signal	AM	11.6	B	11.9	B
			PM	12.6	B	12.7	B
#7	Santa Rita Road and West Las Positas Boulevard	Signal	AM	33.9	C	34.0	C
			PM	28.0	C	28.1	C
#8	Santa Rita Road and Stoneridge Drive	Signal	AM	41.6	D	41.6	D
			PM	33.7	C	33.8	C

[1] Signalized intersection levels of service and delays reported are for overall average delay.

Anton Hacienda Apartments





LEGEND

= Project Site Location

= Study Intersection

XX(XX) =AM(PM) Peak-Hour Traffic Volumes

Figure 6
Existing Plus Project Traffic Volumes

NORTH

Existing Plus Approved Conditions Intersection Analysis

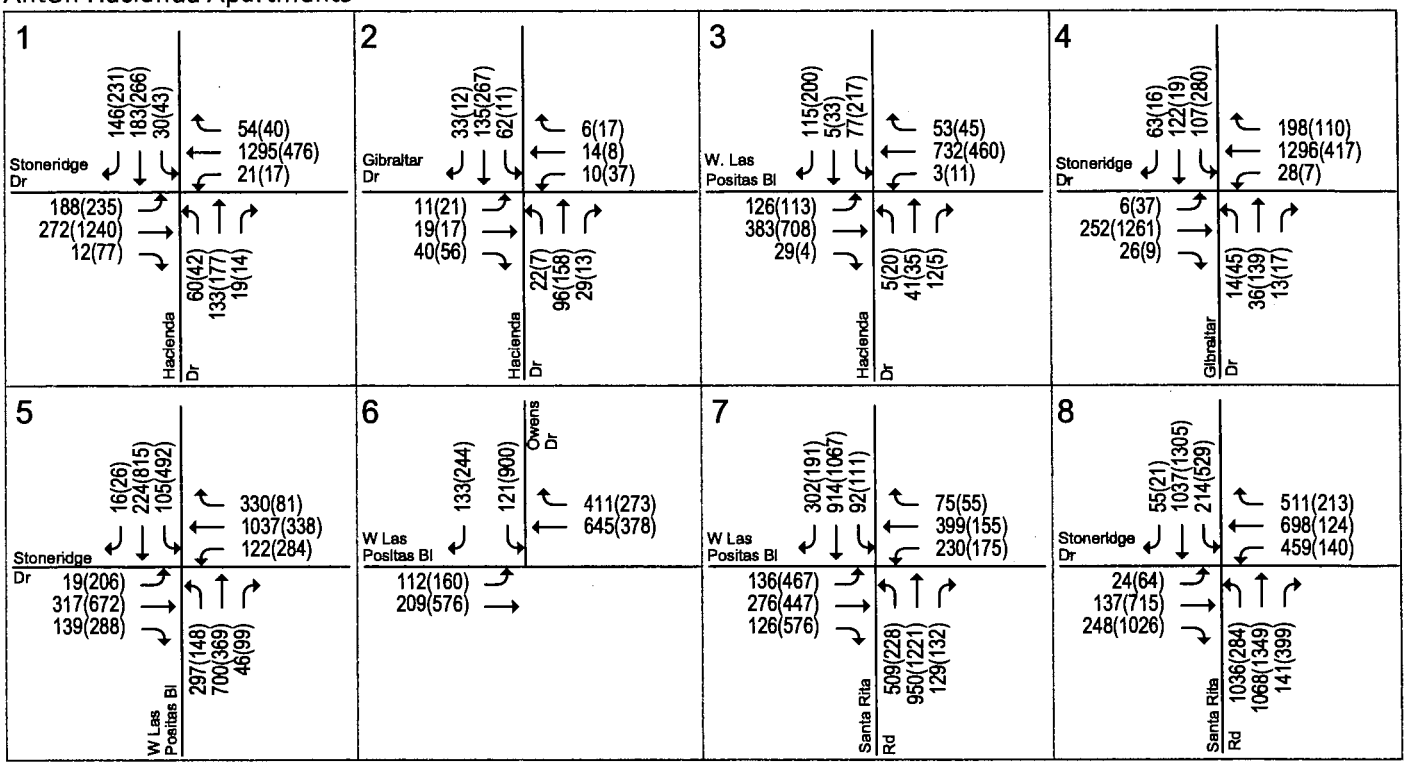
Existing plus approved traffic volumes were estimated using forecasts from the City of Pleasanton TDF model. The Pleasanton TDF model includes various local and regional improvements outside of the project area. The primary improvement that would affect travel patterns in the project area is the planned Stoneridge Drive extension. The improvement consists of a four lane extension of Stonderidge Drive from Trevor Parkway east to El Charro Road, where it will become the western approach leg of the El Charro Road and Stoneridge Drive/Jack London Boulevard intersection. The existing plus approved traffic volumes obtained from the City of Pleasanton's Synchro database include Housing Element traffic volumes, which also include the proposed Anton Hacienda apartment project. For this reason, the project trips were subtracted from the existing plus approved (with project) traffic volumes to determine the existing plus approved no project traffic volumes. Existing plus approved plus project conditions were evaluated relative to existing plus approved no project conditions in order to determine potential near-term project impacts. The results show that, measured against City of Pleasanton standards, all of the study intersections would operate at acceptable levels of service during the AM and PM peak hours under existing plus approved scenarios with or without the proposed project. The level of service results for the existing plus approved scenarios are summarized in Table 5. The existing plus approved and existing plus approved plus project traffic volumes at the study intersections are shown in Figures 7 and 8, respectively.

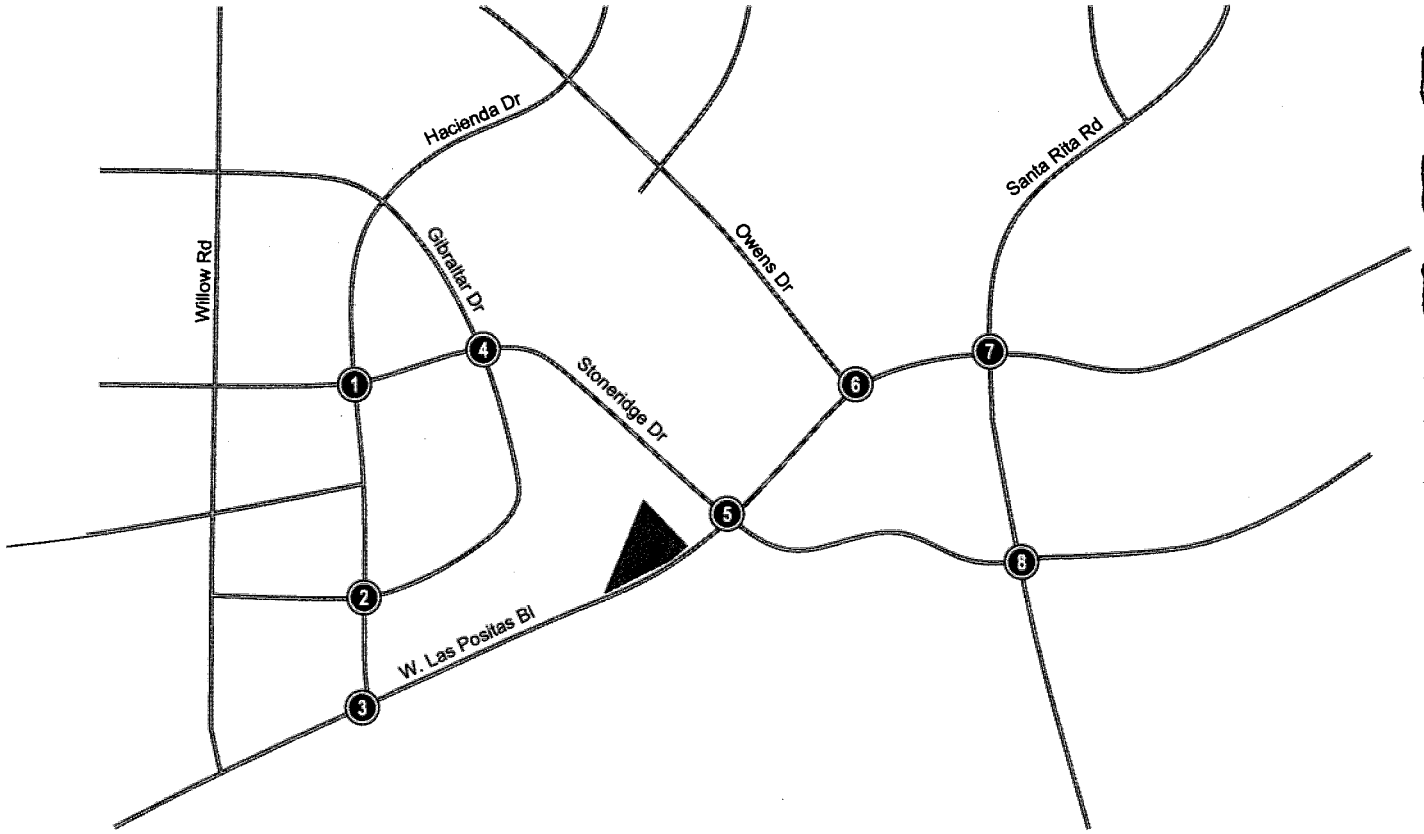
Table 5
Existing Plus Approved Plus Project Intersection Levels of Service Summary

				Existing + Approved			
				No Project		With Project	
Study Number	Intersection	Traffic Control	Peak Hour	Delay (in seconds)[1]	LOS[1]	Delay (in seconds)[1]	LOS[1]
#1	Hacienda Drive and Stoneridge Drive	Signal	AM	24.9	C	25.0	C
			PM	23.7	C	23.7	C
#2	Hacienda Drive and Gibraltar Drive	Signal	AM	7.4	A	7.4	A
			PM	6.5	A	6.5	A
#3	Hacienda Drive and West Las Positas Boulevard	Signal	AM	19.0	B	18.5	B
			PM	16.6	B	16.5	B
#4	Gibraltar Drive and Stoneridge Drive	Signal	AM	9.2	A	9.2	A
			PM	20.7	C	21.1	C
#5	Stoneridge Drive and West Las Positas Boulevard	Signal	AM	27.9	C	29.0	C
			PM	36.6	D	37.0	D
#6	Owens Drive and West Las Positas Boulevard	Signal	AM	9.7	A	9.9	A
			PM	14.3	B	14.4	B
#7	Santa Rita Road and West Las Positas Boulevard	Signal	AM	28.9	C	28.9	C
			PM	25.2	C	25.2	C
#8	Santa Rita Road and Stoneridge Drive	Signal	AM	51.5	D	51.7	D
			PM	39.3	D	39.5	D

[1] Signalized intersection levels of service and delays reported are for overall average delay.

Anton Hacienda Apartments





LEGEND

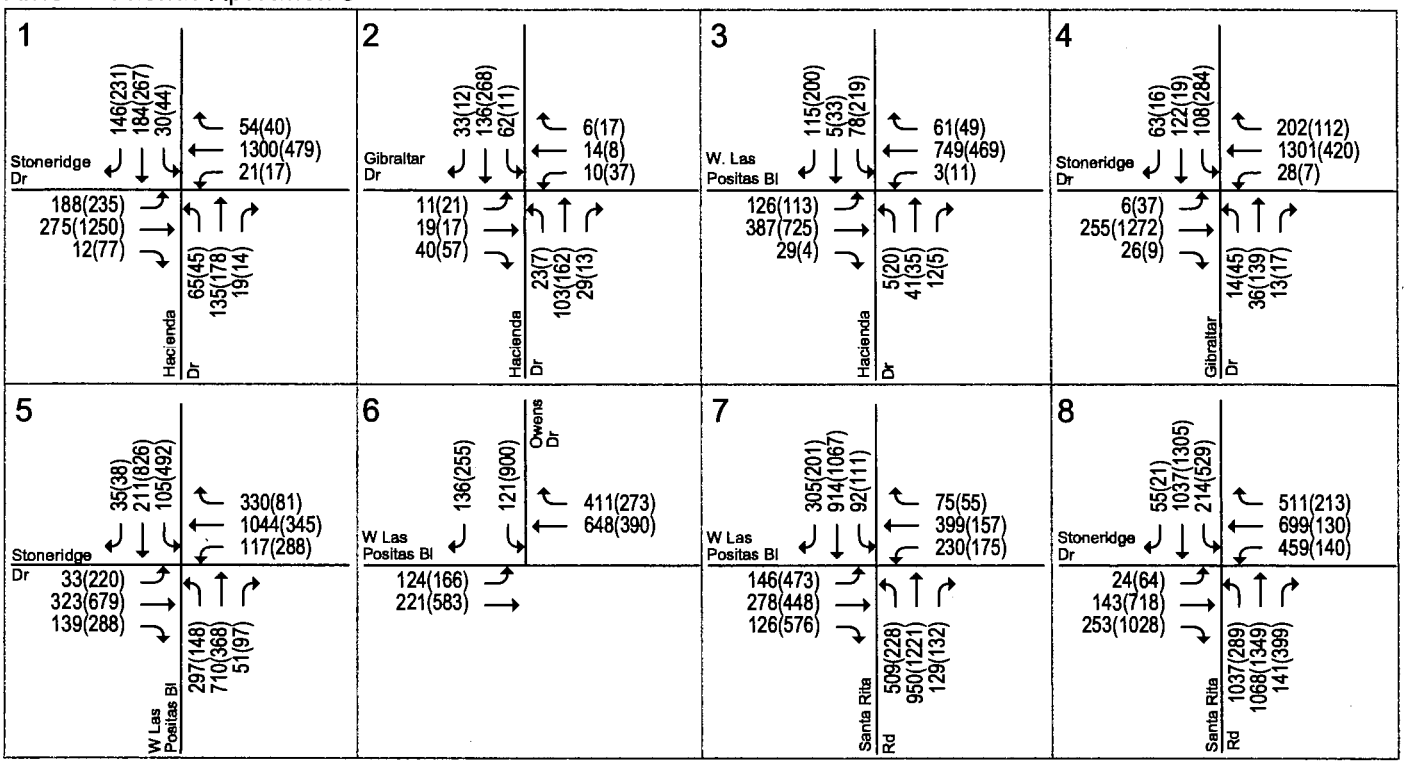
= Project Site Location

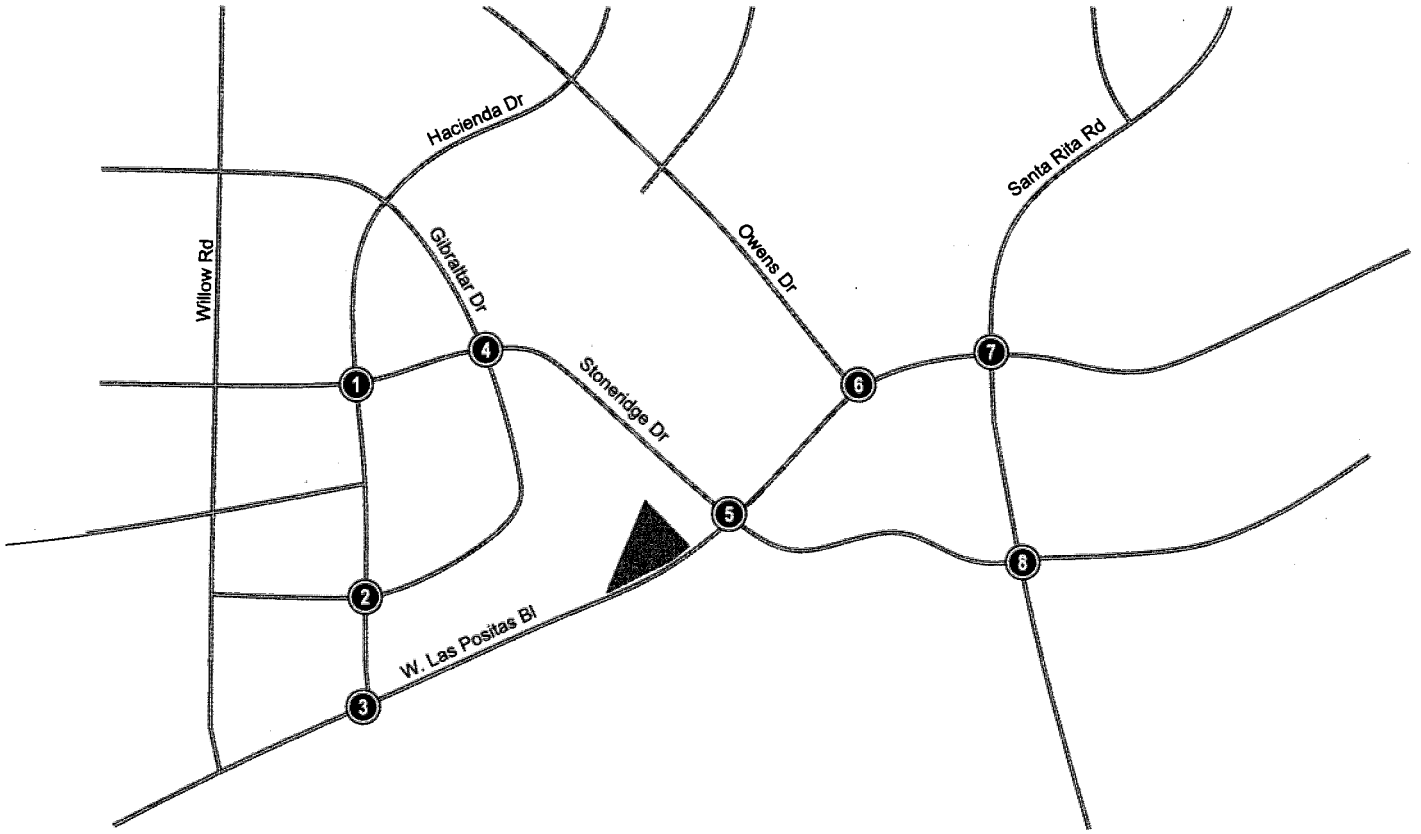
= Study Intersection

XX(XX) =AM(PM) Peak-Hour Traffic Volumes

Figure 7
Existing Plus Approved No Project Traffic Volumes

NORTH





LEGEND

= Project Site Location

= Study Intersection

XX(XX) =AM(PM) Peak-Hour Traffic Volumes

Figure 8
Existing Plus Approved With Project Traffic Volumes

NORTH

Buildout Conditions Intersection Analysis

Buildout traffic volumes were estimated using forecasts from the City of Pleasanton TDF model. The Pleasanton TDF model includes various local and regional improvements outside of the project area. Similar to existing plus approved conditions, the primary improvement that would affect travel patterns in the project area is the planned Stoneridge Drive extension. The buildout traffic volumes obtained from the City of Pleasanton's Synchro database include Housing Element traffic volumes, which also include the proposed Anton Hacienda apartment project. For this reason, the project trips were subtracted from the buildout (with project) traffic volumes to determine the buildout no project traffic volumes. Buildout with project conditions were evaluated relative to buildout no project conditions in order to determine potential project impacts. The results show that the intersection of Santa Rita Road and Stoneridge Drive would operate at an unacceptable LOS E under both buildout no project and buildout with project conditions during the AM peak hour. The City of Pleasanton level of service standard for this intersection is LOS D. The project would add 13 trips to the intersection during the AM peak hour. Since the project would add 10 or more peak hour trips to the intersection, the project is considered to have a significant impact at the intersection.

> **Mitigation**: The City of Pleasanton currently has a traffic impact fee program to fund future improvements needed to support the buildout of the General Plan. According to the *Traffic Impact Fee and Nexus Report*, May 2010, intersection improvements are proposed for the Stoneridge Drive/Santa Rita Road intersection. The improvements include converting the second eastbound right turn lane to an eastbound through lane, converting the remaining eastbound right turn to a free right turn lane, constructing a northbound right turn lane, and converting a northbound through lane to a third northbound left turn lane. With the improvements, the Stoneridge Drive and Santa Rita Road intersection would operate at LOS D during the AM peak hour. Therefore, participation in the City's traffic impact fee program would mitigate the project's impact at this location.

All other study intersections would operate at acceptable levels of service under buildout conditions during both the AM and PM peak hours with or without the proposed project. The level of service results for buildout conditions are summarized in Table 6. The buildout no project and buildout with project traffic volumes at the study intersections are shown in Figures 9 and 10, respectively.

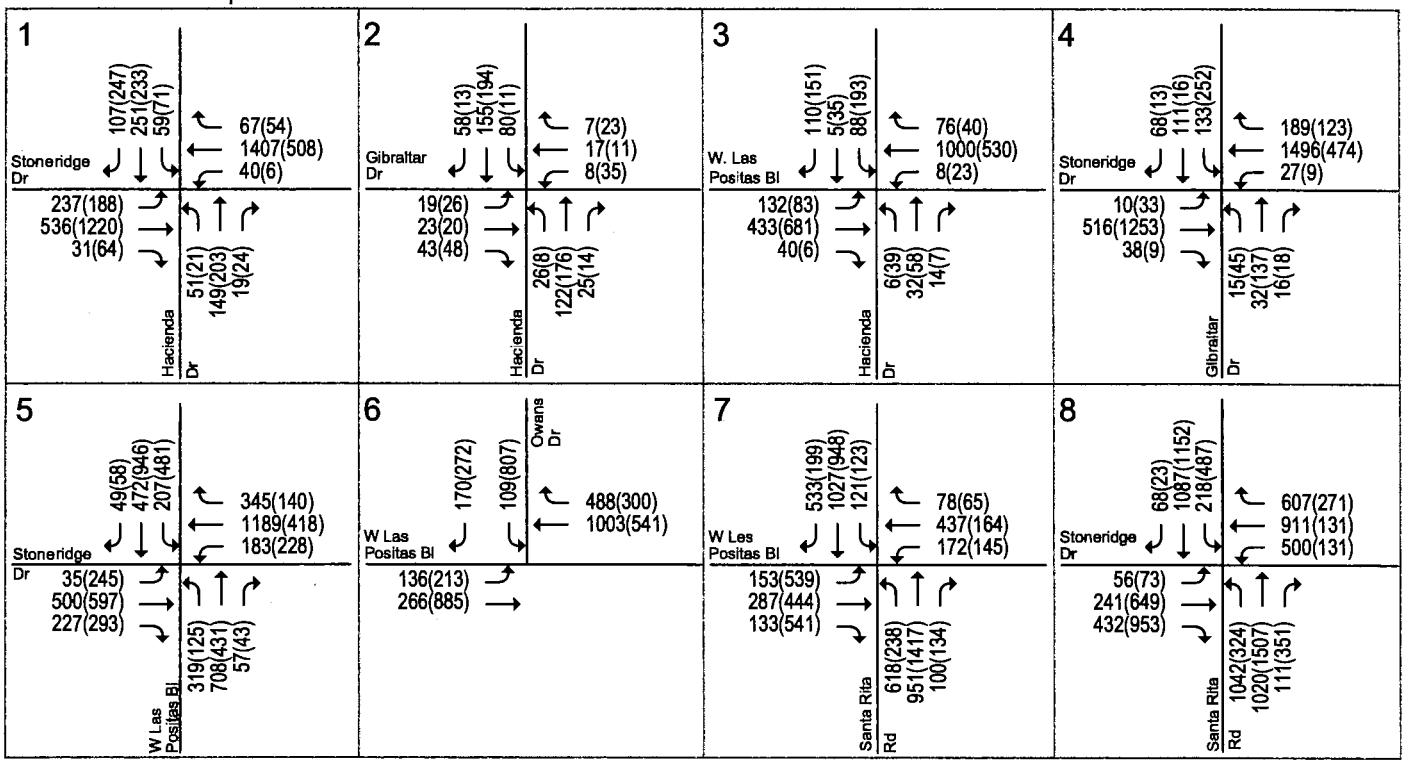
Table 6
Buildout Intersection Levels of Service Summary

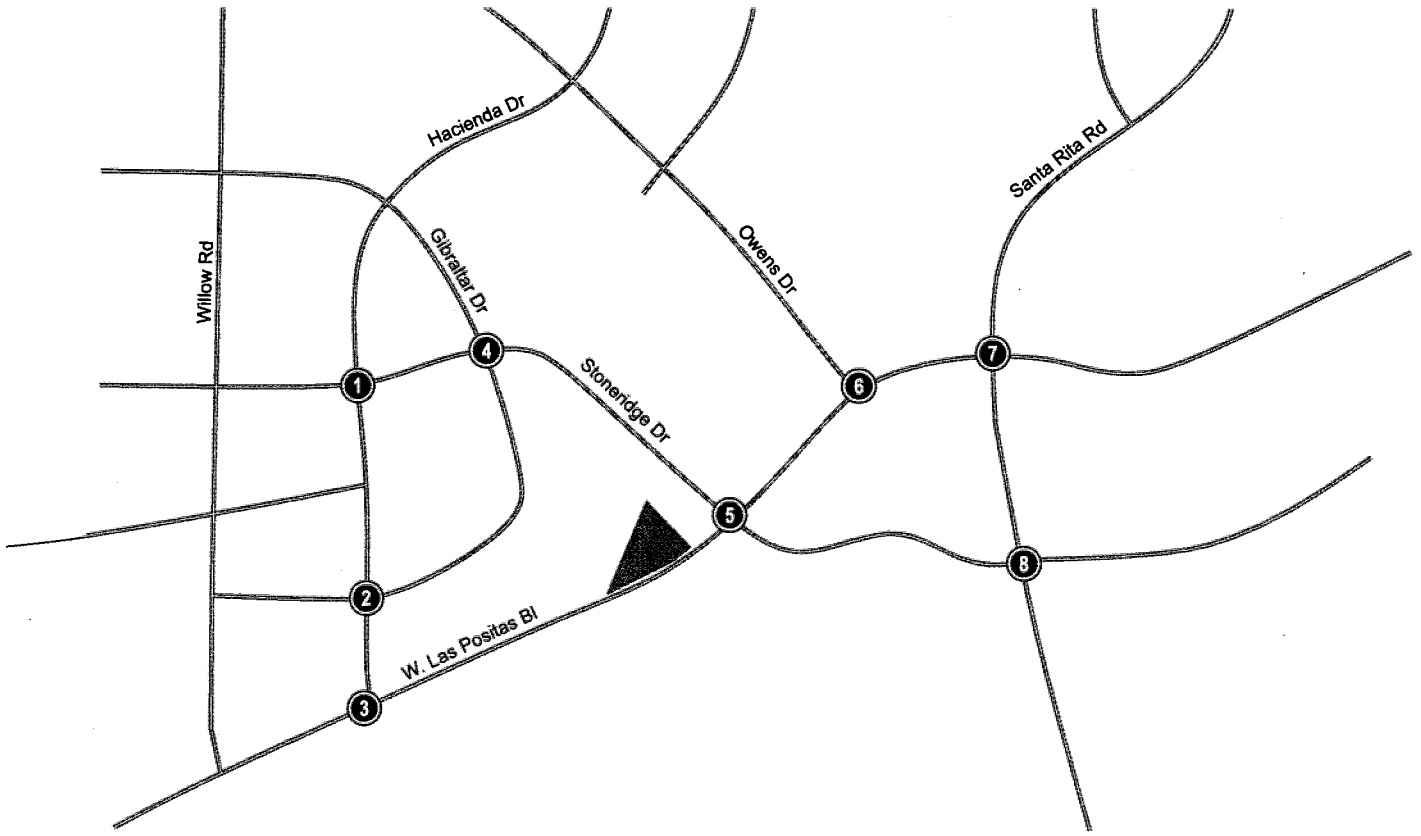
				Buildout			
				No Project		With Project	
Study Number	Intersection	Traffic Control	Peak Hour	Delay (in seconds)[1]	LOS[1]	Delay (in seconds)[1]	LOS[1]
#1	Hacienda Drive and Stoneridge Drive	Signal	AM	26.3	C	26.4	C
			PM	21.7	C	21.9	C
#2	Hacienda Drive and Gibraltar Drive	Signal	AM	7.9	A	7.9	A
			PM	6.7	A	6.7	A
#3	Hacienda Drive and West Las Positas Boulevard	Signal	AM	19.7	B	19.8	B
			PM	18.2	B	18.2	B
#4	Gibraltar Drive and Stoneridge Drive	Signal	AM	9.9	A	9.9	A
			PM	18.5	B	18.9	B
#5	Stoneridge Drive and West Las Positas Boulevard	Signal	AM	39.6	D	43.0	D
			PM	34.9	C	35.7	D
#6	Owens Drive and West Las Positas Boulevard	Signal	AM	11.3	B	11.6	B
			PM	15.7	B	15.9	B
#7	Santa Rita Road and West Las Positas Boulevard	Signal	AM	34.9	C	35.0	C
			PM	24.5	C	24.5	C
#8	Santa Rita Road and Stoneridge Drive	Signal	AM	63.9	E	**64.0**	**E**
	with Mitigation					*43.1*	*D*
			PM	38.8	D	38.9	D

Denotes Significant Impact

[1] Signalized intersection levels of service and delays reported are for overall average delay.

Anton Hacienda Apartments





LEGEND

= Project Site Location

(X) = Study Intersection

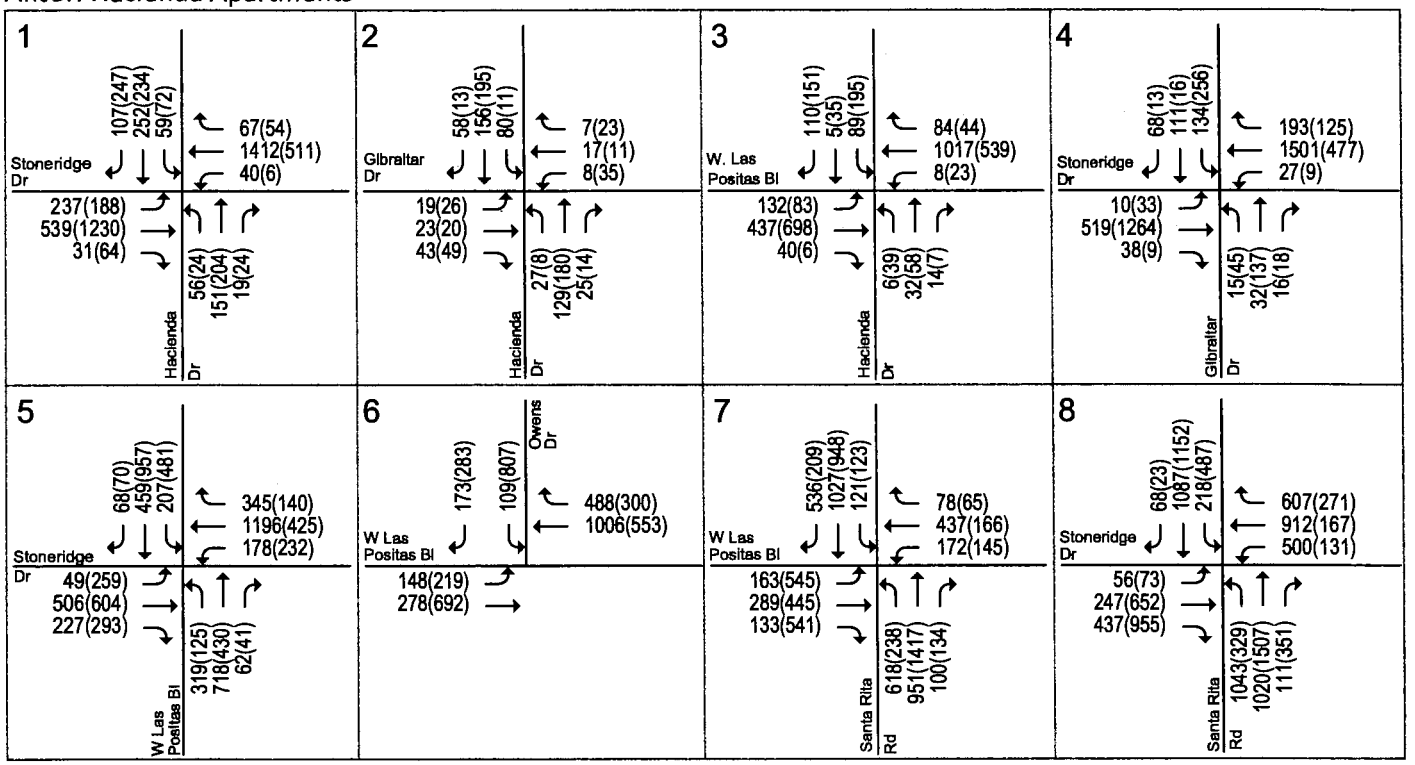
XX(XX) =AM(PM) Peak-Hour Traffic Volumes

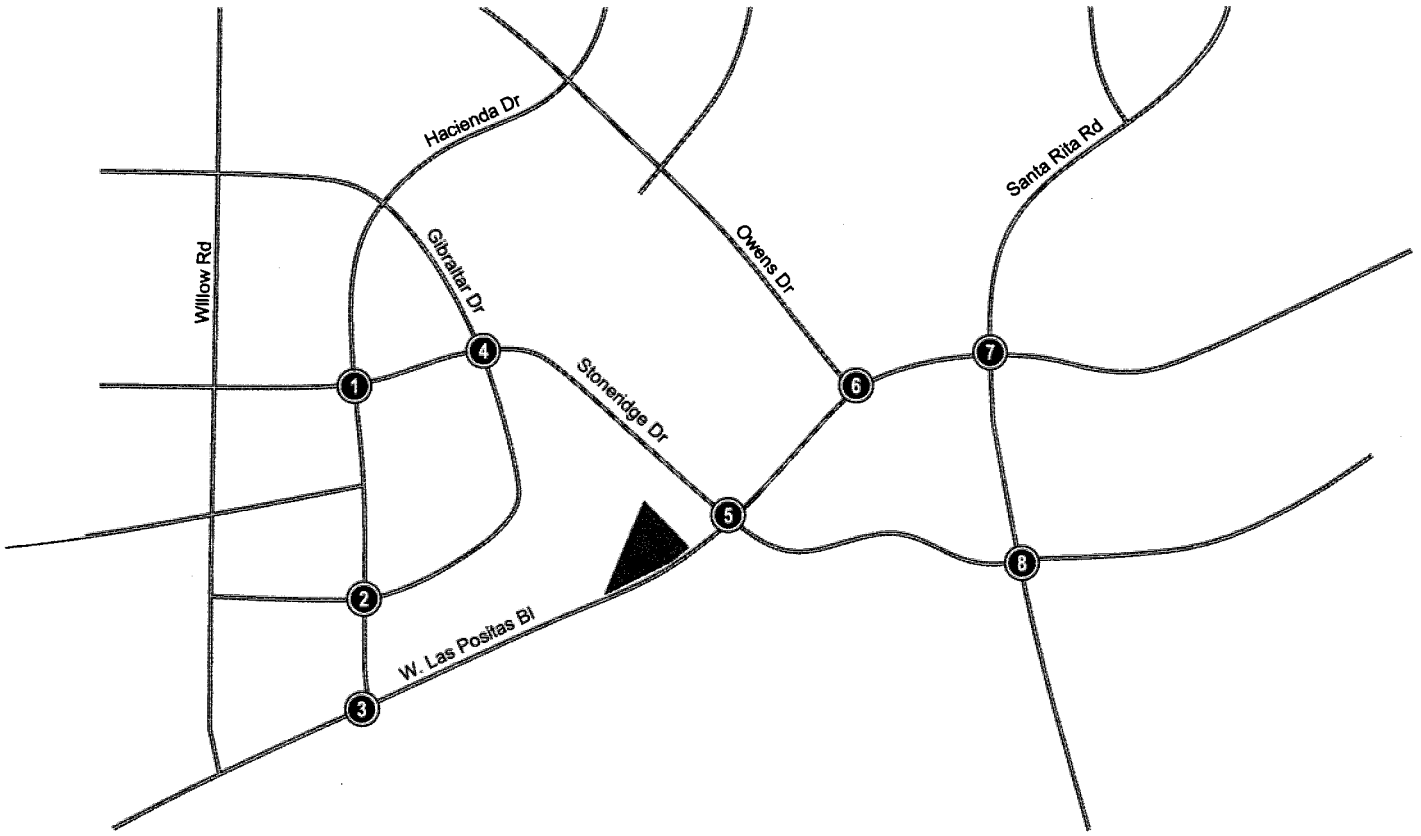
Figure 9
Buildout No Project
Traffic Volumes

HEXAGON TRANSPORTATION CONSULTANTS, INC.

NORTH
Not to Scale

Anton Hacienda Apartments





LEGEND

= Project Site Location

= Study Intersection

XX(XX) =AM(PM) Peak-Hour Traffic Volumes

Figure 10
Buildout With Project Traffic Volumes

NORTH

Vehicle Queuing Analysis

A vehicle queuing analysis was conducted for the left turn movements where the project would add traffic at the intersection of Stoneridge Drive and West Las Positas Boulevard. Vehicle queues were estimated using a Poisson probability distribution. The basis of the analysis is as follows: (1) the Poisson probability distribution is used to estimate the 95th percentile maximum number of queued vehicles per signal cycle for a particular movement; (2) the estimated maximum number of vehicles in the queue is translated into a queue length, assuming 25 feet per vehicle; and (3) the estimated maximum queue length is compared to the existing or planned available storage capacity for the movement. This analysis thus provides a basis for estimating future storage requirements at intersections. Table 7 shows that left turn storage would be adequate at the intersection of Stoneridge Drive and West Las Positas Boulevard for all project scenarios.

Site Access, On-Site Circulation and Parking

This section describes the site access, on-site circulation, and parking for the proposed project. This review is based on the project site plan provided by KTGY Group, Inc. and dated August 31, 2012 (See Figure 2).

Site Access

Access to the project site will be provided via existing driveways on West Las Positas Boulevard and Stoneridge Drive. Both driveways are stop controlled on the driveway approaches and have one inbound and one outbound lane. The West Las Positas Boulevard driveway is a full-access driveway that would provide direct access to the project site. The primary access from Stoneridge Drive would occur at the northern full-access medical center driveway, where vehicles would travel through the medical center's northwest drive aisle to the project site. The project site and the medical center have a reciprocal easement agreement allowing vehicular access over and across the roads and driveways of each parcel. The existing corner sight distance at both project driveways was reviewed in the field and determined to be adequate.

West Las Positas Boulevard Driveway

Under existing plus project conditions, during the AM peak hour, the project driveway would have 40 inbound trips (10 project trips and 30 existing medical center trips) and 48 outbound trips (43 project trips and 5 existing medical center trips). During the PM peak hour, the project driveway would have 53 inbound trips (41 project trips and 12 existing medical center trips) and 35 outbound trips (22 project trips and 13 existing medical center trips). Based on the trip distribution and assignment, approximately 60% of the total project trips would access the project site via the West Las Positas Boulevard driveway. Driveway delays would be reasonably short, and motorists could enter and exit the project site easily during peak hours. Under existing plus project conditions, the project driveway would experience an average delay of 12.7 seconds (LOS B) during the AM peak hour, and 14.2 seconds (LOS B) during the PM peak hour. It is estimated that the inbound left turn and outbound vehicle queues would be one to two vehicles (25 to 50 feet). The existing left turn pocket on West Las Positas Boulevard provides 115 feet of storage for inbound left turns, and the project driveway provides approximately 50 feet of storage for the outbound lane. Therefore, the proposed project would have adequate inbound and outbound vehicle storage at this location.

Stoneridge Drive Driveway

Under existing plus project conditions, during the AM peak hour, the project driveway would have 59 inbound trips (7 project trips and 52 existing medical center trips) and 30 outbound trips (26 project trips and 4 existing medical center trips). During the PM peak hour, the project driveway would have 40 inbound trips (27 project trips and 13 existing medical center trips) and 53 outbound trips (14 project trips and 39 existing medical center trips). Based on the trip distribution and assignment, approximately 40% of the total project trips would access the project site via the Stoneridge Drive driveway. Driveway delays would be reasonably short, and motorists could enter and exit the project site easily during peak hours. Under existing plus project conditions, the project driveway would experience an average delay of 11.4 seconds

(LOS B) during the AM peak hour, and 19.3 seconds (LOS C) during the PM peak hour. It is estimated that the inbound left turn and outbound vehicle queues would be one to two vehicles (25 to 50 feet). The existing left turn pocket on Stoneridge Drive provides 80 feet of storage for inbound left turns, and the project driveway provides approximately 75 feet of storage for the outbound lane. Therefore, the proposed project would have adequate inbound and outbound vehicle storage at this location.

On-Site Circulation

The onsite circulation was reviewed in accordance with generally accepted traffic engineering standards. Generally, the proposed plan would provide adequate connectivity through the site for vehicles, bicycles, and pedestrians. However, on the southeast portion of the site, the project plan shows a four legged intersection between two project drive aisles and a medical office drive aisle. The legs of this intersection are not oriented at 90 degrees, and there is parking from the existing medical office use that would back into the intersection. In addition, because the intersection legs are oriented at odd angles, there is an abnormally large pavement area within the intersection where lane channelization is not provided. Standard traffic engineering practice is for the legs of an intersection to be oriented at 90 degrees and for parking to be located on drive aisles rather than within the intersection. The volume and speed of traffic within this intersection would be relatively low, and therefore, vehicle conflicts would be infrequent. However, the proposed design would not meet typical traffic engineering standards.

> **Recommendation:** There are many factors such as desired unit density, parcel shape, landscape requirements, setback requirements, etc. that ultimately determine the site layout. To the extent possible, it would be advisable to redesign the poorly aligned intersection so that the intersection legs are oriented at approximately 90 degrees and parking is not located within the intersection. If this is not deemed feasible (or desirable due to other site constraints), then the City of Pleasanton may consider stop signs on the west and south approaches so that vehicles are approaching at slow speeds and the right of way is more clearly defined.

The project applicant provided a figure showing a review of fire access turn templates on the site. The figure shows that fire trucks would be able to adequately maneuver throughout the project site.

The height of the low level landscaping is not shown on the current site plan. The on-site project drive aisles should be free and clear of any obstructions to optimize sight distance, thereby ensuring that vehicles can see pedestrians and other vehicles traveling within the project site. Adequate corner sight distance (sight distance triangles) should be provided at all on-site intersections.

Table 7
Vehicle Queuing Analysis Summary

	Stoneridge Dr. / West Las Positas Blvd.			
	Stoneridge Dr.*		Stoneridge Dr.*	
	EBL	EBL	WBL	WBL
Measurement	AM	PM	AM	PM
Existing				
Cycle/Delay[1] (sec)	120	120	120	120
Volume (vph)	75	226	150	90
Avg. Queue (veh)	2.5	7.5	5.0	3.0
Avg. Queue[2] (ft.)	63	188	125	75
95th %. Queue (veh)	5	12	9	6
95th %. Queue (ft.)[2]	125	300	225	150
Storage (ft.)	500	500	600	600
Adequate (Y/N)	Y	Y	Y	Y
Existing + Project				
Cycle/Delay[1] (sec)	120	120	120	120
Volume (vph)	89	240	145	94
Avg. Queue (veh)	3.0	8.0	4.8	3.1
Avg. Queue[2] (ft.)	74	200	121	78
95th %. Queue (veh)	6	13	9	6
95th %. Queue (ft.)[2]	150	325	225	150
Storage (ft.)	500	500	600	600
Adequate (Y/N)	Y	Y	Y	Y
Existing + App				
Cycle/Delay[1] (sec)	120	120	120	120
Volume (vph)	19	206	122	284
Avg. Queue (veh)	0.6	6.9	4.1	9.5
Avg. Queue[2] (ft.)	16	172	102	237
95th %. Queue (veh)	2	11	8	15
95th %. Queue (ft.)[2]	50	275	200	375
Storage (ft.)	500	500	600	600
Adequate (Y/N)	Y	Y	Y	Y
Existing + App + Project				
Cycle/Delay[1] (sec)	120	120	120	120
Volume (vph)	33	220	117	288
Avg. Queue (veh)	1.1	7.3	3.9	9.6
Avg. Queue[2] (ft.)	28	183	98	240
95th %. Queue (veh)	3	12	7	15
95th %. Queue (ft.)[2]	75	300	175	375
Storage (ft.)	500	500	600	600
Adequate (Y/N)	Y	Y	Y	Y
Buildout No Proj				
Cycle/Delay[1] (sec)	120	120	120	120
Volume (vph)	35	245	183	228
Avg. Queue (veh)	1.2	8.2	6.1	7.6
Avg. Queue[2] (ft.)	29	204	153	190
95th %. Queue (veh)	3	13	10	12
95th %. Queue (ft.)[2]	75	325	250	300
Storage (ft.)	500	500	600	600
Adequate (Y/N)	Y	Y	Y	Y
Buildout + Project				
Cycle/Delay[1] (sec)	120	120	120	120
Volume (vph)	49	259	178	232
Avg. Queue (veh)	1.6	8.6	5.9	7.7
Avg. Queue[2] (ft.)	41	216	148	193
95th %. Queue (veh)	4	14	10	13
95th %. Queue (ft.)[2]	100	350	250	325
Storage (ft.)	500	500	600	600
Adequate (Y/N)	Y	Y	Y	Y

[1] Vehicle queue calculations based on cycle length for signalized intersections.
[2] Assumes 25 Feet Per Vehicle Queued.
* Assumes Stoneridge Drive runs east/west and W. Las Positas Blvd. runs north/south.

Parking

The existing 10-acre site contains 534 non-handicap parking spaces. The project will occupy 5.6 acres on this existing site. The loss of the 5.6 acres will reduce the medical center parking by approximately 308 spaces. The medical center will then have 226 remaining non-handicap parking spaces. Of the parking provided by the project on the project site, 22 of those parking spaces are intended to be shared by the project and the medical center per the reciprocal easement agreement. The future parking supply of the medical center will then be approximately 248 non-handicap spaces.

A parking analysis was conducted for two different purposes: (1) to determine whether the parking needs of the medical center will be adequately accommodated with the 248 non-handicap spaces that will still be available; and (2) to determine whether the proposed project will provide parking spaces in sufficient number, type and design, in compliance with the city code.

Medical Center Parking

The number of occupied parking spaces at the medical center was counted on two separate weekdays in October at 10:30 AM and 2:30 PM, the times when parking demand is typically the highest. The field observations showed that the maximum parking demand occurred at 10:30 AM.

The project site occupies a portion of an existing site that is used by the medical center. The project will therefore be built in an area that provides parking for the existing medical center. The project, when completed, will thereby displace some of the parking spaces on the existing site. The parking counts were conducted to determine if the remaining parking spaces (remaining after the project replaces a portion of the existing spaces) would be of sufficient number to accommodate the current parking demand for the existing 55,868 s.f. medical center on site. In order to make this determination, the existing site was delineated into three separate areas (area A, B and C), one of which (area A) coincides with the area to be used by the proposed project. This is shown on Figure 11. It should be noted that, at the time of the parking counts, it was determined that the medical center was 100 percent occupied.

The total parking supply on the existing site is 534 non-handicap spaces. Parking area A includes 308 non-handicap parking spaces. Most of area A parking is located relatively far from the entrances into the existing medical center building. Of the 308 non-handicap parking spaces in area A, a maximum of 38 spaces were occupied during the peak time. Parking area B is located at the back and side of the medical center building and provides closer but still less convenient access to the front entrance of the medical center. Of the 146 non-handicap parking spaces in area B, a maximum of 60 spaces were occupied during the peak time. Parking area C is located directly in front of the main entrance to the medical center building and provides the most convenient access to the existing building. All 80 of the non-handicap parking spaces in area C were occupied at the peak time. Table 8 shows the parking supply, occupancy and availability for the three areas and for the total site.

The proposed project will eliminate parking area A. Table 8 shows that 38 spaces were occupied in parking area A during the peak time of day. This means that removal of parking area A would cause 38 more vehicles to park in areas B and C. Table 8 shows that there are 86 spaces available in area B. Parking area B therefore has enough spaces to accommodate the vehicles displaced from area A.

It should again be noted that the proposed project would include 22 new spaces that would be shared with the medical center. The available parking for the medical center would therefore increase from 86 non-handicap spaces to 108 non-handicap spaces during Monday through Friday from 8:30 AM to 5:30 PM per the easement agreement. Again, this exceeds the increased demand of 38 vehicles due to displacement of vehicles by the proposed project.

The existing site provides 3 handicap spaces in area A, 2 handicap spaces in area B, and 5 handicap spaces in area C. Parking demand at the peak time showed all 10 handicap parking spaces to be occupied. With removal of the 3 handicap spaces in area A, the existing medical center building will not have enough handicap spaces (7 handicap spaces total) to accommodate existing demand (10 handicap spaces). Note that the total demand could be more than 10 handicap vehicles because all 10 spaces were occupied during the parking survey.

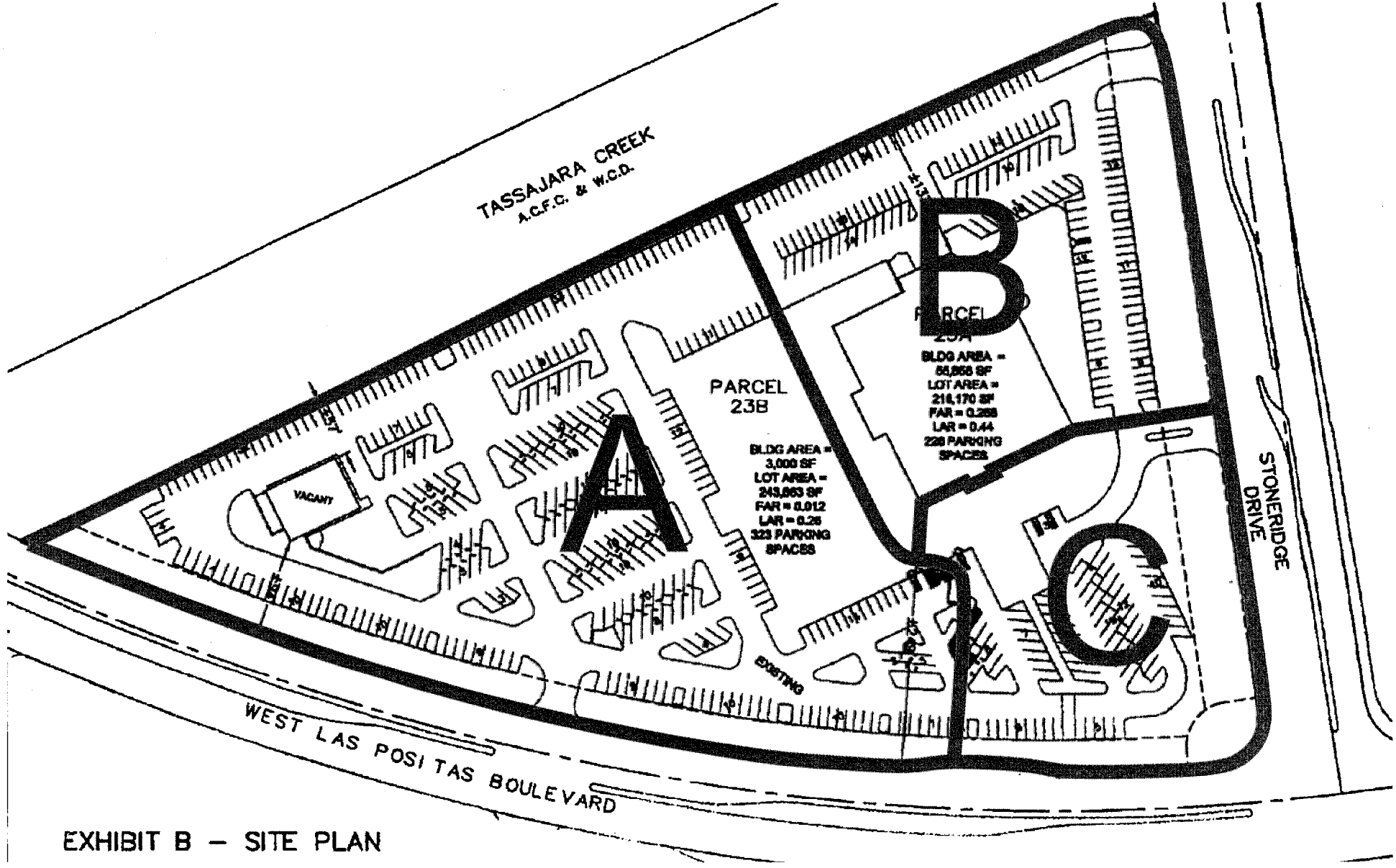


Figure 11
Parking Areas On Existing Site

Table 8
Existing On-site Parking Supply and Demand

Area	Regular Parking Spaces			Handicap Parking Spaces		
	Total Available Parking	Max Observed Parking	Available	Total Available Parking	Max Observed Parking	Available
A	308	38	270	3	3	0
B	146	60	86	2	2	0
C	80	80	0	5	5	0
Total On-site Parking	534	178	356	10	10	0

The Americans with Disabilities Act (ADA) section 4.1.2(5)(d)(i) states that facilities providing outpatient medical care must provide (handicap) accessible spaces in an amount totaling 10 percent of the total parking spaces on site. With the removal of parking area A, the existing medical center building will have a total of 226 non-handicap parking spaces. The ADA would therefore require that approximately 23 handicap accessible parking spaces be provided for the existing medical center use. As stated previously, there would be an excess of about 70 standard-size parking spaces on the existing medical center site (86 available spaces + 22 easement spaces – 38 spaces displaced from Area A). Although the space (surface area) requirements for handicap accessible spaces is greater than for standard parking spaces, the magnitude of the surplus of parking spaces is such that the existing medical center site could accommodate the need for 16 additional handicap accessible spaces. Therefore, based on the existing parking demand, the project would not adversely impact parking conditions at the existing medical center.

Although it appears the 248 remaining parking spaces would be adequate to meet the demand of the existing medical center following the completion of the adjacent Anton apartment project, additional analysis was conducted using the City of Pleasanton code. According to the City of Pleasanton parking code, a medical office would require one parking space per 150 s.f. of gross floor area. Based on the City code, the 55,868 s.f. medical center would require 373 parking spaces or 125 more parking spaces than what is projected to be available.

Proposed Project Parking

Parking on the project site was evaluated to determine whether the project would provide enough parking spaces to accommodate the uses on site and to assess whether the project complies with the City of Pleasanton Municipal Code for parking space design and type.

Code-Required Minimum Number of Spaces

The Pleasanton municipal code section 18.88.030(A) provides the schedule of off-street parking space requirements for specific land uses. The code specifies the number of parking spaces needed for apartments, with further specifications as to the required number of covered parking spaces and visitor spaces. Based on the City of Pleasanton parking code requirements, the proposed project should provide parking as follows:

- Two bedrooms or less = 2 spaces per unit for the first four units and 1.5 spaces for each additional unit
- Three bedrooms or more = 2 spaces per unit
- Visitor = 1 space for each 7 units

Parking for the project was calculated based on the above rates as follows:

- Two bedrooms or less: (4 units x 2 spaces) + (148 units x 1.5 spaces) =230 spaces
- Three bedrooms or more: 16 units x 2 spaces = 32 spaces
- Visitor: 168 units / 7 = 24 spaces
- Total parking required per code = 286 spaces

According to the formula, the project would need to provide a minimum of 286 spaces of which 168 spaces would need to be covered (one covered space per apartment unit). The conceptual site plan shows the project to provide 290 total spaces, with 168 of them covered (90 in a garage, 78 in carports). The number of visitor and handicap spaces is not shown, but the total number of spaces and the aforementioned breakdown are consistent with the minimum number of required visitor spaces.

> **Recommendation:** City staff should review the final project design to determine if there is an adequate allocation of visitor, handicap, and resident parking spaces.

Code-Required Parking Space Design

The Pleasanton municipal code section 18.88.040 provides the design standards for off-street parking facilities. It specifies the required length and width of off-street parking spaces and the standard parking aisle widths. The parking space dimensions and aisle widths vary depending on the angle of parking spaces relative to the aisle. The site plan shows all parking to be 90 degrees (perpendicular), except for 14 parallel spaces.

The city code specifies parking space dimensions as follows: for garage and carport spaces: 10-foot width and 20-foot length; for uncovered spaces: 9-foot width and 19-foot length; and for parallel spaces: 9-foot width and 23-foot length. The site plan specifies dimensions only for uncovered spaces: 9 feet in width and 18 feet in length. This does not meet the city's standard for minimum length for uncovered spaces (unless vehicle overhang beyond the wheel stop is counted). In addition, the code requires parking aisles to be a minimum of 25 feet wide for perpendicular parking. The site plan shows aisle widths of 24 feet. This does not meet the city code requirements.

> **Recommendation:** City staff should review parking stall dimensions and drive aisle widths to determine if they meet City standards. If not, then either a variance or redesign of the parking areas would be required.

Other Transportation Modes

According to the U.S. Census, pedestrian trips comprise approximately 3% of the total commute mode share in the City of Pleasanton. For the proposed project, this would equate to approximately 2 or 3 new pedestrian trips during both the AM and PM peak hours. In addition, the project would generate some pedestrian trips to/from transit stops (see further discussion below) and recreational areas. Overall, the volume of pedestrian trips generated by the project would not exceed the carrying capacity of the existing sidewalks and crosswalks on streets surrounding the site. All of the streets in the project vicinity have sidewalks and crosswalks at signalized intersections.

According to the U.S. Census, bicycle trips comprise less than 1% percent of the total commute mode share in the City of Pleasanton. For the proposed project, this would equate to approximately 1 or 2 new bike trips during both the AM and PM peak hours. The low volume of bicycle trips generated by the project would not exceed the bicycle-carrying capacity of streets and trails surrounding the site, and the increase in bicycle trips would not by itself require new off-site bicycle facilities. The project would provide direct access to the proposed Tassajara Creek trail, which borders the project to the northwest. The proposed Tassajara Creek trail would run from West Las Positas Boulevard north to I-580, where it would continue into the City of Dublin. Stoneridge Drive has striped bike lanes along the southbound travelled way north and south of West Las Positas Boulevard and striped bike lanes along the northbound travelled way south of West Las Positas Boulevard. Along the project frontage, West Las Positas Boulevard is currently signed as a bike route. According to the City of Pleasanton *Pedestrian and Bicycle Master Plan,* the segment of West Las Positas Boulevard adjacent to the project site is planned to include future bike lanes. To accommodate the future bike lanes, the plan states the existing travel lanes would be restriped to 11 feet wide and 5.5 foot bike lanes would be added. On-site, the project is proposing to provide a total of 135 bicycle parking spaces (90 in the parking garages and 45 separate bike storage rooms).

The Livermore-Amador Valley Transit Authority (LAVTA) currently provides bus service, via Wheels, in the project vicinity, including lines 9, 54, 604, and 610. There are currently existing bus pullouts with shelters located on the north side of West Las Positas Boulevard west of Stoneridge Drive and on the east side of

Stoneridge Drive north of West Las Positas Boulevard within the project vicinity. Routes 9 and 54 have bus stops along Stoneridge Drive and West Las Positas Boulevard near the project site. Route 604 is a school focused route and provides service and bus stops along Stoneridge Drive near the project site. Route 610 is a school focused route and provides service and bus stops along West Las Positas Boulevard near the project site. According to the LAVTA Short Range Transit Plan (FY 2012 to 2021), most vehicles in the fleet have a seating capacity of 39 riders with an additional capacity of 21 standees. The bus routes that serve the project area average between 12.3 and 24.7 passengers per hour. According to the U.S. Census, transit trips comprise approximately 7% of the total commute mode share in the City of Pleasanton. For the proposed project, a 7% mode share would equate to approximately 6 or 7 new transit trips during both the AM and PM peak hours. This volume of riders would not exceed the carrying capacity of the existing bus service near the project site. Therefore, no improvements to the existing transit facilities would be necessary in conjunction with the proposed project. It should be noted that residents living within the Hacienda Business Park are eligible for free ECO Passes, which allows them to ride the Wheels Bus System for free.

Conclusions

The study intersection of Santa Rita Road and Stoneridge Drive would operate at an unacceptable LOS E under both buildout no project and buildout with project conditions during the AM peak hour. The project would add 13 trips to the intersection during the AM peak hour. Since the project would add 10 or more trips to the intersection, the project is considered to have a significant impact at the intersection.

> **Mitigation**: The City of Pleasanton currently has a traffic impact fee program to fund future improvements needed to support the buildout of the General Plan. According to the *Traffic Impact Fee and Nexus Report*, May 2010, intersection improvements are proposed for the Stoneridge Drive/Santa Rita Road intersection. The improvements include converting the second eastbound right turn lane to an eastbound through lane, converting the remaining eastbound right turn to a free right turn lane, constructing a northbound right turn lane, and converting a northbound through lane to a third northbound left turn lane. With the improvements, the Stoneridge Drive and Santa Rita Road intersection would operate at LOS D during the AM peak hour. Therefore, participation in the City's traffic impact fee program would mitigate the project's impact at this location.

All other study intersections would operate at acceptable levels of service under existing, existing plus approved, and buildout conditions during both the AM and PM peak hours.

Generally, the proposed plan would provide adequate connectivity through the site for vehicles, bicycles, and pedestrians. However, on the southeast portion of the site, the project plan shows a four legged intersection between two project drive aisles and a medical office drive aisle. The legs of this intersection are not oriented at 90 degrees and there is parking from the existing medical office use that would back into the intersection. In addition, because the intersection legs are oriented at odd angles, there is an abnormally large pavement area within the intersection where lane channelization is not provided.

> **Recommendation:** To the extent possible, it would be advisable to redesign the poorly aligned intersection so that the intersection legs are oriented at approximately 90 degrees and parking is not located within the intersection. If this is not deemed feasible (or desirable due to other site constraints), then the City of Pleasanton may consider stop signs on the west and south approaches so that vehicles are approaching at slow speeds and the right of way is more clearly defined.

Based on the existing medical center parking demand, the proposed removal of parking at the project site would not result in a parking deficiency at the adjacent medical center. However, according to the City of Pleasanton parking code, the existing 55,868 s.f. medical center would require 373 parking spaces or 125 more parking spaces than what is projected to be available.

The conceptual site plan for the proposed apartment project shows 290 total parking spaces, with 168 of them covered (90 in garages and 78 in carports). The number of visitor spaces is not shown, but the total number of spaces and the aforementioned breakdown are consistent with the minimum number of required visitor spaces.

Recommendation: City staff should review the final project design to determine if there is an adequate allocation of visitor, handicap, and resident parking spaces.

Recommendation: City staff should review parking stall dimensions and drive aisle widths to determine if they meet City standards. If not, then either a variance or redesign of the parking areas would be required.

The project would not result in significant impacts to pedestrian or transit facilities. However, according to the City of Pleasanton *Pedestrian and Bicycle Master Plan,* the segment of West Las Positas Boulevard adjacent to the project site is planned to include future bike lanes. To accommodate the future bike lanes, the plan states the existing travel lanes would be restriped to 11 feet wide and 5.5 foot bike lanes would be added.

Anton Hacienda Apartments
Appendix

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HCM Signalized Intersection Capacity Analysis
57: Stoneridge & Hacienda

11/27/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.95		1.00	0.91		0.97	0.95		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.91	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.99		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)	3547	3584		1829	5223		3547	3599		1829	4426	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3547	3584		1829	5223		3547	3599		1829	4426	
Volume (vph)	124	331	41	11	832	25	10	76	7	36	157	168
Peak-hour factor, PHF	0.87	0.87	0.87	0.90	0.90	0.90	0.77	0.77	0.77	0.86	0.86	0.86
Adj. Flow (vph)	143	380	47	12	924	28	13	99	9	42	183	195
RTOR Reduction (vph)	0	4	0	0	2	0	0	7	0	0	163	0
Lane Group Flow (vph)	143	423	0	12	950	0	13	101	0	42	216	0
Confl. Peds. (#/hr)			12			24			24			120
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	9.9	79.1		2.6	71.8		1.3	12.6		5.7	17.0	
Effective Green, g (s)	10.9	82.1		3.6	74.8		2.3	15.6		6.7	20.0	
Actuated g/C Ratio	0.09	0.68		0.03	0.62		0.02	0.13		0.06	0.17	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	322	2452		55	3256		68	468		102	738	
v/s Ratio Prot	c0.04	0.12		0.01	c0.18		0.00	0.03		c0.02	c0.05	
v/s Ratio Perm												
v/c Ratio	0.44	0.17		0.22	0.29		0.19	0.22		0.41	0.29	
Uniform Delay, d1	51.7	6.8		56.8	10.4		57.9	46.7		54.7	43.8	
Progression Factor	0.89	1.14		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.1		2.0	0.2		1.4	0.2		2.7	0.2	
Delay (s)	46.8	7.9		58.8	10.6		59.3	47.0		57.4	44.0	
Level of Service	D	A		E	B		E	D		E	D	
Approach Delay (s)		17.6			11.2			48.3			45.4	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	22.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	53.1%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95			0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			1.00		1.00	0.97		1.00	0.98	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3255			3537		1829	5060		1829	5137	
Flt Permitted		0.93			0.85		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3036			3067		1829	5060		1829	5137	
Volume (vph)	13	29	64	12	13	1	24	84	22	14	108	16
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.85	0.85	0.85	0.85
Adj. Flow (vph)	15	34	75	14	15	1	28	95	26	16	127	19
RTOR Reduction (vph)	0	51	0	0	1	0	0	18	0	0	13	0
Lane Group Flow (vph)	0	73	0	0	29	0	28	103	0	16	133	0
Confl. Peds. (#/hr)	20		20	20		20			20			20
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		7.8			7.8		1.5	6.5		1.3	6.3	
Effective Green, g (s)		9.8			9.8		2.5	9.5		2.3	9.3	
Actuated g/C Ratio		0.32			0.32		0.08	0.31		0.08	0.30	
Clearance Time (s)		5.0			5.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		972			982		149	1571		137	1561	
v/s Ratio Prot							c0.02	0.02		0.01	c0.03	
v/s Ratio Perm		c0.02			0.01							
v/c Ratio		0.08			0.03		0.19	0.07		0.12	0.09	
Uniform Delay, d1		7.2			7.1		13.1	7.4		13.2	7.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.0		0.6	0.0		0.4	0.0	
Delay (s)		7.3			7.1		13.7	7.4		13.6	7.6	
Level of Service		A			A		B	A		B	A	
Approach Delay (s)		7.3			7.1			8.6			8.2	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	8.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.09		
Actuated Cycle Length (s)	30.6	Sum of lost time (s)	9.0
Intersection Capacity Utilization	33.3%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.95		0.95	0.97	1.00
Satd. Flow (prot)	1829	5239		1829	3657	1636		1829		1737	1775	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.95		0.95	0.97	1.00
Satd. Flow (perm)	1829	5239		1829	3657	1636		1829		1737	1775	1615
Volume (vph)	107	333	7	2	553	42	2	0	0	56	14	101
Peak-hour factor, PHF	0.75	0.75	0.75	0.83	0.83	0.83	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	143	444	9	2	666	51	3	0	0	75	19	135
RTOR Reduction (vph)	0	1	0	0	0	27	0	0	0	0	0	114
Lane Group Flow (vph)	143	452	0	2	666	24	0	3	0	46	48	21
Confl. Peds. (#/hr)									3			1
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	9.3	41.4		0.8	32.9	32.9		3.3		9.2	9.2	9.2
Effective Green, g (s)	10.3	44.4		1.8	35.9	35.9		6.3		12.2	12.2	12.2
Actuated g/C Ratio	0.13	0.58		0.02	0.47	0.47		0.08		0.16	0.16	0.16
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0		6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	246	3033		43	1712	766		150		276	282	257
v/s Ratio Prot	c0.08	0.09		0.00	c0.18			c0.00		0.03	c0.03	
v/s Ratio Perm						0.01						0.01
v/c Ratio	0.58	0.15		0.05	0.39	0.03		0.02		0.17	0.17	0.08
Uniform Delay, d1	31.2	7.4		36.6	13.3	11.0		32.4		27.9	27.9	27.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	3.5	0.1		0.4	0.1	0.0		0.1		0.3	0.3	0.1
Delay (s)	34.6	7.5		37.1	13.4	11.0		32.4		28.1	28.2	27.6
Level of Service	C	A		D	B	B		C		C	C	C
Approach Delay (s)		14.0			13.3			32.4			27.8	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	15.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	76.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	40.2%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		0.95	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.95		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)	1829	3590		1829	5109		1806	3392		1734	3506	
Flt Permitted	0.95	1.00		0.95	1.00		0.64	1.00		0.71	1.00	
Satd. Flow (perm)	1829	3590		1829	5109		1209	3392		1293	3506	
Volume (vph)	2	272	27	21	830	155	15	35	18	95	116	35
Peak-hour factor, PHF	0.84	0.84	0.84	0.91	0.91	0.91	0.75	0.75	0.75	0.82	0.82	0.82
Adj. Flow (vph)	2	324	32	23	912	170	20	47	24	116	141	43
RTOR Reduction (vph)	0	6	0	0	22	0	0	17	0	0	31	0
Lane Group Flow (vph)	2	350	0	23	1060	0	20	54	0	116	153	0
Confl. Peds. (#/hr)			72			24	36		132	132		36
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	0.6	14.9		0.8	15.1		8.6	8.6		8.6	8.6	
Effective Green, g (s)	1.6	17.9		1.8	18.1		11.6	11.6		11.6	11.6	
Actuated g/C Ratio	0.04	0.44		0.04	0.45		0.29	0.29		0.29	0.29	
Clearance Time (s)	4.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	73	1595		82	2295		348	976		372	1009	
v/s Ratio Prot	0.00	0.10		c0.01	c0.21			0.02			0.04	
v/s Ratio Perm							0.02			c0.09		
v/c Ratio	0.03	0.22		0.28	0.46		0.06	0.06		0.31	0.15	
Uniform Delay, d1	18.6	6.9		18.6	7.7		10.4	10.4		11.2	10.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1		1.9	0.1		0.1	0.0		0.5	0.1	
Delay (s)	18.8	7.0		20.5	7.9		10.5	10.4		11.7	10.8	
Level of Service	B	A		C	A		B	B		B	B	
Approach Delay (s)		7.0			8.1			10.4			11.1	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	40.3	Sum of lost time (s)	6.0
Intersection Capacity Utilization	49.7%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1604	3547	3657	1590	1829	5255	1636	1829	5255	1618
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1604	3547	3657	1590	1829	5255	1636	1829	5255	1618
Volume (vph)	75	186	35	150	843	35	22	228	97	63	409	218
Peak-hour factor, PHF	0.79	0.79	0.79	0.85	0.85	0.85	0.80	0.80	0.80	0.86	0.86	0.86
Adj. Flow (vph)	95	235	44	176	992	41	28	285	121	73	476	253
RTOR Reduction (vph)	0	0	28	0	0	22	0	0	91	0	0	89
Lane Group Flow (vph)	95	235	16	176	992	19	28	285	30	73	476	164
Confl. Peds. (#/hr)			12			24			36			12
Turn Type	Prot		Perm	Prot		Perm	Prot		custom	Prot		custom
Protected Phases	7	4		3	8		5	2	2	1	6	6
Permitted Phases			4			8			2			4
Actuated Green, G (s)	3.9	21.3	21.3	6.7	24.1	24.1	2.3	14.2	14.2	4.3	15.2	36.5
Effective Green, g (s)	4.9	24.3	24.3	7.7	27.1	27.1	3.3	16.2	16.2	5.3	18.2	42.5
Actuated g/C Ratio	0.07	0.37	0.37	0.12	0.41	0.41	0.05	0.25	0.25	0.08	0.28	0.65
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	5.0	5.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	265	1357	595	417	1513	658	92	1300	405	148	1460	1050
v/s Ratio Prot	0.03	0.06		c0.05	c0.27		0.02	0.05	0.02	c0.04	c0.09	0.04
v/s Ratio Perm			0.01			0.01						0.06
v/c Ratio	0.36	0.17	0.03	0.42	0.66	0.03	0.30	0.22	0.07	0.49	0.33	0.16
Uniform Delay, d1	28.8	13.8	13.1	26.8	15.4	11.4	30.0	19.6	18.9	28.8	18.8	4.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.1	0.0	0.7	1.0	0.0	1.9	0.1	0.1	2.6	0.1	0.1
Delay (s)	29.6	13.9	13.1	27.5	16.5	11.4	31.9	19.7	19.0	31.4	18.9	4.6
Level of Service	C	B	B	C	B	B	C	B	B	C	B	A
Approach Delay (s)		17.8			17.9			20.3			15.5	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	65.5	Sum of lost time (s)	9.0
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.98	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1829	5255	3428	1470	3547	1611
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1829	5255	3428	1470	3547	1611
Volume (vph)	157	241	589	541	176	116
Peak-hour factor, PHF	0.75	0.75	0.86	0.86	0.75	0.75
Adj. Flow (vph)	209	321	685	629	235	155
RTOR Reduction (vph)	0	0	8	292	0	126
Lane Group Flow (vph)	209	321	781	233	235	29
Confl. Peds. (#/hr)				1		2
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		3	
Permitted Phases		6		2		3
Actuated Green, G (s)	8.9	32.8	19.9	19.9	6.8	6.8
Effective Green, g (s)	9.9	35.8	22.9	22.9	9.8	9.8
Actuated g/C Ratio	0.19	0.69	0.44	0.44	0.19	0.19
Clearance Time (s)	4.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	351	3646	1521	652	674	306
v/s Ratio Prot	c0.11	0.06	c0.23		c0.07	
v/s Ratio Perm				0.16		0.02
v/c Ratio	0.60	0.09	0.51	0.36	0.35	0.10
Uniform Delay, d1	19.0	2.6	10.3	9.5	18.1	17.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	0.0	0.3	0.3	0.3	0.1
Delay (s)	21.7	2.6	10.6	9.8	18.4	17.4
Level of Service	C	A	B	A	B	B
Approach Delay (s)		10.1	10.3		18.0	
Approach LOS		B	B		B	

Intersection Summary			
HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	51.6	Sum of lost time (s)	9.0
Intersection Capacity Utilization	46.3%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1591	3547	3574		3547	5255	1593	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1591	3547	3574		3547	5255	1593	3547	5255	1636
Volume (vph)	137	221	140	240	383	62	542	1027	143	66	971	355
Peak-hour factor, PHF	0.75	0.75	0.75	0.80	0.80	0.80	0.87	0.87	0.87	0.91	0.91	0.91
Adj. Flow (vph)	183	295	187	300	479	78	623	1180	164	73	1067	390
RTOR Reduction (vph)	0	0	143	0	11	0	0	0	69	0	0	0
Lane Group Flow (vph)	183	295	44	300	546	0	623	1180	95	73	1067	390
Confl. Peds. (#/hr)			13			1			10			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			Free
Actuated Green, G (s)	10.2	25.1	25.1	14.6	29.5		21.7	53.8	53.8	5.6	37.7	120.0
Effective Green, g (s)	13.2	28.1	28.1	17.0	31.9		22.8	56.2	56.2	6.7	40.1	120.0
Actuated g/C Ratio	0.11	0.23	0.23	0.14	0.27		0.19	0.47	0.47	0.06	0.33	1.00
Clearance Time (s)	6.0	6.0	6.0	5.4	5.4		4.1	5.4	5.4	4.1	5.4	
Vehicle Extension (s)	1.8	1.8	1.8	1.8	1.8		1.8	5.0	5.0	1.8	5.0	
Lane Grp Cap (vph)	390	856	373	502	950		674	2461	746	198	1756	1636
v/s Ratio Prot	c0.05	0.08		0.08	c0.15		c0.18	0.22		0.02	c0.20	
v/s Ratio Perm			0.03						0.06			0.24
v/c Ratio	0.47	0.34	0.12	0.60	0.57		0.92	0.48	0.13	0.37	0.61	0.24
Uniform Delay, d1	50.1	38.3	36.2	48.3	38.2		47.8	21.9	18.0	54.6	33.4	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.13	1.11	1.70	0.81	0.69	1.00
Incremental Delay, d2	0.3	0.1	0.1	1.3	0.5		14.9	0.5	0.3	0.4	1.4	0.3
Delay (s)	50.4	38.4	36.2	49.6	38.7		68.9	24.8	30.9	44.6	24.3	0.3
Level of Service	D	D	D	D	D		E	C	C	D	C	A
Approach Delay (s)		41.1			42.5			39.3			19.2	
Approach LOS		D			D			D			B	

Intersection Summary			
HCM Average Control Delay	33.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.9%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95	0.88	0.97	0.95	1.00	0.97	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1829	3657	2880	3547	3657	1547	3547	5174		3547	5218	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1829	3657	2880	3547	3657	1547	3547	5174		3547	5218	
Volume (vph)	21	92	22	272	270	267	729	1431	163	208	1140	47
Peak-hour factor, PHF	0.81	0.81	0.81	0.75	0.75	0.75	0.91	0.91	0.91	0.87	0.87	0.87
Adj. Flow (vph)	26	114	27	363	360	356	801	1573	179	239	1310	54
RTOR Reduction (vph)	0	0	5	0	0	240	0	10	0	0	3	0
Lane Group Flow (vph)	26	114	22	363	360	116	801	1742	0	239	1361	0
Confl. Peds. (#/hr)						36						12
Turn Type	Prot		pm+ov	Prot		Perm	Prot			Prot		
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.2	14.1	47.3	18.3	28.2	28.2	33.2	54.6		13.0	34.4	
Effective Green, g (s)	5.2	17.1	51.3	19.3	31.2	31.2	34.2	57.6		14.0	37.4	
Actuated g/C Ratio	0.04	0.14	0.43	0.16	0.26	0.26	0.29	0.48		0.12	0.31	
Clearance Time (s)	4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	1.8	5.0	1.8	1.8	5.0	5.0	1.8	5.0		1.8	5.0	
Lane Grp Cap (vph)	79	521	1231	570	951	402	1011	2484		414	1626	
v/s Ratio Prot	c0.01	0.03	0.01	c0.10	c0.10		c0.23	0.34		0.07	c0.26	
v/s Ratio Perm			0.00			0.08						
v/c Ratio	0.33	0.22	0.02	0.64	0.38	0.29	0.79	0.70		0.58	0.84	
Uniform Delay, d1	55.7	45.5	19.8	47.1	36.4	35.5	39.6	24.5		50.2	38.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.29	1.35	
Incremental Delay, d2	0.9	0.4	0.0	1.7	0.5	0.8	4.0	1.7		1.0	4.5	
Delay (s)	56.6	46.0	19.8	48.8	37.0	36.4	43.7	26.1		65.9	56.4	
Level of Service	E	D	B	D	D	D	D	C		E	E	
Approach Delay (s)		43.4			40.7			31.6			57.8	
Approach LOS		D			D			C			E	

Intersection Summary			
HCM Average Control Delay	41.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
57: Stoneridge & Hacienda

11/27/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.95		1.00	0.91		0.97	0.95		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.89	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.99		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3547	3637		1829	5201		3547	3617		1829	4217	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3547	3637		1829	5201		3547	3617		1829	4217	
Volume (vph)	188	761	23	4	473	25	45	185	11	40	149	281
Peak-hour factor, PHF	0.86	0.86	0.86	0.88	0.88	0.88	0.75	0.75	0.75	0.83	0.83	0.83
Adj. Flow (vph)	219	885	27	5	538	28	60	247	15	48	180	339
RTOR Reduction (vph)	0	1	0	0	3	0	0	4	0	0	284	0
Lane Group Flow (vph)	219	911	0	5	563	0	60	258	0	48	235	0
Confl. Peds. (#/hr)			12			24			24			120
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	12.4	74.6		2.6	64.8		6.3	15.4		7.4	16.5	
Effective Green, g (s)	13.4	77.6		3.6	67.8		7.3	18.4		8.4	19.5	
Actuated g/C Ratio	0.11	0.65		0.03	0.56		0.06	0.15		0.07	0.16	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	396	2352		55	2939		216	555		128	685	
v/s Ratio Prot	c0.06	c0.25		0.00	c0.11		0.02	c0.07		c0.03	0.06	
v/s Ratio Perm												
v/c Ratio	0.55	0.39		0.09	0.19		0.28	0.46		0.38	0.34	
Uniform Delay, d1	50.5	10.0		56.6	12.7		53.8	46.3		53.3	44.6	
Progression Factor	0.79	1.15		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	0.4		0.7	0.1		0.7	0.6		1.8	0.3	
Delay (s)	41.5	12.0		57.3	12.9		54.5	46.9		55.1	44.9	
Level of Service	D	B		E	B		D	D		E	D	
Approach Delay (s)		17.7			13.3			48.3			45.7	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	26.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95			0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.90			0.97		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3198			3443		1829	5194		1829	5202	
Flt Permitted		0.89			0.81		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2888			2859		1829	5194		1829	5202	
Volume (vph)	12	8	43	15	10	6	11	144	10	19	164	10
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.85	0.85	0.85	0.85
Adj. Flow (vph)	14	9	51	18	12	7	13	164	12	22	193	12
RTOR Reduction (vph)	0	39	0	0	5	0	0	9	0	0	9	0
Lane Group Flow (vph)	0	35	0	0	32	0	13	167	0	22	196	0
Confl. Peds. (#/hr)	20		20	20		20			20			20
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		3.4			3.4		0.8	3.6		0.8	3.6	
Effective Green, g (s)		5.4			5.4		1.8	6.6		1.8	6.6	
Actuated g/C Ratio		0.24			0.24		0.08	0.29		0.08	0.29	
Clearance Time (s)		5.0			5.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		684			677		144	1504		144	1506	
v/s Ratio Prot							0.01	0.03		c0.01	c0.04	
v/s Ratio Perm		c0.01			0.01							
v/c Ratio		0.05			0.05		0.09	0.11		0.15	0.13	
Uniform Delay, d1		6.7			6.7		9.7	5.9		9.8	6.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.0		0.3	0.0		0.5	0.0	
Delay (s)		6.8			6.7		10.0	6.0		10.3	6.0	
Level of Service		A			A		B	A		B	A	
Approach Delay (s)		6.8			6.7			6.3			6.4	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	6.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.10		
Actuated Cycle Length (s)	22.8	Sum of lost time (s)	9.0
Intersection Capacity Utilization	32.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.95	1.00
Satd. Flow (prot)	1829	5253		1829	3657	1636		1870	1612	1737	1743	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.95	1.00
Satd. Flow (perm)	1829	5253		1829	3657	1636		1870	1612	1737	1743	1615
Volume (vph)	106	461	1	1	324	36	20	14	1	77	1	146
Peak-hour factor, PHF	0.89	0.89	0.89	0.86	0.86	0.86	0.67	0.67	0.67	0.93	0.93	0.93
Adj. Flow (vph)	119	518	1	1	377	42	30	21	1	83	1	157
RTOR Reduction (vph)	0	0	0	0	0	22	0	0	1	0	0	133
Lane Group Flow (vph)	119	519	0	1	377	20	0	51	0	42	42	24
Confl. Peds. (#/hr)									3			1
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	8.1	43.6		0.9	36.4	36.4		7.7	7.7	9.6	9.6	9.6
Effective Green, g (s)	9.1	46.6		1.9	39.4	39.4		10.7	10.7	12.6	12.6	12.6
Actuated g/C Ratio	0.11	0.56		0.02	0.47	0.47		0.13	0.13	0.15	0.15	0.15
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	199	2921		41	1719	769		239	206	261	262	243
v/s Ratio Prot	c0.07	0.10		0.00	c0.10			c0.03		c0.02	0.02	
v/s Ratio Perm						0.01			0.00			0.01
v/c Ratio	0.60	0.18		0.02	0.22	0.03		0.21	0.00	0.16	0.16	0.10
Uniform Delay, d1	35.6	9.2		40.0	13.1	11.9		32.8	31.9	31.0	31.0	30.7
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.8	0.1		0.2	0.1	0.0		0.4	0.0	0.3	0.3	0.2
Delay (s)	40.4	9.3		40.3	13.2	11.9		33.2	31.9	31.3	31.3	30.9
Level of Service	D	A		D	B	B		C	C	C	C	C
Approach Delay (s)		15.1			13.1			33.2			31.0	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	18.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	83.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	34.6%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.98	1.00		0.95	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	0.97		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1829	3651		1829	5088		1799	3517		1743	3393	
Flt Permitted	0.95	1.00		0.95	1.00		0.72	1.00		0.62	1.00	
Satd. Flow (perm)	1829	3651		1829	5088		1363	3517		1146	3393	
Volume (vph)	21	786	6	3	427	93	33	125	26	129	25	17
Peak-hour factor, PHF	0.88	0.88	0.88	0.87	0.87	0.87	0.75	0.75	0.75	0.77	0.77	0.77
Adj. Flow (vph)	24	893	7	3	491	107	44	167	35	168	32	22
RTOR Reduction (vph)	0	1	0	0	28	0	0	21	0	0	15	0
Lane Group Flow (vph)	24	899	0	3	570	0	44	181	0	168	39	0
Confl. Peds. (#/hr)			72			24	36		132	132		36
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	0.8	17.2		0.6	17.0		10.2	10.2		10.2	10.2	
Effective Green, g (s)	1.8	20.2		1.6	20.0		13.2	13.2		13.2	13.2	
Actuated g/C Ratio	0.04	0.46		0.04	0.45		0.30	0.30		0.30	0.30	
Clearance Time (s)	4.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	75	1676		67	2313		409	1055		344	1018	
v/s Ratio Prot	c0.01	c0.25		0.00	0.11			0.05			0.01	
v/s Ratio Perm							0.03			c0.15		
v/c Ratio	0.32	0.54		0.04	0.25		0.11	0.17		0.49	0.04	
Uniform Delay, d1	20.5	8.5		20.5	7.4		11.1	11.4		12.6	10.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.5	0.3		0.3	0.1		0.1	0.1		1.1	0.0	
Delay (s)	23.0	8.9		20.7	7.4		11.3	11.4		13.7	10.9	
Level of Service	C	A		C	A		B	B		B	B	
Approach Delay (s)		9.2			7.5			11.4			13.0	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	9.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	44.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	62.2%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1602	3547	3657	1587	1829	5255	1636	1829	5255	1619
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1602	3547	3657	1587	1829	5255	1636	1829	5255	1619
Volume (vph)	226	778	29	90	307	22	23	353	194	189	249	124
Peak-hour factor, PHF	0.88	0.88	0.88	0.89	0.89	0.89	0.91	0.91	0.91	0.89	0.89	0.89
Adj. Flow (vph)	257	884	33	101	345	25	25	388	213	212	280	139
RTOR Reduction (vph)	0	0	21	0	0	17	0	0	163	0	0	42
Lane Group Flow (vph)	257	884	12	101	345	8	25	388	50	212	280	97
Confl. Peds. (#/hr)			12			24			36			12
Turn Type	Prot		Perm	Prot		Perm	Prot		custom	Prot		custom
Protected Phases	7	4		3	8		5	2	2	1	6	6
Permitted Phases			4			8			2			4
Actuated Green, G (s)	9.5	23.3	23.3	6.0	19.8	19.8	2.6	15.6	15.6	10.6	22.6	45.9
Effective Green, g (s)	10.5	26.3	26.3	7.0	22.8	22.8	3.6	17.6	17.6	11.6	25.6	51.9
Actuated g/C Ratio	0.14	0.35	0.35	0.09	0.31	0.31	0.05	0.24	0.24	0.16	0.34	0.70
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	5.0	5.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	500	1291	566	333	1119	486	88	1241	386	285	1806	1128
v/s Ratio Prot	c0.07	c0.24		0.03	0.09		0.01	c0.07	0.03	c0.12	0.05	0.03
v/s Ratio Perm			0.01			0.00						0.03
v/c Ratio	0.51	0.68	0.02	0.30	0.31	0.02	0.28	0.31	0.13	0.74	0.16	0.09
Uniform Delay, d1	29.6	20.6	15.7	31.5	19.8	18.0	34.2	23.5	22.4	30.0	17.0	3.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	1.5	0.0	0.5	0.2	0.0	1.8	0.1	0.2	10.1	0.0	0.0
Delay (s)	30.5	22.1	15.7	32.0	20.0	18.0	36.0	23.6	22.6	40.1	17.0	3.7
Level of Service	C	C	B	C	B	B	D	C	C	D	B	A
Approach Delay (s)		23.8			22.4			23.7			21.8	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	23.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	74.5	Sum of lost time (s)	9.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.99	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1829	5255	3460	1470	3547	1614
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1829	5255	3460	1470	3547	1614
Volume (vph)	134	498	330	213	592	216
Peak-hour factor, PHF	0.84	0.84	0.85	0.85	0.89	0.89
Adj. Flow (vph)	160	593	388	251	665	243
RTOR Reduction (vph)	0	0	6	153	0	157
Lane Group Flow (vph)	160	593	414	66	665	86
Confl. Peds. (#/hr)				1		2
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		3	
Permitted Phases		6		2		3
Actuated Green, G (s)	8.3	25.5	13.2	13.2	15.9	15.9
Effective Green, g (s)	9.3	28.5	16.2	16.2	18.9	18.9
Actuated g/C Ratio	0.17	0.53	0.30	0.30	0.35	0.35
Clearance Time (s)	4.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	319	2805	1050	446	1255	571
v/s Ratio Prot	c0.09	0.11	c0.12		c0.19	
v/s Ratio Perm				0.05		0.05
v/c Ratio	0.50	0.21	0.39	0.15	0.53	0.15
Uniform Delay, d1	20.0	6.5	14.7	13.6	13.7	11.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.0	0.2	0.2	0.4	0.1
Delay (s)	21.2	6.6	15.0	13.7	14.1	11.9
Level of Service	C	A	B	B	B	B
Approach Delay (s)		9.7	14.5		13.5	
Approach LOS		A	B		B	

Intersection Summary			
HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	53.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	46.1%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1591	3547	3489		3547	5255	1593	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1591	3547	3489		3547	5255	1593	3547	5255	1636
Volume (vph)	354	307	390	174	107	42	226	1255	141	124	1095	221
Peak-hour factor, PHF	0.94	0.94	0.94	0.91	0.91	0.91	0.90	0.90	0.90	0.89	0.89	0.89
Adj. Flow (vph)	377	327	415	191	118	46	251	1394	157	139	1230	248
RTOR Reduction (vph)	0	0	315	0	40	0	0	0	50	0	0	0
Lane Group Flow (vph)	377	327	100	191	124	0	251	1394	107	139	1230	248
Confl. Peds. (#/hr)			13			1			10			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			Free
Actuated Green, G (s)	15.9	19.0	19.0	10.5	13.6		20.9	60.9	60.9	8.7	48.7	120.0
Effective Green, g (s)	18.9	22.0	22.0	12.9	16.0		22.0	63.3	63.3	9.8	51.1	120.0
Actuated g/C Ratio	0.16	0.18	0.18	0.11	0.13		0.18	0.53	0.53	0.08	0.43	1.00
Clearance Time (s)	6.0	6.0	6.0	5.4	5.4		4.1	5.4	5.4	4.1	5.4	
Vehicle Extension (s)	1.8	1.8	1.8	1.8	1.8		1.8	5.0	5.0	1.8	5.0	
Lane Grp Cap (vph)	559	670	292	381	465		650	2772	840	290	2238	1636
v/s Ratio Prot	c0.11	c0.09		c0.05	0.04		0.07	c0.27		0.04	c0.23	
v/s Ratio Perm			0.06						0.07			0.15
v/c Ratio	0.67	0.49	0.34	0.50	0.27		0.39	0.50	0.13	0.48	0.55	0.15
Uniform Delay, d1	47.6	43.9	42.7	50.5	46.7		43.1	18.2	14.4	52.7	25.8	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.17	1.22	1.49	0.89	0.40	1.00
Incremental Delay, d2	2.5	0.2	0.3	0.4	0.1		0.1	0.6	0.3	0.4	0.9	0.2
Delay (s)	50.2	44.2	42.9	50.9	46.8		50.5	22.8	21.7	47.3	11.4	0.2
Level of Service	D	D	D	D	D		D	C	C	D	B	A
Approach Delay (s)		45.7			49.0			26.5			12.7	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM Average Control Delay	28.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95	0.88	0.97	0.95	1.00	0.97	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1829	3657	2880	3547	3657	1547	3547	5182		3547	5227	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1829	3657	2880	3547	3657	1547	3547	5182		3547	5227	
Volume (vph)	56	266	770	101	106	244	269	1319	134	257	1409	44
Peak-hour factor, PHF	0.92	0.92	0.92	0.84	0.84	0.84	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	61	289	837	120	126	290	286	1403	143	279	1532	48
RTOR Reduction (vph)	0	0	79	0	0	224	0	8	0	0	2	0
Lane Group Flow (vph)	61	289	758	120	126	66	286	1538	0	279	1578	0
Confl. Peds. (#/hr)						36						12
Turn Type	Prot		pm+ov	Prot		Perm	Prot			Prot		
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	6.9	18.1	33.2	9.0	20.2	20.2	15.1	59.9		13.0	57.8	
Effective Green, g (s)	7.9	21.1	37.2	10.0	23.2	23.2	16.1	62.9		14.0	60.8	
Actuated g/C Ratio	0.07	0.18	0.31	0.08	0.19	0.19	0.13	0.52		0.12	0.51	
Clearance Time (s)	4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	1.8	5.0	1.8	1.8	5.0	5.0	1.8	5.0		1.8	5.0	
Lane Grp Cap (vph)	120	643	893	296	707	299	476	2716		414	2648	
v/s Ratio Prot	0.03	0.08	c0.11	c0.03	0.03		0.08	0.30		0.08	c0.30	
v/s Ratio Perm			0.15			0.04						
v/c Ratio	0.51	0.45	0.85	0.41	0.18	0.22	0.60	0.57		0.67	0.60	
Uniform Delay, d1	54.2	44.3	38.8	52.2	40.4	40.8	48.9	19.3		50.8	20.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.02	1.26	
Incremental Delay, d2	1.2	1.0	7.3	0.3	0.3	0.8	1.5	0.9		2.9	0.9	
Delay (s)	55.4	45.3	46.0	52.5	40.7	41.6	50.4	20.2		54.5	27.2	
Level of Service	E	D	D	D	D	D	D	C		D	C	
Approach Delay (s)		46.3			43.8			24.9			31.3	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	33.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
57: Stoneridge & Hacienda

11/27/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.95		1.00	0.91		0.97	0.95		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.91	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.99		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)	3547	3584		1829	5223		3547	3600		1829	4428	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3547	3584		1829	5223		3547	3600		1829	4428	
Volume (vph)	124	334	41	11	837	25	15	78	7	36	158	168
Peak-hour factor, PHF	0.87	0.87	0.87	0.90	0.90	0.90	0.77	0.77	0.77	0.86	0.86	0.86
Adj. Flow (vph)	143	384	47	12	930	28	19	101	9	42	184	195
RTOR Reduction (vph)	0	4	0	0	1	0	0	7	0	0	166	0
Lane Group Flow (vph)	143	427	0	12	957	0	19	103	0	42	213	0
Confl. Peds. (#/hr)			12			24			24			120
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	9.9	79.8		2.6	72.5		2.7	11.9		5.7	14.9	
Effective Green, g (s)	10.9	82.8		3.6	75.5		3.7	14.9		6.7	17.9	
Actuated g/C Ratio	0.09	0.69		0.03	0.63		0.03	0.12		0.06	0.15	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	322	2473		55	3286		109	447		102	661	
v/s Ratio Prot	c0.04	0.12		0.01	c0.18		0.01	0.03		c0.02	c0.05	
v/s Ratio Perm												
v/c Ratio	0.44	0.17		0.22	0.29		0.17	0.23		0.41	0.32	
Uniform Delay, d1	51.7	6.5		56.8	10.1		56.7	47.4		54.7	45.6	
Progression Factor	0.89	1.14		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.1		2.0	0.2		0.8	0.3		2.7	0.3	
Delay (s)	46.8	7.6		58.8	10.3		57.4	47.6		57.4	45.9	
Level of Service	D	A		E	B		E	D		E	D	
Approach Delay (s)		17.4			10.9			49.1			47.1	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	22.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.2%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95			0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			1.00		1.00	0.97		1.00	0.98	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3255			3537		1829	5072		1829	5137	
Flt Permitted		0.93			0.85		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3036			3067		1829	5072		1829	5137	
Volume (vph)	13	29	64	12	13	1	25	91	22	14	109	16
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.85	0.85	0.85	0.85
Adj. Flow (vph)	15	34	75	14	15	1	29	103	26	16	128	19
RTOR Reduction (vph)	0	51	0	0	1	0	0	18	0	0	13	0
Lane Group Flow (vph)	0	73	0	0	29	0	29	111	0	16	134	0
Confl. Peds. (#/hr)	20		20	20		20			20			20
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		7.8			7.8		1.5	6.5		1.3	6.3	
Effective Green, g (s)		9.8			9.8		2.5	9.5		2.3	9.3	
Actuated g/C Ratio		0.32			0.32		0.08	0.31		0.08	0.30	
Clearance Time (s)		5.0			5.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		972			982		149	1575		137	1561	
v/s Ratio Prot							c0.02	0.02		0.01	c0.03	
v/s Ratio Perm		c0.02			0.01							
v/c Ratio		0.08			0.03		0.19	0.07		0.12	0.09	
Uniform Delay, d1		7.2			7.1		13.1	7.4		13.2	7.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.0		0.6	0.0		0.4	0.0	
Delay (s)		7.3			7.1		13.8	7.5		13.6	7.6	
Level of Service		A			A		B	A		B	A	
Approach Delay (s)		7.3			7.1			8.6			8.2	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	8.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.09		
Actuated Cycle Length (s)	30.6	Sum of lost time (s)	9.0
Intersection Capacity Utilization	33.3%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.95		0.95	0.97	1.00
Satd. Flow (prot)	1829	5239		1829	3657	1636		1829		1737	1774	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.95		0.95	0.97	1.00
Satd. Flow (perm)	1829	5239		1829	3657	1636		1829		1737	1774	1615
Volume (vph)	107	337	7	2	570	50	2	0	0	57	14	101
Peak-hour factor, PHF	0.75	0.75	0.75	0.83	0.83	0.83	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	143	449	9	2	687	60	3	0	0	76	19	135
RTOR Reduction (vph)	0	1	0	0	0	32	0	0	0	0	0	114
Lane Group Flow (vph)	143	457	0	2	687	28	0	3	0	46	49	21
Confl. Peds. (#/hr)									3			1
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	9.2	41.1		0.8	32.7	32.7		3.3		9.1	9.1	9.1
Effective Green, g (s)	10.2	44.1		1.8	35.7	35.7		6.3		12.1	12.1	12.1
Actuated g/C Ratio	0.13	0.58		0.02	0.47	0.47		0.08		0.16	0.16	0.16
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0		6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	245	3028		43	1711	765		151		275	281	256
v/s Ratio Prot	c0.08	0.09		0.00	c0.19			c0.00		0.03	c0.03	
v/s Ratio Perm						0.02						0.01
v/c Ratio	0.58	0.15		0.05	0.40	0.04		0.02		0.17	0.17	0.08
Uniform Delay, d1	31.1	7.4		36.4	13.3	11.0		32.2		27.7	27.8	27.4
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	3.5	0.1		0.4	0.2	0.0		0.1		0.3	0.3	0.1
Delay (s)	34.6	7.5		36.9	13.5	11.0		32.2		28.0	28.1	27.5
Level of Service	C	A		D	B	B		C		C	C	C
Approach Delay (s)		14.0			13.3			32.2			27.7	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	15.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	76.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	40.7%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		0.95	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.95		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)	1829	3591		1829	5106		1806	3392		1734	3506	
Flt Permitted	0.95	1.00		0.95	1.00		0.64	1.00		0.71	1.00	
Satd. Flow (perm)	1829	3591		1829	5106		1209	3392		1293	3506	
Volume (vph)	2	275	27	21	835	159	15	35	18	96	116	35
Peak-hour factor, PHF	0.84	0.84	0.84	0.91	0.91	0.91	0.75	0.75	0.75	0.82	0.82	0.82
Adj. Flow (vph)	2	327	32	23	918	175	20	47	24	117	141	43
RTOR Reduction (vph)	0	6	0	0	23	0	0	17	0	0	31	0
Lane Group Flow (vph)	2	353	0	23	1070	0	20	54	0	117	153	0
Confl. Peds. (#/hr)			72			24	36		132	132		36
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	0.6	15.0		0.8	15.2		8.6	8.6		8.6	8.6	
Effective Green, g (s)	1.6	18.0		1.8	18.2		11.6	11.6		11.6	11.6	
Actuated g/C Ratio	0.04	0.45		0.04	0.45		0.29	0.29		0.29	0.29	
Clearance Time (s)	4.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	72	1600		81	2300		347	974		371	1007	
v/s Ratio Prot	0.00	0.10		c0.01	c0.21			0.02			0.04	
v/s Ratio Perm							0.02			c0.09		
v/c Ratio	0.03	0.22		0.28	0.47		0.06	0.06		0.32	0.15	
Uniform Delay, d1	18.7	6.9		18.7	7.7		10.4	10.4		11.3	10.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1		1.9	0.1		0.1	0.0		0.5	0.1	
Delay (s)	18.8	7.0		20.6	7.9		10.5	10.5		11.8	10.8	
Level of Service	B	A		C	A		B	B		B	B	
Approach Delay (s)		7.0			8.1			10.5			11.2	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	40.4	Sum of lost time (s)	6.0
Intersection Capacity Utilization	49.9%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1603	3547	3657	1590	1829	5255	1636	1829	5255	1617
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1603	3547	3657	1590	1829	5255	1636	1829	5255	1617
Volume (vph)	89	192	35	145	850	35	22	238	102	63	396	237
Peak-hour factor, PHF	0.79	0.79	0.79	0.85	0.85	0.85	0.80	0.80	0.80	0.86	0.86	0.86
Adj. Flow (vph)	113	243	44	171	1000	41	28	298	128	73	460	276
RTOR Reduction (vph)	0	0	27	0	0	22	0	0	97	0	0	93
Lane Group Flow (vph)	113	243	17	171	1000	19	28	298	31	73	460	183
Confl. Peds. (#/hr)			12			24			36			12
Turn Type	Prot		Perm	Prot		Perm	Prot		custom	Prot		custom
Protected Phases	7	4		3	8		5	2	2	1	6	6
Permitted Phases			4			8			2			4
Actuated Green, G (s)	5.9	23.5	23.5	6.5	24.1	24.1	2.4	14.3	14.3	4.4	15.3	38.8
Effective Green, g (s)	6.9	26.5	26.5	7.5	27.1	27.1	3.4	16.3	16.3	5.4	18.3	44.8
Actuated g/C Ratio	0.10	0.39	0.39	0.11	0.40	0.40	0.05	0.24	0.24	0.08	0.27	0.66
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	5.0	5.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	362	1431	627	393	1464	636	92	1265	394	146	1420	1070
v/s Ratio Prot	0.03	0.07		c0.05	c0.27		0.02	0.06	0.02	c0.04	c0.09	0.05
v/s Ratio Perm			0.01			0.01						0.07
v/c Ratio	0.31	0.17	0.03	0.44	0.68	0.03	0.30	0.24	0.08	0.50	0.32	0.17
Uniform Delay, d1	28.2	13.4	12.7	28.1	16.8	12.3	31.0	20.7	19.9	29.9	19.8	4.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.1	0.0	0.8	1.3	0.0	1.9	0.1	0.1	2.7	0.1	0.1
Delay (s)	28.7	13.5	12.7	28.9	18.1	12.3	32.9	20.8	20.0	32.5	19.9	4.4
Level of Service	C	B	B	C	B	B	C	C	B	C	B	A
Approach Delay (s)		17.7			19.4			21.3			15.8	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM Average Control Delay	18.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	67.7	Sum of lost time (s)	6.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.98	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1829	5255	3429	1470	3547	1611
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1829	5255	3429	1470	3547	1611
Volume (vph)	169	253	592	541	176	119
Peak-hour factor, PHF	0.75	0.75	0.86	0.86	0.75	0.75
Adj. Flow (vph)	225	337	688	629	235	159
RTOR Reduction (vph)	0	0	8	293	0	129
Lane Group Flow (vph)	225	337	783	233	235	30
Confl. Peds. (#/hr)				1		2
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		3	
Permitted Phases		6		2		3
Actuated Green, G (s)	9.4	33.6	20.2	20.2	6.8	6.8
Effective Green, g (s)	10.4	36.6	23.2	23.2	9.8	9.8
Actuated g/C Ratio	0.20	0.70	0.44	0.44	0.19	0.19
Clearance Time (s)	4.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	363	3670	1518	651	663	301
v/s Ratio Prot	c0.12	0.06	c0.23		c0.07	
v/s Ratio Perm				0.16		0.02
v/c Ratio	0.62	0.09	0.52	0.36	0.35	0.10
Uniform Delay, d1	19.2	2.5	10.5	9.7	18.5	17.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.1	0.0	0.3	0.3	0.3	0.1
Delay (s)	22.3	2.6	10.8	10.0	18.9	17.8
Level of Service	C	A	B	B	B	B
Approach Delay (s)		10.5	10.5		18.4	
Approach LOS		B	B		B	

Intersection Summary			
HCM Average Control Delay	11.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	52.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	47.1%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1591	3547	3574		3547	5255	1593	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1591	3547	3574		3547	5255	1593	3547	5255	1636
Volume (vph)	147	223	140	240	383	62	542	1027	143	66	971	358
Peak-hour factor, PHF	0.75	0.75	0.75	0.80	0.80	0.80	0.87	0.87	0.87	0.91	0.91	0.91
Adj. Flow (vph)	196	297	187	300	479	78	623	1180	164	73	1067	393
RTOR Reduction (vph)	0	0	143	0	11	0	0	0	69	0	0	0
Lane Group Flow (vph)	196	297	44	300	546	0	623	1180	95	73	1067	393
Confl. Peds. (#/hr)			13			1			10			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			Free
Actuated Green, G (s)	10.6	25.1	25.1	14.7	29.2		21.7	53.7	53.7	5.6	37.6	120.0
Effective Green, g (s)	13.6	28.1	28.1	17.1	31.6		22.8	56.1	56.1	6.7	40.0	120.0
Actuated g/C Ratio	0.11	0.23	0.23	0.14	0.26		0.19	0.47	0.47	0.06	0.33	1.00
Clearance Time (s)	6.0	6.0	6.0	5.4	5.4		4.1	5.4	5.4	4.1	5.4	
Vehicle Extension (s)	1.8	1.8	1.8	1.8	1.8		1.8	5.0	5.0	1.8	5.0	
Lane Grp Cap (vph)	402	856	373	505	941		674	2457	745	198	1752	1636
v/s Ratio Prot	c0.06	0.08		0.08	c0.15		c0.18	0.22		0.02	c0.20	
v/s Ratio Perm			0.03						0.06			0.24
v/c Ratio	0.49	0.35	0.12	0.59	0.58		0.92	0.48	0.13	0.37	0.61	0.24
Uniform Delay, d1	49.9	38.3	36.2	48.2	38.4		47.8	21.9	18.1	54.6	33.5	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.13	1.11	1.69	0.81	0.68	1.00
Incremental Delay, d2	0.3	0.1	0.1	1.3	0.6		14.8	0.5	0.3	0.4	1.5	0.3
Delay (s)	50.3	38.4	36.2	49.5	39.0		68.8	24.8	30.9	44.5	24.4	0.3
Level of Service	D	D	D	D	D		E	C	C	D	C	A
Approach Delay (s)		41.2			42.7			39.3			19.2	
Approach LOS		D			D			D			B	

Intersection Summary			
HCM Average Control Delay	34.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.9%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95	0.88	0.97	0.95	1.00	0.97	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1829	3657	2880	3547	3657	1547	3547	5174		3547	5218	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1829	3657	2880	3547	3657	1547	3547	5174		3547	5218	
Volume (vph)	21	98	27	272	271	267	730	1431	163	208	1140	47
Peak-hour factor, PHF	0.81	0.81	0.81	0.75	0.75	0.75	0.91	0.91	0.91	0.87	0.87	0.87
Adj. Flow (vph)	26	121	33	363	361	356	802	1573	179	239	1310	54
RTOR Reduction (vph)	0	0	5	0	0	239	0	10	0	0	3	0
Lane Group Flow (vph)	26	121	28	363	361	117	802	1742	0	239	1361	0
Confl. Peds. (#/hr)						36						12
Turn Type	Prot		pm+ov	Prot		Perm	Prot			Prot		
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.2	14.3	47.4	18.2	28.3	28.3	33.1	54.5		13.0	34.4	
Effective Green, g (s)	5.2	17.3	51.4	19.2	31.3	31.3	34.1	57.5		14.0	37.4	
Actuated g/C Ratio	0.04	0.14	0.43	0.16	0.26	0.26	0.28	0.48		0.12	0.31	
Clearance Time (s)	4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	1.8	5.0	1.8	1.8	5.0	5.0	1.8	5.0		1.8	5.0	
Lane Grp Cap (vph)	79	527	1234	568	954	404	1008	2479		414	1626	
v/s Ratio Prot	c0.01	0.03	0.01	c0.10	c0.10		c0.23	0.34		0.07	c0.26	
v/s Ratio Perm			0.00			0.08						
v/c Ratio	0.33	0.23	0.02	0.64	0.38	0.29	0.80	0.70		0.58	0.84	
Uniform Delay, d1	55.7	45.5	19.8	47.2	36.4	35.4	39.7	24.5		50.2	38.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.29	1.35	
Incremental Delay, d2	0.9	0.5	0.0	1.7	0.5	0.8	4.1	1.7		1.0	4.5	
Delay (s)	56.6	45.9	19.8	48.9	36.9	36.3	43.9	26.2		65.9	56.4	
Level of Service	E	D	B	D	D	D	D	C		E	E	
Approach Delay (s)		42.7			40.7			31.8			57.8	
Approach LOS		D			D			C			E	

Intersection Summary			
HCM Average Control Delay	41.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
57: Stoneridge & Hacienda

11/27/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.95		1.00	0.91		0.97	0.95		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.89	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.99		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3547	3638		1829	5201		3547	3617		1829	4219	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3547	3638		1829	5201		3547	3617		1829	4219	
Volume (vph)	188	771	23	4	476	25	48	186	11	41	150	281
Peak-hour factor, PHF	0.86	0.86	0.86	0.88	0.88	0.88	0.75	0.75	0.75	0.83	0.83	0.83
Adj. Flow (vph)	219	897	27	5	541	28	64	248	15	49	181	339
RTOR Reduction (vph)	0	1	0	0	3	0	0	4	0	0	284	0
Lane Group Flow (vph)	219	923	0	5	566	0	64	259	0	49	236	0
Confl. Peds. (#/hr)			12			24			24			120
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	12.4	74.6		2.6	64.8		6.4	15.4		7.4	16.4	
Effective Green, g (s)	13.4	77.6		3.6	67.8		7.4	18.4		8.4	19.4	
Actuated g/C Ratio	0.11	0.65		0.03	0.56		0.06	0.15		0.07	0.16	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	396	2353		55	2939		219	555		128	682	
v/s Ratio Prot	c0.06	c0.25		0.00	c0.11		0.02	c0.07		c0.03	0.06	
v/s Ratio Perm												
v/c Ratio	0.55	0.39		0.09	0.19		0.29	0.47		0.38	0.35	
Uniform Delay, d1	50.5	10.0		56.6	12.7		53.8	46.3		53.3	44.7	
Progression Factor	0.79	1.15		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	0.5		0.7	0.1		0.7	0.6		1.9	0.3	
Delay (s)	41.6	12.0		57.3	12.9		54.5	46.9		55.2	45.0	
Level of Service	D	B		E	B		D	D		E	D	
Approach Delay (s)		17.7			13.3			48.4			45.9	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	26.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95			0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.90			0.97		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3196			3443		1829	5195		1829	5203	
Flt Permitted		0.90			0.81		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2889			2859		1829	5195		1829	5203	
Volume (vph)	12	8	44	15	10	6	11	148	10	19	165	10
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.85	0.85	0.85	0.85
Adj. Flow (vph)	14	9	52	18	12	7	13	168	12	22	194	12
RTOR Reduction (vph)	0	40	0	0	5	0	0	9	0	0	9	0
Lane Group Flow (vph)	0	35	0	0	32	0	13	171	0	22	197	0
Confl. Peds. (#/hr)	20		20	20		20			20			20
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		3.3			3.3		0.8	3.5		0.8	3.5	
Effective Green, g (s)		5.3			5.3		1.8	6.5		1.8	6.5	
Actuated g/C Ratio		0.23			0.23		0.08	0.29		0.08	0.29	
Clearance Time (s)		5.0			5.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		678			670		146	1494		146	1496	
v/s Ratio Prot							0.01	0.03		c0.01	c0.04	
v/s Ratio Perm		c0.01			0.01							
v/c Ratio		0.05			0.05		0.09	0.11		0.15	0.13	
Uniform Delay, d1		6.7			6.7		9.6	5.9		9.7	6.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.0		0.3	0.0		0.5	0.0	
Delay (s)		6.7			6.7		9.9	6.0		10.2	6.0	
Level of Service		A			A		A	A		B	A	
Approach Delay (s)		6.7			6.7			6.2			6.4	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	6.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.10		
Actuated Cycle Length (s)	22.6	Sum of lost time (s)	9.0
Intersection Capacity Utilization	32.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.95	1.00
Satd. Flow (prot)	1829	5253		1829	3657	1636		1870	1612	1737	1743	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.95	1.00
Satd. Flow (perm)	1829	5253		1829	3657	1636		1870	1612	1737	1743	1615
Volume (vph)	106	478	1	1	333	40	20	14	1	79	1	146
Peak-hour factor, PHF	0.89	0.89	0.89	0.86	0.86	0.86	0.67	0.67	0.67	0.93	0.93	0.93
Adj. Flow (vph)	119	537	1	1	387	47	30	21	1	85	1	157
RTOR Reduction (vph)	0	0	0	0	0	25	0	0	1	0	0	133
Lane Group Flow (vph)	119	538	0	1	387	22	0	51	0	43	43	24
Confl. Peds. (#/hr)									3			1
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	8.1	43.6		0.9	36.4	36.4		7.7	7.7	9.6	9.6	9.6
Effective Green, g (s)	9.1	46.6		1.9	39.4	39.4		10.7	10.7	12.6	12.6	12.6
Actuated g/C Ratio	0.11	0.56		0.02	0.47	0.47		0.13	0.13	0.15	0.15	0.15
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	199	2921		41	1719	769		239	206	261	262	243
v/s Ratio Prot	c0.07	0.10		0.00	c0.11			c0.03		c0.02	0.02	
v/s Ratio Perm						0.01			0.00			0.01
v/c Ratio	0.60	0.18		0.02	0.23	0.03		0.21	0.00	0.16	0.16	0.10
Uniform Delay, d1	35.6	9.2		40.0	13.2	11.9		32.8	31.9	31.0	31.0	30.7
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.8	0.1		0.2	0.1	0.0		0.4	0.0	0.3	0.3	0.2
Delay (s)	40.4	9.3		40.3	13.2	11.9		33.2	31.9	31.3	31.3	30.9
Level of Service	D	A		D	B	B		C	C	C	C	C
Approach Delay (s)		15.0			13.1			33.2			31.0	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	17.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	83.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	34.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.98	1.00		0.95	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	0.97		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1829	3651		1829	5086		1799	3517		1742	3393	
Flt Permitted	0.95	1.00		0.95	1.00		0.72	1.00		0.62	1.00	
Satd. Flow (perm)	1829	3651		1829	5086		1363	3517		1146	3393	
Volume (vph)	21	797	6	3	430	95	33	125	26	133	25	17
Peak-hour factor, PHF	0.88	0.88	0.88	0.87	0.87	0.87	0.75	0.75	0.75	0.77	0.77	0.77
Adj. Flow (vph)	24	906	7	3	494	109	44	167	35	173	32	22
RTOR Reduction (vph)	0	1	0	0	28	0	0	21	0	0	15	0
Lane Group Flow (vph)	24	912	0	3	575	0	44	181	0	173	39	0
Confl. Peds. (#/hr)			72			24	36		132	132		36
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	0.9	17.3		0.6	17.0		10.3	10.3		10.3	10.3	
Effective Green, g (s)	1.9	20.3		1.6	20.0		13.3	13.3		13.3	13.3	
Actuated g/C Ratio	0.04	0.46		0.04	0.45		0.30	0.30		0.30	0.30	
Clearance Time (s)	4.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	79	1677		66	2301		410	1058		345	1021	
v/s Ratio Prot	c0.01	c0.25		0.00	0.11			0.05			0.01	
v/s Ratio Perm							0.03			c0.15		
v/c Ratio	0.30	0.54		0.05	0.25		0.11	0.17		0.50	0.04	
Uniform Delay, d1	20.5	8.6		20.6	7.5		11.2	11.4		12.7	10.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	0.4		0.3	0.1		0.1	0.1		1.1	0.0	
Delay (s)	22.7	9.0		20.8	7.5		11.3	11.5		13.9	10.9	
Level of Service	C	A		C	A		B	B		B	B	
Approach Delay (s)		9.3			7.6			11.4			13.2	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	9.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	44.2	Sum of lost time (s)	6.0
Intersection Capacity Utilization	62.7%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1602	3547	3657	1587	1829	5255	1636	1829	5255	1619
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1602	3547	3657	1587	1829	5255	1636	1829	5255	1619
Volume (vph)	240	785	29	94	314	22	23	352	192	189	260	136
Peak-hour factor, PHF	0.88	0.88	0.88	0.89	0.89	0.89	0.91	0.91	0.91	0.89	0.89	0.89
Adj. Flow (vph)	273	892	33	106	353	25	25	387	211	212	292	153
RTOR Reduction (vph)	0	0	21	0	0	17	0	0	161	0	0	46
Lane Group Flow (vph)	273	892	12	106	353	8	25	387	50	212	292	107
Confl. Peds. (#/hr)			12			24			36			12
Turn Type	Prot		Perm	Prot		Perm	Prot		custom	Prot		custom
Protected Phases	7	4		3	8		5	2	2	1	6	6
Permitted Phases			4			8			2			4
Actuated Green, G (s)	9.7	23.6	23.6	6.1	20.0	20.0	2.6	15.7	15.7	10.5	22.6	46.2
Effective Green, g (s)	10.7	26.6	26.6	7.1	23.0	23.0	3.6	17.7	17.7	11.5	25.6	52.2
Actuated g/C Ratio	0.14	0.36	0.36	0.09	0.31	0.31	0.05	0.24	0.24	0.15	0.34	0.70
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	5.0	5.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	507	1299	569	336	1123	487	88	1242	387	281	1796	1128
v/s Ratio Prot	c0.08	c0.24		0.03	0.10		0.01	c0.07	0.03	c0.12	0.06	0.03
v/s Ratio Perm			0.01			0.00						0.03
v/c Ratio	0.54	0.69	0.02	0.32	0.31	0.02	0.28	0.31	0.13	0.75	0.16	0.09
Uniform Delay, d1	29.8	20.6	15.7	31.6	19.9	18.1	34.4	23.6	22.5	30.3	17.2	3.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	1.5	0.0	0.5	0.2	0.0	1.8	0.1	0.2	10.9	0.0	0.0
Delay (s)	30.9	22.1	15.7	32.2	20.1	18.1	36.2	23.7	22.7	41.3	17.2	3.7
Level of Service	C	C	B	C	C	B	D	C	C	D	B	A
Approach Delay (s)		23.9			22.6			23.9			21.8	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	23.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	74.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.99	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1829	5255	3469	1470	3547	1614
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1829	5255	3469	1470	3547	1614
Volume (vph)	140	505	342	213	592	227
Peak-hour factor, PHF	0.84	0.84	0.85	0.85	0.89	0.89
Adj. Flow (vph)	167	601	402	251	665	255
RTOR Reduction (vph)	0	0	4	157	0	165
Lane Group Flow (vph)	167	601	424	68	665	90
Confl. Peds. (#/hr)				1		2
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		3	
Permitted Phases		6		2		3
Actuated Green, G (s)	8.5	25.9	13.4	13.4	16.0	16.0
Effective Green, g (s)	9.5	28.9	16.4	16.4	19.0	19.0
Actuated g/C Ratio	0.18	0.54	0.30	0.30	0.35	0.35
Clearance Time (s)	4.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	322	2818	1056	447	1250	569
v/s Ratio Prot	c0.09	0.11	c0.12		c0.19	
v/s Ratio Perm				0.05		0.06
v/c Ratio	0.52	0.21	0.40	0.15	0.53	0.16
Uniform Delay, d1	20.1	6.5	14.9	13.7	13.9	12.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.0	0.3	0.2	0.4	0.1
Delay (s)	21.5	6.6	15.1	13.8	14.3	12.1
Level of Service	C	A	B	B	B	B
Approach Delay (s)		9.8	14.7		13.7	
Approach LOS		A	B		B	

Intersection Summary			
HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	53.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	46.7%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1591	3547	3491		3547	5255	1593	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1591	3547	3491		3547	5255	1593	3547	5255	1636
Volume (vph)	360	308	390	174	109	42	226	1255	141	124	1095	231
Peak-hour factor, PHF	0.94	0.94	0.94	0.91	0.91	0.91	0.90	0.90	0.90	0.89	0.89	0.89
Adj. Flow (vph)	383	328	415	191	120	46	251	1394	157	139	1230	260
RTOR Reduction (vph)	0	0	315	0	39	0	0	0	50	0	0	0
Lane Group Flow (vph)	383	328	100	191	127	0	251	1394	107	139	1230	260
Confl. Peds. (#/hr)			13			1			10			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			Free
Actuated Green, G (s)	16.0	19.0	19.0	10.6	13.6		20.9	60.8	60.8	8.7	48.6	120.0
Effective Green, g (s)	19.0	22.0	22.0	13.0	16.0		22.0	63.2	63.2	9.8	51.0	120.0
Actuated g/C Ratio	0.16	0.18	0.18	0.11	0.13		0.18	0.53	0.53	0.08	0.42	1.00
Clearance Time (s)	6.0	6.0	6.0	5.4	5.4		4.1	5.4	5.4	4.1	5.4	
Vehicle Extension (s)	1.8	1.8	1.8	1.8	1.8		1.8	5.0	5.0	1.8	5.0	
Lane Grp Cap (vph)	562	670	292	384	465		650	2768	839	290	2233	1636
v/s Ratio Prot	c0.11	0.09		c0.05	0.04		0.07	c0.27		0.04	c0.23	
v/s Ratio Perm			0.06						0.07			c0.16
v/c Ratio	0.68	0.49	0.34	0.50	0.27		0.39	0.50	0.13	0.48	0.55	0.16
Uniform Delay, d1	47.6	44.0	42.7	50.4	46.8		43.1	18.3	14.4	52.7	25.9	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.17	1.22	1.49	0.89	0.41	1.00
Incremental Delay, d2	2.7	0.2	0.3	0.4	0.1		0.1	0.6	0.3	0.4	0.9	0.2
Delay (s)	50.4	44.2	42.9	50.8	46.9		50.5	22.9	21.7	47.2	11.6	0.2
Level of Service	D	D	D	D	D		D	C	C	D	B	A
Approach Delay (s)		45.8			49.0			26.6			12.8	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95	0.88	0.97	0.95	1.00	0.97	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1829	3657	2880	3547	3657	1547	3547	5182		3547	5227	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1829	3657	2880	3547	3657	1547	3547	5182		3547	5227	
Volume (vph)	56	269	772	101	112	244	274	1319	134	257	1409	44
Peak-hour factor, PHF	0.92	0.92	0.92	0.84	0.84	0.84	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	61	292	839	120	133	290	291	1403	143	279	1532	48
RTOR Reduction (vph)	0	0	79	0	0	224	0	8	0	0	2	0
Lane Group Flow (vph)	61	292	760	120	133	66	291	1538	0	279	1578	0
Confl. Peds. (#/hr)						36						12
Turn Type	Prot		pm+ov	Prot		Perm	Prot			Prot		
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	6.9	18.1	33.2	9.0	20.2	20.2	15.1	59.9		13.0	57.8	
Effective Green, g (s)	7.9	21.1	37.2	10.0	23.2	23.2	16.1	62.9		14.0	60.8	
Actuated g/C Ratio	0.07	0.18	0.31	0.08	0.19	0.19	0.13	0.52		0.12	0.51	
Clearance Time (s)	4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	1.8	5.0	1.8	1.8	5.0	5.0	1.8	5.0		1.8	5.0	
Lane Grp Cap (vph)	120	643	893	296	707	299	476	2716		414	2648	
v/s Ratio Prot	0.03	0.08	c0.11	c0.03	0.04		0.08	0.30		0.08	c0.30	
v/s Ratio Perm			0.15			0.04						
v/c Ratio	0.51	0.45	0.85	0.41	0.19	0.22	0.61	0.57		0.67	0.60	
Uniform Delay, d1	54.2	44.3	38.8	52.2	40.5	40.8	49.0	19.3		50.8	20.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.02	1.26	
Incremental Delay, d2	1.2	1.1	7.5	0.3	0.3	0.8	1.6	0.9		2.9	0.9	
Delay (s)	55.4	45.4	46.3	52.5	40.8	41.6	50.6	20.2		54.7	27.3	
Level of Service	E	D	D	D	D	D	D	C		D	C	
Approach Delay (s)		46.6			43.8			25.0			31.4	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	33.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.3%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.95		1.00	0.91		0.97	0.95		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.93	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.98		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)	3547	3628		1829	5212		3547	3570		1829	4539	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3547	3628		1829	5212		3547	3570		1829	4539	
Volume (vph)	188	272	12	21	1295	54	60	133	19	30	183	146
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)	200	289	13	22	1378	57	64	141	20	32	195	155
RTOR Reduction (vph)	0	1	0	0	2	0	0	11	0	0	129	0
Lane Group Flow (vph)	200	301	0	22	1433	0	64	150	0	32	221	0
Confl. Peds. (#/hr)			12			24			24			120
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	11.8	72.9		3.3	64.4		6.4	18.6		5.2	17.4	
Effective Green, g (s)	12.8	75.9		4.3	67.4		7.4	21.6		6.2	20.4	
Actuated g/C Ratio	0.11	0.63		0.04	0.56		0.06	0.18		0.05	0.17	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	378	2295		66	2927		219	643		94	772	
v/s Ratio Prot	c0.06	0.08		0.01	c0.27		0.02	0.04		c0.02	c0.05	
v/s Ratio Perm												
v/c Ratio	0.53	0.13		0.33	0.49		0.29	0.23		0.34	0.29	
Uniform Delay, d1	50.7	8.8		56.5	15.9		53.8	42.1		54.9	43.5	
Progression Factor	0.77	1.29		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.1		3.0	0.6		0.7	0.2		2.2	0.2	
Delay (s)	40.1	11.5		59.4	16.5		54.5	42.3		57.1	43.7	
Level of Service	D	B		E	B		D	D		E	D	
Approach Delay (s)		22.9			17.1			45.8			44.8	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	24.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1829	5255	3503	1470	3547	1611
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1829	5255	3503	1470	3547	1611
Volume (vph)	112	209	645	411	121	133
Peak-hour factor, PHF	0.86	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	130	246	759	484	142	156
RTOR Reduction (vph)	0	0	0	269	0	127
Lane Group Flow (vph)	130	246	759	215	142	29
Confl. Peds. (#/hr)				1		2
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		3	
Permitted Phases		6		2		3
Actuated Green, G (s)	6.7	27.9	17.2	17.2	5.5	5.5
Effective Green, g (s)	7.7	30.9	20.2	20.2	8.5	8.5
Actuated g/C Ratio	0.17	0.68	0.44	0.44	0.19	0.19
Clearance Time (s)	4.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	310	3577	1559	654	664	302
v/s Ratio Prot	c0.07	0.05	c0.22		c0.04	
v/s Ratio Perm				0.15		0.02
v/c Ratio	0.42	0.07	0.49	0.33	0.21	0.10
Uniform Delay, d1	16.9	2.4	8.9	8.2	15.6	15.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.0	0.2	0.3	0.2	0.1
Delay (s)	17.8	2.4	9.2	8.5	15.8	15.4
Level of Service	B	A	A	A	B	B
Approach Delay (s)		7.7	8.9		15.6	
Approach LOS		A	A		B	

Intersection Summary			
HCM Average Control Delay	9.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	45.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	43.2%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1591	3547	3563		3547	5255	1593	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1591	3547	3563		3547	5255	1593	3547	5255	1636
Volume (vph)	136	276	126	230	399	75	509	950	129	92	914	302
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)	153	310	142	258	448	84	572	1067	145	103	1027	339
RTOR Reduction (vph)	0	0	116	0	14	0	0	0	64	0	0	0
Lane Group Flow (vph)	153	310	26	258	518	0	572	1067	81	103	1027	339
Confl. Peds. (#/hr)			13			1			10			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			Free
Actuated Green, G (s)	12.9	18.7	18.7	14.3	20.7		20.9	60.4	60.4	7.0	46.5	120.0
Effective Green, g (s)	14.0	21.7	21.7	15.4	23.1		22.0	62.8	62.8	8.1	48.9	120.0
Actuated g/C Ratio	0.12	0.18	0.18	0.13	0.19		0.18	0.52	0.52	0.07	0.41	1.00
Clearance Time (s)	4.1	6.0	6.0	4.1	5.4		4.1	5.4	5.4	4.1	5.4	
Vehicle Extension (s)	1.8	1.8	1.8	1.8	1.8		1.8	5.0	5.0	1.8	5.0	
Lane Grp Cap (vph)	414	661	288	455	686		650	2750	834	239	2141	1636
v/s Ratio Prot	0.04	0.08		c0.07	c0.15		c0.16	0.20		0.03	c0.20	
v/s Ratio Perm			0.02						0.05			c0.21
v/c Ratio	0.37	0.47	0.09	0.57	0.76		0.88	0.39	0.10	0.43	0.48	0.21
Uniform Delay, d1	48.9	44.0	40.9	49.2	45.8		47.7	17.1	14.4	53.7	26.2	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.72	0.41	0.09	1.50	0.93	1.00
Incremental Delay, d2	0.2	0.2	0.0	1.0	4.2		10.0	0.3	0.2	0.4	0.7	0.3
Delay (s)	49.1	44.2	41.0	50.1	50.0		44.5	7.3	1.4	81.0	25.0	0.3
Level of Service	D	D	D	D	D		D	A	A	F	C	A
Approach Delay (s)		44.7			50.0			18.7			23.2	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	65.5%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1829	5200		1829	3657	1636		1914	1602	1737	1752	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1829	5200		1829	3657	1636		1914	1602	1737	1752	1615
Volume (vph)	126	383	29	3	332	53	5	41	12	77	5	115
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	148	451	34	4	391	62	6	48	14	91	6	135
RTOR Reduction (vph)	0	5	0	0	0	34	0	0	13	0	0	110
Lane Group Flow (vph)	148	480	0	4	391	28	0	54	1	47	50	25
Confl. Peds. (#/hr)									3			1
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	9.5	43.6		1.1	35.2	35.2		5.2	5.2	12.5	12.5	12.5
Effective Green, g (s)	10.5	46.6		2.1	38.2	38.2		8.2	8.2	15.5	15.5	15.5
Actuated g/C Ratio	0.12	0.55		0.02	0.45	0.45		0.10	0.10	0.18	0.18	0.18
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	228	2871		46	1655	740		186	156	319	322	297
v/s Ratio Prot	c0.08	0.09		0.00	c0.11			c0.03		0.03	c0.03	
v/s Ratio Perm						0.02			0.00			0.02
v/c Ratio	0.65	0.17		0.09	0.24	0.04		0.29	0.01	0.15	0.16	0.08
Uniform Delay, d1	35.2	9.3		40.2	14.2	12.9		35.4	34.4	28.9	28.9	28.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.2	0.1		0.8	0.1	0.0		0.9	0.0	0.2	0.2	0.1
Delay (s)	41.4	9.5		41.0	14.2	12.9		36.3	34.4	29.1	29.2	28.7
Level of Service	D	A		D	B	B		D	C	C	C	C
Approach Delay (s)		16.9			14.3			35.9			28.9	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM Average Control Delay	19.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	84.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	35.5%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1599	3547	3657	1579	1829	5255	1636	1829	5255	1613
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1599	3547	3657	1579	1829	5255	1636	1829	5255	1613
Volume (vph)	19	317	139	122	1037	330	297	700	46	105	224	16
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	21	352	154	136	1152	367	330	778	51	117	249	18
RTOR Reduction (vph)	0	0	99	0	0	170	0	0	34	0	0	8
Lane Group Flow (vph)	21	352	55	136	1152	197	330	778	17	117	249	10
Confl. Peds. (#/hr)			12			24			36			12
Turn Type	Prot		Perm	Prot		Perm	Prot		custom	Prot		custom
Protected Phases	7	4		3	8		5	2	2	1	6	6
Permitted Phases			4			8			2			4
Actuated Green, G (s)	2.1	30.2	30.2	6.8	34.9	34.9	19.8	29.8	29.8	7.6	16.6	46.8
Effective Green, g (s)	3.1	33.2	33.2	7.8	37.9	37.9	20.8	31.8	31.8	8.6	19.6	52.8
Actuated g/C Ratio	0.03	0.36	0.36	0.08	0.41	0.41	0.22	0.34	0.34	0.09	0.21	0.57
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	5.0	5.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	118	1300	568	296	1484	641	407	1789	557	168	1103	912
v/s Ratio Prot	0.01	0.10		c0.04	c0.31		c0.18	c0.15	0.01	0.06	0.05	0.00
v/s Ratio Perm			0.03			0.12						0.00
v/c Ratio	0.18	0.27	0.10	0.46	0.78	0.31	0.81	0.43	0.03	0.70	0.23	0.01
Uniform Delay, d1	43.9	21.5	20.1	40.8	24.1	18.8	34.4	23.8	20.5	41.1	30.6	8.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1	0.1	1.1	2.6	0.3	11.6	0.2	0.0	11.9	0.1	0.0
Delay (s)	44.6	21.6	20.2	41.9	26.7	19.1	46.0	24.0	20.6	53.0	30.7	8.9
Level of Service	D	C	C	D	C	B	D	C	C	D	C	A
Approach Delay (s)		22.1			26.3			30.1			36.5	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM Average Control Delay	27.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	93.4	Sum of lost time (s)	6.0
Intersection Capacity Utilization	74.0%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95	0.88	0.97	0.95	1.00	0.97	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1829	3657	2880	3547	3657	1547	3547	5163		3547	5209	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1829	3657	2880	3547	3657	1547	3547	5163		3547	5209	
Volume (vph)	24	137	248	459	698	511	1036	1068	141	214	1037	55
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	26	151	273	504	767	562	1138	1174	155	235	1140	60
RTOR Reduction (vph)	0	0	0	0	0	236	0	15	0	0	5	0
Lane Group Flow (vph)	26	151	273	504	767	326	1138	1314	0	235	1195	0
Confl. Peds. (#/hr)						36						12
Turn Type	Prot		pm+ov	Prot		Perm	Prot			Prot		
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.0	18.4	50.4	20.2	34.6	34.6	32.0	44.4		17.0	29.4	
Effective Green, g (s)	5.0	21.4	54.4	21.2	37.6	37.6	33.0	47.4		18.0	32.4	
Actuated g/C Ratio	0.04	0.18	0.45	0.18	0.31	0.31	0.28	0.39		0.15	0.27	
Clearance Time (s)	4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	1.8	5.0	1.8	1.8	5.0	5.0	1.8	5.0		1.8	5.0	
Lane Grp Cap (vph)	76	652	1306	627	1146	485	975	2039		532	1406	
v/s Ratio Prot	c0.01	0.04	0.06	c0.14	0.21		c0.32	0.25		0.07	c0.23	
v/s Ratio Perm			0.04			c0.21						
v/c Ratio	0.34	0.23	0.21	0.80	0.67	0.67	1.17	0.64		0.44	0.85	
Uniform Delay, d1	55.9	42.3	19.8	47.4	35.8	35.9	43.5	29.5		46.4	41.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.54	0.48	
Incremental Delay, d2	1.0	0.4	0.0	7.0	2.0	4.8	86.4	1.6		0.2	6.0	
Delay (s)	56.9	42.6	19.8	54.4	37.8	40.6	129.9	31.1		25.3	25.8	
Level of Service	E	D	B	D	D	D	F	C		C	C	
Approach Delay (s)		29.6			43.2			76.7			25.7	
Approach LOS		C			D			E			C	

Intersection Summary			
HCM Average Control Delay	51.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	96.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95			0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.99			1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.97		1.00	0.96		1.00	0.97	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3270			3462		1829	5041		1829	5078	
Flt Permitted		0.91			0.85		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2983			2976		1829	5041		1829	5078	
Volume (vph)	11	19	40	10	14	6	22	96	29	62	135	33
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.85	0.85	0.85	0.85
Adj. Flow (vph)	13	22	47	12	16	7	26	109	34	73	159	39
RTOR Reduction (vph)	0	37	0	0	5	0	0	24	0	0	25	0
Lane Group Flow (vph)	0	45	0	0	30	0	26	119	0	73	173	0
Confl. Peds. (#/hr)	20		20	20		20			20			20
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		3.8			3.8		1.1	4.8		3.1	6.8	
Effective Green, g (s)		5.8			5.8		2.1	7.8		4.1	9.8	
Actuated g/C Ratio		0.22			0.22		0.08	0.29		0.15	0.37	
Clearance Time (s)		5.0			5.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		648			646		144	1473		281	1864	
v/s Ratio Prot							0.01	0.02		c0.04	c0.03	
v/s Ratio Perm		c0.02			0.01							
v/c Ratio		0.07			0.05		0.18	0.08		0.26	0.09	
Uniform Delay, d1		8.3			8.3		11.5	6.9		10.0	5.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.0		0.6	0.0		0.5	0.0	
Delay (s)		8.4			8.3		12.1	6.9		10.5	5.6	
Level of Service		A			A		B	A		B	A	
Approach Delay (s)		8.4			8.3			7.7			6.9	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	7.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.10		
Actuated Cycle Length (s)	26.7	Sum of lost time (s)	6.0
Intersection Capacity Utilization	33.0%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		0.94	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.96		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)	1829	3585		1829	5130		1802	3440		1714	3433	
Flt Permitted	0.95	1.00		0.95	1.00		0.63	1.00		0.72	1.00	
Satd. Flow (perm)	1829	3585		1829	5130		1189	3440		1300	3433	
Volume (vph)	6	252	26	28	1296	198	14	36	13	107	122	63
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)	6	271	28	30	1394	213	15	39	14	115	131	68
RTOR Reduction (vph)	0	6	0	0	14	0	0	10	0	0	51	0
Lane Group Flow (vph)	6	293	0	30	1593	0	15	43	0	115	148	0
Confl. Peds. (#/hr)			72			24	36		132	132		36
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	0.7	21.7		1.0	22.0		9.0	9.0		9.0	9.0	
Effective Green, g (s)	1.7	24.7		2.0	25.0		12.0	12.0		12.0	12.0	
Actuated g/C Ratio	0.04	0.52		0.04	0.52		0.25	0.25		0.25	0.25	
Clearance Time (s)	4.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	65	1856		77	2689		299	865		327	864	
v/s Ratio Prot	0.00	0.08		c0.02	c0.31			0.01			0.04	
v/s Ratio Perm							0.01			c0.09		
v/c Ratio	0.09	0.16		0.39	0.59		0.05	0.05		0.35	0.17	
Uniform Delay, d1	22.3	6.0		22.3	7.8		13.5	13.5		14.7	14.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.0		3.2	0.4		0.1	0.0		0.7	0.1	
Delay (s)	22.9	6.1		25.5	8.2		13.6	13.6		15.3	14.1	
Level of Service	C	A		C	A		B	B		B	B	
Approach Delay (s)		6.4			8.5			13.6			14.5	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	9.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	47.7	Sum of lost time (s)	6.0
Intersection Capacity Utilization	59.6%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.95		1.00	0.91		0.97	0.95		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.92	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.99		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)	3547	3618		1829	5171		3547	3605		1829	4505	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3547	3618		1829	5171		3547	3605		1829	4505	
Volume (vph)	235	1240	77	17	476	40	42	177	14	43	266	231
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)	247	1305	81	18	501	42	44	186	15	45	280	243
RTOR Reduction (vph)	0	3	0	0	5	0	0	6	0	0	148	0
Lane Group Flow (vph)	247	1383	0	18	538	0	44	195	0	45	375	0
Confl. Peds. (#/hr)			12			24			24			120
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	12.4	71.6		3.2	62.4		5.8	18.0		7.2	19.4	
Effective Green, g (s)	13.4	74.6		4.2	65.4		6.8	21.0		8.2	22.4	
Actuated g/C Ratio	0.11	0.62		0.04	0.55		0.06	0.18		0.07	0.19	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	396	2249		64	2818		201	631		125	841	
v/s Ratio Prot	c0.07	c0.38		0.01	0.10		0.01	0.05		c0.02	c0.08	
v/s Ratio Perm												
v/c Ratio	0.62	0.62		0.28	0.19		0.22	0.31		0.36	0.45	
Uniform Delay, d1	50.9	13.9		56.4	13.9		54.1	43.2		53.4	43.3	
Progression Factor	1.30	0.40		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.5	1.0		2.4	0.2		0.6	0.3		1.8	0.4	
Delay (s)	68.6	6.6		58.8	14.0		54.6	43.5		55.2	43.7	
Level of Service	E	A		E	B		D	D		E	D	
Approach Delay (s)		15.9			15.5			45.5			44.6	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.99	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1829	5255	3451	1470	3547	1614
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1829	5255	3451	1470	3547	1614
Volume (vph)	160	576	378	273	900	244
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	165	594	390	281	928	252
RTOR Reduction (vph)	0	0	7	176	0	150
Lane Group Flow (vph)	165	594	422	66	928	102
Confl. Peds. (#/hr)				1		2
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		3	
Permitted Phases		6		2		3
Actuated Green, G (s)	8.7	25.6	12.9	12.9	20.5	20.5
Effective Green, g (s)	9.7	28.6	15.9	15.9	23.5	23.5
Actuated g/C Ratio	0.17	0.49	0.27	0.27	0.40	0.40
Clearance Time (s)	4.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	305	2587	944	402	1435	653
v/s Ratio Prot	c0.09	0.11	c0.12		c0.26	
v/s Ratio Perm				0.05		0.06
v/c Ratio	0.54	0.23	0.45	0.16	0.65	0.16
Uniform Delay, d1	22.2	8.4	17.5	16.0	14.0	11.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.0	0.3	0.2	1.0	0.1
Delay (s)	24.1	8.5	17.8	16.2	15.0	11.1
Level of Service	C	A	B	B	B	B
Approach Delay (s)		11.9	17.2		14.1	
Approach LOS		B	B		B	

Intersection Summary			
HCM Average Control Delay	14.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	9.0
Intersection Capacity Utilization	58.2%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1591	3547	3499		3547	5255	1593	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1591	3547	3499		3547	5255	1593	3547	5255	1636
Volume (vph)	467	447	576	175	155	55	228	1221	132	111	1067	191
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)	481	461	594	180	160	57	235	1259	136	114	1100	197
RTOR Reduction (vph)	0	0	233	0	32	0	0	0	53	0	0	0
Lane Group Flow (vph)	481	461	361	180	185	0	235	1259	83	114	1100	197
Confl. Peds. (#/hr)			13			1			10			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			Free
Actuated Green, G (s)	27.4	27.5	27.5	9.6	10.3		17.9	55.6	55.6	7.7	45.4	120.0
Effective Green, g (s)	28.5	30.5	30.5	10.7	12.7		19.0	58.0	58.0	8.8	47.8	120.0
Actuated g/C Ratio	0.24	0.25	0.25	0.09	0.11		0.16	0.48	0.48	0.07	0.40	1.00
Clearance Time (s)	4.1	6.0	6.0	4.1	5.4		4.1	5.4	5.4	4.1	5.4	
Vehicle Extension (s)	1.8	1.8	1.8	1.8	1.8		1.8	5.0	5.0	1.8	5.0	
Lane Grp Cap (vph)	842	929	404	316	370		562	2540	770	260	2093	1636
v/s Ratio Prot	c0.14	0.13		0.05	0.05		0.07	c0.24		0.03	c0.21	
v/s Ratio Perm			c0.23						0.05			0.12
v/c Ratio	0.57	0.50	0.89	0.57	0.50		0.42	0.50	0.11	0.44	0.53	0.12
Uniform Delay, d1	40.4	38.2	43.2	52.4	50.6		45.5	21.1	16.9	53.2	27.5	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.49	0.21	0.01	1.04	0.35	1.00
Incremental Delay, d2	0.6	0.2	20.8	1.4	0.4		0.1	0.4	0.2	0.4	0.9	0.1
Delay (s)	40.9	38.3	63.9	53.8	51.0		22.4	4.8	0.4	55.8	10.5	0.1
Level of Service	D	D	E	D	D		C	A	A	E	B	A
Approach Delay (s)		49.1			52.3			7.0			12.7	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM Average Control Delay	25.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	72.6%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1829	5251		1829	3657	1636		1890	1603	1737	1763	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1829	5251		1829	3657	1636		1890	1603	1737	1763	1615
Volume (vph)	113	708	4	11	460	45	20	35	5	217	33	200
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	770	4	12	500	49	22	38	5	236	36	217
RTOR Reduction (vph)	0	1	0	0	0	31	0	0	4	0	0	168
Lane Group Flow (vph)	123	773	0	12	500	18	0	60	1	132	140	49
Confl. Peds. (#/hr)									3			1
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	5.5	25.1		0.9	20.5	20.5		4.0	4.0	11.2	11.2	11.2
Effective Green, g (s)	6.5	28.1		1.9	23.5	23.5		7.0	7.0	14.2	14.2	14.2
Actuated g/C Ratio	0.10	0.44		0.03	0.37	0.37		0.11	0.11	0.22	0.22	0.22
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	188	2335		55	1360	608		209	178	390	396	363
v/s Ratio Prot	c0.07	0.15		0.01	c0.14			c0.03		0.08	c0.08	
v/s Ratio Perm						0.01			0.00			0.03
v/c Ratio	0.65	0.33		0.22	0.37	0.03		0.29	0.00	0.34	0.35	0.13
Uniform Delay, d1	27.3	11.4		29.9	14.4	12.6		25.8	25.0	20.6	20.6	19.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.9	0.1		2.0	0.2	0.0		0.8	0.0	0.5	0.5	0.2
Delay (s)	35.2	11.5		31.9	14.6	12.6		26.6	25.0	21.1	21.2	19.8
Level of Service	D	B		C	B	B		C	C	C	C	B
Approach Delay (s)		14.8			14.8			26.4			20.5	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1597	3547	3657	1577	1829	5255	1636	1829	5255	1620
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1597	3547	3657	1577	1829	5255	1636	1829	5255	1620
Volume (vph)	206	672	288	284	338	81	148	369	99	492	815	26
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)	219	715	306	302	360	86	157	393	105	523	867	28
RTOR Reduction (vph)	0	0	197	0	0	60	0	0	85	0	0	10
Lane Group Flow (vph)	219	715	109	302	360	26	157	393	20	523	867	18
Confl. Peds. (#/hr)			12			24			36			12
Turn Type	Prot		Perm	Prot		Perm	Prot		custom	Prot		custom
Protected Phases	7	4		3	8		5	2	2	1	6	6
Permitted Phases			4			8			2			4
Actuated Green, G (s)	7.1	24.0	24.0	10.2	27.1	27.1	11.8	16.7	16.7	29.6	33.5	57.5
Effective Green, g (s)	8.1	27.0	27.0	11.2	30.1	30.1	12.8	18.7	18.7	30.6	36.5	63.5
Actuated g/C Ratio	0.08	0.27	0.27	0.11	0.30	0.30	0.13	0.19	0.19	0.31	0.37	0.64
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	5.0	5.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	289	992	433	399	1106	477	235	988	307	562	1928	1034
v/s Ratio Prot	0.06	c0.20		c0.09	0.10		0.09	0.07	0.01	c0.29	c0.16	0.01
v/s Ratio Perm			0.07			0.02						0.00
v/c Ratio	0.76	0.72	0.25	0.76	0.33	0.05	0.67	0.40	0.06	0.93	0.45	0.02
Uniform Delay, d1	44.7	32.8	28.4	42.8	26.8	24.6	41.3	35.5	33.2	33.4	23.9	6.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.8	2.6	0.3	8.0	0.2	0.0	7.0	0.3	0.1	22.3	0.2	0.0
Delay (s)	55.6	35.4	28.7	50.8	27.0	24.7	48.3	35.7	33.3	55.7	24.1	6.6
Level of Service	E	D	C	D	C	C	D	D	C	E	C	A
Approach Delay (s)		37.3			36.4			38.4			35.4	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	36.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	99.5	Sum of lost time (s)	9.0
Intersection Capacity Utilization	87.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95	0.88	0.97	0.95	1.00	0.97	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1829	3657	2880	3547	3657	1547	3547	5075		3547	5240	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1829	3657	2880	3547	3657	1547	3547	5075		3547	5240	
Volume (vph)	64	715	1026	140	124	213	284	1349	399	529	1305	21
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)	67	753	1080	147	131	224	299	1420	420	557	1374	22
RTOR Reduction (vph)	0	0	0	0	0	158	0	42	0	0	1	0
Lane Group Flow (vph)	67	753	1080	147	131	66	299	1798	0	557	1395	0
Confl. Peds. (#/hr)						36						12
Turn Type	Prot		pm+ov	Prot		Perm	Prot			Prot		
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	6.7	29.1	44.8	9.7	32.1	32.1	15.7	43.1		18.1	45.5	
Effective Green, g (s)	7.7	32.1	48.8	10.7	35.1	35.1	16.7	46.1		19.1	48.5	
Actuated g/C Ratio	0.06	0.27	0.41	0.09	0.29	0.29	0.14	0.38		0.16	0.40	
Clearance Time (s)	4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	1.8	5.0	1.8	1.8	5.0	5.0	1.8	5.0		1.8	5.0	
Lane Grp Cap (vph)	117	978	1171	316	1070	452	494	1950		565	2118	
v/s Ratio Prot	0.04	0.21	c0.13	c0.04	0.04		0.08	c0.35		c0.16	0.27	
v/s Ratio Perm			0.25			0.04						
v/c Ratio	0.57	0.77	0.92	0.47	0.12	0.14	0.61	0.92		0.99	0.66	
Uniform Delay, d1	54.6	40.5	33.8	51.9	31.1	31.4	48.6	35.2		50.3	29.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.65	0.42	
Incremental Delay, d2	4.2	4.4	11.7	0.4	0.1	0.3	1.4	8.7		29.9	1.3	
Delay (s)	58.7	44.9	45.5	52.3	31.3	31.7	50.0	44.0		62.9	13.4	
Level of Service	E	D	D	D	C	C	D	D		E	B	
Approach Delay (s)		45.7			37.6			44.8			27.5	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM Average Control Delay	39.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.3%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95			0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.96		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3248			3367		1829	5185		1829	5218	
Flt Permitted		0.88			0.78		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2899			2698		1829	5185		1829	5218	
Volume (vph)	21	17	56	37	8	17	7	158	13	11	267	12
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)	22	18	58	39	8	18	7	165	14	11	278	12
RTOR Reduction (vph)	0	43	0	0	13	0	0	10	0	0	8	0
Lane Group Flow (vph)	0	55	0	0	52	0	7	169	0	11	282	0
Confl. Peds. (#/hr)	20		20	20		20			20			20
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		4.4			4.4		0.7	4.8		0.7	4.8	
Effective Green, g (s)		6.4			6.4		1.7	7.8		1.7	7.8	
Actuated g/C Ratio		0.26			0.26		0.07	0.31		0.07	0.31	
Clearance Time (s)		5.0			5.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		745			693		125	1624		125	1635	
v/s Ratio Prot							0.00	0.03		c0.01	c0.05	
v/s Ratio Perm		0.02			c0.02							
v/c Ratio		0.07			0.07		0.06	0.10		0.09	0.17	
Uniform Delay, d1		7.0			7.0		10.8	6.1		10.9	6.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.0		0.2	0.0		0.3	0.1	
Delay (s)		7.0			7.1		11.0	6.1		11.2	6.3	
Level of Service		A			A		B	A		B	A	
Approach Delay (s)		7.0			7.1			6.3			6.4	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	6.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.12		
Actuated Cycle Length (s)	24.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	28.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.97	1.00		0.91	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	0.98		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)	1829	3651		1829	5047		1774	3550		1669	3335	
Flt Permitted	0.95	1.00		0.95	1.00		0.73	1.00		0.64	1.00	
Satd. Flow (perm)	1829	3651		1829	5047		1361	3550		1117	3335	
Volume (vph)	37	1261	9	7	417	110	45	139	17	280	19	16
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	44	1484	11	8	491	129	53	164	20	329	22	19
RTOR Reduction (vph)	0	1	0	0	39	0	0	11	0	0	12	0
Lane Group Flow (vph)	44	1494	0	8	581	0	53	173	0	329	29	0
Confl. Peds. (#/hr)			72			24	36		132	132		36
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	4.7	36.0		1.1	32.4		26.5	26.5		26.5	26.5	
Effective Green, g (s)	5.7	39.0		2.1	35.4		29.5	29.5		29.5	29.5	
Actuated g/C Ratio	0.07	0.49		0.03	0.44		0.37	0.37		0.37	0.37	
Clearance Time (s)	4.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	131	1789		48	2245		504	1316		414	1236	
v/s Ratio Prot	c0.02	c0.41		0.00	0.12			0.05			0.01	
v/s Ratio Perm							0.04			c0.29		
v/c Ratio	0.34	0.84		0.17	0.26		0.11	0.13		0.79	0.02	
Uniform Delay, d1	35.1	17.5		37.9	13.9		16.4	16.6		22.3	15.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	3.5		1.6	0.1		0.1	0.0		10.1	0.0	
Delay (s)	36.7	21.1		39.5	13.9		16.5	16.6		32.5	15.9	
Level of Service	D	C		D	B		B	B		C	B	
Approach Delay (s)		21.5			14.3			16.6			30.6	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM Average Control Delay	20.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	79.6	Sum of lost time (s)	6.0
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
12: Stoneridge & Hacienda

11/27/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.95		1.00	0.91		0.97	0.95		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.93	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.98		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)	3547	3629		1829	5212		3547	3572		1829	4541	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3547	3629		1829	5212		3547	3572		1829	4541	
Volume (vph)	188	275	12	21	1300	54	65	135	19	30	184	146
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)	200	293	13	22	1383	57	69	144	20	32	196	155
RTOR Reduction (vph)	0	1	0	0	2	0	0	11	0	0	129	0
Lane Group Flow (vph)	200	305	0	22	1438	0	69	153	0	32	222	0
Confl. Peds. (#/hr)			12			24			24			120
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	11.8	72.8		3.3	64.3		6.5	18.7		5.2	17.4	
Effective Green, g (s)	12.8	75.8		4.3	67.3		7.5	21.7		6.2	20.4	
Actuated g/C Ratio	0.11	0.63		0.04	0.56		0.06	0.18		0.05	0.17	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	378	2292		66	2923		222	646		94	772	
v/s Ratio Prot	c0.06	0.08		0.01	c0.28		0.02	0.04		c0.02	c0.05	
v/s Ratio Perm												
v/c Ratio	0.53	0.13		0.33	0.49		0.31	0.24		0.34	0.29	
Uniform Delay, d1	50.7	8.9		56.5	16.0		53.8	42.1		54.9	43.5	
Progression Factor	0.77	1.29		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.1		3.0	0.6		0.8	0.2		2.2	0.2	
Delay (s)	40.2	11.6		59.4	16.6		54.6	42.3		57.1	43.7	
Level of Service	D	B		E	B		D	D		E	D	
Approach Delay (s)		22.9			17.2			45.9			44.8	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	25.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1829	5255	3503	1470	3547	1611
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1829	5255	3503	1470	3547	1611
Volume (vph)	124	221	648	411	121	136
Peak-hour factor, PHF	0.86	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	144	260	762	484	142	160
RTOR Reduction (vph)	0	0	0	269	0	130
Lane Group Flow (vph)	144	260	762	215	142	30
Confl. Peds. (#/hr)				1		2
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		3	
Permitted Phases		6		2		3
Actuated Green, G (s)	7.0	28.4	17.4	17.4	5.6	5.6
Effective Green, g (s)	8.0	31.4	20.4	20.4	8.6	8.6
Actuated g/C Ratio	0.17	0.68	0.44	0.44	0.19	0.19
Clearance Time (s)	4.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	318	3587	1554	652	663	301
v/s Ratio Prot	c0.08	0.05	c0.22		c0.04	
v/s Ratio Perm				0.15		0.02
v/c Ratio	0.45	0.07	0.49	0.33	0.21	0.10
Uniform Delay, d1	17.0	2.4	9.1	8.3	15.8	15.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.0	0.2	0.3	0.2	0.1
Delay (s)	18.1	2.4	9.3	8.6	16.0	15.6
Level of Service	B	A	A	A	B	B
Approach Delay (s)		8.0	9.1		15.8	
Approach LOS		A	A		B	

Intersection Summary			
HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	46.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	43.9%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1591	3547	3563		3547	5255	1593	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1591	3547	3563		3547	5255	1593	3547	5255	1636
Volume (vph)	146	278	126	230	399	75	509	950	129	92	914	305
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)	164	312	142	258	448	84	572	1067	145	103	1027	343
RTOR Reduction (vph)	0	0	116	0	14	0	0	0	65	0	0	0
Lane Group Flow (vph)	164	312	26	258	518	0	572	1067	80	103	1027	343
Confl. Peds. (#/hr)			13			1			10			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			Free
Actuated Green, G (s)	13.2	18.7	18.7	14.6	20.7		20.9	60.1	60.1	7.0	46.2	120.0
Effective Green, g (s)	14.3	21.7	21.7	15.7	23.1		22.0	62.5	62.5	8.1	48.6	120.0
Actuated g/C Ratio	0.12	0.18	0.18	0.13	0.19		0.18	0.52	0.52	0.07	0.40	1.00
Clearance Time (s)	4.1	6.0	6.0	4.1	5.4		4.1	5.4	5.4	4.1	5.4	
Vehicle Extension (s)	1.8	1.8	1.8	1.8	1.8		1.8	5.0	5.0	1.8	5.0	
Lane Grp Cap (vph)	423	661	288	464	686		650	2737	830	239	2128	1636
v/s Ratio Prot	0.05	0.09		c0.07	c0.15		c0.16	0.20		0.03	c0.20	
v/s Ratio Perm			0.02						0.05			c0.21
v/c Ratio	0.39	0.47	0.09	0.56	0.76		0.88	0.39	0.10	0.43	0.48	0.21
Uniform Delay, d1	48.8	44.0	40.9	48.9	45.8		47.7	17.3	14.5	53.7	26.4	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.72	0.41	0.09	1.50	0.93	1.00
Incremental Delay, d2	0.2	0.2	0.0	0.8	4.2		10.0	0.3	0.2	0.4	0.7	0.3
Delay (s)	49.0	44.2	41.0	49.7	50.0		44.5	7.3	1.5	81.1	25.2	0.3
Level of Service	D	D	D	D	D		D	A	A	F	C	A
Approach Delay (s)		44.7			49.9			18.8			23.3	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1829	5200		1829	3657	1636		1914	1601	1737	1752	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1829	5200		1829	3657	1636		1914	1601	1737	1752	1615
Volume (vph)	126	387	29	3	749	61	5	41	12	78	5	115
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	148	455	34	4	881	72	6	48	14	92	6	135
RTOR Reduction (vph)	0	5	0	0	0	40	0	0	13	0	0	110
Lane Group Flow (vph)	148	484	0	4	881	32	0	54	1	48	50	25
Confl. Peds. (#/hr)									3			1
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	9.4	41.8		1.0	33.4	33.4		4.8	4.8	11.8	11.8	11.8
Effective Green, g (s)	10.4	44.8		2.0	36.4	36.4		7.8	7.8	14.8	14.8	14.8
Actuated g/C Ratio	0.13	0.55		0.02	0.45	0.45		0.10	0.10	0.18	0.18	0.18
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	234	2862		45	1635	732		183	153	316	319	294
v/s Ratio Prot	c0.08	0.09		0.00	c0.24			c0.03		0.03	c0.03	
v/s Ratio Perm						0.02			0.00			0.02
v/c Ratio	0.63	0.17		0.09	0.54	0.04		0.30	0.01	0.15	0.16	0.08
Uniform Delay, d1	33.7	9.1		38.8	16.4	12.7		34.2	33.3	28.0	28.0	27.7
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.5	0.1		0.9	0.3	0.0		0.9	0.0	0.2	0.2	0.1
Delay (s)	39.2	9.2		39.7	16.7	12.7		35.1	33.3	28.2	28.3	27.8
Level of Service	D	A		D	B	B		D	C	C	C	C
Approach Delay (s)		16.2			16.5			34.8			28.0	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	18.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	81.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.1%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1598	3547	3657	1579	1829	5255	1636	1829	5255	1612
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1598	3547	3657	1579	1829	5255	1636	1829	5255	1612
Volume (vph)	33	323	139	117	1044	330	297	710	51	105	211	35
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	37	359	154	130	1160	367	330	789	57	117	234	39
RTOR Reduction (vph)	0	0	98	0	0	171	0	0	38	0	0	17
Lane Group Flow (vph)	37	359	56	130	1160	196	330	789	19	117	234	22
Confl. Peds. (#/hr)			12			24			36			12
Turn Type	Prot		Perm	Prot		Perm	Prot		custom	Prot		custom
Protected Phases	7	4		3	8		5	2	2	1	6	6
Permitted Phases			4			8			2			4
Actuated Green, G (s)	3.7	31.6	31.6	6.8	34.7	34.7	20.1	30.5	30.5	7.5	16.9	48.5
Effective Green, g (s)	4.7	34.6	34.6	7.8	37.7	37.7	21.1	32.5	32.5	8.5	19.9	54.5
Actuated g/C Ratio	0.05	0.36	0.36	0.08	0.40	0.40	0.22	0.34	0.34	0.09	0.21	0.57
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	5.0	5.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	175	1326	580	290	1445	624	405	1790	557	163	1096	921
v/s Ratio Prot	0.01	0.10		c0.04	c0.32		c0.18	c0.15	0.01	0.06	0.04	0.01
v/s Ratio Perm			0.03			0.12						0.01
v/c Ratio	0.21	0.27	0.10	0.45	0.80	0.31	0.81	0.44	0.03	0.72	0.21	0.02
Uniform Delay, d1	43.6	21.5	20.1	41.7	25.6	19.9	35.3	24.4	21.0	42.3	31.3	8.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1	0.1	1.1	3.3	0.3	11.9	0.2	0.0	14.0	0.1	0.0
Delay (s)	44.2	21.6	20.1	42.9	28.9	20.2	47.2	24.6	21.0	56.3	31.4	8.9
Level of Service	D	C	C	D	C	C	D	C	C	E	C	A
Approach Delay (s)		22.7			28.1			30.8			36.6	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM Average Control Delay	29.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	95.4	Sum of lost time (s)	6.0
Intersection Capacity Utilization	74.1%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95	0.88	0.97	0.95	1.00	0.97	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1829	3657	2880	3547	3657	1547	3547	5163		3547	5209	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1829	3657	2880	3547	3657	1547	3547	5163		3547	5209	
Volume (vph)	24	143	253	459	699	511	1037	1068	141	214	1037	55
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	26	157	278	504	768	562	1140	1174	155	235	1140	60
RTOR Reduction (vph)	0	0	0	0	0	236	0	15	0	0	5	0
Lane Group Flow (vph)	26	157	278	504	768	326	1140	1314	0	235	1195	0
Confl. Peds. (#/hr)						36						12
Turn Type	Prot		pm+ov	Prot		Perm	Prot			Prot		
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.0	18.5	50.5	20.1	34.6	34.6	32.0	44.4		17.0	29.4	
Effective Green, g (s)	5.0	21.5	54.5	21.1	37.6	37.6	33.0	47.4		18.0	32.4	
Actuated g/C Ratio	0.04	0.18	0.45	0.18	0.31	0.31	0.28	0.39		0.15	0.27	
Clearance Time (s)	4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	1.8	5.0	1.8	1.8	5.0	5.0	1.8	5.0		1.8	5.0	
Lane Grp Cap (vph)	76	655	1308	624	1146	485	975	2039		532	1406	
v/s Ratio Prot	c0.01	0.04	0.06	c0.14	0.21		c0.32	0.25		0.07	c0.23	
v/s Ratio Perm			0.04			c0.21						
v/c Ratio	0.34	0.24	0.21	0.81	0.67	0.67	1.17	0.64		0.44	0.85	
Uniform Delay, d1	55.9	42.2	19.8	47.5	35.8	35.9	43.5	29.5		46.4	41.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.54	0.48	
Incremental Delay, d2	1.0	0.4	0.0	7.2	2.0	4.8	87.3	1.6		0.2	6.0	
Delay (s)	56.9	42.6	19.8	54.7	37.8	40.6	130.8	31.1		25.2	25.7	
Level of Service	E	D	B	D	D	D	F	C		C	C	
Approach Delay (s)		29.7			43.3			77.1			25.6	
Approach LOS		C			D			E			C	

Intersection Summary			
HCM Average Control Delay	51.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	96.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95			0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.97		1.00	0.97		1.00	0.97	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3270			3462		1829	5053		1829	5079	
Flt Permitted		0.90			0.84		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2982			2972		1829	5053		1829	5079	
Volume (vph)	11	19	40	10	14	6	23	103	29	62	136	33
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.85	0.85	0.85	0.85
Adj. Flow (vph)	13	22	47	12	16	7	27	117	34	73	160	39
RTOR Reduction (vph)	0	37	0	0	5	0	0	24	0	0	25	0
Lane Group Flow (vph)	0	45	0	0	30	0	27	127	0	73	174	0
Confl. Peds. (#/hr)	20		20	20		20			20			20
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		3.7			3.7		1.1	4.6		3.0	6.5	
Effective Green, g (s)		5.7			5.7		2.1	7.6		4.0	9.5	
Actuated g/C Ratio		0.22			0.22		0.08	0.29		0.15	0.36	
Clearance Time (s)		5.0			5.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		646			644		146	1460		278	1835	
v/s Ratio Prot							0.01	0.03		c0.04	c0.03	
v/s Ratio Perm		c0.02			0.01							
v/c Ratio		0.07			0.05		0.18	0.09		0.26	0.09	
Uniform Delay, d1		8.2			8.1		11.3	6.8		9.8	5.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.0		0.6	0.0		0.5	0.0	
Delay (s)		8.2			8.2		11.9	6.8		10.4	5.6	
Level of Service		A			A		B	A		B	A	
Approach Delay (s)		8.2			8.2			7.6			6.9	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	7.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.10		
Actuated Cycle Length (s)	26.3	Sum of lost time (s)	6.0
Intersection Capacity Utilization	33.0%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		0.94	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.96		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)	1829	3585		1829	5128		1802	3440		1714	3433	
Flt Permitted	0.95	1.00		0.95	1.00		0.63	1.00		0.72	1.00	
Satd. Flow (perm)	1829	3585		1829	5128		1189	3440		1300	3433	
Volume (vph)	6	255	26	28	1301	202	14	36	13	108	122	63
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)	6	274	28	30	1399	217	15	39	14	116	131	68
RTOR Reduction (vph)	0	6	0	0	15	0	0	10	0	0	51	0
Lane Group Flow (vph)	6	296	0	30	1601	0	15	43	0	116	148	0
Confl. Peds. (#/hr)			72			24	36		132	132		36
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	0.7	21.8		1.0	22.1		9.0	9.0		9.0	9.0	
Effective Green, g (s)	1.7	24.8		2.0	25.1		12.0	12.0		12.0	12.0	
Actuated g/C Ratio	0.04	0.52		0.04	0.53		0.25	0.25		0.25	0.25	
Clearance Time (s)	4.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	65	1860		77	2693		298	864		326	862	
v/s Ratio Prot	0.00	0.08		c0.02	c0.31			0.01			0.04	
v/s Ratio Perm							0.01			c0.09		
v/c Ratio	0.09	0.16		0.39	0.59		0.05	0.05		0.36	0.17	
Uniform Delay, d1	22.3	6.0		22.3	7.8		13.6	13.6		14.7	14.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.0		3.2	0.4		0.1	0.0		0.7	0.1	
Delay (s)	22.9	6.1		25.5	8.2		13.6	13.6		15.4	14.1	
Level of Service	C	A		C	A		B	B		B	B	
Approach Delay (s)		6.4			8.5			13.6			14.6	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	9.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	47.8	Sum of lost time (s)	6.0
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
12: Stoneridge & Hacienda

11/30/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.95		1.00	0.91		0.97	0.95		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.92	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.99		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)	3547	3618		1829	5172		3547	3605		1829	4507	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3547	3618		1829	5172		3547	3605		1829	4507	
Volume (vph)	235	1250	77	17	479	40	45	178	14	44	267	231
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)	247	1316	81	18	504	42	47	187	15	46	281	243
RTOR Reduction (vph)	0	3	0	0	5	0	0	6	0	0	148	0
Lane Group Flow (vph)	247	1394	0	18	541	0	47	196	0	46	376	0
Confl. Peds. (#/hr)			12			24			24			120
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	12.4	71.5		3.2	62.3		5.9	18.1		7.2	19.4	
Effective Green, g (s)	13.4	74.5		4.2	65.3		6.9	21.1		8.2	22.4	
Actuated g/C Ratio	0.11	0.62		0.04	0.54		0.06	0.18		0.07	0.19	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	396	2246		64	2814		204	634		125	841	
v/s Ratio Prot	c0.07	c0.39		0.01	0.10		0.01	0.05		c0.03	c0.08	
v/s Ratio Perm												
v/c Ratio	0.62	0.62		0.28	0.19		0.23	0.31		0.37	0.45	
Uniform Delay, d1	50.9	14.0		56.4	13.9		54.0	43.1		53.4	43.3	
Progression Factor	1.30	0.40		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.5	1.1		2.4	0.2		0.6	0.3		1.8	0.4	
Delay (s)	68.5	6.7		58.8	14.1		54.6	43.4		55.3	43.7	
Level of Service	E	A		E	B		D	D		E	D	
Approach Delay (s)		16.0			15.5			45.5			44.6	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.99	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1829	5255	3459	1470	3547	1614
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1829	5255	3459	1470	3547	1614
Volume (vph)	166	583	390	273	900	255
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	171	601	402	281	928	263
RTOR Reduction (vph)	0	0	7	179	0	157
Lane Group Flow (vph)	171	601	429	68	928	106
Confl. Peds. (#/hr)				1		2
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		3	
Permitted Phases		6		2		3
Actuated Green, G (s)	8.9	26.0	13.1	13.1	20.6	20.6
Effective Green, g (s)	9.9	29.0	16.1	16.1	23.6	23.6
Actuated g/C Ratio	0.17	0.49	0.27	0.27	0.40	0.40
Clearance Time (s)	4.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	309	2601	950	404	1428	650
v/s Ratio Prot	c0.09	0.11	c0.12		c0.26	
v/s Ratio Perm				0.05		0.07
v/c Ratio	0.55	0.23	0.45	0.17	0.65	0.16
Uniform Delay, d1	22.3	8.4	17.6	16.2	14.2	11.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.0	0.3	0.2	1.0	0.1
Delay (s)	24.5	8.5	17.9	16.4	15.2	11.3
Level of Service	C	A	B	B	B	B
Approach Delay (s)		12.0	17.4		14.3	
Approach LOS		B	B		B	

Intersection Summary			
HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	58.6	Sum of lost time (s)	9.0
Intersection Capacity Utilization	58.9%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1591	3547	3501		3547	5255	1593	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1591	3547	3501		3547	5255	1593	3547	5255	1636
Volume (vph)	473	448	576	175	157	55	228	1221	132	111	1067	201
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)	488	462	594	180	162	57	235	1259	136	114	1100	207
RTOR Reduction (vph)	0	0	233	0	31	0	0	0	53	0	0	0
Lane Group Flow (vph)	488	462	361	180	188	0	235	1259	83	114	1100	207
Confl. Peds. (#/hr)			13			1			10			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			Free
Actuated Green, G (s)	27.3	27.5	27.5	9.6	10.4		17.9	55.6	55.6	7.7	45.4	120.0
Effective Green, g (s)	28.4	30.5	30.5	10.7	12.8		19.0	58.0	58.0	8.8	47.8	120.0
Actuated g/C Ratio	0.24	0.25	0.25	0.09	0.11		0.16	0.48	0.48	0.07	0.40	1.00
Clearance Time (s)	4.1	6.0	6.0	4.1	5.4		4.1	5.4	5.4	4.1	5.4	
Vehicle Extension (s)	1.8	1.8	1.8	1.8	1.8		1.8	5.0	5.0	1.8	5.0	
Lane Grp Cap (vph)	839	929	404	316	373		562	2540	770	260	2093	1636
v/s Ratio Prot	c0.14	0.13		0.05	0.05		0.07	c0.24		0.03	c0.21	
v/s Ratio Perm			c0.23						0.05			0.13
v/c Ratio	0.58	0.50	0.89	0.57	0.50		0.42	0.50	0.11	0.44	0.53	0.13
Uniform Delay, d1	40.5	38.2	43.2	52.4	50.6		45.5	21.1	16.9	53.2	27.5	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.49	0.21	0.01	1.04	0.35	1.00
Incremental Delay, d2	0.7	0.2	20.8	1.4	0.4		0.1	0.4	0.2	0.4	0.9	0.2
Delay (s)	41.2	38.4	63.9	53.8	51.0		22.3	4.8	0.4	55.8	10.6	0.2
Level of Service	D	D	E	D	D		C	A	A	E	B	A
Approach Delay (s)		49.1			52.3			7.0			12.7	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM Average Control Delay	25.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	72.6%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1829	5251		1829	3657	1636		1890	1603	1737	1763	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1829	5251		1829	3657	1636		1890	1603	1737	1763	1615
Volume (vph)	113	725	4	11	469	49	20	35	5	219	33	200
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	788	4	12	510	53	22	38	5	238	36	217
RTOR Reduction (vph)	0	1	0	0	0	33	0	0	4	0	0	168
Lane Group Flow (vph)	123	791	0	12	510	20	0	60	1	133	141	49
Confl. Peds. (#/hr)									3			1
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	5.5	25.2		0.9	20.6	20.6		4.0	4.0	11.2	11.2	11.2
Effective Green, g (s)	6.5	28.2		1.9	23.6	23.6		7.0	7.0	14.2	14.2	14.2
Actuated g/C Ratio	0.10	0.45		0.03	0.37	0.37		0.11	0.11	0.22	0.22	0.22
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	188	2339		55	1363	610		209	177	390	395	362
v/s Ratio Prot	c0.07	c0.15		0.01	0.14			c0.03		0.08	c0.08	
v/s Ratio Perm						0.01			0.00			0.03
v/c Ratio	0.65	0.34		0.22	0.37	0.03		0.29	0.00	0.34	0.36	0.13
Uniform Delay, d1	27.3	11.5		30.0	14.5	12.6		25.9	25.0	20.6	20.7	19.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.9	0.1		2.0	0.2	0.0		0.8	0.0	0.5	0.6	0.2
Delay (s)	35.2	11.5		32.0	14.6	12.6		26.6	25.1	21.1	21.3	19.8
Level of Service	D	B		C	B	B		C	C	C	C	B
Approach Delay (s)		14.7			14.8			26.5			20.6	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	16.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	63.3	Sum of lost time (s)	9.0
Intersection Capacity Utilization	43.1%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1597	3547	3657	1577	1829	5255	1636	1829	5255	1620
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1597	3547	3657	1577	1829	5255	1636	1829	5255	1620
Volume (vph)	220	679	288	288	345	81	148	368	97	492	826	38
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)	234	722	306	306	367	86	157	391	103	523	879	40
RTOR Reduction (vph)	0	0	195	0	0	60	0	0	84	0	0	14
Lane Group Flow (vph)	234	722	111	306	367	26	157	391	19	523	879	26
Confl. Peds. (#/hr)			12			24			36			12
Turn Type	Prot		Perm	Prot		Perm	Prot		custom	Prot		custom
Protected Phases	7	4		3	8		5	2	2	1	6	6
Permitted Phases			4			8			2			4
Actuated Green, G (s)	7.1	24.1	24.1	10.2	27.2	27.2	11.8	16.7	16.7	29.6	33.5	57.6
Effective Green, g (s)	8.1	27.1	27.1	11.2	30.2	30.2	12.8	18.7	18.7	30.6	36.5	63.6
Actuated g/C Ratio	0.08	0.27	0.27	0.11	0.30	0.30	0.13	0.19	0.19	0.31	0.37	0.64
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	5.0	5.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	288	995	435	399	1109	478	235	987	307	562	1926	1034
v/s Ratio Prot	0.07	c0.20		c0.09	0.10		0.09	0.07	0.01	c0.29	c0.17	0.01
v/s Ratio Perm			0.07			0.02						0.01
v/c Ratio	0.81	0.73	0.25	0.77	0.33	0.05	0.67	0.40	0.06	0.93	0.46	0.02
Uniform Delay, d1	45.0	32.9	28.4	42.9	26.9	24.6	41.4	35.5	33.2	33.5	24.0	6.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.9	2.7	0.3	8.6	0.2	0.0	7.0	0.3	0.1	22.3	0.2	0.0
Delay (s)	60.9	35.5	28.7	51.5	27.1	24.6	48.4	35.8	33.3	55.7	24.2	6.6
Level of Service	E	D	C	D	C	C	D	D	C	E	C	A
Approach Delay (s)		38.6			36.6			38.4			35.1	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	37.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	99.6	Sum of lost time (s)	9.0
Intersection Capacity Utilization	88.1%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95	0.88	0.97	0.95	1.00	0.97	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1829	3657	2880	3547	3657	1547	3547	5075		3547	5240	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1829	3657	2880	3547	3657	1547	3547	5075		3547	5240	
Volume (vph)	64	718	1028	140	130	213	289	1349	399	529	1305	21
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)	67	756	1082	147	137	224	304	1420	420	557	1374	22
RTOR Reduction (vph)	0	0	0	0	0	158	0	42	0	0	1	0
Lane Group Flow (vph)	67	756	1082	147	137	66	304	1798	0	557	1395	0
Confl. Peds. (#/hr)						36						12
Turn Type	Prot		pm+ov	Prot		Perm	Prot			Prot		
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	6.7	29.2	44.9	9.7	32.2	32.2	15.7	43.1		18.0	45.4	
Effective Green, g (s)	7.7	32.2	48.9	10.7	35.2	35.2	16.7	46.1		19.0	48.4	
Actuated g/C Ratio	0.06	0.27	0.41	0.09	0.29	0.29	0.14	0.38		0.16	0.40	
Clearance Time (s)	4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	1.8	5.0	1.8	1.8	5.0	5.0	1.8	5.0		1.8	5.0	
Lane Grp Cap (vph)	117	981	1174	316	1073	454	494	1950		562	2113	
v/s Ratio Prot	0.04	0.21	c0.13	c0.04	0.04		0.09	c0.35		c0.16	0.27	
v/s Ratio Perm			0.25			0.04						
v/c Ratio	0.57	0.77	0.92	0.47	0.13	0.14	0.62	0.92		0.99	0.66	
Uniform Delay, d1	54.6	40.5	33.7	51.9	31.1	31.3	48.6	35.2		50.4	29.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.65	0.42	
Incremental Delay, d2	4.2	4.4	11.6	0.4	0.1	0.3	1.6	8.7		31.5	1.3	
Delay (s)	58.7	44.9	45.3	52.3	31.2	31.6	50.2	44.0		64.5	13.5	
Level of Service	E	D	D	D	C	C	D	D		E	B	
Approach Delay (s)		45.6			37.5			44.8			28.0	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM Average Control Delay	39.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.4%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95			0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.96		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3246			3367		1829	5186		1829	5218	
Flt Permitted		0.88			0.78		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2899			2696		1829	5186		1829	5218	
Volume (vph)	21	17	57	37	8	17	7	162	13	11	268	12
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)	22	18	59	39	8	18	7	169	14	11	279	12
RTOR Reduction (vph)	0	44	0	0	13	0	0	10	0	0	8	0
Lane Group Flow (vph)	0	55	0	0	52	0	7	173	0	11	283	0
Confl. Peds. (#/hr)	20		20	20		20			20			20
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		4.4			4.4		0.7	4.8		0.7	4.8	
Effective Green, g (s)		6.4			6.4		1.7	7.8		1.7	7.8	
Actuated g/C Ratio		0.26			0.26		0.07	0.31		0.07	0.31	
Clearance Time (s)		5.0			5.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		745			693		125	1625		125	1635	
v/s Ratio Prot							0.00	0.03		c0.01	c0.05	
v/s Ratio Perm		0.02			c0.02							
v/c Ratio		0.07			0.07		0.06	0.11		0.09	0.17	
Uniform Delay, d1		7.0			7.0		10.8	6.1		10.9	6.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.0		0.2	0.0		0.3	0.1	
Delay (s)		7.0			7.1		11.0	6.1		11.2	6.3	
Level of Service		A			A		B	A		B	A	
Approach Delay (s)		7.0			7.1			6.3			6.4	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	6.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.12		
Actuated Cycle Length (s)	24.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	28.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.97	1.00		0.91	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	0.98		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)	1829	3651		1829	5044		1773	3550		1669	3335	
Flt Permitted	0.95	1.00		0.95	1.00		0.73	1.00		0.64	1.00	
Satd. Flow (perm)	1829	3651		1829	5044		1361	3550		1117	3335	
Volume (vph)	37	1272	9	7	420	112	45	139	17	284	19	16
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	44	1496	11	8	494	132	53	164	20	334	22	19
RTOR Reduction (vph)	0	1	0	0	40	0	0	11	0	0	12	0
Lane Group Flow (vph)	44	1506	0	8	586	0	53	173	0	334	29	0
Confl. Peds. (#/hr)			72			24	36		132	132		36
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	4.7	36.0		1.1	32.4		26.8	26.8		26.8	26.8	
Effective Green, g (s)	5.7	39.0		2.1	35.4		29.8	29.8		29.8	29.8	
Actuated g/C Ratio	0.07	0.49		0.03	0.44		0.37	0.37		0.37	0.37	
Clearance Time (s)	4.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	130	1782		48	2235		508	1324		417	1244	
v/s Ratio Prot	c0.02	c0.41		0.00	0.12			0.05			0.01	
v/s Ratio Perm							0.04			c0.30		
v/c Ratio	0.34	0.85		0.17	0.26		0.10	0.13		0.80	0.02	
Uniform Delay, d1	35.3	17.8		38.0	14.0		16.3	16.5		22.4	15.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	3.9		1.6	0.1		0.1	0.0		10.6	0.0	
Delay (s)	36.9	21.7		39.7	14.1		16.4	16.6		33.0	15.9	
Level of Service	D	C		D	B		B	B		C	B	
Approach Delay (s)		22.1			14.4			16.5			31.1	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM Average Control Delay	21.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	79.9	Sum of lost time (s)	6.0
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
12: Stoneridge & Hacienda

11/30/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.95		1.00	0.91		0.97	0.95		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	0.91	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.98		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)	3547	3624		1829	5151		3547	3584		1829	4429	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3547	3624		1829	5151		3547	3584		1829	4429	
Volume (vph)	188	1230	64	6	511	54	24	204	24	72	234	247
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)	198	1295	67	6	538	57	25	215	25	76	246	260
RTOR Reduction (vph)	0	2	0	0	7	0	0	8	0	0	175	0
Lane Group Flow (vph)	198	1360	0	6	588	0	25	232	0	76	331	0
Confl. Peds. (#/hr)			12			24			24			120
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	10.8	71.9		1.4	62.5		4.1	18.5		8.2	22.6	
Effective Green, g (s)	11.8	74.9		2.4	65.5		5.1	21.5		9.2	25.6	
Actuated g/C Ratio	0.10	0.62		0.02	0.55		0.04	0.18		0.08	0.21	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	349	2262		37	2812		151	642		140	945	
v/s Ratio Prot	c0.06	c0.38		0.00	0.11		0.01	0.06		c0.04	c0.07	
v/s Ratio Perm												
v/c Ratio	0.57	0.60		0.16	0.21		0.17	0.36		0.54	0.35	
Uniform Delay, d1	51.7	13.6		57.8	14.0		55.4	43.2		53.4	40.1	
Progression Factor	1.29	0.31		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	1.0		2.1	0.2		0.5	0.3		4.2	0.2	
Delay (s)	68.3	5.1		59.9	14.1		55.9	43.6		57.6	40.4	
Level of Service	E	A		E	B		E	D		E	D	
Approach Delay (s)		13.1			14.6			44.7			42.6	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1829	5255	3503	1470	3547	1614
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1829	5255	3503	1470	3547	1614
Volume (vph)	219	692	553	300	807	283
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	226	713	570	309	832	292
RTOR Reduction (vph)	0	0	0	215	0	184
Lane Group Flow (vph)	226	713	570	94	832	108
Confl. Peds. (#/hr)				1		2
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		3	
Permitted Phases		6		2		3
Actuated Green, G (s)	10.9	31.2	16.3	16.3	20.5	20.5
Effective Green, g (s)	11.9	34.2	19.3	19.3	23.5	23.5
Actuated g/C Ratio	0.19	0.54	0.30	0.30	0.37	0.37
Clearance Time (s)	4.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	342	2821	1061	445	1309	595
v/s Ratio Prot	c0.12	0.14	c0.16		c0.23	
v/s Ratio Perm				0.06		0.07
v/c Ratio	0.66	0.25	0.54	0.21	0.64	0.18
Uniform Delay, d1	24.0	7.9	18.5	16.5	16.6	13.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.7	0.0	0.5	0.2	1.0	0.1
Delay (s)	28.8	8.0	19.0	16.8	17.6	13.7
Level of Service	C	A	B	B	B	B
Approach Delay (s)		13.0	18.2		16.6	
Approach LOS		B	B		B	

Intersection Summary			
HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	63.7	Sum of lost time (s)	9.0
Intersection Capacity Utilization	63.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1591	3547	3488		3547	5255	1593	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1591	3547	3488		3547	5255	1593	3547	5255	1636
Volume (vph)	545	445	541	145	166	65	238	1417	134	123	948	209
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)	562	459	558	149	171	67	245	1461	138	127	977	215
RTOR Reduction (vph)	0	0	252	0	36	0	0	0	45	0	0	0
Lane Group Flow (vph)	562	459	306	149	202	0	245	1461	93	127	977	215
Confl. Peds. (#/hr)			13			1			10			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			Free
Actuated Green, G (s)	24.5	24.7	24.7	10.0	10.8		18.0	57.7	57.7	8.0	47.7	120.0
Effective Green, g (s)	25.6	27.7	27.7	11.1	13.2		19.1	60.1	60.1	9.1	50.1	120.0
Actuated g/C Ratio	0.21	0.23	0.23	0.09	0.11		0.16	0.50	0.50	0.08	0.42	1.00
Clearance Time (s)	4.1	6.0	6.0	4.1	5.4		4.1	5.4	5.4	4.1	5.4	
Vehicle Extension (s)	1.8	1.8	1.8	1.8	1.8		1.8	5.0	5.0	1.8	5.0	
Lane Grp Cap (vph)	757	844	367	328	384		565	2632	798	269	2194	1636
v/s Ratio Prot	c0.16	0.13		0.04	0.06		0.07	c0.28		c0.04	0.19	
v/s Ratio Perm			c0.19						0.06			0.13
v/c Ratio	0.74	0.54	0.83	0.45	0.52		0.43	0.56	0.12	0.47	0.45	0.13
Uniform Delay, d1	44.1	40.6	43.9	51.6	50.4		45.6	20.7	15.9	53.1	25.0	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.50	0.21	0.02	1.01	0.31	1.00
Incremental Delay, d2	3.5	0.4	14.3	0.4	0.6		0.1	0.4	0.2	0.5	0.6	0.2
Delay (s)	47.6	41.0	58.2	51.9	51.0		23.1	4.8	0.5	54.2	8.4	0.2
Level of Service	D	D	E	D	D		C	A	A	D	A	A
Approach Delay (s)		49.4			51.4			6.9			11.5	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM Average Control Delay	24.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	67.3%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1829	5248		1829	3657	1636		1887	1607	1737	1766	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1829	5248		1829	3657	1636		1887	1607	1737	1766	1615
Volume (vph)	83	698	6	23	539	44	39	58	7	195	35	151
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)	90	759	7	25	586	48	42	63	8	212	38	164
RTOR Reduction (vph)	0	1	0	0	0	31	0	0	6	0	0	131
Lane Group Flow (vph)	90	765	0	25	586	17	0	105	2	122	128	33
Confl. Peds. (#/hr)									3			1
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	6.9	26.8		2.2	22.1	22.1		7.2	7.2	10.9	10.9	10.9
Effective Green, g (s)	7.9	29.8		3.2	25.1	25.1		10.2	10.2	13.9	13.9	13.9
Actuated g/C Ratio	0.11	0.43		0.05	0.36	0.36		0.15	0.15	0.20	0.20	0.20
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	209	2263		85	1328	594		279	237	349	355	325
v/s Ratio Prot	c0.05	0.15		0.01	c0.16			c0.06		0.07	c0.07	
v/s Ratio Perm						0.01			0.00			0.02
v/c Ratio	0.43	0.34		0.29	0.44	0.03		0.38	0.01	0.35	0.36	0.10
Uniform Delay, d1	28.5	13.1		31.9	16.7	14.2		26.6	25.1	23.7	23.8	22.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.1		1.9	0.2	0.0		0.9	0.0	0.6	0.6	0.1
Delay (s)	29.9	13.2		33.8	16.9	14.2		27.4	25.1	24.3	24.4	22.6
Level of Service	C	B		C	B	B		C	C	C	C	C
Approach Delay (s)		14.9			17.4			27.3			23.7	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	18.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	69.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1598	3547	3657	1577	1829	5255	1636	1829	5255	1621
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1598	3547	3657	1577	1829	5255	1636	1829	5255	1621
Volume (vph)	259	604	293	232	425	140	125	430	41	481	957	70
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)	276	643	312	247	452	149	133	457	44	512	1018	74
RTOR Reduction (vph)	0	0	189	0	0	106	0	0	35	0	0	26
Lane Group Flow (vph)	276	643	123	247	452	43	133	457	9	512	1018	48
Confl. Peds. (#/hr)			12			24			36			12
Turn Type	Prot		Perm	Prot		Perm	Prot		custom	Prot		custom
Protected Phases	7	4		3	8		5	2	2	1	6	6
Permitted Phases			4			8			2			4
Actuated Green, G (s)	7.2	22.6	22.6	9.8	25.2	25.2	10.9	17.3	17.3	29.7	35.1	57.7
Effective Green, g (s)	8.2	25.6	25.6	10.8	28.2	28.2	11.9	19.3	19.3	30.7	38.1	63.7
Actuated g/C Ratio	0.08	0.26	0.26	0.11	0.29	0.29	0.12	0.20	0.20	0.31	0.39	0.65
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	5.0	5.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	296	951	416	389	1048	452	221	1031	321	571	2035	1049
v/s Ratio Prot	c0.08	c0.18		0.07	c0.12		0.07	0.09	0.01	c0.28	c0.19	0.02
v/s Ratio Perm			0.08			0.03						0.01
v/c Ratio	0.93	0.68	0.30	0.63	0.43	0.09	0.60	0.44	0.03	0.90	0.50	0.05
Uniform Delay, d1	44.8	32.7	29.2	41.9	28.6	25.7	41.0	34.8	32.0	32.3	22.9	6.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	34.8	1.9	0.4	3.4	0.3	0.1	4.6	0.3	0.0	16.6	0.2	0.0
Delay (s)	79.6	34.6	29.6	45.3	28.9	25.8	45.6	35.1	32.0	48.9	23.1	6.3
Level of Service	E	C	C	D	C	C	D	D	C	D	C	A
Approach Delay (s)		43.4			33.1			37.1			30.6	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM Average Control Delay	35.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	98.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95	0.88	0.97	0.95	1.00	0.97	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1829	3657	2880	3547	3657	1547	3547	5106		3547	5237	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1829	3657	2880	3547	3657	1547	3547	5106		3547	5237	
Volume (vph)	73	652	955	131	167	271	329	1507	351	487	1152	23
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)	77	686	1005	138	176	285	346	1586	369	513	1213	24
RTOR Reduction (vph)	0	0	0	0	0	205	0	30	0	0	2	0
Lane Group Flow (vph)	77	686	1005	138	176	80	346	1925	0	513	1235	0
Confl. Peds. (#/hr)						36						12
Turn Type	Prot		pm+ov	Prot		Perm	Prot			Prot		
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	6.9	27.9	43.9	9.5	30.5	30.5	16.0	44.6		18.0	46.6	
Effective Green, g (s)	7.9	30.9	47.9	10.5	33.5	33.5	17.0	47.6		19.0	49.6	
Actuated g/C Ratio	0.07	0.26	0.40	0.09	0.28	0.28	0.14	0.40		0.16	0.41	
Clearance Time (s)	4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	1.8	5.0	1.8	1.8	5.0	5.0	1.8	5.0		1.8	5.0	
Lane Grp Cap (vph)	120	942	1150	310	1021	432	502	2025		562	2165	
v/s Ratio Prot	0.04	0.19	c0.12	c0.04	0.05		0.10	c0.38		c0.14	0.24	
v/s Ratio Perm			0.23			0.05						
v/c Ratio	0.64	0.73	0.87	0.45	0.17	0.18	0.69	0.95		0.91	0.57	
Uniform Delay, d1	54.7	40.7	33.3	52.0	32.8	32.9	49.0	35.1		49.7	27.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.69	0.44	
Incremental Delay, d2	8.5	3.5	7.4	0.4	0.2	0.4	3.1	11.3		16.8	0.9	
Delay (s)	63.1	44.2	40.6	52.4	32.9	33.3	52.1	46.4		51.2	12.9	
Level of Service	E	D	D	D	C	C	D	D		D	B	
Approach Delay (s)		43.0			37.6			47.2			24.1	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM Average Control Delay	38.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.2%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95			0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.92			0.95		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3285			3347		1829	5188		1829	5197	
Flt Permitted		0.87			0.80		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2895			2756		1829	5188		1829	5197	
Volume (vph)	26	20	49	35	11	23	8	180	14	11	195	13
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)	27	21	51	36	11	24	8	188	15	11	203	14
RTOR Reduction (vph)	0	37	0	0	18	0	0	10	0	0	10	0
Lane Group Flow (vph)	0	62	0	0	53	0	8	193	0	11	207	0
Confl. Peds. (#/hr)	20		20	20		20			20			20
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		4.8			4.8		0.7	5.1		0.7	5.1	
Effective Green, g (s)		6.8			6.8		1.7	8.1		1.7	8.1	
Actuated g/C Ratio		0.27			0.27		0.07	0.32		0.07	0.32	
Clearance Time (s)		5.0			5.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		769			732		121	1642		121	1644	
v/s Ratio Prot							0.00	0.04		c0.01	c0.04	
v/s Ratio Perm		c0.02			0.02							
v/c Ratio		0.08			0.07		0.07	0.12		0.09	0.13	
Uniform Delay, d1		7.1			7.0		11.2	6.2		11.2	6.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.0		0.2	0.0		0.3	0.0	
Delay (s)		7.1			7.1		11.4	6.2		11.6	6.3	
Level of Service		A			A		B	A		B	A	
Approach Delay (s)		7.1			7.1			6.4			6.5	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	6.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.10		
Actuated Cycle Length (s)	25.6	Sum of lost time (s)	9.0
Intersection Capacity Utilization	28.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.97	1.00		0.91	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	0.98		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)	1829	3651		1829	5048		1774	3544		1673	3351	
Flt Permitted	0.95	1.00		0.95	1.00		0.73	1.00		0.64	1.00	
Satd. Flow (perm)	1829	3651		1829	5048		1371	3544		1122	3351	
Volume (vph)	33	1264	9	9	477	125	45	137	18	256	16	13
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	39	1487	11	11	561	147	53	161	21	301	19	15
RTOR Reduction (vph)	0	0	0	0	38	0	0	12	0	0	10	0
Lane Group Flow (vph)	39	1498	0	11	670	0	53	170	0	301	24	0
Confl. Peds. (#/hr)			72			24	36		132	132		36
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	4.5	36.1		1.0	32.6		24.6	24.6		24.6	24.6	
Effective Green, g (s)	5.5	39.1		2.0	35.6		27.6	27.6		27.6	27.6	
Actuated g/C Ratio	0.07	0.50		0.03	0.46		0.36	0.36		0.36	0.36	
Clearance Time (s)	4.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	129	1837		47	2313		487	1259		399	1190	
v/s Ratio Prot	c0.02	c0.41		0.01	0.13			0.05			0.01	
v/s Ratio Perm							0.04			c0.27		
v/c Ratio	0.30	0.82		0.23	0.29		0.11	0.14		0.75	0.02	
Uniform Delay, d1	34.3	16.3		37.1	13.1		16.8	17.0		22.1	16.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	2.9		2.6	0.1		0.1	0.0		7.9	0.0	
Delay (s)	35.6	19.2		39.7	13.2		16.9	17.0		30.0	16.3	
Level of Service	D	B		D	B		B	B		C	B	
Approach Delay (s)		19.6			13.6			17.0			28.6	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	77.7	Sum of lost time (s)	6.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
12: Stoneridge & Hacienda

11/27/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.95		1.00	0.91		0.97	0.95		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.95	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		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)	3547	3621		1829	5206		3547	3580		1829	4767	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3547	3621		1829	5206		3547	3580		1829	4767	
Volume (vph)	237	539	31	40	1412	67	56	151	19	59	252	107
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)	252	573	33	43	1502	71	60	161	20	63	268	114
RTOR Reduction (vph)	0	2	0	0	3	0	0	10	0	0	76	0
Lane Group Flow (vph)	252	604	0	43	1570	0	60	171	0	63	306	0
Confl. Peds. (#/hr)			12			24			24			120
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.6	67.6		7.1	61.1		6.3	17.0		8.3	19.0	
Effective Green, g (s)	14.6	70.6		8.1	64.1		7.3	20.0		9.3	22.0	
Actuated g/C Ratio	0.12	0.59		0.07	0.53		0.06	0.17		0.08	0.18	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	432	2130		123	2781		216	597		142	874	
v/s Ratio Prot	c0.07	0.17		0.02	c0.30		0.02	0.05		c0.03	c0.06	
v/s Ratio Perm												
v/c Ratio	0.58	0.28		0.35	0.56		0.28	0.29		0.44	0.35	
Uniform Delay, d1	49.8	12.2		53.4	18.6		53.8	43.8		52.9	42.8	
Progression Factor	0.76	1.24		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.3		1.7	0.8		0.7	0.3		2.2	0.2	
Delay (s)	39.6	15.4		55.2	19.5		54.5	44.0		55.1	43.0	
Level of Service	D	B		E	B		D	D		E	D	
Approach Delay (s)		22.5			20.4			46.6			44.7	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	26.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1829	5255	3503	1470	3547	1610
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1829	5255	3503	1470	3547	1610
Volume (vph)	148	278	1006	488	109	173
Peak-hour factor, PHF	0.86	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	172	327	1184	574	128	204
RTOR Reduction (vph)	0	0	0	216	0	173
Lane Group Flow (vph)	172	327	1184	358	128	31
Confl. Peds. (#/hr)				1		2
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		3	
Permitted Phases		6		2		3
Actuated Green, G (s)	8.7	41.7	29.0	29.0	6.0	6.0
Effective Green, g (s)	9.7	44.7	32.0	32.0	9.0	9.0
Actuated g/C Ratio	0.16	0.75	0.54	0.54	0.15	0.15
Clearance Time (s)	4.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	297	3935	1878	788	535	243
v/s Ratio Prot	c0.09	0.06	c0.34		c0.04	
v/s Ratio Perm				0.24		0.02
v/c Ratio	0.58	0.08	0.63	0.45	0.24	0.13
Uniform Delay, d1	23.1	2.0	9.7	8.5	22.3	21.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	0.0	0.7	0.4	0.2	0.2
Delay (s)	25.8	2.0	10.4	8.9	22.6	22.2
Level of Service	C	A	B	A	C	C
Approach Delay (s)		10.2	9.9		22.3	
Approach LOS		B	A		C	

Intersection Summary			
HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	59.7	Sum of lost time (s)	9.0
Intersection Capacity Utilization	56.0%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1591	3547	3567		3547	5255	1593	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1591	3547	3567		3547	5255	1593	3547	5255	1636
Volume (vph)	163	289	133	172	437	78	618	951	100	121	1027	536
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)	183	325	149	193	491	88	694	1069	112	136	1154	602
RTOR Reduction (vph)	0	0	122	0	13	0	0	0	51	0	0	0
Lane Group Flow (vph)	183	325	27	193	566	0	694	1069	61	136	1154	602
Confl. Peds. (#/hr)			13			1			10			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			Free
Actuated Green, G (s)	12.3	18.9	18.9	14.7	21.9		20.9	58.5	58.5	8.3	45.9	120.0
Effective Green, g (s)	13.4	21.9	21.9	15.8	24.3		22.0	60.9	60.9	9.4	48.3	120.0
Actuated g/C Ratio	0.11	0.18	0.18	0.13	0.20		0.18	0.51	0.51	0.08	0.40	1.00
Clearance Time (s)	4.1	6.0	6.0	4.1	5.4		4.1	5.4	5.4	4.1	5.4	
Vehicle Extension (s)	1.8	1.8	1.8	1.8	1.8		1.8	5.0	5.0	1.8	5.0	
Lane Grp Cap (vph)	396	667	290	467	722		650	2667	808	278	2115	1636
v/s Ratio Prot	0.05	0.09		c0.05	c0.16		c0.20	0.20		0.04	c0.22	
v/s Ratio Perm			0.02						0.04			c0.37
v/c Ratio	0.46	0.49	0.09	0.41	0.78		1.07	0.40	0.08	0.49	0.55	0.37
Uniform Delay, d1	49.9	44.0	40.8	47.8	45.4		49.0	18.3	15.1	53.0	27.4	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.77	0.47	0.21	1.42	1.00	1.00
Incremental Delay, d2	0.3	0.2	0.1	0.2	5.2		49.1	0.3	0.1	0.4	0.9	0.5
Delay (s)	50.2	44.2	40.8	48.1	50.5		87.0	9.0	3.3	75.7	28.2	0.5
Level of Service	D	D	D	D	D		F	A	A	E	C	A
Approach Delay (s)		45.1			49.9			37.5			22.8	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM Average Control Delay	35.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1829	5189		1829	3657	1636		1910	1600	1737	1750	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1829	5189		1829	3657	1636		1910	1600	1737	1750	1615
Volume (vph)	132	437	40	8	1017	84	6	32	14	89	5	110
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	155	514	47	9	1196	99	7	38	16	105	6	129
RTOR Reduction (vph)	0	6	0	0	0	44	0	0	15	0	0	106
Lane Group Flow (vph)	155	555	0	9	1196	55	0	45	1	54	57	23
Confl. Peds. (#/hr)									3			1
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	9.2	45.8		1.2	37.8	37.8		4.7	4.7	12.2	12.2	12.2
Effective Green, g (s)	10.2	48.8		2.2	40.8	40.8		7.7	7.7	15.2	15.2	15.2
Actuated g/C Ratio	0.12	0.57		0.03	0.47	0.47		0.09	0.09	0.18	0.18	0.18
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	217	2948		47	1737	777		171	143	307	310	286
v/s Ratio Prot	c0.08	0.11		0.00	c0.33			c0.02		0.03	c0.03	
v/s Ratio Perm						0.03			0.00			0.01
v/c Ratio	0.71	0.19		0.19	0.69	0.07		0.26	0.01	0.18	0.18	0.08
Uniform Delay, d1	36.4	9.0		41.0	17.6	12.3		36.5	35.6	30.0	30.1	29.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.6	0.1		2.0	1.2	0.0		0.8	0.0	0.3	0.3	0.1
Delay (s)	47.1	9.1		43.0	18.7	12.3		37.3	35.7	30.3	30.4	29.6
Level of Service	D	A		D	B	B		D	D	C	C	C
Approach Delay (s)		17.3			18.4			36.9			30.0	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM Average Control Delay	19.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	85.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.1%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1597	3547	3657	1576	1829	5255	1636	1829	5255	1613
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1597	3547	3657	1576	1829	5255	1636	1829	5255	1613
Volume (vph)	49	506	227	178	1196	345	319	718	62	207	459	68
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	54	562	252	198	1329	383	354	798	69	230	510	76
RTOR Reduction (vph)	0	0	169	0	0	164	0	0	46	0	0	34
Lane Group Flow (vph)	54	562	83	198	1329	219	354	798	23	230	510	42
Confl. Peds. (#/hr)			12			24			36			12
Turn Type	Prot		Perm	Prot		Perm	Prot		custom	Prot		custom
Protected Phases	7	4		3	8		5	2	2	1	6	6
Permitted Phases			4			8			2			4
Actuated Green, G (s)	5.6	30.3	30.3	9.3	34.0	34.0	22.4	32.2	32.2	10.3	19.1	49.4
Effective Green, g (s)	6.6	33.3	33.3	10.3	37.0	37.0	23.4	34.2	34.2	11.3	22.1	55.4
Actuated g/C Ratio	0.07	0.33	0.33	0.10	0.37	0.37	0.23	0.34	0.34	0.11	0.22	0.55
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	5.0	5.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	232	1205	526	361	1338	577	423	1778	553	204	1149	884
v/s Ratio Prot	0.02	0.15		c0.06	c0.36		c0.19	c0.15	0.01	c0.13	0.10	0.01
v/s Ratio Perm			0.05			0.14						0.02
v/c Ratio	0.23	0.47	0.16	0.55	0.99	0.38	0.84	0.45	0.04	1.13	0.44	0.05
Uniform Delay, d1	44.8	26.9	24.0	43.2	31.9	23.6	37.0	26.1	22.5	44.9	34.2	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	1.00
Incremental Delay, d2	0.5	0.3	0.1	1.7	22.9	0.4	13.4	0.2	0.0	101.5	0.3	0.0
Delay (s)	45.4	27.1	24.1	44.9	54.8	24.0	50.5	26.3	22.5	146.4	34.5	10.6
Level of Service	D	C	C	D	D	C	D	C	C	F	C	B
Approach Delay (s)		27.4			47.6			33.1			63.8	
Approach LOS		C			D			C			E	

Intersection Summary			
HCM Average Control Delay	43.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	101.1	Sum of lost time (s)	6.0
Intersection Capacity Utilization	82.7%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95	0.88	0.97	0.95	1.00	0.97	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1829	3657	2880	3547	3657	1547	3547	5177		3547	5200	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1829	3657	2880	3547	3657	1547	3547	5177		3547	5200	
Volume (vph)	56	247	437	500	912	607	1043	1020	111	218	1087	68
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	62	271	480	549	1002	667	1146	1121	122	240	1195	75
RTOR Reduction (vph)	0	0	0	0	0	176	0	11	0	0	6	0
Lane Group Flow (vph)	62	271	480	549	1002	491	1146	1232	0	240	1264	0
Confl. Peds. (#/hr)						36						12
Turn Type	Prot		pm+ov	Prot		Perm	Prot			Prot		
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	6.6	20.3	50.3	19.5	33.2	33.2	30.0	48.2		12.0	30.2	
Effective Green, g (s)	7.6	23.3	54.3	20.5	36.2	36.2	31.0	51.2		13.0	33.2	
Actuated g/C Ratio	0.06	0.19	0.45	0.17	0.30	0.30	0.26	0.43		0.11	0.28	
Clearance Time (s)	4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	1.8	5.0	1.8	1.8	5.0	5.0	1.8	5.0		1.8	5.0	
Lane Grp Cap (vph)	116	710	1303	606	1103	467	916	2209		384	1439	
v/s Ratio Prot	c0.03	0.07	0.10	0.15	0.27		c0.32	0.24		0.07	c0.24	
v/s Ratio Perm			0.07			c0.32						
v/c Ratio	0.53	0.38	0.37	0.91	0.91	1.05	1.25	0.56		0.62	0.88	
Uniform Delay, d1	54.5	42.1	21.6	48.8	40.3	41.9	44.5	25.9		51.2	41.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.56	0.46	
Incremental Delay, d2	2.4	0.7	0.1	16.8	11.4	55.8	122.1	1.0		2.0	7.1	
Delay (s)	56.8	42.8	21.6	65.6	51.7	97.7	166.6	26.9		30.7	26.1	
Level of Service	E	D	C	E	D	F	F	C		C	C	
Approach Delay (s)		31.4			69.0			93.9			26.9	
Approach LOS		C			E			F			C	

Intersection Summary			
HCM Average Control Delay	64.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	98.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95			0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.92			0.97		1.00	0.98		1.00	0.96	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3294			3471		1829	5106		1829	5011	
Flt Permitted		0.89			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2960			3072		1829	5106		1829	5011	
Volume (vph)	19	23	43	8	17	7	27	129	25	80	156	58
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.85	0.85	0.85	0.85
Adj. Flow (vph)	22	27	51	9	20	8	32	147	29	94	184	68
RTOR Reduction (vph)	0	40	0	0	6	0	0	20	0	0	40	0
Lane Group Flow (vph)	0	60	0	0	31	0	32	156	0	94	212	0
Confl. Peds. (#/hr)	20		20	20		20			20			20
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		4.4			4.4		1.0	6.1		4.1	9.2	
Effective Green, g (s)		6.4			6.4		2.0	9.1		5.1	12.2	
Actuated g/C Ratio		0.22			0.22		0.07	0.31		0.17	0.41	
Clearance Time (s)		5.0			5.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		640			664		124	1570		315	2065	
v/s Ratio Prot							0.02	0.03		c0.05	c0.04	
v/s Ratio Perm		c0.02			0.01							
v/c Ratio		0.09			0.05		0.26	0.10		0.30	0.10	
Uniform Delay, d1		9.3			9.2		13.1	7.3		10.7	5.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.0		1.1	0.0		0.5	0.0	
Delay (s)		9.3			9.2		14.2	7.4		11.2	5.4	
Level of Service		A			A		B	A		B	A	
Approach Delay (s)		9.3			9.2			8.4			7.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	7.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.14		
Actuated Cycle Length (s)	29.6	Sum of lost time (s)	6.0
Intersection Capacity Utilization	33.6%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.97		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.98	1.00		0.92	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.95		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1829	3601		1829	5145		1795	3365		1685	3402	
Flt Permitted	0.95	1.00		0.95	1.00		0.63	1.00		0.72	1.00	
Satd. Flow (perm)	1829	3601		1829	5145		1192	3365		1281	3402	
Volume (vph)	10	519	38	27	1501	193	15	32	16	134	111	68
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)	11	558	41	29	1614	208	16	34	17	144	119	73
RTOR Reduction (vph)	0	4	0	0	10	0	0	13	0	0	56	0
Lane Group Flow (vph)	11	595	0	29	1812	0	16	38	0	144	136	0
Confl. Peds. (#/hr)			72			24	36		132	132		36
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.0	30.1		2.5	31.6		10.9	10.9		10.9	10.9	
Effective Green, g (s)	2.0	33.1		3.5	34.6		13.9	13.9		13.9	13.9	
Actuated g/C Ratio	0.03	0.56		0.06	0.58		0.23	0.23		0.23	0.23	
Clearance Time (s)	4.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	61	2003		108	2992		278	786		299	795	
v/s Ratio Prot	0.01	0.17		c0.02	c0.35			0.01			0.04	
v/s Ratio Perm							0.01			c0.11		
v/c Ratio	0.18	0.30		0.27	0.61		0.06	0.05		0.48	0.17	
Uniform Delay, d1	28.0	7.0		26.8	8.0		17.7	17.7		19.7	18.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.1		1.3	0.4		0.1	0.0		1.2	0.1	
Delay (s)	29.4	7.1		28.1	8.4		17.8	17.7		20.9	18.3	
Level of Service	C	A		C	A		B	B		C	B	
Approach Delay (s)		7.5			8.7			17.7			19.4	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	59.5	Sum of lost time (s)	6.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
12: Stoneridge & Hacienda

11/30/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.95		1.00	0.91		0.97	0.95		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	0.91	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.98		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)	3547	3624		1829	5151		3547	3584		1829	4428	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3547	3624		1829	5151		3547	3584		1829	4428	
Volume (vph)	188	1220	64	6	508	54	21	203	24	71	233	247
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)	198	1284	67	6	535	57	22	214	25	75	245	260
RTOR Reduction (vph)	0	2	0	0	7	0	0	8	0	0	171	0
Lane Group Flow (vph)	198	1349	0	6	585	0	22	231	0	75	334	0
Confl. Peds. (#/hr)			12			24			24			120
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	10.8	71.1		1.4	61.7		2.8	19.3		8.2	24.7	
Effective Green, g (s)	11.8	74.1		2.4	64.7		3.8	22.3		9.2	27.7	
Actuated g/C Ratio	0.10	0.62		0.02	0.54		0.03	0.19		0.08	0.23	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	349	2238		37	2777		112	666		140	1022	
v/s Ratio Prot	c0.06	c0.37		0.00	0.11		0.01	0.06		c0.04	c0.08	
v/s Ratio Perm												
v/c Ratio	0.57	0.60		0.16	0.21		0.20	0.35		0.54	0.33	
Uniform Delay, d1	51.7	14.0		57.8	14.4		56.6	42.5		53.3	38.4	
Progression Factor	1.29	0.30		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	1.0		2.1	0.2		0.9	0.3		3.9	0.2	
Delay (s)	68.3	5.2		59.9	14.5		57.5	42.8		57.2	38.6	
Level of Service	E	A		E	B		E	D		E	D	
Approach Delay (s)		13.3			15.0			44.1			41.0	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	21.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1829	5255	3503	1470	3547	1614
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1829	5255	3503	1470	3547	1614
Volume (vph)	213	685	541	300	807	272
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	220	706	558	309	832	280
RTOR Reduction (vph)	0	0	0	216	0	176
Lane Group Flow (vph)	220	706	558	93	832	104
Confl. Peds. (#/hr)				1		2
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		3	
Permitted Phases		6		2		3
Actuated Green, G (s)	10.7	30.7	16.0	16.0	20.3	20.3
Effective Green, g (s)	11.7	33.7	19.0	19.0	23.3	23.3
Actuated g/C Ratio	0.19	0.53	0.30	0.30	0.37	0.37
Clearance Time (s)	4.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	340	2811	1056	443	1312	597
v/s Ratio Prot	c0.12	0.13	c0.16		c0.23	
v/s Ratio Perm				0.06		0.06
v/c Ratio	0.65	0.25	0.53	0.21	0.63	0.17
Uniform Delay, d1	23.7	7.9	18.3	16.4	16.3	13.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.2	0.0	0.5	0.2	1.0	0.1
Delay (s)	27.9	7.9	18.8	16.6	17.4	13.5
Level of Service	C	A	B	B	B	B
Approach Delay (s)		12.7	18.0		16.4	
Approach LOS		B	B		B	

Intersection Summary			
HCM Average Control Delay	15.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	63.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	63.1%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1591	3547	3487		3547	5255	1593	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1591	3547	3487		3547	5255	1593	3547	5255	1636
Volume (vph)	539	444	541	145	164	65	238	1417	134	123	948	199
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)	556	458	558	149	169	67	245	1461	138	127	977	205
RTOR Reduction (vph)	0	0	252	0	37	0	0	0	45	0	0	0
Lane Group Flow (vph)	556	458	306	149	199	0	245	1461	93	127	977	205
Confl. Peds. (#/hr)			13			1			10			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			Free
Actuated Green, G (s)	24.5	24.7	24.7	10.0	10.8		17.9	57.8	57.8	7.9	47.8	120.0
Effective Green, g (s)	25.6	27.7	27.7	11.1	13.2		19.0	60.2	60.2	9.0	50.2	120.0
Actuated g/C Ratio	0.21	0.23	0.23	0.09	0.11		0.16	0.50	0.50	0.08	0.42	1.00
Clearance Time (s)	4.1	6.0	6.0	4.1	5.4		4.1	5.4	5.4	4.1	5.4	
Vehicle Extension (s)	1.8	1.8	1.8	1.8	1.8		1.8	5.0	5.0	1.8	5.0	
Lane Grp Cap (vph)	757	844	367	328	384		562	2636	799	266	2198	1636
v/s Ratio Prot	c0.16	0.13		0.04	0.06		0.07	c0.28		c0.04	0.19	
v/s Ratio Perm			c0.19						0.06			0.13
v/c Ratio	0.73	0.54	0.83	0.45	0.52		0.44	0.55	0.12	0.48	0.44	0.13
Uniform Delay, d1	44.0	40.6	43.9	51.6	50.4		45.7	20.6	15.8	53.2	24.9	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.51	0.21	0.02	1.01	0.30	1.00
Incremental Delay, d2	3.2	0.4	14.3	0.4	0.5		0.1	0.4	0.2	0.5	0.6	0.2
Delay (s)	47.2	41.0	58.2	51.9	50.9		23.2	4.8	0.5	54.5	8.2	0.2
Level of Service	D	D	E	D	D		C	A	A	D	A	A
Approach Delay (s)		49.3			51.3			6.9			11.4	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM Average Control Delay	24.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	67.3%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1829	5247		1829	3657	1636		1887	1607	1737	1767	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1829	5247		1829	3657	1636		1887	1607	1737	1767	1615
Volume (vph)	83	681	6	23	530	40	39	58	7	193	35	151
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)	90	740	7	25	576	43	42	63	8	210	38	164
RTOR Reduction (vph)	0	1	0	0	0	27	0	0	6	0	0	131
Lane Group Flow (vph)	90	746	0	25	576	16	0	105	2	121	127	33
Confl. Peds. (#/hr)									3			1
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	6.9	26.7		2.2	22.0	22.0		7.2	7.2	10.8	10.8	10.8
Effective Green, g (s)	7.9	29.7		3.2	25.0	25.0		10.2	10.2	13.8	13.8	13.8
Actuated g/C Ratio	0.11	0.43		0.05	0.36	0.36		0.15	0.15	0.20	0.20	0.20
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	210	2262		85	1327	594		279	238	348	354	323
v/s Ratio Prot	c0.05	0.14		0.01	c0.16			c0.06		0.07	c0.07	
v/s Ratio Perm						0.01			0.00			0.02
v/c Ratio	0.43	0.33		0.29	0.43	0.03		0.38	0.01	0.35	0.36	0.10
Uniform Delay, d1	28.4	13.0		31.8	16.6	14.1		26.5	25.0	23.7	23.7	22.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.1		1.9	0.2	0.0		0.9	0.0	0.6	0.6	0.1
Delay (s)	29.8	13.1		33.7	16.8	14.1		27.3	25.1	24.3	24.4	22.6
Level of Service	C	B		C	B	B		C	C	C	C	C
Approach Delay (s)		14.9			17.3			27.2			23.6	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	18.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	68.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.5%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1598	3547	3657	1577	1829	5255	1636	1829	5255	1621
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1598	3547	3657	1577	1829	5255	1636	1829	5255	1621
Volume (vph)	245	597	293	228	418	140	125	431	43	481	946	58
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)	261	635	312	243	445	149	133	459	46	512	1006	62
RTOR Reduction (vph)	0	0	190	0	0	107	0	0	37	0	0	22
Lane Group Flow (vph)	261	635	122	243	445	42	133	459	9	512	1006	40
Confl. Peds. (#/hr)			12			24			36			12
Turn Type	Prot		Perm	Prot		Perm	Prot		custom	Prot		custom
Protected Phases	7	4		3	8		5	2	2	1	6	6
Permitted Phases			4			8			2			4
Actuated Green, G (s)	7.2	22.5	22.5	9.7	25.0	25.0	10.9	17.3	17.3	29.7	35.1	57.6
Effective Green, g (s)	8.2	25.5	25.5	10.7	28.0	28.0	11.9	19.3	19.3	30.7	38.1	63.6
Actuated g/C Ratio	0.08	0.26	0.26	0.11	0.29	0.29	0.12	0.20	0.20	0.31	0.39	0.65
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	5.0	5.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	296	950	415	386	1043	450	222	1033	322	572	2039	1050
v/s Ratio Prot	c0.07	c0.17		0.07	0.12		0.07	0.09	0.01	c0.28	c0.19	0.01
v/s Ratio Perm			0.08			0.03						0.01
v/c Ratio	0.88	0.67	0.29	0.63	0.43	0.09	0.60	0.44	0.03	0.90	0.49	0.04
Uniform Delay, d1	44.5	32.6	29.1	41.9	28.6	25.8	40.9	34.7	31.9	32.2	22.7	6.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	24.9	1.8	0.4	3.2	0.3	0.1	4.3	0.3	0.0	16.4	0.2	0.0
Delay (s)	69.5	34.4	29.5	45.1	28.8	25.9	45.2	35.0	31.9	48.6	22.9	6.3
Level of Service	E	C	C	D	C	C	D	D	C	D	C	A
Approach Delay (s)		40.7			33.0			36.9			30.6	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM Average Control Delay	34.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	98.2	Sum of lost time (s)	9.0
Intersection Capacity Utilization	84.6%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95	0.88	0.97	0.95	1.00	0.97	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1829	3657	2880	3547	3657	1547	3547	5106		3547	5237	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1829	3657	2880	3547	3657	1547	3547	5106		3547	5237	
Volume (vph)	73	649	953	131	131	271	324	1507	351	487	1152	23
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)	77	683	1003	138	138	285	341	1586	369	513	1213	24
RTOR Reduction (vph)	0	0	0	0	0	206	0	30	0	0	2	0
Lane Group Flow (vph)	77	683	1003	138	138	79	341	1925	0	513	1235	0
Confl. Peds. (#/hr)						36						12
Turn Type	Prot		pm+ov	Prot		Perm	Prot			Prot		
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	6.9	27.9	43.7	9.4	30.4	30.4	15.8	44.7		18.0	46.9	
Effective Green, g (s)	7.9	30.9	47.7	10.4	33.4	33.4	16.8	47.7		19.0	49.9	
Actuated g/C Ratio	0.07	0.26	0.40	0.09	0.28	0.28	0.14	0.40		0.16	0.42	
Clearance Time (s)	4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	1.8	5.0	1.8	1.8	5.0	5.0	1.8	5.0		1.8	5.0	
Lane Grp Cap (vph)	120	942	1145	307	1018	431	497	2030		562	2178	
v/s Ratio Prot	0.04	0.19	c0.12	c0.04	0.04		0.10	c0.38		c0.14	0.24	
v/s Ratio Perm			0.23			0.05						
v/c Ratio	0.64	0.73	0.88	0.45	0.14	0.18	0.69	0.95		0.91	0.57	
Uniform Delay, d1	54.7	40.7	33.4	52.1	32.5	32.9	49.1	35.0		49.7	26.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.69	0.44	
Incremental Delay, d2	8.5	3.4	7.5	0.4	0.1	0.4	3.1	11.0		16.8	0.9	
Delay (s)	63.1	44.1	40.9	52.5	32.6	33.4	52.2	46.0		51.2	12.7	
Level of Service	E	D	D	D	C	C	D	D		D	B	
Approach Delay (s)		43.1			37.9			46.9			24.0	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM Average Control Delay	38.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.1%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95			0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.92			0.95		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3287			3347		1829	5187		1829	5196	
Flt Permitted		0.87			0.80		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2897			2761		1829	5187		1829	5196	
Volume (vph)	26	20	48	35	11	23	8	176	14	11	194	13
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)	27	21	50	36	11	24	8	183	15	11	202	14
RTOR Reduction (vph)	0	37	0	0	18	0	0	10	0	0	10	0
Lane Group Flow (vph)	0	61	0	0	53	0	8	188	0	11	206	0
Confl. Peds. (#/hr)	20		20	20		20			20			20
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		4.9			4.9		0.7	5.1		0.8	5.2	
Effective Green, g (s)		6.9			6.9		1.7	8.1		1.8	8.2	
Actuated g/C Ratio		0.27			0.27		0.07	0.31		0.07	0.32	
Clearance Time (s)		5.0			5.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		775			738		121	1628		128	1651	
v/s Ratio Prot							0.00	0.04		c0.01	c0.04	
v/s Ratio Perm		c0.02			0.02							
v/c Ratio		0.08			0.07		0.07	0.12		0.09	0.13	
Uniform Delay, d1		7.1			7.1		11.3	6.3		11.2	6.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.0		0.2	0.0		0.3	0.0	
Delay (s)		7.1			7.1		11.5	6.3		11.5	6.3	
Level of Service		A			A		B	A		B	A	
Approach Delay (s)		7.1			7.1			6.5			6.5	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	6.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.09		
Actuated Cycle Length (s)	25.8	Sum of lost time (s)	6.0
Intersection Capacity Utilization	28.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.97	1.00		0.92	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	0.98		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)	1829	3651		1829	5049		1775	3544		1673	3351	
Flt Permitted	0.95	1.00		0.95	1.00		0.73	1.00		0.64	1.00	
Satd. Flow (perm)	1829	3651		1829	5049		1371	3544		1122	3351	
Volume (vph)	33	1253	9	9	474	123	45	137	18	252	16	13
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	39	1474	11	11	558	145	53	161	21	296	19	15
RTOR Reduction (vph)	0	0	0	0	37	0	0	12	0	0	10	0
Lane Group Flow (vph)	39	1485	0	11	666	0	53	170	0	296	24	0
Confl. Peds. (#/hr)			72			24	36		132	132		36
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	4.5	36.1		1.0	32.6		24.2	24.2		24.2	24.2	
Effective Green, g (s)	5.5	39.1		2.0	35.6		27.2	27.2		27.2	27.2	
Actuated g/C Ratio	0.07	0.51		0.03	0.46		0.35	0.35		0.35	0.35	
Clearance Time (s)	4.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	130	1847		47	2325		482	1247		395	1179	
v/s Ratio Prot	c0.02	c0.41		0.01	0.13			0.05			0.01	
v/s Ratio Perm							0.04			c0.26		
v/c Ratio	0.30	0.80		0.23	0.29		0.11	0.14		0.75	0.02	
Uniform Delay, d1	34.1	15.9		36.9	13.0		16.9	17.1		22.0	16.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	2.6		2.6	0.1		0.1	0.1		7.6	0.0	
Delay (s)	35.4	18.5		39.5	13.0		17.0	17.1		29.7	16.4	
Level of Service	D	B		D	B		B	B		C	B	
Approach Delay (s)		19.0			13.4			17.1			28.3	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM Average Control Delay	18.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	77.3	Sum of lost time (s)	6.0
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
12: Stoneridge & Hacienda

11/27/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.95		1.00	0.91		0.97	0.95		1.00	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.95	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		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)	3547	3621		1829	5206		3547	3579		1829	4765	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3547	3621		1829	5206		3547	3579		1829	4765	
Volume (vph)	237	536	31	40	1407	67	51	149	19	59	251	107
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)	252	570	33	43	1497	71	54	159	20	63	267	114
RTOR Reduction (vph)	0	2	0	0	3	0	0	10	0	0	76	0
Lane Group Flow (vph)	252	601	0	43	1565	0	54	169	0	63	305	0
Confl. Peds. (#/hr)			12			24			24			120
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.6	67.7		7.1	61.2		6.1	16.9		8.3	19.1	
Effective Green, g (s)	14.6	70.7		8.1	64.2		7.1	19.9		9.3	22.1	
Actuated g/C Ratio	0.12	0.59		0.07	0.54		0.06	0.17		0.08	0.18	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	432	2133		123	2785		210	594		142	878	
v/s Ratio Prot	c0.07	0.17		0.02	c0.30		0.02	0.05		c0.03	c0.06	
v/s Ratio Perm												
v/c Ratio	0.58	0.28		0.35	0.56		0.26	0.28		0.44	0.35	
Uniform Delay, d1	49.8	12.1		53.4	18.6		53.9	43.8		52.9	42.7	
Progression Factor	0.76	1.24		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.3		1.7	0.8		0.7	0.3		2.2	0.2	
Delay (s)	39.6	15.3		55.2	19.4		54.6	44.1		55.1	42.9	
Level of Service	D	B		E	B		D	D		E	D	
Approach Delay (s)		22.5			20.3			46.5			44.6	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	26.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91	0.91	0.91	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1829	5255	3503	1470	3547	1610
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1829	5255	3503	1470	3547	1610
Volume (vph)	136	266	1003	488	109	170
Peak-hour factor, PHF	0.86	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	158	313	1180	574	128	200
RTOR Reduction (vph)	0	0	0	216	0	170
Lane Group Flow (vph)	158	313	1180	358	128	30
Confl. Peds. (#/hr)				1		2
Turn Type	Prot			Perm		Perm
Protected Phases	1	6	2		3	
Permitted Phases		6		2		3
Actuated Green, G (s)	8.3	40.9	28.6	28.6	5.9	5.9
Effective Green, g (s)	9.3	43.9	31.6	31.6	8.9	8.9
Actuated g/C Ratio	0.16	0.75	0.54	0.54	0.15	0.15
Clearance Time (s)	4.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	289	3923	1883	790	537	244
v/s Ratio Prot	c0.09	0.06	c0.34		c0.04	
v/s Ratio Perm				0.24		0.02
v/c Ratio	0.55	0.08	0.63	0.45	0.24	0.12
Uniform Delay, d1	22.8	2.0	9.5	8.3	22.0	21.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.0	0.7	0.4	0.2	0.2
Delay (s)	24.9	2.0	10.1	8.7	22.2	21.8
Level of Service	C	A	B	A	C	C
Approach Delay (s)		9.7	9.7		22.0	
Approach LOS		A	A		C	

Intersection Summary			
HCM Average Control Delay	11.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	58.8	Sum of lost time (s)	9.0
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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95		0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1591	3547	3567		3547	5255	1593	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1591	3547	3567		3547	5255	1593	3547	5255	1636
Volume (vph)	153	287	133	172	437	78	618	951	100	121	1027	533
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)	172	322	149	193	491	88	694	1069	112	136	1154	599
RTOR Reduction (vph)	0	0	122	0	13	0	0	0	51	0	0	0
Lane Group Flow (vph)	172	322	27	193	566	0	694	1069	61	136	1154	599
Confl. Peds. (#/hr)			13			1			10			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			Free
Actuated Green, G (s)	12.1	18.9	18.9	14.5	21.9		20.9	58.7	58.7	8.3	46.1	120.0
Effective Green, g (s)	13.2	21.9	21.9	15.6	24.3		22.0	61.1	61.1	9.4	48.5	120.0
Actuated g/C Ratio	0.11	0.18	0.18	0.13	0.20		0.18	0.51	0.51	0.08	0.40	1.00
Clearance Time (s)	4.1	6.0	6.0	4.1	5.4		4.1	5.4	5.4	4.1	5.4	
Vehicle Extension (s)	1.8	1.8	1.8	1.8	1.8		1.8	5.0	5.0	1.8	5.0	
Lane Grp Cap (vph)	390	667	290	461	722		650	2676	811	278	2124	1636
v/s Ratio Prot	0.05	0.09		c0.05	c0.16		c0.20	0.20		0.04	c0.22	
v/s Ratio Perm			0.02						0.04			c0.37
v/c Ratio	0.44	0.48	0.09	0.42	0.78		1.07	0.40	0.08	0.49	0.54	0.37
Uniform Delay, d1	49.9	44.0	40.8	48.0	45.4		49.0	18.1	15.0	53.0	27.3	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.77	0.47	0.21	1.42	1.00	1.00
Incremental Delay, d2	0.3	0.2	0.1	0.2	5.2		49.1	0.3	0.1	0.4	0.8	0.5
Delay (s)	50.2	44.2	40.8	48.3	50.5		87.0	8.9	3.2	75.8	28.1	0.5
Level of Service	D	D	D	D	D		F	A	A	E	C	A
Approach Delay (s)		45.0			50.0			37.5			22.8	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM Average Control Delay	34.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	69.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00		1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1829	5188		1829	3657	1636		1910	1600	1737	1750	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1829	5188		1829	3657	1636		1910	1600	1737	1750	1615
Volume (vph)	132	433	40	8	1000	76	6	32	14	88	5	110
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	155	509	47	9	1176	89	7	38	16	104	6	129
RTOR Reduction (vph)	0	6	0	0	0	40	0	0	15	0	0	106
Lane Group Flow (vph)	155	550	0	9	1176	49	0	45	1	54	56	23
Confl. Peds. (#/hr)									3			1
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	9.2	45.8		1.2	37.8	37.8		4.7	4.7	12.2	12.2	12.2
Effective Green, g (s)	10.2	48.8		2.2	40.8	40.8		7.7	7.7	15.2	15.2	15.2
Actuated g/C Ratio	0.12	0.57		0.03	0.47	0.47		0.09	0.09	0.18	0.18	0.18
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	217	2947		47	1737	777		171	143	307	310	286
v/s Ratio Prot	c0.08	0.11		0.00	c0.32			c0.02		0.03	c0.03	
v/s Ratio Perm						0.03			0.00			0.01
v/c Ratio	0.71	0.19		0.19	0.68	0.06		0.26	0.01	0.18	0.18	0.08
Uniform Delay, d1	36.4	9.0		41.0	17.5	12.2		36.5	35.6	30.0	30.1	29.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.6	0.1		2.0	1.1	0.0		0.8	0.0	0.3	0.3	0.1
Delay (s)	47.1	9.1		43.0	18.5	12.2		37.3	35.7	30.3	30.3	29.6
Level of Service	D	A		D	B	B		D	D	C	C	C
Approach Delay (s)		17.4			18.2			36.9			29.9	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM Average Control Delay	19.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	85.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.6%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	1597	3547	3657	1577	1829	5255	1636	1829	5255	1614
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	1597	3547	3657	1577	1829	5255	1636	1829	5255	1614
Volume (vph)	35	500	227	183	1189	345	319	708	57	207	472	49
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	39	556	252	203	1321	383	354	787	63	230	524	54
RTOR Reduction (vph)	0	0	171	0	0	162	0	0	42	0	0	25
Lane Group Flow (vph)	39	556	81	203	1321	221	354	787	21	230	524	29
Confl. Peds. (#/hr)			12			24			36			12
Turn Type	Prot		Perm	Prot		Perm	Prot		custom	Prot		custom
Protected Phases	7	4		3	8		5	2	2	1	6	6
Permitted Phases			4			8			2			4
Actuated Green, G (s)	3.8	28.7	28.7	9.3	34.2	34.2	22.1	31.6	31.6	10.4	18.9	47.6
Effective Green, g (s)	4.8	31.7	31.7	10.3	37.2	37.2	23.1	33.6	33.6	11.4	21.9	53.6
Actuated g/C Ratio	0.05	0.32	0.32	0.10	0.38	0.38	0.23	0.34	0.34	0.12	0.22	0.54
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	5.0	5.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	172	1171	511	369	1374	593	427	1784	555	211	1162	874
v/s Ratio Prot	0.01	0.15		c0.06	c0.36		c0.19	c0.15	0.01	c0.13	0.10	0.01
v/s Ratio Perm			0.05			0.14						0.01
v/c Ratio	0.23	0.47	0.16	0.55	0.96	0.37	0.83	0.44	0.04	1.09	0.45	0.03
Uniform Delay, d1	45.3	27.0	24.1	42.1	30.2	22.4	36.1	25.4	21.9	43.8	33.3	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	1.00
Incremental Delay, d2	0.7	0.3	0.1	1.8	15.9	0.4	12.5	0.2	0.0	88.0	0.3	0.0
Delay (s)	46.0	27.3	24.2	43.9	46.1	22.8	48.6	25.6	21.9	131.8	33.6	10.6
Level of Service	D	C	C	D	D	C	D	C	C	F	C	B
Approach Delay (s)		27.2			41.2			32.2			60.0	
Approach LOS		C			D			C			E	

Intersection Summary			
HCM Average Control Delay	39.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	99.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	82.7%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95	0.88	0.97	0.95	1.00	0.97	0.91		0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1829	3657	2880	3547	3657	1547	3547	5177		3547	5200	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1829	3657	2880	3547	3657	1547	3547	5177		3547	5200	
Volume (vph)	56	241	432	500	911	607	1042	1020	111	218	1087	68
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	62	265	475	549	1001	667	1145	1121	122	240	1195	75
RTOR Reduction (vph)	0	0	0	0	0	176	0	11	0	0	6	0
Lane Group Flow (vph)	62	265	475	549	1001	491	1145	1232	0	240	1264	0
Confl. Peds. (#/hr)						36						12
Turn Type	Prot		pm+ov	Prot		Perm	Prot			Prot		
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	6.6	20.2	50.2	19.6	33.2	33.2	30.0	48.2		12.0	30.2	
Effective Green, g (s)	7.6	23.2	54.2	20.6	36.2	36.2	31.0	51.2		13.0	33.2	
Actuated g/C Ratio	0.06	0.19	0.45	0.17	0.30	0.30	0.26	0.43		0.11	0.28	
Clearance Time (s)	4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	1.8	5.0	1.8	1.8	5.0	5.0	1.8	5.0		1.8	5.0	
Lane Grp Cap (vph)	116	707	1301	609	1103	467	916	2209		384	1439	
v/s Ratio Prot	c0.03	0.07	0.09	0.15	0.27		c0.32	0.24		0.07	c0.24	
v/s Ratio Perm			0.07			c0.32						
v/c Ratio	0.53	0.37	0.37	0.90	0.91	1.05	1.25	0.56		0.62	0.88	
Uniform Delay, d1	54.5	42.1	21.6	48.7	40.3	41.9	44.5	25.9		51.2	41.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.56	0.46	
Incremental Delay, d2	2.4	0.7	0.1	16.2	11.3	55.8	121.6	1.0		2.0	7.1	
Delay (s)	56.8	42.8	21.7	64.9	51.6	97.7	166.1	26.9		30.7	26.2	
Level of Service	E	D	C	E	D	F	F	C		C	C	
Approach Delay (s)		31.4			68.8			93.6			26.9	
Approach LOS		C			E			F			C	

Intersection Summary			
HCM Average Control Delay	63.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	98.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95			0.95		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.92			0.97		1.00	0.97		1.00	0.96	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3294			3470		1829	5098		1829	5009	
Flt Permitted		0.89			0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2961			3075		1829	5098		1829	5009	
Volume (vph)	19	23	43	8	17	7	26	122	25	80	155	58
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.85	0.85	0.85	0.85
Adj. Flow (vph)	22	27	51	9	20	8	31	139	29	94	182	68
RTOR Reduction (vph)	0	40	0	0	6	0	0	20	0	0	40	0
Lane Group Flow (vph)	0	60	0	0	31	0	31	148	0	94	210	0
Confl. Peds. (#/hr)	20		20	20		20			20			20
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		4.5			4.5		1.0	6.2		4.1	9.3	
Effective Green, g (s)		6.5			6.5		2.0	9.2		5.1	12.3	
Actuated g/C Ratio		0.22			0.22		0.07	0.31		0.17	0.41	
Clearance Time (s)		5.0			5.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		646			671		123	1574		313	2067	
v/s Ratio Prot							0.02	0.03		c0.05	c0.04	
v/s Ratio Perm		c0.02			0.01							
v/c Ratio		0.09			0.05		0.25	0.09		0.30	0.10	
Uniform Delay, d1		9.3			9.2		13.2	7.3		10.8	5.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.0		1.1	0.0		0.5	0.0	
Delay (s)		9.4			9.2		14.3	7.4		11.3	5.4	
Level of Service		A			A		B	A		B	A	
Approach Delay (s)		9.4			9.2			8.4			7.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	7.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.14		
Actuated Cycle Length (s)	29.8	Sum of lost time (s)	6.0
Intersection Capacity Utilization	33.6%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.97		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.98	1.00		0.92	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.95		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1829	3601		1829	5147		1796	3366		1686	3403	
Flt Permitted	0.95	1.00		0.95	1.00		0.63	1.00		0.72	1.00	
Satd. Flow (perm)	1829	3601		1829	5147		1193	3366		1282	3403	
Volume (vph)	10	516	38	27	1496	189	15	32	16	133	111	68
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)	11	555	41	29	1609	203	16	34	17	143	119	73
RTOR Reduction (vph)	0	4	0	0	10	0	0	13	0	0	56	0
Lane Group Flow (vph)	11	592	0	29	1802	0	16	38	0	143	136	0
Confl. Peds. (#/hr)			72			24	36		132	132		36
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.0	29.7		2.5	31.2		10.8	10.8		10.8	10.8	
Effective Green, g (s)	2.0	32.7		3.5	34.2		13.8	13.8		13.8	13.8	
Actuated g/C Ratio	0.03	0.55		0.06	0.58		0.23	0.23		0.23	0.23	
Clearance Time (s)	4.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	62	1996		109	2984		279	787		300	796	
v/s Ratio Prot	0.01	0.16		c0.02	c0.35			0.01			0.04	
v/s Ratio Perm							0.01			c0.11		
v/c Ratio	0.18	0.30		0.27	0.60		0.06	0.05		0.48	0.17	
Uniform Delay, d1	27.7	7.0		26.5	8.0		17.5	17.5		19.5	18.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.1		1.3	0.3		0.1	0.0		1.2	0.1	
Delay (s)	29.1	7.1		27.8	8.4		17.6	17.5		20.7	18.1	
Level of Service	C	A		C	A		B	B		C	B	
Approach Delay (s)		7.5			8.7			17.6			19.2	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

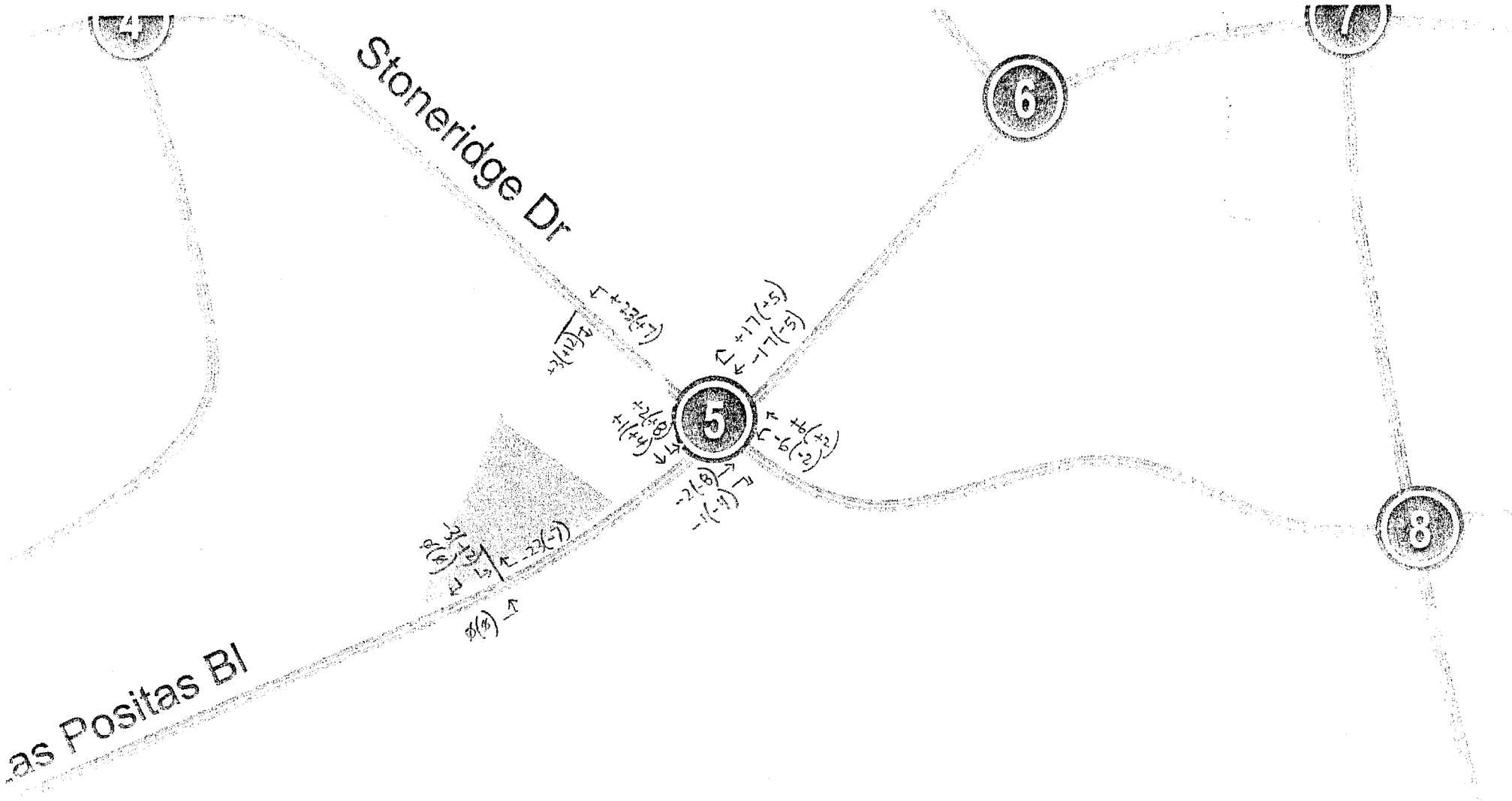
HCM Signalized Intersection Capacity Analysis
19: Stoneridge & Santa Rita

11/28/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	0.94	0.95	1.00	0.97	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	5255	1636	3547	3657	1547	5157	3657	1636	3547	5200	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	5255	1636	3547	3657	1547	5157	3657	1636	3547	5200	
Volume (vph)	56	247	437	500	912	607	1043	1020	111	218	1087	68
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	62	271	480	549	1002	667	1146	1121	122	240	1195	75
RTOR Reduction (vph)	0	0	0	0	0	176	0	0	69	0	6	0
Lane Group Flow (vph)	62	271	480	549	1002	491	1146	1121	53	240	1264	0
Confl. Peds. (#/hr)						36						12
Turn Type	Prot		Free	Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			8			2			
Actuated Green, G (s)	6.6	19.1	120.0	20.7	33.2	33.2	28.7	48.2	48.2	12.0	31.5	
Effective Green, g (s)	7.6	22.1	120.0	21.7	36.2	36.2	29.7	51.2	51.2	13.0	34.5	
Actuated g/C Ratio	0.06	0.18	1.00	0.18	0.30	0.30	0.25	0.43	0.43	0.11	0.29	
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	1.8	5.0		1.8	5.0	5.0	1.8	5.0	5.0	1.8	5.0	
Lane Grp Cap (vph)	116	968	1636	641	1103	467	1276	1560	698	384	1495	
v/s Ratio Prot	c0.03	0.05		0.15	0.27		c0.22	0.31		0.07	c0.24	
v/s Ratio Perm			0.29			c0.32			0.03			
v/c Ratio	0.53	0.28	0.29	0.86	0.91	1.05	0.90	0.72	0.08	0.62	0.85	
Uniform Delay, d1	54.5	42.1	0.0	47.6	40.3	41.9	43.7	28.4	20.4	51.2	40.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.56	0.45	
Incremental Delay, d2	2.4	0.3	0.5	10.5	11.4	55.8	8.4	2.9	0.2	2.0	5.4	
Delay (s)	56.8	42.4	0.5	58.2	51.7	97.7	52.1	31.3	20.6	30.7	23.4	
Level of Service	E	D	A	E	D	F	D	C	C	C	C	
Approach Delay (s)		18.8			67.1			40.7			24.5	
Approach LOS		B			E			D			C	

Intersection Summary			
HCM Average Control Delay	43.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



XX(XX) = AM(PM)

ANTON HACIENDA