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TECHNICAL MEMORANDUM

TO: Ben Austin, P.E., Harper Houf Peterson Righellis

FROM: Chris Maciejewski, P.E.
France Campbell, E.I.T.

DATE: May 8, 2009

SUBJECT: **Sherwood Adams Avenue North Improvements**
Transportation Tech Memo #1: Existing and Future Conditions

P08232-000

The memorandum presents the results of an updated existing and future conditions analysis for the Sherwood Adams Avenue North Improvements Project. It includes documentation of existing facilities, documentation of applicable agency transportation standards, existing operations analysis, future no-build operations analysis, and future operations analysis with the Adams Avenue North extension.

This project consists of the extension of Adams Avenue from Tualatin-Sherwood Boulevard to the Home Depot access along Highway 99W. The initial project study area is shown in Figure 1.

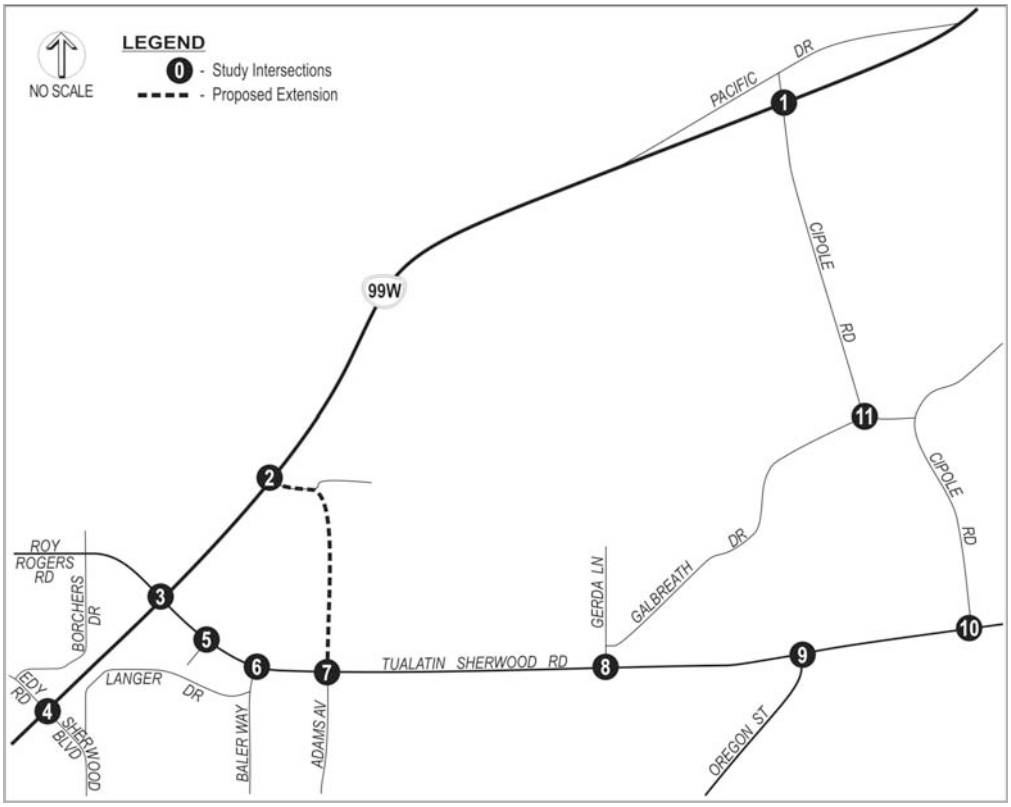

Figure 1: Study Area

Existing Facilities

The following sections discuss the existing transportation facilities in the project area, including a review of existing pedestrian, bicycle, and motor vehicle facilities.

Pedestrian Facilities

An inventory of sidewalks along key roadways within the study area was conducted. Currently, Tualatin-Sherwood Road has sidewalks on both sides through the study area. Highway 99W has sidewalks on both sides until just north of the Home Depot store, where the sidewalks terminate with the beginning of the rural highway section. Edy Road and Sherwood Boulevard also have sidewalks near the intersection with Highway 99W in the study area.

Bicycle Facilities

To assess the adequacy of bicycle facilities within the study area, a brief field inventory of designated bike lanes and shoulder bikeways along key roadways was conducted. There are bike lanes in both directions along Highway 99W, Tualatin-Sherwood Road, Edy Road, and Sherwood Boulevard through the study area. No other key study area roads have bike lanes.

Motor Vehicle Facilities

Field inventories were conducted to determine characteristics of roadways within the study area. Data collected included posted speed limits, roadway lanes, lane configurations, and intersection controls. These characteristics define corridor capacity and operating speeds through the street system, which affect travel path choices for drivers in the study area. The results are listed in Table 1.

Table 1: Existing Key Study Area Roadway Characteristics

Roadway	Agency	Functional Classification	Posted Speed Limit (mph)	Number of Lanes	Lane Width (ft)	Shoulder Width (ft)
Highway 99W	ODOT	Principal Arterial	45/55[a]	4	12	6.0
Tualatin-Sherwood Road	County	Arterial	35/45 [a]	3/4	12	6.0
Edy Rd	ODOT/City	Collector	40	2/3	12	6.0
Sherwood Blvd	City	Arterial	25	3	12	6.0
Oregon Street	City	Arterial	35	3	12	1.5
Cipole Road	County	Collector	45	2	11	1.5
Adams Road	City	Collector	35	2/3	11	2.0

[a] Highway 99W is posted as 45 south of Home Depot and 55 mph to the north. Tualatin-Sherwood Road is posted at 35 mph west of Adams Avenue and 45 mph to the east.

Agency Transportation Standards

Two key agency transportation standards that are required to be addressed for this project include intersection operations/mobility standards and access management standards. An explanation of each is given in the following sections, along with the applicable standards.

Intersection Operations and Mobility Standards

Level of service (LOS) and volume to capacity (v/c) ratios as defined in the *2000 Highway Capacity Manual*[1] (HCM) are two measures of effectiveness (MOEs) that are used as the basis for intersection operations and mobility standards. Explanations of each are given below.

LOS is similar to a "report card" rating based upon average vehicle delay. Level of Service A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. Level of Service D and E are progressively worse peak hour operating conditions. Level of Service F represents conditions where average vehicle delay exceeds 80 seconds per vehicle entering a signalized intersection and demand has exceeded capacity. This condition is typically evident in long queues and delays. Unsignalized intersections provide levels of service for major and minor street turning movements. For this reason, LOS E and even LOS F can occur for a specific turning movement; however, the majority of traffic may not be delayed (in cases where major street traffic is not required to stop). LOS E or F conditions at unsignalized intersections generally provide a basis to study intersections further to determine availability of acceptable gaps, safety and traffic signal warrants.

Volume to capacity (v/c) ratio is the peak hour traffic volume at an intersection divided by the maximum volume that intersection can handle. For example, when a v/c is 0.80, peak hour traffic is using 80 percent of the intersection capacity. If traffic volumes exceed capacity, excessive queues will form and will lengthen until demand subsides below the available capacity (e.g. vehicles waiting to travel through a signalized intersection may have to wait for multiple signal cycles). When the v/c approaches 1.0, intersection operation becomes unstable and small disruptions can cause traffic flow to break down.

The minimum operational standard specified in the City of Sherwood Transportation System Plan is LOS D[2]. The maximum v/c ratio specified by Washington County is 0.99 for signalized intersections.[3] The minimum operational standard for unsignalized intersections specified by Washington County is LOS E. In the case of Highway 99W, ODOT operating performance standards for the study area utilize a v/c ratio of 0.99 for intersections not in a town center and 1.1 for those that are.[4] The intersections of Highway 99W/Tualatin-Sherwood Road and Highway 99W/Edy Road-Sherwood Boulevard are within the Town Center limits.[5] Based on recent conversations and meetings, ODOT has decided to not acknowledge the Town Center limits without the City completing a Town Center Plan. Therefore, ODOT intends to use a maximum v/c ratio of 0.99 for all of Highway 99W through Sherwood.

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[1] *Highway Capacity Manual*, Transportation Research Board, 2000.
[2] Page 8-25, City of Sherwood Transportation System Plan, March 15, 2005.
[3] Washington County 2020 Transportation Plan, Adopted October 29, 2002, Table 5.
[4] 1999 Oregon Highway Plan, Amendment to Table 7, December 13, 2000.
[5] This is according to the Metro Regional and Town Center Map.
(http://www.oregonmetro.gov/index.cfm/go/by.web/id=15467&x=7599901&y=629257&locID=27)

Access Management Standards

Proper roadway access spacing is important to maintain operating characteristics and safety. While all parcels are allowed access, it is desired that access to parcels along major roadways be limited to side streets or consolidated. When roadway access points are located too frequently along a roadway, safety and roadway capacity are diminished. Access management practices can help roadways operate more efficiently and include closure, consolidation, or relocation of accesses. It is best to incorporate appropriate access spacing practices upon initial development or redevelopment to limit the amount of management required in the future.

The ODOT access management standards, as defined in OAR 734-051, call for minimum distances between access points on the same side of statewide highways. The standards vary depending on posted speed on the roadway. Highway 99W is a 45 mph statewide highway that meets ODOT access spacing standards for all roadway intersections and driveways located along the highway within the study area. Additional access spacing standards for study area roadways are identified in the Sherwood TSP and are included in Table 2.

Table 2: Access Management Standards

Facility (by Agency)	Minimum Access Spacing (ft)	Maximum Access Spacing (ft)
ODOT [a]		
- Statewide Highway (45 mph)	990	-
Washington County [b]		
- Arterial	600	-
- Collector	100	-
City of Sherwood [c]		
- Arterial	600	1,000
- Collector	100	400

[a]Source: Oregon Highway Plan, Table 13, ODOT (1999)
[b]Source: Washington County Community Development Code, Article V. Section 01-8.5.B
[c]Source: Sherwood TSP, Table 8-12

HCM Delay vs. Micro-Simulation Delay

Agency delay standards are based on the results of a HCM analysis. However, the HCM methodology treats intersections as isolated nodes that are not impacted by operations at other nearby intersections. The project study area includes seven intersections along Tualatin-Sherwood Road that, under peak hour traffic conditions, experience excessive vehicle queuing impacts that significantly increase driver delay. Therefore, the HCM delay is not an accurate measure of the true intersection delay. While agencies do not have adopted standards for micro-simulation delay, the micro-simulation delay can give a more accurate picture of congestion. Therefore, the intersection operations analysis for this study reports both HCM and micro-simulation delay.

Existing Intersection Operations

The existing intersection operations analysis includes a summary of the existing study intersection volumes and an analysis of the existing intersection operations.

Existing Volumes

An inventory of peak hour traffic conditions was performed in the fall of 2008. Eleven study intersections within the study area were selected for focused analysis in order to address areas of concern along major roadways and to monitor impacts of potential built-out within the Concept Plan area. During the AM peak hour (7:00 to 9:00 a.m.) and the PM peak hour (4:00 to 6:00 p.m.), turn movement counts were conducted at the study intersections. The count data was then used as a basis for evaluating traffic performance at the study intersections for existing PM peak hour conditions. The existing AM and PM peak hour traffic volumes at study intersections are shown in Figure 2.

The traffic volumes were compared to year 2006 historic data in the study area documented in the I-5 to 99W Connector Project[6]. Current traffic volumes were found to have decreased significantly during the PM peak hour on Tualatin-Sherwood Road in the westbound direction, with reductions up to 300 vehicles per hour. While these reductions in traffic volume could be a result of day-to-day or seasonal fluctuation, they could also be the result of decreased traffic volumes in the area due to current economic conditions or they could reflect driver route changes to other less congested corridors.

Existing Operations

The 30th highest hour intersection volumes[7] were used to determine the existing study intersection operating conditions based on the HCM methodology for signalized and unsignalized intersections. The results of this analysis are listed in Table 3 for the AM peak hour and Table 4 for the PM peak hour. As listed, each of the signalized study intersections meets mobility standards during both the AM and PM peak hour, with the exception of Highway 99W/Tualatin Sherwood Road. If ODOT applies a standard v/c ratio of 0.99, the intersection of Highway 99W/Tualatin Sherwood Road fails under existing conditions. The unsignalized intersections of Tualatin-Sherwood Road/Gerda Lane and Tualatin-Sherwood Road/Adams Avenue fail to meet LOS standards due to the side-street movements.

The micro-simulation results for the study intersections indicate a few locations where particular traffic movements are over capacity, which cause significant increased to driver delay. During the AM peak hour, the eastbound approach of Tualatin-Sherwood Road (Roy Rogers Road) at Highway 99W experiences traffic signal cycles that fail to clear all of the queued vehicles. During the PM peak hour, westbound traffic volumes on Tualatin-Sherwood Road approaching Highway 99W queue back through the Shopping Center signal and significantly increases driver delay.

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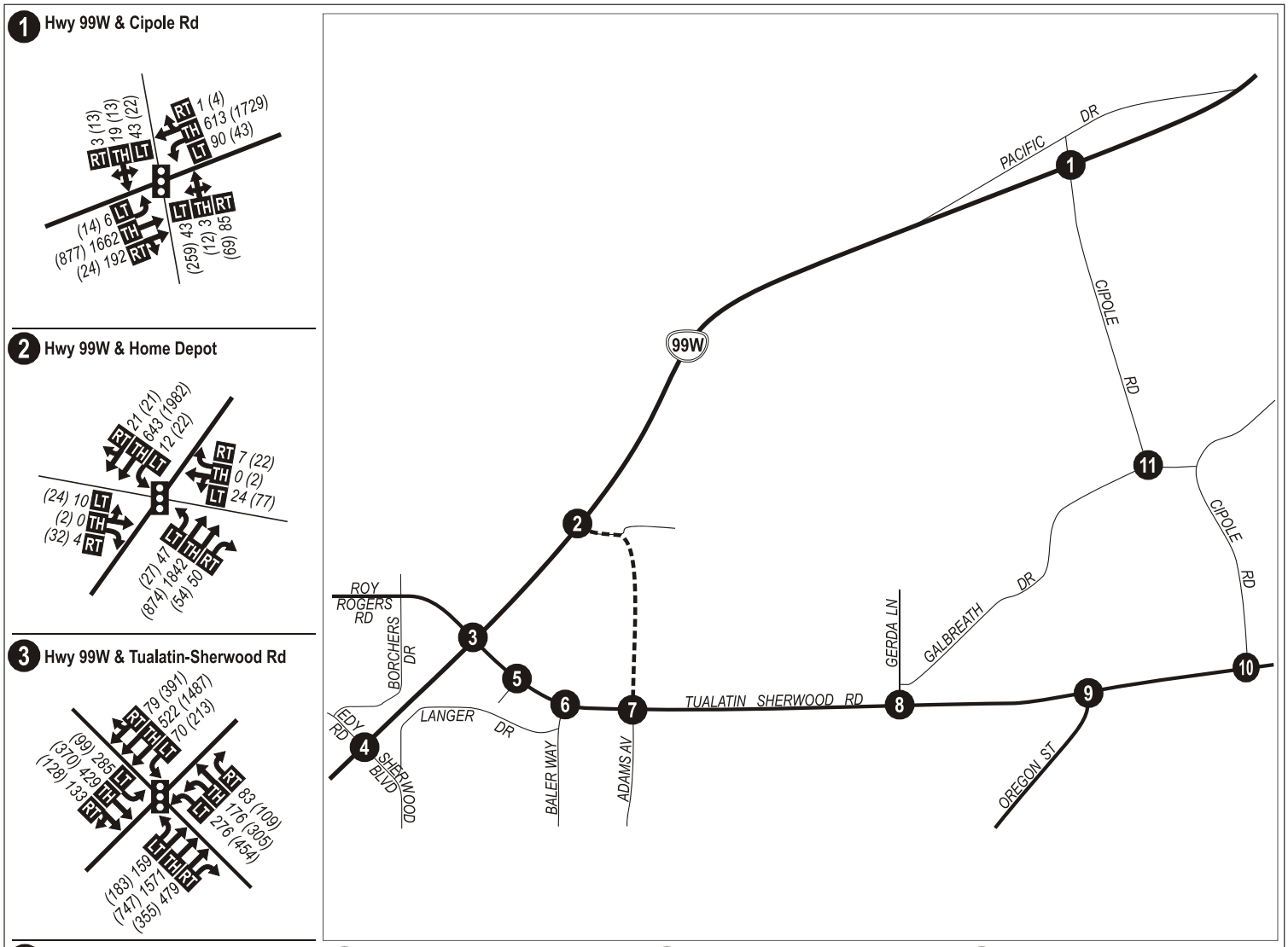
[6] I-5 to 99W Connector Project: Baseline Transportation Conditions Report, David Evans and Associates and DKS Associates, April 2007.

[7] 30th Highest Hour Volumes (30th HHVs) are used to account for seasonal trends in traffic patterns. . A seasonal adjustment factor of 1.09 was applied to Highway 99W through volumes based on local traffic trends and ODOT procedures for calculating a seasonal adjustment factor.



LEGEND

- 0 - Study Intersection
- ← - Lane Configuration
- (PM) AM - Existing Volumes
- LT TH RT - Volume Turn Movement (Left•Thru•Right)
- STOP - Stop Sign
- Traffic Signal
- Proposed Extension

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Figure 2

EXISTING CONDITIONS

Table 3: 2008 Existing Intersection Performance (AM Peak Hour)

Intersection	HCM Delay (sec)	Simulation Delay (sec)	LOS	v/c Ratio	MOEs	
					Agency	Standard
-Signalized intersections						
Highway 99W/Cipole Rd	31.3	25.7	C	0.90	ODOT	v/c ≤ 0.99
Highway 99W/Home Depot	7.8	6.3	A	0.72	ODOT	v/c ≤ 0.99
Highway 99W/Tualatin-Sherwood Rd	59.0	55.6	E	0.81	ODOT	v/c ≤ 0.99*
Highway 99W/Edy Road/ Sherwood Blvd	52.2	>100	D	0.94	ODOT	v/c ≤ 0.99*
Tualatin-Sherwood Rd/Shopping Center	11.3	10.9	B	0.47	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Baler Wy	9.8	12.4	A	0.43	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Oregon St	31.5	44.3	C	0.79	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Cipole Rd	9.3	12.5	A	0.71	County	v/c ≤ 0.99
- Unsignalized Intersections						
Tualatin-Sherwood Rd/Adams Ave	>100	57.2	D/**F**	1.00	County	LOS E
Tualatin-Sherwood Rd/Gerda Ln	76.3	18.5	B/**F**	0.66	County	LOS E
Cipole Rd/Galbreath Rd	11.6	4.3	A/B	0.18	County	LOS E

Signalized intersection:

HCM Delay = Average Intersection Delay (sec.)

Simulation Delay = Simulation Average Intersection Delay (sec.)

LOS = Level of Service

V/C = Volume-to-Capacity Ratio

Bold values do not meet standards.

Unsignalized intersection:

HCM Delay = Critical Movement Approach Delay (sec.)

Simulation Delay = Simulation Critical Movement Approach Delay (sec.)

LOS = Major Street LOS/Minor Street LOS

V/C = Critical Movement Volume-to-Capacity Ratio

* The v/c ratio standard for Highway 99W in the Sherwood Town Center is being discussed by ODOT, Metro, and the City to determine if a standard of 1.1 should apply.

Table 4: 2008 Existing Intersection Performance with 30th HV (PM Peak Hour)

Intersection	HCM Delay (sec)	Simulation Delay (sec)	LOS	v/c Ratio	MOEs	
					Agency	Standard
-Signalized intersections						
Highway 99W/Cipole Rd	28.7	30.1	C	0.89	ODOT	v/c ≤ 0.99
Highway 99W/Home Depot	14.1	19.2	B	0.81	ODOT	v/c ≤ 0.99
Highway 99W/Tualatin-Sherwood Rd	70.1	61.6	E	1.00	ODOT	v/c ≤ 0.99
Highway 99W/Edy Road/ Sherwood Blvd	41.0	60.5	D	0.85	ODOT	v/c ≤ 0.99
Tualatin-Sherwood Rd/Shopping Center	16.6	35.9	B	0.45	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Baler Wy	12.9	19.5	B	0.57	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Oregon St	22.2	39.7	C	0.76	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Cipole Rd	14.8	21.8	B	0.69	County	v/c ≤ 0.99
- Unsignalized Intersections						
Tualatin-Sherwood Rd/Adams Ave	>100	20.0	B/**F**	0.50	County	LOS E
Tualatin-Sherwood Rd/Gerda Ln	32.5	18.2	B/D	0.53	County	LOS E
Cipole Rd/Galbreath Rd	10.1	4.0	A/B	0.09	County	LOS E

Signalized intersection:

HCM Delay = Average Intersection Delay (sec.)

Simulation Delay = Simulation Average Intersection Delay (sec.)

LOS = Level of Service

V/C = Volume-to-Capacity Ratio

Bold values do not meet standards.

Unsignalized intersection:

HCM Delay = Critical Movement Approach Delay (sec.)

Simulation Delay = Simulation Critical Movement Approach Delay (sec.)

LOS = Major Street LOS/Minor Street LOS

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* The v/c ratio standard for Highway 99W in the Sherwood Town Center is being discussed by ODOT, Metro, and the City to determine if a standard of 1.1 should apply.

Future No-Build Operations

Future operations analysis was performed for the study intersections under the no-build scenario, which assumes the completion of financially constrained roadway improvements but does not include the extension of Adams Avenue to the north. In addition, the lands with the Concept Plan area for the project were assumed to develop under existing zoning. The planned roadway improvements include:

- Signalization of Tualatin-Sherwood Road/Adams Avenue
- Conversion of Tualatin-Sherwood Road/Baler Way to right-in/right-out and signal removal
- Widening of Tualatin-Sherwood Road and Roy Rogers Road to 5-lanes from Teton Avenue to west of Highway 99W (tapers to three lanes east of Borchers Drive)
- Completion of the Adams Avenue South Extension from Oregon Street to Century Drive
- Intersection geometric, turn lane, and signal phasing improvements at Highway 99W/Tualatin-Sherwood Road
- Completion of the 124th Avenue extension from Tualatin-Sherwood Road to Tonquin Road
- Widening of Tonquin Road to 3-lanes
- Signalization of Tualatin-Sherwood Road/Gerda Lane

The existing zoning of the lands within the City of Sherwood in the Concept Plan area is light industrial. The Concept Plan area outside of the City limit is zoned for rural density (e.g., one home per 20 acres). The Metro 2030 travel demand model includes approximately 150 non-retail employees in the Concept Plan area, which is equivalent to a floor-area-ratio (FAR) of 0.30 for the lands not restricted by the BPA easements. Therefore, the base Metro forecast for the area represents a reasonable build-out of existing zoning.

The following sections include a summary of the future intersection volume forecasting and the resulting intersection operations.

Future Volumes

Future year 2030 turning movement volumes were estimated for the study intersections using the travel demand model developed by Metro, Washington County, and the I-5 to 99W Connector Project team. To further refine the forecasts, a sub-area model was developed for the study area that includes all public streets and utilizes HCM node delays for trip assignment in order to evaluate changes in circulation and traffic control. The boundaries for the sub-area model include Highway 99W to the northeast, Roy Rogers Road to the northwest, Oregon Street to the southeast, Sherwood Boulevard/Edy Road to the southwest, and Cipole Road to the east.

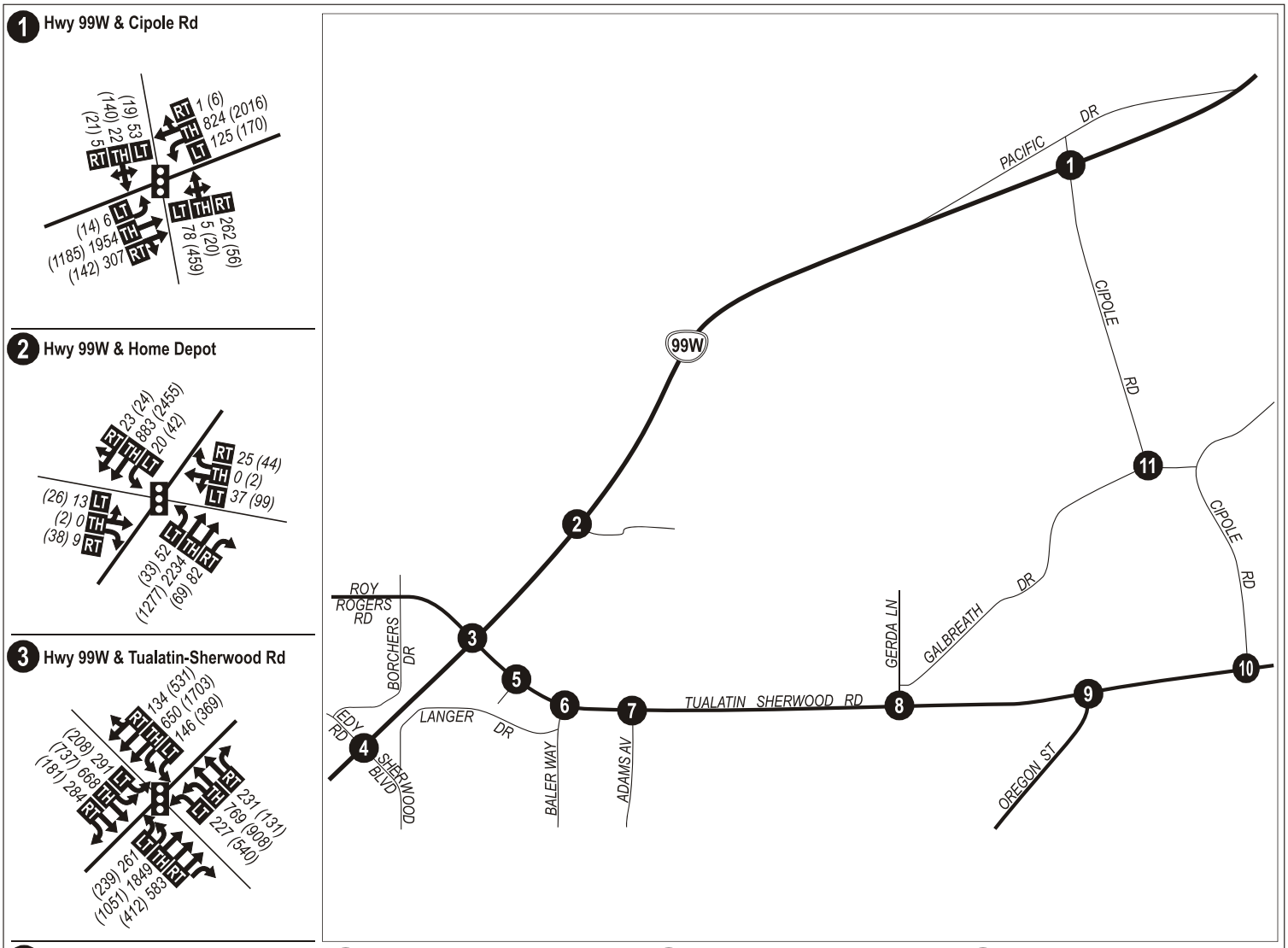
Calibration was performed on the enhanced 2005 base year model using the existing 30th highest hourly volumes (30th HV) at the study intersections. A future year 2030 sub-area model was then developed by coding the planned improvements into the model network re-assigning the 2030 Metro model trip tables. The 2030 future year volumes were then estimated by a post-processing methodology that includes adding the growth increment between the 2005 base year and 2030 future year models for each turn movement to the 2008 existing year 30th HV. The future volumes under the future no-build scenario are shown in Figure 3.

Future Operations

The traffic volumes forecasted for the 2030 No-Build Scenario were used to analyze operating conditions at the study intersections. The results of this analysis are listed in Table 5 for the AM peak hour and Table 6 for the PM peak hour. As shown in the tables, operating standards are exceeded at Highway 99W/Cipole Road and Highway 99W/Edy Road/ Sherwood Blvd during the AM and PM peak hours.

There are three main differences between the future and existing operations. First, the Highway 99W/Cipole Road and Highway 99W/Edy Road/ Sherwood Blvd intersections were not failing under existing operations but are expected to fail in the future. Second, the intersections of Tualatin-Sherwood Road/Adams Avenue and Tualatin-Sherwood Road/Gerda Lane were failing under the existing conditions, and no longer fail in the 2030 No-Build scenario; this is because the intersections will be signalized and also because of the Tualatin-Sherwood Road widening. Third, the intersection of Highway 99W/Tualatin-Sherwood Road was failing under existing PM peak conditions but would no longer fail in the future due to roadway widening, additional turn lanes, and in improved signal phasing. Significant increases in vehicle delay and v/c ratios were found at the majority of study intersections due to future growth.

The simulation delay attained from micro-simulation runs holds distinctly different results due to corridor congestion. Both Highway 99W through the study area and Tualatin-Sherwood Road from Highway 99W through Adams Avenue would experience substantial congestion with average vehicle delays well above acceptable levels.



LEGEND

- 0 - Study Intersection
- ← - Lane Configuration
- (PM) AM - Future Volumes
- LT TH RT - Volume Turn Movement (Left•Thru•Right)
- STOP - Stop Sign
- Traffic Signal

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Figure 3

2030 FUTURE CONDITIONS WITHOUT ADAMS AVENUE NORTH EXTENSION

Table 5: 2030 Intersection Performance without Adams Ave Extension (AM Peak Hour)

Intersection	HCM Delay (sec)	Simulation Delay (sec)	LOS	v/c Ratio	MOEs	
					Agency	Standard
-Signalized intersections						
Highway 99W/Cipole Rd	>100	54.6	F	**1.15**	ODOT	v/c ≤ 0.99
Highway 99W/Home Depot	18.0	7.9	B	0.80	ODOT	v/c ≤ 0.99
Highway 99W/Tualatin-Sherwood Rd	52.4	>100	D	0.98	ODOT	v/c ≤ 0.99
Highway 99W/Edy Road/ Sherwood Blvd	74.4	>100	E	**1.03**	ODOT	v/c ≤ 0.99
Tualatin-Sherwood Rd/Shopping Center	23.0	25.6	C	0.66	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Adams Ave	30.4	>100	C	0.89	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Gerda Ln	4.3	11.5	A	0.54	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Oregon St	18.9	22.8	B	0.78	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Cipole Rd	4.4	6.7	A	0.54	County	v/c ≤ 0.99
- Unsignalized Intersections						
Tualatin-Sherwood Rd/Baler Wy	13.3	10.3	A/B	0.55	County	LOS E
Cipole Rd/Galbreath Rd	16.1	9.9	A/C	0.27	County	LOS E

Signalized intersection:

HCM Delay = Average Intersection Delay (sec.)

Simulation Delay = Simulation Average Intersection Delay (sec.)

LOS = Level of Service

V/C = Volume-to-Capacity Ratio

Bold values do not meet standards.

Unsignalized intersection:

HCM Delay = Critical Movement Approach Delay (sec.)

Simulation Delay = Simulation Critical Movement Approach Delay (sec.)

LOS = Major Street LOS/Minor Street LOS

V/C = Critical Movement Volume-to-Capacity Ratio

Table 6: 2030 Intersection Performance without Adams Ave Extension (PM Peak Hour)

Intersection	HCM Delay (sec)	Simulation Delay (sec)	LOS	v/c Ratio	MOEs	
					Agency	Standard
-Signalized intersections						
Highway 99W/Cipole Rd	92.5	>100	F	**1.29**	ODOT	v/c ≤ 0.99
Highway 99W/Home Depot	25.7	19.7	C	0.88	ODOT	v/c ≤ 0.99
Highway 99W/Tualatin-Sherwood Rd	61.2	>100	E	0.93	ODOT	v/c ≤ 0.99
Highway 99W/Edy Road/ Sherwood Blvd	84.0	>100	F	**1.08**	ODOT	v/c ≤ 0.99
Tualatin-Sherwood Rd/Shopping Center	23.0	>100	C	0.74	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Adams Ave	17.5	40.2	B	0.71	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Gerda Ln	13.7	27.3	B	0.64	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Oregon St	18.0	34.5	B	0.85	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Cipole Rd	9.1	12.0	A	0.67	County	v/c ≤ 0.99
- Unsignalized Intersections						
Tualatin-Sherwood Rd/Baler Wy	13.2	19.2	A/B	0.57	County	LOS E
Cipole Rd/Galbreath Rd	20.7	>100	A/C	0.32	County	LOS E

Signalized intersection:

HCM Delay = Average Intersection Delay (sec.)

Simulation Delay = Simulation Average Intersection Delay (sec.)

LOS = Level of Service

V/C = Volume-to-Capacity Ratio

Bold values do not meet standards.

Unsignalized intersection:

HCM Delay = Critical Movement Approach Delay (sec.)

Simulation Delay = Simulation Critical Movement Approach Delay (sec.)

LOS = Major Street LOS/Minor Street LOS

V/C = Critical Movement Volume-to-Capacity Ratio

Future Operations with Adams Avenue North Extension

Future 2030 forecasting and operations analysis was performed for a scenario that includes the Adams Avenue North extension between the Tualatin-Sherwood Road/Adams Avenue intersection and the Home Depot access to Highway 99W. The financially constrained roadway improvements that were included in the future no-build scenario and the base land use for the Concept Plan area were maintained for this scenario.

Future Volumes with Adams Avenue North Extension

The forecasted traffic volumes that were estimated are shown in Figure 4. With the addition of the Adams Avenue North Extension, a portion of traffic moves between Tualatin-Sherwood Road and Highway 99W to utilize Adams Avenue and avoid the congested intersection of Highway 99W/Tualatin-Sherwood Road. During the AM Peak hour, approximately 500 vehicles would use Adams Avenue North. During the PM peak hour, approximately 700 vehicles use Adams Avenue North.

Future Operations with Adams Avenue North Extension

In addition to the volume analysis, study intersection operations were analyzed and are summarized in Table 7 for the AM peak hour and Table 8 for the PM peak hour. As shown in the tables, operating standards are exceeded at Highway 99W/Cipole Road in AM and PM peak hours.

The future operations are consistent with the no-build scenario, with Highway 99W/Cipole Road and Highway 99W/Edy Road/ Sherwood Blvd failing to meet operating standards with and without the Adams Avenue north extension. Traffic operations at Highway 99W/Cipole Road did slightly improve with the Adams Avenue North Extension.

The micro-simulation delay is fairly consistent with the no-build scenario, as study intersections do not show major differences in average vehicle delay. As with the no-build scenario, the Highway 99W and Tualatin-Sherwood Road corridors continue to be over-capacity with excessive queues creating additional vehicle delays at upstream intersections.

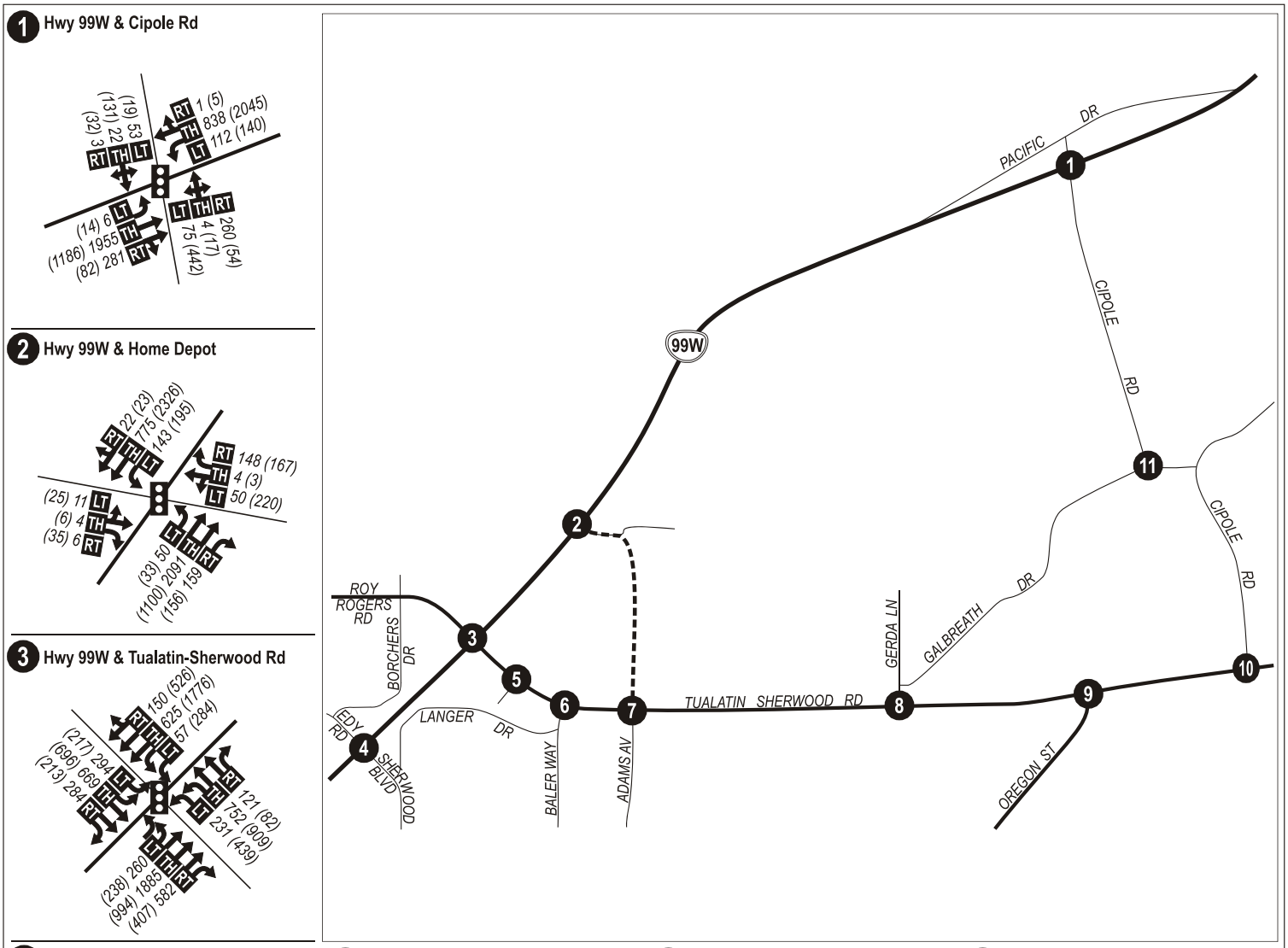

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Figure 4

2030 FUTURE CONDITIONS WITH ADAMS AVENUE NORTH EXTENSION

Table 7: 2030 Intersection Performance with Adams Ave Extension (AM Peak Hour)

Intersection	HCM Delay (sec)	Simulation Delay (sec)	LOS	v/c Ratio	MOEs	
					Agency	Standard
-Signalized intersections						
Highway 99W/Cipole Rd	>100	49.8	F	**1.12**	ODOT	v/c ≤ 0.99
Highway 99W/Adams Ave	33.8	12.0	C	0.85	ODOT	v/c ≤ 0.99
Highway 99W/Tualatin-Sherwood Rd	52.1	>100	D	0.96	ODOT	v/c ≤ 0.99
Highway 99W/Edy Road/ Sherwood Blvd	71.3	>100	E	**1.03**	ODOT	v/c ≤ 0.99
Tualatin-Sherwood Rd/Shopping Center	17.6	21.2	B	0.62	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Adams Ave	28.1	51.8	C	0.83	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Gerda Ln	3.7	9.6	A	0.53	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Oregon St	19.3	22.2	B	0.79	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Cipole Rd	3.1	5.8	A	0.52	County	v/c ≤ 0.99
- Unsignalized Intersections						
Tualatin-Sherwood Rd/Baler Wy	13.7	12.9	A/B	0.52	County	LOS E
Cipole Rd/Galbreath Rd	15.3	6.9	A/C	0.26	County	LOS E

Signalized intersection:

HCM Delay = Average Intersection Delay (sec.)

Simulation Delay = Simulation Average Intersection Delay (sec.)

LOS = Level of Service

V/C = Volume-to-Capacity Ratio

Bold values do not meet standards.

Unsignalized intersection:

HCM Delay = Critical Movement Approach Delay (sec.)

Simulation Delay = Simulation Critical Movement Approach Delay (sec.)

LOS = Major Street LOS/Minor Street LOS

V/C = Critical Movement Volume-to-Capacity Ratio

Table 8: 2030 Intersection Performance with Adams Ave Extension (PM Peak Hour)

Intersection	HCM Delay (sec)	Simulation Delay (sec)	LOS	v/c Ratio	MOEs	
					Agency	Standard
-Signalized intersections						
Highway 99W/Cipole Rd	87.4	>100	F	**1.27**	ODOT	v/c ≤ 0.99
Highway 99W/Adams Ave	40.5	37.1	D	0.98	ODOT	v/c ≤ 0.99
Highway 99W/Tualatin-Sherwood Rd	55.4	98.3	E	0.97	ODOT	v/c ≤ 0.99
Highway 99W/Edy Road/ Sherwood Blvd	81.0	>100	F	**1.07**	ODOT	v/c ≤ 0.99
Tualatin-Sherwood Rd/Shopping Center	19.4	56.7	B	0.64	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Adams Ave	29.1	69.2	C	0.74	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Gerda Ln	11.3	21.9	B	0.63	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Oregon St	19.9	34.1	B	0.86	County	v/c ≤ 0.99
Tualatin-Sherwood Rd/Cipole Rd	7.4	10.2	A	0.64	County	v/c ≤ 0.99
- Unsignalized Intersections	92.0					
Tualatin-Sherwood Rd/Baler Wy	12.8	9.8	A/B	0.52	County	LOS E
Cipole Rd/Galbreath Rd	16.6	>100	A/C	0.25	County	LOS E

Signalized intersection:

HCM Delay = Average Intersection Delay (sec.)

Simulation Delay = Simulation Average Intersection Delay (sec.)

LOS = Level of Service

V/C = Volume-to-Capacity Ratio

Bold values do not meet standards.

Unsignalized intersection:

HCM Delay = Critical Movement Approach Delay (sec.)

Simulation Delay = Simulation Critical Movement Approach Delay (sec.)

LOS = Major Street LOS/Minor Street LOS

V/C = Critical Movement Volume-to-Capacity Ratio

Progression Analysis

In addition to the intersection operations analysis presented in the previous sections, ODOT also requires a corridor progression analysis to assure travel times and corridor through capacity will be maintained. To establish a baseline for the alternatives analysis, a traffic signal progression analysis was conducted for the Highway 99W corridor section that includes the following signalized and coordinated intersections:

- Highway 99W/Home Depot
- Highway 99W/Tualatin-Sherwood Road
- Highway 99W/Sherwood Boulevard-Edy Road

The signal analysis progression analysis is based on the 2008 existing and 2030 future no-build traffic signal system operations during both the AM peak hour and the PM peak hour. The through traffic bandwidths (i.e., the window of time where a platoon of vehicles can travel through all three signals without stopping) along Highway 99W in the study corridor for the 2008 Existing and 2030 future no-build conditions are shown in Table 9.

The through traffic bandwidths shown in Table 9 were used to determine the study area corridor progression volume to capacity (V/C) ratios[8]. These maximum bandwidths assume that each signal reaches its maximum initial phase time, which is the worst case scenario.

Table 9: Signal Progression Bandwidths on Highway 99W

	AM Peak				PM Peak			
	Northbound		Southbound		Northbound		Southbound	
Scenario	BW	V/C	BW	V/C	BW	V/C	BW	V/C
2008 Existing	30	2.11	30	0.74	18	1.67	20	3.41
2030 without Adams Ave Ext.	29	2.43	30	0.93	18	2.24	21	3.69
2030 with Adams Ave Ext.	22	3.00	30	0.82	18	1.93	21	3.50

BW = Traffic bandwidth
V/C = Corridor progression volume to capacity ratio

As shown in Table 9, the corridor progression volume to capacity ratio is above 1.00 for many of the existing and future time periods, indicating that there is not enough bandwidth to efficiently serve existing and projected traffic volumes in the coordinated system.

The critical intersection in the study corridor (the intersection carrying the highest through volume per lane) is the Highway 99W/Home Depot intersection. The intersections in the study corridor had a common cycle length of 120 seconds. Adequate pedestrian timing was provided at the intersections where appropriate.

[8] ((Volume/Saturation Flow Rate)*(Cycle Length/Arterial Bandwidth))

Appendix

Intersection Traffic Counts
Intersection Operational Analysis Worksheets
Progression Time-Space Diagrams

Intersection Traffic Counts

Type of peak hour being reported: System Peak

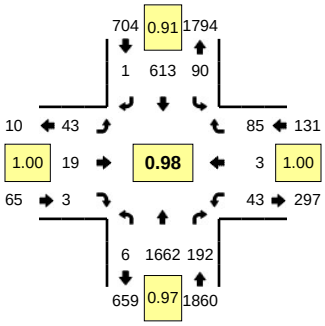
Method for determining peak hour: Total Entering Volume

LOCATION: Hwy 99W -- Cipole Rd

QC JOB #: 10393701

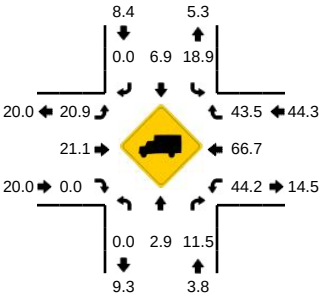
CITY/STATE: Sherwood, OR

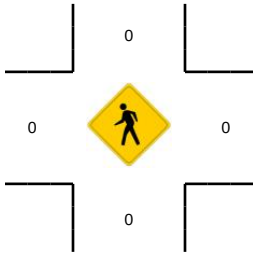
DATE: 11/5/2008

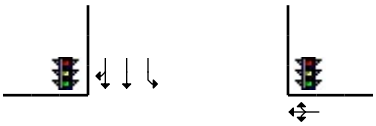


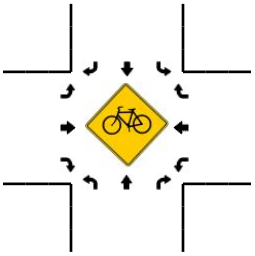
Peak-Hour: 7:10 AM -- 8:10 AM

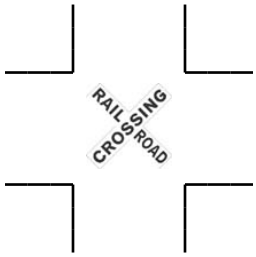
Peak 15-Min: 7:35 AM -- 7:50 AM

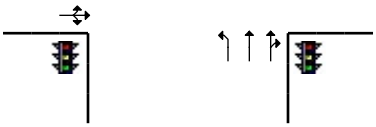


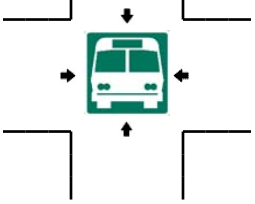












5-Min Count Period Beginning At	Hwy 99W (Northbound)				Hwy 99W (Southbound)				Cipole Rd (Eastbound)				Cipole Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	123	26	0	9	36	0	2	2	1	0	0	3	0	5	0	208	
7:05 AM	0	132	12	0	6	38	0	0	6	2	0	0	2	0	2	0	200	
7:10 AM	0	130	14	0	8	42	0	1	1	3	0	0	5	0	4	0	208	
7:15 AM	2	151	13	0	7	52	0	0	7	1	1	0	2	0	11	0	247	
7:20 AM	0	185	7	0	3	52	0	0	3	2	1	0	5	0	9	0	267	
7:25 AM	1	153	19	0	10	57	0	0	7	1	0	0	2	1	7	0	258	
7:30 AM	0	124	18	0	5	47	0	0	6	4	0	0	3	1	9	0	217	
7:35 AM	1	135	14	0	8	57	0	0	5	0	0	0	2	0	4	0	226	
7:40 AM	0	147	19	0	5	45	0	1	1	1	0	0	4	1	8	0	232	
7:45 AM	0	143	18	0	10	67	0	0	0	0	0	0	4	0	5	0	247	
7:50 AM	0	130	17	0	10	48	0	0	4	1	0	0	5	0	4	0	219	
7:55 AM	2	120	27	0	7	56	0	1	4	1	0	0	1	0	10	0	229	2758
8:00 AM	0	134	16	0	7	46	1	0	3	3	0	0	4	0	6	0	220	2770
8:05 AM	0	110	10	0	6	44	0	1	2	2	1	0	6	0	8	0	190	2760
8:10 AM	0	101	13	0	6	36	0	0	2	0	0	0	5	1	11	0	175	2727
8:15 AM	0	122	10	0	3	59	0	1	1	0	0	0	1	0	10	0	207	2687
8:20 AM	0	87	9	0	8	50	0	2	5	0	0	0	3	2	6	0	172	2592
8:25 AM	3	96	9	0	9	67	0	0	2	0	0	0	3	0	12	0	201	2535
8:30 AM	0	103	3	0	5	58	0	0	4	0	0	0	3	0	5	0	181	2499
8:35 AM	0	89	3	0	2	60	0	0	1	1	0	0	5	0	6	0	167	2440
8:40 AM	0	78	5	0	5	53	0	0	2	1	1	0	1	1	14	0	161	2369
8:45 AM	0	87	10	0	6	74	0	0	1	0	0	0	4	0	7	0	189	2311
8:50 AM	0	87	6	0	5	48	0	2	0	2	0	0	1	0	3	0	154	2246
8:55 AM	1	69	2	0	8	40	0	1	3	0	0	0	2	1	5	0	132	2149

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	1700	204	0	92	676	0	4	24	4	0	0	40	4	68	0	2820
Heavy Trucks	0	56	16		16	52	0		4	0	0		20	0	20		184
Pedestrians		0				0				0				0			0
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/11/2008 10:18 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

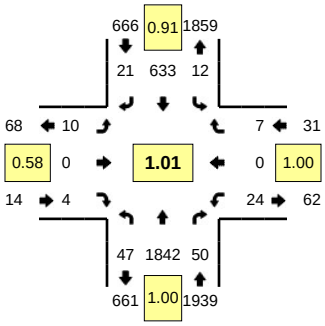
Method for determining peak hour: Total Entering Volume

LOCATION: Hwy 99W -- Home Depot Dwy

QC JOB #: 10393703

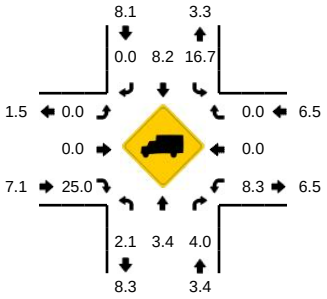
CITY/STATE: Sherwood, OR

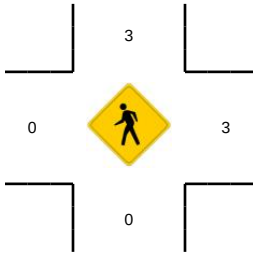
DATE: 11/5/2008

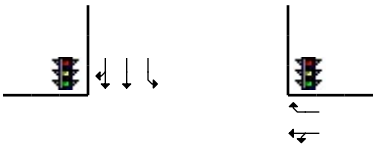


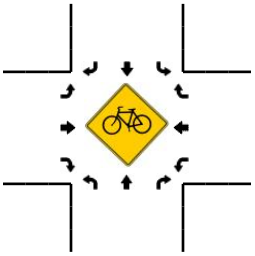
Peak-Hour: 7:10 AM -- 8:10 AM

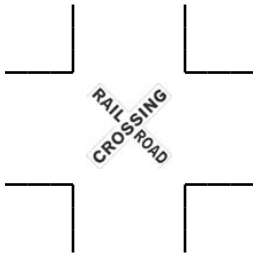
Peak 15-Min: 7:35 AM -- 7:50 AM

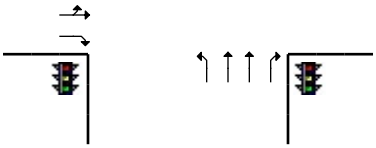


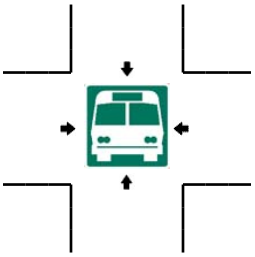












5-Min Count Period Beginning At	Hwy 99W (Northbound)				Hwy 99W (Southbound)				Home Depot Dwy (Eastbound)				Home Depot Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	5	159	4	0	1	49	1	0	0	0	3	0	2	0	0	0	224	
7:05 AM	2	134	0	0	2	32	1	0	0	0	1	0	1	0	1	0	174	
7:10 AM	3	174	4	0	1	58	2	0	1	0	0	0	0	0	0	0	243	
7:15 AM	0	161	2	0	2	44	1	0	2	0	0	0	1	0	1	0	214	
7:20 AM	1	174	4	0	2	48	1	0	0	0	0	0	3	0	1	0	234	
7:25 AM	3	153	1	0	0	66	3	0	0	0	0	0	3	0	0	0	229	
7:30 AM	5	166	2	0	0	38	0	0	1	0	1	0	2	0	4	0	219	
7:35 AM	1	132	4	0	1	67	2	0	3	0	0	0	1	0	0	0	211	
7:40 AM	4	177	2	0	1	50	2	0	0	0	2	0	0	0	0	0	238	
7:45 AM	4	140	4	0	0	59	0	0	1	0	0	0	2	0	0	0	210	
7:50 AM	8	173	10	0	2	71	0	0	0	0	0	0	0	0	0	0	264	
7:55 AM	7	143	7	0	0	53	4	0	0	0	1	0	7	0	0	0	222	2682
8:00 AM	8	147	7	0	1	45	6	0	0	0	0	0	2	0	0	0	216	2674
8:05 AM	3	102	3	0	2	34	0	0	2	0	0	0	3	0	1	0	150	2650
8:10 AM	2	119	9	0	2	64	1	1	0	0	0	0	7	0	1	0	206	2613
8:15 AM	0	105	4	0	1	40	1	0	0	0	0	0	2	0	2	0	155	2554
8:20 AM	2	111	5	1	2	54	1	0	0	0	0	0	5	0	1	0	182	2502
8:25 AM	5	103	11	1	3	69	3	0	1	0	1	0	1	0	4	0	202	2475
8:30 AM	2	96	3	0	1	53	6	0	1	0	1	0	3	0	2	0	168	2424
8:35 AM	4	89	4	0	0	50	0	0	0	0	2	0	5	0	3	0	157	2370
8:40 AM	5	81	6	0	2	70	2	0	1	0	1	0	9	0	4	0	181	2313
8:45 AM	3	95	7	0	2	50	1	0	2	0	1	0	4	0	2	0	167	2270
8:50 AM	3	85	13	0	1	59	1	0	0	0	1	0	3	0	2	0	168	2174
8:55 AM	1	80	7	0	1	40	0	0	0	0	0	0	1	0	1	0	131	2083

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	36	1796	40	0	8	704	16	0	16	0	8	0	12	0	0	0	2636
Heavy Trucks	0	64	4		0	60	0		0	0	0		0	0	0		128
Pedestrians		0				8				0				8			16
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/11/2008 10:18 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

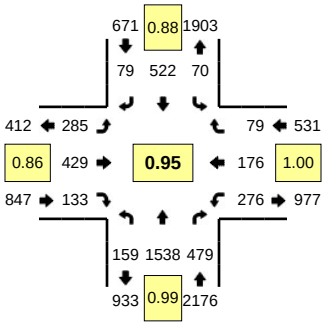
Method for determining peak hour: Total Entering Volume

LOCATION: Hwy 99W -- Tualatin Sherwood Rd

QC JOB #: 10393705

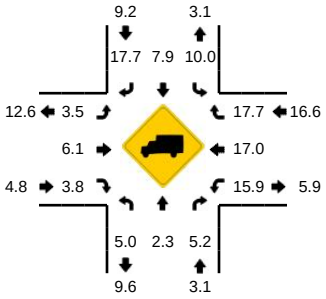
CITY/STATE: Sherwood, OR

DATE: 11/5/2008

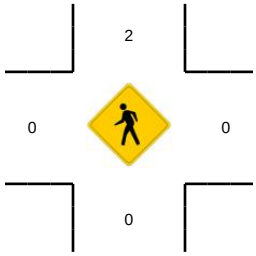


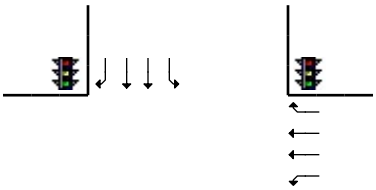
Peak-Hour: 7:10 AM -- 8:10 AM

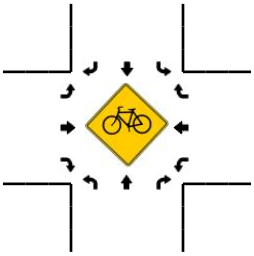
Peak 15-Min: 7:35 AM -- 7:50 AM

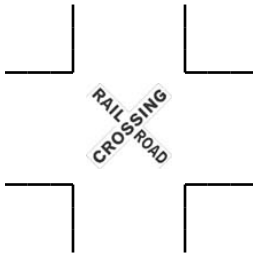


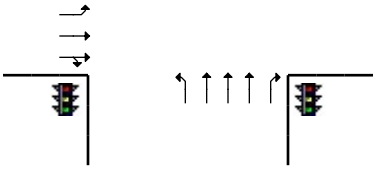
Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

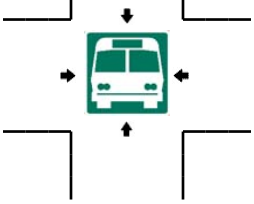












5-Min Count Period Beginning At	Hwy 99W (Northbound)				Hwy 99W (Southbound)				Tualatin Sherwood Rd (Eastbound)				Tualatin Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	18	109	45	0	9	28	10	0	25	40	11	0	24	12	8	0	339	
7:05 AM	12	132	26	0	1	32	6	0	12	17	4	0	10	6	5	0	263	
7:10 AM	14	126	43	0	7	38	5	0	28	27	10	0	31	12	4	0	345	
7:15 AM	13	150	47	0	2	43	5	0	16	24	12	0	14	15	7	0	348	
7:20 AM	21	132	52	0	3	37	10	0	32	34	7	0	26	13	6	0	373	
7:25 AM	11	134	38	0	6	66	5	1	21	42	16	0	18	7	7	0	372	
7:30 AM	17	124	44	0	2	26	5	0	20	31	11	0	29	20	7	0	336	
7:35 AM	13	131	41	1	6	67	4	0	24	51	13	0	27	15	9	0	402	
7:40 AM	13	122	37	0	8	40	5	0	26	38	14	0	29	15	7	0	354	
7:45 AM	9	147	33	0	6	46	8	0	27	44	9	0	18	9	4	0	360	
7:50 AM	7	122	41	0	7	41	12	0	33	46	11	0	31	25	7	0	383	
7:55 AM	7	138	41	1	13	51	4	0	25	28	8	0	16	9	9	0	350	4225
8:00 AM	20	110	36	0	5	23	9	0	17	35	8	0	27	21	9	0	320	4206
8:05 AM	12	102	26	0	4	44	7	0	16	29	14	0	10	15	3	0	282	4225
8:10 AM	18	88	26	1	7	40	6	0	21	29	8	0	32	12	15	0	303	4183
8:15 AM	9	105	37	0	9	44	7	0	13	33	11	0	24	16	7	0	315	4150
8:20 AM	16	77	29	0	6	47	9	0	24	29	13	0	21	19	4	0	294	4071
8:25 AM	15	95	26	0	11	54	10	0	14	31	10	0	22	16	5	0	309	4008
8:30 AM	18	80	34	0	4	43	10	0	17	23	4	0	22	22	5	0	282	3954
8:35 AM	15	76	23	0	4	44	10	0	14	20	6	0	19	15	6	0	252	3804
8:40 AM	9	74	33	2	13	58	7	0	15	20	6	0	32	11	5	0	285	3735
8:45 AM	11	97	33	0	9	36	11	0	9	23	10	0	20	12	6	0	277	3652
8:50 AM	13	69	29	0	6	49	10	0	15	29	7	0	29	15	6	0	277	3546
8:55 AM	13	59	20	0	10	27	4	0	17	12	5	0	40	18	8	0	233	3429

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	140	1600	444	4	80	612	68	0	308	532	144	0	296	156	80	0	4464
Heavy Trucks	8	36	20		8	48	12		16	20	4		40	12	24		248
Pedestrians		0				0				0				0			0
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/11/2008 10:18 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

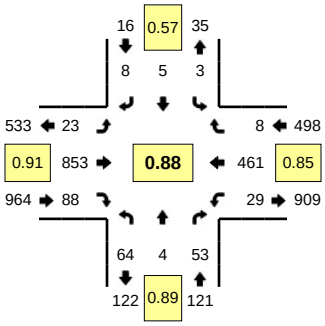
Method for determining peak hour: Total Entering Volume

LOCATION: Shopping Center -- Tualatin Sherwood Rd

QC JOB #: 10393707

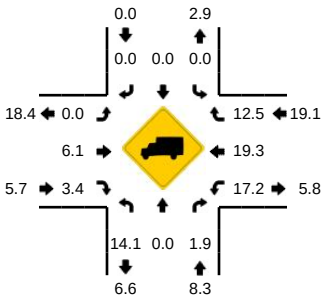
CITY/STATE: Sherwood, OR

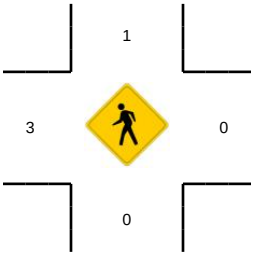
DATE: 11/5/2008

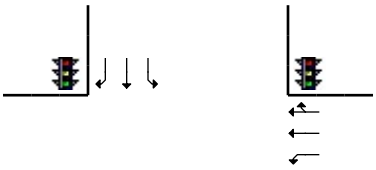


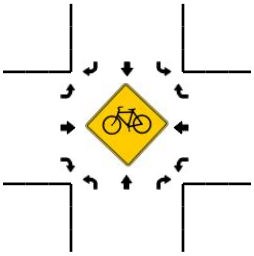
Peak-Hour: 7:10 AM -- 8:10 AM

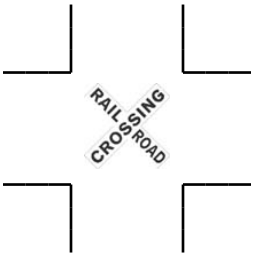
Peak 15-Min: 7:35 AM -- 7:50 AM

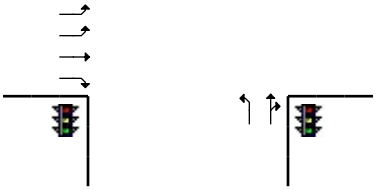


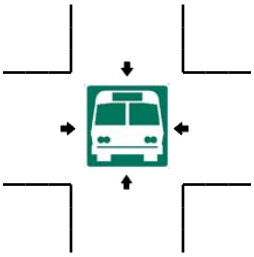












5-Min Count Period Beginning At	Shopping Center (Northbound)				Shopping Center (Southbound)				Tualatin Sherwood Rd (Eastbound)				Tualatin Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	5	0	2	0	0	0	2	0	8	69	8	0	4	33	1	0	132	
7:05 AM	10	1	3	0	0	0	1	0	4	48	2	0	1	28	0	0	98	
7:10 AM	3	0	4	0	0	0	1	0	1	64	4	0	3	34	0	0	114	
7:15 AM	5	0	4	0	0	0	0	0	2	77	2	0	1	33	1	0	125	
7:20 AM	6	0	2	0	0	0	0	0	1	76	3	0	1	38	0	0	127	
7:25 AM	5	0	3	0	0	0	0	0	2	85	4	0	1	39	0	0	139	
7:30 AM	5	0	2	0	0	2	0	0	3	59	9	0	1	30	1	0	112	
7:35 AM	4	2	5	0	2	0	2	0	2	92	6	0	5	52	0	0	172	
7:40 AM	6	0	8	0	0	1	2	0	4	59	10	0	3	45	0	0	138	
7:45 AM	3	0	6	0	0	0	0	0	1	77	15	0	3	38	0	0	143	
7:50 AM	8	1	4	0	0	0	1	0	1	73	15	0	3	42	1	0	149	
7:55 AM	8	0	4	0	1	0	0	0	1	78	10	0	4	41	0	0	147	1596
8:00 AM	6	1	6	0	0	0	0	0	4	62	3	0	4	29	2	0	117	1581
8:05 AM	5	0	5	0	0	2	2	0	1	51	7	0	0	40	3	0	116	1599
8:10 AM	4	1	8	0	1	0	0	0	2	50	9	0	4	40	0	0	119	1604
8:15 AM	8	0	2	0	1	0	0	0	0	69	11	0	1	47	0	0	139	1618
8:20 AM	5	0	5	0	0	0	0	0	3	55	8	0	1	40	2	0	119	1610
8:25 AM	5	1	5	0	0	0	1	0	1	55	4	0	5	34	1	0	112	1583
8:30 AM	7	1	2	0	0	0	1	0	1	63	6	0	2	39	1	1	124	1595
8:35 AM	3	0	3	0	0	0	1	0	0	37	7	0	3	40	0	0	94	1517
8:40 AM	5	0	1	0	0	0	0	0	3	54	8	0	1	44	1	0	117	1496
8:45 AM	2	2	2	0	2	0	1	0	3	54	7	0	5	44	0	0	122	1475
8:50 AM	4	2	3	0	1	1	1	0	3	54	3	0	2	41	2	0	117	1443
8:55 AM	2	0	2	0	1	1	1	0	4	41	8	0	1	55	2	0	118	1414

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	52	8	76	0	8	4	16	0	28	912	124	0	44	540	0	0	1812
Heavy Trucks	0	0	0		0	0	0		0	48	0		8	92	0		148
Pedestrians		0				4				0				0			4
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/11/2008 10:18 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

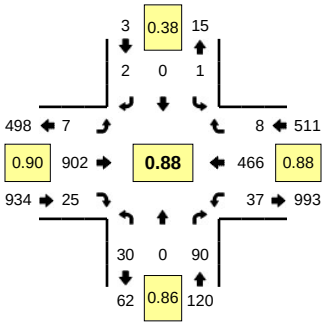
Method for determining peak hour: Total Entering Volume

LOCATION: Baler Way -- Tualatin Sherwood Rd

QC JOB #: 10393709

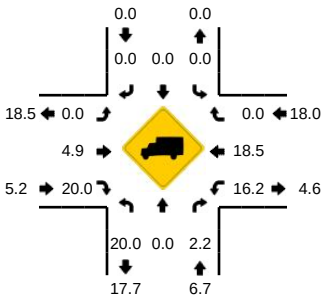
CITY/STATE: Sherwood, OR

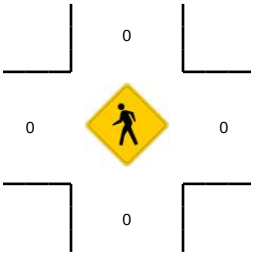
DATE: 11/5/2008

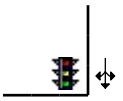


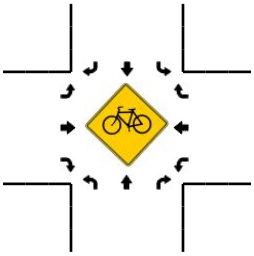
Peak-Hour: 7:10 AM -- 8:10 AM

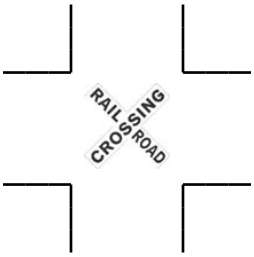
Peak 15-Min: 7:35 AM -- 7:50 AM

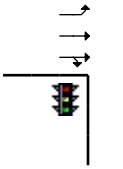


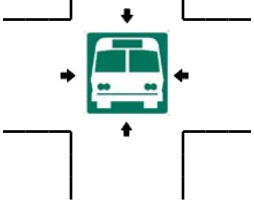












5-Min Count Period Beginning At	Baler Way (Northbound)				Baler Way (Southbound)				Tualatin Sherwood Rd (Eastbound)				Tualatin Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	0	9	0	0	0	0	0	0	68	0	0	1	41	0	0	121	
7:05 AM	3	0	3	0	0	0	0	0	0	61	1	0	1	25	0	0	94	
7:10 AM	1	0	8	0	0	0	0	0	0	63	2	0	5	36	0	0	115	
7:15 AM	4	0	5	0	0	0	0	0	1	84	1	0	0	34	1	0	130	
7:20 AM	5	0	7	0	0	0	0	0	0	78	1	0	4	29	0	0	124	
7:25 AM	4	0	7	0	0	0	0	0	1	75	2	0	5	40	0	0	134	
7:30 AM	4	0	6	0	0	0	0	0	0	68	3	0	3	37	0	0	121	
7:35 AM	1	0	11	0	0	0	2	0	1	90	6	0	1	48	0	0	160	
7:40 AM	2	0	10	0	0	0	0	0	1	78	0	0	2	42	2	0	137	
7:45 AM	0	0	11	0	0	0	0	0	0	83	1	0	5	44	2	0	146	
7:50 AM	3	0	2	0	1	0	0	0	1	68	3	0	2	45	1	0	126	
7:55 AM	2	0	9	0	0	0	0	0	1	87	0	0	3	39	0	0	141	1549
8:00 AM	1	0	7	0	0	0	0	0	0	69	4	0	6	32	1	0	120	1548
8:05 AM	3	0	7	0	0	0	0	0	1	59	2	0	1	40	1	0	114	1568
8:10 AM	5	0	5	0	0	0	0	0	1	61	1	0	3	42	0	0	118	1571
8:15 AM	2	1	13	0	0	0	0	0	0	70	3	0	2	44	0	0	135	1576
8:20 AM	1	0	9	0	1	0	1	0	1	53	4	0	1	48	0	0	119	1571
8:25 AM	2	1	1	0	2	0	0	0	1	54	4	0	6	32	0	0	103	1540
8:30 AM	2	0	3	0	1	0	2	0	1	70	2	0	3	36	0	0	120	1539
8:35 AM	1	0	3	0	0	1	0	0	1	36	0	0	1	44	0	0	87	1466
8:40 AM	2	0	4	0	0	0	2	0	1	56	2	0	1	38	1	0	107	1436
8:45 AM	5	1	10	0	0	0	0	0	1	53	5	0	1	45	1	0	122	1412
8:50 AM	1	0	5	0	0	0	1	0	1	53	5	0	4	54	0	0	124	1410
8:55 AM	3	0	5	0	0	0	1	0	0	50	3	0	7	44	2	0	115	1384

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	0	128	0	0	0	8	0	8	1004	28	0	32	536	16	0	1772
Heavy Trucks	8	0	0		0	0	0		0	40	8		4	84	0		144
Pedestrians		0				0				0				0			0
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/11/2008 10:18 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

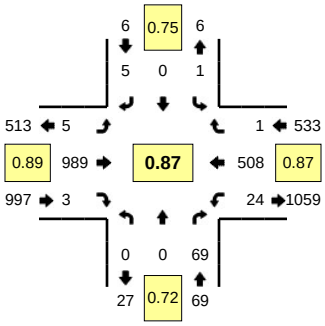
Method for determining peak hour: Total Entering Volume

LOCATION: Adams Ave -- Tualatin Sherwood Rd

QC JOB #: 10393711

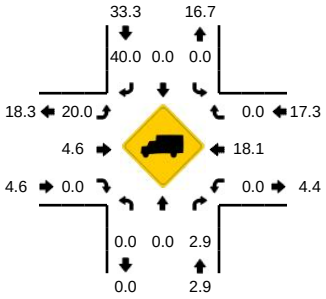
CITY/STATE: Sherwood, OR

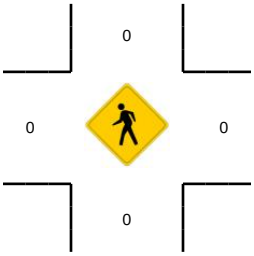
DATE: 11/5/2008

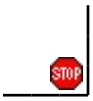


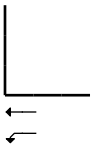
Peak-Hour: 7:10 AM -- 8:10 AM

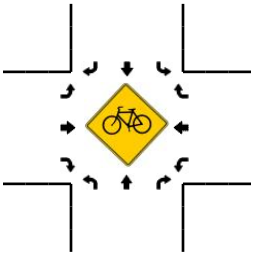
Peak 15-Min: 7:35 AM -- 7:50 AM

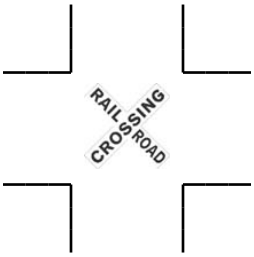


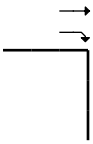


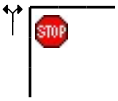












5-Min Count Period Beginning At	Adams Ave (Northbound)				Adams Ave (Southbound)				Tualatin Sherwood Rd (Eastbound)				Tualatin Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	5	0	0	0	0	0	1	70	1	0	1	42	0	0	120	
7:05 AM	0	0	2	0	0	0	0	0	0	67	0	0	1	28	0	0	98	
7:10 AM	0	0	0	0	0	0	0	0	0	69	0	0	1	39	0	0	109	
7:15 AM	0	0	5	0	0	0	1	0	0	95	0	0	1	38	0	0	140	
7:20 AM	0	0	7	0	0	0	0	0	0	83	0	0	1	31	0	0	122	
7:25 AM	0	0	5	0	0	0	0	0	0	75	0	0	0	46	0	0	126	
7:30 AM	0	0	3	0	0	0	0	0	0	82	0	0	2	42	0	0	129	
7:35 AM	0	0	4	0	0	0	1	0	1	95	0	0	3	45	0	0	149	
7:40 AM	0	0	8	0	0	0	0	0	1	90	0	0	2	48	0	0	149	
7:45 AM	0	0	12	0	1	0	0	0	1	92	1	0	1	54	0	0	162	
7:50 AM	0	0	6	0	0	0	0	0	0	76	0	0	3	47	0	0	132	
7:55 AM	0	0	5	0	0	0	1	0	1	90	1	0	3	40	0	0	141	1577
8:00 AM	0	0	8	0	0	0	1	0	1	81	1	0	7	36	0	0	135	1592
8:05 AM	0	0	6	0	0	0	1	0	0	61	0	0	0	42	1	0	111	1605
8:10 AM	0	0	4	0	0	0	0	0	0	70	0	0	3	46	0	0	123	1619
8:15 AM	0	0	2	0	0	0	1	0	0	84	0	0	1	47	0	0	135	1614
8:20 AM	0	0	6	0	0	0	0	0	1	60	0	0	3	47	0	0	117	1609
8:25 AM	0	0	6	0	0	0	1	0	0	61	2	0	4	34	0	0	108	1591
8:30 AM	0	0	4	0	0	0	0	0	0	70	0	0	2	40	0	0	116	1578
8:35 AM	0	0	3	0	0	0	0	0	0	39	0	0	4	48	0	0	94	1523
8:40 AM	0	0	2	0	0	0	0	0	0	59	0	0	6	41	0	0	108	1482
8:45 AM	1	0	1	0	0	0	0	0	1	63	0	0	3	44	0	0	113	1433
8:50 AM	0	0	2	0	0	0	0	0	1	61	1	0	2	61	0	0	128	1429
8:55 AM	0	0	2	0	0	0	1	0	1	54	0	0	6	48	0	0	112	1400

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	96	0	4	0	4	0	12	1108	4	0	24	588	0	0	1840
Heavy Trucks	0	0	0		0	0	0		4	40	0		0	88	0		132
Pedestrians		0				0				0				0			0
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/11/2008 10:18 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

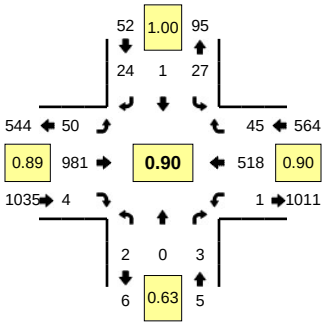
Method for determining peak hour: Total Entering Volume

LOCATION: Gerda Ln -- Tualatin Sherwood Rd

QC JOB #: 10393713

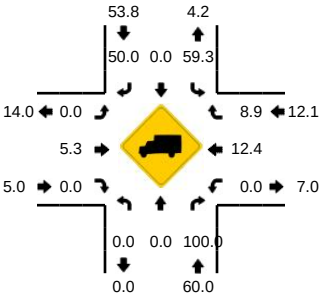
CITY/STATE: Sherwood, OR

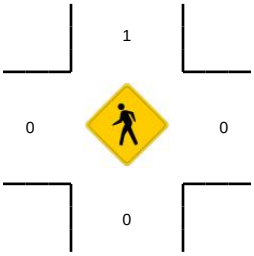
DATE: 11/5/2008

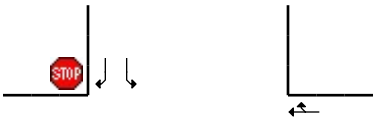


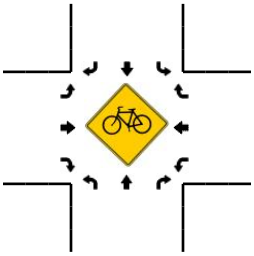
Peak-Hour: 7:10 AM -- 8:10 AM

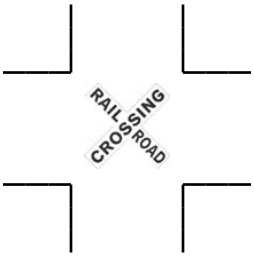
Peak 15-Min: 7:35 AM -- 7:50 AM











5-Min Count Period Beginning At	Gerda Ln (Northbound)				Gerda Ln (Southbound)				Tualatin Sherwood Rd (Eastbound)				Tualatin Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	2	0	4	80	1	0	0	40	3	0	130	
7:05 AM	0	0	0	0	0	0	0	0	5	72	1	0	0	38	3	0	119	
7:10 AM	0	0	0	0	0	0	1	0	2	58	0	0	0	34	3	0	98	
7:15 AM	0	0	0	0	1	0	3	0	7	91	0	0	0	37	6	0	145	
7:20 AM	0	0	1	0	6	0	1	0	0	87	0	0	0	34	4	0	133	
7:25 AM	0	0	0	0	2	0	2	0	3	76	0	0	0	48	3	0	134	
7:30 AM	0	0	0	0	4	0	0	0	4	79	0	0	0	41	4	0	132	
7:35 AM	0	0	0	0	1	1	0	0	2	94	0	0	0	48	3	0	149	
7:40 AM	0	0	0	0	1	0	5	0	3	84	1	0	0	50	2	0	146	
7:45 AM	1	0	1	0	1	0	1	0	8	99	1	0	0	52	2	0	166	
7:50 AM	1	0	1	0	2	0	2	0	4	89	0	0	1	52	5	0	157	
7:55 AM	0	0	0	0	3	0	2	0	7	81	1	0	0	41	4	0	139	1648
8:00 AM	0	0	0	0	1	0	2	0	4	75	0	0	0	37	6	0	125	1643
8:05 AM	0	0	0	0	5	0	5	0	6	68	1	0	0	44	3	0	132	1656
8:10 AM	0	0	0	0	2	0	1	0	4	62	0	0	0	50	5	0	124	1682
8:15 AM	0	0	1	0	2	0	8	0	3	76	0	0	0	31	2	0	123	1660
8:20 AM	0	0	0	0	3	0	2	0	3	63	0	0	0	54	3	0	128	1655
8:25 AM	0	0	0	0	4	0	3	0	10	57	0	0	0	44	8	0	126	1647
8:30 AM	0	0	0	0	2	0	5	0	9	55	0	0	0	29	1	0	101	1616
8:35 AM	0	0	0	0	1	0	3	0	3	45	0	0	0	54	1	0	107	1574
8:40 AM	0	0	0	0	2	0	7	0	6	49	0	0	0	39	4	0	107	1535
8:45 AM	0	0	0	0	1	0	2	0	4	62	0	0	0	40	0	0	109	1478
8:50 AM	0	0	0	0	1	0	4	0	5	59	0	0	0	67	3	0	139	1460
8:55 AM	0	0	0	0	3	0	5	0	7	43	0	0	1	40	1	0	100	1421

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	0	4	0	12	4	24	0	52	1108	8	0	0	600	28	0	1844
Heavy Trucks	0	0	4		8	0	16		0	56	0		0	64	12		160
Pedestrians		0				4				0				0			4
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/11/2008 10:18 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

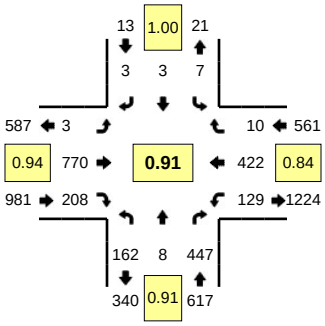
Method for determining peak hour: Total Entering Volume

LOCATION: Oregon St -- Tualatin Sherwood Rd

QC JOB #: 10393715

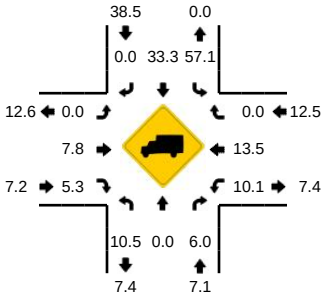
CITY/STATE: Sherwood, OR

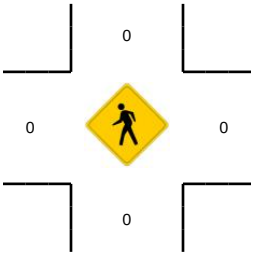
DATE: 11/5/2008

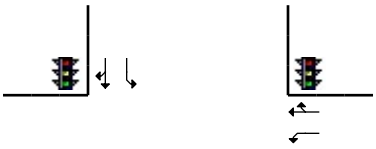


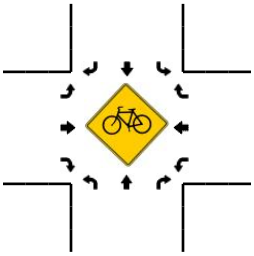
Peak-Hour: 7:10 AM -- 8:10 AM

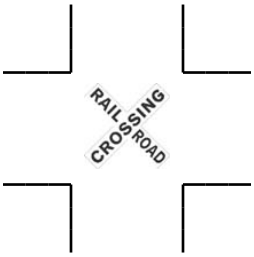
Peak 15-Min: 7:35 AM -- 7:50 AM

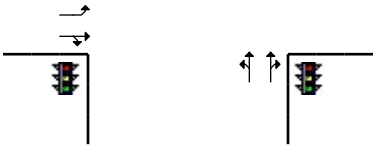


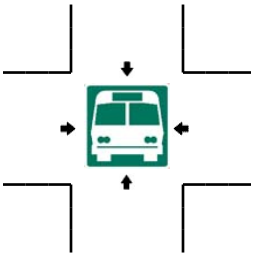












5-Min Count Period Beginning At	Oregon St (Northbound)				Oregon St (Southbound)				Tualatin Sherwood Rd (Eastbound)				Tualatin Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	1	27	0	0	0	0	0	0	11	8	0	12	37	1	0	100	
7:05 AM	5	0	41	0	0	0	1	0	0	64	11	0	15	30	1	0	168	
7:10 AM	7	0	39	0	0	0	0	0	0	52	11	0	7	34	1	0	151	
7:15 AM	12	0	42	0	2	0	0	0	0	63	17	0	4	36	2	0	178	
7:20 AM	10	0	24	0	0	0	0	0	1	77	12	0	12	34	0	0	170	
7:25 AM	14	0	38	0	0	0	0	0	0	71	19	0	11	37	1	0	191	
7:30 AM	14	0	42	0	0	0	0	0	0	61	14	0	13	32	1	0	177	
7:35 AM	19	0	44	0	1	1	0	0	1	63	21	0	10	38	2	0	200	
7:40 AM	10	1	39	0	0	0	0	0	1	73	26	0	13	51	2	0	216	
7:45 AM	15	0	41	0	1	0	0	0	0	60	15	0	14	37	0	0	183	
7:50 AM	13	5	28	0	0	1	2	0	0	66	22	0	6	31	1	0	175	
7:55 AM	21	1	38	0	1	1	0	0	0	45	18	0	10	31	0	0	166	2075
8:00 AM	13	1	41	0	1	0	0	0	0	70	20	0	16	31	0	0	193	2168
8:05 AM	14	0	31	0	1	0	1	0	0	69	13	0	13	30	0	0	172	2172
8:10 AM	9	1	38	0	0	0	1	0	0	58	13	0	8	39	0	0	167	2188
8:15 AM	14	0	34	0	1	0	0	0	0	48	23	0	14	28	0	0	162	2172
8:20 AM	10	0	28	0	0	0	0	0	1	63	11	0	8	46	0	0	167	2169
8:25 AM	8	0	17	0	0	0	0	0	1	56	14	0	14	45	1	0	156	2134
8:30 AM	2	0	22	0	0	0	0	0	1	46	17	0	11	29	1	0	129	2086
8:35 AM	14	1	21	0	0	0	0	0	2	34	6	0	7	41	1	0	127	2013
8:40 AM	4	0	19	0	1	0	0	0	0	44	5	0	15	36	0	0	124	1921
8:45 AM	6	0	15	0	0	0	0	0	1	54	10	0	2	39	0	0	127	1865
8:50 AM	9	0	22	0	0	1	0	0	0	61	7	0	15	61	0	0	176	1866
8:55 AM	15	1	20	0	1	0	0	0	0	35	6	0	15	27	3	0	123	1823

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	176	4	496	0	8	4	0	0	8	784	248	0	148	504	16	0	2396
Heavy Trucks	8	0	20		8	4	0		0	60	12		8	60	0		180
Pedestrians		0				0				0				0			0
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/11/2008 10:18 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

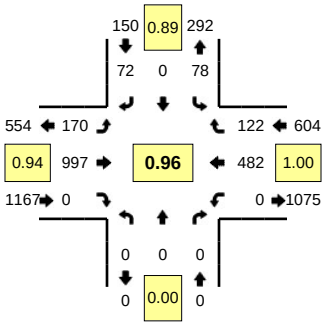
Method for determining peak hour: Total Entering Volume

LOCATION: Cipole Rd -- Tualatin Sherwood Rd

QC JOB #: 10393717

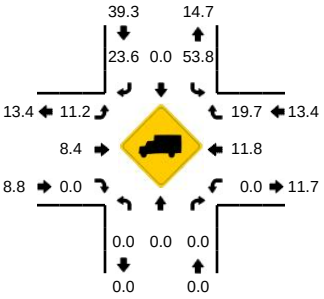
CITY/STATE: Sherwood, OR

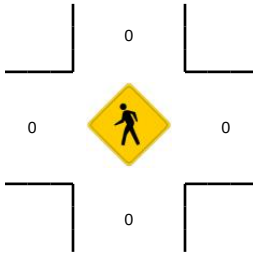
DATE: 11/5/2008

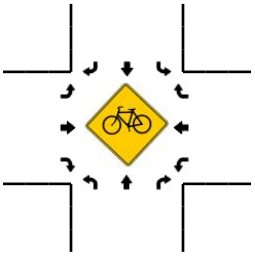


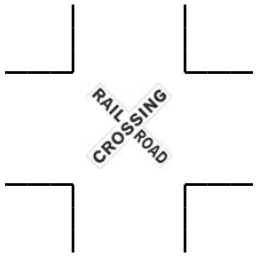
Peak-Hour: 7:10 AM -- 8:10 AM

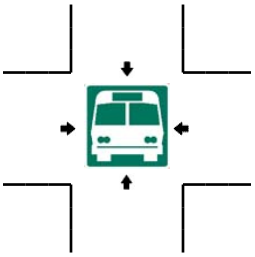
Peak 15-Min: 7:35 AM -- 7:50 AM











5-Min Count Period Beginning At	Cipole Rd (Northbound)				Cipole Rd (Southbound)				Tualatin Sherwood Rd (Eastbound)				Tualatin Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	3	0	16	0	7	80	0	0	0	33	17	0	156	
7:05 AM	0	0	0	0	8	0	5	0	15	84	0	0	0	35	8	0	155	
7:10 AM	0	0	0	0	5	0	3	0	12	78	0	0	0	42	7	0	147	
7:15 AM	0	0	0	0	4	0	3	0	13	88	0	0	0	38	18	0	164	
7:20 AM	0	0	0	0	7	0	6	0	13	82	0	0	0	38	12	0	158	
7:25 AM	0	0	0	0	9	0	8	0	16	82	0	0	0	33	10	0	158	
7:30 AM	0	0	0	0	7	0	6	0	14	79	0	0	0	53	10	0	169	
7:35 AM	0	0	0	0	4	0	5	0	8	98	0	0	0	37	5	0	157	
7:40 AM	0	0	0	0	6	0	5	0	23	86	0	0	0	53	6	0	179	
7:45 AM	0	0	0	0	14	0	8	0	16	78	0	0	0	42	6	0	164	
7:50 AM	0	0	0	0	9	0	7	0	14	76	0	0	0	36	15	0	157	
7:55 AM	0	0	0	0	4	0	5	0	13	78	0	0	0	42	14	0	156	1920
8:00 AM	0	0	0	0	2	0	10	0	13	90	0	0	0	39	6	0	160	1924
8:05 AM	0	0	0	0	7	0	6	0	15	82	0	0	0	29	13	0	152	1921
8:10 AM	0	0	0	0	4	0	4	0	16	93	0	0	0	45	5	0	167	1941
8:15 AM	0	0	0	0	0	0	5	0	12	72	0	0	0	37	7	0	133	1910
8:20 AM	0	0	0	0	5	0	5	0	10	73	0	0	0	53	9	0	155	1907
8:25 AM	0	0	0	0	7	0	5	0	4	65	0	0	0	48	7	0	136	1885
8:30 AM	0	0	0	0	3	0	8	0	8	67	0	0	0	33	9	0	128	1844
8:35 AM	0	0	0	0	4	0	4	0	5	57	0	0	0	49	9	0	128	1815
8:40 AM	0	0	0	0	10	0	5	0	7	50	0	0	0	41	10	0	123	1759
8:45 AM	0	0	0	0	10	0	3	0	5	62	0	0	0	51	3	0	134	1729
8:50 AM	0	0	0	0	5	0	4	0	10	66	0	0	0	57	8	0	150	1722
8:55 AM	0	0	0	0	5	0	7	0	13	52	0	0	0	45	11	0	133	1699

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	96	0	72	0	188	1048	0	0	0	528	68	0	2000
Heavy Trucks	0	0	0		56	0	12		20	88	0		0	40	8		224
Pedestrians		0				0				0				0			0
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/11/2008 10:18 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

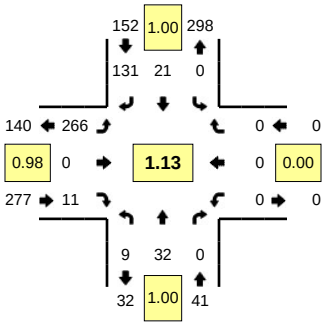
Method for determining peak hour: Total Entering Volume

LOCATION: Cipole Rd -- Cipole Rd

QC JOB #: 10393719

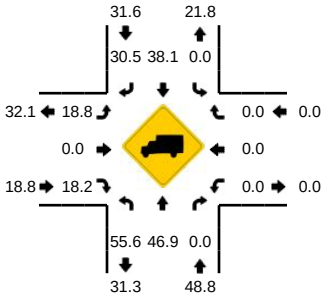
CITY/STATE: Sherwood, OR

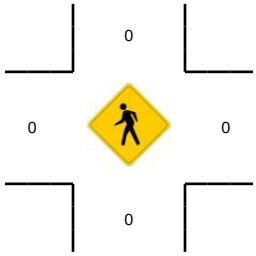
DATE: 11/5/2008

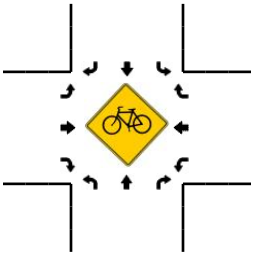


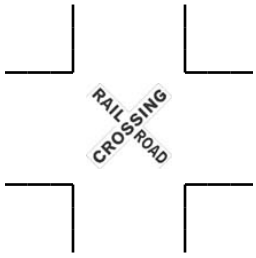
Peak-Hour: 7:10 AM -- 8:10 AM

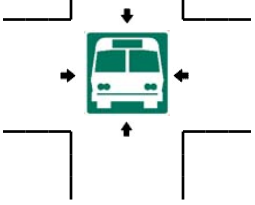
Peak 15-Min: 7:35 AM -- 7:50 AM











5-Min Count Period Beginning At	Cipole Rd (Northbound)				Cipole Rd (Southbound)				Cipole Rd (Eastbound)				Cipole Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	12	4	0	0	0	1	9	0	29	0	2	0	0	0	0	0	57	
7:05 AM	4	3	0	0	0	3	6	0	20	0	1	0	0	0	0	0	37	
7:10 AM	2	3	0	0	0	3	12	0	27	0	0	0	0	0	0	0	47	
7:15 AM	1	3	0	0	0	1	8	0	17	0	0	0	0	0	0	0	30	
7:20 AM	3	6	0	0	0	2	15	0	10	0	0	0	0	0	0	0	36	
7:25 AM	1	6	0	0	0	0	13	0	28	0	0	0	0	0	0	0	48	
7:30 AM	1	2	0	0	0	2	6	0	21	0	1	0	0	0	0	0	33	
7:35 AM	1	4	0	0	0	0	6	0	22	0	2	0	0	0	0	0	35	
7:40 AM	0	0	0	0	0	0	12	0	19	0	1	0	0	0	0	0	32	
7:45 AM	0	2	0	0	0	1	7	0	23	0	4	0	0	0	0	0	37	
7:50 AM	0	0	0	0	0	3	12	0	31	0	1	0	0	0	0	0	47	
7:55 AM	0	3	0	0	0	0	14	0	28	0	0	0	0	0	0	0	45	484
8:00 AM	0	2	0	0	0	4	5	0	25	0	1	0	0	0	0	0	37	464
8:05 AM	0	1	0	0	0	5	21	0	15	0	1	0	0	0	0	0	43	470
8:10 AM	0	3	0	0	0	2	9	0	10	0	2	0	0	0	0	0	26	449
8:15 AM	0	0	0	0	0	1	9	0	14	0	1	0	0	0	0	0	25	444
8:20 AM	0	5	0	0	0	1	10	0	10	0	1	0	0	0	0	0	27	435
8:25 AM	2	4	0	0	0	3	10	0	13	0	1	0	0	0	0	0	33	420
8:30 AM	0	1	0	0	0	2	8	0	5	0	1	0	0	0	0	0	17	404
8:35 AM	0	0	0	0	0	3	12	0	3	0	0	0	0	0	0	0	18	387
8:40 AM	1	2	0	0	0	1	12	0	13	0	0	0	0	0	0	0	29	384
8:45 AM	0	1	0	0	0	4	5	0	15	0	1	0	0	0	0	0	26	373
8:50 AM	0	1	0	0	0	3	6	0	13	0	1	0	0	0	0	0	24	350
8:55 AM	0	1	0	0	0	5	16	0	7	0	0	0	0	0	0	0	29	334

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	24	0	0	0	4	100	0	256	0	28	0	0	0	0	0	416
Heavy Trucks	0	12	0		0	0	16		36	0	4		0	0	0		68
Pedestrians		0				0				0				0			0
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/11/2008 10:18 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: User-Defined

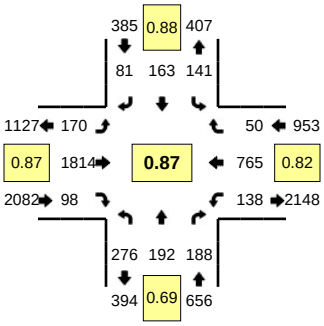
Method for determining peak hour: Total Entering Volume

LOCATION: Edy Rd -- Hwy 99W

QC JOB #: 10396127

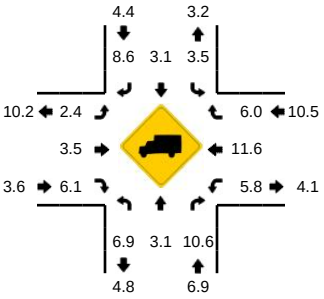
CITY/STATE: Sherwood, OR

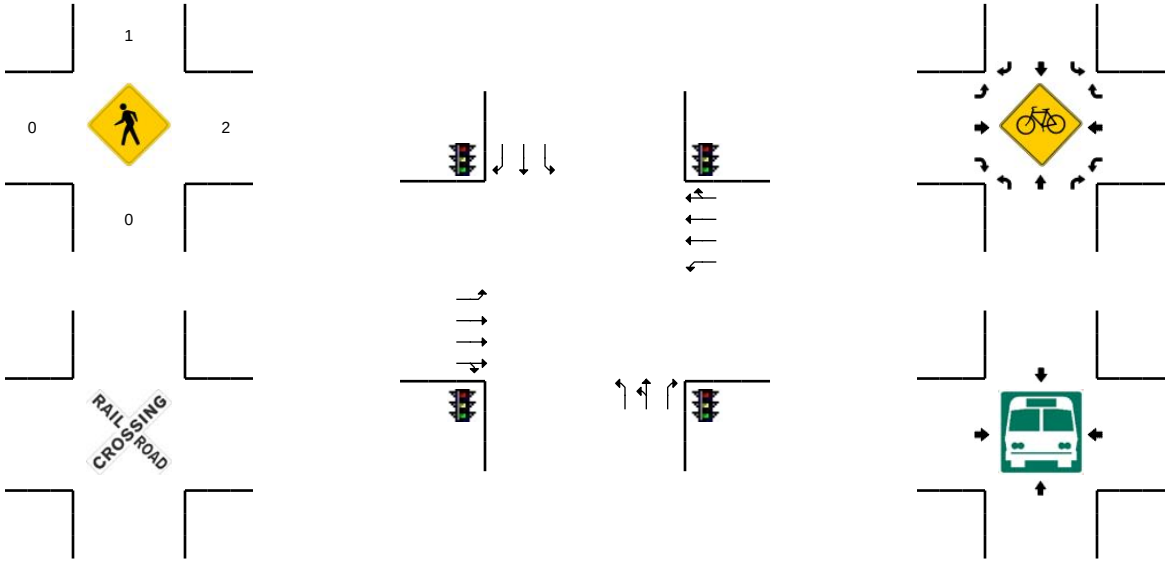
DATE: 11/18/2008



Peak-Hour: 7:10 AM -- 8:10 AM

Peak 15-Min: 7:45 AM -- 8:00 AM





5-Min Count Period Beginning At	Edy Rd (Northbound)				Edy Rd (Southbound)				Hwy 99W (Eastbound)				Hwy 99W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	5	12	14	0	13	7	10	0	7	97	3	0	6	56	6	1	237	
7:05 AM	13	6	13	0	9	4	9	0	20	174	4	0	7	44	8	0	311	
7:10 AM	13	14	7	0	20	16	8	0	12	138	7	0	7	46	2	0	290	
7:15 AM	10	8	15	0	8	7	8	0	17	203	1	0	5	86	3	1	372	
7:20 AM	21	13	14	0	18	16	8	0	9	145	5	0	13	47	1	0	310	
7:25 AM	12	15	11	0	8	13	5	0	16	198	6	1	9	66	2	1	363	
7:30 AM	20	14	17	0	9	19	6	0	11	115	7	1	16	48	3	0	286	
7:35 AM	17	9	15	0	14	19	6	0	18	157	10	0	10	80	4	0	359	
7:40 AM	39	16	16	0	10	16	9	0	13	123	10	0	15	49	8	1	325	
7:45 AM	36	12	16	0	9	14	8	0	14	185	12	1	15	84	6	1	413	
7:50 AM	44	22	20	0	10	12	3	0	11	137	9	0	16	73	3	1	361	
7:55 AM	26	14	19	0	16	15	6	0	16	180	12	0	15	70	7	0	396	4023
8:00 AM	32	36	23	0	7	12	7	0	9	99	8	2	7	37	4	0	283	4069
8:05 AM	6	19	15	0	12	4	7	0	19	134	11	0	5	79	7	0	318	4076
8:10 AM	15	19	11	0	12	11	9	0	12	102	8	0	12	50	6	0	267	4053
8:15 AM	6	8	13	0	7	2	9	0	13	164	3	0	6	71	8	2	312	3993
8:20 AM	6	11	7	0	11	8	8	0	14	110	8	1	5	56	6	1	252	3935
8:25 AM	7	7	7	0	4	9	6	0	10	116	5	0	15	59	2	0	247	3819
8:30 AM	5	17	4	0	8	7	8	0	10	113	4	1	6	43	7	0	233	3766
8:35 AM	14	8	9	0	12	5	5	0	11	96	5	0	8	63	5	2	243	3650
8:40 AM	13	5	15	0	6	6	6	0	7	125	4	0	5	74	4	0	270	3595
8:45 AM	9	6	7	0	6	13	7	0	10	100	8	0	11	53	6	0	236	3418
8:50 AM	8	5	8	0	5	5	8	0	6	100	6	4	10	71	2	0	238	3295
8:55 AM	14	3	10	0	6	8	7	0	12	95	7	0	8	55	4	2	231	3130

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	424	192	220	0	140	164	68	0	164	2008	132	4	184	908	64	8	4680
Heavy Trucks	12	4	32		0	4	4		0	76	12		8	120	4		276
Pedestrians		0				0				0				8			8
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/21/2008 2:41 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

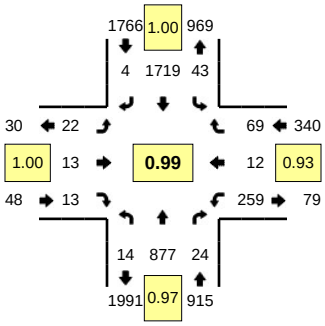
Method for determining peak hour: Total Entering Volume

LOCATION: Hwy 99W -- Cipole Rd

QC JOB #: 10393702

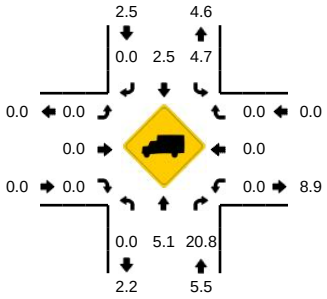
CITY/STATE: Sherwood, OR

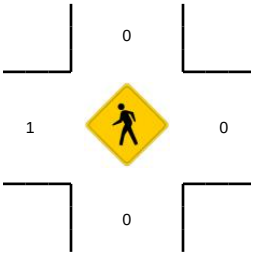
DATE: 11/5/2008

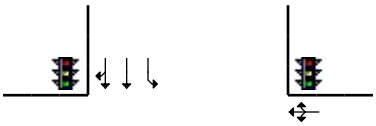


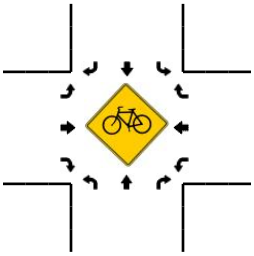
Peak-Hour: 4:45 PM -- 5:45 PM

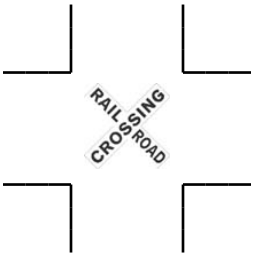
Peak 15-Min: 5:15 PM -- 5:30 PM

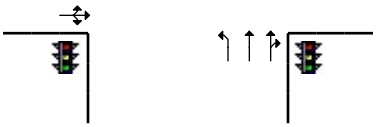


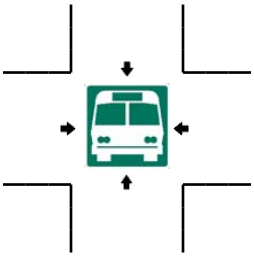












5-Min Count Period Beginning At	Hwy 99W (Northbound)				Hwy 99W (Southbound)				Cipole Rd (Eastbound)				Cipole Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	74	6	0	10	120	0	0	1	3	0	0	15	1	8	0	238	
4:05 PM	0	83	2	0	6	127	0	0	2	2	1	0	22	3	8	0	256	
4:10 PM	0	75	5	0	6	130	0	0	3	0	2	0	25	2	6	0	254	
4:15 PM	1	86	6	0	6	131	0	0	1	2	1	0	18	2	8	0	262	
4:20 PM	0	71	6	0	15	128	0	0	2	0	0	0	3	0	5	0	230	
4:25 PM	0	77	8	0	6	132	0	0	2	0	3	0	16	2	7	0	253	
4:30 PM	0	41	2	0	3	123	0	0	2	1	2	0	20	1	6	0	201	
4:35 PM	0	84	2	1	7	129	0	0	3	1	2	0	27	3	4	0	263	
4:40 PM	2	86	2	0	3	127	0	0	1	0	0	0	27	0	6	0	254	
4:45 PM	0	64	2	0	4	155	0	0	4	1	2	0	16	2	9	0	259	
4:50 PM	3	77	2	0	2	166	0	0	2	1	2	0	19	4	7	0	285	
4:55 PM	1	61	1	0	4	132	0	0	1	2	0	0	29	0	6	0	237	2992
5:00 PM	0	72	5	0	5	145	0	1	2	0	1	0	25	1	9	0	266	3020
5:05 PM	1	70	0	0	4	136	0	0	4	3	2	0	23	1	5	0	249	3013
5:10 PM	1	83	2	0	2	160	0	0	2	2	2	0	26	0	6	0	286	3045
5:15 PM	1	61	0	0	5	153	1	0	0	1	0	0	31	0	2	0	255	3038
5:20 PM	1	62	2	0	4	126	0	0	1	0	1	0	27	0	5	0	229	3037
5:25 PM	1	104	4	0	0	153	0	0	1	1	1	0	21	0	5	0	291	3075
5:30 PM	0	85	3	0	3	130	0	0	1	1	0	0	18	0	4	0	245	3119
5:35 PM	4	78	2	0	4	135	2	0	2	0	1	0	7	3	2	0	240	3096
5:40 PM	1	60	1	0	5	128	1	0	2	1	1	0	17	1	9	0	227	3069
5:45 PM	1	52	2	0	8	139	1	1	2	0	0	0	7	0	8	0	221	3031
5:50 PM	2	62	3	0	6	114	0	0	0	2	1	0	10	0	7	0	207	2953
5:55 PM	0	61	2	0	6	122	0	0	0	1	1	0	9	0	4	0	206	2922

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	908	24	0	36	1728	4	0	8	8	8	0	316	0	48	0	3100
Heavy Trucks	0	36	0		0	40	0		0	0	0		0	0	0		76
Pedestrians		0				0				4				0			4
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/10/2008 5:19 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

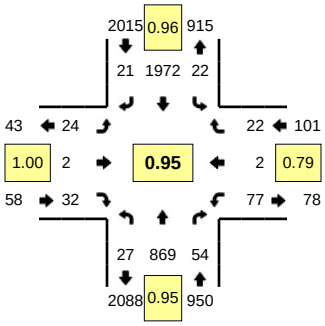
Method for determining peak hour: Total Entering Volume

LOCATION: Hwy 99W -- Home Depot Dwy

QC JOB #: 10393704

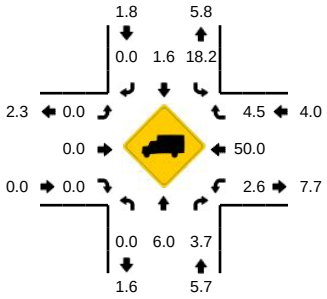
CITY/STATE: Sherwood, OR

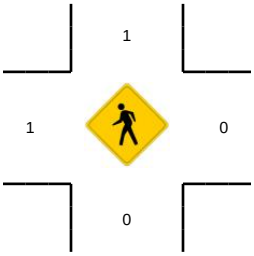
DATE: 11/5/2008

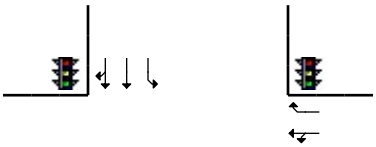


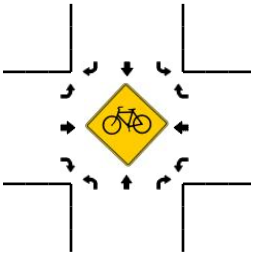
Peak-Hour: 4:45 PM -- 5:45 PM

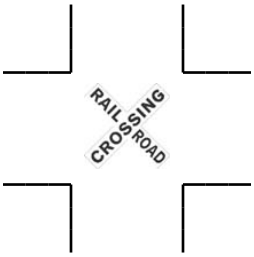
Peak 15-Min: 5:15 PM -- 5:30 PM

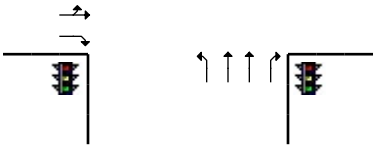


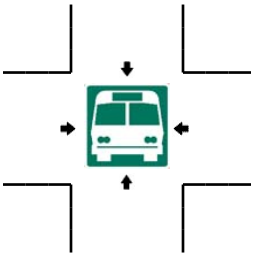












5-Min Count Period Beginning At	Hwy 99W (Northbound)				Hwy 99W (Southbound)				Home Depot Dwy (Eastbound)				Home Depot Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	6	85	4	0	3	138	0	0	1	0	5	0	7	0	0	0	249	
4:05 PM	0	69	2	0	2	155	1	0	3	0	2	0	2	0	2	0	238	
4:10 PM	0	81	4	0	2	142	1	0	0	0	0	0	10	0	0	0	240	
4:15 PM	3	69	6	0	1	175	0	0	0	0	0	0	4	0	0	0	258	
4:20 PM	1	90	5	0	1	128	0	0	1	1	3	0	7	0	0	0	237	
4:25 PM	1	63	2	0	1	137	1	1	0	0	1	0	4	1	1	0	213	
4:30 PM	4	69	6	1	10	132	1	1	4	0	2	0	6	0	1	0	237	
4:35 PM	1	71	2	0	2	174	1	0	0	0	5	0	5	0	1	0	262	
4:40 PM	1	76	4	0	3	165	0	0	4	0	3	0	8	0	0	0	264	
4:45 PM	0	67	6	0	0	175	1	0	1	0	1	0	6	1	0	0	258	
4:50 PM	6	75	2	2	3	133	1	0	2	0	6	0	6	0	1	0	237	
4:55 PM	3	59	2	1	4	203	4	0	0	0	4	0	2	0	4	0	286	2979
5:00 PM	2	71	4	0	0	147	3	0	6	0	2	0	7	0	3	0	245	2975
5:05 PM	1	72	11	0	5	173	4	0	3	0	1	0	6	0	1	0	277	3014
5:10 PM	1	79	4	1	0	153	2	0	5	1	1	0	8	0	2	0	257	3031
5:15 PM	0	56	7	1	2	200	1	0	1	0	1	0	5	0	3	0	277	3050
5:20 PM	1	97	3	0	1	147	1	0	0	0	5	0	11	0	1	0	267	3080
5:25 PM	4	76	5	0	0	173	0	0	1	0	3	0	9	0	3	0	274	3141
5:30 PM	1	87	5	0	2	146	2	0	5	0	3	0	6	1	0	0	258	3162
5:35 PM	0	70	3	0	1	175	1	0	0	0	2	0	3	0	2	0	257	3157
5:40 PM	1	60	2	2	4	147	1	0	0	1	3	0	8	0	2	0	231	3124
5:45 PM	3	59	3	0	1	165	1	0	0	0	1	0	3	0	0	0	236	3102
5:50 PM	3	72	3	0	1	117	1	0	1	0	1	0	4	0	1	0	204	3069
5:55 PM	1	53	2	0	1	129	0	0	1	0	1	0	2	0	1	0	191	2974

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	20	916	60	4	12	2080	8	0	8	0	36	0	100	0	28	0	3272
Heavy Trucks	0	44	0		0	28	0		0	0	0		4	0	0		76
Pedestrians		0				0				0				0			0
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/10/2008 5:19 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

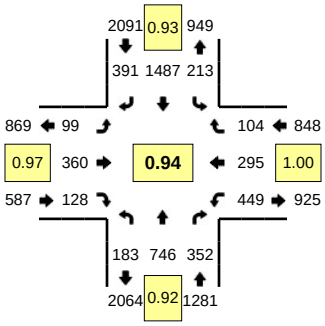
Method for determining peak hour: Total Entering Volume

LOCATION: Hwy 99W -- Tualatin Sherwood Rd

QC JOB #: 10393706

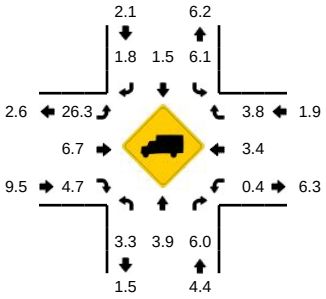
CITY/STATE: Sherwood, OR

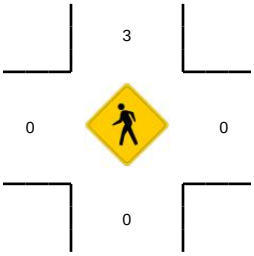
DATE: 11/5/2008

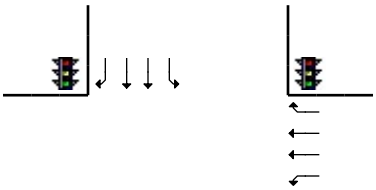


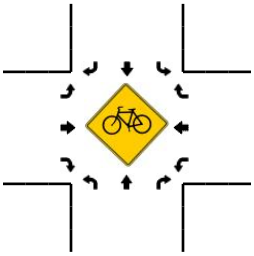
Peak-Hour: 4:45 PM -- 5:45 PM

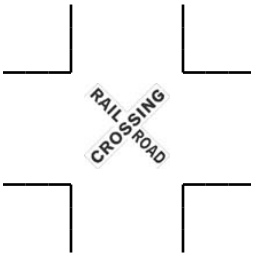
Peak 15-Min: 5:15 PM -- 5:30 PM

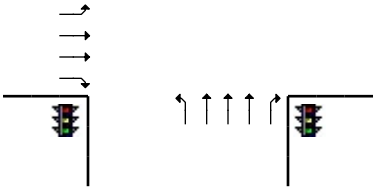


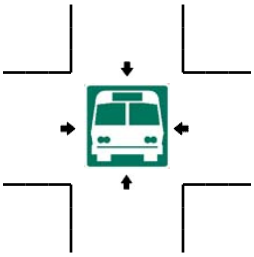












5-Min Count Period Beginning At	Hwy 99W (Northbound)				Hwy 99W (Southbound)				Tualatin Sherwood Rd (Eastbound)				Tualatin Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	14	62	27	0	15	98	16	0	11	23	8	0	37	26	4	0	341	
4:05 PM	18	58	22	0	18	117	24	0	4	18	5	0	13	13	11	0	321	
4:10 PM	15	73	30	0	13	95	31	0	12	26	10	0	48	27	9	0	389	
4:15 PM	10	69	28	0	15	132	40	0	7	25	9	0	32	16	8	0	391	
4:20 PM	5	69	29	0	13	92	19	0	11	26	11	0	39	30	6	0	350	
4:25 PM	10	55	28	0	19	122	25	0	8	18	6	0	16	18	7	0	332	
4:30 PM	15	58	34	0	12	94	25	0	9	36	5	0	29	19	7	0	343	
4:35 PM	12	57	21	0	28	130	30	0	14	27	8	0	37	21	10	0	395	
4:40 PM	14	57	32	0	19	83	36	0	8	25	8	0	43	26	6	0	357	
4:45 PM	11	65	21	0	25	138	43	0	10	32	12	0	29	19	5	0	410	
4:50 PM	20	51	39	0	19	97	24	0	10	36	16	0	40	26	9	0	387	
4:55 PM	11	61	21	0	20	149	32	0	5	29	10	0	32	21	10	0	401	4417
5:00 PM	19	66	32	0	17	109	33	0	7	20	15	0	54	29	5	0	406	4482
5:05 PM	14	58	27	0	22	136	33	0	12	31	9	0	35	22	10	0	409	4570
5:10 PM	19	59	35	0	12	106	26	0	9	27	9	0	38	29	5	0	374	4555
5:15 PM	11	66	29	0	20	148	41	0	5	33	1	0	34	20	8	0	416	4580
5:20 PM	17	73	35	0	12	103	30	0	11	34	13	0	55	32	9	0	424	4654
5:25 PM	15	75	29	0	16	154	41	0	11	32	11	0	26	17	11	0	438	4760
5:30 PM	18	80	30	0	9	92	34	0	5	26	7	0	51	29	13	0	394	4811
5:35 PM	10	52	18	0	23	158	32	0	6	28	12	0	17	21	13	0	390	4806
5:40 PM	18	40	36	0	18	97	22	0	8	32	13	0	38	30	6	0	358	4807
5:45 PM	11	63	35	0	18	137	34	0	7	29	14	0	26	19	6	0	399	4796
5:50 PM	19	52	32	0	11	101	9	0	12	29	17	0	44	33	5	0	364	4773
5:55 PM	13	46	25	0	16	108	18	0	6	21	9	0	39	25	8	0	334	4706

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	172	856	372	0	192	1620	448	0	108	396	100	0	460	276	112	0	5112
Heavy Trucks	8	36	24		0	28	4		20	44	4		4	8	4		184
Pedestrians		0				0				0				0			0
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/10/2008 5:19 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

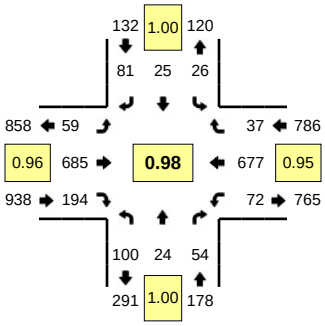
Method for determining peak hour: Total Entering Volume

LOCATION: Shopping Center -- Tualatin Sherwood Rd

QC JOB #: 10393708

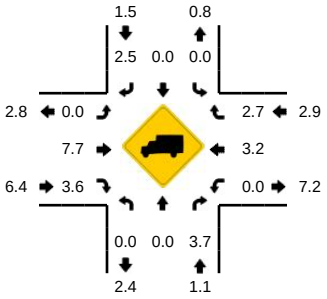
CITY/STATE: Sherwood, OR

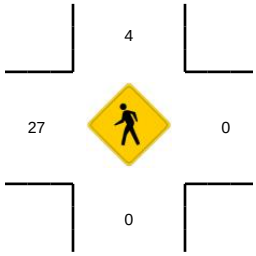
DATE: 11/5/2008

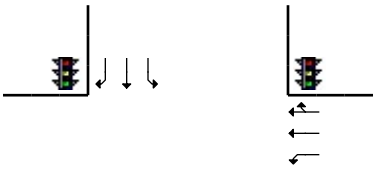


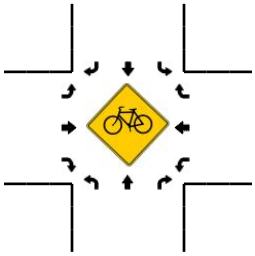
Peak-Hour: 4:45 PM -- 5:45 PM

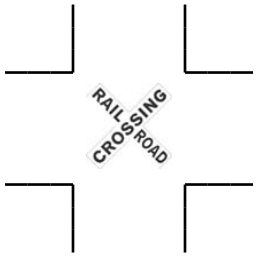
Peak 15-Min: 5:15 PM -- 5:30 PM

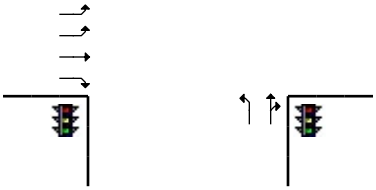


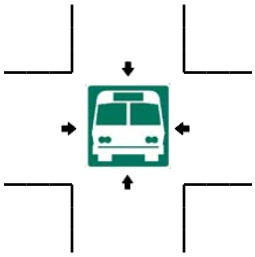












5-Min Count Period Beginning At	Shopping Center (Northbound)				Shopping Center (Southbound)				Tualatin Sherwood Rd (Eastbound)				Tualatin Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	10	2	6	0	0	1	7	0	1	60	15	0	9	43	1	0	155	
4:05 PM	5	3	3	0	1	2	6	0	4	38	12	0	10	45	1	0	130	
4:10 PM	9	1	5	0	0	3	7	0	3	62	17	0	0	70	9	0	186	
4:15 PM	5	1	3	0	0	0	6	0	2	55	12	0	5	47	2	0	138	
4:20 PM	5	3	8	0	0	3	2	0	3	48	18	0	8	41	1	0	140	
4:25 PM	11	1	3	0	1	6	4	0	3	49	14	0	12	37	2	0	143	
4:30 PM	6	2	7	0	2	2	4	0	8	53	16	0	6	42	4	0	152	
4:35 PM	7	2	6	0	2	0	5	0	5	53	20	0	4	67	1	0	172	
4:40 PM	6	3	5	0	0	3	2	0	9	52	9	0	5	57	0	0	151	
4:45 PM	5	1	5	0	3	2	5	0	1	55	19	0	7	50	2	0	155	
4:50 PM	10	1	3	0	1	1	7	0	4	67	27	0	5	65	3	0	194	
4:55 PM	6	1	5	0	0	4	13	0	7	48	26	0	3	64	3	0	180	1896
5:00 PM	8	2	2	0	2	2	7	0	8	52	9	0	8	50	9	0	159	1900
5:05 PM	9	1	4	0	4	2	5	0	5	54	16	0	5	58	3	0	166	1936
5:10 PM	4	5	10	0	2	0	6	0	5	58	10	0	6	57	1	0	164	1914
5:15 PM	9	2	3	0	2	3	7	0	4	50	16	0	7	66	1	0	170	1946
5:20 PM	9	3	2	0	1	1	5	0	6	68	11	0	4	61	4	0	175	1981
5:25 PM	10	0	4	0	2	1	4	0	4	72	14	0	5	55	4	0	175	2013
5:30 PM	14	3	4	0	2	3	7	0	5	51	7	0	5	52	4	0	157	2018
5:35 PM	6	2	8	0	4	2	4	0	2	49	24	0	7	54	3	0	165	2011
5:40 PM	10	3	4	0	3	4	11	0	8	61	15	0	10	45	0	0	174	2034
5:45 PM	8	3	2	0	2	2	5	0	5	65	10	0	3	55	4	0	164	2043
5:50 PM	5	3	2	0	5	6	8	0	5	49	11	0	3	53	0	0	150	1999
5:55 PM	12	1	2	0	0	5	16	0	5	50	14	0	7	62	3	0	177	1996

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	112	20	36	0	20	20	64	0	56	760	164	0	64	728	36	0	2080
Heavy Trucks	0	0	4		0	0	4		0	72	4		0	24	0		108
Pedestrians		0				4				4				0			8
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/10/2008 5:19 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

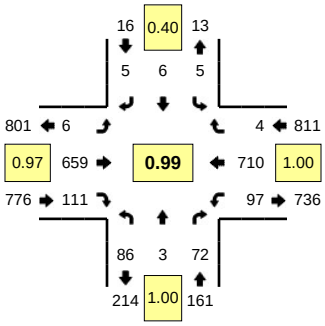
Method for determining peak hour: Total Entering Volume

LOCATION: Baler Way -- Tualatin Sherwood Rd

QC JOB #: 10393710

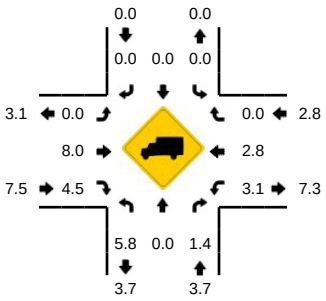
CITY/STATE: Sherwood, OR

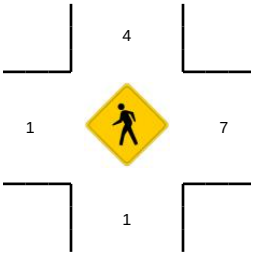
DATE: 11/5/2008

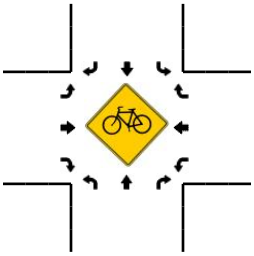


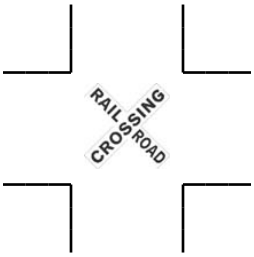
Peak-Hour: 4:45 PM -- 5:45 PM

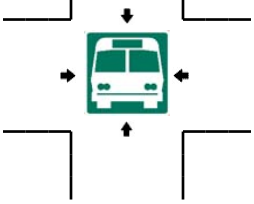
Peak 15-Min: 5:15 PM -- 5:30 PM











5-Min Count Period Beginning At	Baler Way (Northbound)				Baler Way (Southbound)				Tualatin Sherwood Rd (Eastbound)				Tualatin Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	0	5	0	0	0	0	0	0	58	11	0	8	46	1	0	131	
4:05 PM	9	0	4	0	1	1	2	0	0	33	8	0	8	70	1	0	137	
4:10 PM	8	1	7	0	1	0	0	0	0	57	8	0	1	48	1	0	132	
4:15 PM	4	0	8	0	0	0	1	0	0	46	6	0	4	47	1	0	117	
4:20 PM	6	0	5	0	0	0	0	0	0	52	14	0	5	45	1	0	128	
4:25 PM	3	0	11	0	0	1	1	0	0	44	8	0	7	47	0	0	122	
4:30 PM	10	0	1	0	0	1	0	0	0	61	6	0	12	46	0	0	137	
4:35 PM	8	0	4	0	0	1	1	0	2	45	9	0	8	59	0	0	137	
4:40 PM	9	1	10	0	1	1	4	0	2	51	11	0	4	56	0	0	150	
4:45 PM	6	0	6	0	1	0	0	0	0	56	6	0	12	53	0	0	140	
4:50 PM	11	0	6	0	0	1	0	0	1	60	7	0	5	68	2	0	161	
4:55 PM	9	0	4	0	0	1	0	0	0	42	6	0	7	60	0	0	129	1621
5:00 PM	3	0	9	0	0	0	1	0	0	52	14	0	8	53	1	0	141	1631
5:05 PM	5	0	4	0	0	0	0	0	0	57	7	0	9	65	1	0	148	1642
5:10 PM	10	0	4	0	0	1	0	0	3	59	8	0	3	51	0	0	139	1649
5:15 PM	5	2	6	0	0	0	2	0	0	49	7	0	6	75	0	0	152	1684
5:20 PM	6	0	4	0	4	2	1	0	2	56	10	0	6	56	0	0	147	1703
5:25 PM	8	0	4	0	0	1	0	0	0	60	15	0	8	52	0	0	148	1729
5:30 PM	6	0	7	0	0	0	0	0	0	45	12	0	7	57	0	0	134	1726
5:35 PM	9	1	9	0	0	0	0	0	0	60	9	0	16	62	0	0	166	1755
5:40 PM	8	0	9	0	0	0	1	0	0	63	10	0	10	58	0	0	159	1764
5:45 PM	10	3	7	0	0	0	0	0	0	57	9	0	9	48	1	0	144	1768
5:50 PM	9	2	7	0	0	0	2	0	0	40	17	0	7	55	0	0	139	1746
5:55 PM	7	0	2	0	0	0	1	0	0	46	9	0	5	50	0	0	120	1737

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	76	8	56	0	16	12	12	0	8	660	128	0	80	732	0	0	1788
Heavy Trucks	4	0	0		0	0	0		0	84	0		0	28	0		116
Pedestrians		0				12				0				12			24
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/10/2008 5:19 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

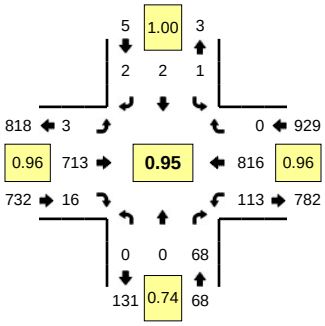
Method for determining peak hour: Total Entering Volume

LOCATION: Adams Ave -- Tualatin Sherwood Rd

QC JOB #: 10393712

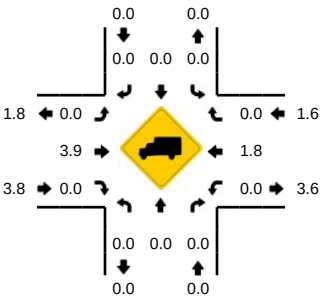
CITY/STATE: Sherwood, OR

DATE: 11/5/2008

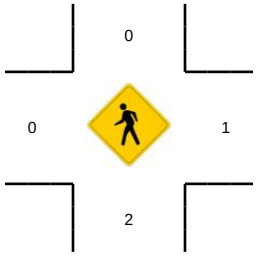


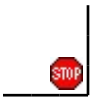
Peak-Hour: 4:45 PM -- 5:45 PM

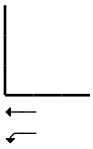
Peak 15-Min: 5:15 PM -- 5:30 PM

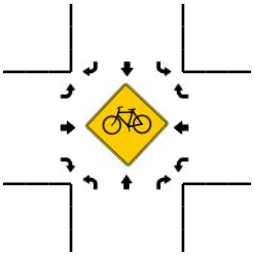


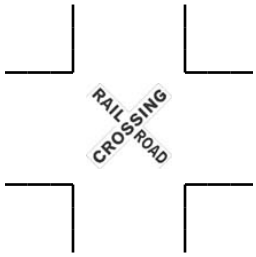
Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

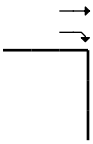


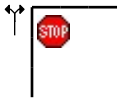












5-Min Count Period Beginning At	Adams Ave (Northbound)				Adams Ave (Southbound)				Tualatin Sherwood Rd (Eastbound)				Tualatin Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	4	0	0	0	1	0	2	59	0	0	9	54	1	0	130	
4:05 PM	2	0	6	0	0	0	0	0	0	39	2	0	5	75	0	0	129	
4:10 PM	0	0	4	0	0	1	0	0	0	58	3	0	3	49	0	0	118	
4:15 PM	0	0	9	0	0	1	0	0	1	50	1	0	10	57	1	0	130	
4:20 PM	0	0	3	0	0	0	0	0	0	58	1	0	11	43	0	0	116	
4:25 PM	0	0	1	0	0	0	0	0	1	45	0	0	16	61	0	0	124	
4:30 PM	0	0	6	0	0	0	2	0	0	65	0	0	7	56	0	0	136	
4:35 PM	1	0	4	0	0	0	0	0	1	48	4	0	7	59	0	0	124	
4:40 PM	1	0	3	0	0	0	1	0	0	62	1	0	5	55	0	0	128	
4:45 PM	0	0	7	0	0	1	0	0	1	54	1	0	9	66	0	0	139	
4:50 PM	0	0	9	0	0	0	0	0	0	74	1	0	4	75	0	0	163	
4:55 PM	0	0	6	0	0	0	0	0	0	43	1	0	8	66	0	0	124	1561
5:00 PM	0	0	1	0	0	1	0	0	0	54	3	0	8	64	0	0	131	1562
5:05 PM	0	0	4	0	0	0	0	0	0	54	2	0	11	73	0	0	144	1577
5:10 PM	0	0	7	0	0	0	0	0	0	59	0	0	10	49	0	0	125	1584
5:15 PM	0	0	7	0	0	0	0	0	0	64	0	0	11	86	0	0	168	1622
5:20 PM	0	0	7	0	0	0	0	0	2	58	2	0	7	60	0	0	136	1642
5:25 PM	0	0	9	0	0	0	1	0	0	63	2	0	14	65	0	0	154	1672
5:30 PM	0	0	3	0	0	0	0	0	0	51	2	0	12	62	0	0	130	1666
5:35 PM	0	0	5	0	0	0	0	0	0	63	1	0	7	76	0	0	152	1694
5:40 PM	0	0	3	0	1	0	1	0	0	76	1	0	12	74	0	0	168	1734
5:45 PM	0	0	9	0	0	0	0	0	0	59	3	0	5	75	0	0	151	1746
5:50 PM	1	0	6	0	0	0	0	0	1	42	1	0	10	39	0	0	100	1683
5:55 PM	0	0	4	0	0	0	0	0	0	49	0	0	6	50	0	0	109	1668

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	92	0	0	0	4	0	8	740	16	0	128	844	0	0	1832
Heavy Trucks	0	0	0		0	0	0		0	48	0		0	16	0		64
Pedestrians		0				0				0				0			0
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/10/2008 5:19 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

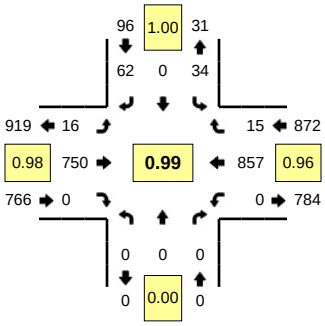
Method for determining peak hour: Total Entering Volume

LOCATION: Gerda Ln -- Tualatin Sherwood Rd

QC JOB #: 10393714

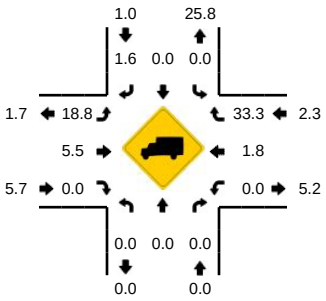
CITY/STATE: Sherwood, OR

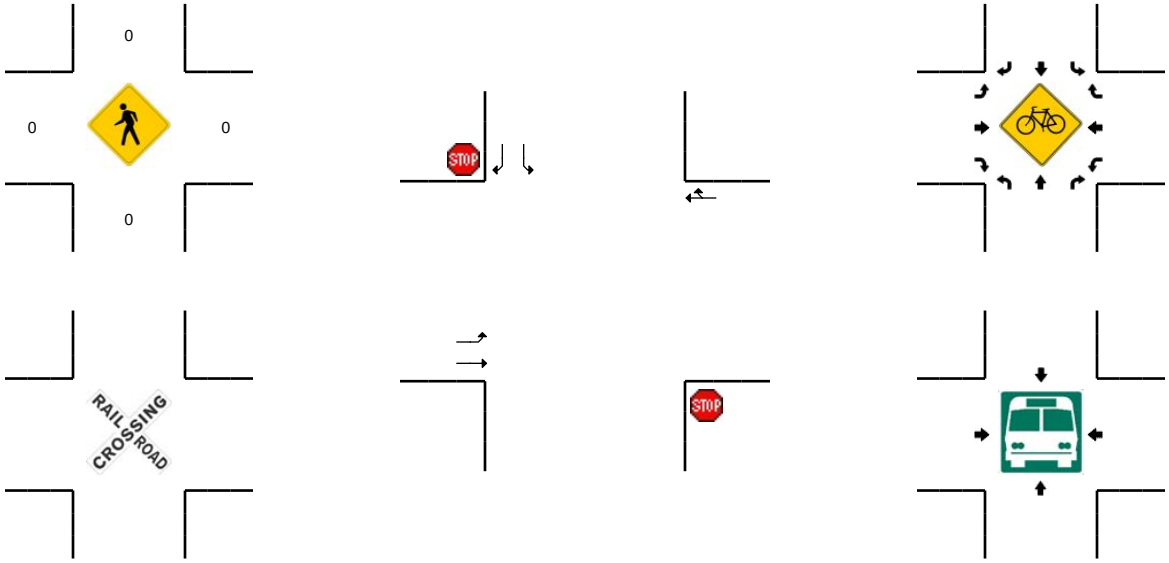
DATE: 11/5/2008



Peak-Hour: 4:45 PM -- 5:45 PM

Peak 15-Min: 5:15 PM -- 5:30 PM





5-Min Count Period Beginning At	Gerda Ln (Northbound)				Gerda Ln (Southbound)				Tualatin Sherwood Rd (Eastbound)				Tualatin Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	6	0	11	0	4	57	0	0	0	50	4	0	132	
4:05 PM	0	0	0	0	2	0	5	0	1	42	0	0	0	66	2	0	118	
4:10 PM	0	0	0	0	3	0	7	0	3	57	0	0	0	49	3	0	122	
4:15 PM	0	0	0	0	5	0	4	0	5	63	0	0	0	64	3	0	144	
4:20 PM	0	0	0	0	3	0	1	0	1	58	0	0	0	59	2	0	124	
4:25 PM	0	0	0	0	5	0	6	0	1	38	0	0	0	52	5	0	107	
4:30 PM	0	0	0	0	3	0	9	0	5	65	0	0	0	61	3	0	146	
4:35 PM	0	0	0	0	6	0	5	0	1	60	0	0	0	60	3	0	135	
4:40 PM	0	0	0	0	0	0	5	0	2	51	0	0	0	57	3	0	118	
4:45 PM	0	0	0	0	3	0	5	0	1	65	0	0	0	68	2	0	144	
4:50 PM	0	0	0	0	2	0	4	0	3	69	0	0	0	74	1	0	153	
4:55 PM	0	0	0	0	3	0	6	0	3	62	0	0	0	66	1	0	141	1584
5:00 PM	0	0	0	0	1	0	5	0	1	54	0	0	0	73	1	0	135	1587
5:05 PM	0	0	0	0	7	0	8	0	2	47	0	0	0	68	2	0	134	1603
5:10 PM	0	0	0	0	4	0	5	0	1	74	0	0	0	59	2	0	145	1626
5:15 PM	0	0	0	0	3	0	7	0	0	73	0	0	0	82	2	0	167	1649
5:20 PM	0	0	0	0	1	0	2	0	1	51	0	0	0	66	0	0	121	1646
5:25 PM	0	0	0	0	3	0	3	0	2	68	0	0	0	74	2	0	152	1691
5:30 PM	0	0	0	0	4	0	5	0	0	59	0	0	0	74	2	0	144	1689
5:35 PM	0	0	0	0	2	0	6	0	1	68	0	0	0	70	0	0	147	1701
5:40 PM	0	0	0	0	1	0	6	0	1	60	0	0	0	83	0	0	151	1734
5:45 PM	0	0	0	0	2	0	3	0	1	63	0	0	0	65	1	0	135	1725
5:50 PM	0	0	0	0	1	0	4	0	1	66	0	0	0	55	3	0	130	1702
5:55 PM	0	0	0	0	0	0	1	0	1	48	0	0	0	57	1	0	108	1669

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	28	0	48	0	12	768	0	0	0	888	16	0	1760
Heavy Trucks	0	0	0		0	0	0		4	52	0		0	20	0		76
Pedestrians		0				0				0				0			0
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/10/2008 5:19 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

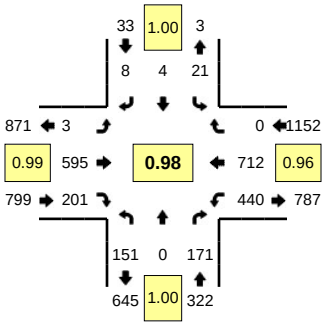
Method for determining peak hour: Total Entering Volume

LOCATION: Oregon St -- Tualatin Sherwood Rd

QC JOB #: 10393716

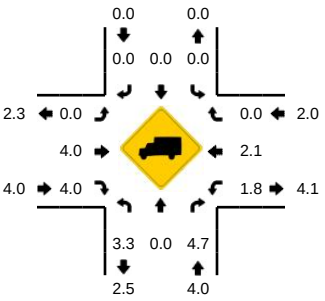
CITY/STATE: Sherwood, OR

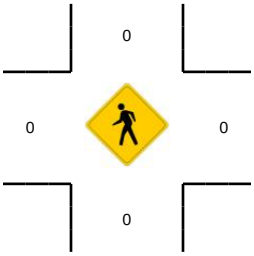
DATE: 11/5/2008

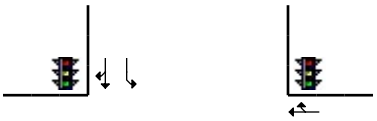


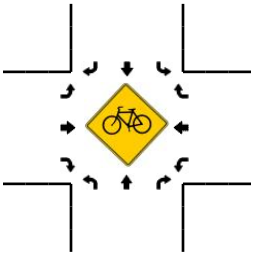
Peak-Hour: 4:45 PM -- 5:45 PM

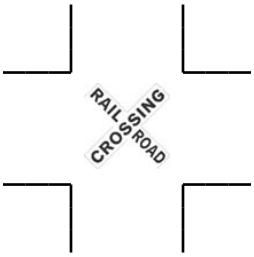
Peak 15-Min: 5:15 PM -- 5:30 PM

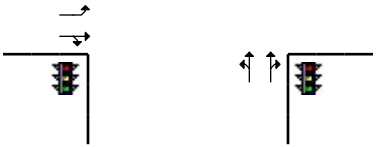


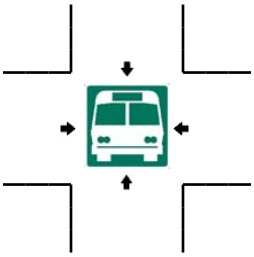












5-Min Count Period Beginning At	Oregon St (Northbound)				Oregon St (Southbound)				Tualatin Sherwood Rd (Eastbound)				Tualatin Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	7	0	14	0	1	0	0	0	0	59	17	0	22	52	1	0	173	
4:05 PM	11	0	21	0	4	1	0	0	0	34	10	0	29	59	2	0	171	
4:10 PM	3	0	14	0	3	1	0	0	0	57	11	0	21	54	1	0	165	
4:15 PM	12	0	18	0	0	0	0	0	0	37	24	0	29	48	1	0	169	
4:20 PM	11	0	13	0	2	0	0	0	1	40	17	0	38	49	1	0	172	
4:25 PM	8	0	16	0	2	0	0	0	1	48	11	0	18	49	1	0	154	
4:30 PM	8	0	9	0	3	1	0	0	0	59	13	0	17	61	0	0	171	
4:35 PM	10	0	13	0	1	1	0	0	3	51	17	0	40	51	2	0	189	
4:40 PM	9	0	18	0	0	0	3	0	1	34	11	0	36	46	0	0	158	
4:45 PM	16	0	11	0	3	1	0	0	0	61	15	0	30	59	0	0	196	
4:50 PM	6	0	16	0	3	0	3	0	1	54	22	0	29	62	0	0	196	
4:55 PM	11	0	8	0	4	0	0	0	0	49	11	0	32	59	0	0	174	2088
5:00 PM	15	0	13	0	1	0	0	0	0	40	5	0	47	54	0	0	175	2090
5:05 PM	10	0	17	0	0	0	2	0	0	50	18	0	30	62	0	0	189	2108
5:10 PM	8	0	17	0	4	0	1	0	1	57	24	0	39	49	0	0	200	2143
5:15 PM	13	0	17	0	2	1	0	0	0	48	22	0	36	68	0	0	207	2181
5:20 PM	7	0	13	0	0	2	2	0	1	40	20	0	48	56	0	0	189	2198
5:25 PM	14	0	16	0	1	0	0	0	0	50	21	0	29	64	0	0	195	2239
5:30 PM	14	0	12	0	0	0	0	0	0	55	16	0	44	59	0	0	200	2268
5:35 PM	15	0	9	0	2	0	0	0	0	52	16	0	37	54	0	0	185	2264
5:40 PM	22	0	22	0	1	0	0	0	0	39	11	0	39	66	0	0	200	2306
5:45 PM	8	0	12	0	2	0	0	0	0	49	9	0	43	53	1	0	177	2287
5:50 PM	2	1	12	0	0	0	0	0	0	63	14	0	37	45	0	0	174	2265
5:55 PM	10	0	8	0	1	1	0	0	0	45	13	0	24	53	1	0	156	2247

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	136	0	184	0	12	12	8	0	4	552	252	0	452	752	0	0	2364
Heavy Trucks	4	0	12		0	0	0		0	24	24		12	20	0		96
Pedestrians		0				0				0				0			0
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/10/2008 5:19 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

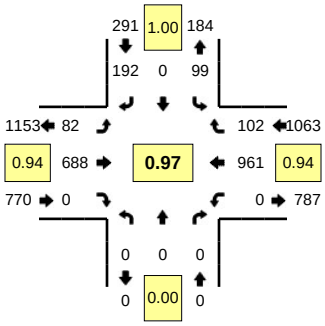
Method for determining peak hour: Total Entering Volume

LOCATION: Cipole Rd -- Tualatin Sherwood Rd

QC JOB #: 10393718

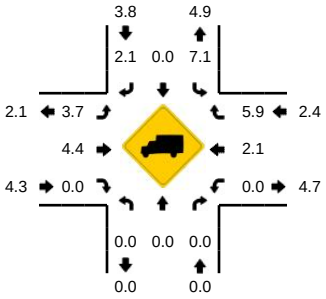
CITY/STATE: Sherwood, OR

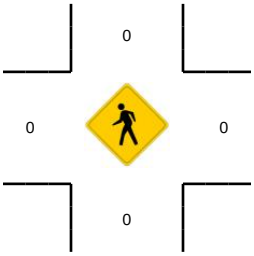
DATE: 11/5/2008

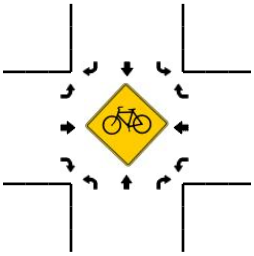


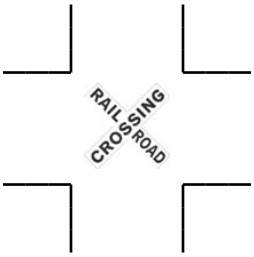
Peak-Hour: 4:45 PM -- 5:45 PM

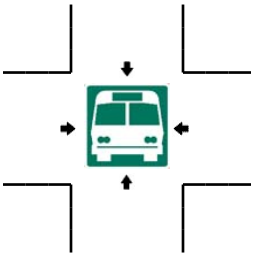
Peak 15-Min: 5:15 PM -- 5:30 PM











5-Min Count Period Beginning At	Cipole Rd (Northbound)				Cipole Rd (Southbound)				Tualatin Sherwood Rd (Eastbound)				Tualatin Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	25	0	18	0	9	57	0	0	0	68	12	0	189	
4:05 PM	0	0	0	0	22	0	14	0	10	44	0	0	0	67	3	0	160	
4:10 PM	0	0	0	0	11	0	19	0	9	55	0	0	0	47	13	0	154	
4:15 PM	0	0	0	0	6	0	26	0	14	64	0	0	0	56	6	0	172	
4:20 PM	0	0	0	0	6	0	16	0	6	50	0	0	0	75	4	0	157	
4:25 PM	0	0	0	0	8	0	9	0	11	52	0	0	0	61	8	0	149	
4:30 PM	0	0	0	0	17	0	22	0	6	52	0	0	0	56	6	0	159	
4:35 PM	0	0	0	0	13	0	19	0	7	59	0	0	0	62	7	0	167	
4:40 PM	0	0	0	0	10	0	22	0	6	57	0	0	0	71	16	0	182	
4:45 PM	0	0	0	0	10	0	11	0	6	60	0	0	0	80	17	0	184	
4:50 PM	0	0	0	0	9	0	26	0	12	54	0	0	0	70	2	0	173	
4:55 PM	0	0	0	0	12	0	14	0	8	65	0	0	0	77	5	0	181	2027
5:00 PM	0	0	0	0	10	0	17	0	6	52	0	0	0	83	9	0	177	2015
5:05 PM	0	0	0	0	16	0	17	0	9	54	0	0	0	68	13	0	177	2032
5:10 PM	0	0	0	0	10	0	20	0	4	49	0	0	0	71	14	0	168	2046
5:15 PM	0	0	0	0	5	0	18	0	4	62	0	0	0	80	6	0	175	2049
5:20 PM	0	0	0	0	8	0	11	0	9	66	0	0	0	90	7	0	191	2083
5:25 PM	0	0	0	0	5	0	14	0	4	60	0	0	0	91	9	0	183	2117
5:30 PM	0	0	0	0	7	0	20	0	6	57	0	0	0	78	6	0	174	2132
5:35 PM	0	0	0	0	4	0	16	0	7	43	0	0	0	75	5	0	150	2115
5:40 PM	0	0	0	0	3	0	8	0	7	66	0	0	0	98	9	0	191	2124
5:45 PM	0	0	0	0	7	0	18	0	9	60	0	0	0	78	4	0	176	2116
5:50 PM	0	0	0	0	2	0	10	0	5	70	0	0	0	65	4	0	156	2099
5:55 PM	0	0	0	0	2	0	5	0	1	53	0	0	0	70	1	0	132	2050

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	72	0	172	0	68	752	0	0	0	1044	88	0	2196
Heavy Trucks	0	0	0		8	0	4		4	32	0		0	20	0		68
Pedestrians		0				0				0				0			0
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/10/2008 5:19 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: System Peak

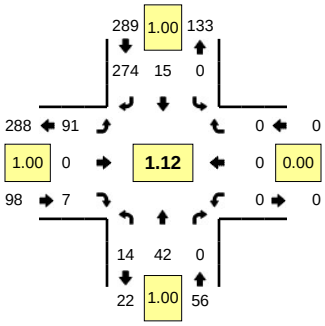
Method for determining peak hour: Total Entering Volume

LOCATION: Cipole Rd -- Galbreath Dr

QC JOB #: 10393720

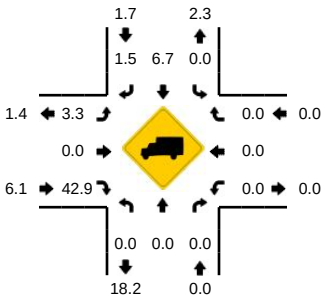
CITY/STATE: Sherwood, OR

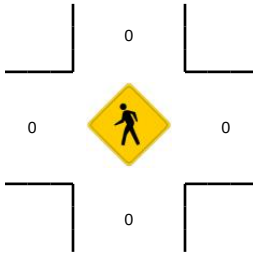
DATE: 11/5/2008

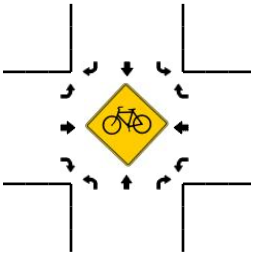


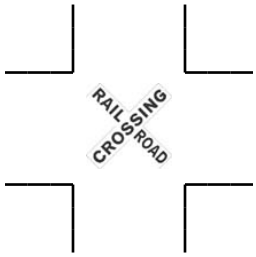
Peak-Hour: 4:45 PM -- 5:45 PM

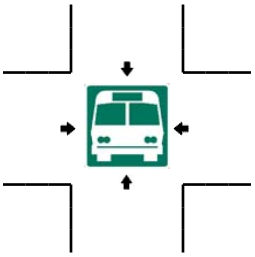
Peak 15-Min: 5:15 PM -- 5:30 PM











5-Min Count Period Beginning At	Cipole Rd (Northbound)				Cipole Rd (Southbound)				Galbreath Dr (Eastbound)				Galbreath Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	4	0	0	0	2	25	0	16	0	1	0	0	0	0	0	50	
4:05 PM	3	3	0	0	0	3	23	0	11	0	2	0	0	0	0	0	45	
4:10 PM	1	2	0	0	0	1	27	0	14	0	1	0	0	0	0	0	46	
4:15 PM	0	3	0	0	0	1	10	0	11	0	5	0	0	0	0	0	30	
4:20 PM	1	2	0	0	0	2	18	0	16	0	2	0	0	0	0	0	41	
4:25 PM	2	4	0	0	0	2	21	0	7	0	1	0	0	0	0	0	37	
4:30 PM	3	5	0	0	0	5	28	0	8	0	1	0	0	0	0	0	50	
4:35 PM	3	4	0	0	0	5	28	0	10	0	1	0	0	0	0	0	51	
4:40 PM	1	4	0	0	0	1	31	0	9	0	1	0	0	0	0	0	47	
4:45 PM	1	3	0	0	0	1	28	0	7	0	2	0	0	0	0	0	42	
4:50 PM	1	3	0	0	0	1	19	0	8	0	1	0	0	0	0	0	33	
4:55 PM	4	9	0	0	0	5	23	0	9	0	0	0	0	0	0	0	50	522
5:00 PM	3	9	0	0	0	3	23	0	13	0	1	0	0	0	0	0	52	524
5:05 PM	0	2	0	0	0	0	29	0	8	0	0	0	0	0	0	0	39	518
5:10 PM	0	4	0	0	0	0	31	0	5	0	0	0	0	0	0	0	40	512
5:15 PM	1	3	0	0	0	1	23	0	11	0	0	0	0	0	0	0	39	521
5:20 PM	0	2	0	0	0	0	25	0	7	0	0	0	0	0	0	0	34	514
5:25 PM	1	3	0	0	0	1	16	0	5	0	0	0	0	0	0	0	26	503
5:30 PM	0	3	0	0	0	0	18	0	7	0	0	0	0	0	0	0	28	481
5:35 PM	2	0	0	0	0	2	23	0	5	0	3	0	0	0	0	0	35	465
5:40 PM	1	1	0	0	0	1	16	0	6	0	0	0	0	0	0	0	25	443
5:45 PM	2	0	0	0	0	2	13	0	9	0	0	0	0	0	0	0	26	427
5:50 PM	1	1	0	0	0	1	14	0	7	0	0	0	0	0	0	0	24	418
5:55 PM	1	1	0	0	0	1	7	0	7	0	0	0	0	0	0	0	17	385

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	32	0	0	0	8	256	0	92	0	0	0	0	0	0	0	396
Heavy Trucks	0	0	0		0	0	4		0	0	0		0	0	0		4
Pedestrians		0				0				0				0			0
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/10/2008 5:19 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: User-Defined

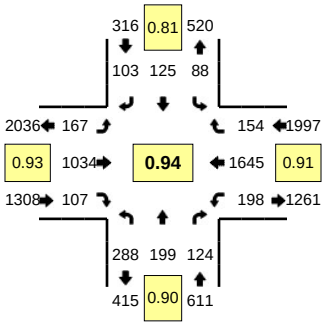
Method for determining peak hour: Total Entering Volume

LOCATION: Hwy 99W -- Edy Rd

QC JOB #: 10396128

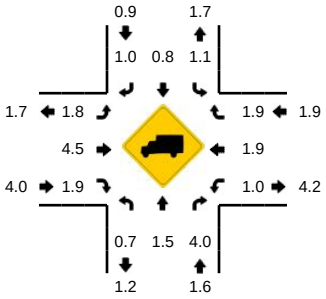
CITY/STATE: Sherwood, OR

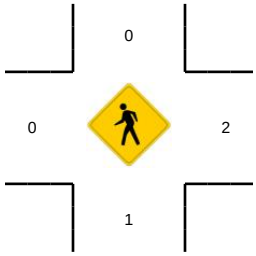
DATE: 11/20/2008

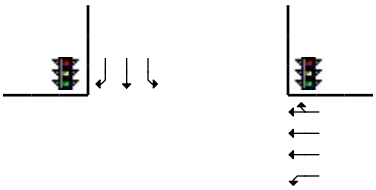


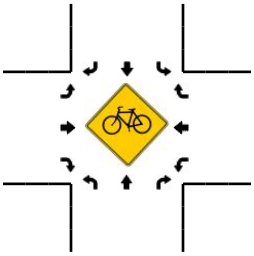
Peak-Hour: 4:50 PM -- 5:50 PM

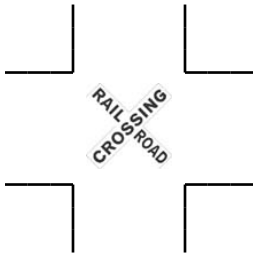
Peak 15-Min: 5:20 PM -- 5:35 PM

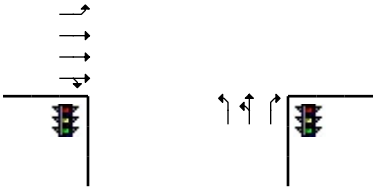


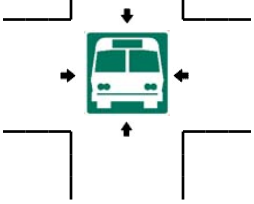












5-Min Count Period Beginning At	Hwy 99W (Northbound)				Hwy 99W (Southbound)				Edy Rd (Eastbound)				Edy Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	22	14	6	0	8	9	9	0	9	64	5	0	12	122	9	1	290	
4:05 PM	20	11	15	0	6	10	6	0	4	98	5	0	17	127	8	1	328	
4:10 PM	23	26	18	0	11	12	12	0	10	59	4	0	15	105	4	0	299	
4:15 PM	16	19	5	0	6	9	8	0	5	119	9	0	10	129	17	1	353	
4:20 PM	20	20	15	0	7	15	11	0	12	70	5	0	14	103	6	2	300	
4:25 PM	19	14	12	0	6	10	13	0	13	71	8	0	8	147	10	3	334	
4:30 PM	33	19	12	0	7	13	14	0	9	90	6	0	17	124	9	1	354	
4:35 PM	16	17	8	0	6	13	9	0	13	92	6	0	9	135	12	1	337	
4:40 PM	22	20	5	0	11	19	12	0	12	63	8	0	17	98	6	1	294	
4:45 PM	17	16	9	0	5	8	9	0	20	105	8	0	15	126	13	1	352	
4:50 PM	30	21	2	0	8	11	16	0	15	78	9	0	21	136	11	3	361	
4:55 PM	23	10	7	0	8	7	12	0	18	96	14	0	6	155	15	2	373	3975
5:00 PM	28	24	11	0	8	15	13	0	15	66	2	0	21	124	12	1	340	4025
5:05 PM	12	11	13	0	10	10	12	0	18	107	6	0	8	131	6	0	344	4041
5:10 PM	26	19	22	0	10	12	8	0	9	70	8	0	14	127	11	0	336	4078
5:15 PM	22	15	9	0	6	12	3	0	9	72	3	0	14	121	14	0	300	4025
5:20 PM	23	19	15	0	5	7	0	0	12	129	13	0	17	158	18	0	416	4141
5:25 PM	22	10	6	0	2	5	12	0	14	84	10	0	20	154	11	0	350	4157
5:30 PM	34	20	11	0	8	15	8	0	12	69	7	0	23	128	18	3	356	4159
5:35 PM	24	9	6	0	7	10	4	0	18	95	8	0	10	144	13	2	350	4172
5:40 PM	26	24	13	0	9	13	8	0	11	78	14	0	18	126	9	3	352	4230
5:45 PM	18	17	9	0	7	8	7	0	16	90	13	0	11	141	16	1	354	4232
5:50 PM	30	18	7	0	9	12	3	0	9	56	8	0	24	98	14	0	288	4159
5:55 PM	17	16	9	0	2	9	4	0	13	109	11	0	12	132	11	1	346	4132

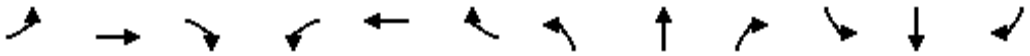
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	316	196	128	0	60	108	80	0	152	1128	120	0	240	1760	188	12	4488
Heavy Trucks	8	0	0		4	4	0		8	76	0		0	8	0		108
Pedestrians		0				0				0				0			0
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/21/2008 2:52 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

2008 Existing Conditions
Study Intersections Operational Analysis



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)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.91			0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1805	3426		1517	3373			1180			1522	
Flt Permitted	0.95	1.00		0.95	1.00			0.88			0.60	
Satd. Flow (perm)	1805	3426		1517	3373			1056			938	
Volume (vph)	6	1812	192	90	668	1	43	3	85	43	19	3
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)	7	2036	216	101	751	1	48	3	96	48	21	3
RTOR Reduction (vph)	0	4	0	0	0	0	0	60	0	0	2	0
Lane Group Flow (vph)	7	2248	0	101	752	0	0	87	0	0	70	0
Heavy Vehicles (%)	0%	3%	12%	19%	7%	0%	44%	67%	44%	21%	21%	0%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	1.1	71.8		10.1	80.8			13.6			13.6	
Effective Green, g (s)	1.6	73.8		10.6	82.8			15.6			15.6	
Actuated g/C Ratio	0.01	0.66		0.09	0.74			0.14			0.14	
Clearance Time (s)	4.5	6.0		4.5	6.0			6.0			6.0	
Vehicle Extension (s)	2.3	4.8		2.3	4.8			2.5			2.5	
Lane Grp Cap (vph)	26	2257		144	2494			147			131	
v/s Ratio Prot	0.00	c0.66		c0.07	0.22							
v/s Ratio Perm								c0.08			0.07	
v/c Ratio	0.27	1.00		0.70	0.30			0.59			0.54	
Uniform Delay, d1	54.6	19.0		49.2	4.9			45.2			44.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	3.2	17.9		12.8	0.1			5.2			3.3	
Delay (s)	57.9	36.9		61.9	5.0			50.4			48.1	
Level of Service	E	D		E	A			D			D	
Approach Delay (s)		36.9			11.8			50.4			48.1	
Approach LOS		D			B			D			D	

Intersection Summary			
HCM Average Control Delay	31.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.0%	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)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	0.97		1.00	1.00	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes		1.00	1.00		0.98	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1805	1258		1642	1615	1770	3505	1494	1543	3335	
Flt Permitted		0.74	1.00		0.75	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1407	1258		1297	1615	1770	3505	1494	1543	3335	
Volume (vph)	10	0	4	24	0	7	47	2008	50	12	701	21
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	0	4	26	0	8	51	2159	54	13	754	23
RTOR Reduction (vph)	0	0	4	0	0	8	0	0	9	0	1	0
Lane Group Flow (vph)	0	11	0	0	26	0	51	2159	45	13	776	0
Confl. Peds. (#/hr)			3	3					3	3		
Heavy Vehicles (%)	0%	0%	25%	8%	0%	0%	2%	3%	4%	17%	8%	0%
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			
Actuated Green, G (s)		5.3	5.3		5.3	5.3	6.8	96.7	96.7	1.5	91.4	
Effective Green, g (s)		7.3	7.3		7.3	7.3	7.3	98.7	98.7	2.0	93.4	
Actuated g/C Ratio		0.06	0.06		0.06	0.06	0.06	0.82	0.82	0.02	0.78	
Clearance Time (s)		6.0	6.0		6.0	6.0	4.5	6.0	6.0	4.5	6.0	
Vehicle Extension (s)		2.5	2.5		2.5	2.5	2.3	4.8	4.8	2.3	4.8	
Lane Grp Cap (vph)		86	77		79	98	108	2883	1229	26	2596	
v/s Ratio Prot							c0.03	c0.62		0.01	0.23	
v/s Ratio Perm		0.01	0.00		c0.02	0.00			0.03			
v/c Ratio		0.13	0.00		0.33	0.00	0.47	0.75	0.04	0.50	0.30	
Uniform Delay, d1		53.3	52.9		54.0	52.9	54.5	4.9	1.9	58.5	3.8	
Progression Factor		1.00	1.00		1.00	1.00	1.13	2.73	1.21	1.00	1.00	
Incremental Delay, d2		0.5	0.0		1.8	0.0	1.2	1.2	0.0	8.5	0.3	
Delay (s)		53.8	52.9		55.8	53.0	62.8	14.6	2.4	67.0	4.1	
Level of Service		D	D		E	D	E	B	A	E	A	
Approach Delay (s)		53.6			55.1			15.4			5.2	
Approach LOS		D			E			B			A	

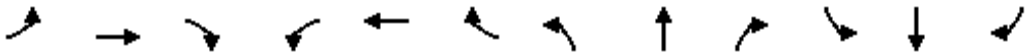
Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	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	0.98		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	5085	1538	1641	4663		3019	1624	1336	1736	3300	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1719	5085	1538	1641	4663		3019	1624	1336	1736	3300	
Volume (vph)	159	1712	479	70	569	79	276	176	83	285	429	133
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)	167	1802	504	74	599	83	291	185	87	300	452	140
RTOR Reduction (vph)	0	0	226	0	21	0	0	0	74	0	24	0
Lane Group Flow (vph)	167	1802	278	74	661	0	291	185	13	300	568	0
Confl. Peds. (#/hr)									2	2		
Heavy Vehicles (%)	5%	2%	5%	10%	8%	18%	16%	17%	18%	4%	6%	4%
Turn Type	Prot		Perm	Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases			2						8			
Actuated Green, G (s)	40.8	53.1	53.1	8.6	20.9		16.5	16.5	16.5	21.8	21.8	
Effective Green, g (s)	41.3	54.6	54.6	9.1	22.4		17.5	17.5	17.5	22.8	22.8	
Actuated g/C Ratio	0.34	0.46	0.46	0.08	0.19		0.15	0.15	0.15	0.19	0.19	
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	2.3	4.7	4.7	2.3	4.7		2.3	2.3	2.3	2.3	2.3	
Lane Grp Cap (vph)	592	2314	700	124	870		440	237	195	330	627	
v/s Ratio Prot	0.10	c0.35		0.05	c0.14		0.10	c0.11		c0.17	0.17	
v/s Ratio Perm			0.18						0.01			
v/c Ratio	0.28	0.78	0.40	0.60	0.76		0.66	0.78	0.07	0.91	0.91	
Uniform Delay, d1	28.6	27.6	21.8	53.7	46.2		48.4	49.4	44.2	47.6	47.5	
Progression Factor	0.32	0.26	0.15	0.90	0.92		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.8	0.3	5.7	6.0		3.2	14.5	0.1	27.2	16.5	
Delay (s)	9.2	8.0	3.5	54.2	48.5		51.6	63.9	44.3	74.8	64.0	
Level of Service	A	A	A	D	D		D	E	D	E	E	
Approach Delay (s)		7.2			49.0			54.5			67.7	
Approach LOS		A			D			D			E	

Intersection Summary			
HCM Average Control Delay	31.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.3%	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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	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		1.00	0.86		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	3360		1543	3029		1583	1607		1805	1900	1590
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	3360		1543	3029		1583	1607		1805	1900	1590
Volume (vph)	23	867	88	29	463	8	64	4	53	3	5	8
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	26	985	100	33	526	9	73	5	60	3	6	9
RTOR Reduction (vph)	0	6	0	0	1	0	0	56	0	0	0	9
Lane Group Flow (vph)	26	1079	0	33	534	0	73	9	0	3	6	0
Confl. Peds. (#/hr)			1	1			3					3
Heavy Vehicles (%)	0%	6%	3%	17%	19%	12%	14%	0%	2%	0%	0%	0%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	0.9	45.6		2.1	46.5		2.1	2.9		0.9	1.3	1.3
Effective Green, g (s)	3.2	47.5		4.1	48.4		4.8	4.6		3.2	3.0	3.0
Actuated g/C Ratio	0.04	0.63		0.05	0.64		0.06	0.06		0.04	0.04	0.04
Clearance Time (s)	6.3	5.9		6.0	5.9		6.7	5.7		6.3	5.7	5.7
Vehicle Extension (s)	2.7	3.2		2.7	3.2		2.6	1.8		2.7	1.8	1.8
Lane Grp Cap (vph)	149	2117		84	1944		101	98		77	76	63
v/s Ratio Prot	0.01	c0.32		c0.02	0.18		c0.05	c0.01		0.00	0.00	
v/s Ratio Perm												0.00
v/c Ratio	0.17	0.51		0.39	0.27		0.72	0.09		0.04	0.08	0.01
Uniform Delay, d1	34.8	7.6		34.4	5.9		34.6	33.4		34.6	34.9	34.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2		2.5	0.1		21.4	0.1		0.2	0.2	0.0
Delay (s)	35.3	7.8		37.0	6.0		56.0	33.6		34.8	35.0	34.8
Level of Service	D	A		D	A		E	C		C	D	C
Approach Delay (s)		8.5			7.8			45.4			34.9	
Approach LOS		A			A			D			C	

Intersection Summary			
HCM Average Control Delay	11.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



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)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3412		1556	1610			1504	1583	1805	1615	
Flt Permitted	0.95	1.00		0.95	1.00			0.76	1.00	0.73	1.00	
Satd. Flow (perm)	1805	3412		1556	1610			1198	1583	1396	1615	
Volume (vph)	7	906	25	37	468	8	30	0	90	1	0	2
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	8	1030	28	42	532	9	34	0	102	1	0	2
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	89	0	2	0
Lane Group Flow (vph)	8	1057	0	42	541	0	0	34	13	1	0	0
Heavy Vehicles (%)	0%	5%	20%	16%	18%	0%	20%	0%	2%	0%	0%	0%
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	1.2	45.5		3.6	47.9			7.3	7.3	7.3	7.3	
Effective Green, g (s)	3.3	47.2		5.7	49.6			9.6	9.6	9.6	9.6	
Actuated g/C Ratio	0.04	0.63		0.08	0.67			0.13	0.13	0.13	0.13	
Clearance Time (s)	6.1	5.7		6.1	5.7			6.3	6.3	6.3	6.3	
Vehicle Extension (s)	2.7	4.5		2.7	4.5			2.6	2.6	2.7	2.7	
Lane Grp Cap (vph)	80	2162		119	1072			154	204	180	208	
v/s Ratio Prot	0.00	0.31		c0.03	c0.34						0.00	
v/s Ratio Perm								c0.03	0.01	0.00		
v/c Ratio	0.10	0.49		0.35	0.50			0.22	0.06	0.01	0.00	
Uniform Delay, d1	34.2	7.2		32.6	6.3			29.1	28.5	28.3	28.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.3		1.5	0.6			0.6	0.1	0.0	0.0	
Delay (s)	34.6	7.5		34.2	6.9			29.7	28.6	28.3	28.3	
Level of Service	C	A		C	A			C	C	C	C	
Approach Delay (s)		7.8			8.9			28.9			28.3	
Approach LOS		A			A			C			C	

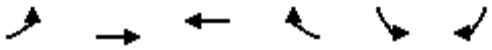
Intersection Summary			
HCM Average Control Delay	9.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	74.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	989	3	24	508	1	0	0	62	0	0	5
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	6	1137	3	28	584	1	0	0	71	0	0	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		688										
pX, platoon unblocked				0.39			0.39	0.39	0.39	0.39	0.39	
vC, conflicting volume	585			1140			1793	1789	1137	1859	1791	584
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	585			1359			3033	3021	1351	3202	3028	584
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.1	6.5	6.6
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.5	4.0	3.7
p0 queue free %	99			86			100	100	0	100	100	99
cM capacity (veh/h)	907			200			3	4	71	0	4	447

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	6	1137	3	28	585	0	71	6
Volume Left	6	0	0	28	0	0	0	0
Volume Right	0	0	3	0	1	0	71	6
cSH	907	1700	1700	200	1700	1700	71	447
Volume to Capacity	0.01	0.67	0.00	0.14	0.34	0.00	1.00	0.01
Queue Length 95th (ft)	0	0	0	12	0	0	129	1
Control Delay (s)	9.0	0.0	0.0	25.9	0.0	0.0	205.5	13.2
Lane LOS	A			D		A	F	B
Approach Delay (s)	0.0			1.2		205.5		13.2
Approach LOS						F		B

Intersection Summary				
Average Delay	8.4			
Intersection Capacity Utilization	62.6%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	50	981	518	45	27	24
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	57	1115	589	51	31	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	640				1843	614
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	640				1843	614
tC, single (s)	4.1				7.0	6.7
tC, 2 stage (s)						
tF (s)	2.2				4.0	3.8
p0 queue free %	94				45	93
cM capacity (veh/h)	954				55	414

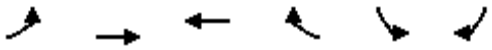
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	57	1115	640	31	27
Volume Left	57	0	0	31	0
Volume Right	0	0	51	0	27
cSH	954	1700	1700	55	414
Volume to Capacity	0.06	0.66	0.38	0.55	0.07
Queue Length 95th (ft)	5	0	0	55	5
Control Delay (s)	9.0	0.0	0.0	131.5	14.3
Lane LOS	A			F	B
Approach Delay (s)	0.4		0.0	76.3	
Approach LOS				F	

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	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			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1759	1538	1641	1666			1656	1524	1150	1509	
Flt Permitted	0.95	1.00	1.00	0.13	1.00			0.73	1.00	0.38	1.00	
Satd. Flow (perm)	1805	1759	1538	222	1666			1271	1524	463	1509	
Volume (vph)	3	770	208	129	422	10	162	8	447	7	3	3
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)	3	846	229	142	464	11	178	9	491	8	3	3
RTOR Reduction (vph)	0	0	32	0	1	0	0	0	94	0	3	0
Lane Group Flow (vph)	3	846	197	142	474	0	0	187	397	8	3	0
Heavy Vehicles (%)	0%	8%	5%	10%	14%	0%	10%	0%	6%	57%	33%	0%
Turn Type	Prot		Perm	pm+pt			Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases			2	6			8		8	4		
Actuated Green, G (s)	7.6	80.3	80.3	88.1	88.1			20.3	35.7	20.3	20.3	
Effective Green, g (s)	9.6	82.3	82.3	90.1	90.1			22.3	39.7	22.3	22.3	
Actuated g/C Ratio	0.07	0.61	0.61	0.67	0.67			0.17	0.30	0.17	0.17	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	1.0	2.5	2.5	1.0	2.5			1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	129	1080	945	334	1120			212	497	77	251	
v/s Ratio Prot	0.00	c0.48		0.06	0.28				c0.10		0.00	
v/s Ratio Perm			0.13	0.23				c0.15	0.16	0.02		
v/c Ratio	0.02	0.78	0.21	0.43	0.42			0.88	0.80	0.10	0.01	
Uniform Delay, d1	57.8	19.2	11.4	18.1	10.1			54.6	43.5	47.4	46.7	
Progression Factor	1.00	1.00	1.00	1.37	1.45			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	3.6	0.1	0.3	1.1			31.3	8.2	0.2	0.0	
Delay (s)	57.9	22.9	11.5	25.2	15.7			85.9	51.7	47.6	46.7	
Level of Service	E	C	B	C	B			F	D	D	D	
Approach Delay (s)		20.6			17.9			61.1			47.2	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM Average Control Delay	31.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
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)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	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)	1626	1759	1696	1346	1172	1302
Flt Permitted	0.41	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	707	1759	1696	1346	1172	1302
Volume (vph)	170	997	482	122	78	72
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	179	1049	507	128	82	76
RTOR Reduction (vph)	0	0	0	22	0	63
Lane Group Flow (vph)	179	1049	507	106	82	13
Heavy Vehicles (%)	11%	8%	12%	20%	54%	24%
Turn Type	pm+pt			Perm		pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2			6		4
Actuated Green, G (s)	109.9	109.9	96.8	96.8	12.1	19.2
Effective Green, g (s)	111.9	111.9	98.8	98.8	14.1	23.2
Actuated g/C Ratio	0.84	0.84	0.74	0.74	0.11	0.17
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	2.5	2.5	2.5	2.5	2.0
Lane Grp Cap (vph)	653	1469	1250	992	123	264
v/s Ratio Prot	0.02	c0.60	0.30		c0.07	0.00
v/s Ratio Perm	0.21			0.08		0.01
v/c Ratio	0.27	0.71	0.41	0.11	0.67	0.05
Uniform Delay, d1	3.0	4.5	6.6	5.0	57.7	46.2
Progression Factor	0.80	0.68	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	1.7	0.2	0.0	11.6	0.0
Delay (s)	2.4	4.8	6.8	5.1	69.3	46.2
Level of Service	A	A	A	A	E	D
Approach Delay (s)		4.5	6.4		58.2	
Approach LOS		A	A		E	

Intersection Summary			
HCM Average Control Delay	9.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	266	11	21	131	9	32
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	292	12	23	144	10	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			304		488	298
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			304		488	298
tC, single (s)			4.5		7.0	6.7
tC, 2 stage (s)						
tF (s)			2.5		4.0	3.7
p0 queue free %			98		98	95
cM capacity (veh/h)			1078		444	647

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	304	167	45
Volume Left	0	23	10
Volume Right	12	0	35
cSH	1700	1078	588
Volume to Capacity	0.18	0.02	0.08
Queue Length 95th (ft)	0	2	6
Control Delay (s)	0.0	1.3	11.6
Lane LOS		A	B
Approach Delay (s)	0.0	1.3	11.6
Approach LOS			B

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91		1.00	0.91	
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	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1845	1482	1603	1720	1455	1770	4944		1703	4604	
Flt Permitted	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1736	1845	1482	1603	1720	1455	1770	4944		1703	4604	
Volume (vph)	141	163	81	276	192	188	170	1814	98	138	765	50
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	162	187	93	317	221	216	195	2085	113	159	879	57
RTOR Reduction (vph)	0	0	83	0	0	145	0	5	0	0	6	0
Lane Group Flow (vph)	162	187	10	257	281	71	195	2193	0	159	930	0
Heavy Vehicles (%)	4%	3%	9%	7%	3%	11%	2%	4%	6%	6%	12%	6%
Turn Type	Split		Perm	Split		Perm	Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8						
Actuated Green, G (s)	12.1	12.1	12.1	21.9	21.9	21.9	10.5	54.5		11.5	55.5	
Effective Green, g (s)	13.1	13.1	13.1	22.9	22.9	22.9	11.0	56.0		12.0	57.0	
Actuated g/C Ratio	0.11	0.11	0.11	0.19	0.19	0.19	0.09	0.47		0.10	0.48	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.5		4.5	5.5	
Vehicle Extension (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	4.7		2.3	4.7	
Lane Grp Cap (vph)	190	201	162	306	328	278	162	2307		170	2187	
v/s Ratio Prot	0.09	c0.10		0.16	c0.16		c0.11	c0.44		c0.09	0.20	
v/s Ratio Perm			0.01			0.05						
v/c Ratio	0.85	0.93	0.06	0.84	0.86	0.26	1.20	0.95		0.94	0.43	
Uniform Delay, d1	52.5	53.0	47.9	46.8	47.0	41.3	54.5	30.7		53.6	20.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.64	0.33	
Incremental Delay, d2	28.5	43.9	0.1	17.5	18.8	0.3	135.9	9.8		40.2	0.4	
Delay (s)	81.0	96.9	48.0	64.3	65.8	41.6	190.4	40.5		74.6	7.2	
Level of Service	F	F	D	E	E	D	F	D		E	A	
Approach Delay (s)		80.8			58.4			52.7			17.0	
Approach LOS		F			E			D			B	

Intersection Summary			
HCM Average Control Delay	47.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

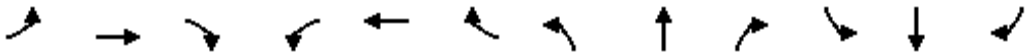
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	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	1.00	1.00		1.00	1.00			0.97			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.98	
Satd. Flow (prot)	1805	3411		1719	3538			1780			1789	
Flt Permitted	0.95	1.00		0.95	1.00			0.77			0.88	
Satd. Flow (perm)	1805	3411		1719	3538			1431			1605	
Volume (vph)	14	956	24	43	1885	4	259	12	69	22	13	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)	15	996	25	45	1964	4	270	12	72	23	14	14
RTOR Reduction (vph)	0	1	0	0	0	0	0	8	0	0	11	0
Lane Group Flow (vph)	15	1020	0	45	1968	0	0	346	0	0	40	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	0%	5%	21%	5%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	2.6	62.7		5.1	65.2			21.1			21.1	
Effective Green, g (s)	3.1	64.7		5.6	67.2			23.1			23.1	
Actuated g/C Ratio	0.03	0.61		0.05	0.64			0.22			0.22	
Clearance Time (s)	4.5	6.0		4.5	6.0			6.0			6.0	
Vehicle Extension (s)	2.3	4.8		2.3	4.8			2.5			2.5	
Lane Grp Cap (vph)	53	2094		91	2256			314			352	
v/s Ratio Prot	0.01	0.30		c0.03	c0.56							
v/s Ratio Perm								c0.24			0.02	
v/c Ratio	0.28	0.49		0.49	0.87			1.10			0.11	
Uniform Delay, d1	50.1	11.2		48.5	15.6			41.2			33.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.7	0.3		2.5	4.3			81.2			0.1	
Delay (s)	51.8	11.6		51.0	19.9			122.3			33.1	
Level of Service	D	B		D	B			F			C	
Approach Delay (s)		12.1			20.6			122.3			33.1	
Approach LOS		B			C			F			C	

Intersection Summary			
HCM Average Control Delay	28.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	105.4	Sum of lost time (s)	8.0
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)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1816	1591		1730	1553	1805	3406	1553	1530	3534	
Flt Permitted		0.65	1.00		0.71	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1242	1591		1291	1553	1805	3406	1553	1530	3534	
Volume (vph)	24	2	32	77	2	22	27	953	54	22	2160	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)	25	2	34	81	2	23	28	1003	57	23	2274	22
RTOR Reduction (vph)	0	0	31	0	0	21	0	0	13	0	0	0
Lane Group Flow (vph)	0	27	3	0	83	2	28	1003	44	23	2296	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	0%	3%	50%	4%	0%	6%	4%	18%	2%	0%
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			
Actuated Green, G (s)		9.7	9.7		9.7	9.7	4.6	90.5	90.5	3.3	89.2	
Effective Green, g (s)		11.7	11.7		11.7	11.7	5.1	92.5	92.5	3.8	91.2	
Actuated g/C Ratio		0.10	0.10		0.10	0.10	0.04	0.77	0.77	0.03	0.76	
Clearance Time (s)		6.0	6.0		6.0	6.0	4.5	6.0	6.0	4.5	6.0	
Vehicle Extension (s)		2.5	2.5		2.5	2.5	2.3	4.8	4.8	2.3	4.8	
Lane Grp Cap (vph)		121	155		126	151	77	2625	1197	48	2686	
v/s Ratio Prot							c0.02	0.29		0.02	c0.65	
v/s Ratio Perm		0.02	0.00		c0.06	0.00			0.03			
v/c Ratio		0.22	0.02		0.66	0.01	0.36	0.38	0.04	0.48	0.85	
Uniform Delay, d1		50.0	49.0		52.2	48.9	55.9	4.5	3.2	57.1	9.9	
Progression Factor		1.00	1.00		1.00	1.00	0.68	3.03	3.70	1.00	1.00	
Incremental Delay, d2		0.7	0.0		10.6	0.0	1.5	0.4	0.1	4.3	3.7	
Delay (s)		50.6	49.0		62.8	49.0	39.8	13.9	12.1	61.5	13.6	
Level of Service		D	D		E	D	D	B	B	E	B	
Approach Delay (s)		49.7			59.8			14.5			14.1	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM Average Control Delay	16.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.97	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	0.97		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	4988	1524	1703	4937		3502	1845	1507	1433	3260	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1752	4988	1524	1703	4937		3502	1845	1507	1433	3260	
Volume (vph)	183	814	355	213	1621	391	454	305	109	99	370	128
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)	195	866	378	227	1724	416	483	324	116	105	394	136
RTOR Reduction (vph)	0	0	237	0	34	0	0	0	88	0	29	0
Lane Group Flow (vph)	195	866	141	227	2106	0	483	324	28	105	501	0
Confl. Peds. (#/hr)									3	3		
Heavy Vehicles (%)	3%	4%	6%	6%	2%	2%	0%	3%	4%	26%	7%	5%
Turn Type	Prot		Perm	Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases			2						8			
Actuated Green, G (s)	12.5	43.4	43.4	18.0	48.9		19.0	19.0	19.0	19.6	19.6	
Effective Green, g (s)	13.0	44.9	44.9	18.5	50.4		20.0	20.0	20.0	20.6	20.6	
Actuated g/C Ratio	0.11	0.37	0.37	0.15	0.42		0.17	0.17	0.17	0.17	0.17	
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	2.3	4.7	4.7	2.3	4.7		2.3	2.3	2.3	2.3	2.3	
Lane Grp Cap (vph)	190	1866	570	263	2074		584	308	251	246	560	
v/s Ratio Prot	c0.11	0.17		0.13	c0.43		0.14	c0.18		0.07	c0.15	
v/s Ratio Perm			0.09						0.02			
v/c Ratio	1.03	0.46	0.25	0.86	1.02		0.83	1.05	0.11	0.43	0.89	
Uniform Delay, d1	53.5	28.4	25.9	49.5	34.8		48.3	50.0	42.4	44.4	48.6	
Progression Factor	0.88	0.69	3.49	1.16	0.96		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	62.3	0.2	0.3	15.0	18.9		9.1	65.6	0.1	0.7	16.5	
Delay (s)	109.1	19.9	90.8	72.7	52.5		57.4	115.6	42.6	45.1	65.1	
Level of Service	F	B	F	E	D		E	F	D	D	E	
Approach Delay (s)		50.6			54.4			76.0			61.8	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM Average Control Delay	58.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.8%	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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	3238		1805	3478		1805	1656		1805	1900	1513
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	3238		1805	3478		1805	1656		1805	1900	1513
Volume (vph)	59	685	194	77	687	37	100	24	54	26	25	81
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)	62	721	204	81	723	39	105	25	57	27	26	85
RTOR Reduction (vph)	0	24	0	0	4	0	0	50	0	0	0	77
Lane Group Flow (vph)	62	901	0	81	758	0	105	32	0	27	26	8
Confl. Peds. (#/hr)			4	4			27					27
Heavy Vehicles (%)	0%	8%	4%	0%	3%	3%	0%	0%	4%	0%	0%	2%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	3.2	37.7		3.2	37.4		3.2	6.9		2.1	5.4	5.4
Effective Green, g (s)	5.5	39.6		5.2	39.3		5.9	8.6		4.4	7.1	7.1
Actuated g/C Ratio	0.07	0.54		0.07	0.53		0.08	0.12		0.06	0.10	0.10
Clearance Time (s)	6.3	5.9		6.0	5.9		6.7	5.7		6.3	5.7	5.7
Vehicle Extension (s)	2.7	3.2		2.7	3.2		2.6	1.8		2.7	1.8	1.8
Lane Grp Cap (vph)	261	1737		127	1852		144	193		108	183	146
v/s Ratio Prot	0.02	c0.28		c0.04	0.22		c0.06	c0.02		0.01	0.01	
v/s Ratio Perm												0.01
v/c Ratio	0.24	0.52		0.64	0.41		0.73	0.16		0.25	0.14	0.06
Uniform Delay, d1	32.2	11.0		33.4	10.3		33.2	29.4		33.1	30.6	30.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	0.3		9.3	0.2		16.0	0.1		1.0	0.1	0.1
Delay (s)	32.6	11.3		42.7	10.5		49.2	29.5		34.1	30.7	30.4
Level of Service	C	B		D	B		D	C		C	C	C
Approach Delay (s)		12.6			13.6			40.6			31.2	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	73.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

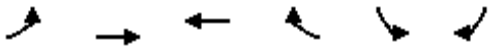
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	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			1.00	1.00	0.99	1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85	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)	1805	3274		1752	1843			1710	1566	1791	1753	
Flt Permitted	0.95	1.00		0.95	1.00			0.73	1.00	0.70	1.00	
Satd. Flow (perm)	1805	3274		1752	1843			1300	1566	1313	1753	
Volume (vph)	6	659	111	100	710	4	86	3	72	5	6	5
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)	6	686	116	104	740	4	90	3	75	5	6	5
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	63	0	4	0
Lane Group Flow (vph)	6	791	0	104	744	0	0	93	12	5	7	0
Confl. Peds. (#/hr)	1		4	4		1	1		7	7		1
Heavy Vehicles (%)	0%	8%	4%	3%	3%	0%	6%	0%	1%	0%	0%	0%
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	1.1	42.1		6.8	47.8			9.6	9.6	9.6	9.6	
Effective Green, g (s)	3.2	43.8		8.9	49.5			11.9	11.9	11.9	11.9	
Actuated g/C Ratio	0.04	0.57		0.12	0.65			0.16	0.16	0.16	0.16	
Clearance Time (s)	6.1	5.7		6.1	5.7			6.3	6.3	6.3	6.3	
Vehicle Extension (s)	2.7	4.5		2.7	4.5			2.6	2.6	2.7	2.7	
Lane Grp Cap (vph)	75	1872		204	1191			202	243	204	272	
v/s Ratio Prot	0.00	0.24		c0.06	c0.40						0.00	
v/s Ratio Perm								c0.07	0.01	0.00		
v/c Ratio	0.08	0.42		0.51	0.62			0.46	0.05	0.02	0.02	
Uniform Delay, d1	35.3	9.3		31.8	8.0			29.4	27.5	27.4	27.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.3		1.7	1.3			1.3	0.1	0.0	0.0	
Delay (s)	35.7	9.5		33.5	9.3			30.7	27.6	27.5	27.5	
Level of Service	D	A		C	A			C	C	C	C	
Approach Delay (s)		9.7			12.3			29.3			27.5	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM Average Control Delay	12.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	76.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.1%	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												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	717	16	113	812	0	0	0	68	1	2	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	755	17	119	855	0	0	0	72	1	2	2
Pedestrians					1						2	
Lane Width (ft)					12.0						12.0	
Walking Speed (ft/s)					4.0						4.0	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		688										
pX, platoon unblocked				0.77			0.77	0.77	0.77	0.77	0.77	
vC, conflicting volume	857			772			1857	1856	756	1928	1873	857
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	857			705			2108	2106	684	2200	2128	857
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			83			100	100	80	94	93	99
cM capacity (veh/h)	791			698			24	33	349	17	32	359

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	3	755	17	119	855	0	72	5
Volume Left	3	0	0	119	0	0	0	1
Volume Right	0	0	17	0	0	0	72	2
cSH	791	1700	1700	698	1700	1700	349	40
Volume to Capacity	0.00	0.44	0.01	0.17	0.50	0.00	0.20	0.13
Queue Length 95th (ft)	0	0	0	15	0	0	19	10
Control Delay (s)	9.6	0.0	0.0	11.2	0.0	0.0	17.9	108.8
Lane LOS	A			B		A	C	F
Approach Delay (s)	0.0			1.4		17.9		108.8
Approach LOS						C		F

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	60.7%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	16	750	857	15	34	62
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	16	773	884	15	35	64
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	899				1697	891
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	899				1697	891
tC, single (s)	4.3				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.4				3.5	3.3
p0 queue free %	98				65	81
cM capacity (veh/h)	689				100	341

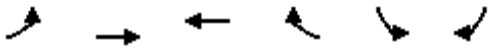
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	16	773	899	35	64
Volume Left	16	0	0	35	0
Volume Right	0	0	15	0	64
cSH	689	1700	1700	100	341
Volume to Capacity	0.02	0.45	0.53	0.35	0.19
Queue Length 95th (ft)	2	0	0	34	17
Control Delay (s)	10.4	0.0	0.0	59.0	18.0
Lane LOS	B			F	C
Approach Delay (s)	0.2		0.0	32.5	
Approach LOS				D	

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

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)	4.0	4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1827	1553	1770	1863			1752	1538	1805	1710	
Flt Permitted	0.95	1.00	1.00	0.25	1.00			0.75	1.00	0.44	1.00	
Satd. Flow (perm)	1805	1827	1553	459	1863			1383	1538	835	1710	
Volume (vph)	3	610	201	440	712	0	151	0	171	21	4	8
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)	3	629	207	454	734	0	156	0	176	22	4	8
RTOR Reduction (vph)	0	0	43	0	0	0	0	0	117	0	7	0
Lane Group Flow (vph)	3	629	164	454	734	0	0	156	59	22	5	0
Heavy Vehicles (%)	0%	4%	4%	2%	2%	0%	3%	0%	5%	0%	0%	0%
Turn Type	Prot		Perm	pm+pt			Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases			2	6			8		8	4		
Actuated Green, G (s)	3.1	75.3	75.3	94.5	94.5			18.4	40.7	18.4	18.4	
Effective Green, g (s)	5.1	77.3	77.3	96.5	96.5			20.4	44.7	20.4	20.4	
Actuated g/C Ratio	0.04	0.58	0.58	0.72	0.72			0.15	0.33	0.15	0.15	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	1.0	2.5	2.5	1.0	2.5			1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	69	1054	896	568	1342			211	559	127	260	
v/s Ratio Prot	0.00	c0.34		c0.14	0.39				0.02		0.00	
v/s Ratio Perm			0.11	c0.43				c0.11	0.02	0.03		
v/c Ratio	0.04	0.60	0.18	0.80	0.55			0.74	0.11	0.17	0.02	
Uniform Delay, d1	62.1	18.3	13.4	15.1	8.7			54.3	30.8	49.5	48.3	
Progression Factor	1.00	1.00	1.00	1.08	1.62			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.8	0.1	5.3	1.2			11.1	0.0	0.2	0.0	
Delay (s)	62.2	19.1	13.5	21.6	15.2			65.3	30.9	49.7	48.3	
Level of Service	E	B	B	C	B			E	C	D	D	
Approach Delay (s)		17.8			17.6			47.1			49.2	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	22.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.5%	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)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	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)	1736	1827	1863	1524	1687	1583
Flt Permitted	0.17	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	319	1827	1863	1524	1687	1583
Volume (vph)	82	688	961	102	99	192
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	85	709	991	105	102	198
RTOR Reduction (vph)	0	0	0	9	0	67
Lane Group Flow (vph)	85	709	991	96	102	131
Heavy Vehicles (%)	4%	4%	2%	6%	7%	2%
Turn Type	pm+pt			Perm		pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2			6		4
Actuated Green, G (s)	109.6	109.6	96.4	96.4	12.4	19.6
Effective Green, g (s)	111.6	111.6	98.4	98.4	14.4	23.6
Actuated g/C Ratio	0.83	0.83	0.73	0.73	0.11	0.18
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.0	2.5	2.5	2.5	2.5	2.0
Lane Grp Cap (vph)	363	1522	1368	1119	181	326
v/s Ratio Prot	0.02	c0.39	c0.53		c0.06	0.03
v/s Ratio Perm	0.18			0.06		0.06
v/c Ratio	0.23	0.47	0.72	0.09	0.56	0.40
Uniform Delay, d1	10.3	3.1	10.1	5.0	56.8	48.9
Progression Factor	2.42	0.63	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.9	1.8	0.0	3.2	0.3
Delay (s)	25.1	2.8	11.9	5.1	60.0	49.2
Level of Service	C	A	B	A	E	D
Approach Delay (s)		5.2	11.3		52.9	
Approach LOS		A	B		D	

Intersection Summary			
HCM Average Control Delay	14.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	91	7	15	274	14	42
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	115	9	19	347	18	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			124		504	120
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			124		504	120
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			99		97	94
cM capacity (veh/h)			1432		524	937

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	124	366	71
Volume Left	0	19	18
Volume Right	9	0	53
cSH	1700	1432	783
Volume to Capacity	0.07	0.01	0.09
Queue Length 95th (ft)	0	1	7
Control Delay (s)	0.0	0.5	10.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	10.1
Approach LOS			B

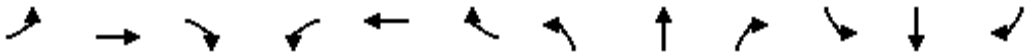
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91		1.00	0.91	
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	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1881	1599	1698	1756	1553	1770	4888		1787	5025	
Flt Permitted	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1881	1599	1698	1756	1553	1770	4888		1787	5025	
Volume (vph)	88	125	103	288	199	124	167	1127	107	198	1793	154
Peak-hour factor, PHF	0.90	0.92	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	98	136	110	306	212	132	178	1199	114	211	1907	164
RTOR Reduction (vph)	0	0	100	0	0	112	0	11	0	0	8	0
Lane Group Flow (vph)	98	136	10	254	264	20	178	1302	0	211	2063	0
Heavy Vehicles (%)	1%	1%	1%	1%	2%	4%	2%	5%	2%	1%	2%	2%
Turn Type	Split		Perm	Split		Perm	Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8						
Actuated Green, G (s)	9.7	9.7	9.7	17.0	17.0	17.0	13.2	42.4		30.9	60.1	
Effective Green, g (s)	10.7	10.7	10.7	18.0	18.0	18.0	13.7	43.9		31.4	61.6	
Actuated g/C Ratio	0.09	0.09	0.09	0.15	0.15	0.15	0.11	0.37		0.26	0.51	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.5		4.5	5.5	
Vehicle Extension (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	4.7		2.3	4.7	
Lane Grp Cap (vph)	159	168	143	255	263	233	202	1788		468	2580	
v/s Ratio Prot	0.05	c0.07		0.15	c0.15		c0.10	0.27		0.12	c0.41	
v/s Ratio Perm			0.01			0.01						
v/c Ratio	0.62	0.81	0.07	1.00	1.00	0.08	0.88	0.73		0.45	0.80	
Uniform Delay, d1	52.7	53.6	50.1	51.0	51.0	43.9	52.3	32.9		37.1	24.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.01	1.03	
Incremental Delay, d2	5.5	23.3	0.1	54.9	56.5	0.1	32.7	1.8		0.1	0.8	
Delay (s)	58.2	77.0	50.2	105.9	107.5	44.0	85.0	34.7		37.4	25.6	
Level of Service	E	E	D	F	F	D	F	C		D	C	
Approach Delay (s)		63.1			94.0			40.7			26.7	
Approach LOS		E			F			D			C	

Intersection Summary			
HCM Average Control Delay	42.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

2030 No-Build Conditions
Study Intersections Operational Analysis



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)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.98		1.00	1.00			0.90			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1805	3406		1517	3405			1348			1539	
Flt Permitted	0.95	1.00		0.95	1.00			0.91			0.48	
Satd. Flow (perm)	1805	3406		1517	3405			1238			757	
Volume (vph)	6	1954	307	125	824	1	78	5	262	53	22	0
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)	7	2124	334	136	896	1	85	5	285	58	24	0
RTOR Reduction (vph)	0	9	0	0	0	0	0	89	0	0	0	0
Lane Group Flow (vph)	7	2449	0	136	897	0	0	286	0	0	82	0
Heavy Vehicles (%)	0%	3%	9%	19%	6%	0%	25%	30%	25%	21%	15%	0%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	1.2	69.0		14.4	82.2			30.4			30.4	
Effective Green, g (s)	1.7	71.0		14.9	84.2			32.4			32.4	
Actuated g/C Ratio	0.01	0.54		0.11	0.65			0.25			0.25	
Clearance Time (s)	4.5	6.0		4.5	6.0			6.0			6.0	
Vehicle Extension (s)	2.3	4.8		2.3	4.8			2.5			2.5	
Lane Grp Cap (vph)	24	1856		173	2200			308			188	
v/s Ratio Prot	0.00	c0.72		c0.09	0.26							
v/s Ratio Perm								c0.23			0.11	
v/c Ratio	0.29	1.32		0.79	0.41			0.93			0.44	
Uniform Delay, d1	63.7	29.7		56.1	11.1			47.8			41.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	3.9	147.8		19.6	0.2			33.0			1.2	
Delay (s)	67.6	177.4		75.7	11.3			80.8			42.4	
Level of Service	E	F		E	B			F			D	
Approach Delay (s)		177.1			19.8			80.8			42.4	
Approach LOS		F			B			F			D	

Intersection Summary			
HCM Average Control Delay	124.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	130.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
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)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes		1.00	1.00		0.98	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1805	1262		1642	1615	1770	3505	1494	1612	3367	
Flt Permitted		0.73	1.00		0.75	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1390	1262		1293	1615	1770	3505	1494	1612	3367	
Volume (vph)	13	0	9	37	0	25	52	2234	82	20	883	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)	14	0	9	39	0	26	55	2352	86	21	929	24
RTOR Reduction (vph)	0	0	8	0	0	24	0	0	15	0	1	0
Lane Group Flow (vph)	0	14	1	0	39	2	55	2352	71	21	952	0
Confl. Peds. (#/hr)			3	3					3	3		
Heavy Vehicles (%)	0%	0%	25%	8%	0%	0%	2%	3%	4%	12%	7%	0%
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			
Actuated Green, G (s)		7.5	7.5		7.5	7.5	7.1	92.9	92.9	3.1	88.9	
Effective Green, g (s)		9.5	9.5		9.5	9.5	7.6	94.9	94.9	3.6	90.9	
Actuated g/C Ratio		0.08	0.08		0.08	0.08	0.06	0.79	0.79	0.03	0.76	
Clearance Time (s)		6.0	6.0		6.0	6.0	4.5	6.0	6.0	4.5	6.0	
Vehicle Extension (s)		2.5	2.5		2.5	2.5	2.3	4.8	4.8	2.3	4.8	
Lane Grp Cap (vph)		110	100		102	128	112	2772	1182	48	2551	
v/s Ratio Prot							c0.03	c0.67		0.01	0.28	
v/s Ratio Perm		0.01	0.00		c0.03	0.00			0.05			
v/c Ratio		0.13	0.01		0.38	0.02	0.49	0.85	0.06	0.44	0.37	
Uniform Delay, d1		51.4	50.9		52.5	50.9	54.3	8.0	2.8	57.2	4.9	
Progression Factor		1.00	1.00		1.00	1.00	1.13	2.40	1.54	1.00	1.00	
Incremental Delay, d2		0.4	0.0		1.7	0.0	1.0	1.8	0.0	3.7	0.4	
Delay (s)		51.8	50.9		54.2	51.0	62.3	21.0	4.3	60.9	5.3	
Level of Service		D	D		D	D	E	C	A	E	A	
Approach Delay (s)		51.4			52.9			21.3			6.5	
Approach LOS		D			D			C			A	

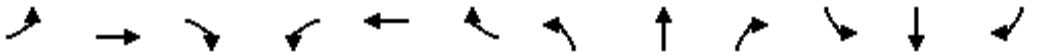
Intersection Summary			
HCM Average Control Delay	18.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

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)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	*0.75	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	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	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)	3400	5085	1538	3213	4803	1442	3019	2436	1446	3367	3406	1553
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)	3400	5085	1538	3213	4803	1442	3019	2436	1446	3367	3406	1553
Volume (vph)	261	1849	583	146	650	134	231	769	227	291	668	284
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	266	1887	595	149	663	137	236	785	232	297	682	290
RTOR Reduction (vph)	0	0	210	0	0	110	0	0	109	0	0	226
Lane Group Flow (vph)	266	1887	385	149	663	27	236	785	123	297	682	64
Confl. Peds. (#/hr)									2	2		
Heavy Vehicles (%)	3%	2%	5%	9%	8%	12%	16%	17%	9%	4%	6%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	39.2	51.1	51.1	9.9	21.8	21.8	13.6	32.0	32.0	7.0	25.4	25.4
Effective Green, g (s)	39.7	52.6	52.6	10.4	23.3	23.3	14.6	33.0	33.0	8.0	26.4	26.4
Actuated g/C Ratio	0.33	0.44	0.44	0.09	0.19	0.19	0.12	0.28	0.28	0.07	0.22	0.22
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.3	4.7	4.7	2.3	4.7	4.7	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	1125	2229	674	278	933	280	367	670	398	224	749	342
v/s Ratio Prot	0.08	c0.37		0.05	c0.14		0.08	c0.32		c0.09	0.20	
v/s Ratio Perm			0.25			0.02			0.08			0.04
v/c Ratio	0.24	0.85	0.57	0.54	0.71	0.10	0.64	1.17	0.31	1.33	0.91	0.19
Uniform Delay, d1	29.1	30.1	25.3	52.5	45.2	39.7	50.2	43.5	34.5	56.0	45.6	38.1
Progression Factor	0.60	0.52	0.29	0.89	0.89	1.00	0.86	0.90	1.26	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.8	0.4	1.3	4.4	0.6	2.6	90.2	0.2	174.2	15.1	0.2
Delay (s)	17.5	16.3	7.6	47.9	44.7	40.2	46.0	129.4	43.7	230.2	60.7	38.2
Level of Service	B	B	A	D	D	D	D	F	D	F	E	D
Approach Delay (s)		14.6			44.6			97.8			95.3	
Approach LOS		B			D			F			F	

Intersection Summary			
HCM Average Control Delay	52.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.8%	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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0		4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		1.00		1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00		0.98
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	1.00		1.00	0.88		1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)	3502	3375		1597	3034		1641	1645		1787		1570
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95		1.00
Satd. Flow (perm)	3502	3375		1597	3034		1641	1645		1787		1570
Volume (vph)	34	1277	84	53	1037	0	163	15	60	43	0	28
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)	37	1388	91	58	1127	0	177	16	65	47	0	30
RTOR Reduction (vph)	0	3	0	0	0	0	0	60	0	0	0	29
Lane Group Flow (vph)	37	1476	0	58	1127	0	177	21	0	47	0	1
Confl. Peds. (#/hr)			1	1			3					3
Heavy Vehicles (%)	0%	6%	3%	13%	19%	12%	10%	0%	2%	1%	1%	1%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	4.2	72.0		6.0	73.5		14.4	8.0		10.1		3.3
Effective Green, g (s)	6.5	73.9		8.0	75.4		17.1	9.7		12.4		5.0
Actuated g/C Ratio	0.05	0.62		0.07	0.63		0.14	0.08		0.10		0.04
Clearance Time (s)	6.3	5.9		6.0	5.9		6.7	5.7		6.3		5.7
Vehicle Extension (s)	2.7	3.2		2.7	3.2		2.6	1.8		2.7		1.8
Lane Grp Cap (vph)	190	2078		106	1906		234	133		185		65
v/s Ratio Prot	0.01	c0.44		0.04	c0.37		c0.11	0.01		c0.03		
v/s Ratio Perm												0.00
v/c Ratio	0.19	0.71		0.55	0.59		0.76	0.16		0.25		0.02
Uniform Delay, d1	54.2	15.7		54.2	13.2		49.4	51.4		49.5		55.1
Progression Factor	0.76	1.11		1.04	1.12		1.00	1.00		1.00		1.00
Incremental Delay, d2	0.3	1.4		3.7	1.0		12.6	0.2		0.6		0.0
Delay (s)	41.3	18.8		59.9	15.8		62.0	51.6		50.1		55.2
Level of Service	D	B		E	B		E	D		D		E
Approach Delay (s)		19.4			17.9			58.7			52.1	
Approach LOS		B			B			E			D	

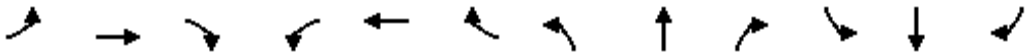
Intersection Summary			
HCM Average Control Delay	23.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	1280	111	0	1091	62	0	0	108	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1391	121	0	1186	67	0	0	117	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		597			688							
pX, platoon unblocked	0.87			0.70			0.76	0.76	0.70	0.76	0.76	0.87
vC, conflicting volume	1253			1512			2045	2705	756	2033	2732	627
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1144			1301			1554	2421	218	1539	2456	425
tC, single (s)	4.1			4.4			7.9	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.7	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	79	100	100	100
cM capacity (veh/h)	539			320			49	25	549	48	24	509

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	928	584	791	463	117	0
Volume Left	0	0	0	0	0	0
Volume Right	0	121	0	67	117	0
cSH	1700	1700	1700	1700	549	1700
Volume to Capacity	0.55	0.34	0.47	0.27	0.21	0.00
Queue Length 95th (ft)	0	0	0	0	20	0
Control Delay (s)	0.0	0.0	0.0	0.0	13.3	0.0
Lane LOS					B	A
Approach Delay (s)	0.0		0.0		13.3	0.0
Approach LOS					B	A

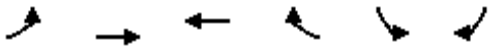
Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	52.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1504	3403		1805	3059		1805	1583		1805	1154	
Flt Permitted	0.25	1.00		0.07	1.00		0.57	1.00		0.58	1.00	
Satd. Flow (perm)	402	3403		142	3059		1086	1583		1100	1154	
Volume (vph)	5	1246	137	170	717	1	433	0	272	1	0	5
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)	5	1354	149	185	779	1	471	0	296	1	0	5
RTOR Reduction (vph)	0	7	0	0	0	0	0	176	0	0	4	0
Lane Group Flow (vph)	5	1496	0	185	780	0	471	120	0	1	1	0
Heavy Vehicles (%)	20%	5%	0%	0%	18%	0%	0%	0%	2%	0%	0%	40%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	54.6	54.6		66.1	66.1		34.7	27.9		11.3	10.5	
Effective Green, g (s)	56.6	56.6		68.1	68.1		36.7	29.9		15.3	12.5	
Actuated g/C Ratio	0.47	0.47		0.57	0.57		0.31	0.25		0.13	0.10	
Clearance Time (s)	6.0	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	
Lane Grp Cap (vph)	219	1605		284	1736		453	394		157	120	
v/s Ratio Prot	0.00	c0.44		c0.08	0.25		c0.17	0.08		0.00	0.00	
v/s Ratio Perm	0.01			0.29			c0.14			0.00		
v/c Ratio	0.02	0.93		0.65	0.45		1.04	0.31		0.01	0.00	
Uniform Delay, d1	17.8	29.9		41.7	15.1		40.1	36.6		45.7	48.2	
Progression Factor	0.46	0.43		0.64	0.33		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	9.5		4.8	0.2		53.0	0.4		0.0	0.0	
Delay (s)	8.3	22.3		31.5	5.2		93.1	37.1		45.7	48.2	
Level of Service	A	C		C	A		F	D		D	D	
Approach Delay (s)		22.3			10.2			71.5			47.8	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM Average Control Delay	30.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		

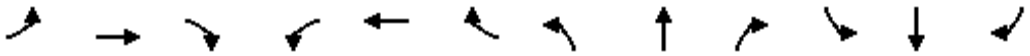
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3438	3185		1245	1242
Flt Permitted	0.23	1.00	1.00		0.95	1.00
Satd. Flow (perm)	436	3438	3185		1245	1242
Volume (vph)	94	1382	881	93	79	46
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	102	1502	958	101	86	50
RTOR Reduction (vph)	0	0	4	0	0	45
Lane Group Flow (vph)	102	1502	1055	0	86	6
Heavy Vehicles (%)	0%	5%	12%	9%	45%	30%
Turn Type	pm+pt					Perm
Protected Phases	7	4	8		6	
Permitted Phases	4					6
Actuated Green, G (s)	98.8	98.8	88.9		13.2	13.2
Effective Green, g (s)	98.8	98.8	88.9		13.2	13.2
Actuated g/C Ratio	0.82	0.82	0.74		0.11	0.11
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	426	2831	2360		137	137
v/s Ratio Prot	0.01	c0.44	0.33		c0.07	
v/s Ratio Perm	0.19					0.00
v/c Ratio	0.24	0.53	0.45		0.63	0.04
Uniform Delay, d1	3.0	3.3	6.0		51.1	47.7
Progression Factor	0.35	0.36	0.26		1.00	1.00
Incremental Delay, d2	0.2	0.1	0.6		8.7	0.1
Delay (s)	1.2	1.3	2.1		59.7	47.9
Level of Service	A	A	A		E	D
Approach Delay (s)		1.3	2.1		55.4	
Approach LOS		A	A		E	

Intersection Summary			
HCM Average Control Delay	4.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		

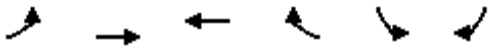
c Critical Lane Group



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)	4.0	4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3343	1568	1671	3165			1659	1538	1150	1522	
Flt Permitted	0.95	1.00	1.00	0.08	1.00			0.73	1.00	0.42	1.00	
Satd. Flow (perm)	1805	3343	1568	135	3165			1274	1538	504	1522	
Volume (vph)	6	1265	153	202	832	14	167	10	496	9	3	4
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)	6	1332	161	213	876	15	176	11	522	9	3	4
RTOR Reduction (vph)	0	0	33	0	1	0	0	0	15	0	3	0
Lane Group Flow (vph)	6	1332	128	213	890	0	0	187	507	9	4	0
Heavy Vehicles (%)	0%	8%	3%	8%	14%	0%	10%	0%	5%	57%	33%	0%
Turn Type	Prot		Perm	pm+pt			Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases			2	6			8		8	4		
Actuated Green, G (s)	5.1	62.0	62.0	77.6	77.6			19.3	40.0	19.3	19.3	
Effective Green, g (s)	7.1	64.0	64.0	79.6	79.6			21.3	44.0	21.3	21.3	
Actuated g/C Ratio	0.06	0.53	0.53	0.66	0.66			0.18	0.37	0.18	0.18	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	1.0	2.5	2.5	1.0	2.5			1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	107	1783	836	380	2099			226	615	89	270	
v/s Ratio Prot	0.00	c0.40		0.11	0.28				c0.16		0.00	
v/s Ratio Perm			0.08	0.27				0.15	0.17	0.02		
v/c Ratio	0.06	0.75	0.15	0.56	0.42			0.83	0.83	0.10	0.01	
Uniform Delay, d1	53.3	21.7	14.2	26.5	9.5			47.6	34.5	41.3	40.7	
Progression Factor	0.82	0.40	0.26	0.74	0.94			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	1.4	0.1	1.0	0.6			20.4	8.4	0.2	0.0	
Delay (s)	44.0	10.2	3.8	20.5	9.4			68.0	42.9	41.5	40.7	
Level of Service	D	B	A	C	A			E	D	D	D	
Approach Delay (s)		9.6			11.6			49.6			41.2	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
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)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1656	3343	3136		1172	1324
Flt Permitted	0.20	1.00	1.00		0.95	1.00
Satd. Flow (perm)	345	3343	3136		1172	1324
Volume (vph)	164	1546	1028	145	35	18
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	167	1578	1049	148	36	18
RTOR Reduction (vph)	0	0	4	0	0	16
Lane Group Flow (vph)	167	1578	1193	0	36	2
Heavy Vehicles (%)	9%	8%	12%	20%	54%	22%
Turn Type	pm+pt					pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Actuated Green, G (s)	101.9	101.9	89.6		6.1	12.4
Effective Green, g (s)	103.9	103.9	91.6		8.1	16.4
Actuated g/C Ratio	0.87	0.87	0.76		0.07	0.14
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	2.0	2.5	2.5		2.5	2.0
Lane Grp Cap (vph)	389	2894	2394		79	225
v/s Ratio Prot	0.03	c0.47	0.38		c0.03	0.00
v/s Ratio Perm	0.34					0.00
v/c Ratio	0.43	0.55	0.50		0.46	0.01
Uniform Delay, d1	2.8	2.0	5.4		53.8	44.8
Progression Factor	2.02	0.62	1.00		1.00	1.00
Incremental Delay, d2	0.2	0.5	0.1		3.0	0.0
Delay (s)	5.9	1.7	5.5		56.8	44.8
Level of Service	A	A	A		E	D
Approach Delay (s)		2.1	5.5		52.8	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	4.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	339	72	43	323	41	70
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	357	76	45	340	43	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			433		825	395
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			433		825	395
tC, single (s)			4.4		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.5		3.7	3.5
p0 queue free %			95		86	88
cM capacity (veh/h)			972		298	607

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	433	385	117
Volume Left	0	45	43
Volume Right	76	0	74
cSH	1700	972	439
Volume to Capacity	0.25	0.05	0.27
Queue Length 95th (ft)	0	4	26
Control Delay (s)	0.0	1.5	16.1
Lane LOS		A	C
Approach Delay (s)	0.0	1.5	16.1
Approach LOS			C

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91		1.00	0.91	
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	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1845	1482	1603	1736	1455	1770	4958		1703	4622	
Flt Permitted	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1736	1845	1482	1603	1736	1455	1770	4958		1703	4622	
Volume (vph)	209	238	108	261	228	147	141	2218	82	247	964	20
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)	220	251	114	275	240	155	148	2335	86	260	1015	21
RTOR Reduction (vph)	0	0	101	0	0	126	0	3	0	0	2	0
Lane Group Flow (vph)	220	251	13	246	269	29	148	2418	0	260	1034	0
Heavy Vehicles (%)	4%	3%	9%	7%	3%	11%	2%	4%	6%	6%	12%	6%
Turn Type	Split		Perm	Split		Perm	Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8						
Actuated Green, G (s)	12.7	12.7	12.7	21.3	21.3	21.3	10.5	54.5		11.5	55.5	
Effective Green, g (s)	13.7	13.7	13.7	22.3	22.3	22.3	11.0	56.0		12.0	57.0	
Actuated g/C Ratio	0.11	0.11	0.11	0.19	0.19	0.19	0.09	0.47		0.10	0.48	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.5		4.5	5.5	
Vehicle Extension (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	4.7		2.3	4.7	
Lane Grp Cap (vph)	198	211	169	298	323	270	162	2314		170	2195	
v/s Ratio Prot	0.13	c0.14		0.15	c0.15		0.08	c0.49		c0.15	0.22	
v/s Ratio Perm			0.01			0.02						
v/c Ratio	1.11	1.19	0.08	0.83	0.83	0.11	0.91	1.04		1.53	0.47	
Uniform Delay, d1	53.2	53.2	47.5	47.0	47.1	40.6	54.0	32.0		54.0	21.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.87	0.44	
Incremental Delay, d2	96.9	122.6	0.1	16.3	16.1	0.1	45.8	31.7		260.8	0.6	
Delay (s)	150.1	175.7	47.6	63.3	63.2	40.7	99.8	63.7		307.8	9.9	
Level of Service	F	F	D	E	E	D	F	E		F	A	
Approach Delay (s)		141.1			58.0			65.8			69.7	
Approach LOS		F			E			E			E	

Intersection Summary			
HCM Average Control Delay	74.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.4%	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)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	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	1.00	0.98		1.00	1.00			0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1770	3340		1736	3538			1761			1824	
Flt Permitted	0.95	1.00		0.95	1.00			0.53			0.96	
Satd. Flow (perm)	1770	3340		1736	3538			982			1768	
Volume (vph)	14	1185	142	170	2016	6	459	20	56	19	140	21
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	14	1209	145	173	2057	6	468	20	57	19	143	21
RTOR Reduction (vph)	0	7	0	0	0	0	0	3	0	0	4	0
Lane Group Flow (vph)	14	1347	0	173	2063	0	0	542	0	0	179	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	5%	15%	4%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	2.6	60.8		15.0	73.2			35.2			35.2	
Effective Green, g (s)	3.1	62.8		15.5	75.2			37.2			37.2	
Actuated g/C Ratio	0.02	0.49		0.12	0.59			0.29			0.29	
Clearance Time (s)	4.5	6.0		4.5	6.0			6.0			6.0	
Vehicle Extension (s)	2.3	4.8		2.3	4.8			2.5			2.5	
Lane Grp Cap (vph)	43	1645		211	2087			287			516	
v/s Ratio Prot	0.01	0.40		c0.10	c0.58							
v/s Ratio Perm								c0.55			0.10	
v/c Ratio	0.33	0.82		0.82	0.99			1.89			0.35	
Uniform Delay, d1	61.2	27.5		54.6	25.7			45.2			35.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.6	3.7		20.7	17.0			413.0			0.3	
Delay (s)	63.7	31.2		75.4	42.7			458.1			35.9	
Level of Service	E	C		E	D			F			D	
Approach Delay (s)		31.6			45.2			458.1			35.9	
Approach LOS		C			D			F			D	

Intersection Summary			
HCM Average Control Delay	92.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	127.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	112.2%	ICU Level of Service	H
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)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1815	1591		1750	1568	1805	3438	1583	1719	3534	
Flt Permitted		0.64	1.00		0.71	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1219	1591		1301	1568	1805	3438	1583	1719	3534	
Volume (vph)	26	2	38	99	2	44	33	1277	69	42	2455	24
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	27	2	39	101	2	45	34	1303	70	43	2505	24
RTOR Reduction (vph)	0	0	35	0	0	40	0	0	19	0	1	0
Lane Group Flow (vph)	0	29	4	0	103	5	34	1303	51	43	2528	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	0%	2%	50%	3%	0%	5%	2%	5%	2%	0%
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			
Actuated Green, G (s)		11.8	11.8		11.8	11.8	4.8	85.0	85.0	6.7	86.9	
Effective Green, g (s)		13.8	13.8		13.8	13.8	5.3	87.0	87.0	7.2	88.9	
Actuated g/C Ratio		0.12	0.12		0.12	0.12	0.04	0.72	0.72	0.06	0.74	
Clearance Time (s)		6.0	6.0		6.0	6.0	4.5	6.0	6.0	4.5	6.0	
Vehicle Extension (s)		2.5	2.5		2.5	2.5	2.3	4.8	4.8	2.3	4.8	
Lane Grp Cap (vph)		140	183		150	180	80	2493	1148	103	2618	
v/s Ratio Prot							0.02	0.38		c0.03	c0.72	
v/s Ratio Perm		0.02	0.00		c0.08	0.00			0.03			
v/c Ratio		0.21	0.02		0.69	0.03	0.42	0.52	0.04	0.42	0.97	
Uniform Delay, d1		48.1	47.1		51.0	47.1	55.9	7.3	4.7	54.4	14.2	
Progression Factor		1.00	1.00		1.00	1.00	0.80	2.70	4.38	1.00	1.00	
Incremental Delay, d2		0.5	0.0		11.3	0.0	1.7	0.6	0.1	1.6	11.2	
Delay (s)		48.7	47.2		62.3	47.2	46.2	20.4	20.6	56.0	25.4	
Level of Service		D	D		E	D	D	C	C	E	C	
Approach Delay (s)		47.8			57.7			21.0			25.9	
Approach LOS		D			E			C			C	

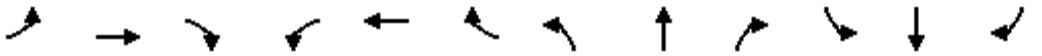
Intersection Summary			
HCM Average Control Delay	25.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

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)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	*0.75	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	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	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)	3400	4988	1524	3303	5085	1583	3502	2767	1507	3127	3374	1553
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)	3400	4988	1524	3303	5085	1583	3502	2767	1507	3127	3374	1553
Volume (vph)	239	1051	412	369	1703	531	540	908	131	208	737	181
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	244	1072	420	377	1738	542	551	927	134	212	752	185
RTOR Reduction (vph)	0	0	169	0	0	111	0	0	53	0	0	150
Lane Group Flow (vph)	244	1072	251	377	1738	431	551	927	81	212	752	35
Confl. Peds. (#/hr)									3	3		
Heavy Vehicles (%)	3%	4%	6%	6%	2%	2%	0%	3%	4%	12%	7%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.7	42.1	42.1	17.0	47.4	47.4	18.9	32.4	32.4	8.5	23.0	23.0
Effective Green, g (s)	12.2	43.6	43.6	17.5	48.9	48.9	19.9	33.4	33.4	9.5	23.0	23.0
Actuated g/C Ratio	0.10	0.36	0.36	0.15	0.41	0.41	0.17	0.28	0.28	0.08	0.19	0.19
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	5.0	5.0	5.0	5.0	4.0	4.0
Vehicle Extension (s)	2.3	4.7	4.7	2.3	4.7	4.7	2.3	2.3	2.3	2.3	3.0	3.0
Lane Grp Cap (vph)	346	1812	554	482	2072	645	581	770	419	248	647	298
v/s Ratio Prot	0.07	c0.21		0.11	c0.34		c0.16	c0.34		0.07	0.22	
v/s Ratio Perm			0.16			0.27			0.05			0.02
v/c Ratio	0.71	0.59	0.45	0.78	0.84	0.67	0.95	1.20	0.19	0.85	1.16	0.12
Uniform Delay, d1	52.2	31.0	29.1	49.4	32.0	29.0	49.5	43.3	33.0	54.6	48.5	40.1
Progression Factor	0.85	0.69	1.08	1.17	0.97	0.97	0.79	0.86	0.97	1.00	1.00	1.00
Incremental Delay, d2	3.1	0.4	0.6	3.0	1.7	2.1	20.6	101.2	0.1	23.4	89.3	0.2
Delay (s)	47.2	21.9	32.1	61.0	32.6	30.3	59.6	138.5	32.1	77.9	137.8	40.3
Level of Service	D	C	C	E	C	C	E	F	C	E	F	D
Approach Delay (s)		27.9			36.1			102.7			111.1	
Approach LOS		C			D			F			F	

Intersection Summary			
HCM Average Control Delay	61.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.8%	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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.94
Flpb, ped/bikes	1.00	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	0.89		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	3278		1805	3499		1805	1632		1805	1900	1481
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	3278		1805	3499		1805	1632		1805	1900	1481
Volume (vph)	81	1247	189	169	1290	15	192	27	89	83	13	97
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	83	1272	193	172	1316	15	196	28	91	85	13	99
RTOR Reduction (vph)	0	9	0	0	0	0	0	80	0	0	0	91
Lane Group Flow (vph)	83	1456	0	172	1331	0	196	39	0	85	13	8
Confl. Peds. (#/hr)			4	4			27					27
Heavy Vehicles (%)	0%	8%	4%	0%	3%	3%	0%	0%	4%	0%	0%	2%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	6.9	63.1		12.5	68.4		12.5	12.8		7.7	7.6	7.6
Effective Green, g (s)	9.2	65.0		14.5	70.3		15.2	14.5		10.0	9.3	9.3
Actuated g/C Ratio	0.08	0.54		0.12	0.59		0.13	0.12		0.08	0.08	0.08
Clearance Time (s)	6.3	5.9		6.0	5.9		6.7	5.7		6.3	5.7	5.7
Vehicle Extension (s)	2.7	3.2		2.7	3.2		2.6	1.8		2.7	1.8	1.8
Lane Grp Cap (vph)	268	1776		218	2050		229	197		150	147	115
v/s Ratio Prot	0.02	c0.44		c0.10	0.38		c0.11	c0.02		0.05	0.01	
v/s Ratio Perm												0.01
v/c Ratio	0.31	0.82		0.79	0.65		0.86	0.20		0.57	0.09	0.07
Uniform Delay, d1	52.4	22.7		51.3	16.6		51.3	47.5		52.9	51.4	51.3
Progression Factor	0.96	0.52		0.81	0.67		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	1.8		15.0	1.4		25.3	0.2		4.3	0.1	0.1
Delay (s)	50.7	13.6		56.6	12.5		76.6	47.7		57.2	51.5	51.4
Level of Service	D	B		E	B		E	D		E	D	D
Approach Delay (s)		15.6			17.6			65.7			53.9	
Approach LOS		B			B			E			D	

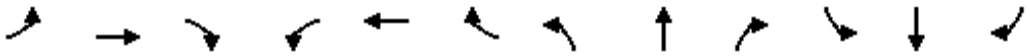
Intersection Summary			
HCM Average Control Delay	23.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	1175	251	0	1413	63	0	0	111	0	0	2
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	1199	256	0	1442	64	0	0	113	0	0	2
Pedestrians		1			7			4			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		597			688							
pX, platoon unblocked	0.81			0.65			0.74	0.74	0.65	0.74	0.74	0.81
vC, conflicting volume	1507			1459			2055	2838	739	2195	2934	755
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1395			1165			1323	2380	53	1512	2510	472
tC, single (s)	4.1			4.2			7.6	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	82	100	100	100
cM capacity (veh/h)	404			381			81	26	646	51	21	442

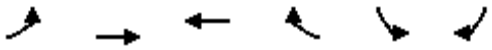
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	799	656	961	545	113	2
Volume Left	0	0	0	0	0	0
Volume Right	0	256	0	64	113	2
cSH	1700	1700	1700	1700	646	442
Volume to Capacity	0.47	0.39	0.57	0.32	0.18	0.00
Queue Length 95th (ft)	0	0	0	0	16	0
Control Delay (s)	0.0	0.0	0.0	0.0	11.8	13.2
Lane LOS					B	B
Approach Delay (s)	0.0		0.0		11.8	13.2
Approach LOS					B	B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		



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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	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		1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85		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)	1805	3407		1805	3539		1805	1593		1801	1758	
Flt Permitted	0.24	1.00		0.08	1.00		0.77	1.00		0.77	1.00	
Satd. Flow (perm)	454	3407		161	3539		1462	1593		1458	1758	
Volume (vph)	3	1076	211	263	1157	0	236	0	274	1	2	2
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	3	1098	215	268	1181	0	241	0	280	1	2	2
RTOR Reduction (vph)	0	12	0	0	0	0	0	231	0	0	2	0
Lane Group Flow (vph)	3	1301	0	268	1181	0	241	49	0	1	2	0
Confl. Peds. (#/hr)	2					2			1	1		
Heavy Vehicles (%)	0%	4%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	58.5	57.4		82.8	75.7		18.1	18.1		6.3	6.3	
Effective Green, g (s)	62.5	59.4		84.8	77.7		20.1	20.1		8.3	8.3	
Actuated g/C Ratio	0.52	0.50		0.71	0.65		0.17	0.17		0.07	0.07	
Clearance Time (s)	6.0	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	
Lane Grp Cap (vph)	271	1686		407	2292		287	267		110	122	
v/s Ratio Prot	0.00	c0.38		c0.12	0.33		c0.10	0.03		0.00	c0.00	
v/s Ratio Perm	0.01			0.35			c0.04			0.00		
v/c Ratio	0.01	0.77		0.66	0.52		0.84	0.18		0.01	0.02	
Uniform Delay, d1	13.8	24.8		27.9	11.2		48.2	42.9		52.0	52.1	
Progression Factor	0.49	0.41		1.35	0.16		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	1.6		3.2	0.2		18.9	1.5		0.0	0.3	
Delay (s)	6.8	11.8		41.1	2.0		67.1	44.4		52.1	52.3	
Level of Service	A	B		D	A		E	D		D	D	
Approach Delay (s)		11.8			9.2			54.9			52.3	
Approach LOS		B			A			D			D	

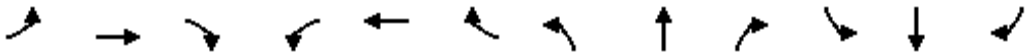
Intersection Summary			
HCM Average Control Delay	17.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1517	3406	3511		1787	1583
Flt Permitted	0.14	1.00	1.00		0.95	1.00
Satd. Flow (perm)	225	3406	3511		1787	1583
Volume (vph)	33	1327	1291	32	299	105
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	34	1354	1317	33	305	107
RTOR Reduction (vph)	0	0	1	0	0	85
Lane Group Flow (vph)	34	1354	1349	0	305	22
Heavy Vehicles (%)	19%	6%	2%	20%	1%	2%
Turn Type	pm+pt					Perm
Protected Phases	7	4	8		6	
Permitted Phases	4					6
Actuated Green, G (s)	87.2	87.2	76.6		24.8	24.8
Effective Green, g (s)	87.2	87.2	76.6		24.8	24.8
Actuated g/C Ratio	0.73	0.73	0.64		0.21	0.21
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	235	2475	2241		369	327
v/s Ratio Prot	0.01	c0.40	c0.38		c0.17	
v/s Ratio Perm	0.10					0.01
v/c Ratio	0.14	0.55	0.60		0.83	0.07
Uniform Delay, d1	15.2	7.4	12.7		45.5	38.3
Progression Factor	0.73	0.60	0.75		1.00	1.00
Incremental Delay, d2	0.2	0.2	1.1		14.0	0.1
Delay (s)	11.3	4.6	10.6		59.6	38.4
Level of Service	B	A	B		E	D
Approach Delay (s)		4.8	10.6		54.1	
Approach LOS		A	B		D	

Intersection Summary			
HCM Average Control Delay	13.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

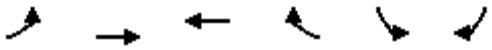
c Critical Lane Group



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)	4.0	4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3471	1568	1770	3539			1752	1538	1805	1726	
Flt Permitted	0.95	1.00	1.00	0.10	1.00			0.75	1.00	0.44	1.00	
Satd. Flow (perm)	1805	3471	1568	188	3539			1376	1538	835	1726	
Volume (vph)	4	1153	508	479	1144	1	160	0	201	25	7	11
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	4	1177	518	489	1167	1	163	0	205	26	7	11
RTOR Reduction (vph)	0	0	114	0	0	0	0	0	11	0	9	0
Lane Group Flow (vph)	4	1177	404	489	1168	0	0	163	194	26	9	0
Heavy Vehicles (%)	0%	4%	3%	2%	2%	0%	3%	0%	5%	0%	0%	0%
Turn Type	Prot		Perm	pm+pt			Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases			2	6			8		8	4		
Actuated Green, G (s)	1.0	56.6	56.6	84.4	84.4			16.6	45.4	16.6	16.6	
Effective Green, g (s)	3.0	58.6	58.6	86.4	86.4			18.6	49.4	18.6	18.6	
Actuated g/C Ratio	0.02	0.49	0.49	0.72	0.72			0.16	0.41	0.16	0.16	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	1.0	2.5	2.5	1.0	2.5			1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	45	1695	766	541	2548			213	684	129	268	
v/s Ratio Prot	0.00	c0.34		c0.23	0.33				0.07		0.01	
v/s Ratio Perm			0.26	c0.42				c0.12	0.05	0.03		
v/c Ratio	0.09	0.69	0.53	0.90	0.46			0.77	0.28	0.20	0.03	
Uniform Delay, d1	57.2	23.8	21.2	32.4	7.0			48.6	23.5	44.2	43.1	
Progression Factor	0.88	0.73	0.62	0.74	0.32			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.9	0.4	14.4	0.4			13.7	0.1	0.3	0.0	
Delay (s)	50.5	18.4	13.5	38.3	2.7			62.3	23.6	44.5	43.1	
Level of Service	D	B	B	D	A			E	C	D	D	
Approach Delay (s)		17.0			13.2			40.7			43.9	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	18.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
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)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1736	3471	3492		1687	1583
Flt Permitted	0.09	1.00	1.00		0.95	1.00
Satd. Flow (perm)	157	3471	3492		1687	1583
Volume (vph)	6	1349	1554	118	146	68
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	6	1377	1586	120	149	69
RTOR Reduction (vph)	0	0	3	0	0	25
Lane Group Flow (vph)	6	1377	1703	0	149	44
Heavy Vehicles (%)	4%	4%	2%	6%	7%	2%
Turn Type	pm+pt					pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Actuated Green, G (s)	93.0	93.0	83.3		15.0	18.7
Effective Green, g (s)	95.0	95.0	85.3		17.0	22.7
Actuated g/C Ratio	0.79	0.79	0.71		0.14	0.19
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	2.0	2.5	2.5		2.5	2.0
Lane Grp Cap (vph)	199	2748	2482		239	352
v/s Ratio Prot	0.00	c0.40	c0.49		c0.09	0.01
v/s Ratio Perm	0.02					0.02
v/c Ratio	0.03	0.50	0.69		0.62	0.12
Uniform Delay, d1	7.7	4.3	9.8		48.5	40.4
Progression Factor	0.14	0.10	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.5	0.7		4.3	0.1
Delay (s)	1.1	1.0	10.5		52.8	40.5
Level of Service	A	A	B		D	D
Approach Delay (s)		1.0	10.5		48.9	
Approach LOS		A	B		D	

Intersection Summary			
HCM Average Control Delay	9.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	305	177	97	428	35	35
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	339	197	108	476	39	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			536		1128	437
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			536		1128	437
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			89		81	94
cM capacity (veh/h)			1022		203	621

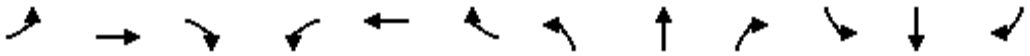
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	536	583	78
Volume Left	0	108	39
Volume Right	197	0	39
cSH	1700	1022	306
Volume to Capacity	0.32	0.11	0.25
Queue Length 95th (ft)	0	9	25
Control Delay (s)	0.0	2.7	20.7
Lane LOS		A	C
Approach Delay (s)	0.0	2.7	20.7
Approach LOS			C

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91		1.00	0.91	
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	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1881	1599	1698	1754	1553	1770	4899		1787	5078	
Flt Permitted	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1881	1599	1698	1754	1553	1770	4899		1787	5078	
Volume (vph)	237	347	139	334	218	238	202	1401	103	304	2172	20
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)	249	365	146	352	229	251	213	1475	108	320	2286	21
RTOR Reduction (vph)	0	0	115	0	0	213	0	7	0	0	1	0
Lane Group Flow (vph)	249	365	31	284	297	38	213	1576	0	320	2306	0
Heavy Vehicles (%)	1%	1%	1%	1%	2%	4%	2%	5%	2%	1%	2%	2%
Turn Type	Split		Perm	Split		Perm	Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8						
Actuated Green, G (s)	11.0	11.0	11.0	17.0	17.0	17.0	13.5	48.7		23.3	58.5	
Effective Green, g (s)	12.0	12.0	12.0	18.0	18.0	18.0	14.0	50.2		23.8	60.0	
Actuated g/C Ratio	0.10	0.10	0.10	0.15	0.15	0.15	0.12	0.42		0.20	0.50	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.5		4.5	5.5	
Vehicle Extension (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	4.7		2.3	4.7	
Lane Grp Cap (vph)	179	188	160	255	263	233	207	2049		354	2539	
v/s Ratio Prot	0.14	c0.19		0.17	c0.17		c0.12	0.32		0.18	c0.45	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	1.39	1.94	0.19	1.11	1.13	0.16	1.03	0.77		0.90	0.91	
Uniform Delay, d1	54.0	54.0	49.6	51.0	51.0	44.4	53.0	29.9		47.0	27.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.87	0.84	
Incremental Delay, d2	206.5	442.6	0.3	90.3	94.8	0.2	70.3	2.1		17.0	3.8	
Delay (s)	260.5	496.6	49.9	141.3	145.8	44.6	123.3	32.0		58.1	26.9	
Level of Service	F	F	D	F	F	D	F	C		E	C	
Approach Delay (s)		333.4			113.8			42.8			30.7	
Approach LOS		F			F			D			C	

Intersection Summary			
HCM Average Control Delay	84.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	100.2%	ICU Level of Service	G
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)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.98		1.00	1.00			0.90			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1805	3414		1517	3405			1347			1542	
Flt Permitted	0.95	1.00		0.95	1.00			0.91			0.48	
Satd. Flow (perm)	1805	3414		1517	3405			1238			761	
Volume (vph)	6	1955	281	112	838	1	75	4	260	53	22	3
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)	7	2125	305	122	911	1	82	4	283	58	24	3
RTOR Reduction (vph)	0	8	0	0	0	0	0	93	0	0	1	0
Lane Group Flow (vph)	7	2422	0	122	912	0	0	276	0	0	84	0
Heavy Vehicles (%)	0%	3%	9%	19%	6%	0%	25%	30%	25%	21%	15%	0%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	1.2	69.3		13.4	81.5			29.3			29.3	
Effective Green, g (s)	1.7	71.3		13.9	83.5			31.3			31.3	
Actuated g/C Ratio	0.01	0.55		0.11	0.65			0.24			0.24	
Clearance Time (s)	4.5	6.0		4.5	6.0			6.0			6.0	
Vehicle Extension (s)	2.3	4.8		2.3	4.8			2.5			2.5	
Lane Grp Cap (vph)	24	1894		164	2213			302			185	
v/s Ratio Prot	0.00	c0.71		c0.08	0.27							
v/s Ratio Perm								c0.22			0.11	
v/c Ratio	0.29	1.28		0.74	0.41			0.91			0.46	
Uniform Delay, d1	62.8	28.6		55.6	10.8			47.3			41.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	3.9	129.8		15.4	0.2			30.3			1.3	
Delay (s)	66.7	158.4		70.9	11.0			77.6			42.6	
Level of Service	E	F		E	B			E			D	
Approach Delay (s)		158.1			18.1			77.6			42.6	
Approach LOS		F			B			E			D	

Intersection Summary			
HCM Average Control Delay	111.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	128.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	99.2%	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)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	0.98		1.00	1.00	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes		1.00	1.00		0.98	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1831	1265		1662	1615	1770	3505	1494	1612	3366	
Flt Permitted		0.79	1.00		0.73	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1498	1265		1269	1615	1770	3505	1494	1612	3366	
Volume (vph)	11	4	6	50	4	148	50	2091	159	143	775	22
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)	12	4	6	53	4	156	53	2201	167	151	816	23
RTOR Reduction (vph)	0	0	5	0	0	141	0	0	47	0	1	0
Lane Group Flow (vph)	0	16	1	0	57	15	53	2201	120	151	838	0
Confl. Peds. (#/hr)			3	3					3	3		
Heavy Vehicles (%)	0%	0%	25%	8%	0%	0%	2%	3%	4%	12%	7%	0%
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			
Actuated Green, G (s)		9.9	9.9		9.9	9.9	7.0	79.5	79.5	14.1	86.6	
Effective Green, g (s)		11.9	11.9		11.9	11.9	7.5	81.5	81.5	14.6	88.6	
Actuated g/C Ratio		0.10	0.10		0.10	0.10	0.06	0.68	0.68	0.12	0.74	
Clearance Time (s)		6.0	6.0		6.0	6.0	4.5	6.0	6.0	4.5	6.0	
Vehicle Extension (s)		2.5	2.5		2.5	2.5	2.3	4.8	4.8	2.3	4.8	
Lane Grp Cap (vph)		149	125		126	160	111	2380	1015	196	2485	
v/s Ratio Prot							0.03	c0.63		c0.09	0.25	
v/s Ratio Perm		0.01	0.00		c0.04	0.01			0.08			
v/c Ratio		0.11	0.00		0.45	0.10	0.48	0.92	0.12	0.77	0.34	
Uniform Delay, d1		49.2	48.7		51.0	49.2	54.4	16.6	6.7	51.1	5.5	
Progression Factor		1.00	1.00		1.00	1.00	1.02	2.15	4.06	1.00	1.00	
Incremental Delay, d2		0.2	0.0		1.9	0.2	1.1	4.6	0.1	16.0	0.4	
Delay (s)		49.4	48.7		52.9	49.4	56.2	40.4	27.4	67.1	5.8	
Level of Service		D	D		D	D	E	D	C	E	A	
Approach Delay (s)		49.2			50.3			39.9			15.2	
Approach LOS		D			D			D			B	

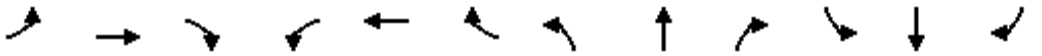
Intersection Summary			
HCM Average Control Delay	33.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

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)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	*0.75	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	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	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)	3400	5085	1538	3213	4803	1442	3019	2436	1446	3367	3406	1553
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)	3400	5085	1538	3213	4803	1442	3019	2436	1446	3367	3406	1553
Volume (vph)	260	1885	582	57	625	150	231	752	121	294	669	284
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	265	1923	594	58	638	153	236	767	123	300	683	290
RTOR Reduction (vph)	0	0	241	0	0	125	0	0	59	0	0	226
Lane Group Flow (vph)	265	1923	353	58	638	28	236	767	64	300	683	64
Confl. Peds. (#/hr)									2	2		
Heavy Vehicles (%)	3%	2%	5%	9%	8%	12%	16%	17%	9%	4%	6%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	40.9	55.3	55.3	5.7	20.1	20.1	13.6	32.0	32.0	7.0	25.4	25.4
Effective Green, g (s)	41.4	56.8	56.8	6.2	21.6	21.6	14.6	33.0	33.0	8.0	26.4	26.4
Actuated g/C Ratio	0.34	0.47	0.47	0.05	0.18	0.18	0.12	0.28	0.28	0.07	0.22	0.22
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.3	4.7	4.7	2.3	4.7	4.7	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	1173	2407	728	166	865	260	367	670	398	224	749	342
v/s Ratio Prot	0.08	c0.38		0.02	c0.13		0.08	c0.31		c0.09	0.20	
v/s Ratio Perm			0.23			0.02			0.04			0.04
v/c Ratio	0.23	0.80	0.48	0.35	0.74	0.11	0.64	1.14	0.16	1.34	0.91	0.19
Uniform Delay, d1	27.9	26.8	21.6	55.0	46.5	41.1	50.2	43.5	33.0	56.0	45.7	38.1
Progression Factor	0.63	0.54	0.41	0.88	0.90	1.00	0.94	1.03	1.38	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.2	0.1	0.7	5.4	0.8	2.8	80.2	0.1	179.6	15.2	0.2
Delay (s)	17.7	14.8	8.9	48.9	47.1	41.9	50.0	125.1	45.6	235.6	60.9	38.2
Level of Service	B	B	A	D	D	D	D	F	D	F	E	D
Approach Delay (s)		13.8			46.3			100.7			96.9	
Approach LOS		B			D			F			F	

Intersection Summary			
HCM Average Control Delay	52.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.3%	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)	4.0	4.0		4.0	4.0		4.0	4.0				4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00				1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00				0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00				1.00
Frt	1.00	0.99		1.00	1.00		1.00	0.90				0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00				1.00
Satd. Flow (prot)	3502	3374		1597	3034		1641	1678				1570
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00				1.00
Satd. Flow (perm)	3502	3374		1597	3034		1641	1678				1570
Volume (vph)	14	1209	84	53	910	0	178	25	57	0	0	16
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)	15	1314	91	58	989	0	193	27	62	0	0	17
RTOR Reduction (vph)	0	3	0	0	0	0	0	49	0	0	0	16
Lane Group Flow (vph)	15	1402	0	58	989	0	193	40	0	0	0	1
Confl. Peds. (#/hr)			1	1			3					3
Heavy Vehicles (%)	0%	6%	3%	13%	19%	12%	10%	0%	2%	1%	1%	1%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	2.0	70.7		7.4	75.8		15.6	24.3				2.0
Effective Green, g (s)	4.3	72.6		9.4	77.7		18.3	26.0				3.7
Actuated g/C Ratio	0.04	0.60		0.08	0.65		0.15	0.22				0.03
Clearance Time (s)	6.3	5.9		6.0	5.9		6.7	5.7				5.7
Vehicle Extension (s)	2.7	3.2		2.7	3.2		2.6	1.8				1.8
Lane Grp Cap (vph)	125	2041		125	1965		250	364				48
v/s Ratio Prot	0.00	c0.42		c0.04	c0.33		c0.12	c0.02				
v/s Ratio Perm												0.00
v/c Ratio	0.12	0.69		0.46	0.50		0.77	0.11				0.01
Uniform Delay, d1	56.0	16.0		52.9	11.1		48.8	37.7				56.4
Progression Factor	1.00	0.83		0.76	0.74		1.00	1.00				1.00
Incremental Delay, d2	0.3	1.3		1.3	0.5		13.3	0.0				0.0
Delay (s)	56.3	14.5		41.3	8.7		62.2	37.8				56.4
Level of Service	E	B		D	A		E	D				E
Approach Delay (s)		15.0			10.5			54.5			56.4	
Approach LOS		B			B			D			E	

Intersection Summary			
HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.8%	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												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	1219	50	0	964	42	0	0	174	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1325	54	0	1048	46	0	0	189	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		597			688							
pX, platoon unblocked	0.77			0.72			0.83	0.83	0.72	0.83	0.83	0.77
vC, conflicting volume	1093			1379			1876	2446	690	1922	2450	547
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	819			1136			1017	1700	177	1073	1705	107
tC, single (s)	4.1			4.4			7.9	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.7	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	69	100	100	100
cM capacity (veh/h)	628			385			140	78	601	101	77	716

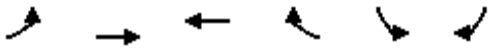
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	883	496	699	395	189	0
Volume Left	0	0	0	0	0	0
Volume Right	0	54	0	46	189	0
cSH	1700	1700	1700	1700	601	1700
Volume to Capacity	0.52	0.29	0.41	0.23	0.31	0.00
Queue Length 95th (ft)	0	0	0	0	34	0
Control Delay (s)	0.0	0.0	0.0	0.0	13.7	0.0
Lane LOS					B	A
Approach Delay (s)	0.0		0.0		13.7	0.0
Approach LOS					B	A

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.86		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1504	3418		1805	3060		1805	1596		1805	1863	
Flt Permitted	0.14	1.00		0.07	1.00		0.36	1.00		0.35	1.00	
Satd. Flow (perm)	216	3418		139	3060		692	1596		670	1863	
Volume (vph)	122	1197	74	170	962	59	309	11	262	157	124	5
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)	133	1301	80	185	1046	64	336	12	285	171	135	5
RTOR Reduction (vph)	0	4	0	0	4	0	0	144	0	0	1	0
Lane Group Flow (vph)	133	1377	0	185	1106	0	336	153	0	171	139	0
Heavy Vehicles (%)	20%	5%	0%	0%	18%	0%	0%	0%	2%	0%	0%	40%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	70.5	56.7		62.1	52.5		35.7	22.3		20.8	13.4	
Effective Green, g (s)	74.3	58.7		66.1	54.5		37.7	24.3		24.8	15.4	
Actuated g/C Ratio	0.62	0.49		0.55	0.45		0.31	0.20		0.21	0.13	
Clearance Time (s)	6.0	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	
Lane Grp Cap (vph)	303	1672		238	1390		387	323		227	239	
v/s Ratio Prot	0.06	c0.40		c0.08	0.36		c0.13	0.10		0.06	0.07	
v/s Ratio Perm	0.21			0.35			c0.14			0.10		
v/c Ratio	0.44	0.82		0.78	0.80		0.87	0.47		0.75	0.58	
Uniform Delay, d1	31.9	26.2		43.5	28.0		35.4	42.2		42.2	49.3	
Progression Factor	0.44	0.41		0.76	0.74		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	4.1		14.1	3.1		18.2	1.1		13.2	3.6	
Delay (s)	14.8	14.8		47.3	23.9		53.5	43.3		55.4	52.9	
Level of Service	B	B		D	C		D	D		E	D	
Approach Delay (s)		14.8			27.3			48.7			54.3	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		

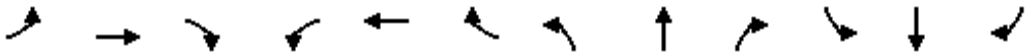
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3438	3186		1245	1242
Flt Permitted	0.23	1.00	1.00		0.95	1.00
Satd. Flow (perm)	439	3438	3186		1245	1242
Volume (vph)	97	1454	901	92	35	67
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	105	1580	979	100	38	73
RTOR Reduction (vph)	0	0	3	0	0	68
Lane Group Flow (vph)	105	1580	1076	0	38	5
Heavy Vehicles (%)	0%	5%	12%	9%	45%	30%
Turn Type	pm+pt					Perm
Protected Phases	7	4	8		6	
Permitted Phases	4					6
Actuated Green, G (s)	103.1	103.1	93.0		8.9	8.9
Effective Green, g (s)	103.1	103.1	93.0		8.9	8.9
Actuated g/C Ratio	0.86	0.86	0.78		0.07	0.07
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	447	2954	2469		92	92
v/s Ratio Prot	0.01	c0.46	0.34		c0.03	
v/s Ratio Perm	0.19					0.00
v/c Ratio	0.23	0.53	0.44		0.41	0.06
Uniform Delay, d1	2.1	2.2	4.6		53.1	51.7
Progression Factor	0.65	0.47	0.43		1.00	1.00
Incremental Delay, d2	0.2	0.1	0.5		3.0	0.3
Delay (s)	1.5	1.1	2.5		56.1	51.9
Level of Service	A	A	A		E	D
Approach Delay (s)		1.2	2.5		53.3	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	3.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		

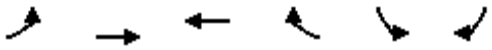
c Critical Lane Group



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)	4.0	4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3343	1568	1671	3165			1658	1538	1150	1522	
Flt Permitted	0.95	1.00	1.00	0.07	1.00			0.73	1.00	0.40	1.00	
Satd. Flow (perm)	1805	3343	1568	132	3165			1272	1538	485	1522	
Volume (vph)	6	1270	205	207	834	14	180	10	509	9	3	4
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)	6	1337	216	218	878	15	189	11	536	9	3	4
RTOR Reduction (vph)	0	0	44	0	1	0	0	0	15	0	3	0
Lane Group Flow (vph)	6	1337	172	218	892	0	0	200	521	9	4	0
Heavy Vehicles (%)	0%	8%	3%	8%	14%	0%	10%	0%	5%	57%	33%	0%
Turn Type	Prot		Perm	pm+pt			Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases			2	6			8		8	4		
Actuated Green, G (s)	5.1	61.9	61.9	76.5	76.5			20.4	40.1	20.4	20.4	
Effective Green, g (s)	7.1	63.9	63.9	78.5	78.5			22.4	44.1	22.4	22.4	
Actuated g/C Ratio	0.06	0.53	0.53	0.65	0.65			0.19	0.37	0.19	0.19	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	1.0	2.5	2.5	1.0	2.5			1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	107	1780	835	365	2070			237	616	91	284	
v/s Ratio Prot	0.00	c0.40		0.11	0.28				c0.15		0.00	
v/s Ratio Perm			0.11	0.28				0.16	0.19	0.02		
v/c Ratio	0.06	0.75	0.21	0.60	0.43			0.84	0.85	0.10	0.01	
Uniform Delay, d1	53.3	21.9	14.7	28.0	10.0			47.1	34.8	40.4	39.8	
Progression Factor	0.75	0.38	0.13	0.87	0.84			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	1.5	0.1	1.6	0.6			22.2	10.0	0.2	0.0	
Delay (s)	40.0	9.7	2.0	26.0	9.0			69.3	44.8	40.6	39.8	
Level of Service	D	A	A	C	A			E	D	D	D	
Approach Delay (s)		8.7			12.4			51.5			40.3	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
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)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1656	3343	3136		1172	1324
Flt Permitted	0.21	1.00	1.00		0.95	1.00
Satd. Flow (perm)	357	3343	3136		1172	1324
Volume (vph)	161	1567	1030	144	13	24
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	164	1599	1051	147	13	24
RTOR Reduction (vph)	0	0	4	0	0	22
Lane Group Flow (vph)	164	1599	1194	0	13	2
Heavy Vehicles (%)	9%	8%	12%	20%	54%	22%
Turn Type	pm+pt					pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Actuated Green, G (s)	106.3	106.3	94.2		1.7	7.8
Effective Green, g (s)	108.3	108.3	96.2		3.7	11.8
Actuated g/C Ratio	0.90	0.90	0.80		0.03	0.10
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	2.0	2.5	2.5		2.5	2.0
Lane Grp Cap (vph)	410	3017	2514		36	174
v/s Ratio Prot	0.03	c0.48	0.38		c0.01	0.00
v/s Ratio Perm	0.33					0.00
v/c Ratio	0.40	0.53	0.48		0.36	0.01
Uniform Delay, d1	1.8	1.1	3.8		57.0	48.8
Progression Factor	3.11	0.58	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.4	0.1		4.5	0.0
Delay (s)	5.7	1.0	3.9		61.4	48.9
Level of Service	A	A	A		E	D
Approach Delay (s)		1.5	3.9		53.3	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	3.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	323	50	43	321	39	74
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	340	53	45	338	41	78
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			393		795	366
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			393		795	366
tC, single (s)			4.4		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.5		3.7	3.5
p0 queue free %			96		87	88
cM capacity (veh/h)			1007		312	630

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	393	383	119
Volume Left	0	45	41
Volume Right	53	0	78
cSH	1700	1007	466
Volume to Capacity	0.23	0.04	0.26
Queue Length 95th (ft)	0	4	25
Control Delay (s)	0.0	1.5	15.3
Lane LOS		A	C
Approach Delay (s)	0.0	1.5	15.3
Approach LOS			C

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91		1.00	0.91	
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	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1845	1482	1603	1735	1455	1770	4958		1703	4622	
Flt Permitted	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1736	1845	1482	1603	1735	1455	1770	4958		1703	4622	
Volume (vph)	233	208	111	261	225	148	146	2240	82	219	962	20
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)	245	219	117	275	237	156	154	2358	86	231	1013	21
RTOR Reduction (vph)	0	0	104	0	0	127	0	3	0	0	2	0
Lane Group Flow (vph)	245	219	13	245	267	29	154	2441	0	231	1032	0
Heavy Vehicles (%)	4%	3%	9%	7%	3%	11%	2%	4%	6%	6%	12%	6%
Turn Type	Split		Perm	Split		Perm	Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8						
Actuated Green, G (s)	12.8	12.8	12.8	21.2	21.2	21.2	10.5	54.5		11.5	55.5	
Effective Green, g (s)	13.8	13.8	13.8	22.2	22.2	22.2	11.0	56.0		12.0	57.0	
Actuated g/C Ratio	0.12	0.12	0.12	0.18	0.18	0.18	0.09	0.47		0.10	0.48	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.5		4.5	5.5	
Vehicle Extension (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	4.7		2.3	4.7	
Lane Grp Cap (vph)	200	212	170	297	321	269	162	2314		170	2195	
v/s Ratio Prot	c0.14	0.12		0.15	c0.15		0.09	c0.49		c0.14	0.22	
v/s Ratio Perm			0.01			0.02						
v/c Ratio	1.23	1.03	0.08	0.82	0.83	0.11	0.95	1.05		1.36	0.47	
Uniform Delay, d1	53.1	53.1	47.4	47.0	47.1	40.7	54.2	32.0		54.0	21.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.89	0.46	
Incremental Delay, d2	137.4	70.7	0.1	16.3	16.1	0.1	55.8	35.2		189.1	0.6	
Delay (s)	190.5	123.8	47.5	63.3	63.2	40.8	110.0	67.2		237.2	10.3	
Level of Service	F	F	D	E	E	D	F	E		F	B	
Approach Delay (s)		136.6			58.0			69.7			51.7	
Approach LOS		F			E			E			D	

Intersection Summary			
HCM Average Control Delay	71.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	96.6%	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)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	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	1.00	0.99		1.00	1.00			0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1770	3379		1736	3538			1760			1809	
Flt Permitted	0.95	1.00		0.95	1.00			0.54			0.96	
Satd. Flow (perm)	1770	3379		1736	3538			984			1747	
Volume (vph)	14	1186	82	140	2045	5	442	17	54	19	131	32
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	14	1210	84	143	2087	5	451	17	55	19	134	33
RTOR Reduction (vph)	0	4	0	0	0	0	0	3	0	0	6	0
Lane Group Flow (vph)	14	1290	0	143	2092	0	0	520	0	0	180	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	5%	15%	4%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	2.6	59.3		13.5	70.2			35.2			35.2	
Effective Green, g (s)	3.1	61.3		14.0	72.2			37.2			37.2	
Actuated g/C Ratio	0.02	0.49		0.11	0.58			0.30			0.30	
Clearance Time (s)	4.5	6.0		4.5	6.0			6.0			6.0	
Vehicle Extension (s)	2.3	4.8		2.3	4.8			2.5			2.5	
Lane Grp Cap (vph)	44	1664		195	2052			294			522	
v/s Ratio Prot	0.01	0.38		c0.08	c0.59							
v/s Ratio Perm								c0.53			0.10	
v/c Ratio	0.32	0.78		0.73	1.02			1.77			0.35	
Uniform Delay, d1	59.7	25.9		53.4	26.1			43.6			34.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.4	2.7		12.2	24.9			359.8			0.3	
Delay (s)	62.1	28.6		65.6	51.1			403.4			34.4	
Level of Service	E	C		E	D			F			C	
Approach Delay (s)		29.0			52.0			403.4			34.4	
Approach LOS		C			D			F			C	

Intersection Summary			
HCM Average Control Delay	87.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	124.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	111.9%	ICU Level of Service	H
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)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1826	1592		1754	1568	1805	3438	1583	1719	3534	
Flt Permitted		0.29	1.00		0.71	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		547	1592		1299	1568	1805	3438	1583	1719	3534	
Volume (vph)	25	6	35	220	3	167	33	1100	156	195	2326	23
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	26	6	36	224	3	170	34	1122	159	199	2373	23
RTOR Reduction (vph)	0	0	32	0	0	149	0	0	56	0	1	0
Lane Group Flow (vph)	0	32	5	0	227	21	34	1122	103	199	2395	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	0%	2%	50%	3%	0%	5%	2%	5%	2%	0%
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			
Actuated Green, G (s)		13.0	13.0		13.0	13.0	4.8	76.0	76.0	14.5	85.7	
Effective Green, g (s)		15.0	15.0		15.0	15.0	5.3	78.0	78.0	15.0	87.7	
Actuated g/C Ratio		0.12	0.12		0.12	0.12	0.04	0.65	0.65	0.12	0.73	
Clearance Time (s)		6.0	6.0		6.0	6.0	4.5	6.0	6.0	4.5	6.0	
Vehicle Extension (s)		2.5	2.5		2.5	2.5	2.3	4.8	4.8	2.3	4.8	
Lane Grp Cap (vph)		68	199		162	196	80	2235	1029	215	2583	
v/s Ratio Prot							0.02	0.33		c0.12	c0.68	
v/s Ratio Perm		0.06	0.00		c0.17	0.01			0.07			
v/c Ratio		0.47	0.02		1.40	0.11	0.42	0.50	0.10	0.93	0.93	
Uniform Delay, d1		48.8	46.1		52.5	46.6	55.9	10.9	7.9	51.9	13.5	
Progression Factor		1.00	1.00		1.13	2.12	0.83	1.67	3.99	1.00	1.00	
Incremental Delay, d2		3.7	0.0		209.9	0.2	1.8	0.7	0.2	40.7	7.3	
Delay (s)		52.5	46.1		269.4	98.8	48.3	18.9	31.6	92.6	20.8	
Level of Service		D	D		F	F	D	B	C	F	C	
Approach Delay (s)		49.1			196.3			21.2			26.3	
Approach LOS		D			F			C			C	

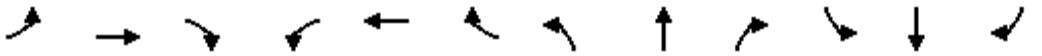
Intersection Summary			
HCM Average Control Delay	40.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

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)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	*0.75	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	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	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)	3400	4988	1524	3303	5085	1583	3502	2767	1507	3127	3374	1553
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)	3400	4988	1524	3303	5085	1583	3502	2767	1507	3127	3374	1553
Volume (vph)	238	994	407	284	1776	526	439	909	82	217	696	213
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	243	1014	415	290	1812	537	448	928	84	221	710	217
RTOR Reduction (vph)	0	0	176	0	0	111	0	0	33	0	0	152
Lane Group Flow (vph)	243	1014	239	290	1812	426	448	928	51	221	710	65
Confl. Peds. (#/hr)									3	3		
Heavy Vehicles (%)	3%	4%	6%	6%	2%	2%	0%	3%	4%	12%	7%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.7	45.0	45.0	14.5	47.8	47.8	16.8	32.0	32.0	8.5	23.7	23.7
Effective Green, g (s)	12.2	46.5	46.5	15.0	49.3	49.3	17.8	33.0	33.0	9.5	24.7	24.7
Actuated g/C Ratio	0.10	0.39	0.39	0.12	0.41	0.41	0.15	0.28	0.28	0.08	0.21	0.21
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.3	4.7	4.7	2.3	4.7	4.7	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	346	1933	591	413	2089	650	519	761	414	248	694	320
v/s Ratio Prot	c0.07	0.20		0.09	c0.36		c0.13	c0.34		0.07	0.21	
v/s Ratio Perm			0.16			0.27			0.03			0.04
v/c Ratio	0.70	0.52	0.40	0.70	0.87	0.66	0.86	1.22	0.12	0.89	1.02	0.20
Uniform Delay, d1	52.1	28.3	26.7	50.4	32.4	28.5	49.9	43.5	32.6	54.7	47.6	39.5
Progression Factor	0.85	0.66	1.12	1.17	0.96	0.96	0.81	0.78	0.80	1.00	1.00	1.00
Incremental Delay, d2	3.0	0.2	0.4	1.7	1.9	1.8	11.6	108.7	0.1	30.0	40.1	0.2
Delay (s)	47.5	18.9	30.4	60.7	32.8	29.2	51.9	142.6	26.2	84.7	87.8	39.7
Level of Service	D	B	C	E	C	C	D	F	C	F	F	D
Approach Delay (s)		25.9			35.2			108.1			78.1	
Approach LOS		C			D			F			E	

Intersection Summary			
HCM Average Control Delay	55.4	HCM Level of Service	E
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	86.2%	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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.94
Flpb, ped/bikes	1.00	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	0.89		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	3272		1805	3498		1805	1643		1805	1900	1481
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	3272		1805	3498		1805	1643		1805	1900	1481
Volume (vph)	66	1132	189	140	1198	15	152	27	75	33	12	80
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	67	1155	193	143	1222	15	155	28	77	34	12	82
RTOR Reduction (vph)	0	9	0	0	0	0	0	66	0	0	0	76
Lane Group Flow (vph)	67	1339	0	143	1237	0	155	39	0	34	12	6
Confl. Peds. (#/hr)			4	4			27					27
Heavy Vehicles (%)	0%	8%	4%	0%	3%	3%	0%	0%	4%	0%	0%	2%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	6.4	64.4		13.7	71.4		11.0	15.0		3.0	6.6	6.6
Effective Green, g (s)	8.7	66.3		15.7	73.3		13.7	16.7		5.3	8.3	8.3
Actuated g/C Ratio	0.07	0.55		0.13	0.61		0.11	0.14		0.04	0.07	0.07
Clearance Time (s)	6.3	5.9		6.0	5.9		6.7	5.7		6.3	5.7	5.7
Vehicle Extension (s)	2.7	3.2		2.7	3.2		2.6	1.8		2.7	1.8	1.8
Lane Grp Cap (vph)	254	1808		236	2137		206	229		80	131	102
v/s Ratio Prot	0.02	c0.41		0.08	c0.35		c0.09	c0.02		0.02	0.01	
v/s Ratio Perm												0.00
v/c Ratio	0.26	0.74		0.61	0.58		0.75	0.17		0.42	0.09	0.06
Uniform Delay, d1	52.6	20.3		49.2	14.1		51.5	45.5		55.9	52.3	52.2
Progression Factor	0.96	0.48		0.81	0.81		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	1.5		3.1	0.9		13.8	0.1		3.0	0.1	0.1
Delay (s)	50.5	11.3		43.1	12.3		65.3	45.7		58.9	52.4	52.3
Level of Service	D	B		D	B		E	D		E	D	D
Approach Delay (s)		13.2			15.5			57.4			54.0	
Approach LOS		B			B			E			D	

Intersection Summary			
HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



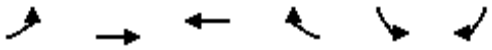
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	995	254	0	1292	32	0	0	201	0	0	2
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	1015	259	0	1318	33	0	0	205	0	0	2
Pedestrians		1			7			4			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		597			688							
pX, platoon unblocked	0.76			0.71			0.83	0.83	0.71	0.83	0.83	0.76
vC, conflicting volume	1352			1278			1811	2501	648	2055	2614	678
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1149			985			910	1740	99	1204	1876	262
tC, single (s)	4.1			4.2			7.6	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	69	100	100	100
cM capacity (veh/h)	468			490			184	73	663	81	60	564

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	677	598	879	472	205	2
Volume Left	0	0	0	0	0	0
Volume Right	0	259	0	33	205	2
cSH	1700	1700	1700	1700	663	564
Volume to Capacity	0.40	0.35	0.52	0.28	0.31	0.00
Queue Length 95th (ft)	0	0	0	0	33	0
Control Delay (s)	0.0	0.0	0.0	0.0	12.8	11.4
Lane LOS					B	B
Approach Delay (s)	0.0		0.0		12.8	11.4
Approach LOS					B	B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	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		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.89		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3429		1805	3455		1805	1675		1803	1897	
Flt Permitted	0.15	1.00		0.07	1.00		0.75	1.00		0.75	1.00	
Satd. Flow (perm)	294	3429		142	3455		1434	1675		1433	1897	
Volume (vph)	43	1032	124	250	995	185	246	81	221	143	185	2
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	44	1053	127	255	1015	189	251	83	226	146	189	2
RTOR Reduction (vph)	0	8	0	0	12	0	0	87	0	0	0	0
Lane Group Flow (vph)	44	1172	0	255	1192	0	251	222	0	146	191	0
Confl. Peds. (#/hr)	2					2			1	1		
Heavy Vehicles (%)	0%	4%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	51.5	47.7		68.8	59.0		21.2	21.2		17.3	17.3	
Effective Green, g (s)	55.5	49.7		70.8	61.0		23.2	23.2		19.3	19.3	
Actuated g/C Ratio	0.46	0.41		0.59	0.51		0.19	0.19		0.16	0.16	
Clearance Time (s)	6.0	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	
Lane Grp Cap (vph)	209	1420		321	1756		333	324		274	305	
v/s Ratio Prot	0.01	0.34		c0.11	0.34		c0.11	0.13		0.06	c0.10	
v/s Ratio Perm	0.09			c0.36			c0.03			0.02		
v/c Ratio	0.21	0.83		0.79	0.68		0.75	0.68		0.53	0.63	
Uniform Delay, d1	19.1	31.3		33.5	22.1		45.5	45.0		45.6	47.0	
Progression Factor	0.60	0.52		1.36	0.48		1.00	1.00		1.22	1.22	
Incremental Delay, d2	0.4	3.4		11.0	0.9		9.3	11.2		1.6	7.8	
Delay (s)	11.9	19.8		56.4	11.6		54.8	56.2		57.4	65.3	
Level of Service	B	B		E	B		D	E		E	E	
Approach Delay (s)		19.5			19.4			55.6			61.8	
Approach LOS		B			B			E			E	

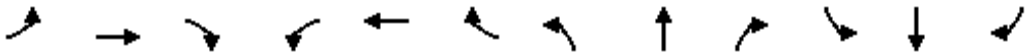
Intersection Summary			
HCM Average Control Delay	29.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1517	3406	3516		1787	1583
Flt Permitted	0.14	1.00	1.00		0.95	1.00
Satd. Flow (perm)	220	3406	3516		1787	1583
Volume (vph)	36	1364	1315	27	269	85
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	37	1392	1342	28	274	87
RTOR Reduction (vph)	0	0	1	0	0	71
Lane Group Flow (vph)	37	1392	1369	0	274	16
Heavy Vehicles (%)	19%	6%	2%	20%	1%	2%
Turn Type	pm+pt					Perm
Protected Phases	7	4	8		6	
Permitted Phases	4					6
Actuated Green, G (s)	89.4	89.4	81.4		22.6	22.6
Effective Green, g (s)	89.4	89.4	81.4		22.6	22.6
Actuated g/C Ratio	0.74	0.74	0.68		0.19	0.19
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	207	2537	2385		337	298
v/s Ratio Prot	0.01	c0.41	c0.39		c0.15	
v/s Ratio Perm	0.13					0.01
v/c Ratio	0.18	0.55	0.57		0.81	0.05
Uniform Delay, d1	7.1	6.6	10.2		46.7	39.9
Progression Factor	1.29	0.73	0.51		1.00	1.00
Incremental Delay, d2	0.2	0.1	0.9		13.9	0.1
Delay (s)	9.4	5.0	6.1		60.6	40.0
Level of Service	A	A	A		E	D
Approach Delay (s)		5.1	6.1		55.6	
Approach LOS		A	A		E	

Intersection Summary			
HCM Average Control Delay	11.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

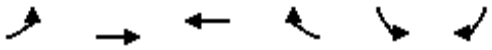
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3471	1568	1770	3539			1752	1538	1805	1716	
Flt Permitted	0.95	1.00	1.00	0.10	1.00			0.75	1.00	0.43	1.00	
Satd. Flow (perm)	1805	3471	1568	178	3539			1377	1538	823	1716	
Volume (vph)	4	1180	488	472	1158	1	164	0	213	25	6	11
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	4	1204	498	482	1182	1	167	0	217	26	6	11
RTOR Reduction (vph)	0	0	108	0	0	0	0	0	11	0	9	0
Lane Group Flow (vph)	4	1204	390	482	1183	0	0	167	206	26	8	0
Heavy Vehicles (%)	0%	4%	3%	2%	2%	0%	3%	0%	5%	0%	0%	0%
Turn Type	Prot		Perm	pm+pt			Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases			2	6			8		8	4		
Actuated Green, G (s)	1.0	57.0	57.0	84.1	84.1			16.9	45.0	16.9	16.9	
Effective Green, g (s)	3.0	59.0	59.0	86.1	86.1			18.9	49.0	18.9	18.9	
Actuated g/C Ratio	0.02	0.49	0.49	0.72	0.72			0.16	0.41	0.16	0.16	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	1.0	2.5	2.5	1.0	2.5			1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	45	1707	771	527	2539			217	679	130	270	
v/s Ratio Prot	0.00	c0.35		c0.23	0.33				0.08		0.00	
v/s Ratio Perm			0.25	c0.43				c0.12	0.06	0.03		
v/c Ratio	0.09	0.71	0.51	0.91	0.47			0.77	0.30	0.20	0.03	
Uniform Delay, d1	57.2	23.7	20.6	33.4	7.2			48.5	24.0	44.0	42.8	
Progression Factor	1.05	0.82	0.88	0.81	0.31			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	1.0	0.3	16.5	0.5			13.7	0.1	0.3	0.0	
Delay (s)	60.0	20.4	18.5	43.6	2.7			62.2	24.1	44.3	42.8	
Level of Service	E	C	B	D	A			E	C	D	D	
Approach Delay (s)		19.9			14.5			40.6			43.7	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
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)		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	0.99		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3496		1687	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3496		1687	1583
Volume (vph)	0	1393	1564	108	102	66
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1421	1596	110	104	67
RTOR Reduction (vph)	0	0	3	0	0	25
Lane Group Flow (vph)	0	1421	1703	0	104	42
Heavy Vehicles (%)	4%	4%	2%	6%	7%	2%
Turn Type	pm+pt					pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Actuated Green, G (s)		96.0	86.3		12.0	15.7
Effective Green, g (s)		98.0	88.3		14.0	19.7
Actuated g/C Ratio		0.82	0.74		0.12	0.16
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		2.5	2.5		2.5	2.0
Lane Grp Cap (vph)		2835	2572		197	313
v/s Ratio Prot		c0.41	c0.49		c0.06	0.01
v/s Ratio Perm						0.02
v/c Ratio		0.50	0.66		0.53	0.13
Uniform Delay, d1		3.4	8.2		49.9	42.9
Progression Factor		0.12	1.00		1.00	1.00
Incremental Delay, d2		0.5	0.6		1.9	0.1
Delay (s)		0.9	8.8		51.8	42.9
Level of Service		A	A		D	D
Approach Delay (s)		0.9	8.8		48.3	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	7.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	247	136	106	412	30	54
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	274	151	118	458	33	60
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			426		1043	350
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			426		1043	350
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			90		85	91
cM capacity (veh/h)			1123		228	696

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	426	576	93
Volume Left	0	118	33
Volume Right	151	0	60
cSH	1700	1123	402
Volume to Capacity	0.25	0.10	0.23
Queue Length 95th (ft)	0	9	22
Control Delay (s)	0.0	2.7	16.6
Lane LOS		A	C
Approach Delay (s)	0.0	2.7	16.6
Approach LOS			C

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91		1.00	0.91	
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	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1881	1599	1698	1757	1553	1770	4899		1787	5078	
Flt Permitted	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1881	1599	1698	1757	1553	1770	4899		1787	5078	
Volume (vph)	251	327	146	317	228	239	197	1405	102	289	2188	20
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)	264	344	154	334	240	252	207	1479	107	304	2303	21
RTOR Reduction (vph)	0	0	129	0	0	214	0	7	0	0	1	0
Lane Group Flow (vph)	264	344	25	281	293	38	207	1579	0	304	2323	0
Heavy Vehicles (%)	1%	1%	1%	1%	2%	4%	2%	5%	2%	1%	2%	2%
Turn Type	Split		Perm	Split		Perm	Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8						
Actuated Green, G (s)	11.0	11.0	11.0	17.0	17.0	17.0	13.5	48.7		23.3	58.5	
Effective Green, g (s)	12.0	12.0	12.0	18.0	18.0	18.0	14.0	50.2		23.8	60.0	
Actuated g/C Ratio	0.10	0.10	0.10	0.15	0.15	0.15	0.12	0.42		0.20	0.50	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.5		4.5	5.5	
Vehicle Extension (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	4.7		2.3	4.7	
Lane Grp Cap (vph)	179	188	160	255	264	233	207	2049		354	2539	
v/s Ratio Prot	0.15	c0.18		0.17	c0.17		c0.12	0.32		0.17	c0.46	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	1.47	1.83	0.16	1.10	1.11	0.16	1.00	0.77		0.86	0.91	
Uniform Delay, d1	54.0	54.0	49.4	51.0	51.0	44.4	53.0	30.0		46.5	27.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.90	0.87	
Incremental Delay, d2	241.3	393.4	0.3	86.4	88.1	0.2	62.6	2.1		11.6	4.1	
Delay (s)	295.3	447.4	49.7	137.4	139.1	44.6	115.6	32.1		53.4	28.3	
Level of Service	F	F	D	F	F	D	F	C		D	C	
Approach Delay (s)		314.4			109.7			41.7			31.2	
Approach LOS		F			F			D			C	

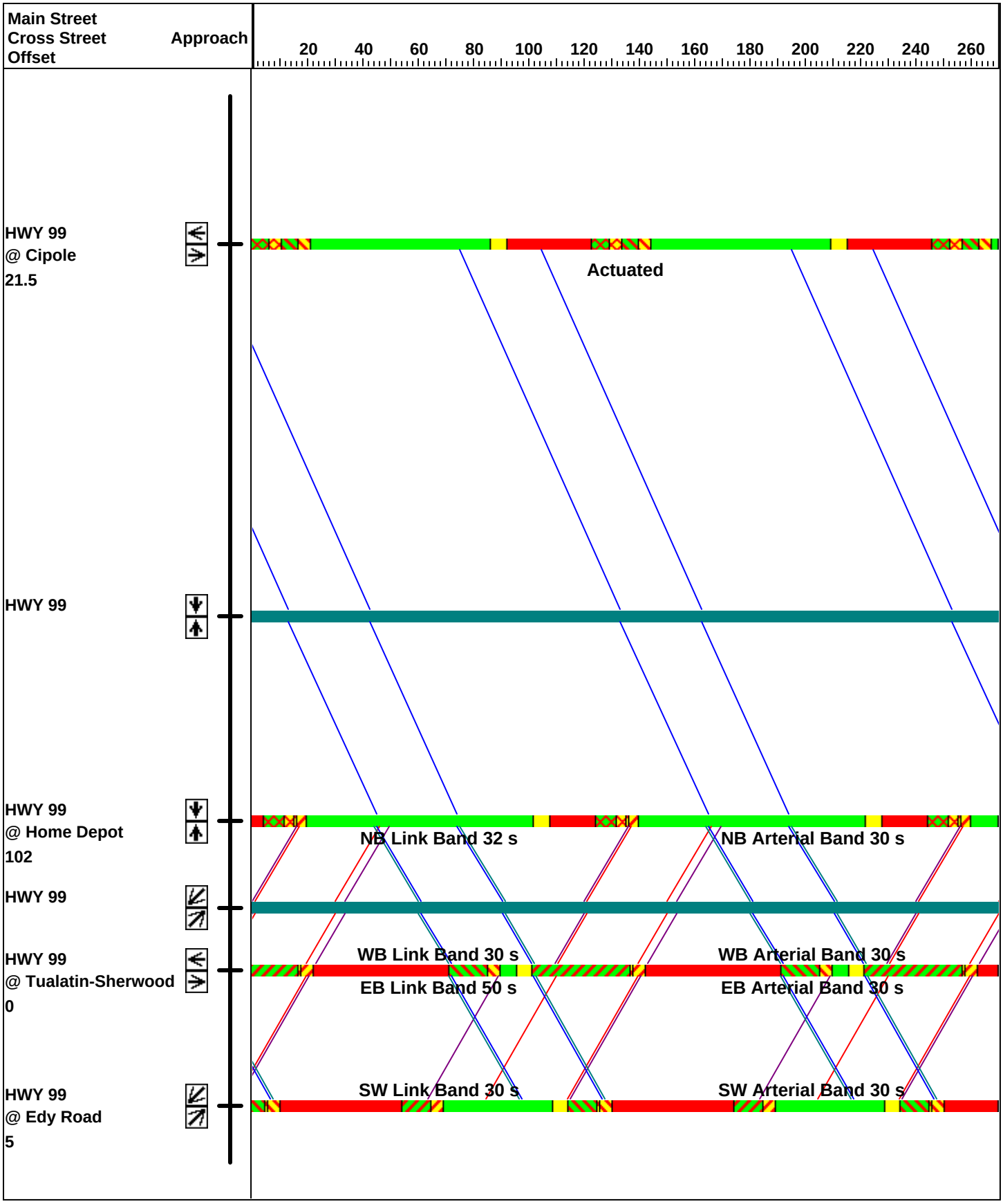
Intersection Summary			
HCM Average Control Delay	81.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	98.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Progression Time-Space Diagrams

Time-Space Diagram - HWY 99

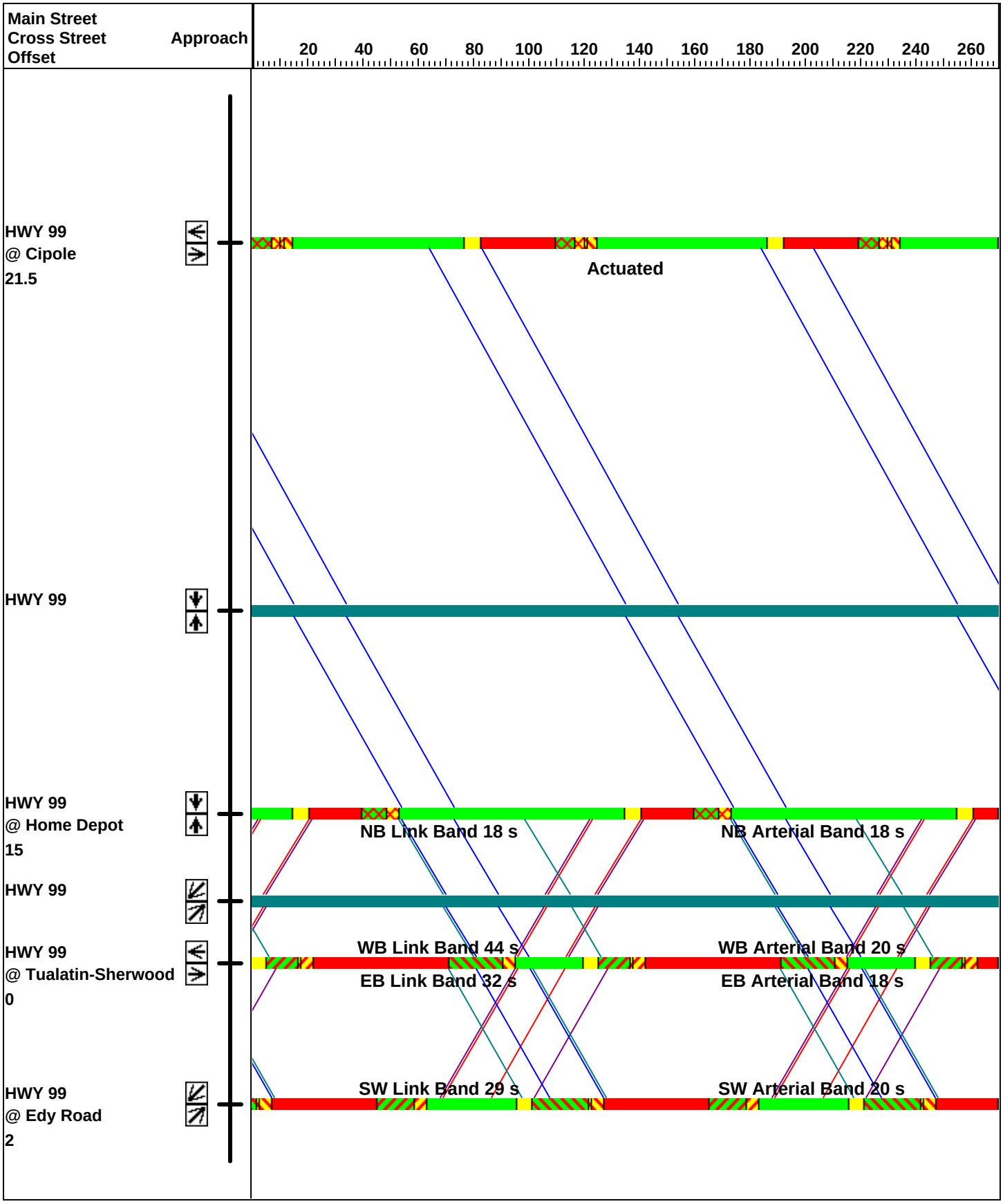
Arterial and Link-Link Bandwidths, 90th Percentile Green Times 3/10/2009



Sherwood Adams Ave N Extension 2008 Existing AM

Time-Space Diagram - HWY 99

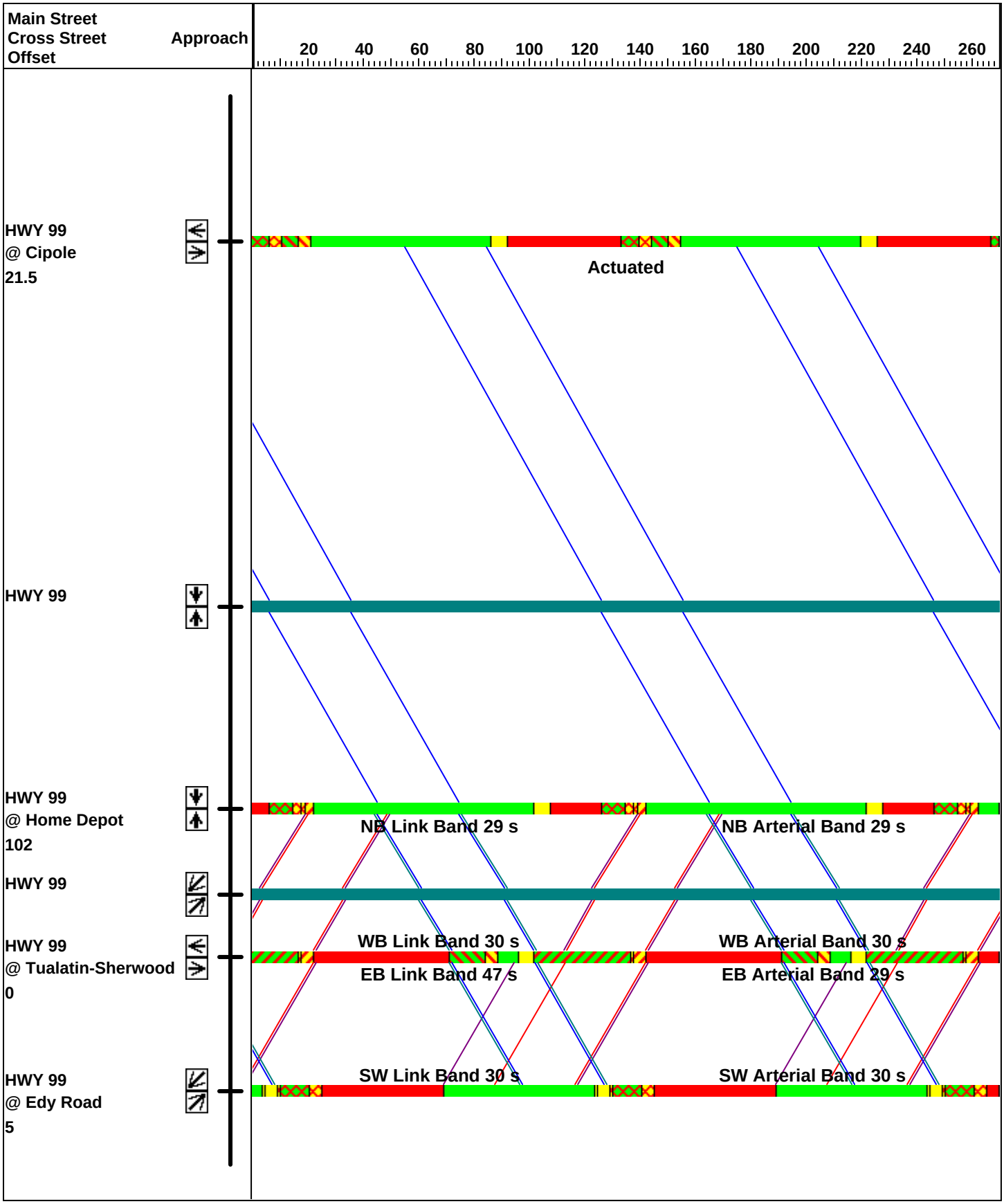
Arterial and Link-Link Bandwidths, 90th Percentile Green Times 3/10/2009



Sherwood Adams Ave N Extension 2008 Existing 30th HV

Time-Space Diagram - HWY 99

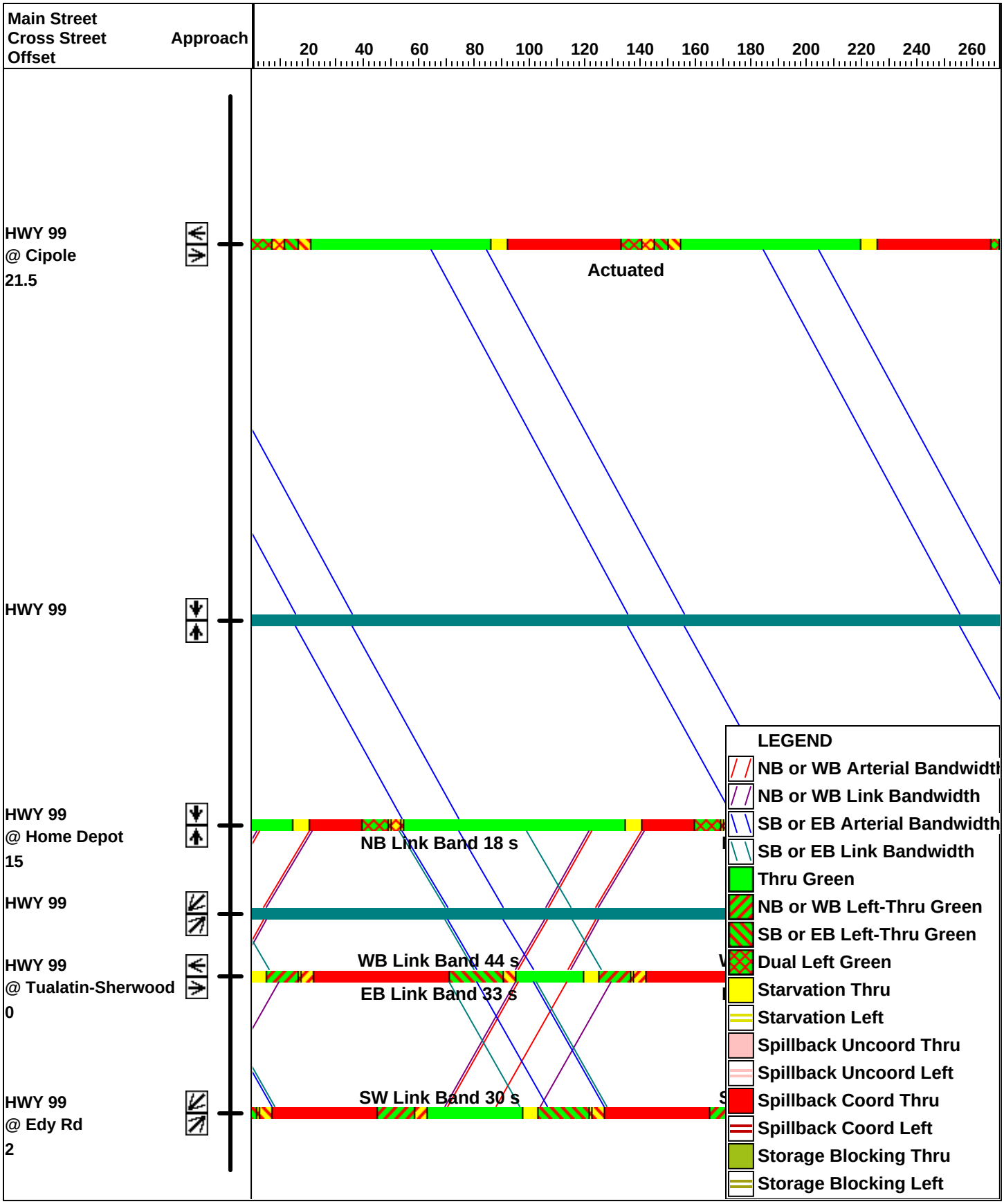
Arterial and Link-Link Bandwidths, 90th Percentile Green Times **3/10/2009**



Sherwood Adams Ave N Extension 2030 AM without Adams Extension

Time-Space Diagram - HWY 99

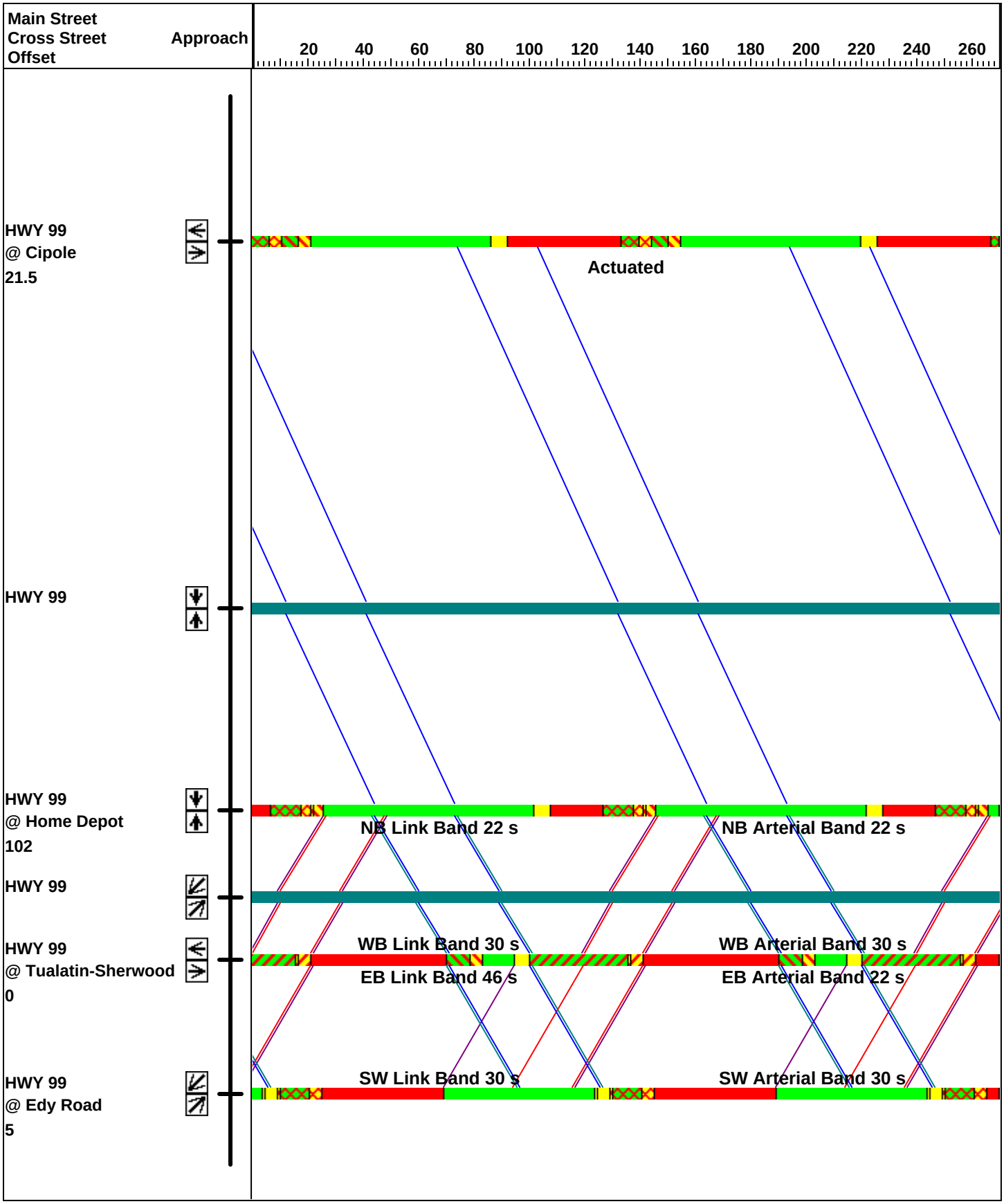
Arterial and Link-Link Bandwidths, 90th Percentile Green Times 3/10/2009



Sherwood Adams Ave N Extension 2030 PM without Adams Extension

Time-Space Diagram - HWY 99

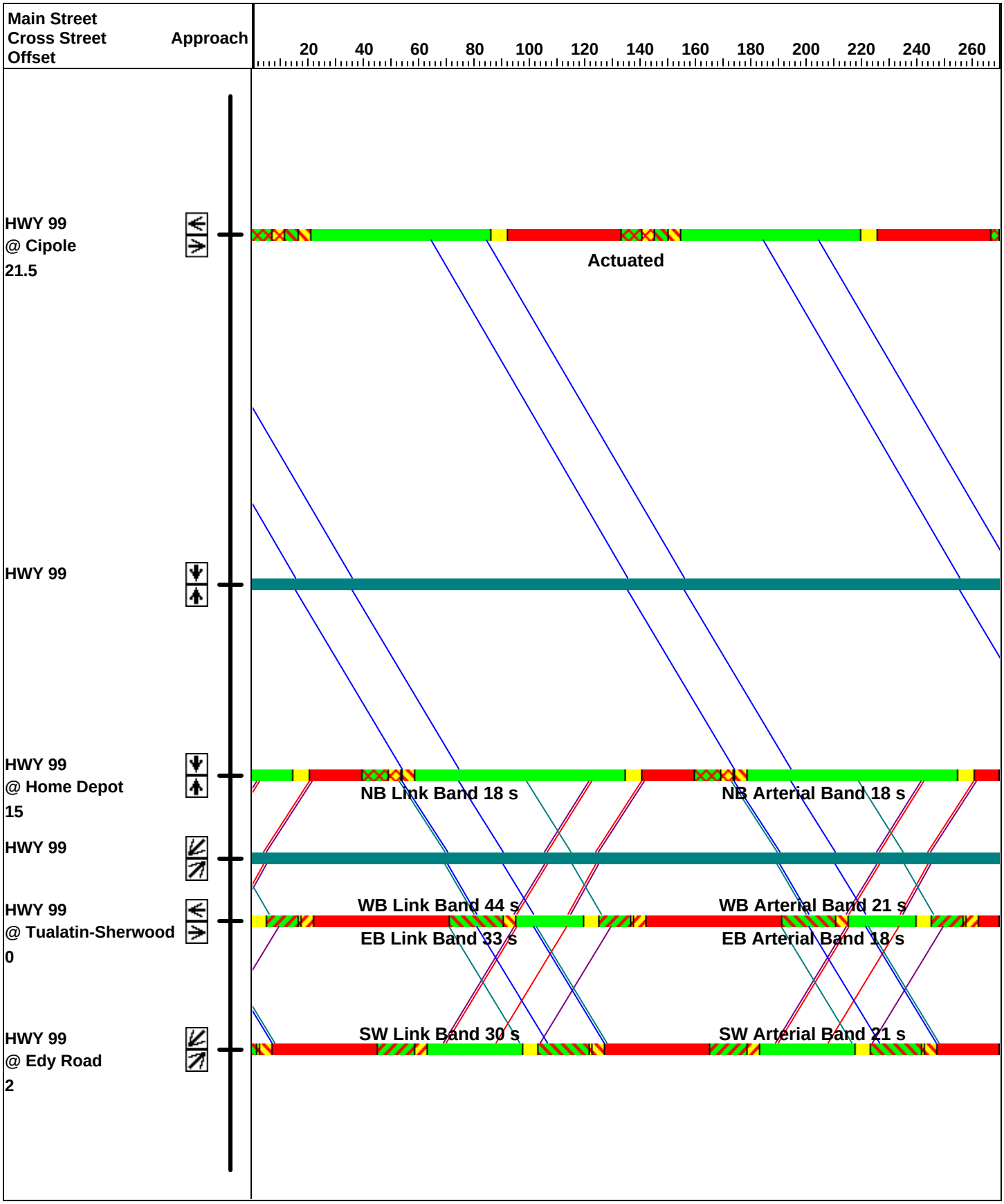
Arterial and Link-Link Bandwidths, 90th Percentile Green Times **3/10/2009**



Sherwood Adams Ave N Extension 2030 AM with Adams Extension

Time-Space Diagram - HWY 99

Arterial and Link-Link Bandwidths, 90th Percentile Green Times 3/10/2009



Sherwood Adams Ave N Extension 2030 PM with Adams Extension

DKS Associates
TRANSPORTATION SOLUTIONS

TECHNICAL MEMORANDUM

TO: Ben Austin, P.E., Harper Houf Peterson Righellis

FROM: Chris Maciejewski, P.E.
France Campbell, E.I.T.

DATE: May 11, 2009

SUBJECT: **Sherwood Adams Avenue North Concept Plan**
Transportation Tech Memo #2: Preliminary Concept Alternatives Analysis

P08232-000

The purpose of this memorandum is to review the transportation performance of the five land use alternatives created for the Sherwood Adams Avenue North Concept Plan. The first two sections of this memorandum discuss compliance of the proposed alternatives with City functional classification and access spacing standards. The final three sections discuss the traffic impacts of the alternatives, including land use and trip generation, study area operations analysis, and recommended mitigation measures. The traffic impact analysis for the potential land use addresses long term issues (to address TPR[1] requirements) utilizing a forecast year of 2030.

Functional Classification

Highway 99W is classified as a statewide highway in the Oregon Highway Plan[2] and a principle arterial in the City of Sherwood Transportation Plan (TSP)[3]. The City's TSP identifies Tualatin-Sherwood Road, Sherwood Boulevard, and Oregon Street as arterials and Edy Road, Cipole Street, Gerda Lane, Galbreath Drive, and Adams Road as collectors. The proposed Adams Avenue North Extension is classified as a collector in each of the five Concept Plan Alternatives, which is consistent with the City's adopted TSP.

Access Spacing Review

The functional classification establishes the access spacing standards for transportation facilities. Along the proposed Adams Avenue north extension, a collector roadway, access spacing should be a minimum of 100 feet and a maximum of 400 feet[3]. In addition, access should be limited within the influence area of other intersections (i.e., not allowing full access near Tualatin-Sherwood Road or Highway 99W where vehicle queues would block the access). In all of the alternatives, access along Adams Avenue can be designed to meet the minimum spacing

[1]Transportation Planning Rule, Oregon DLCD, http://www.oregon.gov/ODOT/TD/TP/TPR.shtml
[2] *1999 Oregon Highway Plan*, Oregon Department of Transportation, January 2006.
[3] *City of Sherwood Transportation System Plan*, Prepared by DKS Associates, March 2005.

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standard. Maximum spacing standards may not be met along the PGE substation and the UGB boundary, where land would not develop and access is not needed.

Land Use and Trip Generation

Five land use alternatives were generated to represent the range of land use and traffic impact for the plan area. The Concept Plan development areas are displayed in Figure 1 and the corresponding land use assumption for each alternative is shown in Table 2. The BPA/PGE transmission easement and the PGE facility were assumed to be used as public facility, open space or parking to support the developable areas with no potential for generating significant additional future motor vehicle traffic. Alternative 1 assumes that the land within the study area fully develops according to the existing zoning. A portion of the Concept Plan area east of the proposed Adams Avenue north extension (Area C in Figure 1) is currently outside of the City limit and is zoned for rural density. Therefore, Alternative 1 did not include development in the portion of the Concept Plan area outside of the City limits. The total new PM peak hour trips generated by the concept plan alternatives range from approximately 150 trips to 480 trips.

To determine the impact of rezoning the study area, the amount of motor vehicle traffic generated by each alternative was determined. Trip generation was estimated based on rates provided by the Institute of Transportation Engineers[4] (ITE) for similar land use types (e.g. light industrial, restaurants, retail uses, and office uses). Table 2 lists the estimated PM peak hour trips for each of the alternatives. Pass-by trips[5] for Alternatives 3 through 5 are also listed in Table 2 and the total new trips account for the estimated pass-by trips. The total number of new trips was used to verify that the City's 43 trips per net developable acre CAP[6] was not exceeded in any of the Concept Plan development areas shown in Figure 1 for the five alternatives. Any locations exceeding the City's trip CAP were scaled down to conformance.

[4] *Trip Generation Manual, 8th Edition,* Institute of Transportation Engineers, 2008.
[5] *Trip Generation Handbook, 2nd Edition*, Institute of Transportation Engineers, 2004.
[6] City of Sherwood Municipal Code Chapter 16.108.070 (CAP), Section D4.

Figure 1: Adams Avenue North Concept Plan Developable Areas

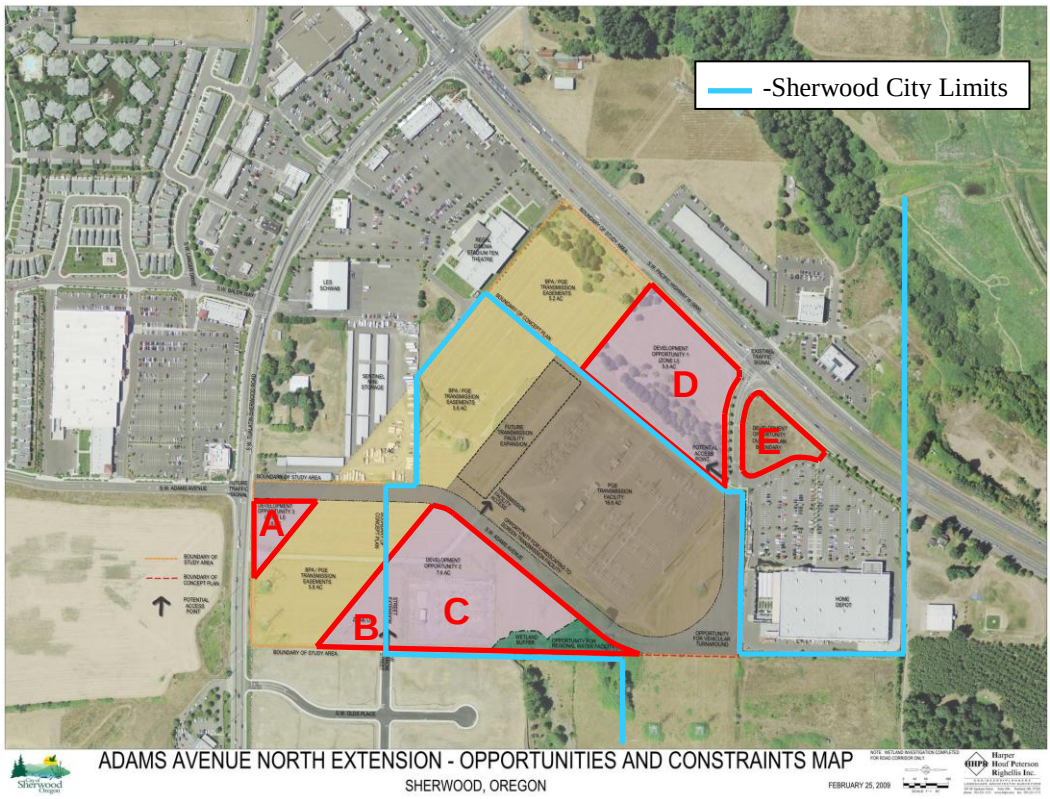


Table 1: Alternatives Land Use Scenarios

	Concept Area (See Figure 1)				
Alternative	**A**	**B**	**C**	**D**	**E**
1	LI	LI	R	LI	LI
2	LI	LI	LI	LI	LI
3	LI	LI	LI	GC	LI
4	GC*	LI	LI	OC	OC
5	GC*	LI	LI	GC	GC*

* Area developed was limited by City's 43 trips per acre CAP
GC – General Commercial
LI – Light Industrial
OC – Office Commercial
R – Rural

Table 2: Motor Vehicle Trip Generation Comparison – PM Peak Hour

Scenario / Land Use (ITE Code)	Acres	KSF*	PM Trips In	PM Trips Out	PM Trips Total
Alternative 1					
Light Industrial (710)	9.4	102.4	26	111	153
Total New Trips			26	111	153
Alternative 2					
Light Industrial (710)	15.9	173.2	44	214	258
Total New Trips			44	214	258
Alternative 3					
General Commercial (820, 934)	5.8	63.2	210	206	416
Light Industrial (710)	10.1	110.0	28	136	164
Pass-by Trips			88	86	174
Total New Trips			150	256	406
Alternative 4					
General Commercial (934)	0.9	2.3**	40	36	76
Light Industrial (710)	7.6	82.8	21	102	123
Office Commercial (710, 934)	7.4	80.6	124	190	314
Pass-by Trips			73	67	140
Total New Trips			112	261	373
Alternative 5					
General Commercial (820, 934)	8.3	82.8**	317	309	626
Light Industrial (710)	7.6	82.8	21	102	123
Pass-by Trips			138	132	270
Total New Trips			200	279	479

*KSF – Building area, thousand square feet
** Area developed was limited by City's 43 trips per acre CAP

Operations Analysis

The following sections describe the future forecasting and operations analysis completed for the Adams Avenue North Concept Plan alternatives. The future conditions evaluation includes future forecasting, identification of funded study area improvements, and motor vehicle intersection capacity analysis.

Future Forecasting

Future travel demand forecasting for the Adams Avenue North study area utilized the latest 2030 VISUM travel demand model developed by Metro, Washington County, and DKS Associates for the I-5 to 99W Connector Study. As part of the model development for the I-5 to 99W Connector Study, the Sherwood TSP travel demand model zone structure and network detail was used as a guideline to refine the regional model. In addition, a detailed focus model was created for the

Adams Avenue North Concept Plan study area, which incorporates the use of *HCM 2000 Methodology* for turn delays (instead of the regional model macroscopic delay functions).

Future 2030 PM peak hour volumes at study intersections were developed for the five Adams Avenue North Concept Plan land use scenarios by adjusting the travel demand model trip tables to reflect the trip rates listed in Table 2. These volumes were then used to analyze and determine future impacts from the proposed Adams Avenue North area on the planned roadway network.

Planned Study Area Roadway Improvements

Assumed transportation improvements in the study area were limited to Metro 2035 Regional Transportation Plan (RTP)[7] financially constrained roadway improvements and the extension of Adams Avenue to the north. Other capacity improvement projects in Metro's RTP or other plans without committed funding were not included in any of the future analysis scenarios in order to meet OAR 660-012-060 requirements. The planned roadway improvements include:

- Signalization of Tualatin-Sherwood Road/Adams Avenue
- Conversion of Tualatin-Sherwood Road/Baler Way to right-in/right-out and signal removal
- Widening of Tualatin-Sherwood Road and Roy Rogers Road to 5-lanes from Teton Avenue to west of Highway 99W (tapers to three lanes east of Borchers Drive)
- Completion of the Adams Avenue South Extension from Oregon Street to Century Drive
- Intersection geometric, turn lane, and signal phasing improvements at Highway 99W/Tualatin-Sherwood Road
- Completion of the 124th Avenue extension from Tualatin-Sherwood Road to Tonquin Road
- Widening of Tonquin Road to 3-lanes
- Signalization of Tualatin-Sherwood Road/Gerda Lane

In addition, the operations analysis found that turn lane and signal timing improvements would be required under any scenario (including 2030 Baseline Conditions) at Highway 99W/Adams Avenue. Therefore, construction of a dual westbound left-turn lane from Adams Avenue westbound to Highway 99W southbound and conversion to protected left phasing was assumed for all scenarios.

Capacity Analysis

In order to provide a baseline comparison to the future Adams Avenue North Concept Plan alternatives, the 2030 Alternative 1 scenario evaluates future traffic volumes assuming the planned roadway geometry and full development of the Adams Avenue North Concept Plan area under existing zoning. Each alternative was then evaluated to determine impacts to the study area. Intersections that do not meet performance standards must be mitigated to the level of performance (per Oregon's Transportation Planning Rule (TPR)) that would occur under development of the area with existing zoning (Alternative 1) or that would meet mobility standards, whichever is higher.

[7] Metro 2035 Regional Transportation Plan, http://www.oregonmetro.gov/index.cfm/go/by.web/id=25037.

The maximum v/c ratio specified by Washington County is 0.99 for signalized intersections.[8] The minimum operational standard for unsignalized intersections specified by Washington County is LOS E. In the case of Highway 99W, ODOT operating performance standards for the study area is a v/c ratio of 0.99 for intersections not in a town center and 1.1 for those that are located within a Town Center.[9] The intersections of Highway 99W/Tualatin-Sherwood Road and Highway 99W/Edy Road-Sherwood Boulevard are within the Town Center limits. [10] Based on recent conversations and meetings, ODOT has decided to not acknowledge the Town Center limits without the City completing a Town Center Plan. Therefore, ODOT intends to use a maximum v/c ratio of 0.99 for all of Highway 99W through Sherwood.

As listed in Table 3, with the addition of land development in the Adams Avenue North Concept Plan, all study intersections except for the Highway 99W/Edy Road/ Sherwood Blvd and Highway 99W/Tualatin-Sherwood Rd intersections meet ODOT/County standards in all alternatives.

Mitigation Measures

With the addition of land development in the Adams Avenue North Concept Plan, the Highway 99W/Edy Road/Sherwood Blvd (Alternatives 1 through 5) and Highway 99W/Tualatin-Sherwood Rd (Alternative 5) study intersections will not meet ODOT/County standards. Therefore, off-site transportation mitigations are required at Highway 99W/Edy Road/Sherwood Blvd and 99W/Tualatin-Sherwood Rd to offset the impacts of the Adams Avenue North Concept Plan for TPR compliance.

As listed in Table 3, the Highway 99W/Edy Road/Sherwood Blvd intersection operates above the v/c ratio standard of 0.99 and mitigations are required to bring the intersection to the level of performance that would occur under Alternative 1. To determine if mitigations are required for the alternatives, the software TRAFFIX (which provides v/c ratios to the nearest 0.001) was used to determine the increase in the v/c ratio from Alternative 1 for Alternatives 2, 3, 4, and 5, as a change in v/c of less than 0.01 may not require mitigation.

To offset the impacts of the Adams Avenue North Concept Plan at Highway 99W/Edy Road/Sherwood Blvd, a north-eastbound right turn lane along Highway 99W is adequate for Alternatives 2 and 4. The necessary mitigation for Alternative 5 includes widening Sherwood Boulevard to provide two left turn lanes, one through lane, and one right turn lane approaching Highway 99W. This would also likely require widening of the Edy Road approach to Highway 99W to install a median or second left turn lane to align the through lanes across the Highway 99W. Signal, signing, and striping modifications are required for all mitigations.

The intersection of Highway 99W/Tualatin-Sherwood Rd is forecasted to operate above the v/c ratio standard of 0.99 for Alternative 5. Mitigations such as additional turn lanes would not be feasible at the intersection as all turn lane improvements (dual left turn lanes and right turn pockets) and signal phasing improvements are already included in the baseline analysis. The

[8] Washington County 2020 Transportation Plan, Adopted October 29, 2002, Table 5.
[9] 1999 Oregon Highway Plan, Amendment to Table 7, December 13, 2000.
[10] This is according to the Metro Regional and Town Center Map.
(http://www.oregonmetro.gov/index.cfm/go/by.web/id=15467&x=7599901&y=629257&locID=27)

remaining deficient critical movement at this intersection is the westbound Tualatin-Sherwood Road through movement to Roy Rogers Road, which is limited by lane utilization (both through lanes would not be fully utilized as the outside through lane merges into the inside lane just west of Highway 99W). To improve the westbound approach and meet the 0.99 v/c ratio standard, the Roy Rogers widening would likely need to be carried further west (e.g., through the Borchers Drive intersection) to improve the lane utilization across Highway 99W.

Table 3: 2030 PM Peak Hour Intersection Performance

			Intersection Performance (Delay LOS V/C)				
Intersection	**Agency**	**Standard**	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
Signalized Intersections							
Highway 99W/Adams Ave	ODOT	v/c ≤ 0.99	30.1 C 0.86	30.7 C 0.87	31.3 C 0.87	31.0 C 0.87	31.6 C 0.87
Highway 99W/Tualatin-Sherwood Rd	ODOT	v/c ≤ 0.99	66.2 E 0.98	66.3 E 0.99	68.2 E 0.99	68.3 E 0.99	69.7 E **1.00**
Highway 99W/Edy Road/ Sherwood Blvd	ODOT	v/c ≤ 0.99	71.5 E **1.06**	72.4 E **1.07**	75.4 E **1.08**	74.8 E **1.08**	77.7 E **1.09**
Tualatin-Sherwood Rd/Shopping Center	County	v/c ≤ 0.99	19.5 B 0.73	20.2 C 0.74	20.1 C 0.75	20.0 B 0.74	20.3 C 0.75
Tualatin-Sherwood Rd/Adams Ave	County	v/c ≤ 0.99	46.4 D 0.92	46.7 D 0.93	48.9 D 0.94	50.5 D 0.94	51.1 D 0.94
Tualatin-Sherwood Rd/Gerda Ln	County	v/c ≤ 0.99	9.6 A 0.62	9.7 A 0.62	9.7 A 0.63	9.7 A 0.63	9.6 A 0.63
Tualatin-Sherwood Rd/Oregon St	County	v/c ≤ 0.99	22.3 C 0.90	22.4 C 0.90	22.6 C 0.90	22.5 C 0.90	22.6 C 0.90
Unsignalized Intersections							
Tualatin-Sherwood Rd/Baler Wy	County	LOS E	13.8 A/B 0.67	14.1 A/B 0.67	14.1 A/B 0.68	14.0 A/B 0.68	14.1 A/B 0.69

Changes in V/C at Highway 99W/Edy Road/ Sherwood Blvd compared to Alternative 1:

Alternative 2: +0.001

Alternative 3: +0.018

Alternative 4: +0.013

Alternative 5: +0.028

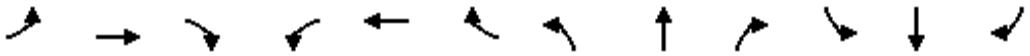
Signalized intersection:
HCM Delay = Average Intersection Delay (sec.)
LOS = Level of Service
V/C = Volume-to-Capacity Ratio
Bold values do not meet standards.

Unsignalized intersection:
HCM Delay = Critical Movement Approach Delay (sec.)
LOS = Major Street LOS/Minor Street LOS
V/C = Critical Movement Volume-to-Capacity Ratio

Appendix

- **2030 Intersection Operational Analysis Worksheets**
  - **Alternative 1**
  - **Alternative 2**
  - **Alternative 3**
  - **Alternative 4**
  - **Alternative 5**
- **Sensitivity Analysis Worksheets**

Alternative 1

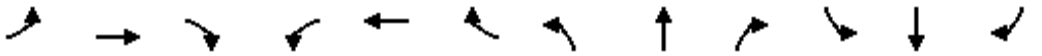


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	1.00			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1770	3343		1736	3538			1760			1834	
Flt Permitted	0.95	1.00		0.95	1.00			0.52			0.95	
Satd. Flow (perm)	1770	3343		1736	3538			954			1759	
Volume (vph)	15	1210	140	125	2050	5	315	15	40	20	160	15
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	15	1235	143	128	2092	5	321	15	41	20	163	15
RTOR Reduction (vph)	0	6	0	0	0	0	0	4	0	0	2	0
Lane Group Flow (vph)	15	1372	0	128	2097	0	0	373	0	0	196	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	5%	15%	4%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	2.6	61.5		13.0	71.9			35.2			35.2	
Effective Green, g (s)	3.1	63.5		13.5	73.9			37.2			37.2	
Actuated g/C Ratio	0.02	0.50		0.11	0.59			0.29			0.29	
Clearance Time (s)	4.5	6.0		4.5	6.0			6.0			6.0	
Vehicle Extension (s)	2.3	4.8		2.3	4.8			2.5			2.5	
Lane Grp Cap (vph)	43	1682		186	2072			281			519	
v/s Ratio Prot	0.01	0.41		c0.07	c0.59							
v/s Ratio Perm								c0.39			0.11	
v/c Ratio	0.35	0.82		0.69	1.01			1.33			0.38	
Uniform Delay, d1	60.6	26.4		54.3	26.2			44.5			35.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.8	3.6		8.8	22.8			170.6			0.3	
Delay (s)	63.4	30.0		63.2	48.9			215.1			35.6	
Level of Service	E	C		E	D			F			D	
Approach Delay (s)		30.3			49.8			215.1			35.6	
Approach LOS		C			D			F			D	

Intersection Summary			
HCM Average Control Delay	57.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	126.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	104.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

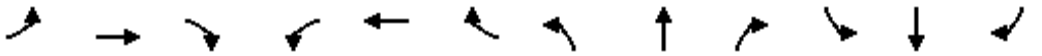
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		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	
Frt	1.00	0.87		1.00	0.86		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1624		3433	1552		1805	3438	1583	1719	3535	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1805	1624		3433	1552		1805	3438	1583	1719	3535	
Volume (vph)	25	5	35	210	5	125	30	1220	100	100	2280	20
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	26	5	36	214	5	128	31	1245	102	102	2327	20
RTOR Reduction (vph)	0	34	0	0	116	0	0	0	42	0	0	0
Lane Group Flow (vph)	26	7	0	214	17	0	31	1245	60	102	2347	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	0%	2%	50%	3%	0%	5%	2%	5%	2%	0%
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	7.2	4.4		11.9	9.1		4.6	68.2	68.2	15.0	78.6	
Effective Green, g (s)	7.2	6.4		11.9	11.1		5.1	70.2	70.2	15.5	80.6	
Actuated g/C Ratio	0.06	0.05		0.10	0.09		0.04	0.59	0.59	0.13	0.67	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.5	6.0	6.0	4.5	6.0	
Vehicle Extension (s)	3.0	2.5		3.0	2.5		2.3	4.8	4.8	2.3	4.8	
Lane Grp Cap (vph)	108	87		340	144		77	2011	926	222	2374	
v/s Ratio Prot	c0.01	0.00		c0.06	0.01		0.02	c0.36		0.06	c0.66	
v/s Ratio Perm									0.04			
v/c Ratio	0.24	0.08		0.63	0.12		0.40	0.62	0.06	0.46	0.99	
Uniform Delay, d1	53.8	54.0		51.9	50.0		56.0	16.2	10.7	48.4	19.2	
Progression Factor	1.00	1.00		1.04	1.58		0.98	0.49	0.36	1.00	1.00	
Incremental Delay, d2	1.2	0.3		3.5	0.3		1.6	1.2	0.1	0.9	16.0	
Delay (s)	55.0	54.3		57.7	79.0		56.3	9.0	4.0	49.3	35.2	
Level of Service	D	D		E	E		E	A	A	D	D	
Approach Delay (s)		54.5			65.8			9.7			35.8	
Approach LOS		D			E			A			D	

Intersection Summary			
HCM Average Control Delay	30.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



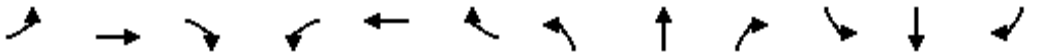
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	*0.75	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	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	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)	3400	4988	1524	3303	5085	1583	3502	2767	1507	3127	3374	1553
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)	3400	4988	1524	3303	5085	1583	3502	2767	1507	3127	3374	1553
Volume (vph)	195	940	435	325	1765	460	605	995	180	255	705	205
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	199	959	444	332	1801	469	617	1015	184	260	719	209
RTOR Reduction (vph)	0	0	174	0	0	116	0	0	67	0	0	152
Lane Group Flow (vph)	199	959	270	332	1801	353	617	1015	117	260	719	57
Confl. Peds. (#/hr)									3	3		
Heavy Vehicles (%)	3%	4%	6%	6%	2%	2%	0%	3%	4%	12%	7%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.1	42.7	42.7	15.9	47.5	47.5	19.4	32.0	32.0	9.4	22.0	22.0
Effective Green, g (s)	11.6	44.2	44.2	16.4	49.0	49.0	20.4	33.0	33.0	10.4	23.0	23.0
Actuated g/C Ratio	0.10	0.37	0.37	0.14	0.41	0.41	0.17	0.28	0.28	0.09	0.19	0.19
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.3	4.7	4.7	2.3	4.7	4.7	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	329	1837	561	451	2076	646	595	761	414	271	647	298
v/s Ratio Prot	0.06	c0.19		0.10	c0.35		c0.18	c0.37		0.08	0.21	
v/s Ratio Perm			0.18			0.22			0.08			0.04
v/c Ratio	0.60	0.52	0.48	0.74	0.87	0.55	1.04	1.33	0.28	0.96	1.11	0.19
Uniform Delay, d1	52.0	29.6	29.1	49.7	32.5	27.0	49.8	43.5	34.2	54.6	48.5	40.7
Progression Factor	0.80	0.60	1.00	0.97	0.69	0.48	0.76	0.86	0.92	1.00	1.00	1.00
Incremental Delay, d2	1.5	0.3	0.7	2.4	2.3	1.4	40.3	156.3	0.1	42.9	70.0	0.2
Delay (s)	43.3	18.0	29.7	50.8	24.8	14.5	78.0	193.7	31.7	97.5	118.5	40.9
Level of Service	D	B	C	D	C	B	E	F	C	F	F	D
Approach Delay (s)		24.4			26.2			138.0			100.2	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM Average Control Delay	66.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.7%	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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	3275		1805	3485		1805	1661		1805	1900	1481
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	3275		1805	3485		1805	1661		1805	1900	1481
Volume (vph)	70	1200	190	115	1560	60	135	30	65	50	30	85
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	71	1224	194	117	1592	61	138	31	66	51	31	87
RTOR Reduction (vph)	0	9	0	0	2	0	0	58	0	0	0	82
Lane Group Flow (vph)	71	1409	0	117	1651	0	138	39	0	51	31	5
Confl. Peds. (#/hr)			4	4			27					27
Heavy Vehicles (%)	0%	8%	4%	0%	3%	3%	0%	0%	4%	0%	0%	2%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	6.5	66.7		12.4	72.3		10.9	12.6		4.4	5.7	5.7
Effective Green, g (s)	8.8	68.6		14.4	74.2		13.6	14.3		6.7	7.4	7.4
Actuated g/C Ratio	0.07	0.57		0.12	0.62		0.11	0.12		0.06	0.06	0.06
Clearance Time (s)	6.3	5.9		6.0	5.9		6.7	5.7		6.3	5.7	5.7
Vehicle Extension (s)	2.7	3.2		2.7	3.2		2.6	1.8		2.7	1.8	1.8
Lane Grp Cap (vph)	257	1872		217	2155		205	198		101	117	91
v/s Ratio Prot	0.02	c0.43		0.06	c0.47		c0.08	0.02		0.03	c0.02	
v/s Ratio Perm												0.00
v/c Ratio	0.28	0.75		0.54	0.77		0.67	0.20		0.50	0.26	0.06
Uniform Delay, d1	52.6	19.3		49.7	16.6		51.1	47.7		55.0	53.7	53.0
Progression Factor	0.97	0.52		0.89	0.79		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	1.3		1.3	1.6		7.8	0.2		3.3	0.4	0.1
Delay (s)	51.2	11.3		45.3	14.7		58.9	47.8		58.3	54.1	53.1
Level of Service	D	B		D	B		E	D		E	D	D
Approach Delay (s)		13.2			16.7			54.3			54.9	
Approach LOS		B			B			D			D	

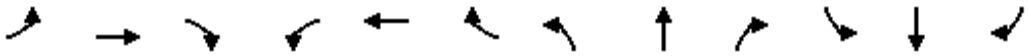
Intersection Summary			
HCM Average Control Delay	19.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	1115	205	0	1665	15	0	0	230	0	0	15
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	1138	209	0	1699	15	0	0	235	0	0	15
Pedestrians		1			7			4			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		597			688							
pX, platoon unblocked	0.72			0.69			0.83	0.83	0.69	0.83	0.83	0.72
vC, conflicting volume	1715			1351			2112	2962	684	2518	3059	859
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1605			1065			1128	2147	104	1615	2263	416
tC, single (s)	4.1			4.2			7.6	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	63	100	100	96
cM capacity (veh/h)	297			446			123	41	642	37	34	425

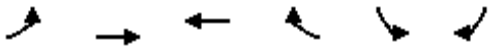
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	759	588	1133	582	235	15
Volume Left	0	0	0	0	0	0
Volume Right	0	209	0	15	235	15
cSH	1700	1700	1700	1700	642	425
Volume to Capacity	0.45	0.35	0.67	0.34	0.37	0.04
Queue Length 95th (ft)	0	0	0	0	42	3
Control Delay (s)	0.0	0.0	0.0	0.0	13.8	13.8
Lane LOS					B	B
Approach Delay (s)	0.0		0.0		13.8	13.8
Approach LOS					B	B

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		



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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	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		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.86		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3408		1805	3490		1805	1603		1805	1886	
Flt Permitted	0.14	1.00		0.07	1.00		0.00	1.00		0.00	1.00	
Satd. Flow (perm)	259	3408		138	3490		0	1603		0	1886	
Volume (vph)	70	1075	210	290	1190	120	400	10	230	100	95	5
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	71	1097	214	296	1214	122	408	10	235	102	97	5
RTOR Reduction (vph)	0	13	0	0	6	0	0	213	0	0	2	0
Lane Group Flow (vph)	71	1298	0	296	1330	0	408	32	0	102	100	0
Confl. Peds. (#/hr)	2					2			1	1		
Heavy Vehicles (%)	0%	4%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	54.1	49.0		74.2	63.1		18.1	9.4		18.4	9.7	
Effective Green, g (s)	58.1	51.0		76.2	65.1		20.1	11.4		20.4	11.7	
Actuated g/C Ratio	0.48	0.42		0.64	0.54		0.17	0.10		0.17	0.10	
Clearance Time (s)	6.0	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	
Lane Grp Cap (vph)	217	1448		382	1893		302	152		307	184	
v/s Ratio Prot	0.02	c0.38		c0.14	0.38		c0.23	0.02		0.06	c0.05	
v/s Ratio Perm	0.14			0.35								
v/c Ratio	0.33	0.90		0.77	0.70		1.35	0.21		0.33	0.54	
Uniform Delay, d1	18.1	32.1		34.4	20.3		50.0	50.2		43.8	51.6	
Progression Factor	0.78	0.55		1.27	0.53		1.00	1.00		0.87	0.88	
Incremental Delay, d2	0.7	6.4		8.1	1.0		178.3	3.2		0.6	10.7	
Delay (s)	14.8	24.1		51.8	11.8		228.2	53.3		38.8	55.9	
Level of Service	B	C		D	B		F	D		D	E	
Approach Delay (s)		23.6			19.1			162.6			47.4	
Approach LOS		C			B			F			D	

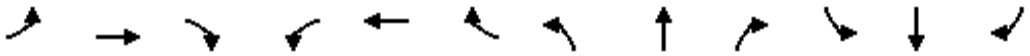
Intersection Summary			
HCM Average Control Delay	46.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1517	3406	3531		1787	1583
Flt Permitted	0.12	1.00	1.00		0.95	1.00
Satd. Flow (perm)	197	3406	3531		1787	1583
Volume (vph)	35	1360	1455	10	195	120
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	36	1388	1485	10	199	122
RTOR Reduction (vph)	0	0	0	0	0	104
Lane Group Flow (vph)	36	1388	1495	0	199	18
Heavy Vehicles (%)	19%	6%	2%	20%	1%	2%
Turn Type	pm+pt					Perm
Protected Phases	7	4	8		6	
Permitted Phases	4					6
Actuated Green, G (s)	94.3	94.3	86.1		17.7	17.7
Effective Green, g (s)	94.3	94.3	86.1		17.7	17.7
Actuated g/C Ratio	0.79	0.79	0.72		0.15	0.15
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	201	2677	2533		264	233
v/s Ratio Prot	0.01	c0.41	c0.42		c0.11	
v/s Ratio Perm	0.13					0.01
v/c Ratio	0.18	0.52	0.59		0.75	0.08
Uniform Delay, d1	6.1	4.6	8.3		49.1	44.1
Progression Factor	3.02	0.83	0.49		1.00	1.00
Incremental Delay, d2	0.2	0.1	0.9		11.5	0.1
Delay (s)	18.8	3.9	4.9		60.6	44.3
Level of Service	B	A	A		E	D
Approach Delay (s)		4.3	4.9		54.4	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	9.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

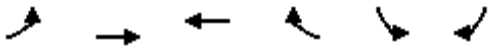
c Critical Lane Group



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)	4.0	4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3471	1568	1770	3539			1752	1538	1805	1710	
Flt Permitted	0.95	1.00	1.00	0.08	1.00			0.75	1.00	0.40	1.00	
Satd. Flow (perm)	1805	3471	1568	149	3539			1379	1538	766	1710	
Volume (vph)	5	1145	445	545	1270	0	180	0	205	25	5	10
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	5	1168	454	556	1296	0	184	0	209	26	5	10
RTOR Reduction (vph)	0	0	111	0	0	0	0	0	11	0	8	0
Lane Group Flow (vph)	5	1168	343	556	1296	0	0	184	198	26	7	0
Heavy Vehicles (%)	0%	4%	3%	2%	2%	0%	3%	0%	5%	0%	0%	0%
Turn Type	Prot		Perm	pm+pt			Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases			2	6			8		8	4		
Actuated Green, G (s)	1.0	51.0	51.0	83.1	83.1			17.9	51.0	17.9	17.9	
Effective Green, g (s)	3.0	53.0	53.0	85.1	85.1			19.9	55.0	19.9	19.9	
Actuated g/C Ratio	0.02	0.44	0.44	0.71	0.71			0.17	0.46	0.17	0.17	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	1.0	2.5	2.5	1.0	2.5			1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	45	1533	693	580	2510			229	756	127	284	
v/s Ratio Prot	0.00	c0.34		c0.28	0.37				0.08		0.00	
v/s Ratio Perm			0.22	c0.40				c0.13	0.05	0.03		
v/c Ratio	0.11	0.76	0.49	0.96	0.52			0.80	0.26	0.20	0.02	
Uniform Delay, d1	57.2	28.2	23.9	35.0	8.0			48.2	20.0	43.2	41.9	
Progression Factor	0.86	0.77	0.79	0.85	0.31			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	1.9	0.3	21.9	0.6			17.2	0.1	0.3	0.0	
Delay (s)	49.5	23.6	19.3	51.8	3.1			65.4	20.1	43.5	41.9	
Level of Service	D	C	B	D	A			E	C	D	D	
Approach Delay (s)		22.5			17.7			41.3			42.9	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	22.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
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)		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3523		1687	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3523		1687	1583
Volume (vph)	0	1345	1635	40	165	175
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1372	1668	41	168	179
RTOR Reduction (vph)	0	0	1	0	0	20
Lane Group Flow (vph)	0	1372	1708	0	168	159
Heavy Vehicles (%)	4%	4%	2%	6%	7%	2%
Turn Type	pm+pt					pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Actuated Green, G (s)		91.7	80.8		16.3	21.2
Effective Green, g (s)		93.7	82.8		18.3	25.2
Actuated g/C Ratio		0.78	0.69		0.15	0.21
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		2.5	2.5		2.5	2.0
Lane Grp Cap (vph)		2710	2431		257	385
v/s Ratio Prot		c0.40	c0.48		c0.10	0.02
v/s Ratio Perm						0.08
v/c Ratio		0.51	0.70		0.65	0.41
Uniform Delay, d1		4.8	11.2		47.9	41.0
Progression Factor		0.10	1.00		1.00	1.00
Incremental Delay, d2		0.5	0.9		5.2	0.3
Delay (s)		1.0	12.1		53.1	41.3
Level of Service		A	B		D	D
Approach Delay (s)		1.0	12.1		47.0	
Approach LOS		A	B		D	

Intersection Summary			
HCM Average Control Delay	11.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	310	145	60	280	15	50
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	344	161	67	311	17	56
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			506		869	425
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			506		869	425
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		94	91
cM capacity (veh/h)			1049		303	631

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	506	378	72
Volume Left	0	67	17
Volume Right	161	0	56
cSH	1700	1049	505
Volume to Capacity	0.30	0.06	0.14
Queue Length 95th (ft)	0	5	12
Control Delay (s)	0.0	2.1	13.3
Lane LOS		A	B
Approach Delay (s)	0.0	2.1	13.3
Approach LOS			B

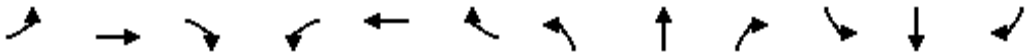
Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2		3.2	3.2	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91		1.00	0.91	
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)	1787	1881	1599	1698	1763	1553	1770	4902		1787	5073	
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)	1787	1881	1599	1698	1763	1553	1770	4902		1787	5073	
Volume (vph)	210	335	145	310	270	170	110	1470	100	335	2215	35
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)	221	353	153	326	284	179	116	1547	105	353	2332	37
RTOR Reduction (vph)	0	0	125	0	0	151	0	7	0	0	1	0
Lane Group Flow (vph)	221	353	28	299	311	28	116	1645	0	353	2368	0
Heavy Vehicles (%)	1%	1%	1%	1%	2%	4%	2%	5%	2%	1%	2%	2%
Turn Type	Split		Perm	Split		Perm	Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8						
Actuated Green, G (s)	11.0	11.0	11.0	17.0	17.0	17.0	10.8	50.0		22.0	61.2	
Effective Green, g (s)	12.8	12.8	12.8	18.8	18.8	18.8	12.1	52.3		23.3	63.5	
Actuated g/C Ratio	0.11	0.11	0.11	0.16	0.16	0.16	0.10	0.44		0.19	0.53	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.5		4.5	5.5	
Vehicle Extension (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	4.7		2.3	4.7	
Lane Grp Cap (vph)	191	201	171	266	276	243	178	2136		347	2684	
v/s Ratio Prot	0.12	c0.19		0.18	c0.18		0.07	c0.34		c0.20	c0.47	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	1.16	1.76	0.16	1.12	1.13	0.12	0.65	0.77		1.02	0.88	
Uniform Delay, d1	53.6	53.6	48.7	50.6	50.6	43.5	51.9	28.7		48.3	24.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.88	0.87	
Incremental Delay, d2	113.8	360.0	0.3	92.7	92.7	0.1	7.0	2.0		38.8	2.4	
Delay (s)	167.4	413.6	49.0	143.3	143.3	43.6	58.9	30.8		81.6	24.2	
Level of Service	F	F	D	F	F	D	E	C		F	C	
Approach Delay (s)		262.0			120.7			32.6			31.6	
Approach LOS		F			F			C			C	

Intersection Summary			
HCM Average Control Delay	71.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	96.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Alternative 2

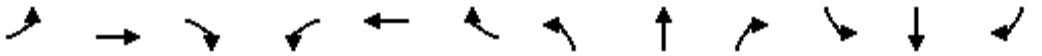


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	1.00			0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1770	3331		1736	3538			1759			1834	
Flt Permitted	0.95	1.00		0.95	1.00			0.52			0.95	
Satd. Flow (perm)	1770	3331		1736	3538			955			1760	
Volume (vph)	15	1205	160	125	2050	5	320	15	45	20	160	15
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	15	1230	163	128	2092	5	327	15	46	20	163	15
RTOR Reduction (vph)	0	7	0	0	0	0	0	4	0	0	2	0
Lane Group Flow (vph)	15	1386	0	128	2097	0	0	384	0	0	196	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	5%	15%	4%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	2.6	61.8		13.0	72.2			35.2			35.2	
Effective Green, g (s)	3.1	63.8		13.5	74.2			37.2			37.2	
Actuated g/C Ratio	0.02	0.50		0.11	0.59			0.29			0.29	
Clearance Time (s)	4.5	6.0		4.5	6.0			6.0			6.0	
Vehicle Extension (s)	2.3	4.8		2.3	4.8			2.5			2.5	
Lane Grp Cap (vph)	43	1680		185	2075			281			518	
v/s Ratio Prot	0.01	0.42		c0.07	c0.59							
v/s Ratio Perm								c0.40			0.11	
v/c Ratio	0.35	0.82		0.69	1.01			1.37			0.38	
Uniform Delay, d1	60.7	26.6		54.5	26.1			44.6			35.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.8	3.8		9.4	22.4			186.8			0.3	
Delay (s)	63.5	30.4		63.9	48.5			231.5			35.8	
Level of Service	E	C		E	D			F			D	
Approach Delay (s)		30.8			49.4			231.5			35.8	
Approach LOS		C			D			F			D	

Intersection Summary			
HCM Average Control Delay	59.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	126.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	105.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

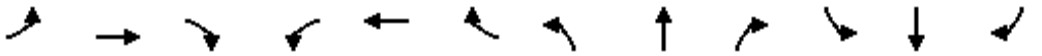
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		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	
Frt	1.00	0.87		1.00	0.86		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1624		3433	1551		1805	3438	1583	1719	3535	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1805	1624		3433	1551		1805	3438	1583	1719	3535	
Volume (vph)	25	5	35	220	5	120	30	1250	85	95	2295	20
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	26	5	36	224	5	122	31	1276	87	97	2342	20
RTOR Reduction (vph)	0	34	0	0	111	0	0	0	35	0	0	0
Lane Group Flow (vph)	26	7	0	224	16	0	31	1276	52	97	2362	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	0%	2%	50%	3%	0%	5%	2%	5%	2%	0%
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	7.3	4.3		12.0	9.0		4.6	68.4	68.4	14.8	78.6	
Effective Green, g (s)	7.3	6.3		12.0	11.0		5.1	70.4	70.4	15.3	80.6	
Actuated g/C Ratio	0.06	0.05		0.10	0.09		0.04	0.59	0.59	0.13	0.67	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.5	6.0	6.0	4.5	6.0	
Vehicle Extension (s)	3.0	2.5		3.0	2.5		2.3	4.8	4.8	2.3	4.8	
Lane Grp Cap (vph)	110	85		343	142		77	2017	929	219	2374	
v/s Ratio Prot	c0.01	0.00		c0.07	0.01		0.02	c0.37		0.06	c0.67	
v/s Ratio Perm									0.03			
v/c Ratio	0.24	0.08		0.65	0.11		0.40	0.63	0.06	0.44	0.99	
Uniform Delay, d1	53.7	54.1		52.0	50.0		56.0	16.3	10.6	48.4	19.5	
Progression Factor	1.00	1.00		1.04	1.41		0.99	0.49	0.30	1.00	1.00	
Incremental Delay, d2	1.1	0.3		4.3	0.3		1.6	1.2	0.1	0.8	17.3	
Delay (s)	54.8	54.4		58.3	71.0		56.9	9.3	3.3	49.2	36.8	
Level of Service	D	D		E	E		E	A	A	D	D	
Approach Delay (s)		54.6			62.9			10.0			37.3	
Approach LOS		D			E			A			D	

Intersection Summary			
HCM Average Control Delay	30.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



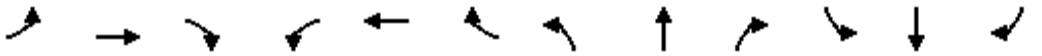
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	*0.75	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	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	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)	3400	4988	1524	3303	5085	1583	3502	2767	1507	3127	3374	1553
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)	3400	4988	1524	3303	5085	1583	3502	2767	1507	3127	3374	1553
Volume (vph)	195	950	440	325	1770	475	610	995	180	255	705	200
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	199	969	449	332	1806	485	622	1015	184	260	719	204
RTOR Reduction (vph)	0	0	174	0	0	116	0	0	67	0	0	152
Lane Group Flow (vph)	199	969	275	332	1806	369	622	1015	117	260	719	52
Confl. Peds. (#/hr)									3	3		
Heavy Vehicles (%)	3%	4%	6%	6%	2%	2%	0%	3%	4%	12%	7%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.1	42.7	42.7	15.9	47.5	47.5	19.4	32.0	32.0	9.4	22.0	22.0
Effective Green, g (s)	11.6	44.2	44.2	16.4	49.0	49.0	20.4	33.0	33.0	10.4	23.0	23.0
Actuated g/C Ratio	0.10	0.37	0.37	0.14	0.41	0.41	0.17	0.28	0.28	0.09	0.19	0.19
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.3	4.7	4.7	2.3	4.7	4.7	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	329	1837	561	451	2076	646	595	761	414	271	647	298
v/s Ratio Prot	0.06	c0.19		0.10	c0.36		c0.18	c0.37		0.08	0.21	
v/s Ratio Perm			0.18			0.23			0.08			0.03
v/c Ratio	0.60	0.53	0.49	0.74	0.87	0.57	1.05	1.33	0.28	0.96	1.11	0.17
Uniform Delay, d1	52.0	29.7	29.2	49.7	32.6	27.4	49.8	43.5	34.2	54.6	48.5	40.6
Progression Factor	0.80	0.60	1.00	0.97	0.70	0.49	0.75	0.88	0.93	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.3	0.7	2.4	2.3	1.5	42.2	156.1	0.1	42.9	70.0	0.2
Delay (s)	43.3	18.1	29.9	50.8	24.9	15.0	79.4	194.4	32.1	97.5	118.5	40.7
Level of Service	D	B	C	D	C	B	E	F	C	F	F	D
Approach Delay (s)		24.5			26.4			138.7			100.5	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM Average Control Delay	66.3	HCM Level of Service	E
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.0%	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)	8.0	4.0		4.0	4.0		4.0	8.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	3276		1805	3484		1805	1661		1805	1900	1481
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	3276		1805	3484		1805	1661		1805	1900	1481
Volume (vph)	70	1210	190	115	1560	65	135	30	65	55	25	85
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	71	1235	194	117	1592	66	138	31	66	56	26	87
RTOR Reduction (vph)	0	8	0	0	2	0	0	60	0	0	0	82
Lane Group Flow (vph)	71	1421	0	117	1656	0	138	37	0	56	26	5
Confl. Peds. (#/hr)			4	4			27					27
Heavy Vehicles (%)	0%	8%	4%	0%	3%	3%	0%	0%	4%	0%	0%	2%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	7.9	68.1		11.1	71.0		10.9	12.6		4.3	5.6	5.6
Effective Green, g (s)	6.2	70.0		13.1	72.9		13.6	10.3		6.6	7.3	7.3
Actuated g/C Ratio	0.05	0.58		0.11	0.61		0.11	0.09		0.06	0.06	0.06
Clearance Time (s)	6.3	5.9		6.0	5.9		6.7	5.7		6.3	5.7	5.7
Vehicle Extension (s)	2.7	3.2		2.7	3.2		2.6	1.8		2.7	1.8	1.8
Lane Grp Cap (vph)	181	1911		197	2117		205	143		99	116	90
v/s Ratio Prot	0.02	c0.43		0.06	c0.48		c0.08	0.02		0.03	c0.01	
v/s Ratio Perm												0.00
v/c Ratio	0.39	0.74		0.59	0.78		0.67	0.26		0.57	0.22	0.06
Uniform Delay, d1	55.1	18.4		50.9	17.6		51.1	51.3		55.3	53.7	53.1
Progression Factor	1.06	0.52		0.90	0.80		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	1.2		2.6	1.8		7.8	0.3		6.4	0.4	0.1
Delay (s)	58.8	10.9		48.2	16.0		58.9	51.6		61.7	54.0	53.2
Level of Service	E	B		D	B		E	D		E	D	D
Approach Delay (s)		13.1			18.1			55.9			56.2	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



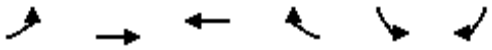
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	1135	210	0	1665	15	0	0	220	0	0	15
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	1158	214	0	1699	15	0	0	224	0	0	15
Pedestrians		1			7			4			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		597			688							
pX, platoon unblocked	0.72			0.70			0.84	0.84	0.70	0.84	0.84	0.72
vC, conflicting volume	1715			1376			2135	2985	697	2518	3084	859
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1605			1107			1159	2172	134	1616	2291	415
tC, single (s)	4.1			4.2			7.6	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	64	100	100	96
cM capacity (veh/h)	297			432			117	39	618	37	33	425

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	772	600	1133	582	224	15
Volume Left	0	0	0	0	0	0
Volume Right	0	214	0	15	224	15
cSH	1700	1700	1700	1700	618	425
Volume to Capacity	0.45	0.35	0.67	0.34	0.36	0.04
Queue Length 95th (ft)	0	0	0	0	41	3
Control Delay (s)	0.0	0.0	0.0	0.0	14.1	13.8
Lane LOS					B	B
Approach Delay (s)	0.0		0.0		14.1	13.8
Approach LOS					B	B

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	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		1.00	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.86		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3405		1805	3494		1805	1603		1805	1887	
Flt Permitted	0.14	1.00		0.07	1.00		0.00	1.00		0.00	1.00	
Satd. Flow (perm)	262	3405		139	3494		0	1603		0	1887	
Volume (vph)	60	1075	220	295	1195	110	400	10	230	100	100	5
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	61	1097	224	301	1219	112	408	10	235	102	102	5
RTOR Reduction (vph)	0	13	0	0	5	0	0	213	0	0	2	0
Lane Group Flow (vph)	61	1308	0	301	1326	0	408	32	0	102	105	0
Confl. Peds. (#/hr)	2					2			1	1		
Heavy Vehicles (%)	0%	4%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	53.4	48.5		73.8	62.9		18.2	9.4		18.8	10.0	
Effective Green, g (s)	57.4	50.5		75.8	64.9		20.2	11.4		20.8	12.0	
Actuated g/C Ratio	0.48	0.42		0.63	0.54		0.17	0.10		0.17	0.10	
Clearance Time (s)	6.0	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	
Lane Grp Cap (vph)	214	1433		384	1890		304	152		313	189	
v/s Ratio Prot	0.02	c0.38		c0.14	0.38		c0.23	0.02		0.06	c0.06	
v/s Ratio Perm	0.12			0.36								
v/c Ratio	0.29	0.91		0.78	0.70		1.34	0.21		0.33	0.56	
Uniform Delay, d1	18.3	32.7		34.7	20.4		49.9	50.2		43.5	51.5	
Progression Factor	0.66	0.56		1.26	0.53		1.00	1.00		0.88	0.88	
Incremental Delay, d2	0.6	7.6		8.6	1.0		174.4	3.2		0.6	11.1	
Delay (s)	12.6	26.0		52.2	11.7		224.3	53.3		38.9	56.5	
Level of Service	B	C		D	B		F	D		D	E	
Approach Delay (s)		25.4			19.2			160.2			47.9	
Approach LOS		C			B			F			D	

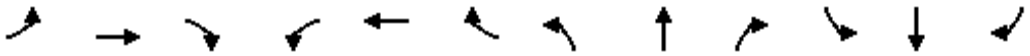
Intersection Summary			
HCM Average Control Delay	46.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1517	3406	3524		1787	1583
Flt Permitted	0.12	1.00	1.00		0.95	1.00
Satd. Flow (perm)	197	3406	3524		1787	1583
Volume (vph)	35	1360	1445	20	195	115
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	36	1388	1474	20	199	117
RTOR Reduction (vph)	0	0	1	0	0	100
Lane Group Flow (vph)	36	1388	1493	0	199	17
Heavy Vehicles (%)	19%	6%	2%	20%	1%	2%
Turn Type	pm+pt					Perm
Protected Phases	7	4	8		6	
Permitted Phases	4					6
Actuated Green, G (s)	94.3	94.3	86.1		17.7	17.7
Effective Green, g (s)	94.3	94.3	86.1		17.7	17.7
Actuated g/C Ratio	0.79	0.79	0.72		0.15	0.15
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	201	2677	2528		264	233
v/s Ratio Prot	0.01	c0.41	c0.42		c0.11	
v/s Ratio Perm	0.13					0.01
v/c Ratio	0.18	0.52	0.59		0.75	0.07
Uniform Delay, d1	6.1	4.6	8.3		49.1	44.1
Progression Factor	3.07	0.85	0.53		1.00	1.00
Incremental Delay, d2	0.2	0.1	0.9		11.5	0.1
Delay (s)	19.0	4.1	5.3		60.6	44.2
Level of Service	B	A	A		E	D
Approach Delay (s)		4.4	5.3		54.5	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	9.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

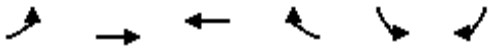
c Critical Lane Group



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)	4.0	4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3471	1568	1770	3539			1752	1538	1805	1710	
Flt Permitted	0.95	1.00	1.00	0.08	1.00			0.75	1.00	0.40	1.00	
Satd. Flow (perm)	1805	3471	1568	150	3539			1379	1538	766	1710	
Volume (vph)	5	1135	455	550	1265	0	180	0	205	25	5	10
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	5	1158	464	561	1291	0	184	0	209	26	5	10
RTOR Reduction (vph)	0	0	116	0	0	0	0	0	11	0	8	0
Lane Group Flow (vph)	5	1158	348	561	1291	0	0	184	198	26	7	0
Heavy Vehicles (%)	0%	4%	3%	2%	2%	0%	3%	0%	5%	0%	0%	0%
Turn Type	Prot		Perm	pm+pt			Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases			2	6			8		8	4		
Actuated Green, G (s)	1.0	50.7	50.7	83.1	83.1			17.9	51.3	17.9	17.9	
Effective Green, g (s)	3.0	52.7	52.7	85.1	85.1			19.9	55.3	19.9	19.9	
Actuated g/C Ratio	0.02	0.44	0.44	0.71	0.71			0.17	0.46	0.17	0.17	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	1.0	2.5	2.5	1.0	2.5			1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	45	1524	689	584	2510			229	760	127	284	
v/s Ratio Prot	0.00	c0.33		c0.28	0.36				0.08		0.00	
v/s Ratio Perm			0.22	c0.40				c0.13	0.05	0.03		
v/c Ratio	0.11	0.76	0.51	0.96	0.51			0.80	0.26	0.20	0.02	
Uniform Delay, d1	57.2	28.3	24.3	35.0	8.0			48.2	19.8	43.2	41.9	
Progression Factor	0.86	0.76	0.79	0.88	0.31			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	1.8	0.4	22.1	0.5			17.2	0.1	0.3	0.0	
Delay (s)	49.4	23.3	19.4	52.7	3.0			65.4	19.9	43.5	41.9	
Level of Service	D	C	B	D	A			E	B	D	D	
Approach Delay (s)		22.3			18.1			41.2			42.9	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	22.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
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)		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3523		1687	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3523		1687	1583
Volume (vph)	0	1340	1640	40	185	175
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1367	1673	41	189	179
RTOR Reduction (vph)	0	0	1	0	0	19
Lane Group Flow (vph)	0	1367	1713	0	189	160
Heavy Vehicles (%)	4%	4%	2%	6%	7%	2%
Turn Type	pm+pt					pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Actuated Green, G (s)		90.2	79.3		17.8	22.7
Effective Green, g (s)		92.2	81.3		19.8	26.7
Actuated g/C Ratio		0.77	0.68		0.16	0.22
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		2.5	2.5		2.5	2.0
Lane Grp Cap (vph)		2667	2387		278	405
v/s Ratio Prot		c0.39	c0.49		c0.11	0.02
v/s Ratio Perm						0.08
v/c Ratio		0.51	0.72		0.68	0.39
Uniform Delay, d1		5.3	12.1		47.1	39.8
Progression Factor		0.10	1.00		1.00	1.00
Incremental Delay, d2		0.5	1.0		5.9	0.2
Delay (s)		1.0	13.1		53.0	40.0
Level of Service		A	B		D	D
Approach Delay (s)		1.0	13.1		46.7	
Approach LOS		A	B		D	

Intersection Summary			
HCM Average Control Delay	11.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	330	145	50	285	25	50
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	367	161	56	317	28	56
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			528		875	447
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			528		875	447
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		91	91
cM capacity (veh/h)			1029		304	613

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	528	372	83
Volume Left	0	56	28
Volume Right	161	0	56
cSH	1700	1029	458
Volume to Capacity	0.31	0.05	0.18
Queue Length 95th (ft)	0	4	16
Control Delay (s)	0.0	1.8	14.6
Lane LOS		A	B
Approach Delay (s)	0.0	1.8	14.6
Approach LOS			B

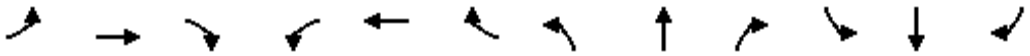
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2		3.2	3.2	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91		1.00	0.91	
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)	1787	1881	1599	1698	1764	1553	1770	4902		1787	5075	
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)	1787	1881	1599	1698	1764	1553	1770	4902		1787	5075	
Volume (vph)	215	335	145	310	275	170	115	1470	100	335	2225	30
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)	226	353	153	326	289	179	121	1547	105	353	2342	32
RTOR Reduction (vph)	0	0	125	0	0	151	0	7	0	0	1	0
Lane Group Flow (vph)	226	353	28	301	314	28	121	1645	0	353	2373	0
Heavy Vehicles (%)	1%	1%	1%	1%	2%	4%	2%	5%	2%	1%	2%	2%
Turn Type	Split		Perm	Split		Perm	Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8						
Actuated Green, G (s)	11.0	11.0	11.0	17.0	17.0	17.0	10.9	50.0		22.0	61.1	
Effective Green, g (s)	12.8	12.8	12.8	18.8	18.8	18.8	12.2	52.3		23.3	63.4	
Actuated g/C Ratio	0.11	0.11	0.11	0.16	0.16	0.16	0.10	0.44		0.19	0.53	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.5		4.5	5.5	
Vehicle Extension (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	4.7		2.3	4.7	
Lane Grp Cap (vph)	191	201	171	266	276	243	180	2136		347	2681	
v/s Ratio Prot	0.13	c0.19		0.18	c0.18		0.07	c0.34		c0.20	c0.47	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	1.18	1.76	0.16	1.13	1.14	0.12	0.67	0.77		1.02	0.89	
Uniform Delay, d1	53.6	53.6	48.7	50.6	50.6	43.5	52.0	28.7		48.3	25.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.89	0.88	
Incremental Delay, d2	123.2	360.0	0.3	95.3	96.5	0.1	8.2	2.0		38.6	2.5	
Delay (s)	176.8	413.6	49.0	145.9	147.1	43.6	60.2	30.8		81.4	24.4	
Level of Service	F	F	D	F	F	D	E	C		F	C	
Approach Delay (s)		264.3			123.3			32.8			31.8	
Approach LOS		F			F			C			C	

Intersection Summary			
HCM Average Control Delay	72.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		

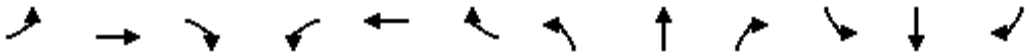
c Critical Lane Group

Alternative 3



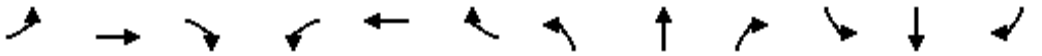
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	1.00			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1770	3338		1736	3538			1763			1834	
Flt Permitted	0.95	1.00		0.95	1.00			0.51			0.95	
Satd. Flow (perm)	1770	3338		1736	3538			947			1760	
Volume (vph)	15	1220	150	125	2060	5	325	15	35	20	160	15
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	15	1245	153	128	2102	5	332	15	36	20	163	15
RTOR Reduction (vph)	0	7	0	0	0	0	0	3	0	0	2	0
Lane Group Flow (vph)	15	1391	0	128	2107	0	0	380	0	0	196	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	5%	15%	4%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	2.6	61.8		13.0	72.2			35.2			35.2	
Effective Green, g (s)	3.1	63.8		13.5	74.2			37.2			37.2	
Actuated g/C Ratio	0.02	0.50		0.11	0.59			0.29			0.29	
Clearance Time (s)	4.5	6.0		4.5	6.0			6.0			6.0	
Vehicle Extension (s)	2.3	4.8		2.3	4.8			2.5			2.5	
Lane Grp Cap (vph)	43	1684		185	2075			278			518	
v/s Ratio Prot	0.01	0.42		c0.07	c0.60							
v/s Ratio Perm								c0.40			0.11	
v/c Ratio	0.35	0.83		0.69	1.02			1.37			0.38	
Uniform Delay, d1	60.7	26.6		54.5	26.1			44.6			35.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.8	3.9		9.4	23.7			186.7			0.3	
Delay (s)	63.5	30.5		63.9	49.8			231.4			35.8	
Level of Service	E	C		E	D			F			D	
Approach Delay (s)		30.8			50.6			231.4			35.8	
Approach LOS		C			D			F			D	

Intersection Summary			
HCM Average Control Delay	59.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	126.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	105.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



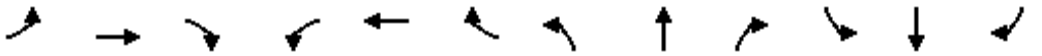
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		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	
Frt	1.00	0.87		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1625		3433	1555		1805	3438	1583	1719	3534	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1805	1625		3433	1555		1805	3438	1583	1719	3534	
Volume (vph)	25	5	35	260	5	160	30	1210	140	145	2255	20
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	26	5	36	265	5	163	31	1235	143	148	2301	20
RTOR Reduction (vph)	0	34	0	0	147	0	0	0	61	0	0	0
Lane Group Flow (vph)	26	7	0	265	21	0	31	1235	82	148	2321	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	0%	2%	50%	3%	0%	5%	2%	5%	2%	0%
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	7.1	4.6		12.5	10.0		4.6	67.2	67.2	15.2	77.8	
Effective Green, g (s)	7.1	6.6		12.5	12.0		5.1	69.2	69.2	15.7	79.8	
Actuated g/C Ratio	0.06	0.06		0.10	0.10		0.04	0.58	0.58	0.13	0.66	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.5	6.0	6.0	4.5	6.0	
Vehicle Extension (s)	3.0	2.5		3.0	2.5		2.3	4.8	4.8	2.3	4.8	
Lane Grp Cap (vph)	107	89		358	156		77	1983	913	225	2350	
v/s Ratio Prot	c0.01	0.00		c0.08	0.01		0.02	c0.36		0.09	c0.66	
v/s Ratio Perm									0.05			
v/c Ratio	0.24	0.08		0.74	0.14		0.40	0.62	0.09	0.66	0.99	
Uniform Delay, d1	53.9	53.8		52.2	49.3		56.0	16.8	11.3	49.6	19.6	
Progression Factor	1.00	1.00		1.04	1.51		0.98	0.47	0.44	1.00	1.00	
Incremental Delay, d2	1.2	0.3		7.8	0.3		1.6	1.2	0.2	5.7	15.9	
Delay (s)	55.1	54.1		62.2	74.5		56.6	9.1	5.2	55.3	35.5	
Level of Service	E	D		E	E		E	A	A	E	D	
Approach Delay (s)		54.5			66.9			9.7			36.7	
Approach LOS		D			E			A			D	

Intersection Summary			
HCM Average Control Delay	31.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



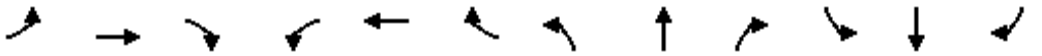
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	*0.75	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	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	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)	3400	4988	1524	3303	5085	1583	3502	2767	1507	3127	3374	1553
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)	3400	4988	1524	3303	5085	1583	3502	2767	1507	3127	3374	1553
Volume (vph)	195	970	435	330	1775	480	615	1000	190	255	720	195
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	199	990	444	337	1811	490	628	1020	194	260	735	199
RTOR Reduction (vph)	0	0	173	0	0	116	0	0	70	0	0	152
Lane Group Flow (vph)	199	990	271	337	1811	374	628	1020	124	260	735	47
Confl. Peds. (#/hr)									3	3		
Heavy Vehicles (%)	3%	4%	6%	6%	2%	2%	0%	3%	4%	12%	7%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.1	42.6	42.6	16.1	47.6	47.6	19.3	32.0	32.0	9.3	22.0	22.0
Effective Green, g (s)	11.6	44.1	44.1	16.6	49.1	49.1	20.3	33.0	33.0	10.3	23.0	23.0
Actuated g/C Ratio	0.10	0.37	0.37	0.14	0.41	0.41	0.17	0.28	0.28	0.09	0.19	0.19
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.3	4.7	4.7	2.3	4.7	4.7	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	329	1833	560	457	2081	648	592	761	414	268	647	298
v/s Ratio Prot	0.06	c0.20		0.10	c0.36		c0.18	c0.37		0.08	0.22	
v/s Ratio Perm			0.18			0.24			0.08			0.03
v/c Ratio	0.60	0.54	0.48	0.74	0.87	0.58	1.06	1.34	0.30	0.97	1.14	0.16
Uniform Delay, d1	52.0	29.9	29.2	49.6	32.5	27.4	49.8	43.5	34.4	54.7	48.5	40.4
Progression Factor	0.80	0.60	0.98	0.98	0.72	0.50	0.76	0.84	0.92	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.3	0.7	2.4	2.4	1.6	47.4	159.0	0.2	46.5	79.2	0.1
Delay (s)	43.3	18.3	29.4	50.9	25.8	15.4	85.3	195.5	31.6	101.2	127.7	40.6
Level of Service	D	B	C	D	C	B	F	F	C	F	F	D
Approach Delay (s)		24.4			27.1			140.6			107.4	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM Average Control Delay	68.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.6%	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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	3277		1805	3484		1805	1661		1805	1900	1481
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	3277		1805	3484		1805	1661		1805	1900	1481
Volume (vph)	70	1225	190	115	1590	65	140	30	65	55	35	80
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	71	1250	194	117	1622	66	143	31	66	56	36	82
RTOR Reduction (vph)	0	8	0	0	2	0	0	58	0	0	0	77
Lane Group Flow (vph)	71	1436	0	117	1686	0	143	39	0	56	36	5
Confl. Peds. (#/hr)			4	4			27					27
Heavy Vehicles (%)	0%	8%	4%	0%	3%	3%	0%	0%	4%	0%	0%	2%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	6.5	67.2		11.7	72.1		11.0	13.1		4.1	5.8	5.8
Effective Green, g (s)	8.8	69.1		13.7	74.0		13.7	14.8		6.4	7.5	7.5
Actuated g/C Ratio	0.07	0.58		0.11	0.62		0.11	0.12		0.05	0.06	0.06
Clearance Time (s)	6.3	5.9		6.0	5.9		6.7	5.7		6.3	5.7	5.7
Vehicle Extension (s)	2.7	3.2		2.7	3.2		2.6	1.8		2.7	1.8	1.8
Lane Grp Cap (vph)	257	1887		206	2148		206	205		96	119	93
v/s Ratio Prot	0.02	c0.44		0.06	c0.48		c0.08	0.02		0.03	c0.02	
v/s Ratio Perm												0.00
v/c Ratio	0.28	0.76		0.57	0.78		0.69	0.19		0.58	0.30	0.06
Uniform Delay, d1	52.6	19.2		50.3	17.1		51.1	47.2		55.5	53.8	52.9
Progression Factor	0.95	0.55		0.89	0.80		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	1.3		1.8	1.7		9.1	0.2		7.9	0.5	0.1
Delay (s)	50.3	11.8		46.9	15.5		60.3	47.4		63.4	54.3	53.0
Level of Service	D	B		D	B		E	D		E	D	D
Approach Delay (s)		13.6			17.5			55.1			56.6	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM Average Control Delay	20.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



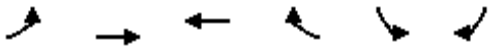
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	1150	200	0	1695	15	0	0	235	0	0	15
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	1173	204	0	1730	15	0	0	240	0	0	15
Pedestrians		1			7			4			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		597			688							
pX, platoon unblocked	0.71			0.69			0.83	0.83	0.69	0.83	0.83	0.71
vC, conflicting volume	1746			1382			2161	3025	700	2572	3120	874
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1643			1098			1150	2192	103	1645	2306	418
tC, single (s)	4.1			4.2			7.6	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	62	100	100	96
cM capacity (veh/h)	284			428			118	38	635	34	32	419

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	782	595	1153	592	240	15
Volume Left	0	0	0	0	0	0
Volume Right	0	204	0	15	240	15
cSH	1700	1700	1700	1700	635	419
Volume to Capacity	0.46	0.35	0.68	0.35	0.38	0.04
Queue Length 95th (ft)	0	0	0	0	44	3
Control Delay (s)	0.0	0.0	0.0	0.0	14.1	13.9
Lane LOS					B	B
Approach Delay (s)	0.0		0.0		14.1	13.9
Approach LOS					B	B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		

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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	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		1.00	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.86		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3404		1805	3491		1805	1609		1805	1887	
Flt Permitted	0.13	1.00		0.07	1.00		0.00	1.00		0.00	1.00	
Satd. Flow (perm)	244	3404		137	3491		0	1609		0	1887	
Volume (vph)	75	1090	225	290	1215	120	405	15	230	105	100	5
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	77	1112	230	296	1240	122	413	15	235	107	102	5
RTOR Reduction (vph)	0	14	0	0	5	0	0	213	0	0	2	0
Lane Group Flow (vph)	77	1328	0	296	1357	0	413	37	0	107	105	0
Confl. Peds. (#/hr)	2					2			1	1		
Heavy Vehicles (%)	0%	4%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	54.4	49.4		74.3	63.3		17.6	9.2		18.5	10.1	
Effective Green, g (s)	58.4	51.4		76.3	65.3		19.6	11.2		20.5	12.1	
Actuated g/C Ratio	0.49	0.43		0.64	0.54		0.16	0.09		0.17	0.10	
Clearance Time (s)	6.0	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	
Lane Grp Cap (vph)	210	1458		378	1900		295	150		308	190	
v/s Ratio Prot	0.02	c0.39		c0.14	0.39		c0.23	0.02		0.06	c0.06	
v/s Ratio Perm	0.16			0.36								
v/c Ratio	0.37	0.91		0.78	0.71		1.40	0.25		0.35	0.55	
Uniform Delay, d1	18.3	32.2		34.8	20.4		50.2	50.5		43.9	51.4	
Progression Factor	0.96	0.54		1.27	0.53		1.00	1.00		0.91	0.91	
Incremental Delay, d2	0.9	7.5		8.6	1.1		199.3	3.9		0.6	10.2	
Delay (s)	18.5	24.8		52.9	11.8		249.5	54.4		40.3	56.7	
Level of Service	B	C		D	B		F	D		D	E	
Approach Delay (s)		24.5			19.1			175.9			48.5	
Approach LOS		C			B			F			D	

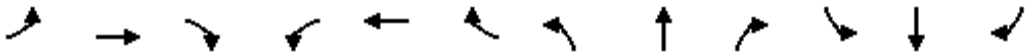
Intersection Summary			
HCM Average Control Delay	48.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1517	3406	3532		1787	1583
Flt Permitted	0.12	1.00	1.00		0.95	1.00
Satd. Flow (perm)	191	3406	3532		1787	1583
Volume (vph)	35	1380	1475	10	195	120
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	36	1408	1505	10	199	122
RTOR Reduction (vph)	0	0	0	0	0	104
Lane Group Flow (vph)	36	1408	1515	0	199	18
Heavy Vehicles (%)	19%	6%	2%	20%	1%	2%
Turn Type	pm+pt					Perm
Protected Phases	7	4	8		6	
Permitted Phases	4					6
Actuated Green, G (s)	94.3	94.3	86.1		17.7	17.7
Effective Green, g (s)	94.3	94.3	86.1		17.7	17.7
Actuated g/C Ratio	0.79	0.79	0.72		0.15	0.15
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	197	2677	2534		264	233
v/s Ratio Prot	0.01	c0.41	c0.43		c0.11	
v/s Ratio Perm	0.14					0.01
v/c Ratio	0.18	0.53	0.60		0.75	0.08
Uniform Delay, d1	6.3	4.7	8.4		49.1	44.1
Progression Factor	3.06	0.85	0.52		1.00	1.00
Incremental Delay, d2	0.2	0.1	0.9		11.5	0.1
Delay (s)	19.5	4.1	5.3		60.6	44.3
Level of Service	B	A	A		E	D
Approach Delay (s)		4.5	5.3		54.4	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	9.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

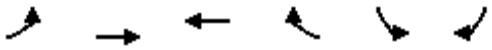
c Critical Lane Group



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)	4.0	4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3471	1568	1770	3539			1752	1538	1805	1710	
Flt Permitted	0.95	1.00	1.00	0.08	1.00			0.75	1.00	0.40	1.00	
Satd. Flow (perm)	1805	3471	1568	149	3539			1379	1538	766	1710	
Volume (vph)	5	1155	460	550	1280	0	180	0	205	25	5	10
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	5	1179	469	561	1306	0	184	0	209	26	5	10
RTOR Reduction (vph)	0	0	114	0	0	0	0	0	11	0	8	0
Lane Group Flow (vph)	5	1179	355	561	1306	0	0	184	198	26	7	0
Heavy Vehicles (%)	0%	4%	3%	2%	2%	0%	3%	0%	5%	0%	0%	0%
Turn Type	Prot		Perm	pm+pt			Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases			2	6			8		8	4		
Actuated Green, G (s)	1.0	50.9	50.9	83.1	83.1			17.9	51.1	17.9	17.9	
Effective Green, g (s)	3.0	52.9	52.9	85.1	85.1			19.9	55.1	19.9	19.9	
Actuated g/C Ratio	0.02	0.44	0.44	0.71	0.71			0.17	0.46	0.17	0.17	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	1.0	2.5	2.5	1.0	2.5			1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	45	1530	691	581	2510			229	757	127	284	
v/s Ratio Prot	0.00	c0.34		c0.28	0.37				0.08		0.00	
v/s Ratio Perm			0.23	c0.40				c0.13	0.05	0.03		
v/c Ratio	0.11	0.77	0.51	0.97	0.52			0.80	0.26	0.20	0.02	
Uniform Delay, d1	57.2	28.4	24.3	35.2	8.0			48.2	19.9	43.2	41.9	
Progression Factor	0.88	0.76	0.79	0.87	0.30			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	2.0	0.4	23.1	0.6			17.2	0.1	0.3	0.0	
Delay (s)	50.6	23.8	19.5	53.8	3.0			65.4	20.0	43.5	41.9	
Level of Service	D	C	B	D	A			E	C	D	D	
Approach Delay (s)		22.6			18.3			41.3			42.9	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	22.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
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)		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3523		1687	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3523		1687	1583
Volume (vph)	0	1355	1655	40	175	175
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1383	1689	41	179	179
RTOR Reduction (vph)	0	0	1	0	0	19
Lane Group Flow (vph)	0	1383	1729	0	179	160
Heavy Vehicles (%)	4%	4%	2%	6%	7%	2%
Turn Type	pm+pt					pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Actuated Green, G (s)		90.9	80.0		17.1	22.0
Effective Green, g (s)		92.9	82.0		19.1	26.0
Actuated g/C Ratio		0.77	0.68		0.16	0.22
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		2.5	2.5		2.5	2.0
Lane Grp Cap (vph)		2687	2407		269	396
v/s Ratio Prot		c0.40	c0.49		c0.11	0.02
v/s Ratio Perm						0.08
v/c Ratio		0.51	0.72		0.67	0.40
Uniform Delay, d1		5.1	11.8		47.4	40.4
Progression Factor		0.09	1.00		1.00	1.00
Incremental Delay, d2		0.5	1.0		5.5	0.2
Delay (s)		1.0	12.8		52.9	40.6
Level of Service		A	B		D	D
Approach Delay (s)		1.0	12.8		46.8	
Approach LOS		A	B		D	

Intersection Summary			
HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	320	150	50	290	15	50
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	356	167	56	322	17	56
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			522		872	439
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			522		872	439
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		95	91
cM capacity (veh/h)			1034		305	620

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	522	378	72
Volume Left	0	56	17
Volume Right	167	0	56
cSH	1700	1034	501
Volume to Capacity	0.31	0.05	0.14
Queue Length 95th (ft)	0	4	13
Control Delay (s)	0.0	1.8	13.4
Lane LOS		A	B
Approach Delay (s)	0.0	1.8	13.4
Approach LOS			B

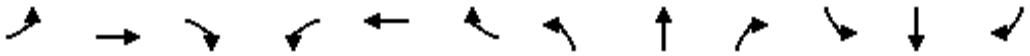
Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2		3.2	3.2	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91		1.00	0.91	
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)	1787	1881	1599	1698	1763	1553	1770	4900		1787	5075	
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)	1787	1881	1599	1698	1763	1553	1770	4900		1787	5075	
Volume (vph)	210	350	140	315	275	175	110	1480	105	340	2225	30
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)	221	368	147	332	289	184	116	1558	111	358	2342	32
RTOR Reduction (vph)	0	0	115	0	0	155	0	7	0	0	1	0
Lane Group Flow (vph)	221	368	32	304	317	29	116	1662	0	358	2373	0
Heavy Vehicles (%)	1%	1%	1%	1%	2%	4%	2%	5%	2%	1%	2%	2%
Turn Type	Split		Perm	Split		Perm	Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8						
Actuated Green, G (s)	11.0	11.0	11.0	17.0	17.0	17.0	10.8	49.9		22.1	61.2	
Effective Green, g (s)	12.8	12.8	12.8	18.8	18.8	18.8	12.1	52.2		23.4	63.5	
Actuated g/C Ratio	0.11	0.11	0.11	0.16	0.16	0.16	0.10	0.44		0.19	0.53	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.5		4.5	5.5	
Vehicle Extension (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	4.7		2.3	4.7	
Lane Grp Cap (vph)	191	201	171	266	276	243	178	2132		348	2686	
v/s Ratio Prot	0.12	c0.20		0.18	c0.18		0.07	c0.34		c0.20	c0.47	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	1.16	1.83	0.19	1.14	1.15	0.12	0.65	0.78		1.03	0.88	
Uniform Delay, d1	53.6	53.6	48.9	50.6	50.6	43.5	51.9	29.0		48.3	25.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.89	0.88	
Incremental Delay, d2	113.8	392.7	0.3	99.3	100.4	0.1	7.0	2.1		41.4	2.4	
Delay (s)	167.4	446.3	49.2	149.9	151.0	43.6	58.9	31.1		84.3	24.4	
Level of Service	F	F	D	F	F	D	E	C		F	C	
Approach Delay (s)		283.2			126.1			32.9			32.3	
Approach LOS		F			F			C			C	

Intersection Summary			
HCM Average Control Delay	75.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	97.5%	ICU Level of Service	F
Analysis Period (min)	15		

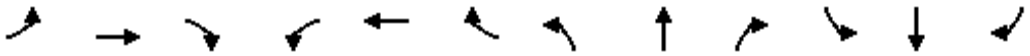
c Critical Lane Group

Alternative 4



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)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	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	1.00	0.98		1.00	1.00			0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1770	3335		1736	3538			1759			1834	
Flt Permitted	0.95	1.00		0.95	1.00			0.52			0.95	
Satd. Flow (perm)	1770	3335		1736	3538			955			1760	
Volume (vph)	15	1210	155	125	2055	5	320	15	45	20	160	15
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	15	1235	158	128	2097	5	327	15	46	20	163	15
RTOR Reduction (vph)	0	7	0	0	0	0	0	4	0	0	2	0
Lane Group Flow (vph)	15	1386	0	128	2102	0	0	384	0	0	196	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	5%	15%	4%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	2.6	61.8		13.0	72.2			35.2			35.2	
Effective Green, g (s)	3.1	63.8		13.5	74.2			37.2			37.2	
Actuated g/C Ratio	0.02	0.50		0.11	0.59			0.29			0.29	
Clearance Time (s)	4.5	6.0		4.5	6.0			6.0			6.0	
Vehicle Extension (s)	2.3	4.8		2.3	4.8			2.5			2.5	
Lane Grp Cap (vph)	43	1682		185	2075			281			518	
v/s Ratio Prot	0.01	0.42		c0.07	c0.59							
v/s Ratio Perm								c0.40			0.11	
v/c Ratio	0.35	0.82		0.69	1.01			1.37			0.38	
Uniform Delay, d1	60.7	26.6		54.5	26.1			44.6			35.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.8	3.8		9.4	23.0			186.8			0.3	
Delay (s)	63.5	30.4		63.9	49.2			231.5			35.8	
Level of Service	E	C		E	D			F			D	
Approach Delay (s)		30.7			50.0			231.5			35.8	
Approach LOS		C			D			F			D	

Intersection Summary			
HCM Average Control Delay	59.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	126.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	105.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

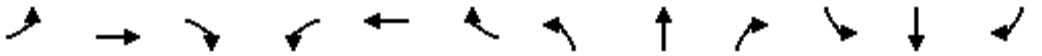


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		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	
Frt	1.00	0.87		1.00	0.86		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1624		3433	1553		1805	3438	1583	1719	3535	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1805	1624		3433	1553		1805	3438	1583	1719	3535	
Volume (vph)	25	5	35	240	5	135	30	1230	120	115	2280	20
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	26	5	36	245	5	138	31	1255	122	117	2327	20
RTOR Reduction (vph)	0	34	0	0	125	0	0	0	50	0	0	0
Lane Group Flow (vph)	26	7	0	245	18	0	31	1255	72	117	2347	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	0%	2%	50%	3%	0%	5%	2%	5%	2%	0%
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	7.3	4.4		12.3	9.4		4.6	68.0	68.0	14.8	78.2	
Effective Green, g (s)	7.3	6.4		12.3	11.4		5.1	70.0	70.0	15.3	80.2	
Actuated g/C Ratio	0.06	0.05		0.10	0.10		0.04	0.58	0.58	0.13	0.67	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.5	6.0	6.0	4.5	6.0	
Vehicle Extension (s)	3.0	2.5		3.0	2.5		2.3	4.8	4.8	2.3	4.8	
Lane Grp Cap (vph)	110	87		352	148		77	2006	923	219	2363	
v/s Ratio Prot	c0.01	0.00		c0.07	0.01		0.02	c0.37		0.07	c0.66	
v/s Ratio Perm									0.05			
v/c Ratio	0.24	0.08		0.70	0.12		0.40	0.63	0.08	0.53	0.99	
Uniform Delay, d1	53.7	54.0		52.0	49.7		56.0	16.4	10.9	49.0	19.6	
Progression Factor	1.00	1.00		1.04	1.46		1.00	0.48	0.37	1.00	1.00	
Incremental Delay, d2	1.1	0.3		5.7	0.3		1.6	1.2	0.1	1.7	17.0	
Delay (s)	54.8	54.3		59.8	72.7		57.4	9.0	4.2	50.7	36.6	
Level of Service	D	D		E	E		E	A	A	D	D	
Approach Delay (s)		54.5			64.5			9.7			37.3	
Approach LOS		D			E			A			D	

Intersection Summary			
HCM Average Control Delay	31.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

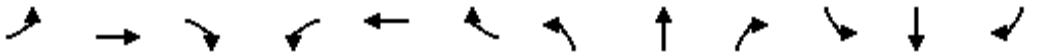
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	*0.75	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	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	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)	3400	4988	1524	3303	5085	1583	3502	2767	1507	3127	3374	1553
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)	3400	4988	1524	3303	5085	1583	3502	2767	1507	3127	3374	1553
Volume (vph)	195	970	445	330	1785	480	620	1000	185	255	715	190
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	199	990	454	337	1821	490	633	1020	189	260	730	194
RTOR Reduction (vph)	0	0	173	0	0	116	0	0	68	0	0	152
Lane Group Flow (vph)	199	990	281	337	1821	374	633	1020	121	260	730	42
Confl. Peds. (#/hr)									3	3		
Heavy Vehicles (%)	3%	4%	6%	6%	2%	2%	0%	3%	4%	12%	7%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.1	42.7	42.7	16.0	47.6	47.6	19.3	32.0	32.0	9.3	22.0	22.0
Effective Green, g (s)	11.6	44.2	44.2	16.5	49.1	49.1	20.3	33.0	33.0	10.3	23.0	23.0
Actuated g/C Ratio	0.10	0.37	0.37	0.14	0.41	0.41	0.17	0.28	0.28	0.09	0.19	0.19
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.3	4.7	4.7	2.3	4.7	4.7	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	329	1837	561	454	2081	648	592	761	414	268	647	298
v/s Ratio Prot	0.06	c0.20		0.10	c0.36		c0.18	c0.37		0.08	0.22	
v/s Ratio Perm			0.18			0.24			0.08			0.03
v/c Ratio	0.60	0.54	0.50	0.74	0.88	0.58	1.07	1.34	0.29	0.97	1.13	0.14
Uniform Delay, d1	52.0	29.9	29.4	49.7	32.6	27.4	49.8	43.5	34.3	54.7	48.5	40.3
Progression Factor	0.81	0.61	0.99	0.98	0.71	0.50	0.76	0.87	0.92	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.3	0.8	2.6	2.4	1.6	50.3	159.1	0.2	46.5	76.3	0.1
Delay (s)	43.4	18.4	29.7	51.0	25.6	15.2	88.3	196.8	31.7	101.2	124.8	40.4
Level of Service	D	B	C	D	C	B	F	F	C	F	F	D
Approach Delay (s)		24.6			26.9			142.5			105.8	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM Average Control Delay	68.3	HCM Level of Service	E
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.8%	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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	3277		1805	3484		1805	1661		1805	1900	1481
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	3277		1805	3484		1805	1661		1805	1900	1481
Volume (vph)	70	1225	190	115	1585	65	135	30	65	55	30	85
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	71	1250	194	117	1617	66	138	31	66	56	31	87
RTOR Reduction (vph)	0	9	0	0	2	0	0	58	0	0	0	82
Lane Group Flow (vph)	71	1435	0	117	1681	0	138	39	0	56	31	5
Confl. Peds. (#/hr)			4	4			27					27
Heavy Vehicles (%)	0%	8%	4%	0%	3%	3%	0%	0%	4%	0%	0%	2%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	6.5	66.8		12.3	72.3		10.9	12.9		4.1	5.7	5.7
Effective Green, g (s)	8.8	68.7		14.3	74.2		13.6	14.6		6.4	7.4	7.4
Actuated g/C Ratio	0.07	0.57		0.12	0.62		0.11	0.12		0.05	0.06	0.06
Clearance Time (s)	6.3	5.9		6.0	5.9		6.7	5.7		6.3	5.7	5.7
Vehicle Extension (s)	2.7	3.2		2.7	3.2		2.6	1.8		2.7	1.8	1.8
Lane Grp Cap (vph)	257	1876		215	2154		205	202		96	117	91
v/s Ratio Prot	0.02	c0.44		0.06	c0.48		c0.08	0.02		0.03	c0.02	
v/s Ratio Perm												0.00
v/c Ratio	0.28	0.77		0.54	0.78		0.67	0.19		0.58	0.26	0.06
Uniform Delay, d1	52.6	19.5		49.8	16.9		51.1	47.4		55.5	53.7	53.0
Progression Factor	0.96	0.54		0.90	0.80		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	1.3		1.4	1.7		7.8	0.2		7.9	0.4	0.1
Delay (s)	51.0	11.9		46.1	15.2		58.9	47.6		63.4	54.1	53.1
Level of Service	D	B		D	B		E	D		E	D	D
Approach Delay (s)		13.7			17.2			54.2			56.6	
Approach LOS		B			B			D			E	

Intersection Summary			
HCM Average Control Delay	20.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



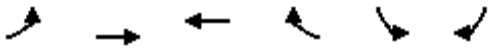
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	1170	190	0	1690	15	0	0	220	0	0	15
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	1194	194	0	1724	15	0	0	224	0	0	15
Pedestrians		1			7			4			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		597			688							
pX, platoon unblocked	0.72			0.68			0.82	0.82	0.68	0.82	0.82	0.72
vC, conflicting volume	1741			1392			2173	3036	705	2562	3125	872
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1640			1109			1192	2240	104	1664	2349	435
tC, single (s)	4.1			4.2			7.6	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	64	100	100	96
cM capacity (veh/h)	288			422			109	35	632	34	30	414

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	796	592	1150	590	224	15
Volume Left	0	0	0	0	0	0
Volume Right	0	194	0	15	224	15
cSH	1700	1700	1700	1700	632	414
Volume to Capacity	0.47	0.35	0.68	0.35	0.36	0.04
Queue Length 95th (ft)	0	0	0	0	40	3
Control Delay (s)	0.0	0.0	0.0	0.0	13.8	14.0
Lane LOS					B	B
Approach Delay (s)	0.0		0.0		13.8	14.0
Approach LOS					B	B

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	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		1.00	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.86		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3399		1805	3492		1805	1609		1805	1860	
Flt Permitted	0.14	1.00		0.07	1.00		0.00	1.00		0.00	1.00	
Satd. Flow (perm)	260	3399		136	3492		0	1609		0	1860	
Volume (vph)	70	1075	245	295	1205	115	405	15	230	115	90	15
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	71	1097	250	301	1230	117	413	15	235	117	92	15
RTOR Reduction (vph)	0	15	0	0	5	0	0	214	0	0	5	0
Lane Group Flow (vph)	71	1332	0	301	1342	0	413	36	0	117	102	0
Confl. Peds. (#/hr)	2					2			1	1		
Heavy Vehicles (%)	0%	4%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	54.7	49.8		75.0	64.1		17.1	8.6		18.4	9.9	
Effective Green, g (s)	58.7	51.8		77.0	66.1		19.1	10.6		20.4	11.9	
Actuated g/C Ratio	0.49	0.43		0.64	0.55		0.16	0.09		0.17	0.10	
Clearance Time (s)	6.0	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	
Lane Grp Cap (vph)	216	1467		382	1924		287	142		307	184	
v/s Ratio Prot	0.02	c0.39		c0.14	0.38		c0.23	0.02		0.06	c0.05	
v/s Ratio Perm	0.14			0.37								
v/c Ratio	0.33	0.91		0.79	0.70		1.44	0.25		0.38	0.55	
Uniform Delay, d1	17.7	31.9		34.9	19.7		50.4	51.0		44.2	51.5	
Progression Factor	0.81	0.54		1.26	0.52		1.00	1.00		0.89	0.89	
Incremental Delay, d2	0.7	7.0		8.8	0.9		216.3	4.2		0.8	10.9	
Delay (s)	15.1	24.2		52.9	11.2		266.8	55.2		40.1	56.7	
Level of Service	B	C		D	B		F	E		D	E	
Approach Delay (s)		23.8			18.8			187.0			48.0	
Approach LOS		C			B			F			D	

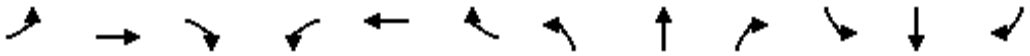
Intersection Summary			
HCM Average Control Delay	50.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1517	3406	3528		1787	1583
Flt Permitted	0.12	1.00	1.00		0.95	1.00
Satd. Flow (perm)	194	3406	3528		1787	1583
Volume (vph)	35	1380	1460	15	195	115
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	36	1408	1490	15	199	117
RTOR Reduction (vph)	0	0	0	0	0	100
Lane Group Flow (vph)	36	1408	1505	0	199	17
Heavy Vehicles (%)	19%	6%	2%	20%	1%	2%
Turn Type	pm+pt					Perm
Protected Phases	7	4	8		6	
Permitted Phases	4					6
Actuated Green, G (s)	94.3	94.3	86.1		17.7	17.7
Effective Green, g (s)	94.3	94.3	86.1		17.7	17.7
Actuated g/C Ratio	0.79	0.79	0.72		0.15	0.15
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	199	2677	2531		264	233
v/s Ratio Prot	0.01	c0.41	c0.43		c0.11	
v/s Ratio Perm	0.14					0.01
v/c Ratio	0.18	0.53	0.59		0.75	0.07
Uniform Delay, d1	6.2	4.7	8.4		49.1	44.1
Progression Factor	2.97	0.88	0.52		1.00	1.00
Incremental Delay, d2	0.2	0.1	0.9		11.5	0.1
Delay (s)	18.7	4.2	5.2		60.6	44.2
Level of Service	B	A	A		E	D
Approach Delay (s)		4.6	5.2		54.5	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	9.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

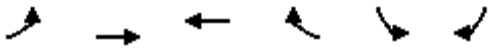
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3471	1568	1770	3539			1752	1538	1805	1710	
Flt Permitted	0.95	1.00	1.00	0.08	1.00			0.75	1.00	0.40	1.00	
Satd. Flow (perm)	1805	3471	1568	149	3539			1379	1538	766	1710	
Volume (vph)	5	1150	460	550	1275	0	180	0	205	25	5	10
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	5	1173	469	561	1301	0	184	0	209	26	5	10
RTOR Reduction (vph)	0	0	115	0	0	0	0	0	11	0	8	0
Lane Group Flow (vph)	5	1173	354	561	1301	0	0	184	198	26	7	0
Heavy Vehicles (%)	0%	4%	3%	2%	2%	0%	3%	0%	5%	0%	0%	0%
Turn Type	Prot		Perm	pm+pt			Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases			2	6			8		8	4		
Actuated Green, G (s)	1.0	50.9	50.9	83.1	83.1			17.9	51.1	17.9	17.9	
Effective Green, g (s)	3.0	52.9	52.9	85.1	85.1			19.9	55.1	19.9	19.9	
Actuated g/C Ratio	0.02	0.44	0.44	0.71	0.71			0.17	0.46	0.17	0.17	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	1.0	2.5	2.5	1.0	2.5			1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	45	1530	691	581	2510			229	757	127	284	
v/s Ratio Prot	0.00	c0.34		c0.28	0.37				0.08		0.00	
v/s Ratio Perm			0.23	c0.40				c0.13	0.05	0.03		
v/c Ratio	0.11	0.77	0.51	0.97	0.52			0.80	0.26	0.20	0.02	
Uniform Delay, d1	57.2	28.3	24.2	35.2	8.0			48.2	19.9	43.2	41.9	
Progression Factor	0.87	0.76	0.78	0.87	0.31			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	1.9	0.4	23.1	0.5			17.2	0.1	0.3	0.0	
Delay (s)	50.1	23.3	19.3	53.7	3.1			65.4	20.0	43.5	41.9	
Level of Service	D	C	B	D	A			E	C	D	D	
Approach Delay (s)		22.3			18.3			41.3			42.9	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	22.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
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)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1736	3471	3523		1687	1583
Flt Permitted	0.08	1.00	1.00		0.95	1.00
Satd. Flow (perm)	139	3471	3523		1687	1583
Volume (vph)	5	1355	1650	40	175	180
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	5	1383	1684	41	179	184
RTOR Reduction (vph)	0	0	1	0	0	19
Lane Group Flow (vph)	5	1383	1724	0	179	165
Heavy Vehicles (%)	4%	4%	2%	6%	7%	2%
Turn Type	pm+pt					pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Actuated Green, G (s)	90.9	90.9	80.0		17.1	22.0
Effective Green, g (s)	92.9	92.9	82.0		19.1	26.0
Actuated g/C Ratio	0.77	0.77	0.68		0.16	0.22
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	2.0	2.5	2.5		2.5	2.0
Lane Grp Cap (vph)	199	2687	2407		269	396
v/s Ratio Prot	0.00	c0.40	c0.49		c0.11	0.02
v/s Ratio Perm	0.02					0.08
v/c Ratio	0.03	0.51	0.72		0.67	0.42
Uniform Delay, d1	9.4	5.1	11.8		47.4	40.5
Progression Factor	0.15	0.10	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.5	1.0		5.5	0.3
Delay (s)	1.5	1.0	12.7		52.9	40.7
Level of Service	A	A	B		D	D
Approach Delay (s)		1.0	12.7		46.8	
Approach LOS		A	B		D	

Intersection Summary			
HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	325	145	50	285	25	50
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	361	161	56	317	28	56
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			522		869	442
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			522		869	442
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		91	91
cM capacity (veh/h)			1034		306	618

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	522	372	83
Volume Left	0	56	28
Volume Right	161	0	56
cSH	1700	1034	461
Volume to Capacity	0.31	0.05	0.18
Queue Length 95th (ft)	0	4	16
Control Delay (s)	0.0	1.8	14.5
Lane LOS		A	B
Approach Delay (s)	0.0	1.8	14.5
Approach LOS			B

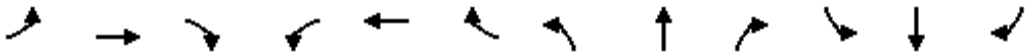
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2		3.2	3.2	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91		1.00	0.91	
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)	1787	1881	1599	1698	1763	1553	1770	4902		1787	5075	
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)	1787	1881	1599	1698	1763	1553	1770	4902		1787	5075	
Volume (vph)	215	345	140	315	275	175	110	1475	100	340	2230	30
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)	226	363	147	332	289	184	116	1553	105	358	2347	32
RTOR Reduction (vph)	0	0	117	0	0	155	0	7	0	0	1	0
Lane Group Flow (vph)	226	363	30	304	317	29	116	1651	0	358	2378	0
Heavy Vehicles (%)	1%	1%	1%	1%	2%	4%	2%	5%	2%	1%	2%	2%
Turn Type	Split		Perm	Split		Perm	Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8						
Actuated Green, G (s)	11.0	11.0	11.0	17.0	17.0	17.0	10.8	49.8		22.2	61.2	
Effective Green, g (s)	12.8	12.8	12.8	18.8	18.8	18.8	12.1	52.1		23.5	63.5	
Actuated g/C Ratio	0.11	0.11	0.11	0.16	0.16	0.16	0.10	0.43		0.20	0.53	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.5		4.5	5.5	
Vehicle Extension (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	4.7		2.3	4.7	
Lane Grp Cap (vph)	191	201	171	266	276	243	178	2128		350	2686	
v/s Ratio Prot	0.13	c0.19		0.18	c0.18		0.07	c0.34		c0.20	c0.47	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	1.18	1.81	0.18	1.14	1.15	0.12	0.65	0.78		1.02	0.89	
Uniform Delay, d1	53.6	53.6	48.8	50.6	50.6	43.5	51.9	29.0		48.2	25.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.89	0.89	
Incremental Delay, d2	123.2	381.8	0.3	99.3	100.4	0.1	7.0	2.1		39.3	2.4	
Delay (s)	176.8	435.4	49.1	149.9	151.0	43.6	58.9	31.1		82.3	24.6	
Level of Service	F	F	D	F	F	D	E	C		F	C	
Approach Delay (s)		278.8			126.1			32.9			32.1	
Approach LOS		F			F			C			C	

Intersection Summary			
HCM Average Control Delay	74.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	97.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Alternative 5



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)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	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	1.00	0.98		1.00	1.00			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1770	3344		1736	3538			1763			1834	
Flt Permitted	0.95	1.00		0.95	1.00			0.52			0.95	
Satd. Flow (perm)	1770	3344		1736	3538			948			1760	
Volume (vph)	15	1225	140	125	2065	5	325	15	35	20	160	15
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	15	1250	143	128	2107	5	332	15	36	20	163	15
RTOR Reduction (vph)	0	6	0	0	0	0	0	3	0	0	2	0
Lane Group Flow (vph)	15	1387	0	128	2112	0	0	380	0	0	196	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	5%	15%	4%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	2.6	61.7		13.0	72.1			35.2			35.2	
Effective Green, g (s)	3.1	63.7		13.5	74.1			37.2			37.2	
Actuated g/C Ratio	0.02	0.50		0.11	0.59			0.29			0.29	
Clearance Time (s)	4.5	6.0		4.5	6.0			6.0			6.0	
Vehicle Extension (s)	2.3	4.8		2.3	4.8			2.5			2.5	
Lane Grp Cap (vph)	43	1685		185	2074			279			518	
v/s Ratio Prot	0.01	0.41		c0.07	c0.60							
v/s Ratio Perm								c0.40			0.11	
v/c Ratio	0.35	0.82		0.69	1.02			1.36			0.38	
Uniform Delay, d1	60.7	26.6		54.4	26.2			44.6			35.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.8	3.8		9.4	24.5			184.6			0.3	
Delay (s)	63.5	30.3		63.8	50.6			229.2			35.8	
Level of Service	E	C		E	D			F			D	
Approach Delay (s)		30.7			51.4			229.2			35.8	
Approach LOS		C			D			F			D	

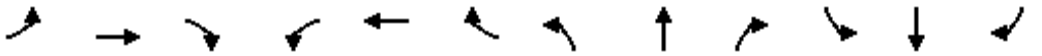
Intersection Summary			
HCM Average Control Delay	59.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	126.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	105.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

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)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		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	
Frt	1.00	0.87		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1625		3433	1555		1805	3438	1583	1719	3534	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1805	1625		3433	1555		1805	3438	1583	1719	3534	
Volume (vph)	25	5	35	270	5	165	30	1195	175	155	2255	20
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	26	5	36	276	5	168	31	1219	179	158	2301	20
RTOR Reduction (vph)	0	34	0	0	151	0	0	0	77	0	0	0
Lane Group Flow (vph)	26	7	0	276	22	0	31	1219	102	158	2321	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	0%	2%	50%	3%	0%	5%	2%	5%	2%	0%
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	7.0	4.6		12.6	10.2		4.6	66.2	66.2	16.1	77.7	
Effective Green, g (s)	7.0	6.6		12.6	12.2		5.1	68.2	68.2	16.6	79.7	
Actuated g/C Ratio	0.06	0.06		0.10	0.10		0.04	0.57	0.57	0.14	0.66	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.5	6.0	6.0	4.5	6.0	
Vehicle Extension (s)	3.0	2.5		3.0	2.5		2.3	4.8	4.8	2.3	4.8	
Lane Grp Cap (vph)	105	89		360	158		77	1954	900	238	2347	
v/s Ratio Prot	c0.01	0.00		c0.08	0.01		0.02	c0.35		0.09	c0.66	
v/s Ratio Perm									0.06			
v/c Ratio	0.25	0.08		0.77	0.14		0.40	0.62	0.11	0.66	0.99	
Uniform Delay, d1	54.0	53.8		52.3	49.1		56.0	17.3	11.9	49.1	19.7	
Progression Factor	1.00	1.00		1.04	1.52		0.99	0.45	0.53	1.00	1.00	
Incremental Delay, d2	1.2	0.3		9.1	0.3		1.6	1.2	0.2	5.8	16.1	
Delay (s)	55.2	54.1		63.4	74.8		56.7	9.0	6.6	54.9	35.8	
Level of Service	E	D		E	E		E	A	A	D	D	
Approach Delay (s)		54.5			67.8			9.7			37.0	
Approach LOS		D			E			A			D	

Intersection Summary			
HCM Average Control Delay	31.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

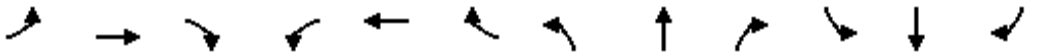
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	*0.75	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	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	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)	3400	4988	1524	3303	5085	1583	3502	2767	1507	3127	3374	1553
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)	3400	4988	1524	3303	5085	1583	3502	2767	1507	3127	3374	1553
Volume (vph)	195	985	435	330	1780	480	620	1005	195	255	730	185
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	199	1005	444	337	1816	490	633	1026	199	260	745	189
RTOR Reduction (vph)	0	0	173	0	0	115	0	0	72	0	0	152
Lane Group Flow (vph)	199	1005	271	337	1816	375	633	1026	127	260	745	37
Confl. Peds. (#/hr)									3	3		
Heavy Vehicles (%)	3%	4%	6%	6%	2%	2%	0%	3%	4%	12%	7%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.1	42.7	42.7	16.0	47.6	47.6	19.3	32.0	32.0	9.3	22.0	22.0
Effective Green, g (s)	11.6	44.2	44.2	16.5	49.1	49.1	20.3	33.0	33.0	10.3	23.0	23.0
Actuated g/C Ratio	0.10	0.37	0.37	0.14	0.41	0.41	0.17	0.28	0.28	0.09	0.19	0.19
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.3	4.7	4.7	2.3	4.7	4.7	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	329	1837	561	454	2081	648	592	761	414	268	647	298
v/s Ratio Prot	0.06	c0.20		0.10	c0.36		c0.18	c0.37		0.08	0.22	
v/s Ratio Perm			0.18			0.24			0.08			0.02
v/c Ratio	0.60	0.55	0.48	0.74	0.87	0.58	1.07	1.35	0.31	0.97	1.15	0.12
Uniform Delay, d1	52.0	30.0	29.1	49.7	32.6	27.4	49.8	43.5	34.4	54.7	48.5	40.2
Progression Factor	0.80	0.60	0.97	0.98	0.72	0.51	0.76	0.85	0.92	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.3	0.7	2.5	2.3	1.6	50.0	162.4	0.2	46.5	85.1	0.1
Delay (s)	43.1	18.4	29.0	51.2	25.9	15.5	88.0	199.3	31.8	101.2	133.6	40.3
Level of Service	D	B	C	D	C	B	F	F	C	F	F	D
Approach Delay (s)		24.2			27.2			143.5			111.8	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM Average Control Delay	69.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	91.2%	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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	3277		1805	3484		1805	1661		1805	1900	1481
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	3277		1805	3484		1805	1661		1805	1900	1481
Volume (vph)	70	1235	190	125	1605	65	140	30	65	55	35	80
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	71	1260	194	128	1638	66	143	31	66	56	36	82
RTOR Reduction (vph)	0	9	0	0	2	0	0	58	0	0	0	77
Lane Group Flow (vph)	71	1446	0	128	1702	0	143	39	0	56	36	5
Confl. Peds. (#/hr)			4	4			27					27
Heavy Vehicles (%)	0%	8%	4%	0%	3%	3%	0%	0%	4%	0%	0%	2%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	6.5	67.1		11.9	72.2		10.9	13.1		4.0	5.8	5.8
Effective Green, g (s)	8.8	69.0		13.9	74.1		13.6	14.8		6.3	7.5	7.5
Actuated g/C Ratio	0.07	0.57		0.12	0.62		0.11	0.12		0.05	0.06	0.06
Clearance Time (s)	6.3	5.9		6.0	5.9		6.7	5.7		6.3	5.7	5.7
Vehicle Extension (s)	2.7	3.2		2.7	3.2		2.6	1.8		2.7	1.8	1.8
Lane Grp Cap (vph)	257	1884		209	2151		205	205		95	119	93
v/s Ratio Prot	0.02	c0.44		0.07	c0.49		c0.08	0.02		0.03	c0.02	
v/s Ratio Perm												0.00
v/c Ratio	0.28	0.77		0.61	0.79		0.70	0.19		0.59	0.30	0.06
Uniform Delay, d1	52.6	19.4		50.5	17.2		51.2	47.2		55.6	53.8	52.9
Progression Factor	0.95	0.56		0.89	0.79		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	1.3		2.6	1.7		9.3	0.2		8.1	0.5	0.1
Delay (s)	50.1	12.1		47.5	15.3		60.5	47.4		63.7	54.3	53.0
Level of Service	D	B		D	B		E	D		E	D	D
Approach Delay (s)		13.8			17.6			55.2			56.7	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



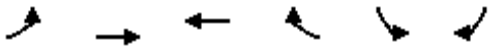
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	1175	190	0	1720	15	0	0	230	0	0	15
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	1199	194	0	1755	15	0	0	235	0	0	15
Pedestrians		1			7			4			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		597			688							
pX, platoon unblocked	0.71			0.68			0.83	0.83	0.68	0.83	0.83	0.71
vC, conflicting volume	1771			1397			2194	3071	707	2605	3161	887
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1677			1113			1174	2236	100	1672	2344	428
tC, single (s)	4.1			4.2			7.6	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	63	100	100	96
cM capacity (veh/h)	274			418			112	35	633	33	30	410

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	799	594	1170	600	235	15
Volume Left	0	0	0	0	0	0
Volume Right	0	194	0	15	235	15
cSH	1700	1700	1700	1700	633	410
Volume to Capacity	0.47	0.35	0.69	0.35	0.37	0.04
Queue Length 95th (ft)	0	0	0	0	43	3
Control Delay (s)	0.0	0.0	0.0	0.0	14.0	14.1
Lane LOS					B	B
Approach Delay (s)	0.0		0.0		14.0	14.1
Approach LOS					B	B

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		

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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	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		1.00	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.87		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3402		1805	3492		1805	1628		1805	1860	
Flt Permitted	0.13	1.00		0.07	1.00		0.00	1.00		0.00	1.00	
Satd. Flow (perm)	238	3402		135	3492		0	1628		0	1860	
Volume (vph)	80	1090	235	290	1230	120	410	30	220	120	90	15
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	82	1112	240	296	1255	122	418	31	224	122	92	15
RTOR Reduction (vph)	0	14	0	0	5	0	0	203	0	0	5	0
Lane Group Flow (vph)	82	1338	0	296	1372	0	418	52	0	122	102	0
Confl. Peds. (#/hr)	2					2			1	1		
Heavy Vehicles (%)	0%	4%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	55.0	50.1		74.7	63.8		17.2	9.3		18.0	10.1	
Effective Green, g (s)	59.0	52.1		76.7	65.8		19.2	11.3		20.0	12.1	
Actuated g/C Ratio	0.49	0.43		0.64	0.55		0.16	0.09		0.17	0.10	
Clearance Time (s)	6.0	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	
Lane Grp Cap (vph)	207	1477		373	1915		289	153		301	188	
v/s Ratio Prot	0.02	c0.39		c0.14	0.39		c0.23	0.03		0.07	c0.05	
v/s Ratio Perm	0.17			0.37								
v/c Ratio	0.40	0.91		0.79	0.72		1.45	0.34		0.41	0.54	
Uniform Delay, d1	18.1	31.7		35.1	20.2		50.4	50.9		44.7	51.3	
Progression Factor	1.07	0.53		1.31	0.53		1.00	1.00		0.95	0.94	
Incremental Delay, d2	1.0	6.9		9.4	1.1		219.3	6.0		0.8	9.8	
Delay (s)	20.4	23.5		55.2	11.8		269.7	56.8		43.1	58.2	
Level of Service	C	C		E	B		F	E		D	E	
Approach Delay (s)		23.3			19.5			189.1			50.2	
Approach LOS		C			B			F			D	

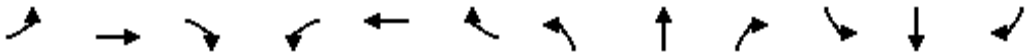
Intersection Summary			
HCM Average Control Delay	51.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1517	3406	3532		1787	1583
Flt Permitted	0.12	1.00	1.00		0.95	1.00
Satd. Flow (perm)	188	3406	3532		1787	1583
Volume (vph)	35	1390	1485	10	195	115
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	36	1418	1515	10	199	117
RTOR Reduction (vph)	0	0	0	0	0	100
Lane Group Flow (vph)	36	1418	1525	0	199	17
Heavy Vehicles (%)	19%	6%	2%	20%	1%	2%
Turn Type	pm+pt					Perm
Protected Phases	7	4	8		6	
Permitted Phases	4					6
Actuated Green, G (s)	94.3	94.3	86.1		17.7	17.7
Effective Green, g (s)	94.3	94.3	86.1		17.7	17.7
Actuated g/C Ratio	0.79	0.79	0.72		0.15	0.15
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	194	2677	2534		264	233
v/s Ratio Prot	0.01	c0.42	c0.43		c0.11	
v/s Ratio Perm	0.14					0.01
v/c Ratio	0.19	0.53	0.60		0.75	0.07
Uniform Delay, d1	6.4	4.7	8.4		49.1	44.1
Progression Factor	2.96	0.86	0.50		1.00	1.00
Incremental Delay, d2	0.2	0.1	0.9		11.5	0.1
Delay (s)	19.2	4.1	5.1		60.6	44.2
Level of Service	B	A	A		E	D
Approach Delay (s)		4.5	5.1		54.5	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	9.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

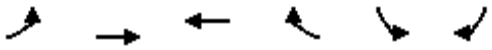
c Critical Lane Group



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)	4.0	4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3471	1568	1770	3539			1752	1538	1805	1710	
Flt Permitted	0.95	1.00	1.00	0.08	1.00			0.75	1.00	0.39	1.00	
Satd. Flow (perm)	1805	3471	1568	151	3539			1379	1538	750	1710	
Volume (vph)	5	1155	460	550	1290	0	185	0	215	25	5	10
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	5	1179	469	561	1316	0	189	0	219	26	5	10
RTOR Reduction (vph)	0	0	115	0	0	0	0	0	11	0	8	0
Lane Group Flow (vph)	5	1179	354	561	1316	0	0	189	208	26	7	0
Heavy Vehicles (%)	0%	4%	3%	2%	2%	0%	3%	0%	5%	0%	0%	0%
Turn Type	Prot		Perm	pm+pt			Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases			2	6			8		8	4		
Actuated Green, G (s)	1.0	50.5	50.5	82.8	82.8			18.2	51.5	18.2	18.2	
Effective Green, g (s)	3.0	52.5	52.5	84.8	84.8			20.2	55.5	20.2	20.2	
Actuated g/C Ratio	0.02	0.44	0.44	0.71	0.71			0.17	0.46	0.17	0.17	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	1.0	2.5	2.5	1.0	2.5			1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	45	1519	686	583	2501			232	763	126	288	
v/s Ratio Prot	0.00	c0.34		c0.28	0.37				0.08		0.00	
v/s Ratio Perm			0.23	c0.40				c0.14	0.06	0.03		
v/c Ratio	0.11	0.78	0.52	0.96	0.53			0.81	0.27	0.21	0.02	
Uniform Delay, d1	57.2	28.7	24.5	35.1	8.2			48.1	19.8	43.0	41.7	
Progression Factor	0.87	0.76	0.80	0.85	0.31			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	2.1	0.4	22.5	0.6			18.4	0.1	0.3	0.0	
Delay (s)	50.2	23.9	19.9	52.4	3.1			66.5	19.9	43.3	41.7	
Level of Service	D	C	B	D	A			E	B	D	D	
Approach Delay (s)		22.9			17.8			41.5			42.7	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	22.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
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)		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3523		1687	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3523		1687	1583
Volume (vph)	0	1370	1660	40	165	175
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1398	1694	41	168	179
RTOR Reduction (vph)	0	0	1	0	0	19
Lane Group Flow (vph)	0	1398	1734	0	168	160
Heavy Vehicles (%)	4%	4%	2%	6%	7%	2%
Turn Type	pm+pt					pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Actuated Green, G (s)		91.7	80.8		16.3	21.2
Effective Green, g (s)		93.7	82.8		18.3	25.2
Actuated g/C Ratio		0.78	0.69		0.15	0.21
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		2.5	2.5		2.5	2.0
Lane Grp Cap (vph)		2710	2431		257	385
v/s Ratio Prot		c0.40	c0.49		c0.10	0.02
v/s Ratio Perm						0.08
v/c Ratio		0.52	0.71		0.65	0.42
Uniform Delay, d1		4.8	11.4		47.9	41.0
Progression Factor		0.10	1.00		1.00	1.00
Incremental Delay, d2		0.5	0.9		5.2	0.3
Delay (s)		1.0	12.3		53.1	41.3
Level of Service		A	B		D	D
Approach Delay (s)		1.0	12.3		47.0	
Approach LOS		A	B		D	

Intersection Summary			
HCM Average Control Delay	11.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	310	150	50	290	15	50
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	344	167	56	322	17	56
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			511		861	428
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			511		861	428
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		95	91
cM capacity (veh/h)			1044		310	629

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	511	378	72
Volume Left	0	56	17
Volume Right	167	0	56
cSH	1700	1044	508
Volume to Capacity	0.30	0.05	0.14
Queue Length 95th (ft)	0	4	12
Control Delay (s)	0.0	1.8	13.3
Lane LOS		A	B
Approach Delay (s)	0.0	1.8	13.3
Approach LOS			B

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2		3.2	3.2	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91		1.00	0.91	
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)	1787	1881	1599	1698	1763	1553	1770	4900		1787	5077	
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)	1787	1881	1599	1698	1763	1553	1770	4900		1787	5077	
Volume (vph)	210	360	135	315	275	180	110	1490	105	340	2230	25
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)	221	379	142	332	289	189	116	1568	111	358	2347	26
RTOR Reduction (vph)	0	0	108	0	0	159	0	7	0	0	1	0
Lane Group Flow (vph)	221	379	34	304	317	30	116	1672	0	358	2372	0
Heavy Vehicles (%)	1%	1%	1%	1%	2%	4%	2%	5%	2%	1%	2%	2%
Turn Type	Split		Perm	Split		Perm	Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8						
Actuated Green, G (s)	11.0	11.0	11.0	17.0	17.0	17.0	10.8	50.2		21.8	61.2	
Effective Green, g (s)	12.8	12.8	12.8	18.8	18.8	18.8	12.1	52.5		23.1	63.5	
Actuated g/C Ratio	0.11	0.11	0.11	0.16	0.16	0.16	0.10	0.44		0.19	0.53	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.5		4.5	5.5	
Vehicle Extension (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	4.7		2.3	4.7	
Lane Grp Cap (vph)	191	201	171	266	276	243	178	2144		344	2687	
v/s Ratio Prot	0.12	c0.20		0.18	c0.18		0.07	c0.34		c0.20	c0.47	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	1.16	1.89	0.20	1.14	1.15	0.12	0.65	0.78		1.04	0.88	
Uniform Delay, d1	53.6	53.6	48.9	50.6	50.6	43.5	51.9	28.8		48.4	25.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.89	0.88	
Incremental Delay, d2	113.8	416.7	0.3	99.3	100.4	0.1	7.0	2.1		44.9	2.4	
Delay (s)	167.4	470.3	49.3	149.9	151.0	43.6	58.9	30.9		88.0	24.4	
Level of Service	F	F	D	F	F	D	E	C		F	C	
Approach Delay (s)		299.5			125.6			32.8			32.8	
Approach LOS		F			F			C			C	

Intersection Summary			
HCM Average Control Delay	77.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	98.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Sensitivity Analysis Worksheets

For Sensitivity Analysis Only

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Hwy 99W/Edy Road

Cycle (sec):	120	Critical Vol./Cap.(X):	1.010
Loss Time (sec):	16	Average Delay (sec/veh):	63.6
Optimal Cycle:	180	Level Of Service:	E

Street Name:	Hwy 99W						Edy Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	2	1 0	1 0	2	1 0	1 0	1	0 1	1 1	0	0 1
Volume Module:												
Base Vol:	111	1470	103	338	2175	40	208	336	147	345	269	169
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	111	1470	103	338	2175	40	208	336	147	345	269	169
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	111	1470	103	338	2175	40	208	336	147	345	269	169
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	117	1547	108	356	2289	42	219	354	155	363	283	178
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	117	1547	108	356	2289	42	219	354	155	363	283	178
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	117	1547	108	356	2289	42	219	354	155	363	283	178
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.94	0.94	0.93	0.98	0.98	0.94	0.99	0.84	0.95	0.95	0.83
Lanes:	1.00	2.80	0.20	1.00	2.95	0.05	1.00	1.00	1.00	1.12	0.88	1.00
Final Sat.:	1718	5020	352	1769	5469	101	1787	1881	1599	2036	1587	1583
Capacity Analysis Module:												
Vol/Sat:	0.07	0.31	0.31	0.20	0.42	0.42	0.12	0.19	0.10	0.18	0.18	0.11
Crit Moves:		****		****				****		****		
Green/Cycle:	0.07	0.31	0.31	0.20	0.43	0.43	0.19	0.19	0.19	0.18	0.18	0.18
Volume/Cap:	0.97	1.01	1.01	1.01	0.97	0.97	0.66	1.01	0.52	1.01	1.01	0.64
Uniform Del:	55.6	41.7	41.7	48.1	33.1	33.1	45.3	48.8	44.0	49.4	49.4	45.8
IncremntDel:	70.7	24.8	24.8	50.6	11.4	11.4	4.8	50.8	1.6	38.2	38.2	4.8
InitQueuDel:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Delay/Veh:	126.4	66.5	66.5	98.7	44.5	44.5	50.1	99.6	45.6	87.6	87.6	50.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	126.4	66.5	66.5	98.7	44.5	44.5	50.1	99.6	45.6	87.6	87.6	50.7
LOS by Move:	F	E	E	F	D	D	D	F	D	F	F	D
HCM2kAvgQ:	7	27	27	19	34	34	8	19	6	17	17	7

For Sensitivity Analysis Only

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Hwy 99W/Edy Road

Cycle (sec):	120	Critical Vol./Cap.(X):	0.998
Loss Time (sec):	16	Average Delay (sec/veh):	62.1
Optimal Cycle:	180	Level Of Service:	E

Street Name:	Hwy 99W						Edy Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	2	1 0	1 0	2	1 0	1 0	1	0 1	1	1 0	0 1
Volume Module:												
Base Vol:	113	1468	102	337	2224	28	213	334	144	310	274	169
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	113	1468	102	337	2224	28	213	334	144	310	274	169
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	113	1468	102	337	2224	28	213	334	144	310	274	169
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	119	1545	107	355	2341	29	224	352	152	326	288	178
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	119	1545	107	355	2341	29	224	352	152	326	288	178
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	119	1545	107	355	2341	29	224	352	152	326	288	178
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.94	0.94	0.93	0.98	0.98	0.94	0.99	0.84	0.95	0.95	0.83
Lanes:	1.00	2.81	0.19	1.00	2.96	0.04	1.00	1.00	1.00	1.06	0.94	1.00
Final Sat.:	1718	5023	349	1769	5506	69	1787	1881	1599	1925	1702	1583
Capacity Analysis Module:												
Vol/Sat:	0.07	0.31	0.31	0.20	0.43	0.43	0.13	0.19	0.09	0.17	0.17	0.11
Crit Moves:		****		****				****		****		
Green/Cycle:	0.07	0.31	0.31	0.20	0.44	0.44	0.19	0.19	0.19	0.17	0.17	0.17
Volume/Cap:	0.97	1.00	1.00	1.00	0.97	0.97	0.67	1.00	0.51	1.00	1.00	0.66
Uniform Del:	55.6	41.5	41.5	47.9	33.0	33.0	45.3	48.7	43.8	49.8	49.8	46.6
IncremntDel:	71.9	21.5	21.5	47.0	12.1	12.1	5.2	47.2	1.4	35.6	35.6	6.0
InitQueuDel:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Delay/Veh:	127.5	63.0	63.0	94.9	45.1	45.1	50.5	96.0	45.2	85.4	85.4	52.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	127.5	63.0	63.0	94.9	45.1	45.1	50.5	96.0	45.2	85.4	85.4	52.6
LOS by Move:	F	E	E	F	D	D	D	F	D	F	F	D
HCM2kAvgQ:	8	27	27	18	34	34	9	18	6	16	16	7

For Sensitivity Analysis Only

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Hwy 99W/Edy Road

Cycle (sec):	120	Critical Vol./Cap.(X):	1.015
Loss Time (sec):	16	Average Delay (sec/veh):	65.1
Optimal Cycle:	180	Level Of Service:	E

Street Name:	Hwy 99W						Edy Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	2	1 0	1 0	2	1 0	1 0	1	0 1	1	1 0	0 1
Volume Module:												
Base Vol:	111	1482	103	339	2224	32	208	350	140	316	274	174
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	111	1482	103	339	2224	32	208	350	140	316	274	174
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	111	1482	103	339	2224	32	208	350	140	316	274	174
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	117	1560	108	357	2341	34	219	368	147	333	288	183
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	117	1560	108	357	2341	34	219	368	147	333	288	183
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	117	1560	108	357	2341	34	219	368	147	333	288	183
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.94	0.94	0.93	0.98	0.98	0.94	0.99	0.84	0.95	0.95	0.83
Lanes:	1.00	2.81	0.19	1.00	2.96	0.04	1.00	1.00	1.00	1.07	0.93	1.00
Final Sat.:	1718	5023	349	1769	5496	79	1787	1881	1599	1943	1684	1583
Capacity Analysis Module:												
Vol/Sat:	0.07	0.31	0.31	0.20	0.43	0.43	0.12	0.20	0.09	0.17	0.17	0.12
Crit Moves:		****		****				****			****	
Green/Cycle:	0.07	0.31	0.31	0.20	0.44	0.44	0.19	0.19	0.19	0.17	0.17	0.17
Volume/Cap:	0.98	1.01	1.01	1.01	0.98	0.98	0.63	1.01	0.48	1.01	1.01	0.69
Uniform Del:	55.7	41.6	41.6	48.1	33.3	33.3	44.5	48.4	43.0	49.9	49.9	46.9
IncremntDel:	75.3	25.9	25.9	51.8	13.5	13.5	3.9	51.0	1.2	40.1	40.1	7.2
InitQueuDel:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Delay/Veh:	131.1	67.5	67.5	99.8	46.9	46.9	48.4	99.4	44.2	90.0	90.0	54.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	131.1	67.5	67.5	99.8	46.9	46.9	48.4	99.4	44.2	90.0	90.0	54.1
LOS by Move:	F	E	E	F	D	D	D	F	D	F	F	D
HCM2kAvgQ:	8	27	27	19	35	35	8	19	5	17	17	8

For Sensitivity Analysis Only

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Hwy 99W/Edy Road

Cycle (sec):	120	Critical Vol./Cap.(X):	1.010
Loss Time (sec):	16	Average Delay (sec/veh):	64.7
Optimal Cycle:	180	Level Of Service:	E

Street Name:	Hwy 99W						Edy Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	0 1	1	1 0	0 1
Volume Module:												
Base Vol:	112	1476	102	338	2229	32	216	347	140	314	274	173
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	112	1476	102	338	2229	32	216	347	140	314	274	173
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	112	1476	102	338	2229	32	216	347	140	314	274	173
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	118	1554	107	356	2346	34	227	365	147	331	288	182
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	118	1554	107	356	2346	34	227	365	147	331	288	182
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	118	1554	107	356	2346	34	227	365	147	331	288	182
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.94	0.94	0.93	0.98	0.98	0.94	0.99	0.84	0.95	0.95	0.83
Lanes:	1.00	2.81	0.19	1.00	2.96	0.04	1.00	1.00	1.00	1.07	0.93	1.00
Final Sat.:	1718	5025	347	1769	5496	79	1787	1881	1599	1937	1690	1583
Capacity Analysis Module:												
Vol/Sat:	0.07	0.31	0.31	0.20	0.43	0.43	0.13	0.19	0.09	0.17	0.17	0.12
Crit Moves:		****		****				****		****		
Green/Cycle:	0.07	0.31	0.31	0.20	0.44	0.44	0.19	0.19	0.19	0.17	0.17	0.17
Volume/Cap:	0.98	1.01	1.01	1.01	0.98	0.98	0.66	1.01	0.48	1.01	1.01	0.68
Uniform Del:	55.7	41.6	41.6	48.0	33.4	33.4	44.8	48.5	43.1	49.9	49.9	46.8
IncremntDel:	75.7	24.6	24.6	50.4	14.0	14.0	4.8	49.8	1.2	38.8	38.8	7.0
InitQueuDel:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Delay/Veh:	131.4	66.2	66.2	98.5	47.3	47.3	49.6	98.3	44.3	88.7	88.7	53.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	131.4	66.2	66.2	98.5	47.3	47.3	49.6	98.3	44.3	88.7	88.7	53.8
LOS by Move:	F	E	E	F	D	D	D	F	D	F	F	D
HCM2kAvgQ:	8	27	27	19	35	35	9	19	5	17	17	8

For Sensitivity Analysis Only

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Hwy 99W/Edy Road

Cycle (sec):	120	Critical Vol./Cap.(X):	1.025
Loss Time (sec):	16	Average Delay (sec/veh):	67.4
Optimal Cycle:	180	Level Of Service:	E

Street Name:	Hwy 99W						Edy Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	0 1	1	1 0	0 1
Volume Module:												
Base Vol:	111	1489	103	340	2228	26	208	362	137	317	275	181
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	111	1489	103	340	2228	26	208	362	137	317	275	181
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	111	1489	103	340	2228	26	208	362	137	317	275	181
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	117	1567	108	358	2345	27	219	381	144	334	289	191
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	117	1567	108	358	2345	27	219	381	144	334	289	191
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	117	1567	108	358	2345	27	219	381	144	334	289	191
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.94	0.94	0.93	0.98	0.98	0.94	0.99	0.84	0.95	0.95	0.83
Lanes:	1.00	2.81	0.19	1.00	2.97	0.03	1.00	1.00	1.00	1.07	0.93	1.00
Final Sat.:	1718	5025	348	1769	5511	64	1787	1881	1599	1942	1685	1583
Capacity Analysis Module:												
Vol/Sat:	0.07	0.31	0.31	0.20	0.43	0.43	0.12	0.20	0.09	0.17	0.17	0.12
Crit Moves:		****		****				****			****	
Green/Cycle:	0.07	0.30	0.30	0.20	0.43	0.43	0.20	0.20	0.20	0.17	0.17	0.17
Volume/Cap:	0.98	1.03	1.03	1.03	0.98	0.98	0.62	1.03	0.46	1.03	1.03	0.72
Uniform Del:	55.8	41.7	41.7	48.2	33.6	33.6	44.0	48.1	42.5	49.9	49.9	47.3
IncremntDel:	77.4	29.0	29.0	54.8	14.7	14.7	3.4	53.3	1.0	43.1	43.1	9.1
InitQueuDel:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Delay/Veh:	133.2	70.7	70.7	103.0	48.4	48.4	47.4	101	43.5	93.1	93.1	56.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	133.2	70.7	70.7	103.0	48.4	48.4	47.4	101	43.5	93.1	93.1	56.4
LOS by Move:	F	E	E	F	D	D	D	F	D	F	F	E
HCM2kAvgQ:	8	28	28	19	35	35	8	20	5	17	17	8

TECHNICAL MEMORANDUM

TO: Ben Austin, P.E., Harper Houf Peterson Righellis

FROM: Chris Maciejewski, P.E.
France Campbell, E.I.T.

DATE: May 18, 2009

SUBJECT: **Sherwood Adams Avenue North Concept Plan**
Transportation Tech Memo #3: Preferred Concept Alternative Analysis

P08232-000

The purpose of this memorandum is to review the transportation performance of the preferred land use alternative created for the Sherwood Adams Avenue North Concept Plan. The first two sections of this memorandum discuss compliance of the Preferred Alternative with City functional classification and access spacing standards. The final three sections discuss the traffic impacts of the Preferred Alternative, including land use and trip generation, study area operations analysis, and recommended mitigation measures. The traffic impact analysis for the preferred land use addresses long term issues (to address TPR[1] requirements) utilizing a forecast year of 2030.

Functional Classification

Highway 99W is classified as a statewide highway in the Oregon Highway Plan[2] and a principle arterial in the City of Sherwood Transportation Plan (TSP)[3]. The City's TSP identifies Tualatin-Sherwood Road, Sherwood Boulevard, and Oregon Street as arterials and Edy Road, Gerda Lane, and Adams Avenue as collectors. The proposed Adams Avenue North Extension is classified as a collector in the Preferred Concept Plan Alternative, which is consistent with the City's adopted TSP.

Access Spacing Review

The functional classification establishes the access spacing standards for transportation facilities. Along the proposed Adams Avenue North extension, a collector roadway, access spacing should be a minimum of 100 feet and a maximum of 400 feet[3]. In addition, access should be limited within the influence area of other intersections (i.e., not allowing full access near Tualatin-Sherwood Road or Highway 99W where vehicle queues would block the access). In the Preferred Alternative, access along Adams Avenue can be designed to meet the minimum

[1] Transportation Planning Rule, Oregon DLCD, http://www.oregon.gov/ODOT/TD/TP/TPR.shtml
[2] *1999 Oregon Highway Plan*, Oregon Department of Transportation, January 2006.
[3] *City of Sherwood Transportation System Plan*, Prepared by DKS Associates, March 2005.

spacing standard. Maximum spacing standards may not be met along the PGE substation and the UGB boundary, where land would not develop and access is not needed.

Land Use and Trip Generation

The land use for the Alternative 1 and the Preferred Alternative were evaluated to determine the traffic impacts for the plan area. The Concept Plan development areas are displayed in Figure 1 and the corresponding land use assumptions for the Preferred Alternative are shown in Tables 1 and 2. The BPA/PGE transmission easement and the PGE facility were assumed to be used as a public facility, open space or parking to support the developable areas with no potential for generating significant additional future motor vehicle traffic. Alternative 1 assumes that the land within the study area fully develops according to the existing zoning. A portion of the Concept Plan area east of the proposed Adams Avenue North extension (Area C in Figure 1) is currently outside of the City limit and is zoned for rural density. Therefore, Alternative 1 did not include development in the portion of the Concept Plan area outside of the City limits. The total new PM peak hour trips generated by the Preferred Concept Plan Alternative are approximately 300 trips.

To determine the impact of rezoning the study area, the amount of motor vehicle traffic generated by Alternative 1 and the Preferred Alternative was determined. Trip generation was estimated based on rates provided by the Institute of Transportation Engineers[4] (ITE) for similar land use types (e.g. light industrial, restaurants, retail uses, and office uses). Table 2 lists the estimated PM peak hour trips for Alternative 1 and the Preferred Alternative. Pass-by trips[5] are also listed in Table 2 and the total new trips account for the estimated pass-by trips. The total number of new trips was used to verify that the City's 43 trips per net developable acre CAP[6] was not exceeded in any of the Concept Plan development areas shown in Figure 1 for the alternatives. Any locations exceeding the City's trip CAP were scaled down to conformance.

[4] *Trip Generation Manual, 8th Edition,* Institute of Transportation Engineers, 2008.
[5] *Trip Generation Handbook, 2nd Edition*, Institute of Transportation Engineers, 2004.
[6] City of Sherwood Municipal Code Chapter 16.108.070 (CAP), Section D4.

Figure 1: Adams Avenue North Concept Plan Developable Areas

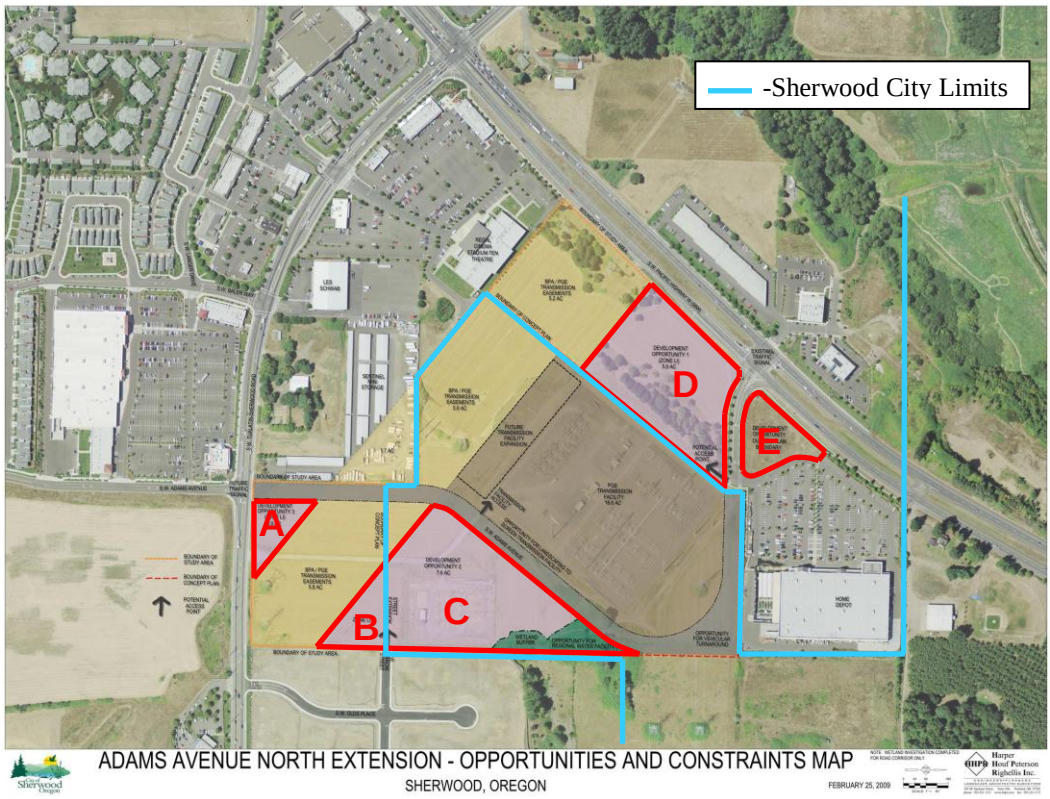


Table 1: Alternatives Land Use Scenarios

	Concept Area (See Figure 1)				
Alternative	**A**	**B**	**C**	**D**	**E**
1	LI	LI	R	LI	LI
Preferred	GC*	LI	LI	OC	OC

* Area developed was limited by City's 43 trips per acre CAP
GC – General Commercial
LI – Light Industrial
OC – Office Commercial
R – Rural

Table 2: Motor Vehicle Trip Generation Comparison – PM Peak Hour

Scenario / Land Use (ITE Code)	Acres	KSF*	PM Trips In	PM Trips Out	PM Trips Total
Alternative 1					
Light Industrial (710)	9.4	102.4	26	111	153
Total New Trips			26	111	153
Preferred Alternative					
General Commercial (934)	0.9	2.3**	40	36	76
Light Industrial (710)	7.6	82.8	21	102	123
Office Commercial (710, 934)	7.4	80.6	58	120	178
Pass-by Trips			40	32	72
Total New Trips			79	226	305

*KSF – Building area, thousand square feet
** Area developed was limited by City's 43 trips per acre CAP

Operations Analysis

The following sections describe the future forecasting and operations analysis completed for the Adams Avenue North Concept Plan. The future conditions evaluation includes future forecasting, identification of funded study area improvements, and motor vehicle intersection capacity analysis.

Future Forecasting

Future travel demand forecasting for the Adams Avenue North study area utilized the latest 2030 VISUM travel demand model developed by Metro, Washington County, and DKS Associates for the I-5 to 99W Connector Study. As part of the model development for the I-5 to 99W Connector Study, the Sherwood TSP travel demand model zone structure and network detail was used as a guideline to refine the regional model. In addition, a detailed focus model was created for the Adams Avenue North Concept Plan study area, which incorporates the use of *HCM 2000 Methodology* for turn delays (instead of the regional model macroscopic delay functions).

Future 2030 PM peak hour volumes at study intersections were developed for Adams Avenue North Concept Plan land use scenario by adjusting the travel demand model trip tables to reflect the trip rates listed in Table 2. These volumes were then used to analyze and determine future impacts from the proposed Adams Avenue North area on the planned roadway network. The future 2030 PM peak hour scenarios include:

- Alternative 1 - 2030 development according to the existing zoning in the Adams Avenue North area
- Preferred Alternative - 2030 with Adams Avenue North Concept Plan

Planned Study Area Roadway Improvements
Assumed transportation improvements in the study area were limited to Metro 2035 Regional Transportation Plan (RTP)[7] financially constrained roadway improvements and the extension of Adams Avenue to the north. Other capacity improvement projects in Metro's RTP or other plans without committed funding were not included in any of the future analysis scenarios in order to meet OAR 660-012-060 requirements. The planned roadway improvements include:

- Signalization of Tualatin-Sherwood Road/Adams Avenue
- Widening of Tualatin-Sherwood Road and Roy Rogers Road to 5-lanes from Teton Avenue to west of Highway 99W (tapers to three lanes east of Borchers Drive)
- Completion of the Adams Avenue South Extension from Oregon Street to Century Drive
- Intersection geometric, turn lane, and signal phasing improvements at Highway 99W/Tualatin-Sherwood Road
- Completion of the 124th Avenue extension from Tualatin-Sherwood Road to Tonquin Road
- Widening of Tonquin Road to 3-lanes
- Signalization of Tualatin-Sherwood Road/Gerda Lane

Conversion of Tualatin-Sherwood Road/Baler Way to right-in/right-out and signal removal is an identified Metro 2035 RTP financially constrained improvement as was included in the prior alternatives analysis, but based on coordination with Washington County the likelihood of removing the signal is uncertain and as part of Adams Avenue improvements and is therefore not appropriate for inclusion in this analysis.

In addition, the operations analysis found that turn lane improvements would be required under any scenario (including 2030 Alternative 1 Baseline Conditions) at Highway 99W/Adams Avenue. Therefore, construction of a westbound left-turn lane from Adams Avenue westbound to Highway 99W southbound is required, which is added to the existing shared westbound left-thru lane and right turn pocket. The signal phasing in the future conditions assumes split phasing for Adams Avenue, which is consistent with the existing conditions.

Capacity Analysis
In order to provide a baseline comparison to the future Adams Avenue North Concept Plan Preferred Alternative, the 2030 Alternative 1 scenario evaluates future traffic volumes assuming the planned roadway geometry and full development of the Adams Avenue North Concept Plan area under existing zoning. The Preferred Concept Plan Alternative was then evaluated to determine impacts to the study area. Intersections that do not meet performance standards must be mitigated to the level of performance (per Oregon's Transportation Planning Rule (TPR)) that would occur under development of the area with existing zoning (Alternative 1) or that would meet mobility standards, whichever is higher.

The maximum v/c ratio specified by Washington County is 0.99 for signalized intersections.[8] The minimum operational standard for unsignalized intersections specified by Washington

[7] Metro 2035 Regional Transportation Plan, http://www.oregonmetro.gov/index.cfm/go/by.web/id=25037.
[8] Washington County 2020 Transportation Plan, Adopted October 29, 2002, Table 5.

County is LOS E. In the case of Highway 99W, ODOT operating performance standards for the study area is a v/c ratio of 0.99 for intersections not in a Town Center and 1.1 for those that are located within a Town Center.[9] The intersection of Highway 99W/Tualatin-Sherwood Road and Highway 99W/Edy Road-Sherwood Boulevard are within the Town Center designation.[10] Based on recent conversations and meetings, ODOT has decided to not acknowledge the Town Center limits without the City completing a Town Center Plan. The City and Metro contend that this is inconsistent with past practices and the Sherwood Town Center boundaries have been part of the adopted Functional Plan and used for local needs and regional modeling efforts since 2000. However, ODOT intends to use a maximum v/c ratio of 0.99 for all of Highway 99W through Sherwood.

As listed in Table 3, with the addition of land development in the Adams Avenue North Concept Plan, all study intersections except for the Highway 99W/Edy Road-Sherwood Blvd intersection meet ODOT/County standards in Alternative 1 and the Preferred Concept Plan Alternative. If the Town Center v/c ratio standard of 1.1 is used, all intersections in the preferred alternative meet ODOT/County standards.

Mitigation Measures

While the City continues to disagree with ODOT's current interpretation that only an adopted Town Center Plan is considered a Town Center, in order to demonstrate compliance, analysis of potential mitigation was done relative to a 0.99 v/c ratio standard. With the addition of land development in the Adams Avenue North Concept Plan Preferred Alternative, only the Highway 99W/Edy Road-Sherwood Blvd study intersection will not meet the ODOT 0.99 v/c ratio standard in the alternatives. Therefore, off-site transportation mitigations could be required at Highway 99W/Edy Road-Sherwood Blvd to offset the impacts of the Adams Avenue North Concept Plan for TPR compliance.

To determine if mitigations are required for the Preferred Alternative, the software TRAFFIX (which provides v/c ratios to the nearest 0.001) was used to determine the increase in the v/c ratio from Alternative 1 (reasonable worst-case of existing zoning) for the Preferred Alternative, as a change in v/c of less than 0.01 may not require mitigation. The analysis found that the v/c ratio changed by 0.014, which indicates mitigation would be required.

To offset the impacts of the Adams Avenue North Concept Plan at Highway 99W/Edy Road-Sherwood Blvd, an improvement such as a north-eastbound right-turn lane along Highway 99W is adequate for the Preferred Alternative (including signal, signing, and striping modifications). While the construction of the right-turn lane would provide adequate capacity mitigation, the City should consider completing a study at the intersection to determine the ultimate geometry/configuration and funding mechanisms before conditioning specific improvements that may not be compatible with or proportional to build-out of the intersection.

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[9] 1999 Oregon Highway Plan, Amendment to Table 7, December 13, 2000.
[10] This is according to the Metro Regional and Town Center Map.
(http://www.oregonmetro.gov/index.cfm/go/by.web/id=15467&x=7599901&y=629257&locID=27)

Table 3: 2030 PM Peak Hour Intersection Performance

			Intersection Performance (Delay LOS V/C)	
Intersection	**Agency**	**Standard**	**Alternative 1**	**Preferred Alternative**
Signalized Intersections				
Highway 99W/Adams Ave	ODOT	v/c ≤ 0.99	42.1 D 0.91	44.1 D 0.92
Highway 99W/Tualatin-Sherwood Rd	ODOT	v/c ≤ 0.99	63.1 E 0.98	63.8 E 0.98
Highway 99W/Edy Road-Sherwood Blvd	ODOT	v/c ≤ 0.99	74.9 E **1.07**	79.4 E **1.09**
Tualatin-Sherwood Rd/Shopping Center	County	v/c ≤ 0.99	17.1 B 0.73	22.2 C 0.72
Tualatin-Sherwood Rd/Baler Wy	County	LOS E	12.4 B 0.67	11.4 B 0.67
Tualatin-Sherwood Rd/Adams Ave	County	v/c ≤ 0.99	30.6 C 0.85	31.3 C 0.86
Tualatin-Sherwood Rd/Gerda Ln	County	v/c ≤ 0.99	8.7 A 0.62	8.5 A 0.63
Tualatin-Sherwood Rd/Oregon St	County	v/c ≤ 0.99	22.1 C 0.90	21.8 C 0.90

Change in V/C at Highway 99W/Edy Road-Sherwood Blvd compared to Alternative 1:

Preferred Alternative: +0.014

Signalized intersection:

HCM Delay = Average Intersection Delay (sec.)
LOS = Level of Service
V/C = Volume-to-Capacity Ratio

Note: The performance listed for the intersection of Highway 99W/Edy Road-Sherwood Blvd in Alternative 1 has changed from the value reported in Technical Memorandum #2 (Alternatives Analysis), which reported a v/c ratio of 1.06. The revised v/c ratio of 1.07 reflects the update to the analysis that maintains the existing signal at the intersection of Tualatin-Sherwood Road/Baler Way.

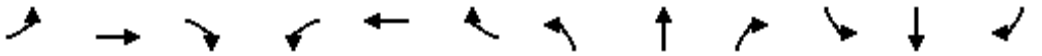
Appendix

- **2030 Intersection Operational Analysis Worksheets**
  - **Alternative 1**
  - **Preferred Alternative**
- **Sensitivity Analysis Worksheets**

Alternative 1

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)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	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	
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1626		1681	1646	1568	1805	3438	1583	1719	3534	
Flt Permitted	0.95	1.00		0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1805	1626		1681	1646	1568	1805	3438	1583	1719	3534	
Volume (vph)	25	5	35	205	5	75	30	1280	100	100	2275	20
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	26	5	36	209	5	77	31	1306	102	102	2321	20
RTOR Reduction (vph)	0	34	0	0	0	55	0	0	36	0	0	0
Lane Group Flow (vph)	26	7	0	125	89	22	31	1306	66	102	2341	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	0%	2%	50%	3%	0%	5%	2%	5%	2%	0%
Turn Type	Split			Split		pm+ov	Prot		pm+ov	Prot		
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	5.8	5.8		13.5	13.5	32.0	4.6	59.7	73.2	18.5	73.6	
Effective Green, g (s)	7.8	7.8		15.5	15.5	34.5	5.1	61.7	77.2	19.0	75.6	
Actuated g/C Ratio	0.06	0.06		0.13	0.13	0.29	0.04	0.51	0.64	0.16	0.63	
Clearance Time (s)	6.0	6.0		6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.3	2.3	4.8	2.5	2.3	4.8	
Lane Grp Cap (vph)	117	106		217	213	451	77	1768	1071	272	2226	
v/s Ratio Prot	c0.01	0.00		c0.07	0.05	0.01	0.02	c0.38	0.01	0.06	c0.66	
v/s Ratio Perm						0.01			0.03			
v/c Ratio	0.22	0.07		0.58	0.42	0.05	0.40	0.74	0.06	0.38	1.05	
Uniform Delay, d1	53.2	52.7		49.2	48.1	30.9	56.0	22.8	7.9	45.2	22.2	
Progression Factor	1.00	1.00		1.14	1.14	1.71	0.74	0.57	0.01	1.00	1.00	
Incremental Delay, d2	0.7	0.2		2.9	0.9	0.0	1.6	2.3	0.0	0.5	34.3	
Delay (s)	53.9	52.9		58.9	55.9	52.7	43.0	15.4	0.1	45.7	56.5	
Level of Service	D	D		E	E	D	D	B	A	D	E	
Approach Delay (s)		53.3			56.4			14.9			56.1	
Approach LOS		D			E			B			E	

Intersection Summary			
HCM Average Control Delay	42.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.3%	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)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	*0.75	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	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	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)	3400	4988	1524	3303	5085	1583	3502	2767	1507	3127	3374	1553
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)	3400	4988	1524	3303	5085	1583	3502	2767	1507	3127	3374	1553
Volume (vph)	195	940	425	320	1755	460	585	990	240	255	700	205
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	199	959	434	327	1791	469	597	1010	245	260	714	209
RTOR Reduction (vph)	0	0	175	0	0	116	0	0	90	0	0	152
Lane Group Flow (vph)	199	959	259	327	1791	353	597	1010	155	260	714	57
Confl. Peds. (#/hr)									3	3		
Heavy Vehicles (%)	3%	4%	6%	6%	2%	2%	0%	3%	4%	12%	7%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.1	42.9	42.9	15.7	47.5	47.5	19.4	32.0	32.0	9.4	22.0	22.0
Effective Green, g (s)	11.6	44.4	44.4	16.2	49.0	49.0	20.4	33.0	33.0	10.4	23.0	23.0
Actuated g/C Ratio	0.10	0.37	0.37	0.13	0.41	0.41	0.17	0.28	0.28	0.09	0.19	0.19
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.3	4.7	4.7	2.3	4.7	4.7	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	329	1846	564	446	2076	646	595	761	414	271	647	298
v/s Ratio Prot	0.06	c0.19		0.10	c0.35		c0.17	c0.37		0.08	0.21	
v/s Ratio Perm			0.17			0.22			0.10			0.04
v/c Ratio	0.60	0.52	0.46	0.73	0.86	0.55	1.00	1.33	0.37	0.96	1.10	0.19
Uniform Delay, d1	52.0	29.5	28.7	49.8	32.4	27.0	49.8	43.5	35.2	54.6	48.5	40.7
Progression Factor	0.80	0.59	1.01	0.95	0.58	0.38	0.75	0.87	0.92	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.3	0.7	1.8	1.7	1.1	30.8	153.3	0.2	42.9	67.2	0.2
Delay (s)	43.2	17.7	29.5	49.2	20.5	11.4	68.1	191.4	32.6	97.5	115.7	40.9
Level of Service	D	B	C	D	C	B	E	F	C	F	F	D
Approach Delay (s)		24.1			22.4			130.6			98.5	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM Average Control Delay	63.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.8%	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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.89		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	3251		1805	3484		1805	1654		1805	1900	1481
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	3251		1805	3484		1805	1654		1805	1900	1481
Volume (vph)	70	1110	255	75	1600	65	125	25	60	50	35	85
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	71	1133	260	77	1633	66	128	26	61	51	36	87
RTOR Reduction (vph)	0	14	0	0	2	0	0	55	0	0	0	82
Lane Group Flow (vph)	71	1379	0	77	1697	0	128	32	0	51	36	5
Confl. Peds. (#/hr)			4	4			27					27
Heavy Vehicles (%)	0%	8%	4%	0%	3%	3%	0%	0%	4%	0%	0%	2%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	6.5	72.2		8.0	73.4		9.7	10.6		5.3	5.8	5.8
Effective Green, g (s)	8.8	74.1		10.0	75.3		12.4	12.3		7.6	7.5	7.5
Actuated g/C Ratio	0.07	0.62		0.08	0.63		0.10	0.10		0.06	0.06	0.06
Clearance Time (s)	6.3	5.9		6.0	5.9		6.7	5.7		6.3	5.7	5.7
Vehicle Extension (s)	2.7	3.2		2.7	3.2		2.6	1.8		2.7	1.8	1.8
Lane Grp Cap (vph)	257	2007		150	2186		187	170		114	119	93
v/s Ratio Prot	0.02	c0.42		0.04	c0.49		c0.07	0.02		0.03	c0.02	
v/s Ratio Perm												0.00
v/c Ratio	0.28	0.69		0.51	0.78		0.68	0.19		0.45	0.30	0.06
Uniform Delay, d1	52.6	15.2		52.7	16.2		51.9	49.3		54.2	53.8	52.9
Progression Factor	0.91	0.66		0.80	0.53		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.9		1.9	2.1		9.3	0.2		2.3	0.5	0.1
Delay (s)	48.2	11.0		44.1	10.8		61.2	49.5		56.5	54.3	53.0
Level of Service	D	B		D	B		E	D		E	D	D
Approach Delay (s)		12.8			12.2			56.4			54.3	
Approach LOS		B			B			E			D	

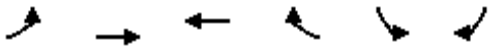
Intersection Summary			
HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	0.99	1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85	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)	1805	3320		1752	3502			1709	1558	1790	1745	
Flt Permitted	0.95	1.00		0.95	1.00			0.72	1.00	0.41	1.00	
Satd. Flow (perm)	1805	3320		1752	3502			1298	1558	770	1745	
Volume (vph)	10	1090	135	80	1550	10	190	5	160	10	5	5
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	10	1112	138	82	1582	10	194	5	163	10	5	5
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	132	0	4	0
Lane Group Flow (vph)	10	1244	0	82	1592	0	0	199	31	10	6	0
Confl. Peds. (#/hr)	1		4	4		1	1		7	7		1
Heavy Vehicles (%)	0%	7%	3%	3%	3%	0%	6%	0%	1%	0%	0%	0%
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	1.4	72.9		12.3	83.8			22.8	22.8	22.8	22.8	
Effective Green, g (s)	1.4	72.9		12.3	83.8			22.8	22.8	22.8	22.8	
Actuated g/C Ratio	0.01	0.61		0.10	0.70			0.19	0.19	0.19	0.19	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	21	2017		180	2446			247	296	146	332	
v/s Ratio Prot	0.01	0.37		c0.05	c0.45						0.00	
v/s Ratio Perm								c0.15	0.02	0.01		
v/c Ratio	0.48	0.62		0.46	0.65			0.81	0.10	0.07	0.02	
Uniform Delay, d1	58.9	14.8		50.7	10.0			46.5	40.2	39.9	39.5	
Progression Factor	0.93	0.23		0.84	0.63			1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.5	1.1		1.1	0.8			17.2	0.2	0.2	0.0	
Delay (s)	67.2	4.5		43.7	7.1			63.7	40.3	40.1	39.5	
Level of Service	E	A		D	A			E	D	D	D	
Approach Delay (s)		5.0			8.9			53.1			39.8	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	12.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	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		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.86		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3412		1805	3489		1805	1603		1805	1886	
Flt Permitted	0.12	1.00		0.07	1.00		0.00	1.00		0.00	1.00	
Satd. Flow (perm)	222	3412		134	3489		0	1603		0	1886	
Volume (vph)	5	1065	190	235	1270	130	360	10	235	105	95	5
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	5	1087	194	240	1296	133	367	10	240	107	97	5
RTOR Reduction (vph)	0	11	0	0	5	0	0	163	0	0	2	0
Lane Group Flow (vph)	5	1270	0	240	1424	0	367	87	0	107	100	0
Confl. Peds. (#/hr)	2					2			1	1		
Heavy Vehicles (%)	0%	4%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	52.1	50.9		72.3	65.1		21.4	8.8		20.9	8.3	
Effective Green, g (s)	56.1	52.9		74.3	67.1		23.4	10.8		22.9	10.3	
Actuated g/C Ratio	0.47	0.44		0.62	0.56		0.19	0.09		0.19	0.09	
Clearance Time (s)	6.0	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	
Lane Grp Cap (vph)	146	1504		325	1951		352	144		344	162	
v/s Ratio Prot	0.00	c0.37		c0.11	0.41		c0.20	0.05		0.06	c0.05	
v/s Ratio Perm	0.02			0.35								
v/c Ratio	0.03	0.84		0.74	0.73		1.04	0.60		0.31	0.62	
Uniform Delay, d1	18.7	29.9		32.8	19.7		48.3	52.5		41.8	53.0	
Progression Factor	0.56	0.42		1.33	0.50		1.00	1.00		0.81	0.82	
Incremental Delay, d2	0.1	3.8		7.2	1.2		59.5	17.4		0.5	16.1	
Delay (s)	10.6	16.4		50.9	11.0		107.8	70.0		34.2	59.7	
Level of Service	B	B		D	B		F	E		C	E	
Approach Delay (s)		16.4			16.7			92.5			46.6	
Approach LOS		B			B			F			D	

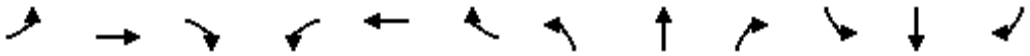
Intersection Summary			
HCM Average Control Delay	30.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1517	3406	3535		1787	1583
Flt Permitted	0.12	1.00	1.00		0.95	1.00
Satd. Flow (perm)	193	3406	3535		1787	1583
Volume (vph)	35	1360	1475	5	195	135
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	36	1388	1505	5	199	138
RTOR Reduction (vph)	0	0	0	0	0	117
Lane Group Flow (vph)	36	1388	1510	0	199	21
Heavy Vehicles (%)	19%	6%	2%	20%	1%	2%
Turn Type	pm+pt					Perm
Protected Phases	7	4	8		6	
Permitted Phases	4					6
Actuated Green, G (s)	94.0	94.0	86.1		18.0	18.0
Effective Green, g (s)	94.0	94.0	86.1		18.0	18.0
Actuated g/C Ratio	0.78	0.78	0.72		0.15	0.15
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	194	2668	2536		268	237
v/s Ratio Prot	0.01	c0.41	c0.43		c0.11	
v/s Ratio Perm	0.14					0.01
v/c Ratio	0.19	0.52	0.60		0.74	0.09
Uniform Delay, d1	6.3	4.8	8.4		48.8	43.9
Progression Factor	1.88	0.54	0.41		1.00	1.00
Incremental Delay, d2	0.2	0.1	0.9		10.6	0.2
Delay (s)	12.1	2.7	4.3		59.4	44.1
Level of Service	B	A	A		E	D
Approach Delay (s)		2.9	4.3		53.1	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	8.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3471	1568	1770	3539			1752	1538	1805	1710	
Flt Permitted	0.95	1.00	1.00	0.08	1.00			0.75	1.00	0.40	1.00	
Satd. Flow (perm)	1805	3471	1568	153	3539			1379	1538	766	1710	
Volume (vph)	5	1145	445	530	1275	0	180	0	205	25	5	10
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	5	1168	454	541	1301	0	184	0	209	26	5	10
RTOR Reduction (vph)	0	0	106	0	0	0	0	0	9	0	8	0
Lane Group Flow (vph)	5	1168	348	541	1301	0	0	184	200	26	7	0
Heavy Vehicles (%)	0%	4%	3%	2%	2%	0%	3%	0%	5%	0%	0%	0%
Turn Type	Prot		Perm	pm+pt			Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases			2	6			8		8	4		
Actuated Green, G (s)	1.0	52.4	52.4	83.1	83.1			17.9	49.6	17.9	17.9	
Effective Green, g (s)	3.0	54.4	54.4	85.1	85.1			19.9	53.6	19.9	19.9	
Actuated g/C Ratio	0.02	0.45	0.45	0.71	0.71			0.17	0.45	0.17	0.17	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	1.0	2.5	2.5	1.0	2.5			1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	45	1574	711	563	2510			229	738	127	284	
v/s Ratio Prot	0.00	c0.34		c0.27	0.37				0.08		0.00	
v/s Ratio Perm			0.22	c0.41				c0.13	0.05	0.03		
v/c Ratio	0.11	0.74	0.49	0.96	0.52			0.80	0.27	0.20	0.02	
Uniform Delay, d1	57.2	27.0	23.0	35.2	8.0			48.2	20.9	43.2	41.9	
Progression Factor	0.95	0.80	0.81	0.77	0.40			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	1.6	0.3	23.0	0.6			17.2	0.1	0.3	0.0	
Delay (s)	54.9	23.2	19.0	50.3	3.7			65.4	21.0	43.5	41.9	
Level of Service	D	C	B	D	A			E	C	D	D	
Approach Delay (s)		22.2			17.4			41.8			42.9	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	22.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2		3.2	3.2	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91		1.00	0.91	
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	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1881	1599	1698	1760	1553	1770	4900		1787	5072	
Flt Permitted	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1881	1599	1698	1760	1553	1770	4900		1787	5072	
Volume (vph)	210	335	145	345	270	170	110	1470	105	340	2175	40
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)	221	353	153	363	284	179	116	1547	111	358	2289	42
RTOR Reduction (vph)	0	0	125	0	0	151	0	7	0	0	1	0
Lane Group Flow (vph)	221	353	28	317	330	28	116	1651	0	358	2330	0
Heavy Vehicles (%)	1%	1%	1%	1%	2%	4%	2%	5%	2%	1%	2%	2%
Turn Type	Split		Perm	Split		Perm	Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8						
Actuated Green, G (s)	11.0	11.0	11.0	17.0	17.0	17.0	10.8	49.8		22.2	61.2	
Effective Green, g (s)	12.8	12.8	12.8	18.8	18.8	18.8	12.1	52.1		23.5	63.5	
Actuated g/C Ratio	0.11	0.11	0.11	0.16	0.16	0.16	0.10	0.43		0.20	0.53	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.5		4.5	5.5	
Vehicle Extension (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	4.7		2.3	4.7	
Lane Grp Cap (vph)	191	201	171	266	276	243	178	2127		350	2684	
v/s Ratio Prot	0.12	c0.19		0.19	c0.19		0.07	c0.34		c0.20	c0.46	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	1.16	1.76	0.16	1.19	1.20	0.12	0.65	0.78		1.02	0.87	
Uniform Delay, d1	53.6	53.6	48.7	50.6	50.6	43.5	51.9	29.0		48.2	24.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.88	0.87	
Incremental Delay, d2	113.8	360.0	0.3	117.2	117.8	0.1	7.0	2.1		40.8	2.2	
Delay (s)	167.4	413.6	49.0	167.8	168.4	43.6	58.9	31.1		83.1	23.7	
Level of Service	F	F	D	F	F	D	E	C		F	C	
Approach Delay (s)		262.0			141.1			32.9			31.6	
Approach LOS		F			F			C			C	

Intersection Summary			
HCM Average Control Delay	74.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	97.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

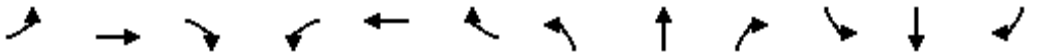
Preferred Alternative

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)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	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	
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1626		1681	1648	1568	1805	3438	1583	1719	3535	
Flt Permitted	0.95	1.00		0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1805	1626		1681	1648	1568	1805	3438	1583	1719	3535	
Volume (vph)	25	5	35	215	5	85	30	1290	105	100	2290	20
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	26	5	36	219	5	87	31	1316	107	102	2337	20
RTOR Reduction (vph)	0	34	0	0	0	62	0	0	38	0	0	0
Lane Group Flow (vph)	26	7	0	130	94	25	31	1316	69	102	2357	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	0%	2%	50%	3%	0%	5%	2%	5%	2%	0%
Turn Type	Split			Split		pm+ov	Prot		pm+ov	Prot		
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	5.8	5.8		13.8	13.8	32.2	4.6	59.5	73.3	18.4	73.3	
Effective Green, g (s)	7.8	7.8		15.8	15.8	34.7	5.1	61.5	77.3	18.9	75.3	
Actuated g/C Ratio	0.06	0.06		0.13	0.13	0.29	0.04	0.51	0.64	0.16	0.63	
Clearance Time (s)	6.0	6.0		6.0	6.0	4.5	4.5	6.0	6.0	4.5	6.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.3	2.3	4.8	2.5	2.3	4.8	
Lane Grp Cap (vph)	117	106		221	217	453	77	1762	1072	271	2218	
v/s Ratio Prot	c0.01	0.00		c0.08	0.06	0.01	0.02	c0.38	0.01	0.06	c0.67	
v/s Ratio Perm						0.01			0.04			
v/c Ratio	0.22	0.07		0.59	0.43	0.06	0.40	0.75	0.06	0.38	1.06	
Uniform Delay, d1	53.2	52.7		49.0	48.0	30.8	56.0	23.1	7.9	45.3	22.4	
Progression Factor	1.00	1.00		1.07	1.07	1.28	0.70	0.60	0.00	1.00	1.00	
Incremental Delay, d2	0.7	0.2		3.1	1.0	0.0	1.6	2.4	0.0	0.5	38.3	
Delay (s)	53.9	52.9		55.5	52.3	39.5	40.9	16.2	0.0	45.8	60.6	
Level of Service	D	D		E	D	D	D	B	A	D	E	
Approach Delay (s)		53.3			50.1			15.5			60.0	
Approach LOS		D			D			B			E	

Intersection Summary			
HCM Average Control Delay	44.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.0%	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)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	*0.75	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	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	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)	3400	4988	1524	3303	5085	1583	3502	2767	1507	3127	3374	1553
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)	3400	4988	1524	3303	5085	1583	3502	2767	1507	3127	3374	1553
Volume (vph)	195	950	425	325	1775	470	590	1000	240	260	705	195
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	199	969	434	332	1811	480	602	1020	245	265	719	199
RTOR Reduction (vph)	0	0	173	0	0	116	0	0	88	0	0	152
Lane Group Flow (vph)	199	969	261	332	1811	364	602	1020	157	265	719	47
Confl. Peds. (#/hr)									3	3		
Heavy Vehicles (%)	3%	4%	6%	6%	2%	2%	0%	3%	4%	12%	7%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.1	42.9	42.9	15.8	47.6	47.6	19.3	32.0	32.0	9.3	22.0	22.0
Effective Green, g (s)	11.6	44.4	44.4	16.3	49.1	49.1	20.3	33.0	33.0	10.3	23.0	23.0
Actuated g/C Ratio	0.10	0.37	0.37	0.14	0.41	0.41	0.17	0.28	0.28	0.09	0.19	0.19
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.3	4.7	4.7	2.3	4.7	4.7	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	329	1846	564	449	2081	648	592	761	414	268	647	298
v/s Ratio Prot	0.06	c0.19		0.10	c0.36		c0.17	c0.37		0.08	0.21	
v/s Ratio Perm			0.17			0.23			0.10			0.03
v/c Ratio	0.60	0.52	0.46	0.74	0.87	0.56	1.02	1.34	0.38	0.99	1.11	0.16
Uniform Delay, d1	52.0	29.6	28.7	49.8	32.5	27.2	49.9	43.5	35.2	54.8	48.5	40.4
Progression Factor	0.80	0.59	1.00	0.96	0.57	0.36	0.78	0.77	0.67	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.3	0.7	1.8	1.7	1.1	33.4	158.7	0.2	51.3	70.0	0.1
Delay (s)	43.2	17.8	29.3	49.7	20.3	10.8	72.5	192.4	24.0	106.1	118.5	40.6
Level of Service	D	B	C	D	C	B	E	F	C	F	F	D
Approach Delay (s)		24.1			22.3			131.6			102.6	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM Average Control Delay	63.8	HCM Level of Service	E
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.5%	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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.89		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	3257		1805	3485		1805	1654		1805	1900	1481
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	3257		1805	3485		1805	1654		1805	1900	1481
Volume (vph)	70	1135	240	75	1615	65	125	25	60	50	35	90
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	71	1158	245	77	1648	66	128	26	61	51	36	92
RTOR Reduction (vph)	0	13	0	0	2	0	0	55	0	0	0	84
Lane Group Flow (vph)	71	1390	0	77	1712	0	128	32	0	51	36	8
Confl. Peds. (#/hr)			4	4			27					27
Heavy Vehicles (%)	0%	8%	4%	0%	3%	3%	0%	0%	4%	0%	0%	2%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	6.5	69.4		7.8	70.4		9.7	10.0		8.9	8.8	8.8
Effective Green, g (s)	8.8	71.3		9.8	72.3		12.4	11.7		11.2	10.5	10.5
Actuated g/C Ratio	0.07	0.59		0.08	0.60		0.10	0.10		0.09	0.09	0.09
Clearance Time (s)	6.3	5.9		6.0	5.9		6.7	5.7		6.3	5.7	5.7
Vehicle Extension (s)	2.7	3.2		2.7	3.2		2.6	1.8		2.7	1.8	1.8
Lane Grp Cap (vph)	257	1935		147	2100		187	161		168	166	130
v/s Ratio Prot	0.02	c0.43		0.04	c0.49		c0.07	0.02		c0.03	0.02	
v/s Ratio Perm												0.01
v/c Ratio	0.28	0.72		0.52	0.82		0.68	0.20		0.30	0.22	0.06
Uniform Delay, d1	52.6	17.2		52.9	18.6		51.9	49.8		50.8	50.9	50.2
Progression Factor	0.78	1.12		0.83	0.62		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	1.1		2.2	2.8		9.3	0.2		0.9	0.2	0.1
Delay (s)	41.2	20.5		46.2	14.4		61.2	50.1		51.6	51.2	50.3
Level of Service	D	C		D	B		E	D		D	D	D
Approach Delay (s)		21.5			15.8			56.7			50.9	
Approach LOS		C			B			E			D	

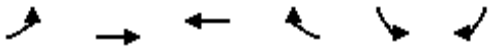
Intersection Summary			
HCM Average Control Delay	22.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	0.99	1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85	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)	1805	3321		1752	3502			1709	1558	1790	1745	
Flt Permitted	0.95	1.00		0.95	1.00			0.72	1.00	0.41	1.00	
Satd. Flow (perm)	1805	3321		1752	3502			1299	1558	781	1745	
Volume (vph)	10	1115	135	90	1565	10	185	5	160	10	5	5
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	10	1138	138	92	1597	10	189	5	163	10	5	5
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	133	0	4	0
Lane Group Flow (vph)	10	1269	0	92	1607	0	0	194	30	10	6	0
Confl. Peds. (#/hr)	1		4	4		1	1		7	7		1
Heavy Vehicles (%)	0%	7%	3%	3%	3%	0%	6%	0%	1%	0%	0%	0%
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	1.4	70.0		15.6	84.2			22.4	22.4	22.4	22.4	
Effective Green, g (s)	1.4	70.0		15.6	84.2			22.4	22.4	22.4	22.4	
Actuated g/C Ratio	0.01	0.58		0.13	0.70			0.19	0.19	0.19	0.19	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	21	1937		228	2457			242	291	146	326	
v/s Ratio Prot	0.01	0.38		c0.05	c0.46						0.00	
v/s Ratio Perm								c0.15	0.02	0.01		
v/c Ratio	0.48	0.66		0.40	0.65			0.80	0.10	0.07	0.02	
Uniform Delay, d1	58.9	16.9		47.9	9.9			46.7	40.5	40.2	39.8	
Progression Factor	0.93	0.10		0.83	0.59			1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.2	1.3		0.6	0.8			17.1	0.2	0.2	0.0	
Delay (s)	66.8	2.9		40.3	6.5			63.8	40.6	40.4	39.8	
Level of Service	E	A		D	A			E	D	D	D	
Approach Delay (s)		3.4			8.4			53.2			40.1	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	11.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
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)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	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		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.86		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3408		1805	3493		1805	1615		1805	1860	
Flt Permitted	0.10	1.00		0.07	1.00		0.00	1.00		0.00	1.00	
Satd. Flow (perm)	197	3408		136	3493		0	1615		0	1860	
Volume (vph)	20	1065	205	240	1280	120	365	20	230	115	90	15
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	20	1087	209	245	1306	122	372	20	235	117	92	15
RTOR Reduction (vph)	0	12	0	0	5	0	0	165	0	0	5	0
Lane Group Flow (vph)	20	1284	0	245	1423	0	372	90	0	117	102	0
Confl. Peds. (#/hr)	2					2			1	1		
Heavy Vehicles (%)	0%	4%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	51.9	49.9		70.6	62.6		21.6	10.1		21.3	9.8	
Effective Green, g (s)	55.9	51.9		72.6	64.6		23.6	12.1		23.3	11.8	
Actuated g/C Ratio	0.47	0.43		0.60	0.54		0.20	0.10		0.19	0.10	
Clearance Time (s)	6.0	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	
Lane Grp Cap (vph)	145	1474		315	1880		355	163		350	183	
v/s Ratio Prot	0.00	c0.38		c0.11	0.41		c0.21	0.06		0.06	c0.05	
v/s Ratio Perm	0.06			0.36								
v/c Ratio	0.14	0.87		0.78	0.76		1.05	0.55		0.33	0.56	
Uniform Delay, d1	19.7	31.0		33.8	21.6		48.2	51.4		41.7	51.6	
Progression Factor	0.71	0.41		1.36	0.47		1.00	1.00		0.83	0.84	
Incremental Delay, d2	0.4	4.9		9.8	1.5		60.8	12.7		0.6	11.4	
Delay (s)	14.2	17.6		55.8	11.7		109.0	64.0		35.2	54.8	
Level of Service	B	B		E	B		F	E		D	D	
Approach Delay (s)		17.6			18.1			90.7			44.6	
Approach LOS		B			B			F			D	

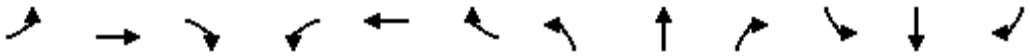
Intersection Summary			
HCM Average Control Delay	31.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1517	3406	3535		1787	1583
Flt Permitted	0.12	1.00	1.00		0.95	1.00
Satd. Flow (perm)	191	3406	3535		1787	1583
Volume (vph)	35	1360	1480	5	195	120
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	36	1388	1510	5	199	122
RTOR Reduction (vph)	0	0	0	0	0	104
Lane Group Flow (vph)	36	1388	1515	0	199	18
Heavy Vehicles (%)	19%	6%	2%	20%	1%	2%
Turn Type	pm+pt					Perm
Protected Phases	7	4	8		6	
Permitted Phases	4					6
Actuated Green, G (s)	94.0	94.0	86.1		18.0	18.0
Effective Green, g (s)	94.0	94.0	86.1		18.0	18.0
Actuated g/C Ratio	0.78	0.78	0.72		0.15	0.15
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	193	2668	2536		268	237
v/s Ratio Prot	0.01	c0.41	c0.43		c0.11	
v/s Ratio Perm	0.14					0.01
v/c Ratio	0.19	0.52	0.60		0.74	0.08
Uniform Delay, d1	6.4	4.8	8.4		48.8	43.9
Progression Factor	1.87	0.60	0.36		1.00	1.00
Incremental Delay, d2	0.2	0.1	0.9		10.6	0.1
Delay (s)	12.2	3.0	3.9		59.4	44.0
Level of Service	B	A	A		E	D
Approach Delay (s)		3.2	3.9		53.5	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3471	1568	1770	3539			1752	1538	1805	1710	
Flt Permitted	0.95	1.00	1.00	0.08	1.00			0.75	1.00	0.40	1.00	
Satd. Flow (perm)	1805	3471	1568	155	3539			1379	1538	766	1710	
Volume (vph)	5	1135	455	535	1285	0	180	0	215	25	5	10
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	5	1158	464	546	1311	0	184	0	219	26	5	10
RTOR Reduction (vph)	0	0	108	0	0	0	0	0	9	0	8	0
Lane Group Flow (vph)	5	1158	356	546	1311	0	0	184	210	26	7	0
Heavy Vehicles (%)	0%	4%	3%	2%	2%	0%	3%	0%	5%	0%	0%	0%
Turn Type	Prot		Perm	pm+pt			Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases			2	6			8		8	4		
Actuated Green, G (s)	1.0	52.1	52.1	83.1	83.1			17.9	49.9	17.9	17.9	
Effective Green, g (s)	3.0	54.1	54.1	85.1	85.1			19.9	53.9	19.9	19.9	
Actuated g/C Ratio	0.02	0.45	0.45	0.71	0.71			0.17	0.45	0.17	0.17	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	1.0	2.5	2.5	1.0	2.5			1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	45	1565	707	568	2510			229	742	127	284	
v/s Ratio Prot	0.00	c0.33		c0.27	0.37				0.08		0.00	
v/s Ratio Perm			0.23	c0.41				c0.13	0.06	0.03		
v/c Ratio	0.11	0.74	0.50	0.96	0.52			0.80	0.28	0.20	0.02	
Uniform Delay, d1	57.2	27.2	23.4	35.1	8.1			48.2	20.9	43.2	41.9	
Progression Factor	0.95	0.79	0.81	0.71	0.47			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	1.5	0.4	22.6	0.6			17.2	0.1	0.3	0.0	
Delay (s)	54.8	22.9	19.3	47.5	4.3			65.4	20.9	43.5	41.9	
Level of Service	D	C	B	D	A			E	C	D	D	
Approach Delay (s)		22.0			17.0			41.2			42.9	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	21.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2		3.2	3.2	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91		1.00	0.91	
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	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1881	1599	1698	1759	1553	1770	4900		1787	5072	
Flt Permitted	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1881	1599	1698	1759	1553	1770	4900		1787	5072	
Volume (vph)	210	355	145	350	270	170	110	1475	105	340	2185	40
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)	221	374	153	368	284	179	116	1553	111	358	2300	42
RTOR Reduction (vph)	0	0	118	0	0	151	0	7	0	0	1	0
Lane Group Flow (vph)	221	374	35	319	333	28	116	1657	0	358	2341	0
Heavy Vehicles (%)	1%	1%	1%	1%	2%	4%	2%	5%	2%	1%	2%	2%
Turn Type	Split		Perm	Split		Perm	Prot			Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8						
Actuated Green, G (s)	11.0	11.0	11.0	17.0	17.0	17.0	10.8	49.9		22.1	61.2	
Effective Green, g (s)	12.8	12.8	12.8	18.8	18.8	18.8	12.1	52.2		23.4	63.5	
Actuated g/C Ratio	0.11	0.11	0.11	0.16	0.16	0.16	0.10	0.44		0.19	0.53	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	5.5		4.5	5.5	
Vehicle Extension (s)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	4.7		2.3	4.7	
Lane Grp Cap (vph)	191	201	171	266	276	243	178	2132		348	2684	
v/s Ratio Prot	0.12	c0.20		0.19	c0.19		0.07	c0.34		c0.20	c0.46	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	1.16	1.86	0.21	1.20	1.21	0.12	0.65	0.78		1.03	0.87	
Uniform Delay, d1	53.6	53.6	49.0	50.6	50.6	43.5	51.9	28.9		48.3	24.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.89	0.88	
Incremental Delay, d2	113.8	405.8	0.3	120.1	122.0	0.1	7.0	2.1		42.0	2.2	
Delay (s)	167.4	459.4	49.3	170.7	172.6	43.6	58.9	31.0		84.8	24.0	
Level of Service	F	F	D	F	F	D	E	C		F	C	
Approach Delay (s)		289.2			144.1			32.9			32.1	
Approach LOS		F			F			C			C	

Intersection Summary			
HCM Average Control Delay	79.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	98.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Sensitivity Analysis Worksheets

For Sensitivity Analysis Only

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Hwy 99W/Edy Road

Cycle (sec):	120	Critical Vol./Cap.(X):	1.010
Loss Time (sec):	16	Average Delay (sec/veh):	63.6
Optimal Cycle:	180	Level Of Service:	E

Street Name:	Hwy 99W						Edy Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	0 1	1	1 0	0 1
Volume Module:												
Base Vol:	111	1470	103	338	2175	40	208	336	147	345	269	169
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	111	1470	103	338	2175	40	208	336	147	345	269	169
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	111	1470	103	338	2175	40	208	336	147	345	269	169
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	117	1547	108	356	2289	42	219	354	155	363	283	178
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	117	1547	108	356	2289	42	219	354	155	363	283	178
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	117	1547	108	356	2289	42	219	354	155	363	283	178
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.94	0.94	0.93	0.98	0.98	0.94	0.99	0.84	0.95	0.95	0.83
Lanes:	1.00	2.80	0.20	1.00	2.95	0.05	1.00	1.00	1.00	1.12	0.88	1.00
Final Sat.:	1718	5020	352	1769	5469	101	1787	1881	1599	2036	1587	1583
Capacity Analysis Module:												
Vol/Sat:	0.07	0.31	0.31	0.20	0.42	0.42	0.12	0.19	0.10	0.18	0.18	0.11
Crit Moves:		****		****				****		****		
Green/Cycle:	0.07	0.31	0.31	0.20	0.43	0.43	0.19	0.19	0.19	0.18	0.18	0.18
Volume/Cap:	0.97	1.01	1.01	1.01	0.97	0.97	0.66	1.01	0.52	1.01	1.01	0.64
Uniform Del:	55.6	41.7	41.7	48.1	33.1	33.1	45.3	48.8	44.0	49.4	49.4	45.8
IncremntDel:	70.7	24.8	24.8	50.6	11.4	11.4	4.8	50.8	1.6	38.2	38.2	4.8
InitQueuDel:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Delay/Veh:	126.4	66.5	66.5	98.7	44.5	44.5	50.1	99.6	45.6	87.6	87.6	50.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	126.4	66.5	66.5	98.7	44.5	44.5	50.1	99.6	45.6	87.6	87.6	50.7
LOS by Move:	F	E	E	F	D	D	D	F	D	F	F	D
HCM2kAvgQ:	7	27	27	19	34	34	8	19	6	17	17	7

For Sensitivity Analysis Only

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Hwy 99W/Edy Road

Cycle (sec):	120	Critical Vol./Cap.(X):	1.024
Loss Time (sec):	16	Average Delay (sec/veh):	67.0
Optimal Cycle:	180	Level Of Service:	E

Street Name:	Hwy 99W						Edy Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	0 1	1	1 0	0 1
Volume Module:												
Base Vol:	111	1476	103	338	2186	41	208	353	143	348	270	172
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	111	1476	103	338	2186	41	208	353	143	348	270	172
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	111	1476	103	338	2186	41	208	353	143	348	270	172
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	117	1554	108	356	2301	43	219	372	151	366	284	181
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	117	1554	108	356	2301	43	219	372	151	366	284	181
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	117	1554	108	356	2301	43	219	372	151	366	284	181
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.94	0.94	0.93	0.98	0.98	0.94	0.99	0.84	0.95	0.95	0.83
Lanes:	1.00	2.80	0.20	1.00	2.94	0.06	1.00	1.00	1.00	1.13	0.87	1.00
Final Sat.:	1718	5022	350	1769	5467	103	1787	1881	1599	2040	1583	1583
Capacity Analysis Module:												
Vol/Sat:	0.07	0.31	0.31	0.20	0.42	0.42	0.12	0.20	0.09	0.18	0.18	0.11
Crit Moves:		****		****				****			****	
Green/Cycle:	0.07	0.30	0.30	0.20	0.43	0.43	0.19	0.19	0.19	0.18	0.18	0.18
Volume/Cap:	0.98	1.02	1.02	1.02	0.98	0.98	0.64	1.02	0.49	1.02	1.02	0.65
Uniform Del:	55.8	41.9	41.9	48.2	33.8	33.8	44.5	48.4	43.1	49.5	49.5	46.1
IncremntDel:	76.2	28.7	28.7	54.6	14.1	14.1	3.9	53.6	1.2	42.0	42.0	5.5
InitQueuDel:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Delay/Veh:	132.0	70.6	70.6	102.8	47.9	47.9	48.4	102	44.4	91.5	91.5	51.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	132.0	70.6	70.6	102.8	47.9	47.9	48.4	102	44.4	91.5	91.5	51.5
LOS by Move:	F	E	E	F	D	D	D	F	D	F	F	D
HCM2kAvgQ:	8	28	28	19	35	35	8	20	5	18	18	7

Mitigated, For Sensitivity analysis only.

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Hwy 99W/Edy Road

Cycle (sec):	120	Critical Vol./Cap.(X):	0.998
Loss Time (sec):	16	Average Delay (sec/veh):	65.3
Optimal Cycle:	180	Level Of Service:	E

Street Name:	Hwy 99W						Edy Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	3 0	1	1 0	2 1	0	1 0	1 0	1	1 1	0 0	1
Volume Module:												
Base Vol:	111	1476	103	338	2186	41	208	353	143	348	270	172
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	111	1476	103	338	2186	41	208	353	143	348	270	172
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	111	1476	103	338	2186	41	208	353	143	348	270	172
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	117	1554	108	356	2301	43	219	372	151	366	284	181
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	117	1554	108	356	2301	43	219	372	151	366	284	181
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	117	1554	108	356	2301	43	219	372	151	366	284	181
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.95	0.81	0.93	0.98	0.98	0.94	0.99	0.84	0.95	0.95	0.83
Lanes:	1.00	3.00	1.00	1.00	2.94	0.06	1.00	1.00	1.00	1.13	0.87	1.00
Final Sat.:	1718	5426	1537	1769	5467	103	1787	1881	1599	2040	1583	1583
Capacity Analysis Module:												
Vol/Sat:	0.07	0.29	0.07	0.20	0.42	0.42	0.12	0.20	0.09	0.18	0.18	0.11
Crit Moves:		****		****				****			****	
Green/Cycle:	0.07	0.29	0.29	0.20	0.42	0.42	0.20	0.20	0.20	0.18	0.18	0.18
Volume/Cap:	1.00	1.00	0.25	1.00	1.00	1.00	0.62	1.00	0.48	1.00	1.00	0.64
Uniform Del:	55.9	42.7	32.8	47.9	34.8	34.8	44.0	48.1	42.6	49.2	49.2	45.6
IncremntDel:	83.4	22.2	0.3	47.0	18.7	18.7	3.3	45.9	1.1	34.6	34.6	4.7
InitQueuDel:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Delay/Veh:	139.3	64.9	33.1	94.8	53.5	53.5	47.3	94.0	43.7	83.8	83.8	50.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	139.3	64.9	33.1	94.8	53.5	53.5	47.3	94.0	43.7	83.8	83.8	50.2
LOS by Move:	F	E	C	F	D	D	D	F	D	F	F	D
HCM2kAvgQ:	8	25	3	18	36	36	8	19	5	17	17	7