Appendix A

Curve Evaluation

Memorandum

505 Fifth Avenue S., Suite 300, Seattle, WA 98104 | P 206.436.0515 | F 425.339.6018

To: Jed Ireland, PE

From: Dan Hansen, PE

Date: July 16, 2015

Re: Sahalee Way Corridor Curve Evaluations

Horizontal Curvature

The horizontal curves on the Sahalee Way Corridor between NE 25th Way and SR 202 were evaluated to assess design speed in the existing and proposed conditions. Note that the proposed superelevation profile has not been established yet. Figure 1 shows the Corridor with labels for the major horizontal curves.

Figure 1 – Sahalee Way Corridor Horizontal Curves

Two alignments were established for the project: the C-Line follows the existing centerline of the roadway, while the S-Line traverses the centerline of the existing right-of-way within the City Limits, and follows the roadway centerline in unincorporated Snohomish County. Existing curve radii and superelevation were measured using the C-Line and the provided elevation data. The proposed curve radii match the S-Line radii, with superelevation yet to be determined. Design speeds were found to the nearest 5 miles per hour (MPH) based on the methodology provided in the American Association of State Highway and Transportation Officials' (AASHTO) *A Policy on the Geometric Design of Highways and* Streets. Table 1 shows the existing horizontal curve design speeds. The regulatory posted speed limit in the corridor is 45 MPH.

Table 1 – Existing Curve Design Speeds

Curve No.	C-Line Starting Station	C-Line Radius	Existing Design Radius	Existing Approximate Superelevation	Existing Design Speed	Notes
1	54+14.64	995.73	996	4.2%	35 MPH	
2	71+88.70	1320.53	1321	3.8%	35 MPH	
3	108+40.68	524.08	524	5.6%	35 MPH	35 MPH Curve Warning Sign
4	123+83.40	581.04	581	5.6%	35 MPH	35 MPH Curve Warning Sign
5	142+00.17	729.72	730	4.8%	40 MPH	40 MPH Curve Warning Sign
6	164+40.08	887.13	887	6%	50 MPH	

Table 2 shows the proposed curve radii along the S-Line. Note that in Table 1, the design radius is equivalent to the C-Line radius (after rounding). However, with any configuration larger than a two-lane highway, the design radius is equal to the radius of the inner edge line of the innermost travel lane. As a result, the design radii for the three-lane and five-lane alternatives are different. Table 2 also excludes the superelevation and assumes that superelevation will be maximized up to 6.0% wherever necessary. Design speeds in Table 2 are the maximum possible design speed. Any speed less than the values shown can be used at the curves if the desired environment is high-speed by changing the superelevation percentages.

Table 2 – Proposed Curve Maximum Design Speeds

Curve No.	S-Line Starting Station	S-Line Radius	Design Radius, Three-Lanes	Design Radius, Five-Lanes	Max Design Speed, Three-Lanes	Max Design Speed, Five-Lanes
1	55+31.04	998.03	981	970	50 MPH	50 MPH
2	73+59.67	1060.56	1044	1033	50 MPH	50 MPH
3	109+76.28	527.1	510	499	40 MPH	40 MPH
4	125+33.06	529.57	513	502	40 MPH	40 MPH
5	143+11.00	700	683	672	45 MPH	45 MPH
6	165+57.73	887.13	870	859	50 MPH	50 MPH

While Table 2 shows high-speed design options, low-speed urban design values are also applicable to this corridor. Generally, low-speed roadways will not have any superelevation but allow for smaller curve radii because of how drivers respond to the urban environment, including items like bike lanes and sidewalks. Table 3 shows the curves with the necessary superelevation to meet certain design speeds.

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Table 3 – Superelevation Necessary for Proposed Low-Speed Urban Design Curves

Curve No.	35 MPH, Three-Lane	40 MPH, Three-Lane	45 MPH, Three-Lane	35 MPH, Five-Lane	40 MPH, Five-Lane	45 MPH, Five-Lane
1	NC	NC	RC	NC	NC	RC
2	NC	NC	NC	NC	NC	RC
3	NC	5.6%	Not Possible	RC	5.6%	Not Possible
4	NC	4.8%	Not Possible	RC	5.6%	Not Possible
5	NC	RC	4.8%	NC	RC	5.6%
6	NC	NC	2%	NC	NC	RC

NC – Normal Crown RC – Reverse Crown

As Table 3 shows, a 45 MPH design speed cannot be maintained through the Corridor with the low-speed urban design values. The only speed and lane combination that does not require any superelevation is 35 MPH with three travel lanes. All other possibilities are achievable by modifying superelevation.

Vertical Curvature

A similar process was used for the vertical curves in the Corridor. Four major curves—two crest, two sag—were identified and are shown below on Figure 2.

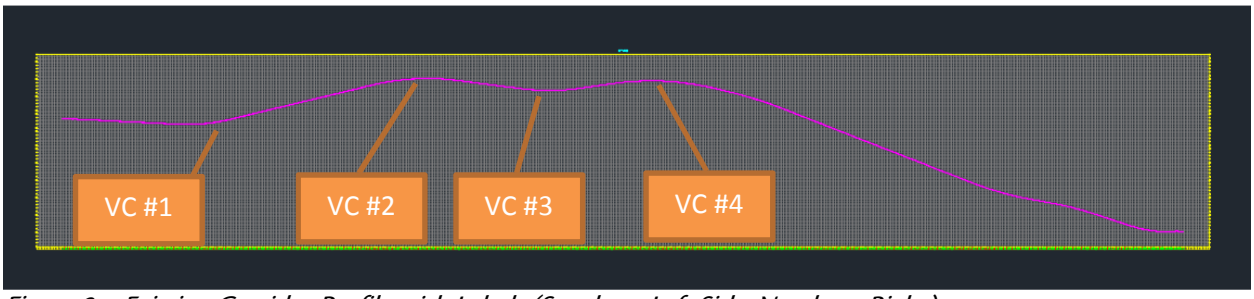


Figure 2 – Existing Corridor Profile with Labels (South on Left Side; North on Right)

The existing vertical curves were reviewed using the Washington State Department of Transportation (WSDOT) Design Manual. Chapter 1260 specifies that design speed for vertical curves is a function of the grades and length of the curve. There is no distinction for low- or high-speed design for vertical curvature. Table 4 shows the analysis of the existing profile.

Table 4 – Existing Vertical Curvature Analysis

Curve No.	Type	Grades	Difference in Grades	Curve Length (ft)	Stopping Sight Dist. (ft)	Design Speed
1	Sag	-5%, 2.4%	7.4%	605	375	40 MPH
2	Crest	2.4%, -1.3%	3.7%	950	745	70 MPH
3	Sag	-1.3%, 1.5%	2.8%	700	1125	> 80 MPH
4	Crest	1.5%, -2.3%	3.8%	1155	810	70 MPH

Recommendations

We recommend using the 40 MHP low-speed urban design criteria. This will allow for the existing profile to remain in place, encourage a more bicycle- and pedestrian-friendly environment, and allow for half of the major curves to be designed without any superelevation. All curves will meet the 40 MPH design speed.

Appendix B

Design Criteria

Memorandum

2707 Colby Avenue, Suite 900, Everett, WA 98201 | P 425.252.7700 | F 425.339.6018

To: Jed Ireland, PE

From: Dan Hansen, PE
Perteet Inc.

Revised: September 22, 2015

Re: Sahalee Way Design Criteria

Introduction

The City of Sammamish has initiated a project to construct improvements for the Sahalee Way NE / 228th Avenue NE corridor, a north-south principal arterial that spans the length of the City. The project includes the area between the northern City Limit to NE 25th Way. Before the final design stage begins, the City has tasked Perteet with providing corridor layouts, cost estimates, and traffic analyses for two typical cross sections. Each alternative includes a central median that will become left-turn lanes at intersections, bicycle lanes on each side of the roadway, and sidewalks separated from each curb line by a planter strip. The comparison will help inform whether one or two vehicle travel lanes should be provided per direction.

This memorandum supports this design effort by detailing the relevant design standards that will be applied to the corridor layouts. These standards focus on geometric design. Other standards for illumination, traffic signals, signing, and other similar elements will not be included.

Design Criteria

The City of Sammamish has adopted the roadway design standards included in the *Interim Public Works Standards* (April 2000) for arterials. All design standards are taken from that source, if available. If not available, standards are taken from the Washington State Department of Transportation (WSDOT) *Design Manual M 22-01.10*. Table 1 provides the standards to be used inside City Limits.

This project contains a segment of Sahalee Way NE between SR 202 and NE 37th Way that is outside of City Limits. As a result, the Sammamish standards will not govern the design. The King County *Road Design and Construction Standards – 2007* will govern. Table 2 details the approach for unincorporated King County.

The City of Sammamish and King County have classified the corridor as a Principal Arterial. The former will only be applied within City Limits; the latter will only be applied north of the City Limit, with a rural designation because that corridor segment is outside of the King County Urban Growth area.

WSDOT provides design criteria based on a classification that is a function of various factors, including number of lanes and urban/rural designation. Note that there is no official classification for a two-lane divided highway (with a median), so the P-4 ("Two-Lane") classification has been assumed. Conversely, the four-lane section is classified as P-2 ("Divided Multilane"). The rural designation will be applied outside of Sammamish, while the urban designation will be used inside City Limits.

Table 1 – Design Criteria within Sammamish (Three-Lane Base Design)

Item	Standard	Source	Proposed	Notes
Speed				
Existing Speed Limit	No standard		45 miles per hour	
Proposed Speed Limit	No standard		40 miles per hour	Reduce to match design speed
Design Speed	Not less than posted speed	WSDOT DM, Chapter 1140	40 miles per hour	Reduces clear zone requirements compared to 45 MPH
Cross Section Elements				
Minimum Right-of-Way	85-feet to 95-feet wide	IPWS, Table I, Principal Arterial	Match existing (84-feet)	Match existing
Raised Landscape Median	8-feet to 12-feet wide	IPWS, Table I, Principal Arterial	8-foot to 12-foot striped median	Per discussion with City
Travel Lane	11-feet wide, two per direction; may be reduced to 10-feet wide with City Engineer's approval	IPWS, Table I, Principal Arterial IPWS, FIG01-01	11-feet wide	
Turn Lane	12-feet wide	WSDOT DM, Exhibit 1140-6	12-feet wide	
Bike Lane	5-feet wide, both sides	IPWS, Table I, Principal Arterial IPWS, FIG01-01	West side: 5-foot standard met East side: included in 8-foot shoulder	Per discussion with City
Parking Lane	No parking	IPWS, Table I, Principal Arterial	No parking	
Shoulder	No shoulder	IPWS, FIG01-01	8-foot asphalt shoulder on east side	Per discussion with City
Curb and Gutter	Cement concrete, both sides	IPWS, Table I, Principal Arterial	Cement concrete, west side only	Per discussion with City
Planter Strip	3.5-feet to 5-feet wide, both sides; may be reduced or eliminated due to insufficient ROW with City Engineer's approval	IPWS, Table I, Principal Arterial IPWS, FIG01-01	3-feet wide, west side only	Per discussion with City

Table 1 – Design Criteria within Sammamish (Three-Lane Base Design) (Continued)

Item	Standard	Source	Proposed	Notes
Cross Section Elements (Continued)				
Sidewalk	6-feet wide, both sides	IPWS, Table I, Principal Arterial	6-feet wide, west side only	Per discussion with City
Side Slope	Per WSDOT Design Manual Exhibit 1230-3 (two-lane highway) or 1230-1 (four-lane highway)	WSDOT DM, Chapter 1230	2:1 maximum	
Vertical and Horizontal Alignment				
Grade	0.7% to 8.0%	IPWS, Table I, Principal Arterial	Match existing (approximately 1.0% to 10%)	
Vertical Curve	Per WSDOT Design Manual 1260.03(2) and 1260.03(3)	WSDOT DM, Chapter 1260	Match existing	See Appendix A
Tabled Grade Near Intersection	1 foot per 30 feet maximum if approaching an arterial, otherwise 1 foot per 20 feet maximum	IPWS, PWS.15.160	Match existing	
Minimum Centerline Radius, Normal Crown Section, Superelevated	Per AASHTO, "A Policy on Geometric Design of Highways and Streets"	IPWS, Table I, Principal Arterial	Match existing	See Appendix A
Minimum Centerline Radius, Normal Crown Section, No Superelevation	600 feet	IPWS, Table I, Principal Arterial	Match existing	See Appendix A
Taper	40:1 minimum	WSDOT DM, Exhibit 1310-10a	40:1 minimum	
Sight Distance (Dependent on Design Speed)				
Stopping Sight Distance	325 feet minimum	IPWS, Table II	Match existing	
Entering Sight Distance	470 feet minimum	IPWS, Table III	415 feet minimum	

Table 1 – Design Criteria within Sammamish (Three-Lane Base Design) (Continued)

Item	Standard	Source	Proposed	Notes
Access				
Intersection Spacing	300 feet minimum	IPWS, PWS.15.160	Match existing (850 feet minimum)	
Intersection Curb Radii	25 feet to 35 feet	IPWS, Table 1, Principal Arterial	25 feet (residential and local access) or 35 feet (collectors)	
Intersection Skew	90 degree preferred	IPWS, PWS.15.160	Will review skewed intersections to improve where feasible	
Turn Lane Pocket	100-feet long minimum, with longer pocket lengths determined by traffic analysis	WSDOT DM, 1310.04(2)(a)	100 feet minimum	Queue lengths to be evaluated with final design
Turn Lane Opening	50-feet long	WSDOT DM, Exhibit 1310-10a	50-feet long	
Driveway to Driveway Spacing	75 feet minimum, including driveways on opposite side of road	IPWS, PWS.15.170	Match existing (75 feet minimum)	
Driveway to Intersection Spacing	150 feet minimum	IPWS, PWS.15.170	Match existing (0 feet minimum)	
Residential Driveway Width	24 feet (two-way access) or 20 feet (one-way access), maximum	IPWS, PWS.15.170	24 feet (two-way access) or 20 feet (one-way access), maximum	
Commercial Driveway Width	30 feet (two-way access) or 20 feet (one-way access), maximum	IPWS, PWS.15.170	30 feet (two-way access) or 20 feet (one-way access), maximum	
Industrial Driveway Width	35 feet (two-way access) or 25 feet (one-way access), maximum	IPWS, PWS.15.170	35 feet (two-way access) or 25 feet (one-way access), maximum	

Table 1 – Design Criteria within Sammamish (Three-Lane Base Design) (Continued)

Item	Standard	Source	Proposed	Notes
Miscellaneous				
Pavement	Thickness and materials require project-specific design	IPWS, PWS.15.190	11-inches HMA over 6-inches CSTC; overlay existing	Assumed pavement thickness and materials; assume existing pavement suitable after 2-inch grind and overlay
Clear Zone	Developed on a case-by-case basis where curb is used	WSDOT DM, 1600.03(2)	3 feet (at intersections and driveway openings) or 1.5 feet (elsewhere) minimum from face of curb to nearest edge of any fixed object	Based on AASHTO *Roadside Design Guide*, 3.4.1
Guardrail	Apply WSDOT methodology for placement	IPWS, PWS.15.500	Apply WSDOT methodology for placement	
Wall	8-foot maximum rock walls where soil conditions are stable; structural wall where cut/fill height exceeds 6 feet or soil is unstable	IPWS, PWS.15.510	CUT Less than 6' – Gravity Block 6' to 11' – Cast-in-Place Conc. 11' to 17' – Cantilever Soldier Over 17' – Soldier Tie-Back FILL All heights - MSE	Per structural engineer recommendations
Plant Selection	Per PWS.15.520	IPWS, PWS.15.520	Street tress to be planted in median and planter strips per PWS.15.520	To be determined in final design; no irrigation

Green Book: AASHTO, A Policy on Geometric Design of Highways and Streets
IPWS: City of Sammamish Interim Public Works Standards
PWS: City of Sammamish Public Works Standards
WSDOT DM: Washington State Department of Transportation Design Manual M 22-01.10

Table 2 – Design Criteria in Unincorporated King County (Three-Lane Climbing Lane Enhancement)

Item	Standard	Source	Proposed	Notes
Speed				
Speed Limit	No standard	45 miles per hour	Maintain Existing	
Design Speed	10 miles per hour above the posted speed limit	KCRDCS, 1.16	55 miles per hour (10 miles per hour above the posted speed limit)	KCRDCS, 1.16
Cross Section Elements				
Travel Lane	11-feet wide	KCRDCS, 2.02(A)	11-feet wide	
Turn Lane	12-feet wide	KCRDCS, 2.03(A)	12-feet wide	
Bike Lane	4-feet wide, minimum (may overlap with shoulder)	KCRDCS, 3.10	8-feet wide (in shoulder)	
Parking Lane	No parking	KCRDCS, 2.03(A)	No parking	
Shoulder	8-feet wide	KCRDCS, 2.03(A)	8-feet wide	
Curb and Gutter	No curb and gutter	KCRDCS, 2.03(A)	No curb and gutter	
Planter Strip	No planter strip	KCRDCS, 2.03(A)	No planter strip	
Sidewalk	No sidewalk	KCRDCS, 2.03(A)	No sidewalk	
Side Slope	2:1 preferred maximum	KCRDCS, 5.02	2:1 maximum	

Table 2 – Design Criteria in Unincorporated King County (Three-Lane Climbing Lane Enhancement) (Continued)

Item	Standard	Source	Proposed	Notes
Vertical and Horizontal Alignment				
Grade	9% maximum	KCRDCS, 2.02(A)	Match existing (approximately 1.0% to 10%)	
Vertical Curve	Per WSDOT Design Manual 1260.03(2) and 1260.03(3)	WSDOT DM, Chapter 1260	Match existing	See Appendix A
Tabled Grade Near Intersection	1 foot per 30 feet maximum if approaching an arterial, otherwise 1 foot per 20 feet maximum	KCRDCS, 2.10	Match existing	
Minimum Centerline Radius, Normal Crown Section, Superelevated	1065 feet (6%) or 965 (8% maximum superelevation)	KCRDCS, Table 2.1	Match existing	See Appendix A
Minimum Centerline Radius, Normal Crown Section, No Superelevation	Not applicable. Superelevation to be used on rural roads.		Not applicable. Superelevation to be used on rural roads.	
Taper	Length (ft) = Posted Speed Limit (mph) x Alignment Shift (ft)	KCRDS, FID. 4-002	Length (ft) = Posted Speed Limit (mph) x Alignment Shift (ft)	
Sight Distance (Dependent on Design Speed)				
Stopping Sight Distance	495 feet minimum	KCRDCS, Table 2.1	Match existing	
Entering Sight Distance	610 feet minimum typical, with adjustments as necessary per Table 2.1	KCRDCS, Table 2.1	610 feet minimum typical, with adjustments as necessary per Table 2.1	

Table 2 – Design Criteria in Unincorporated King County (Three-Lane Climbing Lane Enhancement) (Continued)

Item	Standard	Source	Proposed	Notes
Access				
Intersection Spacing	1000 feet minimum	KCRDCS, 2.10	Match existing (800 feet minimum)	
Intersection Curb Radii	35 feet	KCRDCS, 2.10	25 feet (residential and local access) or 35 feet (collectors)	
Intersection Skew	85 to 95 degrees	KCRDCS, 2.10	Match existing	
Turn Lane Pocket	100-feet long minimum, with longer pocket lengths determined by traffic analysis	KCRDCS, FIG. 4-002	Based on 95th percentile queue lengths (from traffic analysis); 100 feet minimum	
Turn Lane Opening	Length (ft) = 3 x Posted Speed Limit (mph)	KCRDCS, FIG. 4-002	135-feet long (3 x Posted Speed Limit)	
Driveway to Driveway Spacing	Per KCRDCS, 3.01	KCRDCS, 3.01	Match existing	
Driveway to Intersection Spacing	No standard.		Match existing (100 feet)	
Residential Driveway Width	10 to 30 feet	KCRDCS, 3.01	30 feet	
Commercial Driveway Width	25 to 35 feet	KCRDCS, 3.01	20 feet	

Table 2 – Design Criteria in Unincorporated King County (Three-Lane Climbing Lane Enhancement) (Continued)

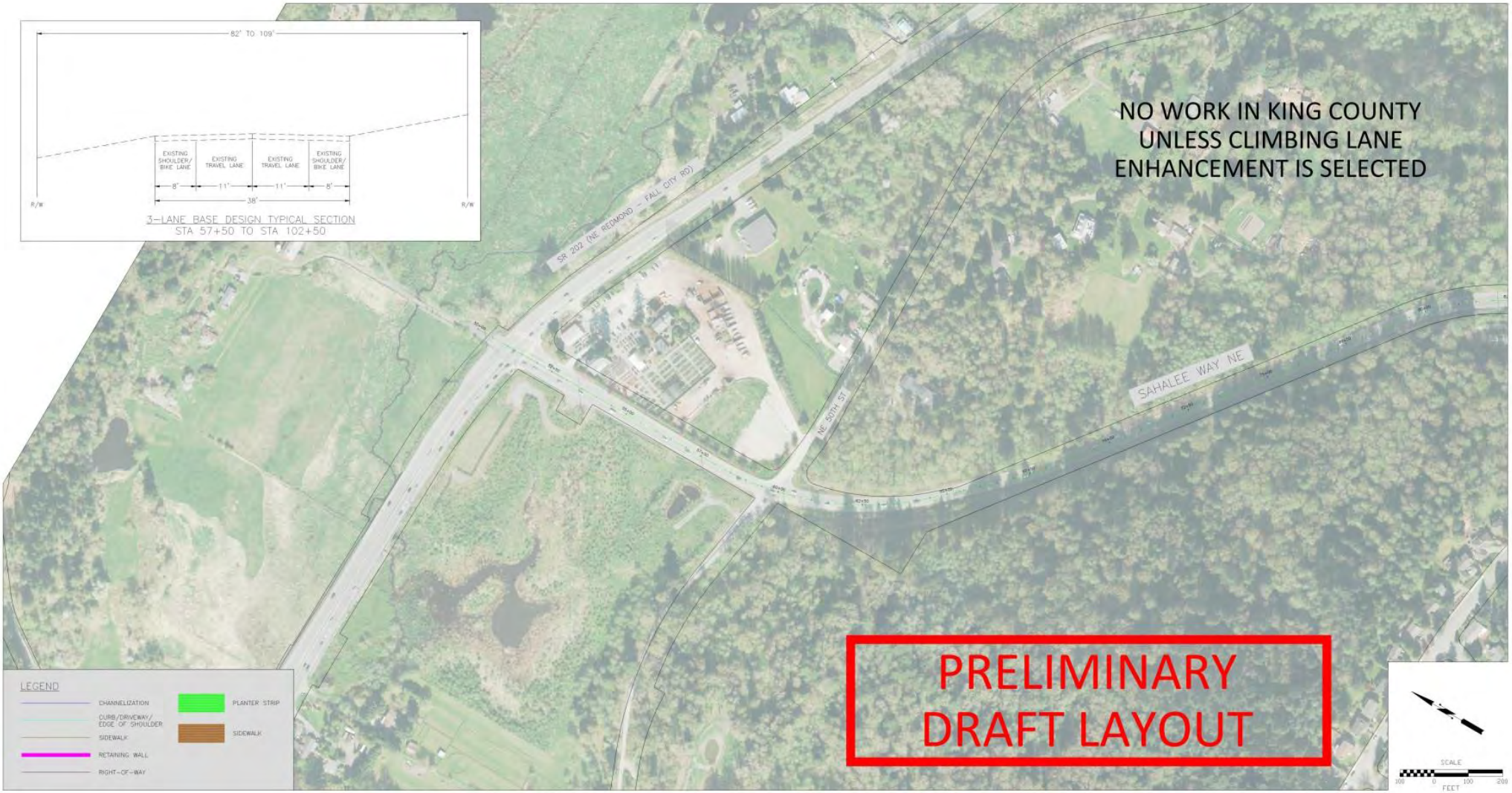
Item	Standard	Source	Proposed	Notes
Miscellaneous				
Pavement	Thickness and materials require project-specific design	KCRDCS, 4.05	11-inches HMA over 6-inches CSTC	Assumed pavement thickness and materials
Clear Zone	No objects within curve section; 10 feet minimum from edge of travelled way on tangent sections	KCRDCS, FIG. 5-001	No objects within curve section; 10 feet minimum from edge of travelled way on tangent sections	
Guardrail	Apply WSDOT methodology for placement	KCRDCS, 5.09	Apply WSDOT methodology for placement	
Wall	8-foot maximum rock walls where soil conditions are stable; structural wall where cut/fill height exceeds 8 feet or soil is unstable	KCRDCS, 5.01	CUT Less than 6' – Gravity Block 6' to 11' – Cast-in-Place Conc. 11' to 17' – Cantilever Soldier Over 17' – Soldier Tie-Back FILL All heights - MSE	Per structural engineer recommendations
Plant Selection	Per KCRDCS, 5.03	KCRDCS, 5.03	Not used	

KCRDCS: King County Road Design and Construction Standards – 2007
WSDOT DM: Washington State Department of Transportation Design Manual M 22-01.10

Storm drainage requirements will be submitted in a supplemental memorandum.

Appendix C

Three-Lane Base Design Preliminary Layout

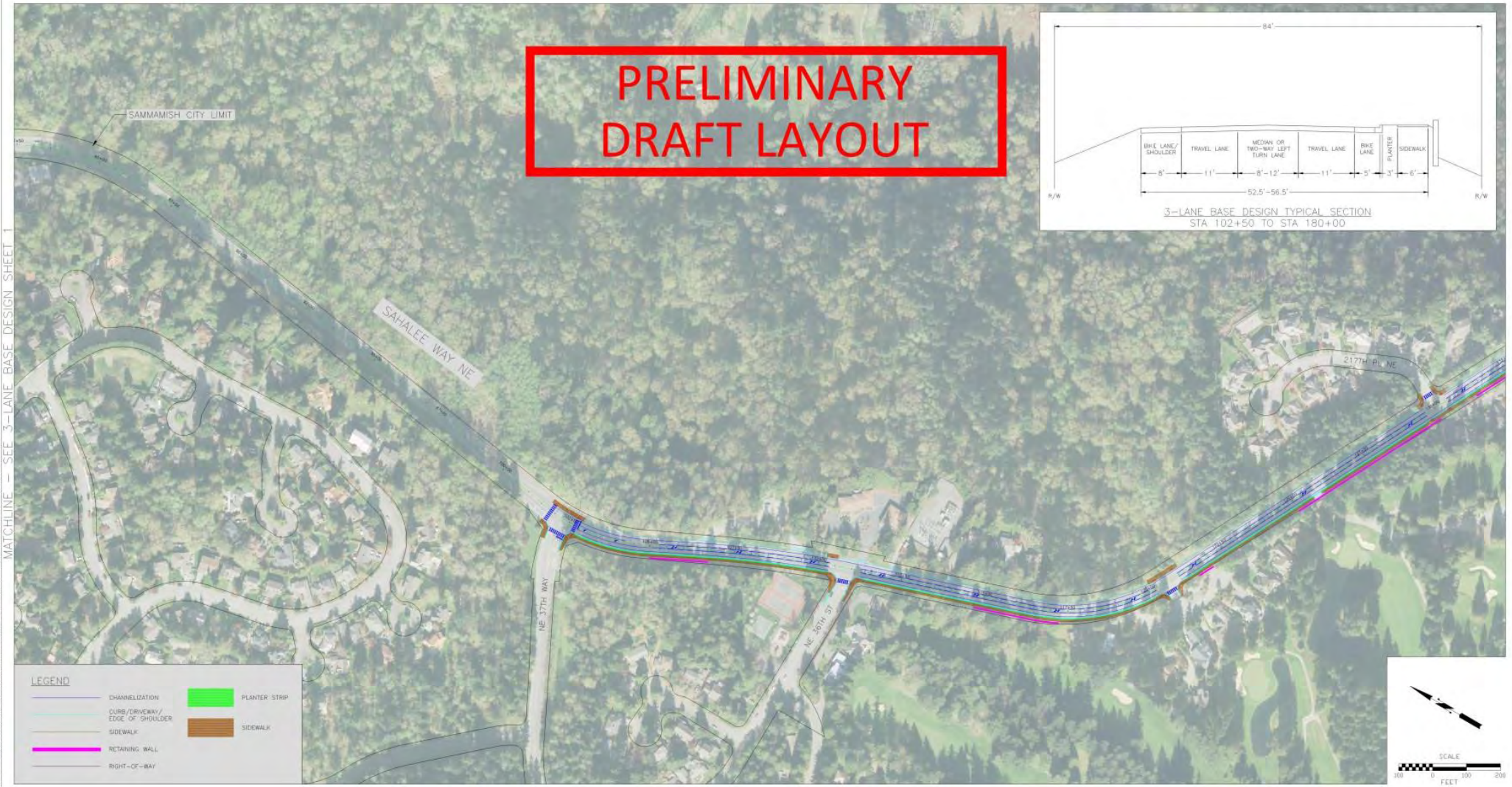


No.	Date	Revision	By	Appr.

Perteet
425-252-7700 | 1-800-615-9900
2707 Colby Avenue, Suite 900
Everett, Washington 98201

Drawn By: BMF	Date: 9/22/15	SCALE	CITY OF SAMMAMISH
Designed By: BMF	9/22/15	Horiz: 1"=100'	SAHALEE WAY CORRIDOR WIDENING
Checked By: JAT	9/22/15	Vert: NONE	3-LANE BASE DESIGN
Approved By:		Project Number:	Drawing No. / Sheet No. 1 of 3

PRELIMINARY DRAFT LAYOUT

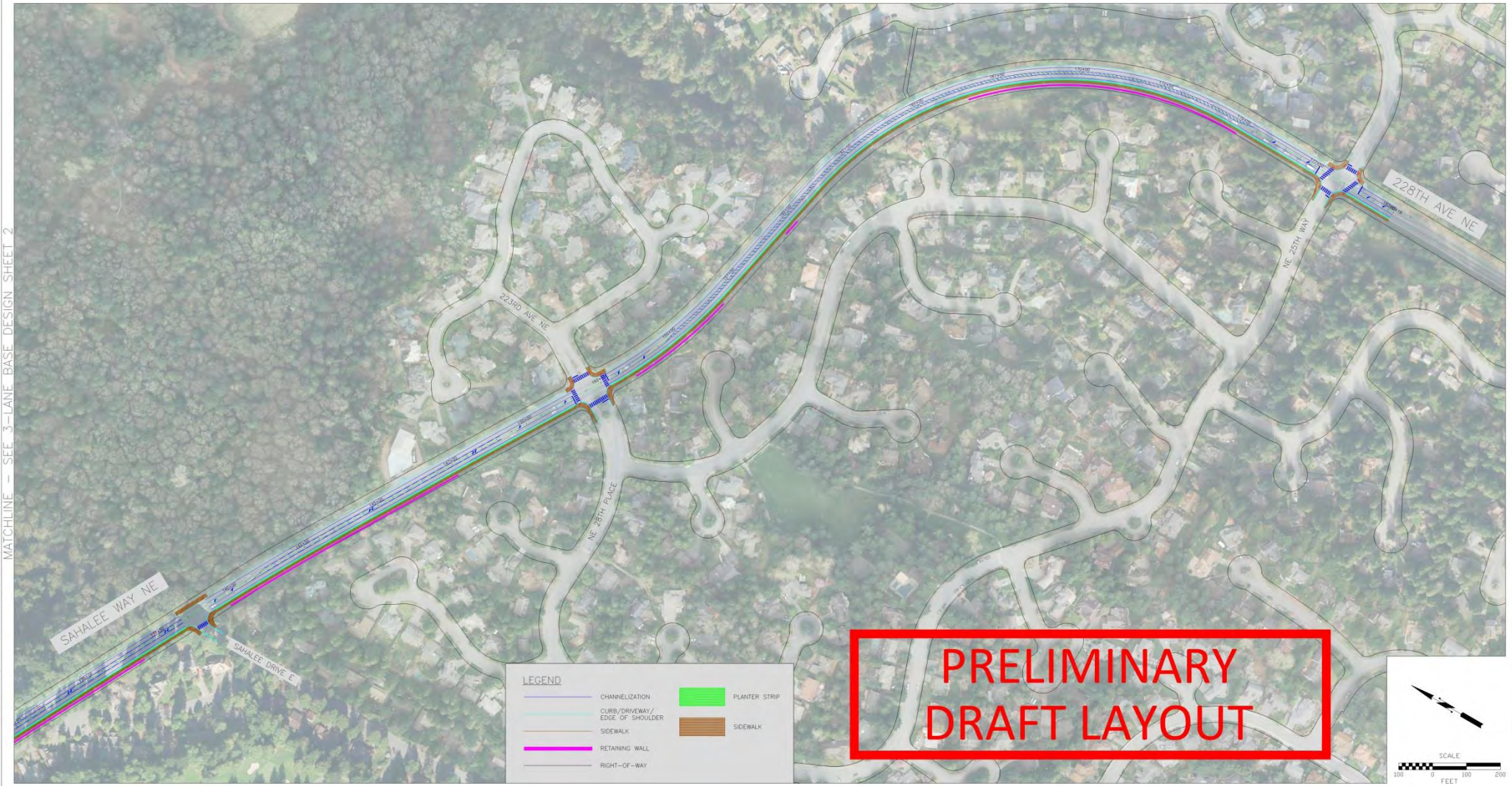


3-LANE BASE DESIGN TYPICAL SECTION
STA 102+50 TO STA 180+00

No.	Date	Revision	By	Appr.

Perteet
425-252-7700 I 1-800-615-9900
2707 Colby Avenue, Suite 900
Everett, Washington 98201

Drawn By: BMP	Date: 9/22/15	SCALE: Horiz. 1"=100'	CITY OF SAMMAMISH
Designed By: BMP	9/22/15	Vert. NONE	SAHALEE WAY CORRIDOR WIDENING
Checked By: JAT	9/22/15	Project Number	3-LANE BASE DESIGN
Approved By:			Drawing No. / Sheet No. 2 of 3 Total



PRELIMINARY
DRAFT LAYOUT

MATCHLINE – SEE 3-LANE BASE DESIGN SHEET 2

Sep 23, 2015 - 9:27am BProwell C:\Projects\SharePoint\Sahalee Way Corridor Improvem - Doc\CAD\Exhibits\DSGN Plot.dwg Layout Name: DSGN Plot 3

No.	Date	Revision	By	Appr.

Perteet
425-252-7700 | 1-800-615-9900
2707 Colby Avenue, Suite 900
Everett, Washington 98201

Drawn By BMP	Date 9/22/15	SCALE
Designed By BMP	9/22/15	Horiz 1"=100'
Checked By JAT	9/22/15	Vert NONE
Approved By		Project Number

CITY OF SAMMAMISH

SAHALEE WAY CORRIDOR WIDENING

3-LANE BASE DESIGN

Drawing No.

Sheet No. 3 of Total 3

Appendix D

Three-Lane Design Preliminary Cost Estimates

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description: Sahalee Way: 3-Lane - Base
Corridor Section: NE 25th Way to Sammamish City Limit
Location: Sammamish, WA

Client: City of Sammamish
Date: July-15
Date of Cost Index: 2015
Calculated By/Entered By: BMP 9/8/2015
Checked By:

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (PARTIAL ACQUISITION)	LS	$20,000	1	$20,000
		RIGHT OF WAY (FULL ACQUISITION)	LS	$0	1	$0
		CONSTRUCTION EASEMENTS	SF	$5	12,700	$63,500
		RIGHT OF WAY TOTAL				**$83,500**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB, DEMO	ACRE	$10,000	4.9	$49,000
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$0	1	$0
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	26,100	$522,000
		PLANING BITUMINIOUS PAVEMENT	SY	$2	33,400	$66,800
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$18	24,000	$432,000
	1.3	**STORMWATER MITIGATION**	LS	$1,303,100	1	$1,303,100
	1.4	**STORM DRAINAGE CONVEYANCE**	LS	$1,873,950	1	$1,873,950
2		**STRUCTURE**				
		CONCRETE BRIDGES	SF	$250	-	$0
		CONCRETE BRIDGES WIDENING	SF	$350	-	$0
		APPROACH SLAB	SY	$140	-	$0
		BRIDGE EMBANKMENT	CY	$50	-	$0
		GRAVITY BLOCK WALL (CUT)	SF	$40	9,200	$368,000
		CAST-IN-PLACE CONCRETE WALL (CUT)	SF	$80	900	$72,000
		CANTELIEVER SOLDIER PILE WALL (CUT)	SF	$125	-	$0
		SOLDIER PILE TIEBACK WALL (CUT)	SF	$180	-	$0
		MECHANICALLY STABILIZED EARTH WALL (FILL)	SF	$35	11,000	$385,000
		BRIDGE REMOVAL	SF	$40	-	$0
		CULVERT	LF	$1,750	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$12	-	$0
		HOT MIX ASPHALT	TON	$100	7,400	$740,000
		CRUSHED SURFACING	TON	$35	4,300	$150,500
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	2,300	$34,500
		HANDRAIL	LF	$100	1,800	$180,000
		SEEDING, MULCHING & FERTILIZING	LS	$93,000	1	$93,000
		WETLAND MITIGATION	LS	$0	1	$0
		ENVIRONMENTAL PERMITS	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL	LS	$149,300	1	$149,300
		LANDSCAPING	LS	$171,000	1	$171,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$18	3,100	$55,800
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$450,000	1	$450,000
		ILLUMINATION	LS	$132,700	1	$132,700
		SIGNING	LS	$58,000	1	$58,000
		CURBS	LF	$15	6,100	$91,500
		CURB RAMPS	EA	$1,500	45	$67,500
		SIDEWALKS	SY	$25	5,200	$130,000
		DRIVEWAYS	SY	$75	500	$37,500
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL	LS	$380,700	1	$380,700
	5a.	**OTHER ITEMS**				
		SURVEYING	LS	$120,000	1	$120,000
		SPECIAL ITEMS	EST	$0	1	$0
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**MISCELLANEOUS (0%)**	LS	$0	1	$0
7		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$8,113,850**
8		**MOBILIZATION**				
		10.00% OF ITEM 7	EST	$812,000	1	$812,000
9		**SUBTOTAL (ITEMS 7 & 8)**				**$8,925,850**
10		**SALES TAX**				
		0.0% OF (% OF ITEM 9)	EST	$0	1	$0
11		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
12		**SUBTOTAL (ITEMS 9 THRU 11)**				**$8,925,850**

Least Cost Estimate

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Sahalee Way: 3-Lane - Base	Client:	City of Sammamish
Corridor Section:	NE 25th Way to Sammamish City Limit	Date:	July-15
Location:	Sammamish, WA	Date of Cost Index:	2015
		Calculated By/Entered By:	BMP 9/8/2015
		Checked By:	

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
13		**CONSTRUCTION**				
		ENGINEERING (12% OF ITEM 12)	EST	$1,072,000	1	$1,072,000
		CONTINGENCIES (30% OF ITEM 12)	EST	$2,678,000	1	$2,678,000
14		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$12,675,850**
III.		**PRELIMINARY ENGINEERING**				
		(12% OF ITEM 14)	EST	$1,393,000	1	$1,393,000
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$14,160,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.04	2018	2015	**$15,930,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description: Sahalee Way: 3-Lane - Base w/ Bus Pullouts
Corridor Section: NE 25th Way to Sammamish City Limit
Location: Sammamish, WA

Client: City of Sammamish
Date: July-15
Date of Cost Index: 2015
Calculated By/Entered By: BMP 9/21/2015
Checked By:

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (PARTIAL ACQUISITION)	LS	$50,000	1	$50,000
		RIGHT OF WAY (FULL ACQUISITION)	LS	$0	1	$0
		CONSTRUCTION EASEMENTS	SF	$5	14,300	$71,500
		RIGHT OF WAY TOTAL				**$121,500**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB, DEMO	ACRE	$10,000	4.9	$49,000
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$0	1	$0
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	27,000	$540,000
		PLANING BITUMINIOUS PAVEMENT	SY	$2	33,400	$66,800
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$18	24,100	$433,800
	1.3	**STORMWATER MITIGATION**	LS	$1,399,000	1	$1,399,000
	1.4	**STORM DRAINAGE CONVEYANCE**	LS	$1,873,950	1	$1,873,950
2		**STRUCTURE**				
		CONCRETE BRIDGES	SF	$250	-	$0
		CONCRETE BRIDGES WIDENING	SF	$350	-	$0
		APPROACH SLAB	SY	$140	-	$0
		BRIDGE EMBANKMENT	CY	$50	-	$0
		GRAVITY BLOCK WALL (CUT)	SF	$40	9,400	$376,000
		CAST-IN-PLACE CONCRETE WALL (CUT)	SF	$80	900	$72,000
		CANTELIEVER SOLDIER PILE WALL (CUT)	SF	$125	-	$0
		SOLDIER PILE TIEBACK WALL (CUT)	SF	$180	-	$0
		MECHANICALLY STABILIZED EARTH WALL (FILL)	SF	$35	11,200	$392,000
		BRIDGE REMOVAL	SF	$40	-	$0
		CULVERT	LF	$1,750	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$12	-	$0
		HOT MIX ASPHALT	TON	$100	7,600	$760,000
		CRUSHED SURFACING	TON	$35	4,300	$150,500
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	2,300	$34,500
		HANDRAIL	LF	$100	1,800	$180,000
		SEEDING, MULCHING & FERTILIZING	LS	$93,000	1	$93,000
		WETLAND MITIGATION	LS	$0	1	$0
		ENVIRONMENTAL PERMITS	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL	LS	$152,300	1	$152,300
		LANDSCAPING	LS	$171,000	1	$171,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$18	3,100	$55,800
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$450,000	1	$450,000
		ILLUMINATION	LS	$132,700	1	$132,700
		SIGNING	LS	$58,000	1	$58,000
		CURBS	LF	$15	6,100	$91,500
		CURB RAMPS	EA	$1,500	45	$67,500
		SIDEWALKS (PERVIOUS)	SY	$25	5,200	$130,000
		DRIVEWAYS	SY	$75	500	$37,500
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL	LS	$388,400	1	$388,400
	5a.	**OTHER ITEMS**				
		SURVEYING	LS	$122,400	1	$122,400
		SPECIAL ITEMS	EST	$0	1	$0
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**MISCELLANEOUS (0%)**	LS	$0	1	$0
7		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$8,277,650**
8		**MOBILIZATION**				
		10.00% OF ITEM 7	EST	$828,000	1	$828,000
9		**SUBTOTAL (ITEMS 7 & 8)**				**$9,105,650**
10		**SALES TAX**				
		0.0% OF (% OF ITEM 9)	EST	$0	1	$0
11		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
12		**SUBTOTAL (ITEMS 9 THRU 11)**				**$9,105,650**

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description: Sahalee Way: 3-Lane - Base w/ Bus Pullouts
Corridor Section: NE 25th Way to Sammamish City Limit
Location: Sammamish, WA

Client: City of Sammamish
Date: July-15
Date of Cost Index: 2015
Calculated By/Entered By: BMP 9/21/2015
Checked By:

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
13		**CONSTRUCTION**				
		ENGINEERING (12% OF ITEM 12)	EST	$1,093,000	1	$1,093,000
		CONTINGENCIES (30% OF ITEM 12)	EST	$2,732,000	1	$2,732,000
14		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$12,930,650**
III.		**PRELIMINARY ENGINEERING**				
		(12% OF ITEM 14)	EST	$1,421,000	1	$1,421,000
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$14,480,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.04	2018	2015	**$16,290,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description: Sahalee Way: 3-Lane - Base w/ Raised Island
Corridor Section: NE 25th Way to Sammamish City Limit
Location: Sammamish, WA

Client: City of Sammamish
Date: July-15
Date of Cost Index: 2015
Calculated By/Entered By: BMP 9/21/2015
Checked By:

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (PARTIAL ACQUISITION)	LS	$20,000	1	$20,000
		RIGHT OF WAY (FULL ACQUISITION)	LS	$0	1	$0
		CONSTRUCTION EASEMENTS	SF	$5	12,700	$63,500
		RIGHT OF WAY TOTAL				**$83,500**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB, DEMO	ACRE	$10,000	4.9	$49,000
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$0	1	$0
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	26,500	$530,000
		PLANING BITUMINIOUS PAVEMENT	SY	$2	33,400	$66,800
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$18	24,700	$444,600
	1.3	**STORMWATER MITIGATION**	LS	$1,173,700	1	$1,173,700
	1.4	**STORM DRAINAGE CONVEYANCE**	LS	$1,873,950	1	$1,873,950
2		**STRUCTURE**				
		CONCRETE BRIDGES	SF	$250	-	$0
		CONCRETE BRIDGES WIDENING	SF	$350	-	$0
		APPROACH SLAB	SY	$140	-	$0
		BRIDGE EMBANKMENT	CY	$50	-	$0
		GRAVITY BLOCK WALL (CUT)	SF	$40	9,200	$368,000
		CAST-IN-PLACE CONCRETE WALL (CUT)	SF	$80	900	$72,000
		CANTELIEVER SOLDIER PILE WALL (CUT)	SF	$125	-	$0
		SOLDIER PILE TIEBACK WALL (CUT)	SF	$180	-	$0
		MECHANICALLY STABILIZED EARTH WALL (FILL)	SF	$35	11,000	$385,000
		BRIDGE REMOVAL	SF	$40	-	$0
		CULVERT	LF	$1,750	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$12	-	$0
		HOT MIX ASPHALT	TON	$100	7,300	$730,000
		CRUSHED SURFACING	TON	$35	4,300	$150,500
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	2,300	$34,500
		HANDRAIL	LF	$100	1,800	$180,000
		SEEDING, MULCHING & FERTILIZING	LS	$93,000	1	$93,000
		WETLAND MITIGATION	LS	$0	1	$0
		ENVIRONMENTAL PERMITS	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL	LS	$149,700	1	$149,700
		LANDSCAPING	LS	$253,000	1	$253,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$18	3,100	$55,800
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$450,000	1	$450,000
		ILLUMINATION	LS	$132,700	1	$132,700
		SIGNING	LS	$58,000	1	$58,000
		CURBS	LF	$15	9,900	$148,500
		CURB RAMPS	EA	$1,500	45	$67,500
		SIDEWALKS (PERVIOUS)	SY	$25	5,200	$130,000
		DRIVEWAYS	SY	$75	500	$37,500
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL	LS	$381,700	1	$381,700
	5a.	**OTHER ITEMS**				
		SURVEYING	LS	$120,300	1	$120,300
		SPECIAL ITEMS	EST	$0	1	$0
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**MISCELLANEOUS (0%)**	LS	$0	1	$0
7		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$8,135,750**
8		**MOBILIZATION**				
		10.00% OF ITEM 7	EST	$814,000	1	$814,000
9		**SUBTOTAL (ITEMS 7 & 8)**				**$8,949,750**
10		**SALES TAX**				
		0.0% OF (% OF ITEM 9)	EST	$0	1	$0
11		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
12		**SUBTOTAL (ITEMS 9 THRU 11)**				**$8,949,750**

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Sahalee Way: 3-Lane - Base w/ Raised Island	Client:	City of Sammamish
Corridor Section:	NE 25th Way to Sammamish City Limit	Date:	July-15
Location:	Sammamish, WA	Date of Cost Index:	2015
		Calculated By/Entered By:	BMP 9/21/2015
		Checked By:	

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
13		**CONSTRUCTION**				
		ENGINEERING (12% OF ITEM 12)	EST	$1,074,000	1	$1,074,000
		CONTINGENCIES (30% OF ITEM 12)	EST	$2,685,000	1	$2,685,000
14		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$12,708,750**
III.		**PRELIMINARY ENGINEERING**				
		(12% OF ITEM 14)	EST	$1,526,000	1	$1,526,000
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$14,320,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.04	2018	2015	**$16,110,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description: Sahalee Way: 3-Lane - Base w/ Full-Width Medians
Corridor Section: NE 25th Way to Sammamish City Limit
Location: Sammamish, WA

Client: City of Sammamish
Date: July-15
Date of Cost Index: 2015
Calculated By/Entered By: BMP 9/21/2015
Checked By:

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (PARTIAL ACQUISITION)	LS	$20,000	1	$20,000
		RIGHT OF WAY (FULL ACQUISITION)	LS	$0	1	$0
		CONSTRUCTION EASEMENTS	SF	$5	13,700	$68,500
		RIGHT OF WAY TOTAL				**$88,500**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB, DEMO	ACRE	$10,000	6.0	$60,000
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$0	1	$0
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	25,400	$508,000
		PLANING BITUMINIOUS PAVEMENT	SY	$2	40,700	$81,400
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$18	24,200	$435,600
	1.3	**STORMWATER MITIGATION**	LS	$1,674,100	1	$1,674,100
	1.4	**STORM DRAINAGE CONVEYANCE**	LS	$2,103,450	1	$2,103,450
2		**STRUCTURE**				
		CONCRETE BRIDGES	SF	$250	-	$0
		CONCRETE BRIDGES WIDENING	SF	$350	-	$0
		APPROACH SLAB	SY	$140	-	$0
		BRIDGE EMBANKMENT	CY	$50	-	$0
		GRAVITY BLOCK WALL (CUT)	SF	$40	7,100	$284,000
		CAST-IN-PLACE CONCRETE WALL (CUT)	SF	$80	6,000	$480,000
		CANTELIEVER SOLDIER PILE WALL (CUT)	SF	$125	-	$0
		SOLDIER PILE TIEBACK WALL (CUT)	SF	$180	-	$0
		MECHANICALLY STABILIZED EARTH WALL (FILL)	SF	$35	13,800	$483,000
		BRIDGE REMOVAL	SF	$40	-	$0
		CULVERT	LF	$1,750	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$12	-	$0
		HOT MIX ASPHALT	TON	$100	10,000	$1,000,000
		CRUSHED SURFACING	TON	$35	5,600	$196,000
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	2,500	$37,500
		HANDRAIL	LF	$100	1,800	$180,000
		SEEDING, MULCHING & FERTILIZING	LS	$114,000	1	$114,000
		WETLAND MITIGATION	LS	$0	1	$0
		ENVIRONMENTAL PERMITS	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL	LS	$178,200	1	$178,200
		LANDSCAPING	LS	$172,000	1	$172,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$18	4,200	$75,600
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$450,000	1	$450,000
		ILLUMINATION	LS	$157,100	1	$157,100
		SIGNING	LS	$65,000	1	$65,000
		CURBS	LF	$15	7,800	$117,000
		CURB RAMPS	EA	$1,500	45	$67,500
		SIDEWALKS (PERVIOUS)	SY	$25	5,200	$130,000
		DRIVEWAYS	SY	$75	500	$37,500
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL	LS	$454,400	1	$454,400
	5a.	**OTHER ITEMS**				
		SURVEYING	LS	$143,200	1	$143,200
		SPECIAL ITEMS	EST	$0	1	$0
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**MISCELLANEOUS (0%)**	LS	$0	1	$0
7		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$9,684,550**
8		**MOBILIZATION**				
		10.00% OF ITEM 7	EST	$969,000	1	$969,000
9		**SUBTOTAL (ITEMS 7 & 8)**				**$10,653,550**
10		**SALES TAX**				
		0.0% OF (% OF ITEM 9)	EST	$0	1	$0
11		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
12		**SUBTOTAL (ITEMS 9 THRU 11)**				**$10,653,550**

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Sahalee Way: 3-Lane - Base w/ Full-Width Medians	Client:	City of Sammamish
Corridor Section:	NE 25th Way to Sammamish City Limit	Date:	July-15
Location:	Sammamish, WA	Date of Cost Index:	2015
		Calculated By/Entered By:	BMP 9/21/2015
		Checked By:	

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
13		**CONSTRUCTION**				
		ENGINEERING (12% OF ITEM 12)	EST	$1,279,000	1	$1,279,000
		CONTINGENCIES (30% OF ITEM 12)	EST	$3,197,000	1	$3,197,000
14		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$15,129,550**
III.		**PRELIMINARY ENGINEERING**				
		(12% OF ITEM 14)	EST	$1,663,000	1	$1,663,000
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$16,890,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.04	2018	2015	**$19,000,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description: Sahalee Way: 3-Lane - Base w/ 5' Planter Strips
Corridor Section: NE 25th Way to Sammamish City Limit
Location: Sammamish, WA

Client: City of Sammamish
Date: July-15
Date of Cost Index: 2015
Calculated By/Entered By: BMP 9/21/2015
Checked By:

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (PARTIAL ACQUISITION)	LS	$20,000	1	$20,000
		RIGHT OF WAY (FULL ACQUISITION)	LS	$0	1	$0
		CONSTRUCTION EASEMENTS	SF	$5	12,700	$63,500
		RIGHT OF WAY TOTAL				**$83,500**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB, DEMO	ACRE	$10,000	4.9	$49,000
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$0	1	$0
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	28,700	$574,000
		PLANING BITUMINIOUS PAVEMENT	SY	$2	33,400	$66,800
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$18	24,100	$433,800
	1.3	**STORMWATER MITIGATION**	LS	$1,303,100	1	$1,303,100
	1.4	**STORM DRAINAGE CONVEYANCE**	LS	$1,873,950	1	$1,873,950
2		**STRUCTURE**				
		CONCRETE BRIDGES	SF	$250	-	$0
		CONCRETE BRIDGES WIDENING	SF	$350	-	$0
		APPROACH SLAB	SY	$140	-	$0
		BRIDGE EMBANKMENT	CY	$50	-	$0
		GRAVITY BLOCK WALL (CUT)	SF	$40	9,400	$376,000
		CAST-IN-PLACE CONCRETE WALL (CUT)	SF	$80	3,300	$264,000
		CANTELIEVER SOLDIER PILE WALL (CUT)	SF	$125	-	$0
		SOLDIER PILE TIEBACK WALL (CUT)	SF	$180	-	$0
		MECHANICALLY STABILIZED EARTH WALL (FILL)	SF	$35	13,100	$458,500
		BRIDGE REMOVAL	SF	$40	-	$0
		CULVERT	LF	$1,750	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$12	-	$0
		HOT MIX ASPHALT	TON	$100	7,400	$740,000
		CRUSHED SURFACING	TON	$35	4,300	$150,500
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	2,300	$34,500
		HANDRAIL	LF	$100	1,800	$180,000
		SEEDING, MULCHING & FERTILIZING	LS	$93,000	1	$93,000
		WETLAND MITIGATION	LS	$0	1	$0
		ENVIRONMENTAL PERMITS	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL	LS	$158,100	1	$158,100
		LANDSCAPING	LS	$281,000	1	$281,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$18	3,100	$55,800
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$450,000	1	$450,000
		ILLUMINATION	LS	$132,700	1	$132,700
		SIGNING	LS	$58,000	1	$58,000
		CURBS	LF	$15	6,100	$91,500
		CURB RAMPS	EA	$1,500	45	$67,500
		SIDEWALKS (PERVIOUS)	SY	$25	5,200	$130,000
		DRIVEWAYS	SY	$75	500	$37,500
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL	LS	$403,000	1	$403,000
	5a.	**OTHER ITEMS**				
		SURVEYING	LS	$127,000	1	$127,000
		SPECIAL ITEMS	EST	$0	1	$0
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**MISCELLANEOUS (0%)**	LS	$0	1	$0
7		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$8,589,250**
8		**MOBILIZATION**				
		10.00% OF ITEM 7	EST	$859,000	1	$859,000
9		**SUBTOTAL (ITEMS 7 & 8)**				**$9,448,250**
10		**SALES TAX**				
		0.0% OF (% OF ITEM 9)	EST	$0	1	$0
11		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
12		**SUBTOTAL (ITEMS 9 THRU 11)**				**$9,448,250**

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Sahalee Way: 3-Lane - Base w/ 5' Planter Strips	Client:	City of Sammamish
Corridor Section:	NE 25th Way to Sammamish City Limit	Date:	July-15
Location:	Sammamish, WA	Date of Cost Index:	2015
		Calculated By/Entered By:	BMP 9/21/2015
		Checked By:	

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
13		**CONSTRUCTION**				
		ENGINEERING (12% OF ITEM 12)	EST	$1,134,000	1	$1,134,000
		CONTINGENCIES (30% OF ITEM 12)	EST	$2,835,000	1	$2,835,000
14		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$13,417,250**
III.		**PRELIMINARY ENGINEERING**				
		(12% OF ITEM 14)	EST	$1,474,000	1	$1,474,000
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$14,980,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.04	2018	2015	**$16,860,000**

The above opinion of cost is a planning level estimate only. It is based on best available information and scope at the time, not on the results of a detailed engineering study, and is supplied as a budgeting guide only. Perteet, Inc. does not guarantee or warrant the accuracy of this planning level estimate.

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description: Sahalee Way: 3-Lane - Right Turn at NE 28th Place
Corridor Section: NE 25th Way to Sammamish City Limit
Location: Sammamish, WA

Client: City of Sammamish
Date: July-15
Date of Cost Index: 2015
Calculated By/Entered By: BMP 9/21/2015
Checked By:

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (PARTIAL ACQUISITION)	LS	$100,000	1	$100,000
		RIGHT OF WAY (FULL ACQUISITION)	LS	$0	1	$0
		CONSTRUCTION EASEMENTS	SF	$5	16,500	$82,500
		RIGHT OF WAY TOTAL				**$182,500**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB, DEMO	ACRE	$10,000	4.9	$49,000
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$0	1	$0
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	27,800	$556,000
		PLANING BITUMINIOUS PAVEMENT	SY	$2	33,400	$66,800
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$18	24,200	$435,600
	1.3	**STORMWATER MITIGATION**	LS	$1,351,000	1	$1,351,000
	1.4	**STORM DRAINAGE CONVEYANCE**	LS	$1,873,950	1	$1,873,950
2		**STRUCTURE**				
		CONCRETE BRIDGES	SF	$250	-	$0
		CONCRETE BRIDGES WIDENING	SF	$350	-	$0
		APPROACH SLAB	SY	$140	-	$0
		BRIDGE EMBANKMENT	CY	$50	-	$0
		GRAVITY BLOCK WALL (CUT)	SF	$40	11,400	$456,000
		CAST-IN-PLACE CONCRETE WALL (CUT)	SF	$80	900	$72,000
		CANTELIEVER SOLDIER PILE WALL (CUT)	SF	$125	-	$0
		SOLDIER PILE TIEBACK WALL (CUT)	SF	$180	-	$0
		MECHANICALLY STABILIZED EARTH WALL (FILL)	SF	$35	11,000	$385,000
		BRIDGE REMOVAL	SF	$40	-	$0
		CULVERT	LF	$1,750	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$12	-	$0
		HOT MIX ASPHALT	TON	$100	7,600	$760,000
		CRUSHED SURFACING	TON	$35	4,400	$154,000
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	2,700	$40,500
		HANDRAIL	LF	$100	1,800	$180,000
		SEEDING, MULCHING & FERTILIZING	LS	$93,000	1	$93,000
		WETLAND MITIGATION	LS	$0	1	$0
		ENVIRONMENTAL PERMITS	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL	LS	$153,400	1	$153,400
		LANDSCAPING	LS	$171,000	1	$171,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$18	3,100	$55,800
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$450,000	1	$450,000
		ILLUMINATION	LS	$132,700	1	$132,700
		SIGNING	LS	$58,000	1	$58,000
		CURBS	LF	$15	6,100	$91,500
		CURB RAMPS	EA	$1,500	45	$67,500
		SIDEWALKS (PERVIOUS)	SY	$25	5,200	$130,000
		DRIVEWAYS	SY	$75	500	$37,500
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL	LS	$391,100	1	$391,100
	5a.	**OTHER ITEMS**				
		SURVEYING	LS	$123,200	1	$123,200
		SPECIAL ITEMS	EST	$0	1	$0
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**MISCELLANEOUS (0%)**	LS	$0	1	$0
7		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$8,334,550**
8		**MOBILIZATION**				
		10.00% OF ITEM 7	EST	$834,000	1	$834,000
9		**SUBTOTAL (ITEMS 7 & 8)**				**$9,168,550**
10		**SALES TAX**				
		0.0% OF (% OF ITEM 9)	EST	$0	1	$0
11		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
12		**SUBTOTAL (ITEMS 9 THRU 11)**				**$9,168,550**

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Sahalee Way: 3-Lane - Right Turn at NE 28th Place	Client:	City of Sammamish
Corridor Section:	NE 25th Way to Sammamish City Limit	Date:	July-15
Location:	Sammamish, WA	Date of Cost Index:	2015
		Calculated By/Entered By:	BMP 9/21/2015
		Checked By:	

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
13		**CONSTRUCTION**				
		ENGINEERING (12% OF ITEM 12)	EST	$1,101,000	1	$1,101,000
		CONTINGENCIES (30% OF ITEM 12)	EST	$2,751,000	1	$2,751,000
14		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$13,020,550**
III.		**PRELIMINARY ENGINEERING**				
		(12% OF ITEM 14)	EST	$1,431,000	1	$1,431,000
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$14,640,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.04	2018	2015	**$16,470,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description: Sahalee Way: 3-Lane - Base w/ Climbing Lane (Sammamish)
Corridor Section: NE 25th Way to Sammamish City Limit
Location: Sammamish, WA

Client: City of Sammamish
Date: July-15
Date of Cost Index: 2015
Calculated By/Entered By: BMP 9/21/2015
Checked By:

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (PARTIAL ACQUISITION)	LS	$20,000	1	$20,000
		RIGHT OF WAY (FULL ACQUISITION)	LS	$0	1	$0
		CONSTRUCTION EASEMENTS	SF	$5	17,900	$89,500
		RIGHT OF WAY TOTAL				**$109,500**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB, DEMO	ACRE	$10,000	6.5	$65,000
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$0	1	$0
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	32,400	$648,000
		PLANING BITUMINIOUS PAVEMENT	SY	$2	40,700	$81,400
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$18	25,000	$450,000
	1.3	**STORMWATER MITIGATION**	LS	$1,536,500	1	$1,536,500
	1.4	**STORM DRAINAGE CONVEYANCE**	LS	$2,143,050	1	$2,143,050
2		**STRUCTURE**				
		CONCRETE BRIDGES	SF	$250	-	$0
		CONCRETE BRIDGES WIDENING	SF	$350	-	$0
		APPROACH SLAB	SY	$140	-	$0
		BRIDGE EMBANKMENT	CY	$50	-	$0
		GRAVITY BLOCK WALL (CUT)	SF	$40	11,500	$460,000
		CAST-IN-PLACE CONCRETE WALL (CUT)	SF	$80	6,600	$528,000
		CANTELIEVER SOLDIER PILE WALL (CUT)	SF	$125	-	$0
		SOLDIER PILE TIEBACK WALL (CUT)	SF	$180	-	$0
		MECHANICALLY STABILIZED EARTH WALL (FILL)	SF	$35	16,500	$577,500
		BRIDGE REMOVAL	SF	$40	-	$0
		CULVERT	LF	$1,750	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$12	-	$0
		HOT MIX ASPHALT	TON	$100	9,200	$920,000
		CRUSHED SURFACING	TON	$35	5,200	$182,000
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	3,300	$49,500
		HANDRAIL	LF	$100	2,400	$240,000
		SEEDING, MULCHING & FERTILIZING	LS	$114,000	1	$114,000
		WETLAND MITIGATION	LS	$0	1	$0
		ENVIRONMENTAL PERMITS	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL	LS	$185,400	1	$185,400
		LANDSCAPING	LS	$172,000	1	$172,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$18	4,200	$75,600
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$450,000	1	$450,000
		ILLUMINATION	LS	$157,100	1	$157,100
		SIGNING	LS	$65,000	1	$65,000
		CURBS	LF	$15	7,800	$117,000
		CURB RAMPS	EA	$1,500	45	$67,500
		SIDEWALKS	SY	$25	5,200	$130,000
		DRIVEWAYS	SY	$75	500	$37,500
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL	LS	$472,700	1	$472,700
	5a.	**OTHER ITEMS**				
		SURVEYING	LS	$148,900	1	$148,900
		SPECIAL ITEMS	EST	$0	1	$0
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**MISCELLANEOUS (0%)**	LS	$0	1	$0
7		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$10,073,650**
8		**MOBILIZATION**				
		10.00% OF ITEM 7	EST	$1,008,000	1	$1,008,000
9		**SUBTOTAL (ITEMS 7 & 8)**				**$11,081,650**
10		**SALES TAX**				
		0.0% OF (% OF ITEM 9)	EST	$0	1	$0
11		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
12		**SUBTOTAL (ITEMS 9 THRU 11)**				**$11,081,650**

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Sahalee Way: 3-Lane - Base w/ Climbing Lane (Sammamish)	Client:	City of Sammamish
Corridor Section:	NE 25th Way to Sammamish City Limit	Date:	July-15
Location:	Sammamish, WA	Date of Cost Index:	2015
		Calculated By/Entered By:	BMP 9/21/2015
		Checked By:	

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
13		**CONSTRUCTION**				
		ENGINEERING (12% OF ITEM 12)	EST	$1,330,000	1	$1,330,000
		CONTINGENCIES (30% OF ITEM 12)	EST	$3,325,000	1	$3,325,000
14		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$15,736,650**
III.		**PRELIMINARY ENGINEERING**				
		(12% OF ITEM 14)	EST	$1,729,000	1	$1,729,000
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$17,580,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.04	2018	2015	**$19,780,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description: Sahalee Way: 3-Lane Base w/ Truck Climbing Lane
Corridor Section: Sammamish City Limit to SR 202
Location: King County, WA

Client: City of Sammamish
Date: July-15
Date of Cost Index: 2015
Calculated By/Entered By: BMP 8/27/2015
Checked By:

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (PARTIAL ACQUISITION)	LS	$0	1	$0
		RIGHT OF WAY (FULL ACQUISITION)	LS	$0	1	$0
		CONSTRUCTION EASEMENTS	SF	$5	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB, DEMO	ACRE	$10,000	0.7	$7,000
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$0	1	$0
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	1,900	$38,000
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$18	700	$12,600
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$10	15,600	$156,000
	1.4	**STORM DRAINAGE CONVEYANCE**	LS	$253,800	1	$253,800
2		**STRUCTURE**				
		CONCRETE BRIDGES	SF	$250	-	$0
		CONCRETE BRIDGES WIDENING	SF	$350	-	$0
		APPROACH SLAB	SY	$140	-	$0
		BRIDGE EMBANKMENT	CY	$50	-	$0
		CAST-IN-PLACE CONCRETE WALL (CUT)	SF	$80	7,900	$632,000
		CANTELIEVER SOLDIER PILE WALL (CUT)	SF	$125	-	$0
		SOLDIER PILE TIEBACK WALL (CUT)	SF	$180	-	$0
		MECHANICALLY STABILIZED EARTH WALL (FILL)	SF	$35	-	$0
		BRIDGE REMOVAL	SF	$40	-	$0
		CULVERT	LF	$1,750	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$12	-	$0
		HOT MIX ASPHALT	TON	$100	1,100	$110,000
		CRUSHED SURFACING	TON	$35	600	$21,000
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	800	$12,000
		SEEDING, MULCHING & FERTILIZING	LS	$17,000	1	$17,000
		WETLAND MITIGATION	LS	$0	1	$0
		ENVIRONMENTAL PERMITS	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL	LS	$25,400	1	$25,400
		LANDSCAPING	LS	$0	1	$0
5		**TRAFFIC**				
		GUARD RAIL	LF	$18	-	$0
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$0	1	$0
		ILLUMINATION	LS	$0	1	$0
		SIGNING	LS	$7,000	1	$7,000
		CURBS	LF	$15	-	$0
		CURB RAMPS	EA	$1,500	-	$0
		SIDEWALKS	SY	$25	-	$0
		DRIVEWAYS	SY	$75	-	$0
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL	LS	$64,600	1	$64,600
	5a.	**OTHER ITEMS**				
		SURVEYING	LS	$20,400	1	$20,400
		SPECIAL ITEMS	EST	$0	1	$0
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**MISCELLANEOUS (0%)**	LS	$0	1	$0
7		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$1,376,800**
8		**MOBILIZATION**				
		10.00% OF ITEM 7	EST	$138,000	1	$138,000
9		**SUBTOTAL (ITEMS 7 & 8)**				**$1,514,800**
10		**SALES TAX**				
		0.0% OF (% OF ITEM 9)	EST	$0	1	$0
11		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
12		**SUBTOTAL (ITEMS 9 THRU 11)**				**$1,514,800**
13		**CONSTRUCTION**				
		ENGINEERING (12% OF ITEM 12)	EST	$182,000	1	$182,000

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Sahalee Way: 3-Lane Base w/ Truck Climbing Lane	Client:	City of Sammamish
Corridor Section:	Sammamish City Limit to SR 202	Date:	July-15
Location:	King County, WA	Date of Cost Index:	2015
		Calculated By/Entered By:	BMP 8/27/2015
		Checked By:	

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		CONTINGENCIES (30% OF ITEM 12)	EST	$455,000	1	$455,000
14		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$2,151,800**
III.		**PRELIMINARY ENGINEERING**				
		(12% OF ITEM 14)	EST	$237,000	1	$237,000
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$2,390,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.04	2018	2015	**$2,690,000**

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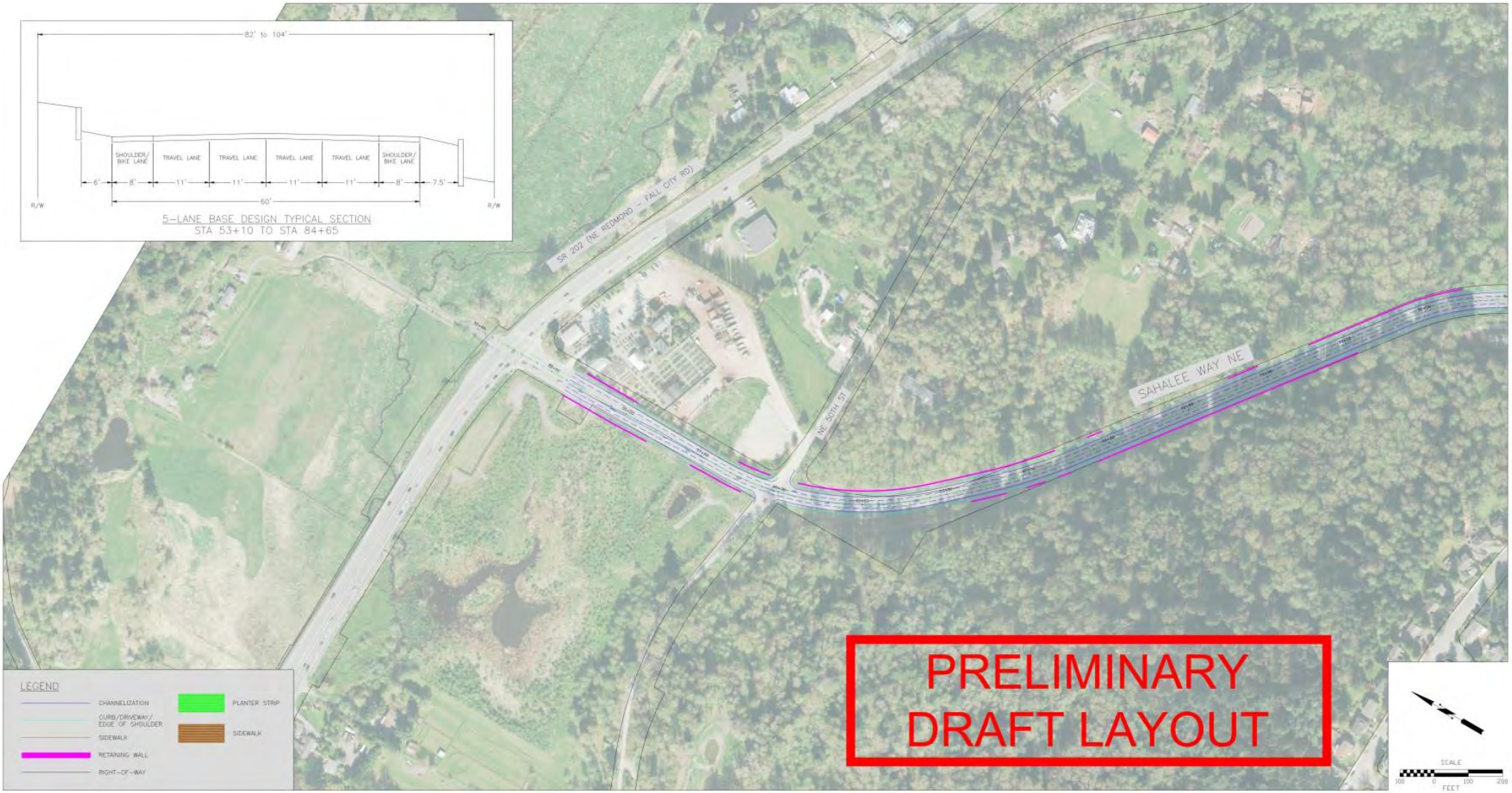
Appendix E

Five-Lane Design Preliminary Layout



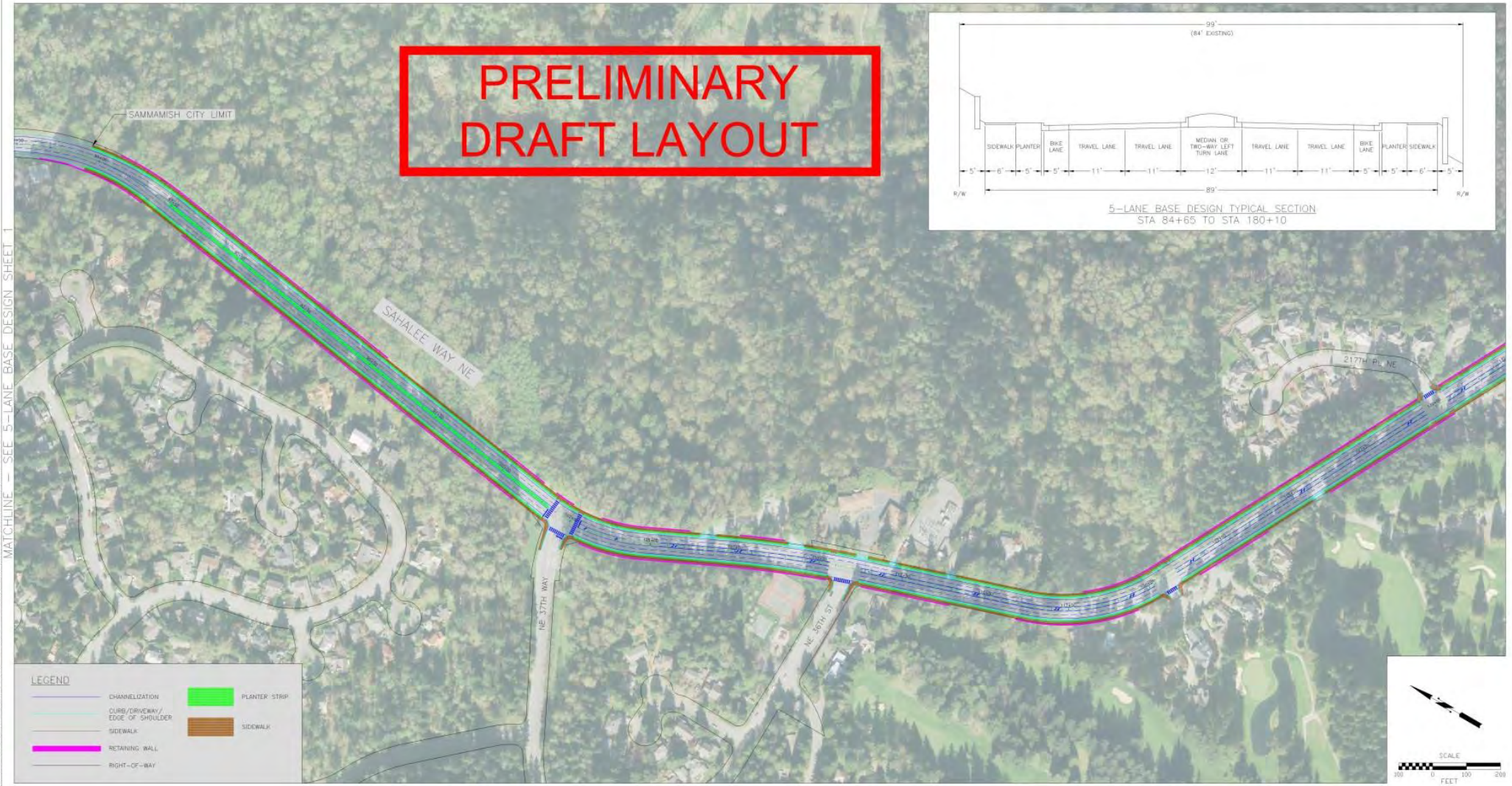
Sep 22, 2015 - 1:29pm BPowell C:\Projects\SharePoint\Sahalee Way Corridor Improvem - Doc\CAD\Exhibits\DSGN Plot 5 LANE.dwg Layout Name: DSGN Plot 1

No.	Date	Revision	By	Appr.

Perteet
425-252-7700 I 1-800-615-9900
2707 Colby Avenue, Suite 900
Everett, Washington 98201

Drawn By: BMF	Date: 9/22/15	SCALE	CITY OF SAMMAMISH
Designed By: BMF	9/22/15	Horiz: 1"=100'	SAHALEE WAY CORRIDOR WIDENING
Checked By: JAT	9/22/15	Vert: NONE	5-LANE BASE DESIGN
Approved By:		Project Number	Drawing No. / Sheet No. 1 of 3

PRELIMINARY DRAFT LAYOUT



MATCHLINE – SEE 5-LANE BASE DESIGN SHEET 1

MATCHLINE – SEE 5-LANE BASE DESIGN SHEET 3

Sep 22, 2015 - 1:51pm BPowell C:\Projects\SharePoint\Sahalee Way Corridor Improvem - Doc\CAD\Exhibits\DSGN Plot 5 LANE.dwg Layout Name: DSGN Plot 2

No.	Date	Revision	By	Appr.

Perteet
425-252-7700 | 1-800-615-9900
2707 Colby Avenue, Suite 900
Everett, Washington 98201

Drawn By: BMF	Date: 9/22/15	SCALE
Designed By: BMF	9/22/15	Horiz: 1"=100'
Checked By: JAT	9/22/15	Vert: NONE
Approved By:		Project Number

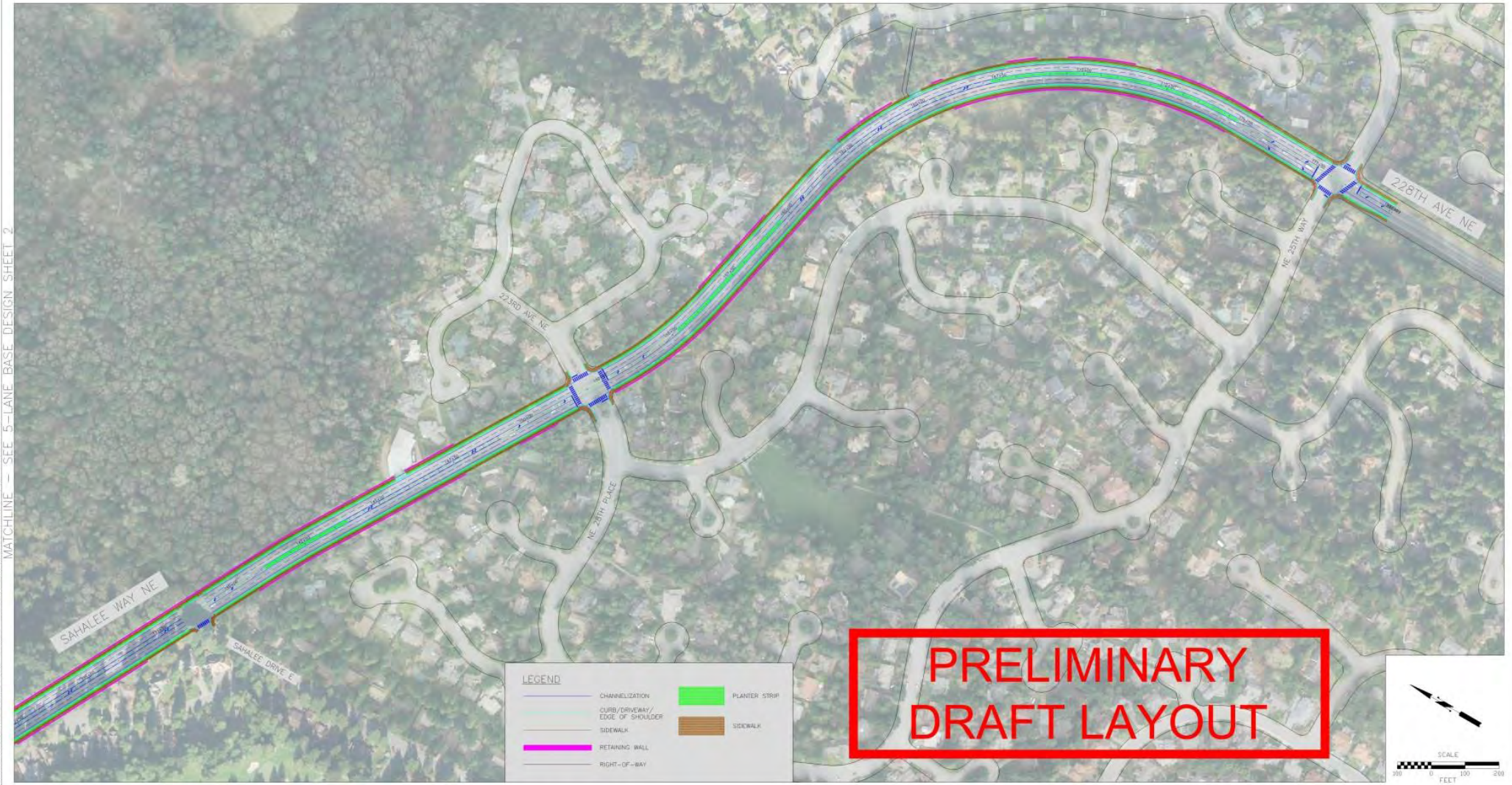
CITY OF SAMMAMISH

SAHALEE WAY CORRIDOR WIDENING

5-LANE BASE DESIGN

Drawing No.

Sheet No. 2 of 3 Total



MATCHLINE – SEE 5-LANE BASE DESIGN SHEET 2

Sep 22, 2015 - 1:54pm BPowell C:\Projects\SharePoint\Sahalee Way Corridor Improvem - Doc\CAD\Exhibits\DSGN Plot 5 LANE.dwg Layout Name: DSGN Plot 3

No.	Date	Revision	By	Appr.

Perteet
425-252-7700 | 1-800-615-9900
2707 Colby Avenue, Suite 900
Everett, Washington 98201

Drawn By: BMP	Date: 9/22/15	SCALE	CITY OF SAMMAMISH
Designed By: BMP	9/22/15	Horiz: 1"=100'	SAHALEE WAY CORRIDOR WIDENING
Checked By: JAT	9/22/15	Vert: NONE	5-LANE BASE DESIGN
Approved By:		Project Number	Drawing No. / Sheet No. 3 of Total 3

Appendix F

Five-Lane Design Preliminary Cost Estimates

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description: Sahalee Way: 5-Lane Baseline
Corridor Section: Sammamish City Limit to SR 202
Location: King County, WA

Client: City of Sammamish
Date: July-15
Date of Cost Index: 2015
Calculated By/Entered By: BMP 8/24/2015
Checked By:

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (PARTIAL ACQUISITION)	LS	$40,000	1	$40,000
		RIGHT OF WAY (FULL ACQUISITION)	LS	$0	1	$0
		CONSTRUCTION EASEMENTS	SF	$5	4,200	$21,000
		RIGHT OF WAY TOTAL				**$61,000**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB, DEMO	ACRE	$10,000	2.8	$28,000
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$0	1	$0
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	14,500	$290,000
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$18	13,800	$248,400
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$10	189,500	$1,895,000
	1.4	**STORM DRAINAGE CONVEYANCE**	LS	$412,300	1	$412,300
2		**STRUCTURE**				
		CONCRETE BRIDGES	SF	$250	-	$0
		CONCRETE BRIDGES WIDENING	SF	$350	-	$0
		APPROACH SLAB	SY	$140	-	$0
		BRIDGE EMBANKMENT	CY	$50	-	$0
		MODULAR BLOCK WALL (CUT)	SF	$35	1,100	$38,500
		SOLDIER PILE WALL W/ CONCRETE FACING (CUT)	SF	$125	9,600	$1,200,000
		SOLDIER PILE WALL W/ CONCRETE FACING (CUT)	SF	$150	3,300	$495,000
		MECHANICALLY STABILIZED EARTH WALL (FILL)	SF	$45	3,200	$144,000
		SOLDIER PILE WALL W/ CONCRETE FACING (FILL)	SF	$45	9,600	$432,000
		SOLDIER PILE WALL W/ CONCRETE FACING (FILL)	SF	$45	-	$0
		BRIDGE REMOVAL	SF	$40	-	$0
		CULVERT	LF	$1,750	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$12	-	$0
		HOT MIX ASPHALT	TON	$100	11,600	$1,160,000
		CRUSHED SURFACING	TON	$35	6,500	$227,500
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	LS	$76,000	1	$76,000
		WETLAND MITIGATION	LS	$0	1	$0
		ENVIRONMENTAL PERMITS	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL	LS	$144,400	1	$144,400
		LANDSCAPING	LS	$0	1	$0
5		**TRAFFIC**				
		GUARD RAIL	LF	$18	2,100	$37,800
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$0	1	$0
		ILLUMINATION	LS	$519,800	1	$519,800
		SIGNING	LS	$12,000	1	$12,000
		CURBS	LF	$15	-	$0
		CURB RAMPS	EA	$1,500	-	$0
		SIDEWALKS	SY	$25	-	$0
		DRIVEWAYS	SY	$75	-	$0
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL	LS	$368,100	1	$368,100
	5a.	**OTHER ITEMS**				
		SURVEYING	LS	$116,000	1	$116,000
		SPECIAL ITEMS	EST	$0	1	$0
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**MISCELLANEOUS (0%)**	LS	$0	1	$0
7		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$7,844,800**
8		**MOBILIZATION**				
		10.00% OF ITEM 7	EST	$785,000	1	$785,000
9		**SUBTOTAL (ITEMS 7 & 8)**				**$8,629,800**
10		**SALES TAX**				
		0.0% OF (% OF ITEM 9)	EST	$0	1	$0
11		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
12		**SUBTOTAL (ITEMS 9 THRU 11)**				**$8,629,800**

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description: Sahalee Way: 5-Lane Baseline
Corridor Section: Sammamish City Limit to SR 202
Location: King County, WA

Client: City of Sammamish
Date: July-15
Date of Cost Index: 2015
Calculated By/Entered By: BMP 8/24/2015
Checked By:

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
13		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$1,295,000	1	$1,295,000
		CONTINGENCIES (30% OF ITEM 12)	EST	$2,589,000	1	$2,589,000
14		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$12,513,800**
III.		**PRELIMINARY ENGINEERING**				
		(15% OF ITEM 14)	EST	$1,878,000	1	$1,878,000
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$14,460,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.04	2018	2015	**$16,270,000**

The above opinion of cost is a planning level estimate only. It is based on best available information and scope at the time, not on the results of a detailed engineering study, and is supplied as a budgeting guide only. Perteet, Inc. does not guarantee or warrant the accuracy of this planning level estimate.

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description: Sahalee Way: 5-Lane Baseline
Corridor Section: NE 25th Way to Sammamish City Limit
Location: Sammamish, WA

Client: City of Sammamish
Date: July-15
Date of Cost Index: 2015
Calculated By/Entered By: BMP 8/24/2015
Checked By:

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (PARTIAL ACQUISITION)	LS	$5,640,000	1	$5,640,000
		RIGHT OF WAY (FULL ACQUISITION)	LS	$0	1	$0
		CONSTRUCTION EASEMENTS	SF	$5	88,500	$442,500
		RIGHT OF WAY TOTAL				**$6,082,500**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB, DEMO	ACRE	$10,000	15.2	$152,000
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$0	1	$0
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	79,400	$1,588,000
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$18	78,200	$1,407,600
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$10	762,700	$7,627,000
	1.4	**STORM DRAINAGE CONVEYANCE**	LS	$1,447,650	1	$1,447,650
2		**STRUCTURE**				
		CONCRETE BRIDGES	SF	$250	-	$0
		CONCRETE BRIDGES WIDENING	SF	$350	-	$0
		APPROACH SLAB	SY	$140	-	$0
		BRIDGE EMBANKMENT	CY	$50	-	$0
		MODULAR BLOCK WALL (CUT)	SF	$35	8,000	$280,000
		SOLDIER PILE WALL W/ CONCRETE FACING (CUT)	SF	$125	23,400	$2,925,000
		SOLDIER PILE WALL W/ CONCRETE FACING (CUT)	SF	$150	32,200	$4,830,000
		MECHANICALLY STABILIZED EARTH WALL (FILL)	SF	$45	4,700	$211,500
		SOLDIER PILE WALL W/ CONCRETE FACING (FILL)	SF	$45	57,800	$2,601,000
		SOLDIER PILE WALL W/ CONCRETE FACING (FILL)	SF	$45	-	$0
		BRIDGE REMOVAL	SF	$40	-	$0
		CULVERT	LF	$1,750	320	$560,000
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$12	-	$0
		HOT MIX ASPHALT	TON	$100	42,400	$4,240,000
		CRUSHED SURFACING	TON	$35	24,000	$840,000
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	LS	$230,000	1	$230,000
		WETLAND MITIGATION	LS	$0	1	$0
		ENVIRONMENTAL PERMITS	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL	LS	$676,200	1	$676,200
		LANDSCAPING	LS	$1,138,000	1	$1,138,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$18	-	$0
		CONCRETE BARRIER	LF	$65	5,700	$370,500
		SIGNAL SYSTEMS	LS	$900,000	1	$900,000
		ILLUMINATION	LS	$1,548,400	1	$1,548,400
		SIGNING	LS	$43,000	1	$43,000
		CURBS	LF	$15	25,000	$375,000
		CURB RAMPS	EA	$1,500	45	$67,500
		SIDEWALKS	SY	$25	12,600	$315,000
		DRIVEWAYS	SY	$75	400	$30,000
		SC&DI (ITS)	LS	$80,000	1	$80,000
		TRAFFIC CONTROL	LS	$1,724,200	1	$1,724,200
	5a.	**OTHER ITEMS**				
		SURVEYING	LS	$543,200	1	$543,200
		SPECIAL ITEMS	EST	$0	1	$0
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**MISCELLANEOUS (0%)**	LS	$0	1	$0
7		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$36,750,750**
8		**MOBILIZATION**				
		10.00% OF ITEM 7	EST	$3,676,000	1	$3,676,000
9		**SUBTOTAL (ITEMS 7 & 8)**				**$40,426,750**
10		**SALES TAX**				
		0.0% OF (% OF ITEM 9)	EST	$0	1	$0
11		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
12		**SUBTOTAL (ITEMS 9 THRU 11)**				**$40,426,750**

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Sahalee Way: 5-Lane Baseline	Client:	City of Sammamish
Corridor Section:	NE 25th Way to Sammamish City Limit	Date:	July-15
Location:	Sammamish, WA	Date of Cost Index:	2015
		Calculated By/Entered By:	BMP 8/24/2015
		Checked By:	

ESTIMATE TEMPLATE COSTS - UPDATED AUGUST 2015

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
13		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$6,065,000	1	$6,065,000
		CONTINGENCIES (30% OF ITEM 12)	EST	$12,129,000	1	$12,129,000
14		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$58,620,750**
III.		**PRELIMINARY ENGINEERING**				
		(15% OF ITEM 14)	EST	$8,794,000	1	$8,794,000
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$73,500,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.04	2018	2015	**$82,680,000**

The above opinion of cost is a planning level estimate only. It is based on best available information and scope at the time, not on the results of a detailed engineering study, and is supplied as a budgeting guide only. Perteet, Inc. does not guarantee or warrant the accuracy of this planning level estimate.

Appendix G

Turning Movement Counts

Prepared for: **City of Sammamish**

Traffic Count Consultants, Inc.

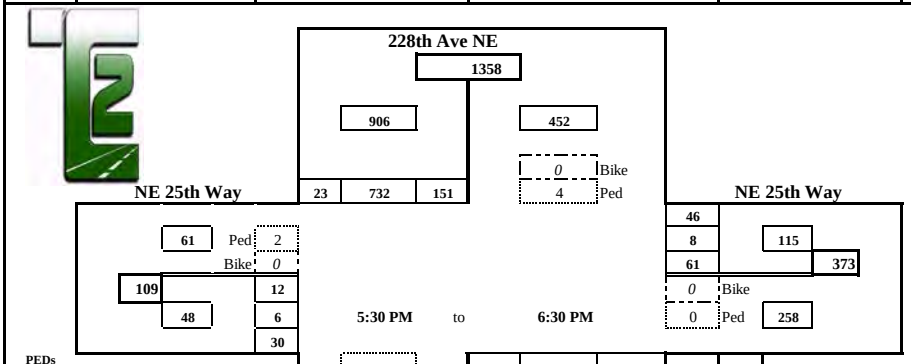
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 228th Ave NE & NE 25th Way **Date of Count:** Tues 3/25/2014

Location: Sammamish, Washington **Checked By:** Jess

Time Interval Ending at	From North on (SB) 228th Ave NE				From South on (NB) 228th Ave NE				From East on (WB) NE 25th Way				From West on (EB) NE 25th Way				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:45 P	3	24	143	4	3	8	113	19	0	8	0	15	0	14	0	19	367
5:00 P	2	33	173	2	2	12	123	27	0	21	1	15	1	8	0	7	422
5:15 P	2	18	154	4	1	14	107	26	0	10	2	11	0	3	1	6	356
5:30 P	3	25	187	5	1	9	104	24	0	11	3	12	1	6	1	14	401
5:45 P	0	36	187	3	5	7	101	25	0	17	0	12	0	4	0	4	396
6:00 P	2	35	184	9	6	5	97	23	0	16	3	14	0	4	2	8	400
6:15 P	1	39	164	4	4	8	96	28	0	19	4	9	0	1	3	7	382
6:30 P	3	41	197	7	3	10	100	25	0	9	1	11	0	3	1	11	416
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	16	251	1389	38	25	73	841	197	0	111	14	99	2	43	8	76	3140
Peak Hour: 5:30 PM to 6:30 PM																	
Total	6	151	732	23	18	30	394	101	0	61	8	46	0	12	6	30	1594
Approach	906				525				115				48				1594
%HV	0.7%				3.4%				n/a				n/a				1.5%
PHF	0.92				0.97				0.87				0.80				0.96



PEDs Across:	N	S	E	W	
INT 01		2			2
INT 02					0
INT 03				1	1
INT 04	1				1
INT 05	1				1
INT 06		4		2	6
INT 07	3	1			4
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	5	7	0	3	15

Bicycles From:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO BIKES				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

1688 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.80	n/a
Check	WB	0.87	n/a
In: 1594	NB	0.97	3.4%
Out: 1594	SB	0.92	0.7%
	T Int.	0.96	1.5%

Conditions:

Special Notes

SAM14029TM_12p

Prepared for: **City of Sammamish**

Traffic Count Consultants, Inc.

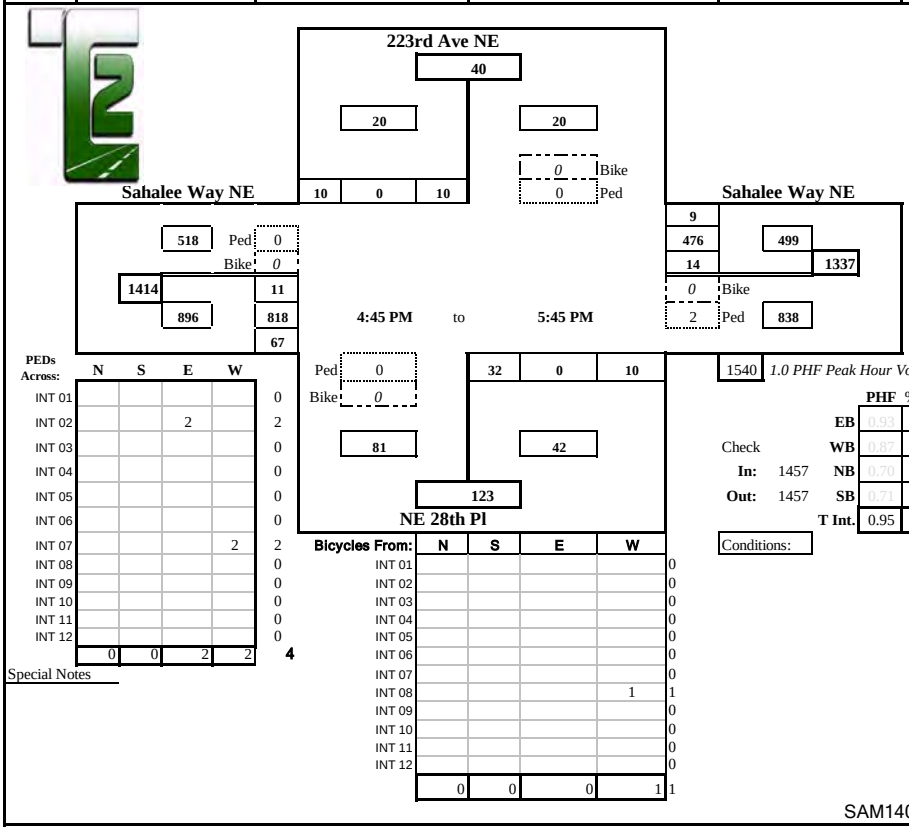
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 223rd Ave NE/NE 28th Pl & Sahalee Way NE **Date of Count:** Tues 3/25/2014

Location: Sammamish, Washington **Checked By:** Jess

Time Interval Ending at	From North on (SB) 223rd Ave NE				From South on (NB) NE 28th Pl				From East on (WB) Sahalee Way NE				From West on (EB) Sahalee Way NE				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:45 P	0	0	0	2	0	8	0	2	2	5	111	9	3	1	171	20	329
5:00 P	0	4	0	3	0	7	0	3	3	4	139	0	2	2	207	16	385
5:15 P	0	1	0	1	0	13	0	2	1	2	114	4	2	3	168	19	327
5:30 P	0	2	0	3	0	5	0	3	2	5	108	2	3	4	220	15	367
5:45 P	0	3	0	3	0	7	0	2	4	3	115	3	0	2	223	17	378
6:00 P	0	1	0	1	0	4	1	5	7	2	110	0	2	3	214	19	360
6:15 P	0	2	0	0	0	4	0	3	4	3	99	4	1	2	211	12	340
6:30 P	0	1	0	0	0	4	0	2	3	2	102	7	1	0	207	21	346
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	14	0	13	0	52	1	22	26	26	898	29	14	17	1621	139	2832
Peak Hour: 4:45 PM to 5:45 PM																	
Total	0	10	0	10	0	32	0	10	10	14	476	9	7	11	818	67	1457
Approach	20				42				499				896				1457
%HV	n/a				n/a				2.0%				0.8%				1.2%
PHF	0.71				0.70				0.87				0.93				0.95



PEDs Across:	N	S	E	W	
INT 01					0
INT 02			2		2
INT 03					0
INT 04					0
INT 05					0
INT 06					0
INT 07				2	2
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	2	2	4

Bicycles From:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06					0
INT 07					0
INT 08				1	1
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	1	1

1540 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.93	0.8%
Check	WB	0.87	2.0%
In: 1457	NB	0.70	n/a
Out: 1457	SB	0.71	n/a
	T Int.	0.95	1.2%

Conditions:

Special Notes

SAM14029TM_25p

Prepared for: **City of Sammamish**

Traffic Count Consultants, Inc.

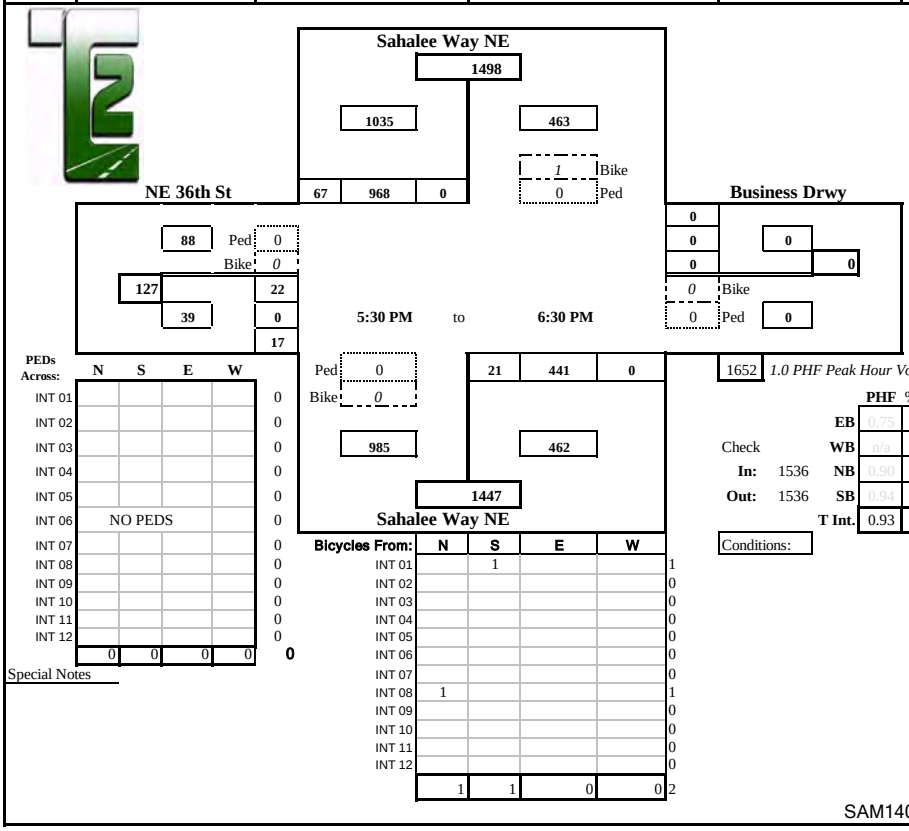
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Sahalee Way NE & NE 36th St **Date of Count:** Tues 3/25/2014

Location: Sammamish, Washington **Checked By:** Jess

Time Interval Ending at	From North on (SB) Sahalee Way NE				From South on (NB) Sahalee Way NE				From East on (WB) Business Drwy				From West on (EB) NE 36th St				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:45 P	3	0	200	14	2	5	123	0	0	0	0	0	0	6	0	4	352
5:00 P	2	0	208	18	3	7	140	1	0	0	0	1	0	11	0	6	392
5:15 P	3	0	204	14	1	5	123	0	0	0	0	0	0	4	0	1	351
5:30 P	2	0	238	21	1	8	109	0	0	0	0	0	0	7	0	1	384
5:45 P	0	0	259	16	2	1	123	0	0	0	0	0	0	3	0	4	406
6:00 P	2	0	223	13	8	4	104	0	0	0	0	0	0	3	0	5	352
6:15 P	1	0	230	22	5	8	94	0	0	0	0	0	0	7	0	4	365
6:30 P	3	0	256	16	3	8	120	0	0	0	0	0	0	9	0	4	413
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	16	0	1818	134	25	46	936	1	0	0	0	1	0	50	0	29	3015
	Peak Hour: 5:30 PM to 6:30 PM																
Total	6	0	968	67	18	21	441	0	0	0	0	0	0	22	0	17	1536
Approach	1035				462				0				39				1536
%HV	0.6%				3.9%				n/a				n/a				1.6%
PHF	0.94				0.90				n/a				0.75				0.93



1652 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.75	n/a
Check	WB	n/a	n/a
In: 1536	NB	0.90	3.9%
Out: 1536	SB	0.94	0.6%
	T Int.	0.93	1.6%

Conditions:

Special Notes

SAM14029TM_26p

Prepared for: **City of Sammamish**

Traffic Count Consultants, Inc.

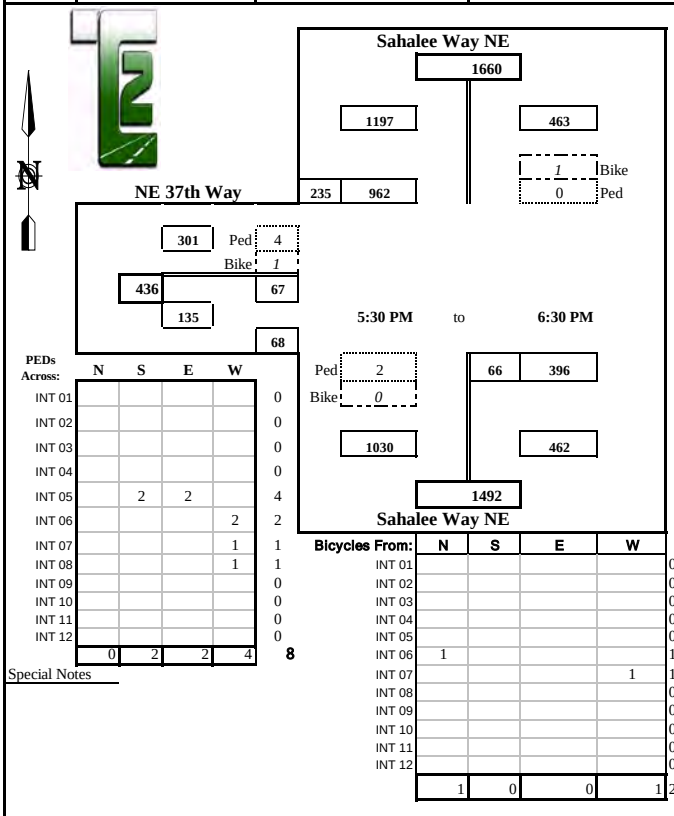
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Sahalee Way NE & NE 37th Way **Date of Count:** Tues 3/25/2014

Location: Sammamish, Washington **Checked By:** Jess

Time Interval	From North on (SB) Sahalee Way NE				From South on (NB) Sahalee Way NE				From East on (WB) 0				From West on (EB) NE 37th Way				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:45 P	2	0	201	38	2	24	106	0	0	0	0	0	0	19	0	18	406
5:00 P	3	0	201	48	3	21	133	0	0	0	0	0	0	21	0	14	438
5:15 P	2	0	206	44	1	21	101	0	0	0	0	0	0	16	0	21	409
5:30 P	2	0	235	50	2	20	101	0	0	0	0	0	0	27	0	16	449
5:45 P	1	0	242	47	2	13	111	0	0	0	0	0	0	19	0	18	450
6:00 P	1	0	216	54	8	10	98	0	0	0	0	0	0	15	0	15	408
6:15 P	1	0	236	63	5	20	86	0	0	0	0	0	1	15	0	17	437
6:30 P	3	0	268	71	3	23	101	0	0	0	0	0	0	18	0	18	499
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	15	0	1805	415	26	152	837	0	0	0	0	0	1	150	0	137	3496
Peak Hour:	5:30 PM to 6:30 PM																
Total	6	0	962	235	18	66	396	0	0	0	0	0	1	67	0	68	1794
Approach	1197				462				0				135				1794
%HV	0.5%				3.9%				n/a				0.7%				1.4%
PHF	0.88				0.93				n/a				0.91				0.90



PEDs Across:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05		2	2		4
INT 06				2	2
INT 07				1	1
INT 08				1	1
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	2	2	4	8

Bicycles From:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	1				1
INT 07				1	1
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	1	0	0	1	2

1996 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.91	0.7%
Check	WB	n/a	n/a
In: 1794	NB	0.93	3.9%
Out: 1794	SB	0.88	0.5%
	T Int.	0.90	1.4%

Conditions:

Special Notes

SAM14029TM_13p

Prepared for: **City of Sammamish**

Traffic Count Consultants, Inc.

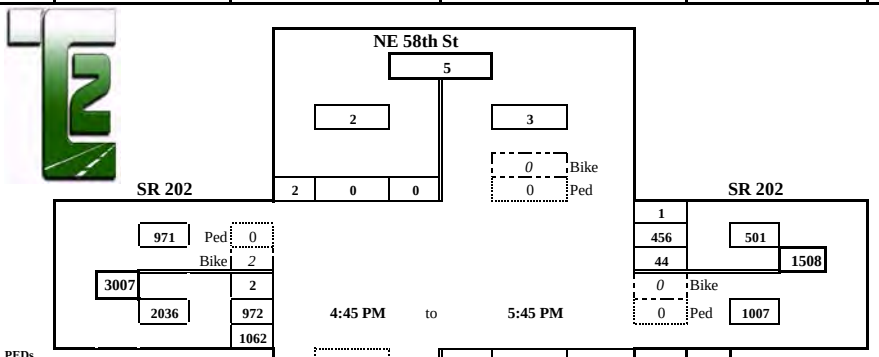
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: NE 58th St/Sahalee Way NE & NE Redmond-Fall City Rd (SR 202) **Date of Count:** Tues 3/25/2014

Location: Sammamish, Washington **Checked By:** Jess

Time Interval	From North on (SB) NE 58th St				From South on (NB) Sahalee Way NE				From East on (WB) SR 202				From West on (EB) SR 202				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:45 P	0	1	0	1	6	123	0	8	5	12	125	1	7	1	236	225	733
5:00 P	0	0	0	0	2	137	0	15	1	9	134	0	5	2	215	241	753
5:15 P	0	0	0	0	0	122	0	9	2	11	111	0	3	0	225	250	728
5:30 P	0	0	0	1	3	111	0	6	4	11	122	0	8	0	286	296	833
5:45 P	0	0	0	1	2	143	0	5	0	13	89	1	3	0	246	275	773
6:00 P	0	0	0	0	8	106	0	6	2	9	95	0	3	0	260	269	745
6:15 P	0	0	0	0	6	94	0	5	1	11	100	0	2	0	208	297	715
6:30 P	0	0	0	1	3	112	1	9	1	6	81	0	2	1	217	293	721
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	1	0	4	30	948	1	63	16	82	857	2	33	4	1893	2146	6001
Peak Hour: 4:45 PM to 5:45 PM																	
Total	0	0	0	2	7	513	0	35	7	44	456	1	19	2	972	1062	3087
Approach			2				548				501				2036		3087
%HV			n/a				1.3%				1.4%				0.9%		1.1%
PHF			0.50				0.90				0.88				0.87		0.93



PEDs Across:	N	S	E	W	
INT 01		2			2
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	2	0	0	2

Special Notes

Bicycles From:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05				2	2
INT 06				1	1
INT 07				1	1
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	4	4

3332 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.87	0.9%
Check	WB	0.88	1.4%
In: 3087	NB	0.90	1.3%
Out: 3087	SB	0.50	n/a
	T Int.	0.93	1.1%

N U's	S U's	E U's	W U's
			0
			0
			0
			0
			0
			0
			0
			1
0	0	0	1

SAM14029TM_37p

Prepared for: **City of Sammamish**

Traffic Count Consultants, Inc.

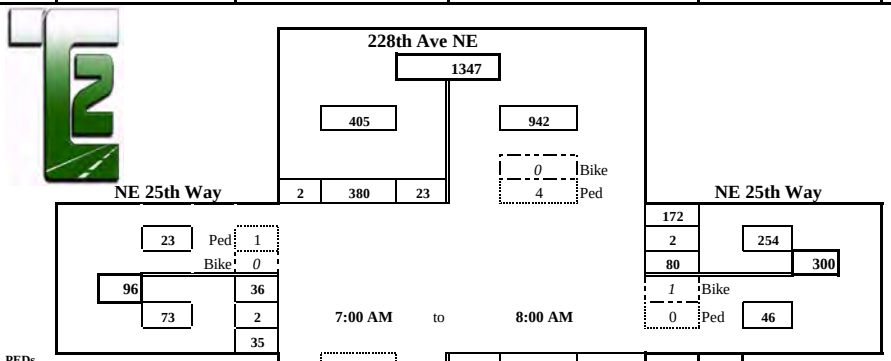
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 228th Ave NE & NE 25th Way **Date of Count:** Tues 3/25/2014

Location: Sammamish, Washington **Checked By:** Jess

Time Interval	From North on (SB) 228th Ave NE				From South on (NB) 228th Ave NE				From East on (WB) NE 25th Way				From West on (EB) NE 25th Way				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	4	4	116	0	5	5	138	5	1	30	1	55	0	14	0	19	387
7:30 A	7	5	111	0	0	9	178	5	0	17	0	31	1	8	1	6	371
7:45 A	1	4	72	1	6	3	242	10	0	15	0	38	0	11	0	3	399
8:00 A	3	10	81	1	2	2	176	1	0	18	1	48	0	3	1	7	349
8:15 A	3	11	70	2	1	2	154	8	1	21	2	28	0	14	2	4	318
8:30 A	6	6	70	1	6	1	178	4	0	23	3	14	0	8	1	8	317
8:45 A	3	14	98	4	0	7	162	9	0	18	1	33	0	10	3	6	365
9:00 A	4	12	119	2	4	5	158	6	2	28	8	27	1	4	3	10	382
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	31	66	737	11	24	34	1386	48	4	170	16	274	2	72	11	63	2888
	Peak Hour: 7:00 AM to 8:00 AM																
Total	15	23	380	2	13	19	734	21	1	80	2	172	1	36	2	35	1506
Approach	405				774				254				73				1506
%HV	3.7%				1.7%				0.4%				1.4%				2.0%
PHF	0.84				0.76				0.74				0.55				0.94



PEDs Across:	N	S	E	W	
INT 01		1			1
INT 02	3	1			4
INT 03	1	1		1	3
INT 04					0
INT 05	1				1
INT 06		1		1	2
INT 07	1				1
INT 08	1				1
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	7	4	0	2	13

Bicycles From:	N	S	E	W	
INT 01					0
INT 02					0
INT 03			1		1
INT 04					0
INT 05					0
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	1	0	1

1596 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.55	1.4%
Check	WB	0.74	0.4%
In: 1506	NB	0.76	1.7%
Out: 1506	SB	0.84	3.7%
	T Int.	0.94	2.0%

Conditions:

Special Notes

SAM14029TM_12a

Prepared for: **City of Sammamish**

Traffic Count Consultants, Inc.

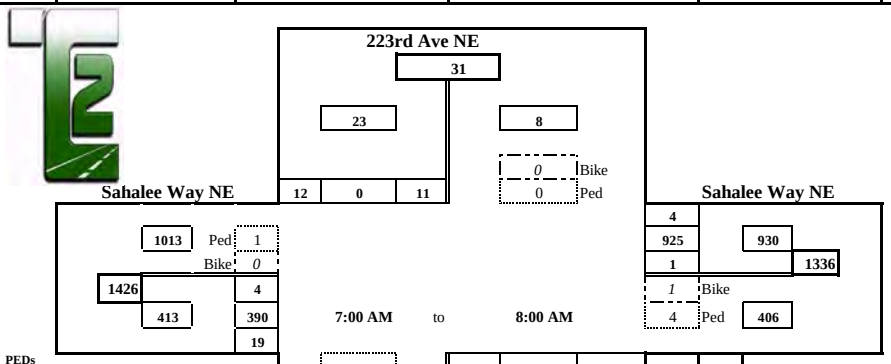
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 223rd Ave NE/NE 28th Pl & Sahalee Way NE **Date of Count:** Tues 3/25/2014

Location: Sammamish, Washington **Checked By:** Jess

Time Interval	From North on (SB) 223rd Ave NE				From South on (NB) NE 28th Pl				From East on (WB) Sahalee Way NE				From West on (EB) Sahalee Way NE				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	1	3	0	5	1	17	0	2	6	1	193	1	5	0	127	4	353
7:30 A	0	3	0	2	0	22	0	0	0	0	216	1	6	1	102	5	352
7:45 A	0	2	0	5	0	15	0	2	4	0	287	0	3	2	74	1	388
8:00 A	0	3	0	0	0	22	0	1	4	0	229	2	4	1	87	9	354
8:15 A	0	2	0	6	1	22	0	2	2	2	192	1	3	2	77	7	313
8:30 A	0	2	1	3	0	17	0	5	6	6	190	4	6	2	68	4	302
8:45 A	1	5	0	2	0	16	1	10	0	7	197	1	3	1	86	2	328
9:00 A	0	3	0	2	0	12	0	3	5	1	185	2	4	2	108	5	323
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	2	23	1	25	2	143	1	25	27	17	1689	12	34	11	729	37	2713
Peak Hour: 7:00 AM to 8:00 AM																	
Total	1	11	0	12	1	76	0	5	14	1	925	4	18	4	390	19	1447
Approach	23				81				930				413				1447
%HV	4.3%				1.2%				1.5%				4.4%				2.3%
PHF	0.72				0.88				0.81				0.79				0.93



1552 *1.0 PHF Peak Hour Volume*

	PHF	%HV
EB	0.79	4.4%
WB	0.81	1.5%
NB	0.88	1.2%
SB	0.72	4.3%
T Int.	0.93	2.3%

Check In: 1447 Out: 1447

PEDs Across:

	N	S	E	W	
INT 01					0
INT 02			1		1
INT 03			1	1	2
INT 04		1	2		3
INT 05			1		1
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	1	5	1	7

Bicycles From:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04		1	1		2
INT 05					0
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	1	1	0	2

N U's	S U's	E U's	W U's
		0	
		0	
		0	
		0	
		2	
		1	
		0	
		0	
0	0	3	0

Special Notes

SAM14029TM_25a

Prepared for: **City of Sammamish**

Traffic Count Consultants, Inc.

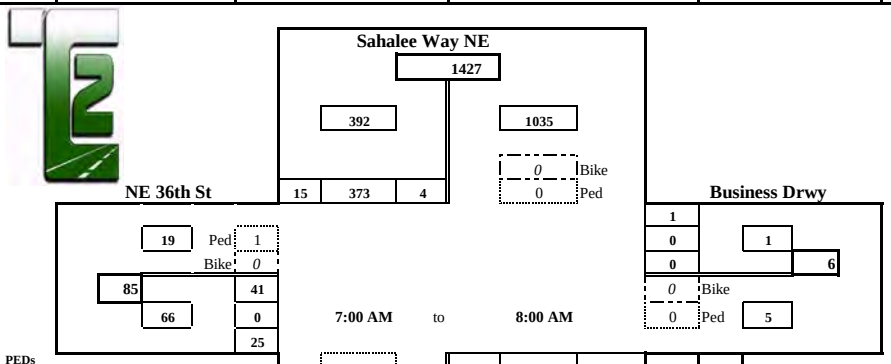
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Sahalee Way NE & NE 36th St **Date of Count:** Tues 3/25/2014

Location: Sammamish, Washington **Checked By:** Jess

Time Interval	From North on (SB) Sahalee Way NE				From South on (NB) Sahalee Way NE				From East on (WB) Business Drwy				From West on (EB) NE 36th St				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	5	0	111	5	5	2	224	0	0	0	0	0	1	14	0	9	365
7:30 A	3	2	96	1	0	2	258	1	0	0	0	0	0	9	0	6	375
7:45 A	2	2	75	3	4	0	278	0	0	0	0	1	0	9	0	4	372
8:00 A	3	0	91	6	3	0	233	0	0	0	0	0	0	9	0	6	345
8:15 A	3	0	64	4	1	2	203	0	0	0	0	1	0	13	0	3	290
8:30 A	2	1	59	6	4	1	212	0	0	0	0	0	0	10	0	6	295
8:45 A	2	0	95	4	4	2	250	0	0	0	0	0	2	17	0	4	372
9:00 A	5	0	93	8	4	3	202	0	0	0	0	0	1	24	0	5	335
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	25	5	684	37	25	12	1860	1	0	0	0	2	4	105	0	43	2749
	Peak Hour: 7:00 AM to 8:00 AM																
Total	13	4	373	15	12	4	993	1	0	0	0	1	1	41	0	25	1457
Approach	392				998				1				66				1457
%HV	3.3%				1.2%				n/a				1.5%				1.8%
PHF	0.84				0.90				0.25				0.72				0.97



PEDs Across:	N	S	E	W	
INT 01					0
INT 02					0
INT 03				1	1
INT 04					0
INT 05					0
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	1	1

Bicycles From:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04		2			2
INT 05					0
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	2	0	0	2

1500 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.72	1.5%
Check	WB	0.25	n/a
In: 1457	NB	0.90	1.2%
Out: 1457	SB	0.84	3.3%
	T Int.	0.97	1.8%

Conditions:

Special Notes

SAM14029TM_26a

Prepared for: **City of Sammamish**

Traffic Count Consultants, Inc.

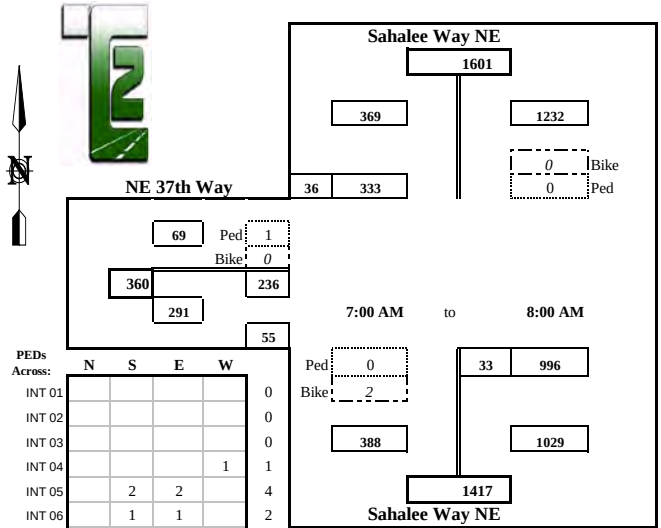
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Sahalee Way NE & NE 37th Way **Date of Count:** Tues 3/25/2014

Location: Sammamish, Washington **Checked By:** Jess

Time Interval	From North on (SB) Sahalee Way NE				From South on (NB) Sahalee Way NE				From East on (WB) 0				From West on (EB) NE 37th Way				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	3	0	88	8	6	4	242	0	0	0	0	0	3	54	0	31	427
7:30 A	5	0	87	8	1	8	259	0	0	0	0	0	1	64	0	8	434
7:45 A	1	0	78	6	4	11	272	0	0	0	0	0	0	62	0	6	435
8:00 A	3	0	80	14	3	10	223	0	0	0	0	0	0	56	0	10	393
8:15 A	4	0	58	18	1	7	219	0	0	0	0	0	0	63	0	16	381
8:30 A	2	0	61	18	6	9	221	0	0	0	0	0	1	76	0	10	395
8:45 A	3	0	71	13	2	19	242	0	0	0	0	0	2	57	0	14	416
9:00 A	6	0	97	14	5	17	220	0	0	0	0	0	2	81	0	17	446
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	27	0	620	99	28	85	1898	0	0	0	0	0	9	513	0	112	3327
Peak Hour: 7:00 AM to 8:00 AM																	
Total	12	0	333	36	14	33	996	0	0	0	0	0	4	236	0	55	1689
Approach	369				1029				0				291				1689
%HV	3.3%				1.4%				n/a				1.4%				1.8%
PHF	0.96				0.91				n/a				0.86				0.97



PEDs Across:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04				1	1
INT 05		2	2		4
INT 06		1	1		2
INT 07					0
INT 08		1	1		2
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	4	4	1	9

Bicycles From:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04		2			2
INT 05					0
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	2	0	0	2

1784 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.86	1.4%
Check	WB	n/a	n/a
In: 1689	NB	0.91	1.4%
Out: 1689	SB	0.96	3.3%
	T Int.	0.97	1.8%

Conditions:

Special Notes

SAM14029TM_13a

Prepared for: **City of Sammamish**

Traffic Count Consultants, Inc.

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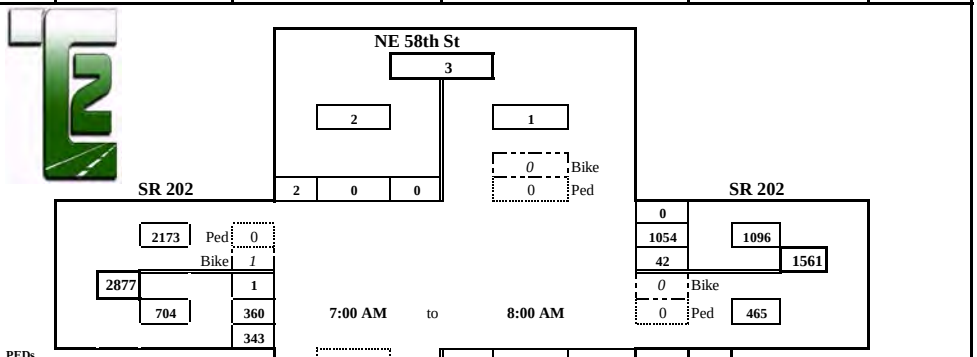
WBE/DBE

Intersection: NE 58th St/Sahalee Way NE & NE Redmond-Fall City Rd (SR 202) **Date of Count:** Tues 3/25/2014

Location: Sammamish, Washington **Checked By:** Jess

Time Interval	From North on (SB) NE 58th St				From South on (NB) Sahalee Way NE				From East on (WB) SR 202				From West on (EB) SR 202				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	0	0	0	0	3	257	0	28	7	15	247	0	13	0	101	85	733
7:30 A	0	0	0	0	5	299	0	40	7	13	253	0	10	0	115	84	804
7:45 A	0	0	0	1	4	298	0	21	4	10	327	0	8	1	61	74	793
8:00 A	0	0	0	1	3	263	0	16	9	4	227	0	7	0	83	100	694
8:15 A	0	0	0	0	1	260	0	18	13	9	237	0	10	1	72	64	661
8:30 A	0	0	0	1	3	287	0	22	4	4	250	0	10	1	75	82	722
8:45 A	0	0	0	1	6	286	0	19	5	6	205	0	18	0	95	83	695
9:00 A	0	0	0	0	4	259	0	30	5	8	178	0	12	0	118	88	681
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	4	29	2209	0	194	54	69	1924	0	88	3	720	660	5783
Peak Hour: 7:00 AM to 8:00 AM																	
Total	0	0	0	2	15	1117	0	105	27	42	1054	0	38	1	360	343	3024
Approach	2				1222				1096				704				3024
%HV	n/a				1.2%				2.5%				5.4%				2.6%
PHF	0.50				0.90				0.81				0.88				0.94



3216 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.88	5.4%
Check	WB	0.81	2.5%
In: 3024	NB	0.90	1.2%
Out: 3024	SB	0.50	n/a
	T Int.	0.94	2.6%

PEDs Across:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO PEDS				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

Bicycles From:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04				1	1
INT 05			2		2
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	2	1	3

N U's	S U's	E U's	W U's
			0
			0
			1
			0
			0
			0
			0
			0
0	0	0	1

Special Notes

SAM14029TM_37a

Appendix H

2035 Modeled Traffic Volumes and Adjustments

The 2035 projections provide intersection approach / departure volumes as opposed to turning movement counts. As such, each movement was scaled by the ratio of future volumes to existing volumes equally for each movement. The following tables show the 2014 count and 2035 projected approach volumes.

Table B-1 – 2014 Turning Movement Count Approach Volumes

Intersection	Entering Vehicles			
	EB	WB	NB	SB
SR 202 @ Sahalee	2036	501	548	2
Sahalee @ 37th	152		521	1073
Sahalee @ 36th	37	1	517	978
Sahalee @ 223rd/28th	896	499	42	20
228th @ 25th	54	115	579	827

Table B-2 – 2035 PM Peak Hour Three-Lane Projected Approach Volumes

Intersection	Entering Vehicles			
	EB	WB	NB	SB
SR 202 @ Sahalee	2471	482		
Sahalee @ 37th			778	1139
Sahalee @ 36th		13		
Sahalee @ 223rd/28th	1306	631		13
228th @ 25th	58			1161

Table B-3 – 2035 PM Peak Hour Five-Lane Projected Approach Volumes

Intersection	Entering Vehicles			
	EB	WB	NB	SB
SR 202 @ Sahalee	2555	566		
Sahalee @ 37th			853	1303
Sahalee @ 36th		13		
Sahalee @ 223rd/28th	1579	716		13
228th @ 25th	52			1499

In Tables B-2 and B-3, some volumes are missing because they were not provided in the 2035 model output. The missing volumes with a blue highlight were calculated manually based on the equations below. The calculations below are for the three-hour volumes, but the same approach can be applied to the five-lane volumes.

<u>SR 202 at Sahalee Way NE</u>

2035 SB volumes assumed to equal 2014 volumes. Approach and departure volumes at the intersection must be equal. The ratio of NB entering to SB exiting volumes assumed to be equal between 2014 and 2035 volumes.

C = SB exiting volume D = NB entering volume

System of equations:	2448 + C = 2953 + D	Keep 2035 SB as existing:	C = 2
	C / D = 1106 / 548	Solve for 2035 NB entering:	D = 496

Sahalee Way NE at NE 36th Street

Approach and departure volumes at the intersection must be equal. Assume ratio of NB entering to SB entering is equal between 2014 counts and 2035 volumes.

X = NB entering Y = SB entering

System of equations:	2319 = 332 + X + Y	Solve for NB entering:	X = 687
	X / Y = 517 / 978	Solve for SB entering:	Y = 1300

Sahalee Way NE at NE 28th Place / 223rd Avenue NE

Approach and departure volumes at the intersection must be equal. Assume ratio of NB entering to SB exiting is equal between 2014 counts and 2035 volumes.

A = SB exiting B = NB entering

System of equations:	1950 + A = 1855 + B	Solve for SB exiting:	A = 7
	A / B = 81 / 42	Solve for NB entering:	B = 102

228th Avenue NE at NE 25th Way

Assume that NB approach volume growth is equal to SB approach volume growth. Assume that WB approach volume growth is equal to EB approach volume growth.

This process fills in the blue cells in Tables B-2 and B-3. The final missing values—highlighted orange—are due to an assessed modelling error. The link volumes included significant growth for the west approach at NE 36th Street. However, a review of the area revealed that there is no available room for developments along NE 36th Street and that the accurate link to apply these volumes to is NE 37th Way. Again, this same approach can be applied to the five-lane volumes.

Sahalee Way NE at NE 36th Street and Sahalee Way NE at NE 37th Way

Assume 2% annual growth for eastbound traffic at Sahalee Way NE. Take difference between projection and 2% growth and apply to eastbound traffic at NE 37th Way.

Eastbound 2014 Count Volume:	37
Eastbound 2035 Model Volume:	319
Eastbound 2035 2% Growth Model Volume:	= 37*(1+0.02)^(2035-2014) = 37*1.02^21 = 57
Volume shift from 36th to 37th:	= 319 – 57 = 262

These values complete the orange cells in Tables B-2 and B-3. The filled in versions of these tables are Tables B-4 and B-5. These completed tables also include movement growth rates.

Table B-4 – Completed 2035 PM Peak Hour Three-Lane Projected Approach Volumes and Growth Factors

Intersection	Total Growth Factor							
	EB	WB	NB	SB	EB	WB	NB	SB
SR 202 @ Sahalee	2471	482	496	2	1.21	0.96	0.91	1.00
Sahalee @ 37th	423		778	1139	2.78		1.49	1.06
Sahalee @ 36th	58	13	687	1300	1.57	13.00	1.33	1.33
Sahalee @ 223rd/28th	1306	631	102	13	1.46	1.26	2.43	0.65
228th @ 25th	58	124	813	1161	1.07	1.08	1.40	1.40

Table B-5 – Completed 2035 PM Peak Hour Five-Lane Projected Approach Volumes and Growth Factors

Intersection	Total Growth Factor							
	EB	WB	NB	SB	EB	WB	NB	SB
SR 202 @ Sahalee	2555	566	559	2	1.25	1.13	1.02	1.00
Sahalee @ 37th	509		853	1303	3.35		1.64	1.21
Sahalee @ 36th	57	13	806	1526	1.54	13.00	1.56	1.56
Sahalee @ 223rd/28th	1579	716	34	13	1.76	1.43	0.81	0.65
228th @ 25th	52	111	1049	1499	0.96	0.97	1.81	1.81

As mentioned previously, these approach volume growth factors were applied equally over each turning movement on the approach leg. 2035 design volumes are shown in Figures 3, 4, 6, and 7.

Appendix I

Traffic Signal Warrant Analysis

Signal Warrant Analysis

NE 28th Place / 223rd Avenue NE

Alternative	Peak Hour Minimums		Four Hour Minimums		Hour 1				Hour 2				Hour 3				Hour 4				Meets	Meets
	Major	Minor	Major	Minor	Major	Minor	Peak?	Four?	Major	Minor	Peak?	Four?	Major	Minor	Peak?	Four?	Major	Minor	Peak?	Four?	Peak?	Four?
Existing	1100	75	800	60	1343	81	Y	Y	1152	88	Y	Y	1349	43	N	N	1381	32	N	N	Y	N
2035, 3-Lane	1100	75	800	60	1928	192	Y	Y	1654	209	Y	Y	1937	102	Y	Y	1983	76	Y	Y	Y	Y
2035, 5-Lane	1200	80	925	60	1978	64	N	Y	1697	69	N	Y	1987	34	N	N	2034	25	N	N	N	N

NE 36th Street

Alternative	Peak Hour Minimums		Four Hour Minimums		Hour 1				Hour 2				Hour 3				Hour 4				Meets	Meets
	Major	Minor	Major	Minor	Major	Minor	Peak?	Four?	Major	Minor	Peak?	Four?	Major	Minor	Peak?	Four?	Major	Minor	Peak?	Four?	Peak?	Four?
Existing	1100	75	800	60	1390	66	N	Y	1209	82	Y	Y	1438	40	N	N	1497	39	N	N	Y	N
2035, 3-Lane	1100	75	800	60	2218	94	Y	Y	1929	118	Y	Y	2295	57	N	N	2389	56	N	N	Y	N
2035, 5-Lane	1200	80	925	60	2254	94	Y	Y	1961	118	Y	Y	2332	57	N	N	2428	56	N	N	Y	N

* Uses 70% values in Figure 4C-2 and 4C-4.

* AM projections assumed to be equal to existing at a minimum. (Conservative assumption.)

* AM hour projections take existing volumes and scale based on ratios of volumes during hour 3 and 4.

* Only 1 hour of PM projections is provided, with no time interval specified. Above assumes that those peak hour volumes are "Hour 3" and that those volumes, scaled by the ratio of existing Hour 4 to Hour 3 volumes, provide projected "Hour 4" volumes.

NOTE: DEA model shows decrease of volume in 2035 if 5-lane option is used. This may need post processing. Difference from 3-lane is substantial.

Appendix J

Field Travel Time Data and Synchro Calibration Procedure

Travel Time Measurements

Agency	Sammamish	Driver	Andrea S
Project	Sahalee Way Corridor	Timer	Iris K
Date	6/25/2015	Time	4:30 PM

NORTHBOUND

Checkpoint	1	2	3	4	5	6	Avg. MPH
Reach 25th queue	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00		
Clear 25th	0:00:29	0:00:03	0:00:02	0:00:03	0:00:03		40.4
Reach 28th queue	0:00:51	0:00:35	0:00:40	0:00:30	0:00:35		
Clear 28th	0:00:02	0:00:02	0:00:02	0:00:02	0:00:01		43.8
Reach 37th queue	0:01:30	0:01:05	0:01:21	0:01:22	0:01:03		
Clear 37th	0:00:04	0:00:02	0:00:02	0:00:03	0:00:14		46.2
Reach SR 202 queue	0:01:26	0:01:10	0:01:18	0:01:10	0:01:07		
Clear SR 202	0:01:48	0:01:36	0:01:13	0:01:07	0:01:36		48
Total Time	0:06:10	0:04:32	0:04:39	0:04:17	0:04:38		

SOUTHBOUND

Checkpoint	1	2	3	4	5	6	Avg. MPH
Reach SR 202 queue	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00		
Clear SR 202	0:01:39	0:01:51	0:01:38	0:01:33	0:01:03		37.6
Reach 37th queue	0:01:33	0:01:07	0:01:21	0:01:00	0:01:12		
Clear 37th	0:00:01	0:00:38	0:00:40	0:00:43	0:00:30		35.4
Reach 28th queue	0:01:25	0:01:19	0:01:21	0:01:26	0:01:25		
Clear 28th	0:00:05	0:00:01	0:00:05	0:00:02	0:00:03		41
Reach 25th queue	0:00:35	0:00:37	0:00:35	0:00:38	0:00:38		
Clear 25th	0:00:02	0:00:02	0:00:14	0:00:02	0:00:02		41.2
Total Time	0:05:21	0:05:37	0:05:55	0:05:26	0:04:53		

Notes:

- *Queues may not form at each location. If no queue is present, leave blank.*
- *Avg. MPH column should be the typical running speed of the vehicle during traffic. Do not use a speed when the vehicle is clearly stopped or slowed due to downstream signals.*

Synchro Calibration Process

Values tweaked to match field travel time measurements from 6/25/15 (PM peak hour starting at 4:30). All changes made on Synchro HCM 2010 tab. Goal to match approach delay to necessary delay in free flow speed tab.

See travel time worksheet tab for data collected. See free flow speed tab for calculations of measured and modelled flow speeds and LOS.

Modifications made to the "Early" model. Same changes applied to "Late" model, but without the expectation of matching field values due to later volume counts.

SR 202:
- Reduced NB *HCM Platoon Ratio* to 1.60
- Adjusted NB *Speed Limit (mph)* to 48

37th:
- Reduced SB *HCM Platoon Ratio* to 0.33
- Reduced SB *Ideal Satd. Flow (vphpl)* to 1700
- Reduced NB *HCM Platoon Ratio* to 0.75
- Adjusted SB *Speed Limit (mph)* to 38
- Adjusted NB *Speed Limit (mph)* to 46

25th:
- Increased SB *HCM Platoon Ratio* to 1.75
- Increased SB *Ideal Satd. Flow (vphpl)* to 2200
- Adjusted SB *Speed Limit (mph)* to 41

No calibration used elsewhere.

Appendix K

Synchro Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	972	1062	44	456	1	513	0	35	0	0	2
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus 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
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1900	1881	1881	1881	1900	1900	1900
Adj Flow Rate, veh/h	2	1045	1142	47	490	1	552	0	38	0	0	2
Adj No. of Lanes	1	1	1	1	2	0	1	1	1	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	147	937	782	147	1823	4	570	598	509	0	0	3
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.60	1.60	1.60	1.00	1.00	1.00
Prop Arrive On Green	0.08	0.50	0.50	0.08	0.50	0.50	0.51	0.00	0.51	0.00	0.00	0.00
Ln Grp Delay, s/veh	103.1	127.7	275.4	111.3	36.2	36.2	85.1	0.0	41.7	0.0	0.0	315.1
Ln Grp LOS	F	F	F	F	D	D	F		D			F
Approach Vol, veh/h		2189			538			590			2	
Approach Delay, s/veh		204.7			42.8			82.3			315.0	
Approach LOS		F			D			F			F	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	8	4	5	6		
Case No	2.0	3.0	12.0	9.0	2.0	4.0		
Phs Duration (G+Y+Rc), s	25.5	128.5	6.4	83.6	25.5	128.5		
Change Period (Y+Rc), s	5.5	7.0	6.0	6.0	5.5	7.0		
Max Green (Gmax), s	20.0	90.0	20.0	90.0	20.0	90.0		
Max Allow Headway (MAH), s	3.1	5.4	5.2	4.7	3.1	5.4		
Max Q Clear (g_c+I1), s	8.0	123.5	2.3	74.8	2.3	20.9		
Green Ext Time (g_e), s	0.0	0.0	0.0	2.8	0.0	51.8		
Prob of Phs Call (p_c)	1.00	1.00	0.13	1.00	1.00	1.00		
Prob of Max Out (p_x)	0.00	0.00	0.00	0.07	0.00	0.00		

Left-Turn Movement Data								
Assigned Mvmt	1		3	7	5			
Mvmt Sat Flow, veh/h	1792		0	1792	1792			

Through Movement Data								
Assigned Mvmt		2	8	4		6		
Mvmt Sat Flow, veh/h		1881	0	1881		3660		

Right-Turn Movement Data								
Assigned Mvmt		12	18	14		16		
Mvmt Sat Flow, veh/h		1565	1615	1599		7		

Left Lane Group Data								
Assigned Mvmt	1	0	3	7	5	0	0	0
Lane Assignment	(Prot)				(Prot)			
Lanes in Grp	1	0	0	1	1	0	0	0

Grp Vol (v), veh/h	47	0	0	552	2	0	0	0
Grp Sat Flow (s), veh/h/ln	1792	0	0	1792	1792	0	0	0
Q Serve Time (g_s), s	6.0	0.0	0.0	72.8	0.3	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	6.0	0.0	0.0	72.8	0.3	0.0	0.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	1792	0	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	147	0	0	570	147	0	0	0
V/C Ratio (X)	0.32	0.00	0.00	0.97	0.01	0.00	0.00	0.00
Avail Cap (c_a), veh/h	147	0	0	661	147	0	0	0
Upstream Filter (I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	105.6	0.0	0.0	58.8	102.9	0.0	0.0	0.0
Incr Delay (d2), s/veh	5.7	0.0	0.0	26.3	0.2	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	111.3	0.0	0.0	85.1	103.1	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	3.0	0.0	0.0	35.9	0.1	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.2	0.0	0.0	4.2	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00
%ile Back of Q (50%), veh/ln	3.2	0.0	0.0	40.1	0.1	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.47	0.00	0.00	4.49	0.02	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	8	4	0	6	0	0
Lane Assignment		T		T		T		
Lanes in Grp	0	1	0	1	0	1	0	0
Grp Vol (v), veh/h	0	1045	0	0	0	239	0	0
Grp Sat Flow (s), veh/h/ln	0	1881	0	1881	0	1787	0	0
Q Serve Time (g_s), s	0.0	121.5	0.0	0.0	0.0	18.9	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	121.5	0.0	0.0	0.0	18.9	0.0	0.0
Lane Grp Cap (c), veh/h	0	937	0	598	0	890	0	0
V/C Ratio (X)	0.00	1.12	0.00	0.00	0.00	0.27	0.00	0.00
Avail Cap (c_a), veh/h	0	937	0	694	0	890	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	61.2	0.0	0.0	0.0	35.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	66.4	0.0	0.0	0.0	0.7	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	127.7	0.0	0.0	0.0	36.2	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	63.2	0.0	0.0	0.0	9.4	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	17.3	0.0	0.0	0.0	0.2	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	80.5	0.0	0.0	0.0	9.6	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	1.91	0.00	0.00	0.00	0.11	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	27.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	18	14	0	16	0	0
Lane Assignment		R	T+R	R		T+R		
Lanes in Grp	0	1	1	1	0	1	0	0
Grp Vol (v), veh/h	0	1142	2	38	0	252	0	0
Grp Sat Flow (s), veh/h/ln	0	1565	1615	1599	0	1880	0	0
Q Serve Time (g_s), s	0.0	121.5	0.3	3.0	0.0	18.9	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	121.5	0.3	3.0	0.0	18.9	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	1599.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	782	3	509	0	936	0	0
V/C Ratio (X)	0.00	1.46	0.79	0.07	0.00	0.27	0.00	0.00
Avail Cap (c_a), veh/h	0	782	132	590	0	936	0	0
Upstream Filter (I)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	61.0	121.8	41.6	0.0	35.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	214.4	193.3	0.1	0.0	0.7	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	275.4	315.1	41.7	0.0	36.2	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	52.8	0.1	1.3	0.0	9.9	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	46.6	0.1	0.0	0.0	0.2	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	99.3	0.3	1.3	0.0	10.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	2.35	0.02	0.19	0.00	0.11	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	90.1	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	156.8
HCM 2010 LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	83	69	75	446	884	189
Number	3	18	5	2	6	16
Initial Q, veh	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00	1.00	1.00			1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1881	1881	1599	1599
Adj Flow Rate, veh/h	86	71	77	460	911	195
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	1	1	1	1
Opposing Right Turn Influence	Yes		Yes			
Cap, veh/h	126	113	243	1520	1139	968
HCM Platoon Ratio	1.00	1.00	1.00	0.75	0.33	0.33
Prop Arrive On Green	0.07	0.07	0.04	0.61	0.24	0.24
Ln Grp Delay, s/veh	50.9	50.1	21.2	6.1	32.3	15.2
Ln Grp LOS	D	D	C	A	C	B
Approach Vol, veh/h	157			537	1106	
Approach Delay, s/veh	50.6			8.3	29.3	
Approach LOS	D			A	C	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs		2	8		5	6		
Case No		4.0	9.0		1.2	7.0		
Phs Duration (G+Y+Rc), s		86.4	11.9		9.4	77.0		
Change Period (Y+Rc), s		7.0	5.0		5.0	7.0		
Max Green (Gmax), s		141.5	25.0		6.5	130.0		
Max Allow Headway (MAH), s		4.9	4.0		3.7	4.9		
Max Q Clear (g_c+I1), s		13.6	6.6		3.0	54.8		
Green Ext Time (g_e), s		15.5	0.4		0.0	15.3		
Prob of Phs Call (p_c)		1.00	0.99		0.88	1.00		
Prob of Max Out (p_x)		0.00	0.00		1.00	0.02		
Left-Turn Movement Data								
Assigned Mvmt			3		5	1		
Mvmt Sat Flow, veh/h			1810		1792	0		
Through Movement Data								
Assigned Mvmt		2	8			6		
Mvmt Sat Flow, veh/h		1881	0			1599		
Right-Turn Movement Data								
Assigned Mvmt		12	18			16		
Mvmt Sat Flow, veh/h		0	1615			1359		
Left Lane Group Data								
Assigned Mvmt	0	0	3	0	5	1	0	0
Lane Assignment					(Pr/Pm)			
Lanes in Grp	0	0	1	0	1	0	0	0

Grp Vol (v), veh/h	0	0	86	0	77	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	1810	0	1792	0	0	0
Q Serve Time (g_s), s	0.0	0.0	4.6	0.0	1.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	4.6	0.0	1.0	0.0	0.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	1810	0	513	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	72.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	17.3	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	9.7	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	70.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	0	126	0	243	0	0	0
V/C Ratio (X)	0.00	0.00	0.68	0.00	0.32	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	460	0	282	0	0	0
Upstream Filter (I)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	44.6	0.0	20.5	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	6.3	0.0	0.7	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	50.9	0.0	21.2	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	2.3	0.0	1.4	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.0	2.5	0.0	1.4	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.11	0.00	0.24	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	8	0	0	6	0	0
Lane Assignment		T				T		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	460	0	0	0	911	0	0
Grp Sat Flow (s), veh/h/ln	0	1881	0	0	0	1599	0	0
Q Serve Time (g_s), s	0.0	11.6	0.0	0.0	0.0	52.8	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	11.6	0.0	0.0	0.0	52.8	0.0	0.0
Lane Grp Cap (c), veh/h	0	1520	0	0	0	1139	0	0
V/C Ratio (X)	0.00	0.30	0.00	0.00	0.00	0.80	0.00	0.00
Avail Cap (c_a), veh/h	0	2708	0	0	0	2115	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	6.0	0.0	0.0	0.0	31.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.0	1.3	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	6.1	0.0	0.0	0.0	32.3	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	6.0	0.0	0.0	0.0	23.4	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	6.1	0.0	0.0	0.0	23.8	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.19	0.00	0.00	0.00	0.14	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	18	0	0	16	0	0
Lane Assignment			R			R		
Lanes in Grp	0	0	1	0	0	1	0	0
Grp Vol (v), veh/h	0	0	71	0	0	195	0	0
Grp Sat Flow (s), veh/h/ln	0	0	1615	0	0	1359	0	0
Q Serve Time (g_s), s	0.0	0.0	4.2	0.0	0.0	11.3	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	4.2	0.0	0.0	11.3	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	1359.2	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	0	113	0	0	968	0	0
V/C Ratio (X)	0.00	0.00	0.63	0.00	0.00	0.20	0.00	0.00
Avail Cap (c_a), veh/h	0	0	411	0	0	1798	0	0
Upstream Filter (I)	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	44.5	0.0	0.0	15.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	5.7	0.0	0.0	0.1	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	50.1	0.0	0.0	15.2	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	1.9	0.0	0.0	4.3	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.0	2.1	0.0	0.0	4.3	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.09	0.00	0.00	0.72	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	24.9
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	21	2	31	59	6	50	42	435	102	112	701	14
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	0.99		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus 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
Adj Sat Flow, veh/h/ln	1900	1827	1900	1900	1900	1900	1863	1863	1900	2178	2178	2200
Adj Flow Rate, veh/h	23	2	33	63	6	54	45	468	110	120	754	15
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	0	0	0	2	2	2	1	1	1
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	145	35	113	187	25	86	551	737	173	561	1143	23
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.75	1.75	1.75
Prop Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.05	0.50	0.50	0.14	0.94	0.94
Ln Grp Delay, s/veh	21.5	0.0	0.0	22.9	0.0	0.0	5.6	0.0	10.4	6.3	0.0	1.5
Ln Grp LOS	C			C			A		B	A		A
Approach Vol, veh/h		58			123			623			889	
Approach Delay, s/veh		21.5			22.9			10.0			2.1	
Approach LOS		C			C			B			A	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Case No	1.1	4.0		8.0	1.1	4.0		8.0
Phs Duration (G+Y+Rc), s	9.2	32.5		11.6	7.4	34.2		11.6
Change Period (Y+Rc), s	5.0	5.6		5.0	5.0	5.6		5.0
Max Green (Gmax), s	35.0	100.0		35.0	35.0	100.0		35.0
Max Allow Headway (MAH), s	3.7	5.0		5.6	3.7	5.0		5.6
Max Q Clear (g_c+I1), s	3.3	14.5		5.8	2.6	5.0		3.7
Green Ext Time (g_e), s	0.3	12.4		1.2	0.1	12.5		1.2
Prob of Phs Call (p_c)	0.83	1.00		0.93	0.49	1.00		0.93
Prob of Max Out (p_x)	0.00	0.00		0.00	0.00	0.00		0.00

Left-Turn Movement Data								
Assigned Mvmt	1			7	5			3
Mvmt Sat Flow, veh/h	2074			684	1774			408

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		1459		201		2128		282

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		343		692		42		910

Left Lane Group Data								
Assigned Mvmt	1	0	0	7	5	0	0	3
Lane Assignment	(Pr/Pm)			L+T+R	(Pr/Pm)			L+T+R
Lanes in Grp	1	0	0	1	1	0	0	1

Grp Vol (v), veh/h	120	0	0	123	45	0	0	58
Grp Sat Flow (s), veh/h/ln	2074	0	0	1576	1774	0	0	1600
Q Serve Time (g_s), s	1.3	0.0	0.0	2.1	0.6	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	1.3	0.0	0.0	3.8	0.6	0.0	0.0	1.7
Perm LT Sat Flow (s_l), veh/h/ln	973	0	0	1395	697	0	0	1357
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1853	0	0	0	1788
Perm LT Eff Green (g_p), s	26.9	0.0	0.0	6.6	26.9	0.0	0.0	6.6
Perm LT Serve Time (g_u), s	14.4	0.0	0.0	4.9	25.6	0.0	0.0	2.8
Perm LT Q Serve Time (g_ps), s	1.6	0.0	0.0	2.1	0.1	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.9	0.0	0.0	0.0	2.3
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.9	0.0	0.0	0.0	1.7
Prop LT Inside Lane (P_L)	1.00	0.00	0.00	0.51	1.00	0.00	0.00	0.40
Lane Grp Cap (c), veh/h	561	0	0	298	551	0	0	294
V/C Ratio (X)	0.21	0.00	0.00	0.41	0.08	0.00	0.00	0.20
Avail Cap (c_a), veh/h	1762	0	0	1097	1636	0	0	1066
Upstream Filter (I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	6.1	0.0	0.0	22.0	5.5	0.0	0.0	21.2
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.9	0.1	0.0	0.0	0.3
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	6.3	0.0	0.0	22.9	5.6	0.0	0.0	21.5
1st-Term Q (Q1), veh/ln	0.7	0.0	0.0	1.7	0.3	0.0	0.0	0.8
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.8	0.0	0.0	1.8	0.3	0.0	0.0	0.8
%ile Storage Ratio (RQ%)	0.10	0.00	0.00	0.05	0.04	0.00	0.00	0.03
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R				T+R		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	578	0	0	0	769	0	0
Grp Sat Flow (s), veh/h/ln	0	1802	0	0	0	2171	0	0
Q Serve Time (g_s), s	0.0	12.5	0.0	0.0	0.0	3.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	12.5	0.0	0.0	0.0	3.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.19	0.00	0.44	0.00	0.02	0.00	0.57
Lane Grp Cap (c), veh/h	0	910	0	0	0	1166	0	0
V/C Ratio (X)	0.00	0.64	0.00	0.00	0.00	0.66	0.00	0.00
Avail Cap (c_a), veh/h	0	3383	0	0	0	4075	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	9.6	0.0	0.0	0.0	0.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.7	0.0	0.0	0.0	0.6	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	10.4	0.0	0.0	0.0	1.5	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	6.1	0.0	0.0	0.0	1.2	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	6.3	0.0	0.0	0.0	1.4	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.14	0.00	0.00	0.00	0.01	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	7.2
HCM 2010 LOS	A

Two Way Analysis cannot be performed on Signalized Intersection.

Two Way Analysis cannot be performed on Signalized Intersection.

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	25	0	12	0	0	1	21	495	1	0	909	69
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	130	-	-	100	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	1	1	1
Mvmt Flow	27	0	13	0	0	1	22	527	1	0	967	73

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1576	1576	1004	1576	1612	527	1040	0	0	528	0	0
Stage 1	1004	1004	-	572	572	-	-	-	-	-	-	-
Stage 2	572	572	-	1004	1040	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	90	111	296	90	105	555	672	-	-	1044	-	-
Stage 1	294	322	-	509	508	-	-	-	-	-	-	-
Stage 2	509	508	-	294	310	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	88	107	296	84	102	555	672	-	-	1044	-	-
Mov Cap-2 Maneuver	244	271	-	84	102	-	-	-	-	-	-	-
Stage 1	284	322	-	492	491	-	-	-	-	-	-	-
Stage 2	491	491	-	281	310	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.3	11.5	0.4	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	672	-	-	244	296	555	1044	-	-
HCM Lane V/C Ratio	0.033	-	-	0.109	0.043	0.002	-	-	-
HCM Control Delay (s)	10.5	-	-	21.6	17.7	11.5	0	-	-
HCM Lane LOS	B	-	-	C	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	11	818	67	14	476	9	32	0	10	10	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	2	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	2	2	2	0	0	0	0	0	0
Mvmt Flow	12	861	71	15	501	9	34	0	11	11	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	511	0	0	934	0	0	1462	1461	898	1462	1492	506
Stage 1	-	-	-	-	-	-	921	921	-	535	535	-
Stage 2	-	-	-	-	-	-	541	540	-	927	957	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1059	-	-	733	-	-	108	130	341	108	125	570
Stage 1	-	-	-	-	-	-	327	352	-	533	527	-
Stage 2	-	-	-	-	-	-	529	524	-	324	339	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1059	-	-	733	-	-	103	126	340	102	121	570
Mov Cap-2 Maneuver	-	-	-	-	-	-	103	126	-	102	121	-
Stage 1	-	-	-	-	-	-	323	347	-	527	516	-
Stage 2	-	-	-	-	-	-	509	513	-	310	335	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	49.8	28.7
HCM LOS			E	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	123	1059	-	-	733	-	-	173
HCM Lane V/C Ratio	0.359	0.011	-	-	0.02	-	-	0.122
HCM Control Delay (s)	49.8	8.4	-	-	10	-	-	28.7
HCM Lane LOS	E	A	-	-	B	-	-	D
HCM 95th %tile Q(veh)	1.5	0	-	-	0.1	-	-	0.4

Two Way Analysis cannot be performed on Signalized Intersection.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	1180	1289	42	439	1	464	0	32	0	0	2
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		0.96	1.00		0.97	1.00		0.96	1.00		0.53
Parking Bus 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
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1900	1881	1881	1881	1900	1900	1900
Adj Flow Rate, veh/h	2	1269	1386	45	472	1	499	0	34	0	0	2
Adj No. of Lanes	1	1	1	1	2	0	1	1	1	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	147	991	807	147	1927	4	518	544	445	0	0	1
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.60	1.60	1.60	1.00	1.00	1.00
Prop Arrive On Green	0.08	0.53	0.53	0.08	0.53	0.53	0.46	0.00	0.46	0.00	0.00	0.00
Ln Grp Delay, s/veh	103.1	191.8	385.2	110.8	32.0	32.0	88.5	0.0	47.5	0.0	0.0	774.5
Ln Grp LOS	F	F	F	F	C	C	F		D			F
Approach Vol, veh/h		2657			518			533			2	
Approach Delay, s/veh		292.6			38.8			85.9			774.4	
Approach LOS		F			D			F			F	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	8	4	5	6		
Case No	2.0	3.0	12.0	9.0	2.0	4.0		
Phs Duration (G+Y+Rc), s	25.5	135.5	6.4	76.6	25.5	135.5		
Change Period (Y+Rc), s	5.5	7.0	6.0	6.0	5.5	7.0		
Max Green (Gmax), s	20.0	90.0	20.0	90.0	20.0	90.0		
Max Allow Headway (MAH), s	3.1	5.4	7.4	4.7	3.1	5.4		
Max Q Clear (g_c+I1), s	7.8	130.5	2.4	67.8	2.3	19.1		
Green Ext Time (g_e), s	0.0	0.0	0.0	2.8	0.0	65.0		
Prob of Phs Call (p_c)	1.00	1.00	0.13	1.00	1.00	1.00		
Prob of Max Out (p_x)	0.00	0.00	0.00	0.01	0.00	0.00		

Left-Turn Movement Data								
Assigned Mvmt	1		3	7	5			
Mvmt Sat Flow, veh/h	1792		0	1792	1792			

Through Movement Data								
Assigned Mvmt		2	8	4		6		
Mvmt Sat Flow, veh/h		1881	0	1881		3659		

Right-Turn Movement Data								
Assigned Mvmt		12	18	14		16		
Mvmt Sat Flow, veh/h		1528	853	1538		8		

Left Lane Group Data								
Assigned Mvmt	1	0	3	7	5	0	0	0
Lane Assignment	(Prot)				(Prot)			
Lanes in Grp	1	0	0	1	1	0	0	0

Grp Vol (v), veh/h	45	0	0	499	2	0	0	0
Grp Sat Flow (s), veh/h/ln	1792	0	0	1792	1792	0	0	0
Q Serve Time (g_s), s	5.8	0.0	0.0	65.8	0.3	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	5.8	0.0	0.0	65.8	0.3	0.0	0.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	1792	0	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	147	0	0	518	147	0	0	0
V/C Ratio (X)	0.31	0.00	0.00	0.96	0.01	0.00	0.00	0.00
Avail Cap (c_a), veh/h	147	0	0	661	147	0	0	0
Upstream Filter (I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	105.5	0.0	0.0	64.2	102.9	0.0	0.0	0.0
Incr Delay (d2), s/veh	5.3	0.0	0.0	24.2	0.2	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	110.8	0.0	0.0	88.5	103.1	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	2.9	0.0	0.0	32.5	0.1	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.2	0.0	0.0	3.5	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00
%ile Back of Q (50%), veh/ln	3.1	0.0	0.0	36.0	0.1	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.44	0.00	0.00	4.03	0.02	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	8	4	0	6	0	0
Lane Assignment		T		T		T		
Lanes in Grp	0	1	0	1	0	1	0	0
Grp Vol (v), veh/h	0	1269	0	0	0	231	0	0
Grp Sat Flow (s), veh/h/ln	0	1881	0	1881	0	1787	0	0
Q Serve Time (g_s), s	0.0	128.5	0.0	0.0	0.0	17.1	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	128.5	0.0	0.0	0.0	17.1	0.0	0.0
Lane Grp Cap (c), veh/h	0	991	0	544	0	941	0	0
V/C Ratio (X)	0.00	1.28	0.00	0.00	0.00	0.24	0.00	0.00
Avail Cap (c_a), veh/h	0	991	0	694	0	941	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	57.7	0.0	0.0	0.0	31.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	134.1	0.0	0.0	0.0	0.6	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	191.8	0.0	0.0	0.0	32.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	66.6	0.0	0.0	0.0	8.5	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	36.9	0.0	0.0	0.0	0.2	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	103.5	0.0	0.0	0.0	8.6	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	2.45	0.00	0.00	0.00	0.10	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	69.5	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data								
Assigned Mvmt	0	12	18	14	0	16	0	0
Lane Assignment		R	T+R	R		T+R		
Lanes in Grp	0	1	1	1	0	1	0	0
Grp Vol (v), veh/h	0	1386	2	34	0	242	0	0
Grp Sat Flow (s), veh/h/ln	0	1528	853	1538	0	1880	0	0
Q Serve Time (g_s), s	0.0	128.5	0.4	3.0	0.0	17.1	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	128.5	0.4	3.0	0.0	17.1	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	1599.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	807	1	445	0	990	0	0
V/C Ratio (X)	0.00	1.72	1.50	0.08	0.00	0.24	0.00	0.00
Avail Cap (c_a), veh/h	0	807	70	567	0	990	0	0
Upstream Filter (I)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	57.5	121.8	47.4	0.0	31.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	327.7	572.7	0.1	0.0	0.6	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	80.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	385.2	774.5	47.5	0.0	32.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	54.5	0.1	1.3	0.0	8.9	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	73.5	0.2	0.0	0.0	0.2	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	128.0	0.3	1.3	0.0	9.1	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	3.03	0.02	0.18	0.00	0.10	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	144.6	0.2	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	227.7
HCM 2010 LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	232	192	112	666	938	201
Number	3	18	5	2	6	16
Initial Q, veh	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00	1.00	1.00			0.96
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1881	1881	1683	1683
Adj Flow Rate, veh/h	239	198	115	687	967	207
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	1	1	1	1
Opposing Right Turn Influence	Yes		Yes			
Cap, veh/h	275	246	184	1435	1165	952
HCM Platoon Ratio	1.00	1.00	0.75	0.75	0.33	0.33
Prop Arrive On Green	0.15	0.15	0.03	0.57	0.23	0.23
Ln Grp Delay, s/veh	68.1	63.8	37.8	13.9	50.0	23.5
Ln Grp LOS	E	E	D	B	D	C
Approach Vol, veh/h	437			802	1174	
Approach Delay, s/veh	66.1			17.3	45.3	
Approach LOS	E			B	D	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs		2	8		5	6		
Case No		4.0	9.0		1.2	7.0		
Phs Duration (G+Y+Rc), s		114.4	26.4		9.9	104.4		
Change Period (Y+Rc), s		7.0	5.0		5.0	7.0		
Max Green (Gmax), s		120.0	35.0		25.0	120.0		
Max Allow Headway (MAH), s		4.9	4.0		3.7	4.9		
Max Q Clear (g_c+I1), s		32.3	20.2		4.5	79.0		
Green Ext Time (g_e), s		22.4	1.3		0.2	18.4		
Prob of Phs Call (p_c)		1.00	1.00		0.99	1.00		
Prob of Max Out (p_x)		0.06	0.01		0.00	0.29		
Left-Turn Movement Data								
Assigned Mvmt			3		5	1		
Mvmt Sat Flow, veh/h			1810		1792	0		
Through Movement Data								
Assigned Mvmt		2	8			6		
Mvmt Sat Flow, veh/h		1881	0			1683		
Right-Turn Movement Data								
Assigned Mvmt		12	18			16		
Mvmt Sat Flow, veh/h		0	1615			1376		
Left Lane Group Data								
Assigned Mvmt	0	0	3	0	5	1	0	0
Lane Assignment					(Pr/Pm)			
Lanes in Grp	0	0	1	0	1	0	0	0

Grp Vol (v), veh/h	0	0	239	0	115	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	1810	0	1792	0	0	0
Q Serve Time (g_s), s	0.0	0.0	18.2	0.0	2.5	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	18.2	0.0	2.5	0.0	0.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	1810	0	481	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	99.4	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	20.4	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	20.4	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	97.4	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	0	275	0	184	0	0	0
V/C Ratio (X)	0.00	0.00	0.87	0.00	0.63	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	450	0	439	0	0	0
Upstream Filter (I)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	58.3	0.0	34.3	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	9.8	0.0	3.5	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	68.1	0.0	37.8	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	9.1	0.0	3.2	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.7	0.0	0.2	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.0	9.8	0.0	3.4	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.43	0.00	0.57	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	8	0	0	6	0	0
Lane Assignment		T				T		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	687	0	0	0	967	0	0
Grp Sat Flow (s), veh/h/ln	0	1881	0	0	0	1683	0	0
Q Serve Time (g_s), s	0.0	30.3	0.0	0.0	0.0	77.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	30.3	0.0	0.0	0.0	77.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	1435	0	0	0	1165	0	0
V/C Ratio (X)	0.00	0.48	0.00	0.00	0.00	0.83	0.00	0.00
Avail Cap (c_a), veh/h	0	1604	0	0	0	1435	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	13.6	0.0	0.0	0.0	46.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.0	3.5	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	13.9	0.0	0.0	0.0	50.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	15.7	0.0	0.0	0.0	36.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	1.1	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	15.8	0.0	0.0	0.0	37.1	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.50	0.00	0.00	0.00	0.22	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	18	0	0	16	0	0
Lane Assignment			R			R		
Lanes in Grp	0	0	1	0	0	1	0	0
Grp Vol (v), veh/h	0	0	198	0	0	207	0	0
Grp Sat Flow (s), veh/h/ln	0	0	1615	0	0	1376	0	0
Q Serve Time (g_s), s	0.0	0.0	16.7	0.0	0.0	17.2	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	16.7	0.0	0.0	17.2	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	1430.7	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	0	246	0	0	952	0	0
V/C Ratio (X)	0.00	0.00	0.81	0.00	0.00	0.22	0.00	0.00
Avail Cap (c_a), veh/h	0	0	402	0	0	1173	0	0
Upstream Filter (I)	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	57.7	0.0	0.0	23.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	6.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	63.8	0.0	0.0	23.5	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	7.4	0.0	0.0	6.6	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.0	7.8	0.0	0.0	6.6	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.34	0.00	0.00	1.11	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	39.8
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	2	33	64	6	54	59	611	143	157	984	20
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	0.97		0.89	0.96		0.89	1.00		0.96	1.00		0.96
Parking Bus 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
Adj Sat Flow, veh/h/ln	1900	1827	1900	1900	1900	1900	1863	1863	1900	2178	2178	2200
Adj Flow Rate, veh/h	25	2	35	69	6	58	63	657	154	169	1058	22
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	0	0	0	2	2	2	1	1	1
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	121	26	119	150	26	90	486	919	215	452	1372	29
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.75	1.75	1.75
Prop Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.04	0.64	0.64	0.10	1.00	1.00
Ln Grp Delay, s/veh	35.6	0.0	0.0	38.2	0.0	0.0	5.0	0.0	11.9	10.1	0.0	0.9
Ln Grp LOS	D			D			A		B	B		A
Approach Vol, veh/h		62			133			874			1249	
Approach Delay, s/veh		35.6			38.2			11.4			2.2	
Approach LOS		D			D			B			A	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Case No	1.1	4.0		8.0	1.1	4.0		8.0
Phs Duration (G+Y+Rc), s	10.0	63.5		17.7	9.0	64.4		17.7
Change Period (Y+Rc), s	5.0	5.6		5.0	5.0	5.6		5.0
Max Green (Gmax), s	35.0	100.0		35.0	35.0	100.0		35.0
Max Allow Headway (MAH), s	3.7	5.1		5.8	3.8	5.1		5.8
Max Q Clear (g_c+I1), s	4.6	29.6		9.4	3.1	2.0		5.2
Green Ext Time (g_e), s	0.5	28.2		1.3	0.1	30.7		1.3
Prob of Phs Call (p_c)	0.99	1.00		1.00	0.80	1.00		1.00
Prob of Max Out (p_x)	0.00	0.20		0.00	0.00	0.10		0.00

Left-Turn Movement Data								
Assigned Mvmt	1			7	5			3
Mvmt Sat Flow, veh/h	2074			650	1774			469

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		1447		185		2124		189

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		339		646		44		853

Left Lane Group Data								
Assigned Mvmt	1	0	0	7	5	0	0	3
Lane Assignment	(Pr/Pm)			L+T+R	(Pr/Pm)			L+T+R
Lanes in Grp	1	0	0	1	1	0	0	1

Grp Vol (v), veh/h	169	0	0	133	63	0	0	62
Grp Sat Flow (s), veh/h/ln	2074	0	0	1480	1774	0	0	1511
Q Serve Time (g_s), s	2.6	0.0	0.0	4.2	1.1	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	2.6	0.0	0.0	7.4	1.1	0.0	0.0	3.2
Perm LT Sat Flow (s_l), veh/h/ln	783	0	0	1330	519	0	0	1312
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1807	0	0	0	1687
Perm LT Eff Green (g_p), s	57.9	0.0	0.0	12.7	57.9	0.0	0.0	12.7
Perm LT Serve Time (g_u), s	30.2	0.0	0.0	9.4	57.9	0.0	0.0	5.3
Perm LT Q Serve Time (g_ps), s	7.2	0.0	0.0	4.2	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	1.7	0.0	0.0	0.0	2.8
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	1.7	0.0	0.0	0.0	2.8
Prop LT Inside Lane (P_L)	1.00	0.00	0.00	0.52	1.00	0.00	0.00	0.40
Lane Grp Cap (c), veh/h	452	0	0	266	486	0	0	266
V/C Ratio (X)	0.37	0.00	0.00	0.50	0.13	0.00	0.00	0.23
Avail Cap (c_a), veh/h	1136	0	0	608	1091	0	0	594
Upstream Filter (I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	9.6	0.0	0.0	36.8	4.9	0.0	0.0	35.2
Incr Delay (d2), s/veh	0.5	0.0	0.0	1.5	0.1	0.0	0.0	0.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	10.1	0.0	0.0	38.2	5.0	0.0	0.0	35.6
1st-Term Q (Q1), veh/ln	1.5	0.0	0.0	3.1	0.5	0.0	0.0	1.4
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
%ile Back of Q (50%), veh/ln	1.6	0.0	0.0	3.2	0.5	0.0	0.0	1.4
%ile Storage Ratio (RQ%)	0.20	0.00	0.00	0.10	0.07	0.00	0.00	0.05
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R				T+R		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	811	0	0	0	1080	0	0
Grp Sat Flow (s), veh/h/ln	0	1786	0	0	0	2168	0	0
Q Serve Time (g_s), s	0.0	27.6	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	27.6	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.19	0.00	0.44	0.00	0.02	0.00	0.56
Lane Grp Cap (c), veh/h	0	1135	0	0	0	1400	0	0
V/C Ratio (X)	0.00	0.71	0.00	0.00	0.00	0.77	0.00	0.00
Avail Cap (c_a), veh/h	0	1961	0	0	0	2381	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	11.1	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.9	0.0	0.0	0.0	0.9	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	11.9	0.0	0.0	0.0	0.9	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	13.5	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.3	0.0	0.0	0.0	0.4	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	13.8	0.0	0.0	0.0	0.4	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	8.6
HCM 2010 LOS	A

Two Way Analysis cannot be performed on Signalized Intersection.

Two Way Analysis cannot be performed on Signalized Intersection.

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	39	0	18	5	0	8	28	658	1	0	1208	92
Conflicting Peds, #/hr	15	0	15	15	0	15	15	0	15	15	0	15
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	130	-	-	100	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	1	1	1
Mvmt Flow	41	0	19	5	0	9	30	700	1	0	1285	98

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2128	2125	1364	2124	2173	731	1398	0	0	716	0	0
Stage 1	1349	1349	-	775	775	-	-	-	-	-	-	-
Stage 2	779	776	-	1349	1398	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	~ 37	51	182	37	47	425	492	-	-	889	-	-
Stage 1	188	221	-	394	411	-	-	-	-	-	-	-
Stage 2	392	410	-	188	209	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 34	47	177	31	43	414	486	-	-	878	-	-
Mov Cap-2 Maneuver	150	183	-	31	43	-	-	-	-	-	-	-
Stage 1	174	218	-	365	381	-	-	-	-	-	-	-
Stage 2	356	380	-	166	206	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	34.7	66.5	0.5	0
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	486	-	-	150	177	72	878	-	-
HCM Lane V/C Ratio	0.061	-	-	0.277	0.108	0.192	-	-	-
HCM Control Delay (s)	12.9	-	-	37.9	27.8	66.5	0	-	-
HCM Lane LOS	B	-	-	E	D	F	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.1	0.4	0.7	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	38

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	16	1192	98	18	602	11	78	0	24	7	0	7
Conflicting Peds, #/hr	15	0	15	15	0	15	15	0	15	15	0	15
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	2	2	2	0	0	0	0	0	0
Mvmt Flow	17	1255	103	19	634	12	82	0	25	7	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	660	0	0	1373	0	0	2051	2053	1336	2060	2099	669
Stage 1	-	-	-	-	-	-	1355	1355	-	692	692	-
Stage 2	-	-	-	-	-	-	696	698	-	1368	1407	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	933	-	-	500	-	-	~ 42	56	190	41	53	461
Stage 1	-	-	-	-	-	-	186	220	-	437	448	-
Stage 2	-	-	-	-	-	-	435	445	-	183	207	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	921	-	-	494	-	-	~ 39	52	185	33	49	450
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 39	52	-	33	49	-
Stage 1	-	-	-	-	-	-	180	213	-	424	425	-
Stage 2	-	-	-	-	-	-	406	423	-	153	201	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.4	$ 749.4	81.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	48	921	-	-	494	-	-	61
HCM Lane V/C Ratio	2.237	0.018	-	-	0.038	-	-	0.242
HCM Control Delay (s)	$ 749.4	9	-	-	12.6	-	-	81.9
HCM Lane LOS	F	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	11.1	0.1	-	-	0.1	-	-	0.8

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Two Way Analysis cannot be performed on Signalized Intersection.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	1180	1289	42	439	1	464	0	32	0	0	2
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		0.96	1.00		0.98	1.00		0.96	1.00		0.50
Parking Bus 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
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1900	1881	1881	1881	1900	1900	1900
Adj Flow Rate, veh/h	2	1269	1386	45	472	1	499	0	34	0	0	2
Adj No. of Lanes	1	1	1	1	2	0	1	1	1	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	38	1115	911	38	2169	5	518	544	445	0	0	1
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.60	1.60	1.60	1.00	1.00	1.00
Prop Arrive On Green	0.02	0.59	0.59	0.02	0.59	0.59	0.46	0.00	0.46	0.00	0.00	0.00
Ln Grp Delay, s/veh	126.3	125.8	292.5	332.0	25.0	25.0	82.6	0.0	50.2	0.0	0.0	852.9
Ln Grp LOS	F	F	F	F	C	C	F		D			F
Approach Vol, veh/h		2657			518			533			2	
Approach Delay, s/veh		212.8			51.7			80.6			852.8	
Approach LOS		F			D			F			F	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	8	4	5	6		
Case No	2.0	3.0	12.0	9.0	2.0	4.0		
Phs Duration (G+Y+Rc), s	11.0	160.0	6.4	80.6	11.0	160.0		
Change Period (Y+Rc), s	5.5	7.0	6.0	6.0	5.5	7.0		
Max Green (Gmax), s	5.5	70.0	10.0	148.0	5.5	70.0		
Max Allow Headway (MAH), s	3.1	5.4	7.7	4.7	3.1	5.4		
Max Q Clear (g_c+I1), s	7.5	155.0	2.4	71.6	2.3	17.6		
Green Ext Time (g_e), s	0.0	0.0	0.0	3.0	0.0	49.1		
Prob of Phs Call (p_c)	1.00	1.00	0.13	1.00	1.00	1.00		
Prob of Max Out (p_x)	0.00	0.00	1.00	0.00	0.00	0.00		

Left-Turn Movement Data								
Assigned Mvmt	1		3	7	5			
Mvmt Sat Flow, veh/h	1792		0	1792	1792			

Through Movement Data								
Assigned Mvmt		2	8	4		6		
Mvmt Sat Flow, veh/h		1881	0	1881		3659		

Right-Turn Movement Data								
Assigned Mvmt		12	18	14		16		
Mvmt Sat Flow, veh/h		1532	811	1538		8		

Left Lane Group Data								
Assigned Mvmt	1	0	3	7	5	0	0	0
Lane Assignment	(Prot)				(Prot)			
Lanes in Grp	1	0	0	1	1	0	0	0

Grp Vol (v), veh/h	45	0	0	499	2	0	0	0
Grp Sat Flow (s), veh/h/ln	1792	0	0	1792	1792	0	0	0
Q Serve Time (g_s), s	5.5	0.0	0.0	69.6	0.3	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	5.5	0.0	0.0	69.6	0.3	0.0	0.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	1792	0	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	38	0	0	518	38	0	0	0
V/C Ratio (X)	1.18	0.00	0.00	0.96	0.05	0.00	0.00	0.00
Avail Cap (c_a), veh/h	38	0	0	1028	38	0	0	0
Upstream Filter (I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	126.3	0.0	0.0	67.9	123.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	203.2	0.0	0.0	14.7	2.6	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	332.0	0.0	0.0	82.6	126.3	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	2.7	0.0	0.0	34.4	0.1	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	2.2	0.0	0.0	2.1	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00
%ile Back of Q (50%), veh/ln	4.9	0.0	0.0	36.5	0.2	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.70	0.00	0.00	4.09	0.03	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	8	4	0	6	0	0
Lane Assignment		T		T		T		
Lanes in Grp	0	1	0	1	0	1	0	0
Grp Vol (v), veh/h	0	1269	0	0	0	231	0	0
Grp Sat Flow (s), veh/h/ln	0	1881	0	1881	0	1787	0	0
Q Serve Time (g_s), s	0.0	153.0	0.0	0.0	0.0	15.6	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	153.0	0.0	0.0	0.0	15.6	0.0	0.0
Lane Grp Cap (c), veh/h	0	1115	0	544	0	1059	0	0
V/C Ratio (X)	0.00	1.14	0.00	0.00	0.00	0.22	0.00	0.00
Avail Cap (c_a), veh/h	0	1115	0	1079	0	1059	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	52.5	0.0	0.0	0.0	24.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	73.3	0.0	0.0	0.0	0.5	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	125.8	0.0	0.0	0.0	25.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	79.3	0.0	0.0	0.0	7.7	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	22.7	0.0	0.0	0.0	0.1	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	102.0	0.0	0.0	0.0	7.8	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	2.42	0.00	0.00	0.00	0.09	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	38.4	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	18	14	0	16	0	0
Lane Assignment		R	T+R	R		T+R		
Lanes in Grp	0	1	1	1	0	1	0	0
Grp Vol (v), veh/h	0	1386	2	34	0	242	0	0
Grp Sat Flow (s), veh/h/ln	0	1532	811	1538	0	1880	0	0
Q Serve Time (g_s), s	0.0	153.0	0.4	3.2	0.0	15.6	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	153.0	0.4	3.2	0.0	15.6	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	1599.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	911	1	445	0	1114	0	0
V/C Ratio (X)	0.00	1.52	1.59	0.08	0.00	0.22	0.00	0.00
Avail Cap (c_a), veh/h	0	911	31	882	0	1114	0	0
Upstream Filter (I)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	52.2	128.8	50.1	0.0	24.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	240.3	620.3	0.1	0.0	0.4	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	103.8	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	292.5	852.9	50.2	0.0	25.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	65.0	0.1	1.4	0.0	8.1	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	60.8	0.2	0.0	0.0	0.1	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	125.8	0.3	1.4	0.0	8.2	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	2.98	0.02	0.20	0.00	0.09	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	118.8	0.2	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	171.6
HCM 2010 LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	232	192	112	666	938	201
Number	3	18	5	2	6	16
Initial Q, veh	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00	1.00	1.00			0.96
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1881	1881	1683	1683
Adj Flow Rate, veh/h	239	198	115	687	967	207
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	1	1	1	1
Opposing Right Turn Influence	Yes		Yes			
Cap, veh/h	289	258	187	1347	1035	843
HCM Platoon Ratio	1.00	1.00	0.75	0.75	0.33	0.33
Prop Arrive On Green	0.16	0.16	0.04	0.54	0.20	0.20
Ln Grp Delay, s/veh	45.6	43.6	30.1	11.9	51.3	19.9
Ln Grp LOS	D	D	C	B	D	B
Approach Vol, veh/h	437			802	1174	
Approach Delay, s/veh	44.7			14.5	45.7	
Approach LOS	D			B	D	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs		2	8		5	6		
Case No		4.0	9.0		1.2	7.0		
Phs Duration (G+Y+Rc), s		76.1	20.5		9.8	66.4		
Change Period (Y+Rc), s		7.0	5.0		5.0	7.0		
Max Green (Gmax), s		69.0	25.0		5.0	60.0		
Max Allow Headway (MAH), s		4.9	4.0		3.7	4.9		
Max Q Clear (g_c+I1), s		24.5	14.3		4.1	56.6		
Green Ext Time (g_e), s		19.0	1.1		0.0	2.8		
Prob of Phs Call (p_c)		1.00	1.00		0.95	1.00		
Prob of Max Out (p_x)		0.26	0.04		1.00	1.00		
Left-Turn Movement Data								
Assigned Mvmt			3		5	1		
Mvmt Sat Flow, veh/h			1810		1792	0		
Through Movement Data								
Assigned Mvmt		2	8			6		
Mvmt Sat Flow, veh/h		1881	0			1683		
Right-Turn Movement Data								
Assigned Mvmt		12	18			16		
Mvmt Sat Flow, veh/h		0	1615			1372		
Left Lane Group Data								
Assigned Mvmt	0	0	3	0	5	1	0	0
Lane Assignment					(Pr/Pm)			
Lanes in Grp	0	0	1	0	1	0	0	0

Grp Vol (v), veh/h	0	0	239	0	115	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	1810	0	1792	0	0	0
Q Serve Time (g_s), s	0.0	0.0	12.3	0.0	2.1	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	12.3	0.0	2.1	0.0	0.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	1810	0	481	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	61.4	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	4.8	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	4.8	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	59.4	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	0	289	0	187	0	0	0
V/C Ratio (X)	0.00	0.00	0.83	0.00	0.62	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	468	0	191	0	0	0
Upstream Filter (I)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	39.3	0.0	24.4	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	6.3	0.0	5.6	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	45.6	0.0	30.1	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	6.2	0.0	2.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.5	0.0	0.3	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.0	6.7	0.0	2.3	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.29	0.00	0.38	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	8	0	0	6	0	0
Lane Assignment		T				T		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	687	0	0	0	967	0	0
Grp Sat Flow (s), veh/h/ln	0	1881	0	0	0	1683	0	0
Q Serve Time (g_s), s	0.0	22.5	0.0	0.0	0.0	54.6	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	22.5	0.0	0.0	0.0	54.6	0.0	0.0
Lane Grp Cap (c), veh/h	0	1347	0	0	0	1035	0	0
V/C Ratio (X)	0.00	0.51	0.00	0.00	0.00	0.93	0.00	0.00
Avail Cap (c_a), veh/h	0	1347	0	0	0	1046	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	11.6	0.0	0.0	0.0	36.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	0.0	14.7	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	11.9	0.0	0.0	0.0	51.3	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	11.6	0.0	0.0	0.0	25.5	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	4.2	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	11.8	0.0	0.0	0.0	29.7	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.37	0.00	0.00	0.00	0.18	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	18	0	0	16	0	0
Lane Assignment			R			R		
Lanes in Grp	0	0	1	0	0	1	0	0
Grp Vol (v), veh/h	0	0	198	0	0	207	0	0
Grp Sat Flow (s), veh/h/ln	0	0	1615	0	0	1372	0	0
Q Serve Time (g_s), s	0.0	0.0	11.3	0.0	0.0	12.2	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	11.3	0.0	0.0	12.2	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	1430.7	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	0	258	0	0	843	0	0
V/C Ratio (X)	0.00	0.00	0.77	0.00	0.00	0.25	0.00	0.00
Avail Cap (c_a), veh/h	0	0	418	0	0	852	0	0
Upstream Filter (I)	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	38.8	0.0	0.0	19.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	4.7	0.0	0.0	0.1	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	43.6	0.0	0.0	19.9	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	5.1	0.0	0.0	4.7	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.0	5.4	0.0	0.0	4.7	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.24	0.00	0.00	0.79	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	35.2
HCM 2010 LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	39	0	18	5	0	8	28	658	1	0	1208	92
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	0.92		0.84	0.92		0.84	1.00		0.96	1.00		0.96
Parking Bus 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
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	41	0	19	5	0	9	30	700	1	0	1285	98
Adj No. of Lanes	1	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	211	0	121	87	19	81	189	1521	2	91	1394	106
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.09	0.00	0.09	0.09	0.00	0.09	0.81	0.81	0.81	0.00	0.81	0.81
Ln Grp Delay, s/veh	34.2	0.0	33.9	33.3	0.0	0.0	24.5	0.0	2.5	0.0	0.0	15.0
Ln Grp LOS	C		C	C			C		A			B
Approach Vol, veh/h		60			14			731			1383	
Approach Delay, s/veh		34.1			33.3			3.4			15.0	
Approach LOS		C			C			A			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Case No		6.0		6.0		6.0		8.0
Phs Duration (G+Y+Rc), s		68.1		11.0		68.1		11.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green (Gmax), s		66.0		16.0		66.0		16.0
Max Allow Headway (MAH), s		5.2		4.9		5.2		4.9
Max Q Clear (g_c+I1), s		51.2		4.1		46.3		2.7
Green Ext Time (g_e), s		12.9		0.2		16.6		0.2
Prob of Phs Call (p_c)		1.00		0.86		1.00		0.86
Prob of Max Out (p_x)		0.90		0.00		0.85		0.00
Left-Turn Movement Data								
Assigned Mvmt		5		7		1		3
Mvmt Sat Flow, veh/h		394		1315		750		285
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		1878		0		1721		218
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		3		1357		131		905
Left Lane Group Data								
Assigned Mvmt	0	5	0	7	0	1	0	3
Lane Assignment								L+T+R
Lanes in Grp	0	1	0	1	0	1	0	1

Grp Vol (v), veh/h	0	30	0	41	0	0	0	14
Grp Sat Flow (s), veh/h/ln	0	394	0	1315	0	750	0	1408
Q Serve Time (g_s), s	0.0	4.9	0.0	1.5	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	49.2	0.0	2.1	0.0	0.0	0.0	0.7
Perm LT Sat Flow (s_l), veh/h/ln	0	394	0	1315	0	750	0	1308
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1666	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	64.1	0.0	7.0	0.0	0.0	0.0	7.0
Perm LT Serve Time (g_u), s	0.0	19.8	0.0	6.4	0.0	0.0	0.0	6.0
Perm LT Q Serve Time (g_ps), s	0.0	4.9	0.0	1.5	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
Prop LT Inside Lane (P_L)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.36
Lane Grp Cap (c), veh/h	0	189	0	211	0	91	0	187
V/C Ratio (X)	0.00	0.16	0.00	0.19	0.00	0.00	0.00	0.07
Avail Cap (c_a), veh/h	0	199	0	360	0	108	0	338
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	24.1	0.0	33.8	0.0	0.0	0.0	33.2
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.4	0.0	0.0	0.0	0.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	24.5	0.0	34.2	0.0	0.0	0.0	33.3
1st-Term Q (Q1), veh/ln	0.0	0.5	0.0	0.8	0.0	0.0	0.0	0.3
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.6	0.0	0.9	0.0	0.0	0.0	0.3
%ile Storage Ratio (RQ%)	0.00	0.11	0.00	0.02	0.00	0.00	0.00	0.04
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		
Lanes in Grp	0	1	0	1	0	1	0	0
Grp Vol (v), veh/h	0	701	0	19	0	1383	0	0
Grp Sat Flow (s), veh/h/ln	0	1881	0	1357	0	1852	0	0
Q Serve Time (g_s), s	0.0	8.9	0.0	1.0	0.0	44.3	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	8.9	0.0	1.0	0.0	44.3	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.00	0.00	1.00	0.00	0.07	0.00	0.64
Lane Grp Cap (c), veh/h	0	1523	0	121	0	1500	0	0
V/C Ratio (X)	0.00	0.46	0.00	0.16	0.00	0.92	0.00	0.00
Avail Cap (c_a), veh/h	0	1567	0	274	0	1544	0	0
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	2.3	0.0	33.3	0.0	5.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.6	0.0	9.3	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	2.5	0.0	33.9	0.0	15.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	4.5	0.0	0.4	0.0	21.5	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	3.9	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.6	0.0	0.4	0.0	25.4	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.13	0.00	0.01	0.00	0.81	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	11.8
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	16	1192	98	18	602	11	78	0	24	7	0	7
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		0.96	1.00		0.96	0.94		0.88	0.96		0.88
Parking Bus 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
Adj Sat Flow, veh/h/ln	1881	1881	1900	1863	1863	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	17	1255	103	19	634	12	82	0	25	7	0	7
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
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
Percent Heavy Veh, %	1	1	1	2	2	2	0	0	0	0	0	0
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	606	1332	109	152	1418	27	200	10	41	146	19	101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.78	0.78	0.78	0.78	0.78	0.78	0.13	0.00	0.13	0.13	0.00	0.13
Ln Grp Delay, s/veh	5.0	0.0	20.1	31.1	0.0	3.4	36.0	0.0	0.0	32.6	0.0	0.0
Ln Grp LOS	A		C	C		A	D			C		
Approach Vol, veh/h		1375			665			107			14	
Approach Delay, s/veh		19.9			4.2			36.0			32.6	
Approach LOS		B			A			D			C	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Case No		8.0		6.0		8.0		6.0
Phs Duration (G+Y+Rc), s		14.7		69.9		14.7		69.9
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green (Gmax), s		16.0		67.0		16.0		67.0
Max Allow Headway (MAH), s		5.7		5.2		5.7		5.2
Max Q Clear (g_c+I1), s		8.1		53.6		2.6		57.1
Green Ext Time (g_e), s		0.3		11.5		0.5		8.7
Prob of Phs Call (p_c)		1.00		1.00		1.00		1.00
Prob of Max Out (p_x)		0.27		0.90		0.01		0.94

Left-Turn Movement Data								
Assigned Mvmt		5		7		1		3
Mvmt Sat Flow, veh/h		988		788		648		399

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		77		1710		148		1821

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		325		140		796		34

Left Lane Group Data								
Assigned Mvmt	0	5	0	7	0	1	0	3
Lane Assignment		L+T+R				L+T+R		
Lanes in Grp	0	1	0	1	0	1	0	1

Grp Vol (v), veh/h	0	107	0	17	0	14	0	19
Grp Sat Flow (s), veh/h/ln	0	1389	0	788	0	1592	0	399
Q Serve Time (g_s), s	0.0	5.4	0.0	0.6	0.0	0.0	0.0	3.5
Cycle Q Clear Time (g_c), s	0.0	6.1	0.0	10.6	0.0	0.6	0.0	55.1
Perm LT Sat Flow (s_l), veh/h/ln	0	1349	0	788	0	1350	0	399
Shared LT Sat Flow (s_sh), veh/h/ln	0	1748	0	0	0	1806	0	0
Perm LT Eff Green (g_p), s	0.0	10.7	0.0	65.9	0.0	10.7	0.0	65.9
Perm LT Serve Time (g_u), s	0.0	10.1	0.0	55.9	0.0	4.6	0.0	14.3
Perm LT Q Serve Time (g_ps), s	0.0	5.4	0.0	0.6	0.0	0.0	0.0	3.5
Time to First Blk (g_f), s	0.0	0.6	0.0	0.0	0.0	2.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.6	0.0	0.0	0.0	0.6	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.77	0.00	1.00	0.00	0.50	0.00	1.00
Lane Grp Cap (c), veh/h	0	251	0	606	0	265	0	152
V/C Ratio (X)	0.00	0.43	0.00	0.03	0.00	0.05	0.00	0.12
Avail Cap (c_a), veh/h	0	336	0	616	0	352	0	158
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	34.8	0.0	5.0	0.0	32.5	0.0	30.7
Incr Delay (d2), s/veh	0.0	1.1	0.0	0.0	0.0	0.1	0.0	0.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	36.0	0.0	5.0	0.0	32.6	0.0	31.1
1st-Term Q (Q1), veh/ln	0.0	2.3	0.0	0.1	0.0	0.3	0.0	0.4
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	2.4	0.0	0.1	0.0	0.3	0.0	0.4
%ile Storage Ratio (RQ%)	0.00	0.09	0.00	0.02	0.00	0.02	0.00	0.07
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment				T+R				T+R
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	1358	0	0	0	646
Grp Sat Flow (s), veh/h/ln	0	0	0	1850	0	0	0	1855
Q Serve Time (g_s), s	0.0	0.0	0.0	51.6	0.0	0.0	0.0	10.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	51.6	0.0	0.0	0.0	10.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.23	0.00	0.08	0.00	0.50	0.00	0.02
Lane Grp Cap (c), veh/h	0	0	0	1441	0	0	0	1445
V/C Ratio (X)	0.00	0.00	0.00	0.94	0.00	0.00	0.00	0.45
Avail Cap (c_a), veh/h	0	0	0	1465	0	0	0	1469
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	7.8	0.0	0.0	0.0	3.2
Incr Delay (d2), s/veh	0.0	0.0	0.0	12.3	0.0	0.0	0.0	0.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	20.1	0.0	0.0	0.0	3.4
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	25.3	0.0	0.0	0.0	5.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	30.2	0.0	0.0	0.0	5.1
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.05
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	15.9
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	2	33	64	6	54	59	611	143	157	984	20
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	0.96		0.89	0.96		0.89	1.00		0.96	1.00		0.96
Parking Bus 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
Adj Sat Flow, veh/h/ln	1900	1827	1900	1900	1900	1900	1863	1863	1900	2178	2178	2200
Adj Flow Rate, veh/h	25	2	35	69	6	58	63	657	154	169	1058	22
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	0	0	0	2	2	2	1	1	1
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	119	26	117	149	25	89	487	925	217	455	1379	29
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.75	1.75	1.75
Prop Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.04	0.64	0.64	0.09	1.00	1.00
Ln Grp Delay, s/veh	36.1	0.0	0.0	38.8	0.0	0.0	4.9	0.0	11.8	10.1	0.0	0.9
Ln Grp LOS	D			D			A		B	B		A
Approach Vol, veh/h		62			133			874			1249	
Approach Delay, s/veh		36.1			38.8			11.3			2.1	
Approach LOS		D			D			B			A	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Case No	1.1	4.0		8.0	1.1	4.0		8.0
Phs Duration (G+Y+Rc), s	9.9	64.5		17.7	9.0	65.5		17.7
Change Period (Y+Rc), s	5.0	5.6		5.0	5.0	5.6		5.0
Max Green (Gmax), s	29.0	109.4		31.6	29.0	109.4		31.6
Max Allow Headway (MAH), s	3.7	5.1		5.8	3.8	5.1		5.8
Max Q Clear (g_c+I1), s	4.6	29.6		9.5	3.1	2.0		5.3
Green Ext Time (g_e), s	0.4	29.3		1.2	0.1	31.1		1.3
Prob of Phs Call (p_c)	0.99	1.00		1.00	0.80	1.00		1.00
Prob of Max Out (p_x)	0.00	0.16		0.00	0.00	0.08		0.00

Left-Turn Movement Data								
Assigned Mvmt	1			7	5			3
Mvmt Sat Flow, veh/h	2074			652	1774			469

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		1447		183		2124		188

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		339		646		44		852

Left Lane Group Data								
Assigned Mvmt	1	0	0	7	5	0	0	3
Lane Assignment	(Pr/Pm)			L+T+R	(Pr/Pm)			L+T+R
Lanes in Grp	1	0	0	1	1	0	0	1

Grp Vol (v), veh/h	169	0	0	133	63	0	0	62
Grp Sat Flow (s), veh/h/ln	2074	0	0	1481	1774	0	0	1509
Q Serve Time (g_s), s	2.6	0.0	0.0	4.2	1.1	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	2.6	0.0	0.0	7.5	1.1	0.0	0.0	3.3
Perm LT Sat Flow (s_l), veh/h/ln	783	0	0	1330	519	0	0	1311
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1807	0	0	0	1677
Perm LT Eff Green (g_p), s	58.9	0.0	0.0	12.7	58.9	0.0	0.0	12.7
Perm LT Serve Time (g_u), s	31.3	0.0	0.0	9.4	58.9	0.0	0.0	5.2
Perm LT Q Serve Time (g_ps), s	7.2	0.0	0.0	4.2	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	1.7	0.0	0.0	0.0	2.8
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	1.7	0.0	0.0	0.0	2.8
Prop LT Inside Lane (P_L)	1.00	0.00	0.00	0.52	1.00	0.00	0.00	0.40
Lane Grp Cap (c), veh/h	455	0	0	264	487	0	0	263
V/C Ratio (X)	0.37	0.00	0.00	0.50	0.13	0.00	0.00	0.24
Avail Cap (c_a), veh/h	997	0	0	549	968	0	0	537
Upstream Filter (I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	9.5	0.0	0.0	37.3	4.8	0.0	0.0	35.7
Incr Delay (d2), s/veh	0.5	0.0	0.0	1.5	0.1	0.0	0.0	0.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	10.1	0.0	0.0	38.8	4.9	0.0	0.0	36.1
1st-Term Q (Q1), veh/ln	1.5	0.0	0.0	3.2	0.5	0.0	0.0	1.4
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
%ile Back of Q (50%), veh/ln	1.6	0.0	0.0	3.3	0.5	0.0	0.0	1.4
%ile Storage Ratio (RQ%)	0.20	0.00	0.00	0.10	0.07	0.00	0.00	0.05
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R				T+R		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	811	0	0	0	1080	0	0
Grp Sat Flow (s), veh/h/ln	0	1786	0	0	0	2168	0	0
Q Serve Time (g_s), s	0.0	27.6	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	27.6	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.19	0.00	0.44	0.00	0.02	0.00	0.56
Lane Grp Cap (c), veh/h	0	1142	0	0	0	1408	0	0
V/C Ratio (X)	0.00	0.71	0.00	0.00	0.00	0.77	0.00	0.00
Avail Cap (c_a), veh/h	0	2120	0	0	0	2574	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.8	0.0	0.0	0.0	0.9	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	11.8	0.0	0.0	0.0	0.9	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	13.5	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.3	0.0	0.0	0.0	0.4	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	13.8	0.0	0.0	0.0	0.4	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	8.6
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	1180	1289	42	439	1	464	0	32	0	0	2
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		0.96	1.00		0.97	1.00		0.96	1.00		0.53
Parking Bus 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
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1900	1881	1881	1881	1900	1900	1900
Adj Flow Rate, veh/h	2	1269	1386	45	472	1	499	0	34	0	0	2
Adj No. of Lanes	1	1	1	1	2	0	1	1	1	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	147	991	807	147	1927	4	518	544	445	0	0	1
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.60	1.60	1.60	1.00	1.00	1.00
Prop Arrive On Green	0.08	0.53	0.53	0.08	0.53	0.53	0.46	0.00	0.46	0.00	0.00	0.00
Ln Grp Delay, s/veh	103.1	191.8	385.2	110.8	32.0	32.0	88.5	0.0	47.5	0.0	0.0	774.5
Ln Grp LOS	F	F	F	F	C	C	F		D			F
Approach Vol, veh/h		2657			518			533			2	
Approach Delay, s/veh		292.6			38.8			85.9			774.4	
Approach LOS		F			D			F			F	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	8	4	5	6		
Case No	2.0	3.0	12.0	9.0	2.0	4.0		
Phs Duration (G+Y+Rc), s	25.5	135.5	6.4	76.6	25.5	135.5		
Change Period (Y+Rc), s	5.5	7.0	6.0	6.0	5.5	7.0		
Max Green (Gmax), s	20.0	90.0	20.0	90.0	20.0	90.0		
Max Allow Headway (MAH), s	3.1	5.4	7.4	4.7	3.1	5.4		
Max Q Clear (g_c+I1), s	7.8	130.5	2.4	67.8	2.3	19.1		
Green Ext Time (g_e), s	0.0	0.0	0.0	2.8	0.0	65.0		
Prob of Phs Call (p_c)	1.00	1.00	0.13	1.00	1.00	1.00		
Prob of Max Out (p_x)	0.00	0.00	0.00	0.01	0.00	0.00		

Left-Turn Movement Data								
Assigned Mvmt	1		3	7	5			
Mvmt Sat Flow, veh/h	1792		0	1792	1792			

Through Movement Data								
Assigned Mvmt		2	8	4		6		
Mvmt Sat Flow, veh/h		1881	0	1881		3659		

Right-Turn Movement Data								
Assigned Mvmt		12	18	14		16		
Mvmt Sat Flow, veh/h		1528	853	1538		8		

Left Lane Group Data								
Assigned Mvmt	1	0	3	7	5	0	0	0
Lane Assignment	(Prot)				(Prot)			
Lanes in Grp	1	0	0	1	1	0	0	0

Grp Vol (v), veh/h	45	0	0	499	2	0	0	0
Grp Sat Flow (s), veh/h/ln	1792	0	0	1792	1792	0	0	0
Q Serve Time (g_s), s	5.8	0.0	0.0	65.8	0.3	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	5.8	0.0	0.0	65.8	0.3	0.0	0.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	1792	0	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	147	0	0	518	147	0	0	0
V/C Ratio (X)	0.31	0.00	0.00	0.96	0.01	0.00	0.00	0.00
Avail Cap (c_a), veh/h	147	0	0	661	147	0	0	0
Upstream Filter (I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	105.5	0.0	0.0	64.2	102.9	0.0	0.0	0.0
Incr Delay (d2), s/veh	5.3	0.0	0.0	24.2	0.2	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	110.8	0.0	0.0	88.5	103.1	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	2.9	0.0	0.0	32.5	0.1	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.2	0.0	0.0	3.5	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00
%ile Back of Q (50%), veh/ln	3.1	0.0	0.0	36.0	0.1	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.44	0.00	0.00	4.03	0.02	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	8	4	0	6	0	0
Lane Assignment		T		T		T		
Lanes in Grp	0	1	0	1	0	1	0	0
Grp Vol (v), veh/h	0	1269	0	0	0	231	0	0
Grp Sat Flow (s), veh/h/ln	0	1881	0	1881	0	1787	0	0
Q Serve Time (g_s), s	0.0	128.5	0.0	0.0	0.0	17.1	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	128.5	0.0	0.0	0.0	17.1	0.0	0.0
Lane Grp Cap (c), veh/h	0	991	0	544	0	941	0	0
V/C Ratio (X)	0.00	1.28	0.00	0.00	0.00	0.24	0.00	0.00
Avail Cap (c_a), veh/h	0	991	0	694	0	941	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	57.7	0.0	0.0	0.0	31.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	134.1	0.0	0.0	0.0	0.6	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	191.8	0.0	0.0	0.0	32.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	66.6	0.0	0.0	0.0	8.5	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	36.9	0.0	0.0	0.0	0.2	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	103.5	0.0	0.0	0.0	8.6	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	2.45	0.00	0.00	0.00	0.10	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	69.5	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data								
Assigned Mvmt	0	12	18	14	0	16	0	0
Lane Assignment		R	T+R	R		T+R		
Lanes in Grp	0	1	1	1	0	1	0	0
Grp Vol (v), veh/h	0	1386	2	34	0	242	0	0
Grp Sat Flow (s), veh/h/ln	0	1528	853	1538	0	1880	0	0
Q Serve Time (g_s), s	0.0	128.5	0.4	3.0	0.0	17.1	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	128.5	0.4	3.0	0.0	17.1	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	1599.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	807	1	445	0	990	0	0
V/C Ratio (X)	0.00	1.72	1.50	0.08	0.00	0.24	0.00	0.00
Avail Cap (c_a), veh/h	0	807	70	567	0	990	0	0
Upstream Filter (I)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	57.5	121.8	47.4	0.0	31.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	327.7	572.7	0.1	0.0	0.6	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	80.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	385.2	774.5	47.5	0.0	32.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	54.5	0.1	1.3	0.0	8.9	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	73.5	0.2	0.0	0.0	0.2	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	128.0	0.3	1.3	0.0	9.1	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	3.03	0.02	0.18	0.00	0.10	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	144.6	0.2	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	227.7
HCM 2010 LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	232	192	112	666	938	201
Number	3	18	5	2	6	16
Initial Q, veh	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00	1.00	1.00			0.96
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1881	1881	1683	1683
Adj Flow Rate, veh/h	239	198	115	687	967	207
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	1	1	1	1
Opposing Right Turn Influence	Yes		Yes			
Cap, veh/h	275	246	184	1435	1165	952
HCM Platoon Ratio	1.00	1.00	0.75	0.75	0.33	0.33
Prop Arrive On Green	0.15	0.15	0.03	0.57	0.23	0.23
Ln Grp Delay, s/veh	68.1	63.8	37.8	13.9	50.0	23.5
Ln Grp LOS	E	E	D	B	D	C
Approach Vol, veh/h	437			802	1174	
Approach Delay, s/veh	66.1			17.3	45.3	
Approach LOS	E			B	D	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs		2	8		5	6		
Case No		4.0	9.0		1.2	7.0		
Phs Duration (G+Y+Rc), s		114.4	26.4		9.9	104.4		
Change Period (Y+Rc), s		7.0	5.0		5.0	7.0		
Max Green (Gmax), s		120.0	35.0		25.0	120.0		
Max Allow Headway (MAH), s		4.9	4.0		3.7	4.9		
Max Q Clear (g_c+I1), s		32.3	20.2		4.5	79.0		
Green Ext Time (g_e), s		22.4	1.3		0.2	18.4		
Prob of Phs Call (p_c)		1.00	1.00		0.99	1.00		
Prob of Max Out (p_x)		0.06	0.01		0.00	0.29		
Left-Turn Movement Data								
Assigned Mvmt			3		5	1		
Mvmt Sat Flow, veh/h			1810		1792	0		
Through Movement Data								
Assigned Mvmt		2	8			6		
Mvmt Sat Flow, veh/h		1881	0			1683		
Right-Turn Movement Data								
Assigned Mvmt		12	18			16		
Mvmt Sat Flow, veh/h		0	1615			1376		
Left Lane Group Data								
Assigned Mvmt	0	0	3	0	5	1	0	0
Lane Assignment					(Pr/Pm)			
Lanes in Grp	0	0	1	0	1	0	0	0

Grp Vol (v), veh/h	0	0	239	0	115	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	1810	0	1792	0	0	0
Q Serve Time (g_s), s	0.0	0.0	18.2	0.0	2.5	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	18.2	0.0	2.5	0.0	0.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	1810	0	481	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	99.4	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	20.4	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	20.4	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	97.4	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	0	275	0	184	0	0	0
V/C Ratio (X)	0.00	0.00	0.87	0.00	0.63	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	450	0	439	0	0	0
Upstream Filter (I)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	58.3	0.0	34.3	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	9.8	0.0	3.5	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	68.1	0.0	37.8	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	9.1	0.0	3.2	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.7	0.0	0.2	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.0	9.8	0.0	3.4	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.43	0.00	0.57	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	8	0	0	6	0	0
Lane Assignment		T				T		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	687	0	0	0	967	0	0
Grp Sat Flow (s), veh/h/ln	0	1881	0	0	0	1683	0	0
Q Serve Time (g_s), s	0.0	30.3	0.0	0.0	0.0	77.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	30.3	0.0	0.0	0.0	77.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	1435	0	0	0	1165	0	0
V/C Ratio (X)	0.00	0.48	0.00	0.00	0.00	0.83	0.00	0.00
Avail Cap (c_a), veh/h	0	1604	0	0	0	1435	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	13.6	0.0	0.0	0.0	46.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.0	3.5	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	13.9	0.0	0.0	0.0	50.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	15.7	0.0	0.0	0.0	36.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	1.1	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	15.8	0.0	0.0	0.0	37.1	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.50	0.00	0.00	0.00	0.22	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	18	0	0	16	0	0
Lane Assignment			R			R		
Lanes in Grp	0	0	1	0	0	1	0	0
Grp Vol (v), veh/h	0	0	198	0	0	207	0	0
Grp Sat Flow (s), veh/h/ln	0	0	1615	0	0	1376	0	0
Q Serve Time (g_s), s	0.0	0.0	16.7	0.0	0.0	17.2	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	16.7	0.0	0.0	17.2	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	1430.7	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	0	246	0	0	952	0	0
V/C Ratio (X)	0.00	0.00	0.81	0.00	0.00	0.22	0.00	0.00
Avail Cap (c_a), veh/h	0	0	402	0	0	1173	0	0
Upstream Filter (I)	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	57.7	0.0	0.0	23.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	6.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	63.8	0.0	0.0	23.5	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	7.4	0.0	0.0	6.6	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.0	7.8	0.0	0.0	6.6	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.34	0.00	0.00	1.11	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	39.8
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	39	0	18	5	0	8	28	658	1	0	1208	92
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	0.92		0.84	0.92		0.84	1.00		0.96	1.00		0.96
Parking Bus 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
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	41	0	19	5	0	9	30	700	1	0	1285	98
Adj No. of Lanes	1	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	211	0	121	87	19	81	189	1521	2	91	1394	106
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.09	0.00	0.09	0.09	0.00	0.09	0.81	0.81	0.81	0.00	0.81	0.81
Ln Grp Delay, s/veh	34.2	0.0	33.9	33.3	0.0	0.0	24.5	0.0	2.5	0.0	0.0	15.0
Ln Grp LOS	C		C	C			C		A			B
Approach Vol, veh/h		60			14			731			1383	
Approach Delay, s/veh		34.1			33.3			3.4			15.0	
Approach LOS		C			C			A			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Case No		6.0		6.0		6.0		8.0
Phs Duration (G+Y+Rc), s		68.1		11.0		68.1		11.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green (Gmax), s		66.0		16.0		66.0		16.0
Max Allow Headway (MAH), s		5.2		4.9		5.2		4.9
Max Q Clear (g_c+I1), s		51.2		4.1		46.3		2.7
Green Ext Time (g_e), s		12.9		0.2		16.6		0.2
Prob of Phs Call (p_c)		1.00		0.86		1.00		0.86
Prob of Max Out (p_x)		0.90		0.00		0.85		0.00
Left-Turn Movement Data								
Assigned Mvmt		5		7		1		3
Mvmt Sat Flow, veh/h		394		1315		750		285
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		1878		0		1721		218
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		3		1357		131		905
Left Lane Group Data								
Assigned Mvmt	0	5	0	7	0	1	0	3
Lane Assignment								L+T+R
Lanes in Grp	0	1	0	1	0	1	0	1

Grp Vol (v), veh/h	0	30	0	41	0	0	0	14
Grp Sat Flow (s), veh/h/ln	0	394	0	1315	0	750	0	1408
Q Serve Time (g_s), s	0.0	4.9	0.0	1.5	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	49.2	0.0	2.1	0.0	0.0	0.0	0.7
Perm LT Sat Flow (s_l), veh/h/ln	0	394	0	1315	0	750	0	1308
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1666	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	64.1	0.0	7.0	0.0	0.0	0.0	7.0
Perm LT Serve Time (g_u), s	0.0	19.8	0.0	6.4	0.0	0.0	0.0	6.0
Perm LT Q Serve Time (g_ps), s	0.0	4.9	0.0	1.5	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
Prop LT Inside Lane (P_L)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.36
Lane Grp Cap (c), veh/h	0	189	0	211	0	91	0	187
V/C Ratio (X)	0.00	0.16	0.00	0.19	0.00	0.00	0.00	0.07
Avail Cap (c_a), veh/h	0	199	0	360	0	108	0	338
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	24.1	0.0	33.8	0.0	0.0	0.0	33.2
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.4	0.0	0.0	0.0	0.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	24.5	0.0	34.2	0.0	0.0	0.0	33.3
1st-Term Q (Q1), veh/ln	0.0	0.5	0.0	0.8	0.0	0.0	0.0	0.3
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.6	0.0	0.9	0.0	0.0	0.0	0.3
%ile Storage Ratio (RQ%)	0.00	0.11	0.00	0.02	0.00	0.00	0.00	0.04
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		
Lanes in Grp	0	1	0	1	0	1	0	0
Grp Vol (v), veh/h	0	701	0	19	0	1383	0	0
Grp Sat Flow (s), veh/h/ln	0	1881	0	1357	0	1852	0	0
Q Serve Time (g_s), s	0.0	8.9	0.0	1.0	0.0	44.3	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	8.9	0.0	1.0	0.0	44.3	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.00	0.00	1.00	0.00	0.07	0.00	0.64
Lane Grp Cap (c), veh/h	0	1523	0	121	0	1500	0	0
V/C Ratio (X)	0.00	0.46	0.00	0.16	0.00	0.92	0.00	0.00
Avail Cap (c_a), veh/h	0	1567	0	274	0	1544	0	0
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	2.3	0.0	33.3	0.0	5.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.6	0.0	9.3	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	2.5	0.0	33.9	0.0	15.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	4.5	0.0	0.4	0.0	21.5	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	3.9	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.6	0.0	0.4	0.0	25.4	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.13	0.00	0.01	0.00	0.81	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	11.8
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	16	1192	98	18	602	11	78	0	24	7	0	7
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		0.96	1.00		0.96	0.94		0.88	0.96		0.88
Parking Bus 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
Adj Sat Flow, veh/h/ln	1881	1881	1900	1863	1863	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	17	1255	103	19	634	12	82	0	25	7	0	7
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
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
Percent Heavy Veh, %	1	1	1	2	2	2	0	0	0	0	0	0
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	605	1329	109	151	1415	27	202	10	41	147	19	101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.78	0.78	0.78	0.78	0.78	0.78	0.13	0.00	0.13	0.13	0.00	0.13
Ln Grp Delay, s/veh	5.0	0.0	20.4	31.2	0.0	3.4	35.5	0.0	0.0	32.2	0.0	0.0
Ln Grp LOS	A		C	C		A	D			C		
Approach Vol, veh/h		1375			665			107			14	
Approach Delay, s/veh		20.2			4.2			35.5			32.2	
Approach LOS		C			A			D			C	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Case No		8.0		6.0		8.0		6.0
Phs Duration (G+Y+Rc), s		14.6		69.0		14.6		69.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green (Gmax), s		16.0		66.0		16.0		66.0
Max Allow Headway (MAH), s		5.7		5.2		5.7		5.2
Max Q Clear (g_c+I1), s		8.0		53.4		2.6		56.9
Green Ext Time (g_e), s		0.3		10.9		0.5		8.1
Prob of Phs Call (p_c)		1.00		1.00		1.00		1.00
Prob of Max Out (p_x)		0.26		0.91		0.01		0.95

Left-Turn Movement Data								
Assigned Mvmt		5		7		1		3
Mvmt Sat Flow, veh/h		988		788		647		399

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		77		1710		149		1821

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		325		140		796		34

Left Lane Group Data								
Assigned Mvmt	0	5	0	7	0	1	0	3
Lane Assignment		L+T+R				L+T+R		
Lanes in Grp	0	1	0	1	0	1	0	1

Grp Vol (v), veh/h	0	107	0	17	0	14	0	19
Grp Sat Flow (s), veh/h/ln	0	1390	0	788	0	1593	0	399
Q Serve Time (g_s), s	0.0	5.4	0.0	0.6	0.0	0.0	0.0	3.5
Cycle Q Clear Time (g_c), s	0.0	6.0	0.0	10.6	0.0	0.6	0.0	54.9
Perm LT Sat Flow (s_l), veh/h/ln	0	1350	0	788	0	1350	0	399
Shared LT Sat Flow (s_sh), veh/h/ln	0	1748	0	0	0	1813	0	0
Perm LT Eff Green (g_p), s	0.0	10.6	0.0	65.0	0.0	10.6	0.0	65.0
Perm LT Serve Time (g_u), s	0.0	10.0	0.0	55.1	0.0	4.6	0.0	13.6
Perm LT Q Serve Time (g_ps), s	0.0	5.4	0.0	0.6	0.0	0.0	0.0	3.5
Time to First Blk (g_f), s	0.0	0.6	0.0	0.0	0.0	1.9	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.6	0.0	0.0	0.0	0.6	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.77	0.00	1.00	0.00	0.50	0.00	1.00
Lane Grp Cap (c), veh/h	0	253	0	605	0	267	0	151
V/C Ratio (X)	0.00	0.42	0.00	0.03	0.00	0.05	0.00	0.13
Avail Cap (c_a), veh/h	0	340	0	614	0	356	0	156
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	34.4	0.0	5.0	0.0	32.1	0.0	30.8
Incr Delay (d2), s/veh	0.0	1.1	0.0	0.0	0.0	0.1	0.0	0.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	35.5	0.0	5.0	0.0	32.2	0.0	31.2
1st-Term Q (Q1), veh/ln	0.0	2.3	0.0	0.1	0.0	0.3	0.0	0.4
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	2.4	0.0	0.1	0.0	0.3	0.0	0.4
%ile Storage Ratio (RQ%)	0.00	0.09	0.00	0.02	0.00	0.02	0.00	0.07
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment				T+R				T+R
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	1358	0	0	0	646
Grp Sat Flow (s), veh/h/ln	0	0	0	1850	0	0	0	1855
Q Serve Time (g_s), s	0.0	0.0	0.0	51.4	0.0	0.0	0.0	10.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	51.4	0.0	0.0	0.0	10.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.23	0.00	0.08	0.00	0.50	0.00	0.02
Lane Grp Cap (c), veh/h	0	0	0	1438	0	0	0	1442
V/C Ratio (X)	0.00	0.00	0.00	0.94	0.00	0.00	0.00	0.45
Avail Cap (c_a), veh/h	0	0	0	1459	0	0	0	1463
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	7.8	0.0	0.0	0.0	3.2
Incr Delay (d2), s/veh	0.0	0.0	0.0	12.6	0.0	0.0	0.0	0.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	20.4	0.0	0.0	0.0	3.4
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	25.3	0.0	0.0	0.0	5.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	30.3	0.0	0.0	0.0	5.1
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.05
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	16.1
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	2	33	64	6	54	59	611	143	157	984	20
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	0.97		0.89	0.96		0.89	1.00		0.96	1.00		0.96
Parking Bus 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
Adj Sat Flow, veh/h/ln	1900	1827	1900	1900	1900	1900	1863	1863	1900	2178	2178	2200
Adj Flow Rate, veh/h	25	2	35	69	6	58	63	657	154	169	1058	22
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	0	0	0	2	2	2	1	1	1
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	121	26	119	150	26	90	486	919	215	452	1372	29
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.75	1.75	1.75
Prop Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.04	0.64	0.64	0.10	1.00	1.00
Ln Grp Delay, s/veh	35.6	0.0	0.0	38.2	0.0	0.0	5.0	0.0	11.9	10.1	0.0	0.9
Ln Grp LOS	D			D			A		B	B		A
Approach Vol, veh/h		62			133			874			1249	
Approach Delay, s/veh		35.6			38.2			11.4			2.2	
Approach LOS		D			D			B			A	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Case No	1.1	4.0		8.0	1.1	4.0		8.0
Phs Duration (G+Y+Rc), s	10.0	63.5		17.7	9.0	64.4		17.7
Change Period (Y+Rc), s	5.0	5.6		5.0	5.0	5.6		5.0
Max Green (Gmax), s	35.0	100.0		35.0	35.0	100.0		35.0
Max Allow Headway (MAH), s	3.7	5.1		5.8	3.8	5.1		5.8
Max Q Clear (g_c+I1), s	4.6	29.6		9.4	3.1	2.0		5.2
Green Ext Time (g_e), s	0.5	28.2		1.3	0.1	30.7		1.3
Prob of Phs Call (p_c)	0.99	1.00		1.00	0.80	1.00		1.00
Prob of Max Out (p_x)	0.00	0.20		0.00	0.00	0.10		0.00

Left-Turn Movement Data								
Assigned Mvmt	1			7	5			3
Mvmt Sat Flow, veh/h	2074			650	1774			469

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		1447		185		2124		189

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		339		646		44		853

Left Lane Group Data								
Assigned Mvmt	1	0	0	7	5	0	0	3
Lane Assignment	(Pr/Pm)			L+T+R	(Pr/Pm)			L+T+R
Lanes in Grp	1	0	0	1	1	0	0	1

Grp Vol (v), veh/h	169	0	0	133	63	0	0	62
Grp Sat Flow (s), veh/h/ln	2074	0	0	1480	1774	0	0	1511
Q Serve Time (g_s), s	2.6	0.0	0.0	4.2	1.1	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	2.6	0.0	0.0	7.4	1.1	0.0	0.0	3.2
Perm LT Sat Flow (s_l), veh/h/ln	783	0	0	1330	519	0	0	1312
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1807	0	0	0	1687
Perm LT Eff Green (g_p), s	57.9	0.0	0.0	12.7	57.9	0.0	0.0	12.7
Perm LT Serve Time (g_u), s	30.2	0.0	0.0	9.4	57.9	0.0	0.0	5.3
Perm LT Q Serve Time (g_ps), s	7.2	0.0	0.0	4.2	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	1.7	0.0	0.0	0.0	2.8
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	1.7	0.0	0.0	0.0	2.8
Prop LT Inside Lane (P_L)	1.00	0.00	0.00	0.52	1.00	0.00	0.00	0.40
Lane Grp Cap (c), veh/h	452	0	0	266	486	0	0	266
V/C Ratio (X)	0.37	0.00	0.00	0.50	0.13	0.00	0.00	0.23
Avail Cap (c_a), veh/h	1136	0	0	608	1091	0	0	594
Upstream Filter (I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	9.6	0.0	0.0	36.8	4.9	0.0	0.0	35.2
Incr Delay (d2), s/veh	0.5	0.0	0.0	1.5	0.1	0.0	0.0	0.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	10.1	0.0	0.0	38.2	5.0	0.0	0.0	35.6
1st-Term Q (Q1), veh/ln	1.5	0.0	0.0	3.1	0.5	0.0	0.0	1.4
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
%ile Back of Q (50%), veh/ln	1.6	0.0	0.0	3.2	0.5	0.0	0.0	1.4
%ile Storage Ratio (RQ%)	0.20	0.00	0.00	0.10	0.07	0.00	0.00	0.05
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R				T+R		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	811	0	0	0	1080	0	0
Grp Sat Flow (s), veh/h/ln	0	1786	0	0	0	2168	0	0
Q Serve Time (g_s), s	0.0	27.6	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	27.6	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.19	0.00	0.44	0.00	0.02	0.00	0.56
Lane Grp Cap (c), veh/h	0	1135	0	0	0	1400	0	0
V/C Ratio (X)	0.00	0.71	0.00	0.00	0.00	0.77	0.00	0.00
Avail Cap (c_a), veh/h	0	1961	0	0	0	2381	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	11.1	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.9	0.0	0.0	0.0	0.9	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	11.9	0.0	0.0	0.0	0.9	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	13.5	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.3	0.0	0.0	0.0	0.4	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	13.8	0.0	0.0	0.0	0.4	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	8.6
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	104.3
Intersection LOS	F

Approach	EB	WB	NB	SB
Entry Lanes	2	1	2	2
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	60	14	731	1383
Demand Flow Rate, veh/h	60	14	738	1397
Vehicles Circulating, veh/h	1303	778	41	35
Vehicles Exiting, veh/h	129	1	1322	757
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	15	15	15	15
Ped Cap Adj	1.000	0.998	0.983	0.983
Approach Delay, s/veh	13.8	7.3	12.8	157.6
Approach LOS	B	A	B	F

Lane	Left	Right	Left	Left	Right	Left	Right
Designated Moves	L	TR	LTR	L	TR	L	TR
Assumed Moves	L	TR	LTR	L	TR	L	TR
RT Channelized							
Lane Util	0.683	0.317	1.000	0.041	0.959	0.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193	5.193	5.193	5.193
Entry Flow, veh/h	41	19	14	30	708	0	1397
Cap Entry Lane, veh/h	307	307	519	1085	1085	1091	1091
Entry HV Adj Factor	1.000	1.000	1.000	1.000	0.990	1.000	0.990
Flow Entry, veh/h	41	19	14	30	701	0	1383
Cap Entry, veh/h	307	307	518	1067	1056	1073	1062
V/C Ratio	0.134	0.062	0.027	0.028	0.664	0.000	1.302
Control Delay, s/veh	14.2	12.8	7.3	3.6	13.2	3.4	157.6
LOS	B	B	A	A	B	A	F
95th %tile Queue, veh	0	0	0	0	5	0	50

Intersection	
Intersection Delay, s/veh	94.9
Intersection LOS	F

Approach	EB	WB	NB	SB
Entry Lanes	2	2	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	1375	665	107	14
Demand Flow Rate, veh/h	1389	678	107	14
Vehicles Circulating, veh/h	26	99	1292	748
Vehicles Exiting, veh/h	736	1300	123	29
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	15	15	15	15
Ped Cap Adj	0.983	0.984	1.000	0.998
Approach Delay, s/veh	141.2	13.3	19.3	7.1
Approach LOS	F	B	C	A

Lane	Left	Right	Left	Right	Left	Left
Designated Moves	L	TR	L	TR	LTR	LTR
Assumed Moves	L	TR	L	TR	LTR	LTR
RT Channelized						
Lane Util	0.012	0.988	0.028	0.972	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193	5.193	5.193
Entry Flow, veh/h	17	1372	19	659	107	14
Cap Entry Lane, veh/h	1101	1101	1023	1023	310	535
Entry HV Adj Factor	1.000	0.990	1.000	0.981	1.000	1.000
Flow Entry, veh/h	17	1358	19	646	107	14
Cap Entry, veh/h	1082	1072	1007	988	310	534
V/C Ratio	0.016	1.267	0.019	0.654	0.345	0.026
Control Delay, s/veh	3.5	143.0	3.7	13.5	19.3	7.1
LOS	A	F	A	B	C	A
95th %tile Queue, veh	0	47	0	5	1	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	1220	1333	50	515	1	523	0	36	0	0	2
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		0.95	1.00		0.97	1.00		0.96	1.00		0.53
Parking Bus 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
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1900	1881	1881	1881	1900	1900	1900
Adj Flow Rate, veh/h	3	1312	1433	54	554	1	562	0	39	0	0	2
Adj No. of Lanes	1	1	1	1	2	0	1	1	1	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	147	927	754	147	1803	3	579	608	499	0	0	1
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.60	1.60	1.60	1.00	1.00	1.00
Prop Arrive On Green	0.08	0.49	0.49	0.08	0.49	0.49	0.52	0.00	0.52	0.00	0.00	0.00
Ln Grp Delay, s/veh	103.2	255.3	471.7	113.0	37.9	37.9	84.5	0.0	40.7	0.0	0.0	774.5
Ln Grp LOS	F	F	F	F	D	D	F		D			F
Approach Vol, veh/h		2748			609			601			2	
Approach Delay, s/veh		368.0			44.5			81.7			774.4	
Approach LOS		F			D			F			F	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	8	4	5	6		
Case No	2.0	3.0	12.0	9.0	2.0	4.0		
Phs Duration (G+Y+Rc), s	25.5	127.2	6.4	84.9	25.5	127.2		
Change Period (Y+Rc), s	5.5	7.0	6.0	6.0	5.5	7.0		
Max Green (Gmax), s	20.0	90.0	20.0	90.0	20.0	90.0		
Max Allow Headway (MAH), s	3.1	5.4	7.4	4.7	3.1	5.4		
Max Q Clear (g_c+I1), s	9.0	122.2	2.4	76.2	2.4	24.1		
Green Ext Time (g_e), s	0.0	0.0	0.0	2.7	0.0	62.5		
Prob of Phs Call (p_c)	1.00	1.00	0.13	1.00	1.00	1.00		
Prob of Max Out (p_x)	0.00	0.00	0.00	0.10	0.00	0.00		

Left-Turn Movement Data								
Assigned Mvmt	1		3	7	5			
Mvmt Sat Flow, veh/h	1792		0	1792	1792			

Through Movement Data								
Assigned Mvmt		2	8	4		6		
Mvmt Sat Flow, veh/h		1881	0	1881		3660		

Right-Turn Movement Data								
Assigned Mvmt		12	18	14		16		
Mvmt Sat Flow, veh/h		1525	853	1542		7		

Left Lane Group Data								
Assigned Mvmt	1	0	3	7	5	0	0	0
Lane Assignment	(Prot)				(Prot)			
Lanes in Grp	1	0	0	1	1	0	0	0

Grp Vol (v), veh/h	54	0	0	562	3	0	0	0
Grp Sat Flow (s), veh/h/ln	1792	0	0	1792	1792	0	0	0
Q Serve Time (g_s), s	7.0	0.0	0.0	74.2	0.4	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	7.0	0.0	0.0	74.2	0.4	0.0	0.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	1792	0	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	147	0	0	579	147	0	0	0
V/C Ratio (X)	0.37	0.00	0.00	0.97	0.02	0.00	0.00	0.00
Avail Cap (c_a), veh/h	147	0	0	661	147	0	0	0
Upstream Filter (I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	106.0	0.0	0.0	57.7	103.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	7.0	0.0	0.0	26.8	0.3	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	113.0	0.0	0.0	84.5	103.2	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	3.4	0.0	0.0	36.6	0.2	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.3	0.0	0.0	4.3	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00
%ile Back of Q (50%), veh/ln	3.7	0.0	0.0	40.9	0.2	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.54	0.00	0.00	4.58	0.03	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	8	4	0	6	0	0
Lane Assignment		T		T		T		
Lanes in Grp	0	1	0	1	0	1	0	0
Grp Vol (v), veh/h	0	1312	0	0	0	270	0	0
Grp Sat Flow (s), veh/h/ln	0	1881	0	1881	0	1787	0	0
Q Serve Time (g_s), s	0.0	120.2	0.0	0.0	0.0	22.1	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	120.2	0.0	0.0	0.0	22.1	0.0	0.0
Lane Grp Cap (c), veh/h	0	927	0	608	0	881	0	0
V/C Ratio (X)	0.00	1.42	0.00	0.00	0.00	0.31	0.00	0.00
Avail Cap (c_a), veh/h	0	927	0	694	0	881	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	61.9	0.0	0.0	0.0	37.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	193.4	0.0	0.0	0.0	0.9	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	255.3	0.0	0.0	0.0	37.9	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	62.6	0.0	0.0	0.0	10.9	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	49.8	0.0	0.0	0.0	0.2	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	112.3	0.0	0.0	0.0	11.1	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	2.66	0.00	0.00	0.00	0.13	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	96.3	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	18	14	0	16	0	0
Lane Assignment		R	T+R	R		T+R		
Lanes in Grp	0	1	1	1	0	1	0	0
Grp Vol (v), veh/h	0	1433	2	39	0	285	0	0
Grp Sat Flow (s), veh/h/ln	0	1525	853	1542	0	1880	0	0
Q Serve Time (g_s), s	0.0	120.2	0.4	3.1	0.0	22.1	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	120.2	0.4	3.1	0.0	22.1	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	1599.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	754	1	499	0	926	0	0
V/C Ratio (X)	0.00	1.90	1.50	0.08	0.00	0.31	0.00	0.00
Avail Cap (c_a), veh/h	0	754	70	569	0	926	0	0
Upstream Filter (I)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	61.6	121.8	40.6	0.0	37.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	410.1	572.7	0.1	0.0	0.9	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	80.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	471.7	774.5	40.7	0.0	37.9	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	50.9	0.1	1.3	0.0	11.5	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	85.9	0.2	0.0	0.0	0.2	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	136.8	0.3	1.3	0.0	11.7	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	3.24	0.02	0.04	0.00	0.13	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	169.7	0.2	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.5	0.4	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	275.0
HCM 2010 LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	278	231	123	730	1073	230
Number	3	18	5	2	6	16
Initial Q, veh	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00	1.00	1.00			0.96
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1881	1881	1683	1683
Adj Flow Rate, veh/h	287	238	127	753	1106	237
Adj No. of Lanes	1	1	1	2	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	1	1	1	1
Opposing Right Turn Influence	Yes		Yes			
Cap, veh/h	343	306	273	2465	1888	809
HCM Platoon Ratio	1.00	1.00	0.75	0.75	0.33	0.33
Prop Arrive On Green	0.19	0.19	0.04	0.52	0.19	0.19
Ln Grp Delay, s/veh	44.2	42.5	15.7	10.4	29.2	22.5
Ln Grp LOS	D	D	B	B	C	C
Approach Vol, veh/h	525			880	1343	
Approach Delay, s/veh	43.4			11.2	28.0	
Approach LOS	D			B	C	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs		2	8		5	6		
Case No		4.0	9.0		1.2	7.0		
Phs Duration (G+Y+Rc), s		75.5	23.8		9.8	65.6		
Change Period (Y+Rc), s		7.0	5.0		5.0	7.0		
Max Green (Gmax), s		120.0	35.0		25.0	120.0		
Max Allow Headway (MAH), s		4.9	4.0		3.7	4.9		
Max Q Clear (g_c+I1), s		14.0	17.2		4.6	33.2		
Green Ext Time (g_e), s		26.1	1.6		0.3	25.4		
Prob of Phs Call (p_c)		1.00	1.00		0.97	1.00		
Prob of Max Out (p_x)		0.03	0.00		0.00	0.05		
Left-Turn Movement Data								
Assigned Mvmt			3		5	1		
Mvmt Sat Flow, veh/h			1810		1792	0		
Through Movement Data								
Assigned Mvmt		2	8			6		
Mvmt Sat Flow, veh/h		3668	0			3282		
Right-Turn Movement Data								
Assigned Mvmt		12	18			16		
Mvmt Sat Flow, veh/h		0	1615			1371		
Left Lane Group Data								
Assigned Mvmt	0	0	3	0	5	1	0	0
Lane Assignment					(Pr/Pm)			
Lanes in Grp	0	0	1	0	1	0	0	0

Grp Vol (v), veh/h	0	0	287	0	127	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	1810	0	1792	0	0	0
Q Serve Time (g_s), s	0.0	0.0	15.2	0.0	2.6	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	15.2	0.0	2.6	0.0	0.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	1810	0	409	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	60.6	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	27.4	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	15.2	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	58.6	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	0	343	0	273	0	0	0
V/C Ratio (X)	0.00	0.00	0.84	0.00	0.47	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	638	0	637	0	0	0
Upstream Filter (I)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	38.8	0.0	14.5	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	5.4	0.0	1.2	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	44.2	0.0	15.7	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	7.6	0.0	1.7	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.5	0.0	0.1	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.0	8.1	0.0	1.8	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.36	0.00	0.30	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	8	0	0	6	0	0
Lane Assignment		T				T		
Lanes in Grp	0	2	0	0	0	2	0	0
Grp Vol (v), veh/h	0	753	0	0	0	1106	0	0
Grp Sat Flow (s), veh/h/ln	0	1787	0	0	0	1599	0	0
Q Serve Time (g_s), s	0.0	12.0	0.0	0.0	0.0	31.2	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	12.0	0.0	0.0	0.0	31.2	0.0	0.0
Lane Grp Cap (c), veh/h	0	2465	0	0	0	1888	0	0
V/C Ratio (X)	0.00	0.31	0.00	0.00	0.00	0.59	0.00	0.00
Avail Cap (c_a), veh/h	0	4321	0	0	0	3866	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	10.3	0.0	0.0	0.0	28.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	10.4	0.0	0.0	0.0	29.2	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	5.9	0.0	0.0	0.0	13.8	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	5.9	0.0	0.0	0.0	13.9	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.19	0.00	0.00	0.00	0.08	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	18	0	0	16	0	0
Lane Assignment			R			R		
Lanes in Grp	0	0	1	0	0	1	0	0
Grp Vol (v), veh/h	0	0	238	0	0	237	0	0
Grp Sat Flow (s), veh/h/ln	0	0	1615	0	0	1371	0	0
Q Serve Time (g_s), s	0.0	0.0	13.9	0.0	0.0	14.7	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	13.9	0.0	0.0	14.7	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	1430.7	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	0	306	0	0	809	0	0
V/C Ratio (X)	0.00	0.00	0.78	0.00	0.00	0.29	0.00	0.00
Avail Cap (c_a), veh/h	0	0	569	0	0	1657	0	0
Upstream Filter (I)	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	38.2	0.0	0.0	22.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	4.3	0.0	0.0	0.2	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	42.5	0.0	0.0	22.5	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	6.2	0.0	0.0	5.6	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.0	6.6	0.0	0.0	5.6	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.29	0.00	0.00	0.94	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	25.6
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	2	30	57	6	48	76	788	185	203	1271	25
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	0.96		0.92	0.97		0.87	1.00		0.96	1.00		0.96
Parking Bus 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
Adj Sat Flow, veh/h/ln	1900	1827	1900	1900	1900	1900	1863	1863	1900	2178	2178	2178
Adj Flow Rate, veh/h	22	2	32	61	6	52	82	847	199	218	1367	27
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	0	0	0	2	2	2	1	1	1
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	91	21	96	120	19	74	398	1033	243	355	1582	1294
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.75	1.75	1.75
Prop Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.04	0.71	0.71	0.09	1.00	1.00
Ln Grp Delay, s/veh	52.2	0.0	0.0	55.9	0.0	0.0	4.4	0.0	16.1	20.4	4.6	0.0
Ln Grp LOS	D			E			A		B	C	A	A
Approach Vol, veh/h		56			119			1128			1612	
Approach Delay, s/veh		52.2			55.9			15.3			6.6	
Approach LOS		D			E			B			A	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Case No	1.1	4.0		8.0	1.1	3.0		8.0
Phs Duration (G+Y+Rc), s	11.3	95.8		19.3	9.7	97.3		19.3
Change Period (Y+Rc), s	5.0	5.6		5.0	5.0	5.6		5.0
Max Green (Gmax), s	35.0	100.0		35.0	35.0	100.0		35.0
Max Allow Headway (MAH), s	3.7	5.1		5.8	3.8	5.1		5.8
Max Q Clear (g_c+I1), s	5.7	53.1		11.3	3.5	2.0		6.1
Green Ext Time (g_e), s	0.6	37.1		1.1	0.2	62.5		1.2
Prob of Phs Call (p_c)	1.00	1.00		1.00	0.94	1.00		1.00
Prob of Max Out (p_x)	0.00	0.74		0.00	0.00	0.52		0.00

Left-Turn Movement Data								
Assigned Mvmt	1			7	5			3
Mvmt Sat Flow, veh/h	2074			676	1774			456

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		1447		168		2178		184

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		340		655		1782		853

Left Lane Group Data								
Assigned Mvmt	1	0	0	7	5	0	0	3
Lane Assignment	(Pr/Pm)			L+T+R	(Pr/Pm)			L+T+R
Lanes in Grp	1	0	0	1	1	0	0	1

Grp Vol (v), veh/h	218	0	0	119	82	0	0	56
Grp Sat Flow (s), veh/h/ln	2074	0	0	1499	1774	0	0	1492
Q Serve Time (g_s), s	3.7	0.0	0.0	5.1	1.5	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	3.7	0.0	0.0	9.3	1.5	0.0	0.0	4.1
Perm LT Sat Flow (s_l), veh/h/ln	628	0	0	1351	385	0	0	1310
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1820	0	0	0	1550
Perm LT Eff Green (g_p), s	90.2	0.0	0.0	14.3	90.2	0.0	0.0	14.3
Perm LT Serve Time (g_u), s	39.1	0.0	0.0	10.1	90.2	0.0	0.0	5.0
Perm LT Q Serve Time (g_ps), s	25.5	0.0	0.0	5.1	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	1.6	0.0	0.0	0.0	3.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	1.6	0.0	0.0	0.0	3.0
Prop LT Inside Lane (P_L)	1.00	0.00	0.00	0.51	1.00	0.00	0.00	0.39
Lane Grp Cap (c), veh/h	355	0	0	213	398	0	0	208
V/C Ratio (X)	0.61	0.00	0.00	0.56	0.21	0.00	0.00	0.27
Avail Cap (c_a), veh/h	826	0	0	441	823	0	0	433
Upstream Filter (I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	18.7	0.0	0.0	53.6	4.1	0.0	0.0	51.5
Incr Delay (d2), s/veh	1.7	0.0	0.0	2.3	0.3	0.0	0.0	0.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	20.4	0.0	0.0	55.9	4.4	0.0	0.0	52.2
1st-Term Q (Q1), veh/ln	4.4	0.0	0.0	4.0	0.7	0.0	0.0	1.8
2nd-Term Q (Q2), veh/ln	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
%ile Back of Q (50%), veh/ln	4.6	0.0	0.0	4.1	0.8	0.0	0.0	1.8
%ile Storage Ratio (RQ%)	0.58	0.00	0.00	0.13	0.10	0.00	0.00	0.07
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment						T		
Lanes in Grp	0	0	0	0	0	1	0	0
Grp Vol (v), veh/h	0	0	0	0	0	1367	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	2178	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	1582	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.86	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	1724	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R				R		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	1046	0	0	0	27	0	0
Grp Sat Flow (s), veh/h/ln	0	1787	0	0	0	1782	0	0
Q Serve Time (g_s), s	0.0	51.1	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	51.1	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.19	0.00	0.44	0.00	1.00	0.00	0.57
Lane Grp Cap (c), veh/h	0	1275	0	0	0	1294	0	0
V/C Ratio (X)	0.00	0.82	0.00	0.00	0.00	0.02	0.00	0.00
Avail Cap (c_a), veh/h	0	1414	0	0	0	1410	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	16.1	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	24.7	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	26.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	12.9
HCM 2010 LOS	B

Two Way Analysis cannot be performed on Signalized Intersection.

Two Way Analysis cannot be performed on Signalized Intersection.

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	39	0	18	5	0	8	33	772	2	0	1418	108
Conflicting Peds, #/hr	15	0	15	15	0	15	15	0	15	15	0	15
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	130	-	-	100	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	1	1	1
Mvmt Flow	41	0	19	5	0	9	35	821	2	0	1509	115

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2077	2490	842	1677	2546	442	1638	0	0	838	0	0
Stage 1	1581	1581	-	908	908	-	-	-	-	-	-	-
Stage 2	496	909	-	769	1638	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	~ 32	30	312	63	27	569	396	-	-	799	-	-
Stage 1	116	171	-	301	357	-	-	-	-	-	-	-
Stage 2	529	357	-	364	160	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 29	27	304	54	24	555	391	-	-	789	-	-
Mov Cap-2 Maneuver	97	142	-	54	24	-	-	-	-	-	-	-
Stage 1	104	169	-	271	321	-	-	-	-	-	-	-
Stage 2	468	321	-	337	158	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	51.7	38.6	0.6	0
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	391	-	-	97	304	121	789	-	-
HCM Lane V/C Ratio	0.09	-	-	0.428	0.063	0.114	-	-	-
HCM Control Delay (s)	15.1	-	-	67.4	17.6	38.6	0	-	-
HCM Lane LOS	C	-	-	F	C	E	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	1.8	0.2	0.4	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	19	1442	118	20	683	13	26	0	8	7	0	7
Conflicting Peds, #/hr	15	0	15	15	0	15	15	0	15	15	0	15
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	2	2	2	0	0	0	0	0	0
Mvmt Flow	20	1518	124	21	719	14	27	0	8	7	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	748	0	0	1657	0	0	2052	2425	851	1597	2480	396
Stage 1	-	-	-	-	-	-	1635	1635	-	783	783	-
Stage 2	-	-	-	-	-	-	417	790	-	814	1697	-
Critical Hdwy	4.12	-	-	4.14	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.22	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	863	-	-	385	-	-	33	33	308	73	30	609
Stage 1	-	-	-	-	-	-	107	161	-	357	407	-
Stage 2	-	-	-	-	-	-	589	404	-	342	150	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	852	-	-	380	-	-	30	30	300	65	27	594
Mov Cap-2 Maneuver	-	-	-	-	-	-	30	30	-	65	27	-
Stage 1	-	-	-	-	-	-	103	155	-	344	380	-
Stage 2	-	-	-	-	-	-	543	377	-	321	145	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.4	287.5	40.2
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	38	852	-	-	380	-	-	117
HCM Lane V/C Ratio	0.942	0.023	-	-	0.055	-	-	0.126
HCM Control Delay (s)	287.5	9.3	-	-	15	-	-	40.2
HCM Lane LOS	F	A	-	-	C	-	-	E
HCM 95th %tile Q(veh)	3.5	0.1	-	-	0.2	-	-	0.4

Two Way Analysis cannot be performed on Signalized Intersection.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	1220	1333	50	515	1	523	0	36	0	0	2
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		0.96	1.00		0.98	1.00		0.95	1.00		0.49
Parking Bus 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
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1900	1881	1881	1881	1900	1900	1900
Adj Flow Rate, veh/h	3	1312	1433	54	554	1	562	0	39	0	0	2
Adj No. of Lanes	1	1	1	1	2	0	1	1	1	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	64	1276	1045	67	2489	4	342	359	290	0	0	1
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.60	1.60	1.60	1.00	1.00	1.00
Prop Arrive On Green	0.04	0.68	0.68	0.04	0.68	0.68	0.31	0.00	0.31	0.00	0.00	0.00
Ln Grp Delay, s/veh	125.8	75.7	216.1	191.5	16.5	16.5	394.6	0.0	77.0	0.0	0.0	908.7
Ln Grp LOS	F	F	F	F	B	B	F		E			F
Approach Vol, veh/h		2748			609			601			2	
Approach Delay, s/veh		148.9			32.0			374.0			908.6	
Approach LOS		F			C			F			F	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	8	4	5	6		
Case No	2.0	3.0	12.0	9.0	2.0	4.0		
Phs Duration (G+Y+Rc), s	15.5	188.1	6.4	57.0	15.0	188.6		
Change Period (Y+Rc), s	5.5	7.0	6.0	6.0	5.5	7.0		
Max Green (Gmax), s	10.0	168.0	13.5	51.0	9.5	168.5		
Max Allow Headway (MAH), s	3.1	5.4	7.8	4.7	3.1	5.4		
Max Q Clear (g_c+I1), s	10.0	183.1	2.4	53.0	2.4	17.2		
Green Ext Time (g_e), s	0.0	0.0	0.0	0.0	0.0	134.1		
Prob of Phs Call (p_c)	1.00	1.00	0.14	1.00	1.00	1.00		
Prob of Max Out (p_x)	0.00	0.00	0.01	1.00	0.00	0.00		

Left-Turn Movement Data								
Assigned Mvmt	1		3	7	5			
Mvmt Sat Flow, veh/h	1792		0	1792	1792			

Through Movement Data								
Assigned Mvmt		2	8	4		6		
Mvmt Sat Flow, veh/h		1881	0	1881		3660		

Right-Turn Movement Data								
Assigned Mvmt		12	18	14		16		
Mvmt Sat Flow, veh/h		1537	784	1516		7		

Left Lane Group Data								
Assigned Mvmt	1	0	3	7	5	0	0	0
Lane Assignment	(Prot)				(Prot)			
Lanes in Grp	1	0	0	1	1	0	0	0

Grp Vol (v), veh/h	54	0	0	562	3	0	0	0
Grp Sat Flow (s), veh/h/ln	1792	0	0	1792	1792	0	0	0
Q Serve Time (g_s), s	8.0	0.0	0.0	51.0	0.4	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	8.0	0.0	0.0	51.0	0.4	0.0	0.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	1792	0	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	67	0	0	342	64	0	0	0
V/C Ratio (X)	0.80	0.00	0.00	1.64	0.05	0.00	0.00	0.00
Avail Cap (c_a), veh/h	67	0	0	342	64	0	0	0
Upstream Filter (I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	127.5	0.0	0.0	92.7	124.4	0.0	0.0	0.0
Incr Delay (d2), s/veh	64.0	0.0	0.0	301.9	1.4	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	191.5	0.0	0.0	394.6	125.8	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	4.0	0.0	0.0	25.2	0.2	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	1.2	0.0	0.0	28.7	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00
%ile Back of Q (50%), veh/ln	5.2	0.0	0.0	53.9	0.2	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.74	0.00	0.00	6.04	0.04	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	54.9	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	8	4	0	6	0	0
Lane Assignment		T		T		T		
Lanes in Grp	0	1	0	1	0	1	0	0
Grp Vol (v), veh/h	0	1312	0	0	0	270	0	0
Grp Sat Flow (s), veh/h/ln	0	1881	0	1881	0	1787	0	0
Q Serve Time (g_s), s	0.0	181.1	0.0	0.0	0.0	15.2	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	181.1	0.0	0.0	0.0	15.2	0.0	0.0
Lane Grp Cap (c), veh/h	0	1276	0	359	0	1215	0	0
V/C Ratio (X)	0.00	1.03	0.00	0.00	0.00	0.22	0.00	0.00
Avail Cap (c_a), veh/h	0	1276	0	359	0	1215	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	43.0	0.0	0.0	0.0	16.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	32.7	0.0	0.0	0.0	0.4	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	75.7	0.0	0.0	0.0	16.5	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	93.9	0.0	0.0	0.0	7.5	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	11.6	0.0	0.0	0.0	0.1	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	105.5	0.0	0.0	0.0	7.7	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	2.50	0.00	0.00	0.00	0.09	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	18	14	0	16	0	0
Lane Assignment		R	T+R	R		T+R		
Lanes in Grp	0	1	1	1	0	1	0	0
Grp Vol (v), veh/h	0	1433	2	39	0	285	0	0
Grp Sat Flow (s), veh/h/ln	0	1537	784	1516	0	1880	0	0
Q Serve Time (g_s), s	0.0	181.1	0.4	5.0	0.0	15.2	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	181.1	0.4	5.0	0.0	15.2	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	1599.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	1045	1	290	0	1278	0	0
V/C Ratio (X)	0.00	1.37	1.65	0.13	0.00	0.22	0.00	0.00
Avail Cap (c_a), veh/h	0	1045	40	290	0	1278	0	0
Upstream Filter (I)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	42.7	133.3	76.7	0.0	16.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	173.4	653.7	0.3	0.0	0.4	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	121.6	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	216.1	908.7	77.0	0.0	16.5	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	77.2	0.1	2.1	0.0	7.9	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	50.3	0.2	0.0	0.0	0.1	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	127.5	0.3	2.1	0.0	8.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	3.02	0.02	0.07	0.00	0.09	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	97.1	0.2	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.3	0.4	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	165.5
HCM 2010 LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	278	231	123	730	1073	230
Number	3	18	5	2	6	16
Initial Q, veh	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00	1.00	1.00			0.95
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1881	1881	1683	1683
Adj Flow Rate, veh/h	287	238	127	753	1106	237
Adj No. of Lanes	1	1	1	2	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	1	1	1	1
Opposing Right Turn Influence	Yes		Yes			
Cap, veh/h	386	344	292	2077	1345	571
HCM Platoon Ratio	1.00	1.00	0.75	0.75	0.33	0.33
Prop Arrive On Green	0.21	0.21	0.06	0.44	0.14	0.14
Ln Grp Delay, s/veh	24.3	23.7	13.6	9.3	27.1	19.0
Ln Grp LOS	C	C	B	A	C	B
Approach Vol, veh/h	525			880	1343	
Approach Delay, s/veh	24.0			9.9	25.7	
Approach LOS	C			A	C	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs		2	8		5	6		
Case No		4.0	9.0		1.2	7.0		
Phs Duration (G+Y+Rc), s		40.9	17.4		9.4	31.5		
Change Period (Y+Rc), s		7.0	5.0		5.0	7.0		
Max Green (Gmax), s		38.0	50.0		8.0	25.0		
Max Allow Headway (MAH), s		4.9	4.0		3.7	4.9		
Max Q Clear (g_c+I1), s		10.2	10.7		4.1	21.6		
Green Ext Time (g_e), s		16.4	1.8		0.1	2.9		
Prob of Phs Call (p_c)		1.00	1.00		0.87	1.00		
Prob of Max Out (p_x)		0.45	0.00		0.81	1.00		
Left-Turn Movement Data								
Assigned Mvmt			3		5	1		
Mvmt Sat Flow, veh/h			1810		1792	0		
Through Movement Data								
Assigned Mvmt		2	8			6		
Mvmt Sat Flow, veh/h		3668	0			3282		
Right-Turn Movement Data								
Assigned Mvmt		12	18			16		
Mvmt Sat Flow, veh/h		0	1615			1359		
Left Lane Group Data								
Assigned Mvmt	0	0	3	0	5	1	0	0
Lane Assignment					(Pr/Pm)			
Lanes in Grp	0	0	1	0	1	0	0	0

Grp Vol (v), veh/h	0	0	287	0	127	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	1810	0	1792	0	0	0
Q Serve Time (g_s), s	0.0	0.0	8.7	0.0	2.1	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	8.7	0.0	2.1	0.0	0.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	1810	0	409	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	26.5	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	4.9	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	4.9	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	24.5	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	0	386	0	292	0	0	0
V/C Ratio (X)	0.00	0.00	0.74	0.00	0.44	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	1551	0	404	0	0	0
Upstream Filter (I)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	21.5	0.0	12.6	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	2.9	0.0	1.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	24.3	0.0	13.6	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	4.3	0.0	1.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.3	0.0	0.1	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.0	4.6	0.0	1.1	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.21	0.00	0.19	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	8	0	0	6	0	0
Lane Assignment		T				T		
Lanes in Grp	0	2	0	0	0	2	0	0
Grp Vol (v), veh/h	0	753	0	0	0	1106	0	0
Grp Sat Flow (s), veh/h/ln	0	1787	0	0	0	1599	0	0
Q Serve Time (g_s), s	0.0	8.2	0.0	0.0	0.0	19.6	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	8.2	0.0	0.0	0.0	19.6	0.0	0.0
Lane Grp Cap (c), veh/h	0	2077	0	0	0	1345	0	0
V/C Ratio (X)	0.00	0.36	0.00	0.00	0.00	0.82	0.00	0.00
Avail Cap (c_a), veh/h	0	2328	0	0	0	1370	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	9.2	0.0	0.0	0.0	23.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.0	4.1	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	9.3	0.0	0.0	0.0	27.1	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	4.0	0.0	0.0	0.0	8.7	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	4.1	0.0	0.0	0.0	9.5	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.13	0.00	0.00	0.00	0.06	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	18	0	0	16	0	0
Lane Assignment			R			R		
Lanes in Grp	0	0	1	0	0	1	0	0
Grp Vol (v), veh/h	0	0	238	0	0	237	0	0
Grp Sat Flow (s), veh/h/ln	0	0	1615	0	0	1359	0	0
Q Serve Time (g_s), s	0.0	0.0	7.9	0.0	0.0	9.3	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	7.9	0.0	0.0	9.3	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	1430.7	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	0	344	0	0	571	0	0
V/C Ratio (X)	0.00	0.00	0.69	0.00	0.00	0.41	0.00	0.00
Avail Cap (c_a), veh/h	0	0	1384	0	0	582	0	0
Upstream Filter (I)	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	21.2	0.0	0.0	18.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	2.5	0.0	0.0	0.5	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	23.7	0.0	0.0	19.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	3.5	0.0	0.0	3.5	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.0	3.7	0.0	0.0	3.6	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.17	0.00	0.00	0.60	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	20.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	39	0	18	5	0	8	33	772	2	0	1418	108
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	0.96		0.92	0.96		0.92	1.00		0.96	1.00		0.96
Parking Bus 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
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	41	0	19	5	0	9	35	821	2	0	1509	115
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	310	0	158	140	27	103	310	2614	6	161	2400	182
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.11	0.00	0.11	0.11	0.00	0.11	0.71	0.71	0.71	0.00	0.71	0.71
Ln Grp Delay, s/veh	18.5	0.0	18.4	18.1	0.0	0.0	7.0	2.5	2.5	0.0	4.0	4.1
Ln Grp LOS	B		B	B			A	A	A		A	A
Approach Vol, veh/h		60			14			858			1624	
Approach Delay, s/veh		18.5			18.1			2.7			4.0	
Approach LOS		B			B			A			A	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Case No		6.0		6.0		6.0		8.0
Phs Duration (G+Y+Rc), s		36.0		8.8		36.0		8.8
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green (Gmax), s		36.0		16.0		36.0		16.0
Max Allow Headway (MAH), s		5.2		4.7		5.2		4.7
Max Q Clear (g_c+I1), s		15.5		3.1		12.6		2.4
Green Ext Time (g_e), s		16.5		0.2		18.4		0.2
Prob of Phs Call (p_c)		1.00		0.67		1.00		0.67
Prob of Max Out (p_x)		0.82		0.00		0.79		0.00

Left-Turn Movement Data								
Assigned Mvmt		5		7		1		3
Mvmt Sat Flow, veh/h		312		1371		669		287

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3657		0		3358		253

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		9		1482		254		972

Left Lane Group Data								
Assigned Mvmt	0	5	0	7	0	1	0	3
Lane Assignment								L+T+R
Lanes in Grp	0	1	0	1	0	1	0	1

Grp Vol (v), veh/h	0	35	0	41	0	0	0	14
Grp Sat Flow (s), veh/h/ln	0	312	0	1371	0	669	0	1512
Q Serve Time (g_s), s	0.0	2.9	0.0	0.8	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	13.5	0.0	1.1	0.0	0.0	0.0	0.4
Perm LT Sat Flow (s_l), veh/h/ln	0	312	0	1371	0	669	0	1360
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1737	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	32.0	0.0	4.8	0.0	0.0	0.0	4.8
Perm LT Serve Time (g_u), s	0.0	21.4	0.0	4.4	0.0	0.0	0.0	4.2
Perm LT Q Serve Time (g_ps), s	0.0	2.9	0.0	0.8	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Prop LT Inside Lane (P_L)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.36
Lane Grp Cap (c), veh/h	0	310	0	310	0	161	0	270
V/C Ratio (X)	0.00	0.11	0.00	0.13	0.00	0.00	0.00	0.05
Avail Cap (c_a), veh/h	0	339	0	654	0	221	0	631
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	6.8	0.0	18.3	0.0	0.0	0.0	18.0
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	7.0	0.0	18.5	0.0	0.0	0.0	18.1
1st-Term Q (Q1), veh/ln	0.0	0.3	0.0	0.5	0.0	0.0	0.0	0.2
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.3	0.0	0.5	0.0	0.0	0.0	0.2
%ile Storage Ratio (RQ%)	0.00	0.05	0.00	0.01	0.00	0.00	0.00	0.02
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T				T		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	401	0	0	0	798	0	0
Grp Sat Flow (s), veh/h/ln	0	1787	0	0	0	1787	0	0
Q Serve Time (g_s), s	0.0	3.7	0.0	0.0	0.0	10.3	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	3.7	0.0	0.0	0.0	10.3	0.0	0.0
Lane Grp Cap (c), veh/h	0	1277	0	0	0	1277	0	0
V/C Ratio (X)	0.00	0.31	0.00	0.00	0.00	0.62	0.00	0.00
Avail Cap (c_a), veh/h	0	1438	0	0	0	1438	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	2.3	0.0	0.0	0.0	3.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.0	0.7	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	2.5	0.0	0.0	0.0	4.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	1.8	0.0	0.0	0.0	4.9	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.8	0.0	0.0	0.0	5.1	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.05	0.00	0.00	0.00	0.16	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		
Lanes in Grp	0	1	0	1	0	1	0	0
Grp Vol (v), veh/h	0	422	0	19	0	826	0	0
Grp Sat Flow (s), veh/h/ln	0	1879	0	1482	0	1825	0	0
Q Serve Time (g_s), s	0.0	3.7	0.0	0.5	0.0	10.6	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	3.7	0.0	0.5	0.0	10.6	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.00	0.00	1.00	0.00	0.14	0.00	0.64
Lane Grp Cap (c), veh/h	0	1343	0	158	0	1304	0	0
V/C Ratio (X)	0.00	0.31	0.00	0.12	0.00	0.63	0.00	0.00
Avail Cap (c_a), veh/h	0	1512	0	530	0	1468	0	0
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	2.3	0.0	18.1	0.0	3.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.3	0.0	0.7	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	2.5	0.0	18.4	0.0	4.1	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	1.9	0.0	0.2	0.0	5.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.9	0.0	0.2	0.0	5.3	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.05	0.00	0.01	0.00	0.17	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	4.0
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	1442	118	20	683	13	26	0	8	7	0	7
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		0.96	1.00		0.96	0.97		0.93	0.97		0.93
Parking Bus 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
Adj Sat Flow, veh/h/ln	1881	1881	1900	1863	1863	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	20	1518	124	21	719	14	27	0	8	7	0	7
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
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
Percent Heavy Veh, %	1	1	1	2	2	2	0	0	0	0	0	0
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	595	2236	181	289	2377	46	289	19	47	200	35	107
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.67	0.67	0.67	0.67	0.67	0.67	0.14	0.00	0.14	0.14	0.00	0.14
Ln Grp Delay, s/veh	3.8	5.4	5.6	8.6	3.0	3.0	16.1	0.0	0.0	15.8	0.0	0.0
Ln Grp LOS	A	A	A	A	A	A	B			B		
Approach Vol, veh/h		1662			754			35			14	
Approach Delay, s/veh		5.5			3.2			16.1			15.8	
Approach LOS		A			A			B			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Case No		8.0		6.0		8.0		6.0
Phs Duration (G+Y+Rc), s		10.0		32.4		10.0		32.4
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green (Gmax), s		16.0		31.0		16.0		31.0
Max Allow Headway (MAH), s		5.6		5.2		5.6		5.2
Max Q Clear (g_c+I1), s		2.8		13.8		2.3		15.8
Green Ext Time (g_e), s		0.1		14.0		0.1		12.6
Prob of Phs Call (p_c)		1.00		1.00		1.00		1.00
Prob of Max Out (p_x)		0.00		0.84		0.00		0.87

Left-Turn Movement Data								
Assigned Mvmt		5		7		1		3
Mvmt Sat Flow, veh/h		983		725		511		304

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		136		3337		246		3548

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		332		270		757		69

Left Lane Group Data								
Assigned Mvmt	0	5	0	7	0	1	0	3
Lane Assignment		L+T+R				L+T+R		
Lanes in Grp	0	1	0	1	0	1	0	1

Grp Vol (v), veh/h	0	35	0	20	0	14	0	21
Grp Sat Flow (s), veh/h/ln	0	1450	0	725	0	1515	0	304
Q Serve Time (g_s), s	0.0	0.2	0.0	0.5	0.0	0.0	0.0	1.9
Cycle Q Clear Time (g_c), s	0.0	0.8	0.0	4.1	0.0	0.3	0.0	13.8
Perm LT Sat Flow (s_l), veh/h/ln	0	1387	0	725	0	1387	0	304
Shared LT Sat Flow (s_sh), veh/h/ln	0	1785	0	0	0	1825	0	0
Perm LT Eff Green (g_p), s	0.0	6.0	0.0	28.4	0.0	6.0	0.0	28.4
Perm LT Serve Time (g_u), s	0.0	5.7	0.0	24.8	0.0	5.2	0.0	16.5
Perm LT Q Serve Time (g_ps), s	0.0	0.2	0.0	0.5	0.0	0.0	0.0	1.9
Time to First Blk (g_f), s	0.0	0.6	0.0	0.0	0.0	1.7	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.6	0.0	0.0	0.0	0.3	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.77	0.00	1.00	0.00	0.50	0.00	1.00
Lane Grp Cap (c), veh/h	0	355	0	595	0	341	0	289
V/C Ratio (X)	0.00	0.10	0.00	0.03	0.00	0.04	0.00	0.07
Avail Cap (c_a), veh/h	0	690	0	640	0	683	0	307
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	15.9	0.0	3.7	0.0	15.8	0.0	8.5
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	16.1	0.0	3.8	0.0	15.8	0.0	8.6
1st-Term Q (Q1), veh/ln	0.0	0.4	0.0	0.1	0.0	0.1	0.0	0.2
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.4	0.0	0.1	0.0	0.1	0.0	0.2
%ile Storage Ratio (RQ%)	0.00	0.01	0.00	0.02	0.00	0.01	0.00	0.03
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment				T				T
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	807	0	0	0	359
Grp Sat Flow (s), veh/h/ln	0	0	0	1787	0	0	0	1770
Q Serve Time (g_s), s	0.0	0.0	0.0	11.5	0.0	0.0	0.0	3.6
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	11.5	0.0	0.0	0.0	3.6
Lane Grp Cap (c), veh/h	0	0	0	1197	0	0	0	1186
V/C Ratio (X)	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.30
Avail Cap (c_a), veh/h	0	0	0	1308	0	0	0	1295
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	4.2	0.0	0.0	0.0	2.9
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	5.4	0.0	0.0	0.0	3.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	5.4	0.0	0.0	0.0	1.7
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	5.8	0.0	0.0	0.0	1.7
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.02
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment				T+R				T+R
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	835	0	0	0	374
Grp Sat Flow (s), veh/h/ln	0	0	0	1821	0	0	0	1847
Q Serve Time (g_s), s	0.0	0.0	0.0	11.8	0.0	0.0	0.0	3.6
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	11.8	0.0	0.0	0.0	3.6
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.23	0.00	0.15	0.00	0.50	0.00	0.04
Lane Grp Cap (c), veh/h	0	0	0	1220	0	0	0	1238
V/C Ratio (X)	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0.30
Avail Cap (c_a), veh/h	0	0	0	1333	0	0	0	1352
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	4.3	0.0	0.0	0.0	2.9
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	5.6	0.0	0.0	0.0	3.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	5.8	0.0	0.0	0.0	1.8
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	6.2	0.0	0.0	0.0	1.8
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.02
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	5.0
HCM 2010 LOS	A

Notes
User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	2	30	57	6	48	76	788	185	203	1271	25
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	0.96		0.91	0.96		0.86	1.00		0.96	1.00		0.96
Parking Bus 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
Adj Sat Flow, veh/h/ln	1900	1827	1900	1900	1900	1900	1863	1863	1900	2178	2178	2178
Adj Flow Rate, veh/h	22	2	32	61	6	52	82	847	199	218	1367	27
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	0	0	0	2	2	2	1	1	1
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	79	18	84	108	15	67	396	1093	257	388	1661	1360
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.75	1.75	1.75
Prop Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.03	0.76	0.76	0.07	1.00	1.00
Ln Grp Delay, s/veh	63.9	0.0	0.0	70.3	0.0	0.0	3.8	0.0	12.6	18.0	2.2	0.0
Ln Grp LOS	E			E			A		B	B	A	A
Approach Vol, veh/h		56			119			1128			1612	
Approach Delay, s/veh		63.9			70.3			11.9			4.3	
Approach LOS		E			E			B			A	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Case No	1.1	4.0		8.0	1.1	3.0		8.0
Phs Duration (G+Y+Rc), s	11.0	118.9		20.2	9.8	120.0		20.2
Change Period (Y+Rc), s	5.0	5.6		5.0	5.0	5.6		5.0
Max Green (Gmax), s	8.0	144.4		17.6	8.0	144.4		17.6
Max Allow Headway (MAH), s	3.7	5.1		5.8	3.8	5.1		5.8
Max Q Clear (g_c+I1), s	5.8	53.8		13.2	3.5	2.0		7.1
Green Ext Time (g_e), s	0.1	59.5		0.4	0.1	76.4		0.7
Prob of Phs Call (p_c)	1.00	1.00		1.00	0.97	1.00		1.00
Prob of Max Out (p_x)	1.00	0.54		1.00	0.45	0.38		0.11

Left-Turn Movement Data								
Assigned Mvmt	1			7	5			3
Mvmt Sat Flow, veh/h	2074			707	1774			449

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		1447		144		2178		175

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		340		661		1783		832

Left Lane Group Data								
Assigned Mvmt	1	0	0	7	5	0	0	3
Lane Assignment	(Pr/Pm)			L+T+R	(Pr/Pm)			L+T+R
Lanes in Grp	1	0	0	1	1	0	0	1

Grp Vol (v), veh/h	218	0	0	119	82	0	0	56
Grp Sat Flow (s), veh/h/ln	2074	0	0	1512	1774	0	0	1456
Q Serve Time (g_s), s	3.8	0.0	0.0	6.0	1.5	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	3.8	0.0	0.0	11.2	1.5	0.0	0.0	5.1
Perm LT Sat Flow (s_l), veh/h/ln	628	0	0	1347	385	0	0	1307
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1803	0	0	0	1461
Perm LT Eff Green (g_p), s	113.3	0.0	0.0	15.2	113.3	0.0	0.0	15.2
Perm LT Serve Time (g_u), s	61.5	0.0	0.0	10.0	113.3	0.0	0.0	4.0
Perm LT Q Serve Time (g_ps), s	26.2	0.0	0.0	6.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	1.2	0.0	0.0	0.0	3.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	1.2	0.0	0.0	0.0	3.0
Prop LT Inside Lane (P_L)	1.00	0.00	0.00	0.51	1.00	0.00	0.00	0.39
Lane Grp Cap (c), veh/h	388	0	0	189	396	0	0	181
V/C Ratio (X)	0.56	0.00	0.00	0.63	0.21	0.00	0.00	0.31
Avail Cap (c_a), veh/h	416	0	0	212	434	0	0	203
Upstream Filter (I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	16.5	0.0	0.0	65.3	3.6	0.0	0.0	62.9
Incr Delay (d2), s/veh	1.5	0.0	0.0	4.9	0.3	0.0	0.0	1.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	18.0	0.0	0.0	70.3	3.8	0.0	0.0	63.9
1st-Term Q (Q1), veh/ln	4.5	0.0	0.0	4.8	0.7	0.0	0.0	2.2
2nd-Term Q (Q2), veh/ln	0.2	0.0	0.0	0.3	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
%ile Back of Q (50%), veh/ln	4.7	0.0	0.0	5.1	0.8	0.0	0.0	2.2
%ile Storage Ratio (RQ%)	0.59	0.00	0.00	0.15	0.10	0.00	0.00	0.08
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment						T		
Lanes in Grp	0	0	0	0	0	1	0	0
Grp Vol (v), veh/h	0	0	0	0	0	1367	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	2178	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	1661	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.82	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	2097	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R				R		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	1046	0	0	0	27	0	0
Grp Sat Flow (s), veh/h/ln	0	1787	0	0	0	1783	0	0
Q Serve Time (g_s), s	0.0	51.8	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	51.8	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.19	0.00	0.44	0.00	1.00	0.00	0.57
Lane Grp Cap (c), veh/h	0	1350	0	0	0	1360	0	0
V/C Ratio (X)	0.00	0.77	0.00	0.00	0.00	0.02	0.00	0.00
Avail Cap (c_a), veh/h	0	1720	0	0	0	1716	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	10.8	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	12.6	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	25.3	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	25.9	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	11.1
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	1220	1333	50	515	1	523	0	36	0	0	2
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		0.95	1.00		0.97	1.00		0.96	1.00		0.53
Parking Bus 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
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1900	1881	1881	1881	1900	1900	1900
Adj Flow Rate, veh/h	3	1312	1433	54	554	1	562	0	39	0	0	2
Adj No. of Lanes	1	1	1	1	2	0	1	1	1	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	147	927	754	147	1803	3	579	608	499	0	0	1
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.60	1.60	1.60	1.00	1.00	1.00
Prop Arrive On Green	0.08	0.49	0.49	0.08	0.49	0.49	0.52	0.00	0.52	0.00	0.00	0.00
Ln Grp Delay, s/veh	103.2	255.3	471.7	113.0	37.9	37.9	84.5	0.0	40.7	0.0	0.0	774.5
Ln Grp LOS	F	F	F	F	D	D	F		D			F
Approach Vol, veh/h		2748			609			601			2	
Approach Delay, s/veh		368.0			44.5			81.7			774.4	
Approach LOS		F			D			F			F	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	8	4	5	6		
Case No	2.0	3.0	12.0	9.0	2.0	4.0		
Phs Duration (G+Y+Rc), s	25.5	127.2	6.4	84.9	25.5	127.2		
Change Period (Y+Rc), s	5.5	7.0	6.0	6.0	5.5	7.0		
Max Green (Gmax), s	20.0	90.0	20.0	90.0	20.0	90.0		
Max Allow Headway (MAH), s	3.1	5.4	7.4	4.7	3.1	5.4		
Max Q Clear (g_c+I1), s	9.0	122.2	2.4	76.2	2.4	24.1		
Green Ext Time (g_e), s	0.0	0.0	0.0	2.7	0.0	62.5		
Prob of Phs Call (p_c)	1.00	1.00	0.13	1.00	1.00	1.00		
Prob of Max Out (p_x)	0.00	0.00	0.00	0.10	0.00	0.00		

Left-Turn Movement Data								
Assigned Mvmt	1		3	7	5			
Mvmt Sat Flow, veh/h	1792		0	1792	1792			

Through Movement Data								
Assigned Mvmt		2	8	4		6		
Mvmt Sat Flow, veh/h		1881	0	1881		3660		

Right-Turn Movement Data								
Assigned Mvmt		12	18	14		16		
Mvmt Sat Flow, veh/h		1525	853	1542		7		

Left Lane Group Data								
Assigned Mvmt	1	0	3	7	5	0	0	0
Lane Assignment	(Prot)				(Prot)			
Lanes in Grp	1	0	0	1	1	0	0	0

Grp Vol (v), veh/h	54	0	0	562	3	0	0	0
Grp Sat Flow (s), veh/h/ln	1792	0	0	1792	1792	0	0	0
Q Serve Time (g_s), s	7.0	0.0	0.0	74.2	0.4	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	7.0	0.0	0.0	74.2	0.4	0.0	0.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	1792	0	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	147	0	0	579	147	0	0	0
V/C Ratio (X)	0.37	0.00	0.00	0.97	0.02	0.00	0.00	0.00
Avail Cap (c_a), veh/h	147	0	0	661	147	0	0	0
Upstream Filter (I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	106.0	0.0	0.0	57.7	103.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	7.0	0.0	0.0	26.8	0.3	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	113.0	0.0	0.0	84.5	103.2	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	3.4	0.0	0.0	36.6	0.2	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.3	0.0	0.0	4.3	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00
%ile Back of Q (50%), veh/ln	3.7	0.0	0.0	40.9	0.2	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.54	0.00	0.00	4.58	0.03	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	8	4	0	6	0	0
Lane Assignment		T		T		T		
Lanes in Grp	0	1	0	1	0	1	0	0
Grp Vol (v), veh/h	0	1312	0	0	0	270	0	0
Grp Sat Flow (s), veh/h/ln	0	1881	0	1881	0	1787	0	0
Q Serve Time (g_s), s	0.0	120.2	0.0	0.0	0.0	22.1	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	120.2	0.0	0.0	0.0	22.1	0.0	0.0
Lane Grp Cap (c), veh/h	0	927	0	608	0	881	0	0
V/C Ratio (X)	0.00	1.42	0.00	0.00	0.00	0.31	0.00	0.00
Avail Cap (c_a), veh/h	0	927	0	694	0	881	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	61.9	0.0	0.0	0.0	37.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	193.4	0.0	0.0	0.0	0.9	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	255.3	0.0	0.0	0.0	37.9	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	62.6	0.0	0.0	0.0	10.9	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	49.8	0.0	0.0	0.0	0.2	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	112.3	0.0	0.0	0.0	11.1	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	2.66	0.00	0.00	0.00	0.13	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	96.3	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	18	14	0	16	0	0
Lane Assignment		R	T+R	R		T+R		
Lanes in Grp	0	1	1	1	0	1	0	0
Grp Vol (v), veh/h	0	1433	2	39	0	285	0	0
Grp Sat Flow (s), veh/h/ln	0	1525	853	1542	0	1880	0	0
Q Serve Time (g_s), s	0.0	120.2	0.4	3.1	0.0	22.1	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	120.2	0.4	3.1	0.0	22.1	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	1599.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	754	1	499	0	926	0	0
V/C Ratio (X)	0.00	1.90	1.50	0.08	0.00	0.31	0.00	0.00
Avail Cap (c_a), veh/h	0	754	70	569	0	926	0	0
Upstream Filter (I)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	61.6	121.8	40.6	0.0	37.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	410.1	572.7	0.1	0.0	0.9	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	80.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	471.7	774.5	40.7	0.0	37.9	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	50.9	0.1	1.3	0.0	11.5	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	85.9	0.2	0.0	0.0	0.2	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	136.8	0.3	1.3	0.0	11.7	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	3.24	0.02	0.04	0.00	0.13	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	169.7	0.2	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.5	0.4	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	275.0
HCM 2010 LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	278	231	123	730	1073	230
Number	3	18	5	2	6	16
Initial Q, veh	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00	1.00	1.00			0.96
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1881	1881	1683	1683
Adj Flow Rate, veh/h	287	238	127	753	1106	237
Adj No. of Lanes	1	1	1	2	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	1	1	1	1
Opposing Right Turn Influence	Yes		Yes			
Cap, veh/h	343	306	273	2465	1888	809
HCM Platoon Ratio	1.00	1.00	0.75	0.75	0.33	0.33
Prop Arrive On Green	0.19	0.19	0.04	0.52	0.19	0.19
Ln Grp Delay, s/veh	44.2	42.5	15.7	10.4	29.2	22.5
Ln Grp LOS	D	D	B	B	C	C
Approach Vol, veh/h	525			880	1343	
Approach Delay, s/veh	43.4			11.2	28.0	
Approach LOS	D			B	C	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs		2	8		5	6		
Case No		4.0	9.0		1.2	7.0		
Phs Duration (G+Y+Rc), s		75.5	23.8		9.8	65.6		
Change Period (Y+Rc), s		7.0	5.0		5.0	7.0		
Max Green (Gmax), s		120.0	35.0		25.0	120.0		
Max Allow Headway (MAH), s		4.9	4.0		3.7	4.9		
Max Q Clear (g_c+I1), s		14.0	17.2		4.6	33.2		
Green Ext Time (g_e), s		26.1	1.6		0.3	25.4		
Prob of Phs Call (p_c)		1.00	1.00		0.97	1.00		
Prob of Max Out (p_x)		0.03	0.00		0.00	0.05		
Left-Turn Movement Data								
Assigned Mvmt			3		5	1		
Mvmt Sat Flow, veh/h			1810		1792	0		
Through Movement Data								
Assigned Mvmt		2	8			6		
Mvmt Sat Flow, veh/h		3668	0			3282		
Right-Turn Movement Data								
Assigned Mvmt		12	18			16		
Mvmt Sat Flow, veh/h		0	1615			1371		
Left Lane Group Data								
Assigned Mvmt	0	0	3	0	5	1	0	0
Lane Assignment					(Pr/Pm)			
Lanes in Grp	0	0	1	0	1	0	0	0

Grp Vol (v), veh/h	0	0	287	0	127	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	1810	0	1792	0	0	0
Q Serve Time (g_s), s	0.0	0.0	15.2	0.0	2.6	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	15.2	0.0	2.6	0.0	0.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	1810	0	409	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	60.6	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	27.4	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	15.2	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	58.6	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	0	343	0	273	0	0	0
V/C Ratio (X)	0.00	0.00	0.84	0.00	0.47	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	638	0	637	0	0	0
Upstream Filter (I)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	38.8	0.0	14.5	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	5.4	0.0	1.2	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	44.2	0.0	15.7	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	7.6	0.0	1.7	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.5	0.0	0.1	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.0	8.1	0.0	1.8	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.36	0.00	0.30	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	8	0	0	6	0	0
Lane Assignment		T				T		
Lanes in Grp	0	2	0	0	0	2	0	0
Grp Vol (v), veh/h	0	753	0	0	0	1106	0	0
Grp Sat Flow (s), veh/h/ln	0	1787	0	0	0	1599	0	0
Q Serve Time (g_s), s	0.0	12.0	0.0	0.0	0.0	31.2	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	12.0	0.0	0.0	0.0	31.2	0.0	0.0
Lane Grp Cap (c), veh/h	0	2465	0	0	0	1888	0	0
V/C Ratio (X)	0.00	0.31	0.00	0.00	0.00	0.59	0.00	0.00
Avail Cap (c_a), veh/h	0	4321	0	0	0	3866	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	10.3	0.0	0.0	0.0	28.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	10.4	0.0	0.0	0.0	29.2	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	5.9	0.0	0.0	0.0	13.8	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	5.9	0.0	0.0	0.0	13.9	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.19	0.00	0.00	0.00	0.08	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	18	0	0	16	0	0
Lane Assignment			R			R		
Lanes in Grp	0	0	1	0	0	1	0	0
Grp Vol (v), veh/h	0	0	238	0	0	237	0	0
Grp Sat Flow (s), veh/h/ln	0	0	1615	0	0	1371	0	0
Q Serve Time (g_s), s	0.0	0.0	13.9	0.0	0.0	14.7	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	13.9	0.0	0.0	14.7	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	1430.7	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	0	306	0	0	809	0	0
V/C Ratio (X)	0.00	0.00	0.78	0.00	0.00	0.29	0.00	0.00
Avail Cap (c_a), veh/h	0	0	569	0	0	1657	0	0
Upstream Filter (I)	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	38.2	0.0	0.0	22.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	4.3	0.0	0.0	0.2	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	42.5	0.0	0.0	22.5	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	6.2	0.0	0.0	5.6	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.0	6.6	0.0	0.0	5.6	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.29	0.00	0.00	0.94	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	25.6
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	39	0	18	5	0	8	33	772	2	0	1418	108
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	0.96		0.92	0.96		0.92	1.00		0.96	1.00		0.96
Parking Bus 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
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	41	0	19	5	0	9	35	821	2	0	1509	115
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	310	0	158	140	27	103	310	2614	6	161	2400	182
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.11	0.00	0.11	0.11	0.00	0.11	0.71	0.71	0.71	0.00	0.71	0.71
Ln Grp Delay, s/veh	18.5	0.0	18.4	18.1	0.0	0.0	7.0	2.5	2.5	0.0	4.0	4.1
Ln Grp LOS	B		B	B			A	A	A		A	A
Approach Vol, veh/h		60			14			858			1624	
Approach Delay, s/veh		18.5			18.1			2.7			4.0	
Approach LOS		B			B			A			A	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Case No		6.0		6.0		6.0		8.0
Phs Duration (G+Y+Rc), s		36.0		8.8		36.0		8.8
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green (Gmax), s		36.0		16.0		36.0		16.0
Max Allow Headway (MAH), s		5.2		4.7		5.2		4.7
Max Q Clear (g_c+I1), s		15.5		3.1		12.6		2.4
Green Ext Time (g_e), s		16.5		0.2		18.4		0.2
Prob of Phs Call (p_c)		1.00		0.67		1.00		0.67
Prob of Max Out (p_x)		0.82		0.00		0.79		0.00

Left-Turn Movement Data								
Assigned Mvmt		5		7		1		3
Mvmt Sat Flow, veh/h		312		1371		669		287

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3657		0		3358		253

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		9		1482		254		972

Left Lane Group Data								
Assigned Mvmt	0	5	0	7	0	1	0	3
Lane Assignment								L+T+R
Lanes in Grp	0	1	0	1	0	1	0	1

Grp Vol (v), veh/h	0	35	0	41	0	0	0	14
Grp Sat Flow (s), veh/h/ln	0	312	0	1371	0	669	0	1512
Q Serve Time (g_s), s	0.0	2.9	0.0	0.8	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	13.5	0.0	1.1	0.0	0.0	0.0	0.4
Perm LT Sat Flow (s_l), veh/h/ln	0	312	0	1371	0	669	0	1360
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1737	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	32.0	0.0	4.8	0.0	0.0	0.0	4.8
Perm LT Serve Time (g_u), s	0.0	21.4	0.0	4.4	0.0	0.0	0.0	4.2
Perm LT Q Serve Time (g_ps), s	0.0	2.9	0.0	0.8	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Prop LT Inside Lane (P_L)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.36
Lane Grp Cap (c), veh/h	0	310	0	310	0	161	0	270
V/C Ratio (X)	0.00	0.11	0.00	0.13	0.00	0.00	0.00	0.05
Avail Cap (c_a), veh/h	0	339	0	654	0	221	0	631
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	6.8	0.0	18.3	0.0	0.0	0.0	18.0
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	7.0	0.0	18.5	0.0	0.0	0.0	18.1
1st-Term Q (Q1), veh/ln	0.0	0.3	0.0	0.5	0.0	0.0	0.0	0.2
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.3	0.0	0.5	0.0	0.0	0.0	0.2
%ile Storage Ratio (RQ%)	0.00	0.05	0.00	0.01	0.00	0.00	0.00	0.02
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T				T		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	401	0	0	0	798	0	0
Grp Sat Flow (s), veh/h/ln	0	1787	0	0	0	1787	0	0
Q Serve Time (g_s), s	0.0	3.7	0.0	0.0	0.0	10.3	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	3.7	0.0	0.0	0.0	10.3	0.0	0.0
Lane Grp Cap (c), veh/h	0	1277	0	0	0	1277	0	0
V/C Ratio (X)	0.00	0.31	0.00	0.00	0.00	0.62	0.00	0.00
Avail Cap (c_a), veh/h	0	1438	0	0	0	1438	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	2.3	0.0	0.0	0.0	3.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.0	0.7	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	2.5	0.0	0.0	0.0	4.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	1.8	0.0	0.0	0.0	4.9	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.8	0.0	0.0	0.0	5.1	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.05	0.00	0.00	0.00	0.16	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		
Lanes in Grp	0	1	0	1	0	1	0	0
Grp Vol (v), veh/h	0	422	0	19	0	826	0	0
Grp Sat Flow (s), veh/h/ln	0	1879	0	1482	0	1825	0	0
Q Serve Time (g_s), s	0.0	3.7	0.0	0.5	0.0	10.6	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	3.7	0.0	0.5	0.0	10.6	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.00	0.00	1.00	0.00	0.14	0.00	0.64
Lane Grp Cap (c), veh/h	0	1343	0	158	0	1304	0	0
V/C Ratio (X)	0.00	0.31	0.00	0.12	0.00	0.63	0.00	0.00
Avail Cap (c_a), veh/h	0	1512	0	530	0	1468	0	0
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	2.3	0.0	18.1	0.0	3.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.3	0.0	0.7	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	2.5	0.0	18.4	0.0	4.1	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	1.9	0.0	0.2	0.0	5.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.9	0.0	0.2	0.0	5.3	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.05	0.00	0.01	0.00	0.17	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	4.0
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	1442	118	20	683	13	26	0	8	7	0	7
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		0.96	1.00		0.96	0.97		0.93	0.97		0.93
Parking Bus 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
Adj Sat Flow, veh/h/ln	1881	1881	1900	1863	1863	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	20	1518	124	21	719	14	27	0	8	7	0	7
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
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
Percent Heavy Veh, %	1	1	1	2	2	2	0	0	0	0	0	0
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	595	2236	181	289	2377	46	289	19	47	200	35	107
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.67	0.67	0.67	0.67	0.67	0.67	0.14	0.00	0.14	0.14	0.00	0.14
Ln Grp Delay, s/veh	3.8	5.4	5.6	8.6	3.0	3.0	16.1	0.0	0.0	15.8	0.0	0.0
Ln Grp LOS	A	A	A	A	A	A	B			B		
Approach Vol, veh/h		1662			754			35			14	
Approach Delay, s/veh		5.5			3.2			16.1			15.8	
Approach LOS		A			A			B			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Case No		8.0		6.0		8.0		6.0
Phs Duration (G+Y+Rc), s		10.0		32.4		10.0		32.4
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green (Gmax), s		16.0		31.0		16.0		31.0
Max Allow Headway (MAH), s		5.6		5.2		5.6		5.2
Max Q Clear (g_c+I1), s		2.8		13.8		2.3		15.8
Green Ext Time (g_e), s		0.1		14.0		0.1		12.6
Prob of Phs Call (p_c)		1.00		1.00		1.00		1.00
Prob of Max Out (p_x)		0.00		0.84		0.00		0.87

Left-Turn Movement Data								
Assigned Mvmt		5		7		1		3
Mvmt Sat Flow, veh/h		983		725		511		304

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		136		3337		246		3548

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		332		270		757		69

Left Lane Group Data								
Assigned Mvmt	0	5	0	7	0	1	0	3
Lane Assignment		L+T+R				L+T+R		
Lanes in Grp	0	1	0	1	0	1	0	1

Grp Vol (v), veh/h	0	35	0	20	0	14	0	21
Grp Sat Flow (s), veh/h/ln	0	1450	0	725	0	1515	0	304
Q Serve Time (g_s), s	0.0	0.2	0.0	0.5	0.0	0.0	0.0	1.9
Cycle Q Clear Time (g_c), s	0.0	0.8	0.0	4.1	0.0	0.3	0.0	13.8
Perm LT Sat Flow (s_l), veh/h/ln	0	1387	0	725	0	1387	0	304
Shared LT Sat Flow (s_sh), veh/h/ln	0	1785	0	0	0	1825	0	0
Perm LT Eff Green (g_p), s	0.0	6.0	0.0	28.4	0.0	6.0	0.0	28.4
Perm LT Serve Time (g_u), s	0.0	5.7	0.0	24.8	0.0	5.2	0.0	16.5
Perm LT Q Serve Time (g_ps), s	0.0	0.2	0.0	0.5	0.0	0.0	0.0	1.9
Time to First Blk (g_f), s	0.0	0.6	0.0	0.0	0.0	1.7	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.6	0.0	0.0	0.0	0.3	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.77	0.00	1.00	0.00	0.50	0.00	1.00
Lane Grp Cap (c), veh/h	0	355	0	595	0	341	0	289
V/C Ratio (X)	0.00	0.10	0.00	0.03	0.00	0.04	0.00	0.07
Avail Cap (c_a), veh/h	0	690	0	640	0	683	0	307
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	15.9	0.0	3.7	0.0	15.8	0.0	8.5
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	16.1	0.0	3.8	0.0	15.8	0.0	8.6
1st-Term Q (Q1), veh/ln	0.0	0.4	0.0	0.1	0.0	0.1	0.0	0.2
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.4	0.0	0.1	0.0	0.1	0.0	0.2
%ile Storage Ratio (RQ%)	0.00	0.01	0.00	0.02	0.00	0.01	0.00	0.03
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment				T				T
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	807	0	0	0	359
Grp Sat Flow (s), veh/h/ln	0	0	0	1787	0	0	0	1770
Q Serve Time (g_s), s	0.0	0.0	0.0	11.5	0.0	0.0	0.0	3.6
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	11.5	0.0	0.0	0.0	3.6
Lane Grp Cap (c), veh/h	0	0	0	1197	0	0	0	1186
V/C Ratio (X)	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.30
Avail Cap (c_a), veh/h	0	0	0	1308	0	0	0	1295
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	4.2	0.0	0.0	0.0	2.9
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	5.4	0.0	0.0	0.0	3.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	5.4	0.0	0.0	0.0	1.7
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	5.8	0.0	0.0	0.0	1.7
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.02
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment				T+R				T+R
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	835	0	0	0	374
Grp Sat Flow (s), veh/h/ln	0	0	0	1821	0	0	0	1847
Q Serve Time (g_s), s	0.0	0.0	0.0	11.8	0.0	0.0	0.0	3.6
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	11.8	0.0	0.0	0.0	3.6
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.23	0.00	0.15	0.00	0.50	0.00	0.04
Lane Grp Cap (c), veh/h	0	0	0	1220	0	0	0	1238
V/C Ratio (X)	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0.30
Avail Cap (c_a), veh/h	0	0	0	1333	0	0	0	1352
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	4.3	0.0	0.0	0.0	2.9
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	5.6	0.0	0.0	0.0	3.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	5.8	0.0	0.0	0.0	1.8
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	6.2	0.0	0.0	0.0	1.8
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.02
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	5.0
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	2	30	57	6	48	76	788	185	203	1271	25
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	0.96		0.92	0.97		0.87	1.00		0.96	1.00		0.96
Parking Bus 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
Adj Sat Flow, veh/h/ln	1900	1827	1900	1900	1900	1900	1863	1863	1900	2178	2178	2178
Adj Flow Rate, veh/h	22	2	32	61	6	52	82	847	199	218	1367	27
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	0	0	0	2	2	2	1	1	1
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	91	21	96	120	19	74	398	1033	243	355	1582	1294
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.75	1.75	1.75
Prop Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.04	0.71	0.71	0.09	1.00	1.00
Ln Grp Delay, s/veh	52.2	0.0	0.0	55.9	0.0	0.0	4.4	0.0	16.1	20.4	4.6	0.0
Ln Grp LOS	D			E			A		B	C	A	A
Approach Vol, veh/h		56			119			1128			1612	
Approach Delay, s/veh		52.2			55.9			15.3			6.6	
Approach LOS		D			E			B			A	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Case No	1.1	4.0		8.0	1.1	3.0		8.0
Phs Duration (G+Y+Rc), s	11.3	95.8		19.3	9.7	97.3		19.3
Change Period (Y+Rc), s	5.0	5.6		5.0	5.0	5.6		5.0
Max Green (Gmax), s	35.0	100.0		35.0	35.0	100.0		35.0
Max Allow Headway (MAH), s	3.7	5.1		5.8	3.8	5.1		5.8
Max Q Clear (g_c+I1), s	5.7	53.1		11.3	3.5	2.0		6.1
Green Ext Time (g_e), s	0.6	37.1		1.1	0.2	62.5		1.2
Prob of Phs Call (p_c)	1.00	1.00		1.00	0.94	1.00		1.00
Prob of Max Out (p_x)	0.00	0.74		0.00	0.00	0.52		0.00

Left-Turn Movement Data								
Assigned Mvmt	1			7	5			3
Mvmt Sat Flow, veh/h	2074			676	1774			456

Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		1447		168		2178		184

Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		340		655		1782		853

Left Lane Group Data								
Assigned Mvmt	1	0	0	7	5	0	0	3
Lane Assignment	(Pr/Pm)			L+T+R	(Pr/Pm)			L+T+R
Lanes in Grp	1	0	0	1	1	0	0	1

Grp Vol (v), veh/h	218	0	0	119	82	0	0	56
Grp Sat Flow (s), veh/h/ln	2074	0	0	1499	1774	0	0	1492
Q Serve Time (g_s), s	3.7	0.0	0.0	5.1	1.5	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	3.7	0.0	0.0	9.3	1.5	0.0	0.0	4.1
Perm LT Sat Flow (s_l), veh/h/ln	628	0	0	1351	385	0	0	1310
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1820	0	0	0	1550
Perm LT Eff Green (g_p), s	90.2	0.0	0.0	14.3	90.2	0.0	0.0	14.3
Perm LT Serve Time (g_u), s	39.1	0.0	0.0	10.1	90.2	0.0	0.0	5.0
Perm LT Q Serve Time (g_ps), s	25.5	0.0	0.0	5.1	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	1.6	0.0	0.0	0.0	3.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	1.6	0.0	0.0	0.0	3.0
Prop LT Inside Lane (P_L)	1.00	0.00	0.00	0.51	1.00	0.00	0.00	0.39
Lane Grp Cap (c), veh/h	355	0	0	213	398	0	0	208
V/C Ratio (X)	0.61	0.00	0.00	0.56	0.21	0.00	0.00	0.27
Avail Cap (c_a), veh/h	826	0	0	441	823	0	0	433
Upstream Filter (I)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	18.7	0.0	0.0	53.6	4.1	0.0	0.0	51.5
Incr Delay (d2), s/veh	1.7	0.0	0.0	2.3	0.3	0.0	0.0	0.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	20.4	0.0	0.0	55.9	4.4	0.0	0.0	52.2
1st-Term Q (Q1), veh/ln	4.4	0.0	0.0	4.0	0.7	0.0	0.0	1.8
2nd-Term Q (Q2), veh/ln	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00
%ile Back of Q (50%), veh/ln	4.6	0.0	0.0	4.1	0.8	0.0	0.0	1.8
%ile Storage Ratio (RQ%)	0.58	0.00	0.00	0.13	0.10	0.00	0.00	0.07
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment						T		
Lanes in Grp	0	0	0	0	0	1	0	0
Grp Vol (v), veh/h	0	0	0	0	0	1367	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	2178	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	1582	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.86	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	1724	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R				R		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	1046	0	0	0	27	0	0
Grp Sat Flow (s), veh/h/ln	0	1787	0	0	0	1782	0	0
Q Serve Time (g_s), s	0.0	51.1	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	51.1	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.19	0.00	0.44	0.00	1.00	0.00	0.57
Lane Grp Cap (c), veh/h	0	1275	0	0	0	1294	0	0
V/C Ratio (X)	0.00	0.82	0.00	0.00	0.00	0.02	0.00	0.00
Avail Cap (c_a), veh/h	0	1414	0	0	0	1410	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	16.1	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	24.7	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	26.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	12.9
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	2	1	3	3
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	60	14	0	0
Demand Flow Rate, veh/h	60	14	0	0
Vehicles Circulating, veh/h	1378	698	41	32
Vehicles Exiting, veh/h	131	1	1397	680
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	15	15	15	15
Ped Cap Adj	1.000	0.998	1.000	1.000
Approach Delay, s/veh	10.0	5.4	0.0	0.0
Approach LOS	B	A	-	-

Lane	Left	Right	Left
Designated Moves	L	TR	LTR
Assumed Moves	L	TR	LTR
RT Channelized			
Lane Util	0.683	0.317	1.000
Critical Headway, s	4.293	4.113	4.113
Entry Flow, veh/h	41	19	14
Cap Entry Lane, veh/h	402	431	693
Entry HV Adj Factor	1.000	1.000	1.000
Flow Entry, veh/h	41	19	14
Cap Entry, veh/h	402	431	692
V/C Ratio	0.102	0.044	0.020
Control Delay, s/veh	10.5	9.0	5.4
LOS	B	A	A
95th %tile Queue, veh	0	0	0

Intersection	
Intersection Delay, s/veh	9.4
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	3	3	1	1
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	0	0	35	14
Demand Flow Rate, veh/h	0	0	35	14
Vehicles Circulating, veh/h	28	47	1560	781
Vehicles Exiting, veh/h	767	1548	146	34
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	15	15	15	15
Ped Cap Adj	1.000	1.000	1.000	0.998
Approach Delay, s/veh	0.0	0.0	10.9	5.7
Approach LOS	-	-	B	A

Lane	Left	Left
Designated Moves	LTR	LTR
Assumed Moves	LTR	LTR
RT Channelized		
Lane Util	1.000	1.000
Critical Headway, s	4.113	4.113
Entry Flow, veh/h	35	14
Cap Entry Lane, veh/h	379	654
Entry HV Adj Factor	1.000	1.000
Flow Entry, veh/h	35	14
Cap Entry, veh/h	379	653
V/C Ratio	0.092	0.021
Control Delay, s/veh	10.9	5.7
LOS	B	A
95th %tile Queue, veh	0	0

Appendix L

Urban Street Segments Level of Service Calculations

Free Flow Speed Analysis (HCM Ch. 17)

Speed Limit	Speed Constant
25	37.4
30	39.7
35	42.1
40	44.4
45	46.8
50	49.1
55	51.5

Median Type	Percent with Restrictive Median	No Curb	Curb
Restrictive	20	0.3	-0.9
	40	0.6	-1.4
	60	0.9	-1.8
	80	1.2	-2.2
	100	1.5	-2.7
Nonrestrictive	N/A	0	-0.5
No Median	N/A	0	-0.5

	Adjustment by Lanes per Direction			
Access Density (pts/mi)	1 Lane	2 Lanes	3 Lanes	4 Lanes
0	0	0	0	0
2	-0.2	-0.1	-0.1	0
4	-0.3	-0.2	-0.1	-0.1
10	-0.8	-0.4	-0.3	-0.2
20	-1.6	-0.8	-0.5	-0.4
40	-3.1	-1.6	-1	-0.8
60	-4.7	-2.3	-1.6	-1.2

Percentage	LOS
0	F
0.31	E
0.41	D
0.51	C
0.68	B
0.86	A

Forumla: Base Free Flow = Speed Constant + Adjustment for Cross Section + Adjustment for Access Points

Scenarios

													EARLY		
			Speed Limit	Restrictive Median Percentage	Curb?	Access Density	Lanes per Direction	Speed Constant	Adjust for Cross Section	Adjust for Access Points	Base FFS	Measured FFS	% of Base	LOS	Calculated FFS	% of Base	LOS
Existing	NB	25th to 28th	45	N/A	No Curb	0	1	46.8	0	0	46.8	45.8	98%	A	45.9	98%	A
		28th to 36th	45	N/A	No Curb	4	1	46.8	0	-0.3	46.5	42.1	91%	A	42.0	90%	A
		36th to 37th	45	N/A	No Curb	0	1	46.8	0	0	46.8	42.1	90%	A	42.0	90%	A
	SB	37th to 36th	45	N/A	No Curb	0	1	46.8	0	0	46.8	39.1	84%	B	39.1	84%	B
		36th to 28th	45	N/A	No Curb	4	1	46.8	0	-0.3	46.5	39.1	84%	B	39.1	84%	B
		28th to 25th	45	N/A	No Curb	0	1	46.8	0	0	46.8	43.5	93%	A	43.7	93%	A
3-Lane Design 2035	NB	25th to 28th	45	60	Curb	0	1	46.8	-1.8	0	45				40.2	89%	A
		28th to 36th	45	60	Curb	4	1	46.8	-1.8	-0.3	44.7				42.4	95%	A
		36th to 37th	45	60	Curb	0	1	46.8	-1.8	0	45				19.2	43%	D
	SB	37th to 36th	45	60	Curb	0	1	46.8	-1.8	0	45				20.8	46%	D
		36th to 28th	45	60	Curb	4	1	46.8	-1.8	-0.3	44.7				33.8	76%	B
		28th to 25th	45	60	Curb	0	1	46.8	-1.8	0	45				42.1	93%	A
5-Lane Design 2035	NB	25th to 28th	45	60	Curb	0	2	46.8	-1.8	0	45				41.1	91%	A
		28th to 36th	45	60	Curb	4	2	46.8	-1.8	-0.2	44.8				42.9	96%	A
		36th to 37th	45	60	Curb	0	2	46.8	-1.8	0	45				24.1	53%	C
	SB	37th to 36th	45	60	Curb	0	2	46.8	-1.8	0	45				34.3	76%	B
		36th to 28th	45	60	Curb	4	2	46.8	-1.8	-0.2	44.8				41.2	92%	A
		28th to 25th	45	60	Curb	0	2	46.8	-1.8	0	45				38.1	85%	B

"Measured FFS" Calculations for Design Options

(Based on Ch. 17 of HCM)

														2015 - Early		2035 - Early	
			Base FFS	L_s	f_L	S_f	v_m	N_th	f_v	f_x	l_1	L	t_R	d_t	S_T,seg	d_t	S_T,seg
Existing	NB	25th to 28th	46.8	7600	1	46.8	65	1	1.0028	1	2	2640	39.1752515	0	45.9473757		
		28th to 37th	46.8	7600	1	46.8		1	1	0	2.5	4960	72.2610723	8.3	41.9783164		
	SB	37th to 28th	46.8	7600	1	46.8		1	1	0	2.5	4960	72.2610723	14.25	39.0911602		
		28th to 25th	46.8	7600	1	46.8		1	1	1	2	2640	39.0675991	2.1	43.723706		
3-Lane Design	NB	25th to 28th	45	7600	1	45		1	1	1	2	2640	40.6060606	0	44.3283582	4.2	40.17314
		28th to 36th	44.7	7600	1	44.7		1	1	0	2.5	4110	62.690665		44.7	3.4	42.40043
		36th to 37th	45	7600	1	45		1	1	0	2.5	850	12.8787879		45	17.3	19.20374
	SB	37th to 36th	45	7600	1	45		1	1	0	2.5	850	12.8787879		45	15	20.78804
		36th to 28th	44.7	7600	1	44.7		1	1	0	2.5	4110	62.690665		44.7	20.2	33.80686
		28th to 25th	45	7600	1	45		1	1	1	2	2640	40.6060606		44.3283582	2.2	42.05012
5-Lane Design	NB	25th to 28th	45	7600	1	45		2	1	1	2	2640	40.6060606	0	44.3283582	3.2	41.0902
		28th to 36th	44.8	7600	1	44.8		2	1	0	2.5	4110	62.5507305		44.8	2.7	42.94623
		36th to 37th	45	7600	1	45		2	1	0	2.5	850	12.8787879		45	11.2	24.06871
	SB	37th to 36th	45	7600	1	45		2	1	0	2.5	850	12.8787879		45	4	34.33573
		36th to 28th	44.8	7600	1	44.8		2	1	0	2.5	4110	62.5507305		44.8	5.5	41.17917
		28th to 25th	45	7600	1	45		2	1	1	2	2640	40.6060606		44.3283582	6.6	38.1307

*delays are approach delays, not movement/lane group delays

Measured FFS from Travel Time Worksheet

NORTHBOUND

Checkpoint	1	2	3	4	5	6	Avg. MPH
Reach 25th queue	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00		
Clear 25th	0:00:29	0:00:03	0:00:02	0:00:03	0:00:03		40.4
Reach 28th queue	0:00:51	0:00:35	0:00:40	0:00:30	0:00:35		
Clear 28th	0:00:02	0:00:02	0:00:02	0:00:02	0:00:01		43.8
Reach 37th queue	0:01:30	0:01:05	0:01:21	0:01:22	0:01:03		
Clear 37th	0:00:04	0:00:02	0:00:02	0:00:03	0:00:14		46.2
Reach SR 202 queue	0:01:26	0:01:10	0:01:18	0:01:10	0:01:07		
Clear SR 202	0:01:48	0:01:36	0:01:13	0:01:07	0:01:36		48
Total Time	0:06:10	0:04:32	0:04:39	0:04:17	0:04:38		

NB (Sec)	Run					Length (ft)
	1	2	3	4	5	
25th to 28th	0:00:53	0:00:37	0:00:43	0:00:33	0:00:36	2640
28th to 37th	0:01:35	0:01:07	0:01:23	0:01:25	0:01:17	4960
37th to 202	0:03:14	0:02:46	0:02:31	0:02:17	0:02:42	5100

NB (MPH)	Run					Average
	1	2	3	4	5	
25th to 28th	34.0	48.6	41.9	54.5	50.0	45.8
28th to 37th	35.6	50.5	40.7	39.8	43.9	42.1
37th to 202	17.9	20.9	23.0	25.4	21.5	21.7

SOUTHBOUND

Checkpoint	1	2	3	4	5	6	Avg. MPH
Reach SR 202 queue	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00		
Clear SR 202	0:01:39	0:01:51	0:01:38	0:01:33	0:01:03		37.6
Reach 37th queue	0:01:33	0:01:07	0:01:21	0:01:00	0:01:12		
Clear 37th	0:00:01	0:00:38	0:00:40	0:00:43	0:00:30		35.4
Reach 28th queue	0:01:25	0:01:19	0:01:21	0:01:26	0:01:25		
Clear 28th	0:00:05	0:00:01	0:00:05	0:00:02	0:00:03		41
Reach 25th queue	0:00:35	0:00:37	0:00:35	0:00:38	0:00:38		
Clear 25th	0:00:02	0:00:02	0:00:14	0:00:02	0:00:02		41.2
Total Time	0:05:21	0:05:37	0:05:55	0:05:26	0:04:53		

SB (Sec)	Run					Length (ft)
	1	2	3	4	5	
202 to 37th	0:01:34	0:01:46	0:02:01	0:01:44	0:01:42	5100
37th to 28th	0:01:30	0:01:21	0:01:26	0:01:29	0:01:27	4960
28th to 25th	0:00:38	0:00:39	0:00:50	0:00:41	0:00:41	2640

SB (MPH)	Run					Average
	1	2	3	4	5	
202 to 37th	37.0	32.8	28.7	33.4	34.1	33.2
37th to 28th	37.6	41.8	39.3	38.0	38.9	39.1
28th to 25th	47.4	46.2	36.0	43.9	43.9	43.5

Appendix M

Two-Lane Highway and Multilane Highway Level of Service Calculations

Notation	*Description*	2014 Existing	2014 Existing with Climbing Lane	2035 Three-Lane	2035 Three-Lane with Climbing Lane	Notes
	Posted Speed Limit	45 mph	45 mph	45 mph	45 mph	
BFFS	*Base Free-Flow Speed*	55 mph	55 mph	55 mph	55 mph	Posted speed limit + 10mph
	Lane Width	11'	11'	11'	11'	
	Shoulder Width	8'	8'	8'	8'	
f_LS	*Adjustment for lane and shoulder width*	0.4 mph	0.4 mph	0.4 mph	0.4 mph	HCM Exhibit 15-7
	Segment length	0.75 mi	0.75 mi	0.75 mi	0.75 mi	
	Access points	1	1	1	1	
	Access points per mile	1.33	1.33	1.33	1.33	
f_A	*Adjustment for access-point density*	0.3 mph	0.3 mph	0.3 mph	0.3 mph	HCM Exhibit 15-8
FFS	*Free-flow speed*	54.3 mph	54.3 mph	54.3 mph	54.3 mph	HCM Equation 15-2
Southbound (Uphill) Analysis						
V_d	*SB demand volume (veh/h)*	1073	1073	1139	1139	
PHF	*SB peak hour factor*	0.88	0.88	0.88	0.88	
f_g,ATS	*SB grade adjustment factor (for ATS)*	1	1	1	1	HCM Exhibit 15-10
P_T	*SB proportion of trucks*	0.0075	0.0075	0.0075	0.0075	
P_R	*SB proportion of RVs*	0	0	0	0	
E_T	*SB passenger car equiv. for trucks (for ATS)*	9.8	9.8	9.8	9.8	HCM Exhibit 15-12
E_R	*SB passenger car equiv. for RVs (for ATS)*	1	1	1	1	HCM Exhibit 15-13
f_HV,ATS	*SB heavy vehicle adjustment factor (for ATS)*	0.94	0.94	0.94	0.94	HCM Equation 15-4
v_d,ATS	*SB demand flow rate for ATS estimate*	1299.79	1299.79	1379.74	1379.74	HCM Equation 15-3
V_o	*NB demand volume (veh/h)*	529	529	496	496	
PHF	*NB peak hour factor*	0.93	0.93	0.93	0.93	
f_g,ATS	*NB grade adjustment factor (for ATS)*	1	1	1	1	HCM Exhibit 15-9
P_T	*NB proportion of trucks*	0.013	0.013	0.013	0.013	
P_R	*NB proportion of RVs*	0	0	0	0	
E_T	*NB passenger car equiv. for trucks (for ATS)*	1.171	1.171	1.204	1.204	HCM Exhibit 15-11; interpolated
E_R	*NB passenger car equiv. for RVs (for ATS)*	1	1	1	1	HCM Exhibit 15-11
f_HV,ATS	*NB heavy vehicle adjustment factor (for ATS)*	1.00	1.00	1.00	1.00	HCM Equation 15-4
v_o,ATS	*NB demand flow rate for ATS estimate*	570.08	570.08	534.75	534.75	HCM Equation 15-3
	Percent no-passing zones	100	100	100	100	
	f_np,ATS at FFS = 50 mph	2.02	2.02	2.16	2.16	HCM Exhibit 15-15; interpolated
	f_np,ATS at FFS = 55 mph	2.03	2.03	2.19	2.19	HCM Exhibit 15-15; interpolated
f_np,ATS	*AST adjusment for no-passing zones*	2.03	2.03	2.19	2.19	HCM Exhibit 15-15; interpolated
ATS_d	***SB average travel speed***	**37.7 mph**	**37.7 mph**	**37.2 mph**	**37.2 mph**	**HCM Equation 15-6**
f_g,PTSF	*SB grade adjustment factor (for PTSF)*	1	1	1	1	HCM Exhibit 15-17
E_T	*SB passenger car equiv. for trucks (for PTSF)*	1	1	1	1	HCM Exhibit 15-19
E_R	*SB passenger car equiv. for RVs (for PTSF)*	1	1	1	1	HCM Exhibit 15-19
f_HV,PTSF	*SB heavy vehicle adjustment factor (for PTSF)*	1	1	1	1	HCM Equation 15-8
v_d,PTSF	*SB demand flow rate for PTSF estimate*	1219.32	1219.32	1294.32	1294.32	HCM Equation 15-7
f_g,PTSF	*NB grade adjustment factor (for PTSF)*	1	1	1	1	HCM Exhibit 15-16

E_T	*NB passenger car equiv. for trucks (for PTSF)*	1	1	1	1	HCM Exhibit 15-18
E_R	*NB passenger car equiv. for RVs (for PTSF)*	1	1	1	1	HCM Exhibit 15-18
f_HV,PTSF	*NB heavy vehicle adjustment factor (for PTSF)*	1	1	1	1	HCM Equation 15-8
v_o,PTSF	*NB demand flow rate for PTSF estimate*	568.82	568.82	533.33	533.33	HCM Equation 15-7
Coeff a	*PTSF coefficient a*	-0.0031	-0.0031	-0.0029	-0.0029	HCM Exhibit 15-20
Coeff b	*PTSF coefficient b*	0.8783	0.8783	0.8877	0.8877	HCM Exhibit 15-20
BPTSF_d	*SB base percent time-spent-following*	79.93	79.93	81.69	81.69	HCM Equation 15-10
	SB/NB directional split	0.68	0.68	0.71	0.71	
	Total flow rate for PTSF estimate	1788.14	1788.14	1827.65	1827.65	
	f_np,PTSF at directional split = 60/40	20.83	20.83	-	-	HCM Exhibit 15-21
	f_np,PTSF at directional split = 70/30	17.25	17.25	16.74	16.74	HCM Exhibit 15-21
	f_np,PTSF at directional split = 80/20	-	-	16.88	16.88	HCM Exhibit 15-21
f_np,PTSF	*SB adjustment to PTSF for no-passing zones*	17.90	17.90	16.75	16.75	HCM Exhibit 15-21
PTSF_d	***SB percent time-spent-following***	**92.1**	**92.1**	**93.5**	**93.5**	**HCM Equation 15-9**
L_t	*Total length*		0.75		0.75	
L_u	*Length of segment upstream of passing lane*		0		0	HCM Page 15-34
L_d	*Length downstream beyond effective length*		0		0	HCM Page 15-34
L_pl	*Length of passing lane*		0.5		0.5	
L_de	*Effective downstream length (for PTSF)*		3.6		3.6	HCM Exhibit 15-23
L'_de	*Actual downstream length (for PTSF)*		0.25		0.25	
f_pl_PTSF	*Adjustment for passing lane impact on PTSF*		0.23		0.23	HCM Exhibit 15-29
PTSF_pl	***SB percent time-spent-following with passing lane***		**22.0**		**22.4**	**HCM Equation 15-16**
L_de	*Effective downstream length (for ATS)*		1.7		1.7	HCM Exhibit 15-23
L'_de	*Actual downstream length (for ATS)*		0.25		0.25	HCM Exhibit 15-29
f_pl,ATS	*SB adjustment factor for passing lane for ATS*		1.14		1.14	HCM Exhibit 15-29
ATS_pl	***SB average travel speed with passing lane***		**42.9 mph**		**42.3 mph**	**Equation 15-18**
	Highway Class	Class I	Class I	Class I	Class I	
	LOS based on ATS	**E**	**D**	**E**	**D**	
	LOS based on PTSF	**E**	**A**	**E**	**A**	
Northbound (Downhill) Analysis						
V_d	*NB demand volume (veh/h)*	529	529	496	496	
PHF	*NB peak hour factor*	0.93	0.93	0.93	0.93	
f_g,ATS	*NB grade adjustment factor (for ATS)*	1	1	1	1	HCM Exhibit 15-10
P_T	*NB proportion of trucks*	0.013	0.013	0.013	0.013	
P_R	*NB proportion of RVs*	0	0	0	0	
E_T	*NB passenger car equiv. for trucks (for ATS)*	1.171	1.171	1.204	1.204	HCM Exhibit 15-12
E_R	*NB passenger car equiv. for RVs (for ATS)*	1	1	1	1	HCM Exhibit 15-13
f_HV,ATS	*NB heavy vehicle adjustment factor (for ATS)*	1.00	1.00	1.00	1.00	HCM Equation 15-4
v_d,ATS	*NB demand flow rate for ATS estimate*	570.08	570.08	534.75	534.75	HCM Equation 15-3
V_o	*SB demand volume (veh/h)*	1073	1073	1139	1139	
PHF	*SB peak hour factor*	0.88	0.88	0.88	0.88	
f_g,ATS	*SB grade adjustment factor (for ATS)*	1	1	1	1	HCM Exhibit 15-9

P_T	*SB proportion of trucks*	0.0075	0.0075	0.0075	0.0075	
P_R	*SB proportion of RVs*	0	0	0	0	
E_T	*SB passenger car equiv. for trucks (for ATS)*	9.8	9.8	9.8	9.8	HCM Exhibit 15-11; interpolated
E_R	*SB passenger car equiv. for RVs (for ATS)*	1	1	1	1	HCM Exhibit 15-11
f_HV,ATS	*SB heavy vehicle adjustment factor (for ATS)*	0.94	0.94	0.94	0.94	HCM Equation 15-4
v_o,ATS	*SB demand flow rate for ATS estimate*	1299.79	1299.79	1379.74	1379.74	HCM Equation 15-3
	Percent no-passing zones	100	100	100	100	
	f_np,ATS at FFS = 50 mph	0.90	0.90	0.82	0.82	HCM Exhibit 15-15; interpolated
	f_np,ATS at FFS = 55 mph	0.95	0.95	0.91	0.91	HCM Exhibit 15-15; interpolated
f_np,ATS	*AST adjusment for no-passing zones*	0.94	0.94	0.90	0.90	HCM Exhibit 15-15; interpolated
ATS_d	***NB average travel speed***	**48.8 mph**	**48.8 mph**	**48.5 mph**	**48.5 mph**	**HCM Equation 15-6; added 10 mph to reflect higher BFFS and match measured values**
f_g,PTSF	*NB grade adjustment factor (for PTSF)*	1	1	1	1	HCM Exhibit 15-17
E_T	*NB passenger car equiv. for trucks (for PTSF)*	1	1	1	1	HCM Exhibit 15-19
E_R	*NB passenger car equiv. for RVs (for PTSF)*	1	1	1	1	HCM Exhibit 15-19
f_HV,PTSF	*NB heavy vehicle adjustment factor (for PTSF)*	1	1	1	1	HCM Equation 15-8
v_d,PTSF	*NB demand flow rate for PTSF estimate*	568.82	568.82	533.33	533.33	HCM Equation 15-7
f_g,PTSF	*SB grade adjustment factor (for PTSF)*	1	1	1	1	HCM Exhibit 15-16
E_T	*SB passenger car equiv. for trucks (for PTSF)*	1	1	1	1	HCM Exhibit 15-18
E_R	*SB passenger car equiv. for RVs (for PTSF)*	1	1	1	1	HCM Exhibit 15-18
f_HV,PTSF	*SB heavy vehicle adjustment factor (for PTSF)*	1	1	1	1	HCM Equation 15-8
v_o,PTSF	*SB demand flow rate for PTSF estimate*	1219.32	1219.32	1294.32	1294.32	HCM Equation 15-7
Coeff a	*PTSF coefficient a*	-0.0054	-0.0054	-0.0056	-0.0056	HCM Exhibit 15-20
Coeff b	*PTSF coefficient b*	0.8246	0.8246	0.8231	0.8231	HCM Exhibit 15-20
BPTSF_d	*SB base percent time-spent-following*	63.83	63.83	62.53	62.53	HCM Equation 15-10
	NB/SB directional split	0.68	0.68	0.71	0.71	
	Total flow rate for PTSF estimate	1788.14	1788.14	1827.65	1827.65	
	f_np,PTSF at directional split = 60/40	20.83	20.83	-	-	HCM Exhibit 15-21
	f_np,PTSF at directional split = 70/30	17.25	17.25	16.74	16.74	HCM Exhibit 15-21
	f_np,PTSF at directional split = 80/20	-	-	16.88	16.88	HCM Exhibit 15-21
f_np,PTSF	*SB adjustment to PTSF for no-passing zones*	17.90	17.90	16.75	16.75	HCM Exhibit 15-21
PTSF_d	***NB percent time-spent-following***	**69.5**	**69.5**	**67.4**	**67.4**	**HCM Equation 15-9**
	Highway Class	Class I	Class I	Class I	Class I	
	LOS based on ATS	**C**	**C**	**C**	**C**	
	LOS based on PTSF	**D**	**D**	**D**	**D**	

Notation	*Description*	Southbound	Northbound	Notes
	Posted Speed Limit	45 mph	45 mph	
BFFS	*Base Free-Flow Speed*	52 mph	52 mph	HCM Page 14-11
	Lane Width	11'	11'	
f_LW	*Adjustment for lane width*	1.9 mph	1.9 mph	HCM Exhibit 14-8
	Shoulder Width	8'	8'	
	Median Width	0'	0'	
LC_R	*Right-side lateral clearance*	6'	6'	6' maximum
LC_L	*Left-side lateral clearance*	0'	0'	6' maximum
TLC	*Total lateral clearnace*	6'	6'	HCM Equation 14-2
f_LC	*Adjustment for lateral clearance*	1.3 mph	1.3 mph	HCM Exhibit 14-9
f_M	*Adjustment for median type*	1.6 mph	1.6 mph	HCM Exhibit 14-10
	Access points	1	1	
	Access points per mile	0.63	0.63	
f_A	*Adjustment for access-point density*	0.2 mph	0.2 mph	HCM Exhibit 14-11
FFS	*Free-flow speed*	47.0 mph	47.0 mph	HCM Equation 14-1
V	*Demand volume (veh/h)*	1303	559	
PHF	*SB peak hour factor*	0.88	0.93	
N	*Number of lanes*	2	2	
P_T	*Proportion of trucks and buses*	0.0075	0.013	
P_R	*Proportion of RCs*	0	0	
E_T	*Passenger car equiv. for trucks and buses*	5.5	1.5	HCM Exhibit 14-13, 14-15
E_R	*Passenger car equiv. for RVs*	6	1.2	HCM Exhibit 14-14
f_HV	*Adjustment factor for heavy vehicles*	0.97	0.99	HCM Equation 14-4
f_P	*Adjustment for driver population*	1	1	
v_p	*Demand flow rate*	765.33	302.49	HCM Equation 14-3
	FFS for speed calculation	45 mph	45 mph	HCM Page 14-3
S	*Speed*	45 mph	45 mph	HCM Exhibit 14-3
D	*Density*	17.01	6.72	HCM Equation 14-5
	LOS	**B**	**A**	

Appendix N

Travel Time Calculations

(Times in seconds)

	Baseline	New Signal at 28th	New Signal at 36th	Optimize Existing Signals	SR 202 Upgrade	Addition of Climbing Lane
Northbound						
Existing	246.0	-	-	-	-	-
2035 Three-Lane	263.2	4.2	3.4	-8.1	-22.4	-
2035 Five-Lane	256.2	3.2	2.7	-24.5	-23.2	-
Southbound						
Existing	199.5	-	-	-	-	-
2035 Three-Lane	220.8	20.2	15.0	0.3	-	-6.9
2035 Five-Lane	197.9	5.5	4.0	-4.6	-	-

*From USS Analysis *28th, 36th unsignalized*

	Travel Time (s) (including control delay)								
	No new signals			New Signal @ 28th		New Signal @ 36th		Optimize Ex Signals	
	2014 Existing	2035 Three-Lane	2035 Five-Lane	2035 Three-Lane	2035 Five-Lane	2035 Three-Lane	2035 Five-Lane	2035 Three-Lane	2035 Five-Lane
25th to 28th	39.2	40.6	40.6	4.2	3.2				
28th to 36th	60.3	62.7	62.6			3.4	2.7		
36th to 37th	20.7	30.2	24.1					-2.8	-1.3
NB Total	120.1	133.5	127.2	4.2	3.2	3.4	2.7	-2.8	-1.3
37th to 36th	12.4	12.9	12.9			15.0	4.0		
36th to 28th	60.3	62.7	62.6	20.2	5.5				
28th to 25th	41.2	42.8	47.2					-0.1	-2.3
SB Total	113.8	118.4	122.6	20.2	5.5	15.0	4.0	-0.1	-2.3

From Highway Analysis

	37th to SR 202 Segment Length (ft)	mi/h			Travel Time (s) (excluding control delay)		
		2014 ATS	2035 3-Lane ATS	2035 5-Lane S	2014 Existing	2035 Three-Lane	2035 Five-Lane
Northbound	3125	48.8	48.5	45.0	43.6	43.8	47.2
Southbound	3125	37.7	37.2	45.0	56.4	57.1	47.2
NB w/ Climbing	3125	-	-	-	-	-	-
SB w/ Climbing	3125	-	42.3	-	-	50.3	-

NB SR 202	82.3	85.9	81.7
SR 37th	29.3	45.3	28
NB SR 202 w/ Mod		63.5	58.5

	Current Timing		Optimized Timing		Difference	
	3-Lane	5-Lane	3-Lane	5-Lane	3-Lane	5-Lane
NB 37th	17.3	11.2	14.5	9.9	-2.8	-1.3
SB 25th	2.2	6.6	2.1	4.3	-0.1	-2.3
NB SR202	85.9	81.7	80.6	58.5	-5.3	-23.2
SB 37th	45.3	28	45.7	25.7	0.4	-2.3

* Optimized timing at 202 benefits EB traffic and hurts NB traffic. Optimized timing is not recommended to improve Sahalee operations.

Appendix O

Drainage Memorandum

OSBORN CONSULTING INCORPORATED

1800 112TH AVENUE NE
SUITE 220E
BELLEVUE, WA 98004
(425) 451-4009

Date:	September 3, 2015
To:	Dan Hansen, PE, and Jesse Thomsen, PE, Perteet Inc.
From:	Laura Ruppert, PE, Osborn Consulting, Inc. Laurie Thomsen, PE, Osborn Consulting, Inc.
Subject:	City of Sammamish Sahalee Way NE Roadway Improvements – Conceptual Drainage Summary

Table of Contents:

1.0 PURPOSE

This memorandum summarizes the flow control and water quality minimum requirements, provides a conceptual level stormwater facility Best Management Practices (BMP) feasibility analysis, and compares conceptual level probable stormwater construction costs for the Sahalee Way Widening Project for the purpose of assisting the City of Sammamish in selecting a preferred roadway widening alternative.

2.0 PROPOSED IMPROVEMENTS

The Sahalee Way Widening project will widen this important corridor between NE 25th Way to NE 37th Way. Sahalee Way NE is classified as a principal arterial and is located in the northern portion of the City. It is the major access route from the north into the City and is currently a two lane road with no sidewalks or marked bike lanes. The proposed project will widen the existing roadway to a minimum three lanes with bike lanes, landscape median, left-turn lanes, concrete curb and gutter, sidewalk and planter strip. The City is investigating if improvements to the corridor should maintain the current number of travel lanes with turn lanes, or expand it to a 5-lane section.

The stormwater management minimum requirements and site suitability criteria were evaluated for two roadway widening alternatives- a 3-lane roadway section and a 5-lane roadway section.

3.0 EXISTING SITE CONDITIONS

Existing Drainage Basin

The project is located within the Bear-Evans Creek subbasin and is tributary to Evans Creek. Evans Creek is a fish-bearing stream that eventually discharges to Lake Sammamish.

The project has been delineated into four Threshold Discharge Areas (TDAs) based on existing discharge locations. The project TDA limits are shown in **Figure 1**. TDA 1 discharges to an Unnamed Creek, just south of the intersection of Sahalee Way NE and 223rd Ave NE. The Unnamed Creek flows north and discharges to Evans Creek within the Evans Creek Preserve Area. TDA 2 discharges to an Unnamed Creek just downstream of Wetland ID No. 1866B at the intersection of NE 30th Place and Sahalee Way NE. The Unnamed Creek flows north-east and discharges to Evans Creek within the Evans Creek Preserve Area. TDA 3 discharges to an Unnamed Creek just south of the intersection of NE 37th Way and Sahalee Way NE. The Unnamed Creek flows east and discharges to Evans Creek within the Evans Creek Preserve Area. TDA 4 flows north toward the northern extent of the project limits, and discharges to an outfall located east of the Sahalee Way roadway, at approximately STA 144+30 (RT).

Existing Stormwater Controls

There are no known existing City of Sammamish flow control or runoff treatment facilities in the Sahalee Way project limits. The City of Sammamish Surface Water Facilities (Retention/Detention) Map shows six retention/detention facilities within the project vicinity. However, these are likely private or residential facilities that do not serve the Sahalee Way NE roadway.

Critical or Sensitive Areas

The following Critical or sensitive areas were identified in the vicinity of the project area through reviewing City of Sammamish GIS maps:

- Within the project limits, the north side of the roadway is bordered by a Landslide Hazard Area and Landslide Hazard Drainage Area. The Landslide Hazard Area requires a 50-foot setback from the top and toe of the designated area. The Landslide Hazard Area extends to the southern/western side of the Sahalee Way NE roadway from the intersection of NE 37th Way to the northwest project limits. A landslide occurred at this location on Sahalee Way in 1982.
- The Landslide Hazard Area borders the Evans Creek Preserve Area, which contains Evans Creek and multiple wetlands. Wetland ID No. 1866B is located along the south side of Sahalee Way NE Roadway approximately at the NE 30th Place intersection.
- An Erosion Hazards near Sensitive Water Bodies Special Overlay is located along the southwestern edge of the Sahalee Way NE roadway in the vicinity of Wetland ID No. 1866B and the overlay extends southwest to Lake Sammamish.

- The majority of the project corridor is located within a Critical Aquifer Recharge area where development standards require infiltration of 75% of on-site stormwater treated to protect drinking water supplies.

Existing Soil Conditions and Groundwater Elevation

Geotechnical investigation has not been conducted for this project. The historical boring logs and geotechnical investigation report for the original 1972 King County roadway construction project indicate that the soils within the project limits likely consist of glacial till deposits with some clay and silts, which typically do not provide significant surface infiltration. Some areas of gravelly soils were noted. Groundwater was noted to be encountered at approximately 5-6 feet below grade, and in some locations as high as 2.5 feet below grade in the original report.

Due to the presence of steep slopes, a Landslide Hazard Area, and a probable high groundwater table within the project area, infiltration facilities are not proposed in this conceptual report. Further project specific geotechnical investigation will be needed to verify site soil conditions, evaluate landslide risk and slope stability, and determine feasibility for infiltration BMPs prior to formalizing a stormwater management approach.

4.0 STORMWATER MANAGEMENT CORE REQUIREMENTS

The stormwater management approach proposed for the project is required to meet the guidelines defined in the 2009 King County Surface Water Design Manual (SWDM) as supplemented by Chapter PWS.20 Storm Drainage of the City of Sammamish Interim Public Works Standards (Ordinance No. O2000-60). The design requirements and guidelines applicable to the conceptual level stormwater design, treatment, and conveyance are summarized in this section. The core requirements will be further evaluated and refined in preliminary and final design for the preferred roadway alternative.

Summary of Existing and Post-Development Project Areas

The existing and proposed impervious and pervious areas were approximated for both the three-lane and the five-lane roadway alternatives to identify the stormwater management minimum requirements for each alternative. The areas are summarized by Threshold Discharge Area (TDA) in **Table 1** and **Table 2**.

Table 1: 3-Lane Design Alternative Contributing Area Summary per TDA (Acre)								
TDA No.	**Existing Impervious (AC)**	**New Impervious (AC)**	**% New Impervious vs Existing Impervious (%)**	**Total New PGIS (AC)**	**% New PGIS vs Existing PGIS (%)**	**Total New NPGIS (AC)**	**Total New NPGPS (AC)**	**Total Partial Reverted Area (AC)**
TDA 1	4.45	1.72	39%	0.61	14%	1.11	1.23	0.31
TDA 2	2.52	0.98	39%	0.29	12%	0.69	0.57	0.00
TDA 3	0.96	0.20	21%	0.00	0%	0.21	0.17	0.00
TDA 4	2.03	1.23	61%	0.74	36%	0.49	0.71	0.30
Project Total	9.96	4.13	41%	1.63	16%	2.50	2.69	0.61

Table 2: 5-Lane Design Alternative Contributing Area Summary per TDA (Acre)								
TDA No.	**Existing Impervious (AC)**	**New Impervious (AC)**	**% New Impervious vs Existing Impervious (%)**	**Total New PGIS (AC)**	**% New PGIS vs Existing PGIS (%)**	**Total New NPGIS (AC)**	**Total New NPGPS (AC)**	**Total Partial Reverted Area (AC)**
TDA 1	4.45	3.65	82%	2.55	57%	1.11	1.23	0.31
TDA 2	2.52	2.26	90%	1.57	62%	0.69	0.57	0.00
TDA 3	0.96	0.57	59%	0.36	37%	0.21	0.17	0.00
TDA 4	2.03	1.39	69%	0.90	44%	0.49	0.71	0.30
Project Total	9.96	7.87	79%	5.36	54%	2.50	2.69	0.61

King County Core and Special Requirements

The applicability of the King County Core Requirements 1 through 8 and Special Requirements 1 through 5 for each TDA are summarized for each conceptual alternative in **Table 3** and **Table 4** below. Both the 3-lane and the 5-lane design alternatives will add more than 2,000 square feet of new and/or replaced impervious surface, and the five Special Requirements also apply.

As shown in **Table 3** below, all TDAs for the 3-lane design alternative are required to comply with Core Requirements 1 through 8. Core Requirements 5, 6 and 7 will not be discussed at this stage of design, but will be addressed during preliminary and final design. The only exception is TDA 3, which is exempt from providing Core Requirement #8 – Water Quality treatment, because it adds less than 5,000 square feet of new plus replaced Pollution Generating Impervious Surface (PGIS) and the total new impervious for the project is less than 50% of the existing impervious.

Table 3: 3-Lane Design Alternative Stormwater Requirement Applicability per TDA

TDA No.	Core Req. #1 – Discharge at a Natural Location	Core Req. #2 – Offsite Analysis	Core Req. #3 – Flow Control	Core Req. #4 – Conveyance System	Core Req. #5 – Erosion & Sediment Control	Core Req. #6 – Maintenance and Operations	Core Req. #7 – Financial Guarantees and Liability	Core Req. #8 – Water Quality
TDA 1	YES	YES	YES	YES	N/A	N/A	N/A	YES
TDA 2	YES	YES	YES	YES	N/A	N/A	N/A	YES
TDA 3	YES	YES	YES	YES	N/A	N/A	N/A	Exempt
TDA 4	YES	YES	YES	YES	N/A	N/A	N/A	YES

As shown in **Table 4**, all of the requirements that apply for the 3-lane design alternative also apply to the 5-lane design alternative. However, TDA 3 is required to provide water quality treatment in addition to the other requirements, because more than 5,000 square feet of new PGIS is being added.

Table 4: 5-Lane Design Alternative Stormwater Requirement Applicability per TDA								
TDA No.	**Core Req. #1 – Discharge at a Natural Location**	**Core Req. #2 – Offsite Analysis**	**Core Req. #3 – Flow Control**	**Core Req. #4 – Conveyance System**	**Core Req. #5 – Erosion & Sediment Control**	**Core Req. #6 – Maintenance and Operations**	**Core Req. #7 – Financial Guarantees and Liability**	**Core Req. #8 – Water Quality**
TDA 1	YES	YES	YES	YES	N/A	N/A	N/A	YES
TDA 2	YES	YES	YES	YES	N/A	N/A	N/A	YES
TDA 3	YES	YES	YES	YES	N/A	N/A	N/A	YES
TDA 4	YES	YES	YES	YES	N/A	N/A	N/A	YES

This memorandum focuses on Core Requirements #3 and #8.

5.0 CORE REQUIREMENT 3 – FLOW CONTROL

Per the 2009 KCSDM and the Flow Control Map provided on the City of Sammamish website, the project is located within the Conservation Flow Control (Level 2) area. The conservation flow control requirement will apply to all TDAs within the project for both the 3-lane and 5-lane design alternatives, as they all will add more than 2,000 square feet of new impervious and do not meet the exemption criteria for Transportation Redevelopment Projects.

Level 2 Flow Control requirements are as follows:

- The developed project and TDA stormwater durations shall match the predeveloped durations for the range of predeveloped discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow. Also, the developed peak discharge rates of the 2-year and 10-year return periods must match the predeveloped peak discharge rates. Historic site conditions, or forested conditions, are to be assumed as the predeveloped condition.
- The KCSWDM requires flow control on transportation redevelopment projects having greater than 2,000 square feet of new plus replaced impervious surface (p. 1-34).
- The KCSWDM requires Level 2 flow control for runoff from non-dispersed new impervious surfaces, for previously unmitigated existing impervious surfaces added since January 8, 2001, and for replaced impervious surfaces in which the total new impervious surface is 5,000 square feet or more and totals 50% or more of the total existing impervious surface within the project limits (p. 1-41).

3-Lane Alternative

Flow control will be provided for the applicable surfaces for the 3-lane alternative as shown in **Table 5**. Flow control will be provided for new impervious and new pervious surfaces. Flow control is not required to be provided for the replaced impervious surfaces, because although the new impervious surfaces are greater than 5,000 square feet, the total project added impervious surface totals less than 50% of the existing impervious within the project limits. Flow control is not required to be provided for the existing impervious surfaces in the project limits because the existing roadway was in place prior to January 8, 2001.

Table 5: 3-Lane Design Alternative Applicable Surfaces Subject to Flow Control per TDA

TDA No.	New Impervious Surface	New Pervious Surface	Existing Impervious Surface Added Since Jan. 8 2001	Replaced Impervious Surface on a Transportation Redevelopment Project
TDA 1	YES	YES	N/A	N/A
TDA 2	YES	YES	N/A	N/A
TDA 3	YES	YES	N/A	N/A
TDA 4	YES	YES	N/A	N/A

5-Lane Alternative

Per **Table 6**, flow control will be provided for the new impervious, new pervious, and replaced impervious surfaces for all TDAs in the 5-lane design alternative. Flow control is required for the replaced impervious surfaces, because the new impervious surface total in each TDA is greater than 5,000 square feet and the total new impervious surface adds more than 50% to the total existing impervious surface in the project limits.

Table 6: 5-Lane Design Alternative Applicable Surfaces Subject to Flow Control per TDA				
TDA No.	**New Impervious Surface**	**New Pervious Surface**	**Existing Impervious Surface Added Since Jan. 8 2001**	**Replaced Impervious Surface on a Transportation Redevelopment Project**
TDA 1	YES	YES	N/A	YES
TDA 2	YES	YES	N/A	YES
TDA 3	YES	YES	N/A	YES
TDA 4	YES	YES	N/A	YES

6.0 CORE REQUIREMENT 8- WATER QUALITY

Per Section 1.2.8 of the KCSWDM, all proposed redevelopment projects are required to provide water quality (WQ) facilities to treat the runoff from new and replaced PGIS and new Pollution-Generating Pervious Surfaces (PGPS) unless an exemption applies. Transportation redevelopment projects are exempt from water quality treatment requirements if the total new impervious surfaces within the project limits is less than 50% of the existing impervious surface, there is less than 5,000 square feet of new PGIS that is not fully dispersed, and there is less than 35,000 square feet of new PGPS that is not fully dispersed.

Required Retrofit Runoff Treatment Levels

The following treatment levels apply to this project:

- Per the City of Sammamish Water Quality Map, the project is located within a basic water quality treatment area.
- Per Section 1.2.8 of the KCSWDM, Enhanced Basic runoff treatment is required because the project's expected ADT is greater than 2,000. The expected ADT for the 3-lane design alternative is approximately 20,000 and the expected ADT for the 5-lane design alternative is approximately 22,700.
- The project area is not a "High-use site." Oil control is not required.
- The project is not located within ¼ mile of a sensitive lake. Phosphorus control is not required.

With the exception of TDA 3 in the 3-lane design alternative, the project is required to provide water quality for the remaining TDAs for both the 3-lane and 5-lane design

alternatives. TDA 3 in the 3-lane design alternative is exempt from providing water quality, because the project total new impervious surface is less than 50% of the total existing impervious surface in the project limits and less than 5,000 square feet of new PGIS and less than 35,000 square feet of PGPS will be added in the TDA.

Water quality treatment will be provided for the applicable surfaces as shown in **Table 7** and **Table 8**.

3-Lane Alternative

As shown in **Table 7**, water quality will be provided for the new PGIS and the new PGPS surfaces for TDAs 1, 2, and 4 in the 3-lane design alternative. Water quality is not required for the replaced PGIS because the new impervious surface is less than 50% of the existing impervious surface within the project limits. All TDAs are exempt from providing water quality for existing impervious surfaces, because the existing roadway was constructed prior to January 8, 2001.

Table 7: 3-Lane Design Alternative Applicable Surfaces subject to Water Quality Treatment per TDA

TDA No.	New PGIS	New PGPS	Existing Impervious Added Since Jan. 8 2001	Replaced PGIS on a Transportation Redevelopment Project
TDA 1	YES	YES	N/A	N/A
TDA 2	YES	YES	N/A	N/A
TDA 3	Exempt	Exempt	Exempt	Exempt
TDA 4	YES	YES	N/A	N/A

5-Lane Alternative

As shown in **Table 8**, all TDAs in the 5-lane design alternative will provide water quality for the new PGIS, the new PGPS, and the replaced PGIS. Replaced PGIS is applicable to all TDAs as each TDA adds more than 5,000 square feet of new impervious and the project total new impervious surfaces adds more than 50% of the existing impervious within the project limits.

Table 8: 5-Lane Design Alternative Applicable Surfaces subject to Water Quality Treatment per TDA				
TDA No.	**New PGIS**	**New PGPS**	**Existing Impervious Added Since Jan. 8 2001**	**Replaced PGIS on a Transportation Redevelopment Project**
TDA 1	YES	YES	N/A	YES
TDA 2	YES	YES	N/A	YES
TDA 3	YES	YES	N/A	YES
TDA 4	YES	YES	N/A	YES

7.0 FLOW CONTROL AND WATER QUALITY BMP ANALYSIS

A conceptual level flow control and water quality BMP analysis was completed to provide an overview of the probable feasibility of BMPs for the project site. The BMPs included in the analysis were selected from the 2009 King County Stormwater Design Manual along with BMPs included in the Tier 1 and Tier 2 lists in both the 2014 Washington State Department of Transportation Highway Runoff Manual and Department of Ecology Stormwater Management Manual for Western Washington. These manuals provide additional BMPs appropriate for linear roadway redevelopment projects and include updated guidance on the selection process, which are not included in the King County manual. **Table 9** below presents the conceptual BMP feasibility analysis completed for flow control and water quality for the project.

Table 9: Conceptual Flow Control and Water Quality BMP Feasibility		
Potentially Suitable BMP Options	Appropriate for the site?	Comments
• FC.01 – Natural Dispersion • FC.02 – Engineered Dispersion	No	• The roadway alignment is located to the southwest of a designated Landslide Hazard Area and to the northeast of a designated Erosion Hazards near Sensitive Water Bodies Area.

		• Vegetated areas within the corridor contain steep slopes and/or are located within the Landslide Hazard Area where dispersion would not be desired.
Infiltration BMPs • HRM Tier 1 Infiltration BMP Options [CAVFS, CABS, MFD, Bioretention Area] • HRM Tier 2 Infiltration BMP Options [Infiltration Pond, Infiltration Trench, Infiltration Vault, Dry Well]	No	• The roadway alignment is located to the southwest of a designated Landslide Hazard Area and to the northeast of a designated Erosion Hazards near Sensitive Water Bodies Area where infiltration may pose a risk to slope stability. • Soils found along the existing alignment are described as gravelly/silty soils that are derived from glacial till making significant infiltration feasibility unlikely.
Combined Runoff Treatment and Flow Control BMP • CO.02 – Combined Stormwater Treatment Wetland/Detention Pond	No	• The Combined Stormwater Treatment Wetland/Detention Pond is the only combined runoff treatment and flow control BMP that will provide enhanced treatment as required by the project. Additional right-of-way would likely be required and is not preferred over other BMP options. • A Landslide Hazard Area is located adjacent to the majority of the roadway alignment along the north-east side which requires a 50-foot setback also eliminating potential locations for a wetland/detention pond.
Detention BMP • FC.03 – Detention Pond	No	• See comments for CO.02 – Combined Stormwater Treatment Wetland/Detention Pond. • An existing stormwater pond is located along the southern side of the Sahalee Way NE roadway, approximately STA 63+00 (LT), more information and analysis would be required to determine feasibility for use and/or expansion of this facility.

Detention BMP • Detention Pipe or Vault	Yes	• Due to site constraints and existing sensitive area restrictions, a detention pipe or vault is determined to be the acceptable BMP for the project to provide the required flow control.
Enhanced Treatment BMP • Emerging Technology – Filterra System	Yes	• The Filterra System has received General Use Level approval from the Department of Ecology to provide enhanced treatment. The Filterra system would be constructed within the footprint of the roadway section, and would not require additional right-of-way. In addition, the landscaping features included as part of the Filterra system would blend aesthetically with the planter strip.
Enhanced Treatment BMP • RT.02 – Compost Amended Vegetated Filter Strip (CAVFS) • RT.07 Media Filter Drain (MFD)	Maybe	• The Landslide Drainage Hazard Area located along the majority of the north-eastern side of the roadway alignment requires a 50-foot setback from the top and toe of the designated area which is assumed to preclude inclusion of any treatment BMPs along that side of the roadway. The Landslide Hazard Area is also located along the southwest side of the roadway within the limits of TDA 4. • Additional residential right-of-way would be required to install a CAVFS or MFD system outside of the roadway cross-section in the 5-lane design alternative. • Steep slopes preclude the use of a CAVFS or MFD BMP along the south-western edge of the roadway for TDA 3. • Approximately 7 – 9 feet of space is available in TDAs 1 and 2 in the 3-lane design alternative, along the south-western edge of the roadway where CAVFS or MFD could potentially be constructed.

Enhanced Treatment BMP • RT.04 – Compost-Amended Biofiltration Swale (CABS)	Maybe	• The Landslide Drainage Hazard Area located along the majority of the north-eastern side of the roadway alignment requires a 50-foot setback from the top and toe of the designated area which is assumed to preclude inclusion of any treatment BMPs along that side of the roadway. The Landslide Hazard Area is also located along the southwest side of the roadway within the limits of TDA 4. • Additional residential right-of-way would be required to install a CABS system outside of the roadway cross-section in the 5-lane design alternative. • Steep slopes preclude the use of a CABS BMP along the southwestern edge of the roadway for TDAs 2 and 3. • Approximately 7 – 9 feet of space is available in TDA 1 in the 3-lane design alternative, along the southwestern edge of the roadway where CABS could potentially be constructed.
Enhanced Treatment BMP • Bioretention Area	Maybe	• The Landslide Drainage Hazard Area located along the majority of the north-eastern side of the roadway alignment requires a 50-foot setback from the top and toe of the designated area which is assumed to preclude inclusion of any treatment BMPs along that side of the roadway. The Landslide Hazard Area is also located along the southwest side of the roadway within the limits of TDA 4. • Additional residential right-of-way would be required to install a bioretention area outside of the roadway cross-section. • Steep slopes preclude the use of a bioretention area BMP along the south-western edge of the roadway for TDA 3.

		• A bioretention area could potentially be constructed along the southwestern edge of the roadway for TDAs 1 and 2 in the 3-lane design alternative.
Enhanced Treatment BMP • Large Sand Filter	Maybe	• A large sand filter could be located beneath the sidewalk and/or planter strip for all TDAs under both design alternatives. • It is assumed that due to the high maintenance requirements of a sand filter and the traffic control requirements needed for maintenance crews to access the vault from the roadway that a sand filter located in the sidewalk and/or planter strip is not desired.
Enhanced Treatment BMP • Two Facility Treatment Train	Maybe	• The two-facility treatment train includes combinations of the items listed above. Please see the comments regarding each individual BMP facility for considerations and/or restraints associated with implementing that BMP. • It is preferred to provide water quality with a single BMP if feasible, rather than constructing dual facilities.
Enhanced Treatment BMP • Constructed Stormwater Treatment Wetland	No	• The Landslide Drainage Hazard Area located along the majority of the north-eastern side of the roadway alignment requires a 50-foot setback from the top and toe of the designated area which is assumed to preclude inclusion of any treatment BMPs along that side of the roadway. The Landslide Hazard Area is also located along the southwest side of the roadway within the limits of TDA 4. • Additional residential right-of-way would be required to construct a stormwater treatment wetland outside of the roadway cross-section for both design alternatives.

Recommendation

Per the analysis completed above, it is determined that detention pipes or vaults combined with the use of Filterra units will provide the least impact to the adjacent residential properties while meeting the 2009 KCSWDM minimum requirements. The project will try to accommodate infiltration to the extent feasible, however with close proximity of critical areas, steep slopes and residential right-of-way (ROW) within the corridor, substantial infiltration may not be desired or achievable. Additional geotechnical investigation will be required to advance the stormwater design and determine if infiltration facilities are feasible. Exhibits showing the conceptual drainage layouts for the 3-lane and 5-lane alternatives are included in **Attachment 1**.

Stormwater BMPs Requiring Further Study

Bioretention could be a potential stormwater solution in this corridor to provide water quality treatment and some of the required flow control. The planter strip on the west side of the road could be expanded by approximately 20 feet to add a bioretention area. The soils in the project area may not be ideal for shallow infiltration of large quantities of stormwater, but some flow control might be achieved by installing orifices on the underdrain pipes in the gravel storage layer. Based on experience from a similar project, a bioretention area would not likely provide all of the flow control required for the 3-lane or 5-lane alternatives and additional flow control BMPs would be required.

OCI recently designed a bioretention area on a roadway project site where bedrock made infiltration infeasible. The bioretention area was installed on a 3-4% profile grade, had a top width of 25 feet, and provided runoff treatment and flow control for approximately 1 acre of impervious surface. Installing a similarly sized bioretention area along Sahalee Way would require approximately 10-14 feet of additional ROW for the 3-lane alternative and approximately 20-25 feet of additional ROW for the 5-lane alternative. ROW acquisition would be primarily of residential properties abutting the roadway corridor. Bioretention was not recommended as the preferred BMP in this conceptual analysis due to potential infeasibility with the soils and slope stability as well as ROW acquisition considerations.

Additionally, there is an existing detention pond located on City ROW on the west side of Sahalee Way in TDA 1. It likely provides detention for the residential neighborhood to the west of the road. It is possible that this pond could be expanded to provide some flow control benefit. Additional information on the system is required to determine the function and extent of the existing pond and determine feasibility of expanding it.

These two BMPs will be considered further as the design progresses.

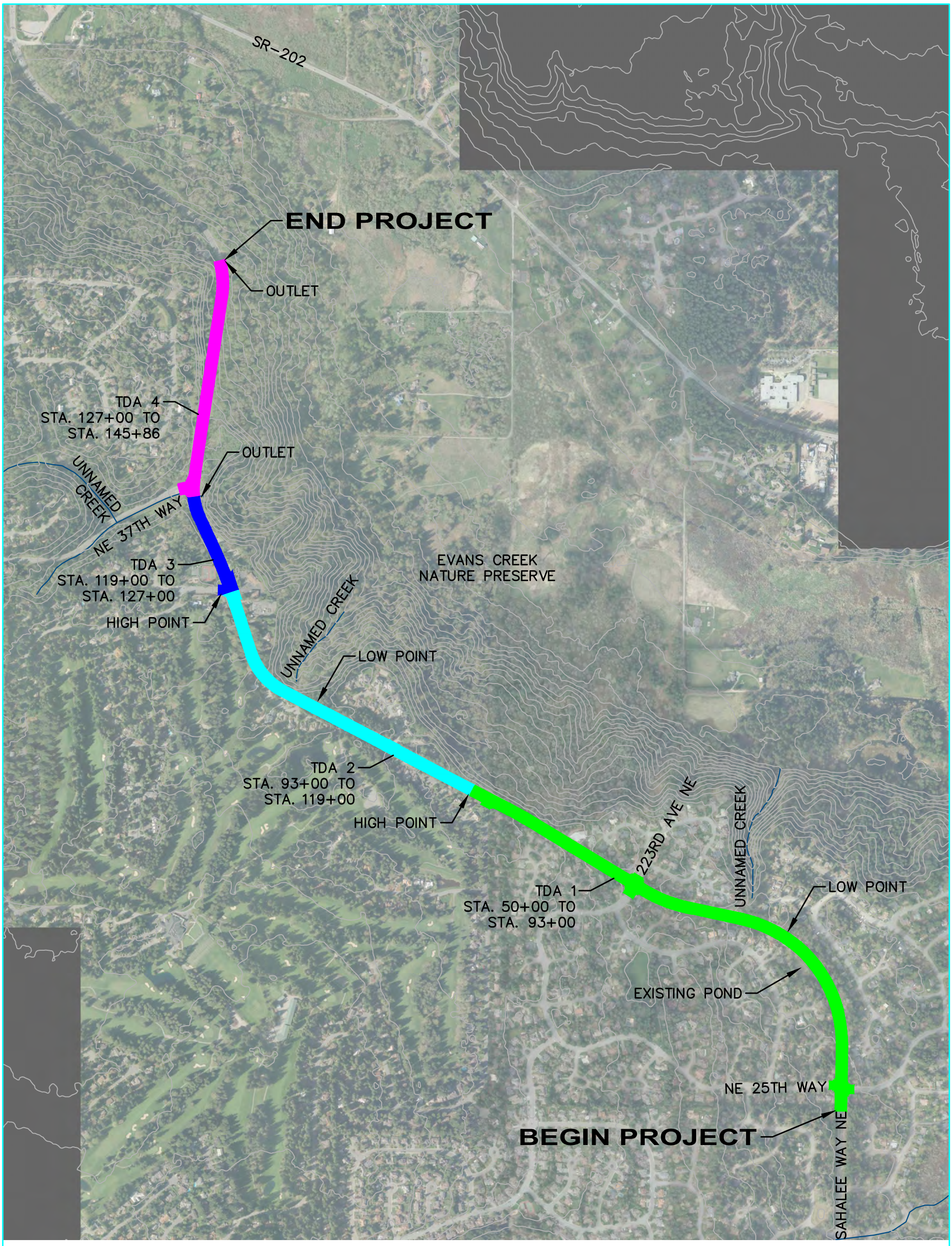
9.0 PROBABLE COST COMPARISON ANALYSIS

Conceptual level stormwater engineer's estimates of probable cost were developed for the purposes of comparing the 3-lane alternative and the 5-lane alternative. The estimates are not based on actual design quantities and are not intended to be used for any purpose other than comparing relative costs between the two roadway alternatives. Facility sizing for each alternative is based on heuristic numbers obtained from other similar projects. The cost estimates are included in **Attachment 2**. The base stormwater construction subtotals (not including tax, markups, contingencies) for the two alternatives are summarized in **Table 10**.

Table 10: Summary of Probable Construction Cost by Alternative		
Roadway Alternative	**Base Stormwater Construction Cost**	**Stormwater Features Included**
3-Lane	$7,664,650	• 4 Detention Vaults • 14 Filterra Units • Conveyance System (Catch Basins and Pipe)
5-Lane	$12,406,250	• 4 Detention Vaults • 48 Filterra Units • Conveyance System (Catch Basins and Pipe)

The stormwater systems and facilities for the 5-lane alternative will likely cost approximately 60% more than the 3-lane alternative, because there is more than twice the amount of impervious surface that requires treatment and flow control in the 5-lane alternative.

ATTACHMENT 1
CONCEPTUAL DRAINAGE FACILITY EXHIBITS



CITY OF SAMMAMISH SAHALEE WAY CORRIDOR IMPROVEMENTS
CONCEPTUAL STORMWATER FACILITY SCHEMATIC
FIGURE 1:
PROJECT OVERVIEW & TDA DELINEATION

N

OSBORN CONSULTING INCORPORATED

SEPTEMBER, 2015

SCALE: 1" = 750'

0 750 1500

CITY OF SAMMAMISH SAHALEE WAY CORRIDOR IMPROVEMENTS
CONCEPTUAL STORMWATER FACILITY SCHEMATIC
FIGURE 2:
3-LANE DESIGN ALTERNATIVE
TDA 1

OSBORN CONSULTING INCORPORATED

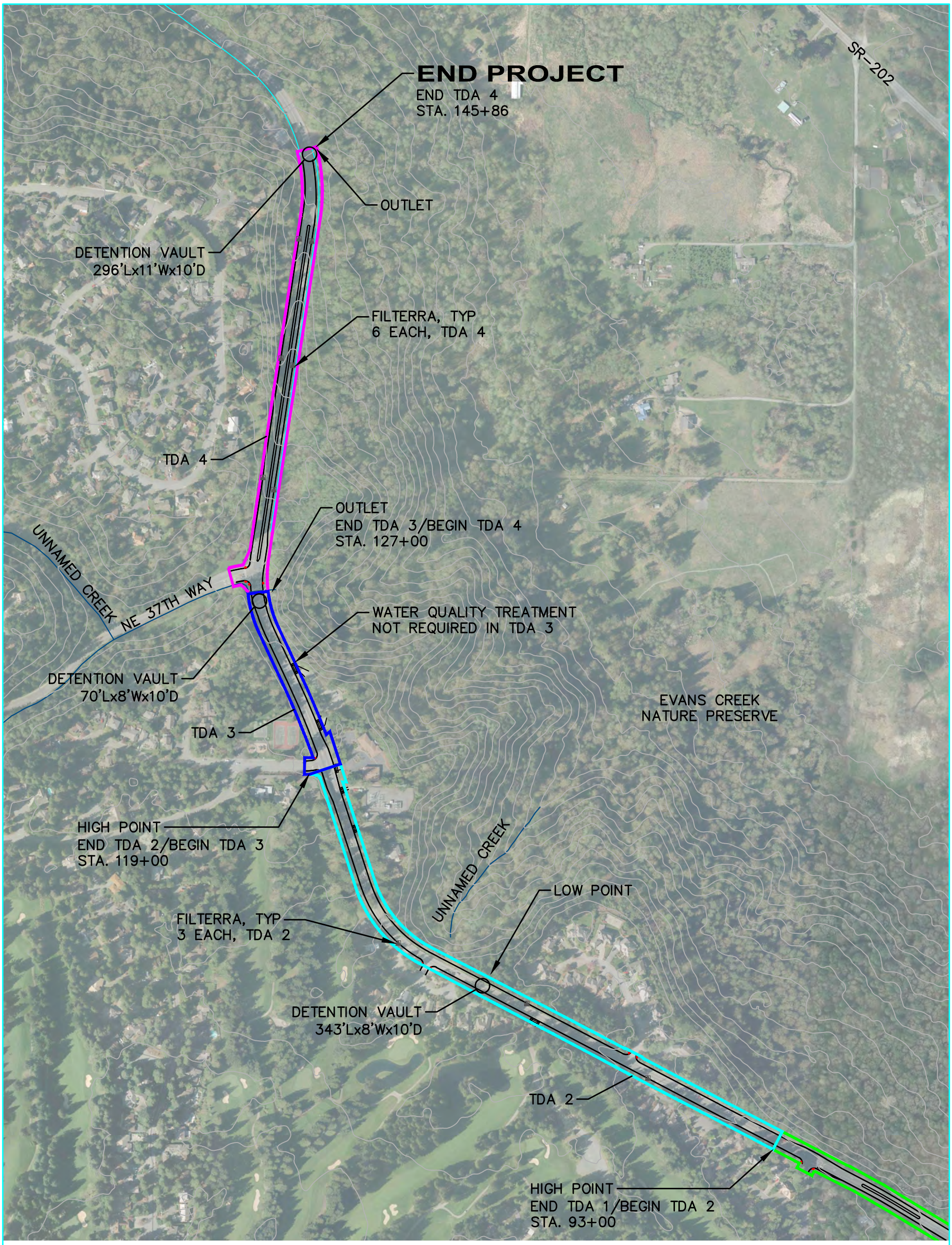
LEGEND

- FILTERRA

SEPTEMBER, 2015

SCALE: 1" = 400'

0 400 800



CITY OF SAMMAMISH SAHALEE WAY CORRIDOR IMPROVEMENTS
CONCEPTUAL STORMWATER FACILITY SCHEMATIC
FIGURE 3:
3-LANE DESIGN ALTERNATIVE
TDAs 2, 3 & 4

OSBORN CONSULTING INCORPORATED

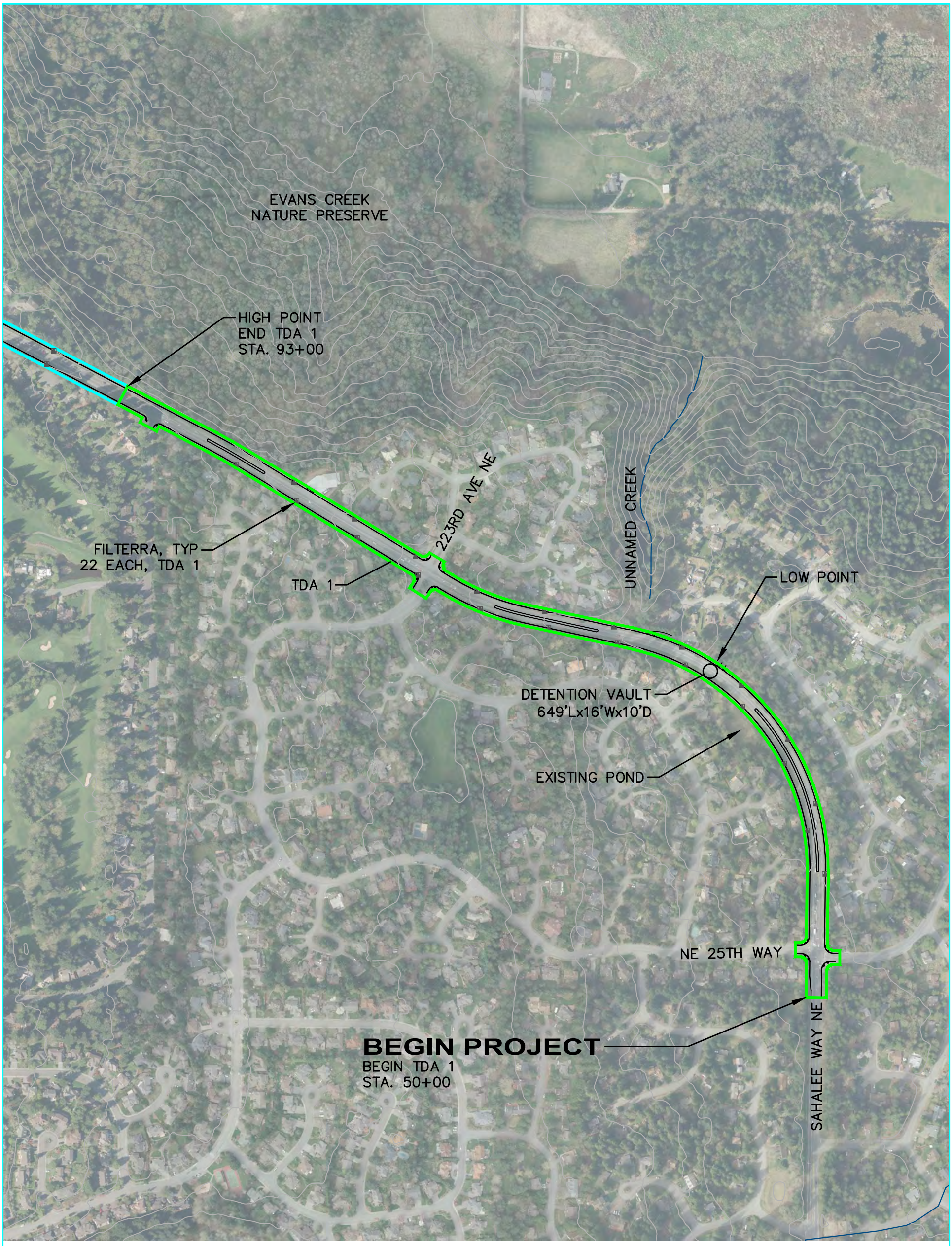
LEGEND

■ FILTERRA

SEPTEMBER, 2015

SCALE: 1" = 400'

0 400 800



CITY OF SAMMAMISH SAHALEE WAY CORRIDOR IMPROVEMENTS
CONCEPTUAL STORMWATER FACILITY SCHEMATIC
FIGURE 4:
5-LANE DESIGN ALTERNATIVE
TDA 1

OSBORN CONSULTING INCORPORATED

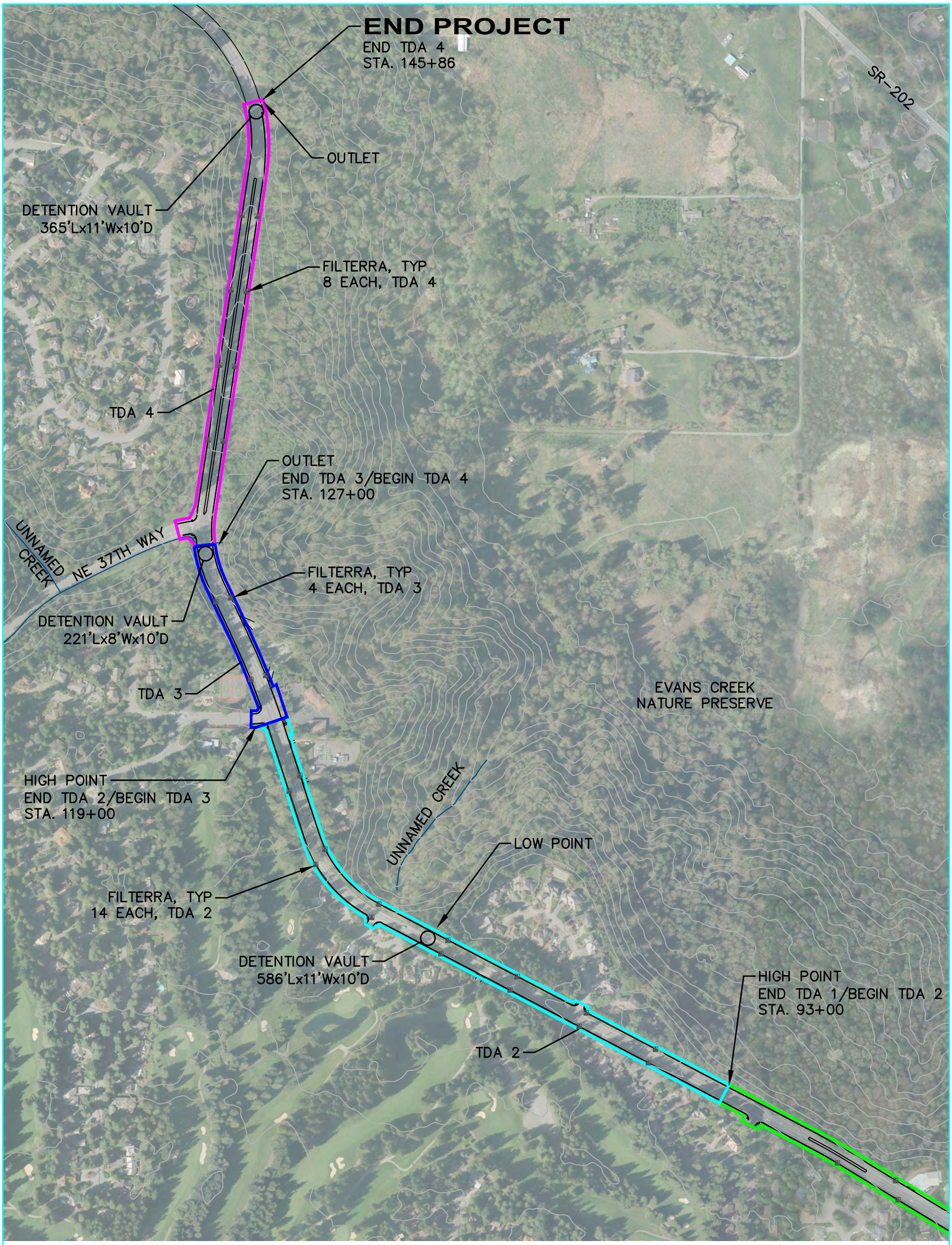
LEGEND

▪ FILTERRA

SEPTEMBER, 2015

SCALE: 1" = 400'

0 400 800



CITY OF SAMMAMISH SAHALEE WAY CORRIDOR IMPROVEMENTS
CONCEPTUAL STORMWATER FACILITY SCHEMATIC
FIGURE 5:
5-LANE DESIGN ALTERNATIVE
TDAs 2, 3 & 4

N

OSBORN CONSULTING INCORPORATED

LEGEND

■ FILTERRA

SCALE: 1" = 400'

0 400 800

SEPTEMBER, 2015

ATTACHMENT 2
CONCEPTUAL DRAINAGE ESTIMATES OF PROBABLE COST

SAHALEE WAY NE ROADWAY IMPROVEMENTS
3-LANE DESIGN ALTERNATIVE
ENGINEER'S ESTIMATE OF PROBABLE COST - PRELIMINARY DESIGN

ITEM NO.	SPECIFICATION NO.	DESCRIPTION OF ITEM	EST QUANTITY	UNIT	UNIT PRICE	AMOUNT	QUANITY CODE	UNIT COST CODE
1	7-05	Catch Basin, Type 1	98	EACH	$ 2,850.00	$279,300.00		
2	7-05	Manhole, Type 2	34	EACH	$ 3,900.00	$132,600.00		
3		Water Quality Structure (Filterra 4'x4')	14	EACH	$ 20,800.00	$291,200.00		
4	7-04	Pipe, D.I., CL 50, 18 IN	9590	LF	$ 135.00	$1,294,650.00		
5	7-04	Pipe, D.I., CL 50, 12 IN	4410	LF	$ 90.00	$396,900.00		
6		Detention Vault (Sum of 4 Vaults)	1	L.S.	$ 5,270,000.00	$5,270,000.00		

TOTAL CONSTRUCTION COST		**$7,664,650.00**
Contractor overhead, profit, and mobilization	10%	$766,465.00
City of Sammamish Sales Tax	9.50%	$728,141.75
Construction Contingency	20%	$1,532,930.00
Subtotal construction costs		$10,692,186.75
Administration and engineering design	20%	$2,138,437.35
Permitting (ROW Permit, Clearing & Grading Permit, Drainage Review)		$0.00
Land acquisition and easements	0%	$0.00
TOTAL COST		**$12,830,630.00**

SAHALEE WAY NE ROADWAY IMPROVEMENTS
3-LANE DESIGN ALTERNATIVE
ENGINEER'S ESTIMATE OF PROBABLE COST - PRELIMINARY DESIGN

Per WWHM Water Quality Test Model: Filterra 4x4 Unit can Treat: 0.13 ac
5662.8 SF

TDA 1			**Assumptions**
Total Length	4300		
New PGIS	0.61 ac		
No. of Filterras Needed	4.692307692	5	
No. of CB 2 Needed	14.33333333	15	Spaced every 300' for access to trunkline
No. of CB 1 Needed	21.5	44	Spaced every 200' for roadway runoff capture; x2 to account for CB on both sides of rdwy (crowned in middle)
Length of 18" trunkline	4300	4300	Length of TDA
Length of 12" SD	1980	1980	45' needed to connect to trunkline every 200' (CB 1 spacing)
Det Vault Cost	$1,980,000		Per vault cost estimate spreadsheet, vault size = 413' L x 11' W x 10' D
TDA 2			
Total Length	2600		
New PGIS	0.29 ac		
No. of Filterras Needed	2.230769231	3	
No. of CB 2 Needed	8.666666667	9	Spaced every 300' for access to trunkline
No. of CB 1 Needed	13	26	Spaced every 200' for roadway runoff capture; x2 to account for CB on both sides of rdwy (crowned in middle)
Length of 18" trunkline	2600	2600	Length of TDA
Length of 12" SD	1170	1170	45' needed to connect to trunkline every 200' (CB 1 spacing)
Det Vault Cost	$1,490,000		Per vault cost estimate spreadsheet, vault size =343' L x 8' W x 10' D
TDA 3			
Total Length	800		
New PGIS	0 ac		
No. of Filterras Needed	0		
No. of CB 2 Needed	2.666666667	3	Spaced every 300' for access to trunkline
No. of CB 1 Needed	4	8	Spaced every 200' for roadway runoff capture; x2 to account for CB on both sides of rdwy (crowned in middle)
Length of 18" trunkline	800	800	Length of TDA
Length of 12" SD	360	360	45' needed to connect to trunkline every 200' (CB 1 spacing)
Det Vault Cost	$360,000		Per vault cost estimate spreadsheet, vault size = 70' L x 8' W x 10' D
TDA 4			
Total Length	1886		
New PGIS	0.74 ac		
No. of Filterras Needed	5.692307692	6	
No. of CB 2 Needed	6.286666667	7	Spaced every 300' for access to trunkline
No. of CB 1 Needed	9.43	20	Spaced every 200' for roadway runoff capture; x2 to account for CB on both sides of rdwy (crowned in middle)
Length of 18" trunkline	1886	1886	Length of TDA
Length of 12" SD	900	900	45' needed to connect to trunkline every 200' (CB 1 spacing)
Det Vault Cost	$1,440,000		Per vault cost estimate spreadsheet, vault size = 296' L x 11' W x 10' D

SAHALEE WAY NE ROADWAY IMPROVEMENTS
5-LANE DESIGN ALTERNATIVE
ENGINEER'S ESTIMATE OF PROBABLE COST - PRELIMINARY DESIGN

ITEM NO.	SPECIFICATION NO.	DESCRIPTION OF ITEM	EST QUANTITY	UNIT	UNIT PRICE	AMOUNT	QUANITY CODE	UNIT COST CODE
1	7-05	Catch Basin, Type 1	98	EACH	$ 2,850.00	$279,300.00		
2	7-05	Manhole, Type 2	34	EACH	$ 3,900.00	$132,600.00		
3		Water Quality Structure (Filterra 4'x4')	48	EACH	$ 20,800.00	$998,400.00		
4	7-04	Pipe, D.I., CL 50, 18 IN	9590	LF	$ 135.00	$1,294,650.00		
5	7-04	Pipe, D.I., CL 50, 12 IN	6570	LF	$ 90.00	$591,300.00		
6		Detention Vault (Sum of 4 Vaults)	1	L.S.	$ 9,110,000.00	$9,110,000.00		

TOTAL CONSTRUCTION COST		**$12,406,250.00**
Contractor overhead, profit, and mobilization	10%	$1,240,625.00
City of Sammamish Sales Tax	9.50%	$1,178,593.75
Construction Contingency	20%	$2,481,250.00
Subtotal construction costs		$17,306,718.75
Administration and engineering design	20%	$3,461,343.75
Permitting (ROW Permit, Clearing & Grading Permit, Drainage Review)		$0.00
Land acquisition and easements	0%	$0.00
TOTAL COST		**$20,768,070.00**

SAHALEE WAY NE ROADWAY IMPROVEMENTS
5-LANE DESIGN ALTERNATIVE
ENGINEER'S ESTIMATE OF PROBABLE COST - PRELIMINARY DESIGN

Per WWHM Water Quality Test Model: Filterra 4x4 Unit can Treat: 0.13 ac
5662.8 SF

TDA 1			**Assumptions**
Total Length	4300		
New PGIS	2.55 ac		
Replaced PGIS	0.296143251 ac		3' width assumed replaced PGIS; to be updated
No. of Filterras Needed	21.89340962	22	
No. of CB 2 Needed	14.33333333	15	Spaced every 300' for access to trunkline
No. of CB 1 Needed	21.5	44	Spaced every 200' for roadway runoff capture; x2 to account for CB on both sides of rdwy (crowned in middle)
Length of 18" trunkline	4300	4300	Length of TDA
Length of 12" SD	2948	2948	67' needed to connect to trunkline every 200' (CB 1 spacing)
Det Vault Cost	$3,580,000		Per vault cost estimate spreadsheet, vault size = 649' L x 16' W x 10' D
TDA 2			
Total Length	2600		
New PGIS	1.57 ac		
Replaced PGIS	0.179063361 ac		3' width assumed replaced PGIS; to be updated
No. of Filterras Needed	13.45433355	14	
No. of CB 2 Needed	8.666666667	9	Spaced every 300' for access to trunkline
No. of CB 1 Needed	13	26	Spaced every 200' for roadway runoff capture; x2 to account for CB on both sides of rdwy (crowned in middle)
Length of 18" trunkline	2600	2600	Length of TDA
Length of 12" SD	1742	1742	67' needed to connect to trunkline every 200' (CB 1 spacing)
Det Vault Cost	$2,780,000		Per vault cost estimate spreadsheet, vault size = 586' L x 11' W x 10' D
TDA 3			
Total Length	800		
New PGIS	0.36 ac		
Replaced PGIS	0.055096419 ac		3' width assumed replaced PGIS; to be updated
No. of Filterras Needed	3.193049375	4	
No. of CB 2 Needed	2.666666667	3	Spaced every 300' for access to trunkline
No. of CB 1 Needed	4	8	Spaced every 200' for roadway runoff capture; x2 to account for CB on both sides of rdwy (crowned in middle)
Length of 18" trunkline	800	800	Length of TDA
Length of 12" SD	536	536	67' needed to connect to trunkline every 200' (CB 1 spacing)
Det Vault Cost	$990,000		Per vault cost estimate spreadsheet, vault size = 221' L x 8' W x 10' D
TDA 4			
Total Length	1886		
New PGIS	0.9 ac		
Replaced PGIS	0.129889807 ac		3' width assumed replaced PGIS; to be updated
No. of Filterras Needed	7.922229286	8	
No. of CB 2 Needed	6.286666667	7	Spaced every 300' for access to trunkline
No. of CB 1 Needed	9.43	20	Spaced every 200' for roadway runoff capture; x2 to account for CB on both sides of rdwy (crowned in middle)
Length of 18" trunkline	1886	1886	Length of TDA
Length of 12" SD	1340	1340	67' needed to connect to trunkline every 200' (CB 1 spacing)
Det Vault Cost	$1,760,000		Per vault cost estimate spreadsheet, vault size = 365' L x 11' W x 10' D