STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TECHNICAL REPORT COVERSHEET

650-050-38
ENVIRONMENTAL
MANAGEMENT
06/17

DRAFT INTERSECTION CONTROL EVALUATION

(CR 675 AT SR 70)

Florida Department of Transportation

District 1

SR 70

Limits of Project: from Lorraine Road to CR 675/Waterbury Road

Manatee County, Florida

Financial Management Number: 414506-2

ETDM Number: 14263

Date: JUNE 2019

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by FDOT pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated December 14, 2016 and executed by FHWA and FDOT.

Memorandum

Date:	June 18, 2019		
To:	David C. Turley, PE FDOT District 1	From:	Christopher Benitez, PE, PTOE Stantec Consulting Services, Inc.
Project:	414506-2: SR 70 between Lorraine Road and CR 675		
Subject:	Intersection Control Evaluation (ICE) CR 675 at SR 70		

Reference: Intersection Control Evaluation (ICE): CR 675 at SR 70

The purpose of this memorandum is to document the Florida Department of Transportation (FDOT) Intersection Control Evaluation (ICE) for the intersection of SR 70 and CR 675. This ICE has been completed as part of the FDOT District 1 project: 414506-2 – SR 70 between Lorraine Road to CR 675. The project proposes to increase capacity along SR 70 by widening from a two-lane undivided, to a four-lane divided facility along with traffic operational improvements at the intersections. The ICE analysis was initiated during the Project Development & Environment (PD&E) phase of the project due to the failing traffic operations during future conditions. According to the project Design Traffic Technical Memorandum (dated October 2018), the intersection of CR 675 and SR 70 will operate at Level of Service (LOS) F as a two-way stop-controlled intersection.

An FDOT ICE for the intersection of CR 675 and SR 70 was completed for both Stage 1 and Stage 2 for several alternative intersection configurations. Based on an interpretation of the results of the ICE analysis, the roundabout is the recommended option. The analysis included an evaluation of the traffic operations, safety, cost, multimodal accommodations, and other impacts such as environmental, utility, and right of way. The evaluation focused on the SR 70 future build conditions as a four-lane divided facility with a design speed of 55 mph. The results are provided in the Stage 2 ICE Form in **Attachment A.** The memorandum is organized as follows:

- Attachment A: ICE Stage 2 Form and Results
- Attachment B: Conceptual Plans
- Attachment C: Traffic Operational Analysis
- Attachment D: Safety Performance for Intersection Control Evaluation (SPICE)
- Attachment E: Cost Estimates
- Attachment F: Delay Calculations
- Attachment G: Benefit/Cost Summary
- Attachment H: ICE Stage 1 Form, Capacity Analysis for Planning of Junctions (CAP-X), and Stage 1 SPICE

ATTACHMENT A

FDOT ICE Stage 2 Form and Results

Florida Department of Transportation
Intersection Control Evaluation (ICE) Form
Stage 2: Intial Control Strategy Assessment

To fulfill the requirements of Stage 2 (Intersection Control Strategy) of FDOT's ICE procedures, complete the following form and append all supporting documentation. Completed forms can be submitted to the District Traffic Operations Engineer (DTOE) and District Design Engineer (DDE) for the project's approval.

Project Name	SR 70 from Lorraine Rd to CR 675	FDOT Project #	414506-2-22-01	Date	06/14/19
Submitted By	Nicole Harris, PE	Agency/Company	Stantec	Email	nicole.harris@stantec.com

List all viable intersection control strategies identified in Stage 1 (Screening):

Signalized Control	Roundabout	Displaced Left-Turn
Quadrant Roadway		

Operational Analyses

Summarize the results of the peak hour analysis performed for each control strategy. Select analysis year based on guidance in the ICE procedures document. Refer to Exhibit 19-8 of the *Highway Capacity Manual, 6th Edition* (HCM6) to determine the appropriate LOS based on intersection delay (*hover over this cell for Exhibit 19-8*).

Design Vehicle	Interstate Semitrailer (WB-62)	Control Vehicle	Interstate Semitrailer (WB-62)

Opening Year: 2025

Control Strategy	Peak Hour	Weekday AM Peak		Peak Hour	Weekday PM Peak		Peak Hour	Saturday Midday Peak	
	LOS	Delay (sec.)	All Queues Accommodated?	LOS	Delay (sec.)	All Queues Accommodated?	LOS	Delay (sec.)	All Queues Accommodated?
Signalized Control	B	14.4	Yes	B	10.9	Yes			
Roundabout	A	6.0	Yes	A	5.6	Yes			
Displaced Left-Turn	B	13.6	Yes	B	17.3	Yes			
Quadrant Roadway	C	20.1	Yes	B	18.3	Yes			

Design Year: 2045

Control Strategy	Peak Hour	Weekday AM Peak		Peak Hour	Weekday PM Peak		Peak Hour	Saturday Midday Peak	
	LOS	Delay (sec.)	All Queues Accommodated?	LOS	Delay (sec.)	All Queues Accommodated?	LOS	Delay (sec.)	All Queues Accommodated?
Signalized Control	B	16.2	Yes	B	13.2	Yes			
Roundabout	A	9.6	Yes	A	7.9	Yes			
Displaced Left-Turn	A	17.2	Yes	B	19.5	Yes			
Quadrant Roadway	D	35.3	Yes	C	31.2	Yes			

Provide any additional discussion necessary regarding the results of the operational analysis:	The results show that the roundabout has the best operations. The signalized control and displaced left-turn are operating at LOS B or better. The Quadrant Roadway design operates at LOS D during the design year AM Peak. The delay that is presented for Displaced Left-Turn and Quadrant were recalculated as Experience Travel Time (ETT) based on guidance from the Highway Capacity Manual (HCM) 6th Edition, Chapter 23. Refer to Attachment F for the Delay Calculations.

Safety Performance

Enter the most recent five (5) years of crash data from the CAR System. | Most recent year of crash data available: 2018

Crash Type		2014	2015	2016	2017	2018	Total
Combined	Total						
	Fatal/Injury						
	PDO						
Single-Vehicle	Total	0	0	0	0	0	0
	Fatal/Injury	0	0	0	0	0	0
	PDO	0	0	0	0	0	0
Multi-Vehicle	Total	0	0	0	0	1	1
	Fatal/Injury	0	0	0	0	1	1
	PDO	0	0	0	0	0	0
Vehicle-Pedestrian	Fatal/Injury	0	0	0	0	0	0
Vehicle-Bicycle	Fatal/Injury	0	0	0	0	0	0
Total	All	0	0	0	0	1	1

Apply the FDOT SPICE Tool to model anticipated safety performance of each control strategy. For intersection types not accommodated in the tool, manually apply crash modification factors detailed in the ICE procedures document or qualitatively describe anticipated safety impacts.

Control Strategy	Anticipated Impact on Safety Performance	Opening Year		Design Year	
		Predicted Total Crashes	Predicted Fatal+Injury Crashes	Predicted Total Crashes	Predicted Fatal+Injury Crashes
Signalized Control	This option had the highest predicted fatal + injury crashes.	1.91	1.05	2.82	1.59
Roundabout	The roundabout has the low predicted fatal + injury crashes which is comparable to the displacd left turn option	5.74	0.96	8.33	1.45
Displaced Left-Turn	This option has a low predicted fatal + injury crashes and the lowest predicted total crashes.	1.68	0.93	2.48	1.40
Quadrant Roadway	Due to a lack of crash experience, the safety performance of a QR is not known (see FHWA Pub. FHWA-HRT-09-060)	N/A	N/A	N/A	N/A

Costs and Benefit/Cost Ratios

Remaining cognizant of the current level of detail of each control strategy's conceptual design, provide a cost estimate for each. You may want to include costs for preliminary engineering, required right-of-way acquisitions, construction, and a contingency. Apply the FDOT ICE Tool to determine the delay benefit-cost ratio (B/C), safety B/C, overall B/C, and net-present value for each control stratetgy.

Control Strategy	ROW Costs ($)	Construction Costs ($)	FDOT ICE Tool Outputs			
			Delay B/C	Safety B/C	Overall B/C	Net Present Value
Signalized Control	$0	$1,080,000	Base	Base	Base	Base
Roundabout	$0	$1,030,000	Preferred	N/A	Preferred	$4,218,006
Displaced Left-Turn	$0	$2,190,000	0.50	Less < 0	Less < 0	-$2,723,275
Quadrant Roadway	$10,000	$2,240,000	N/A	Less < 0	Less < 0	-$6,572,346

Multimodal Accomodations								
Note the existing/anticipated level of pedestrian/bicyclist activity at the study intersection during the peak hours of the typical day. See ICE procedures document for activity level thresholds:								
Peak Hour:	Weekday AM Peak		Weekday PM Peak		Saturday Midday Peak		Acitivity Level	
	Major Street	Minor Street	Major Street	Minor Street	Major Street	Minor Street	Ped.	Bicycles
# of ped. crossings (both approaches, if app.):							Low	Low
# of cyclists (both approaches, if app.):								

Summarize the ability of each viable control strategy to accommodate the exisitng/anticipated level of:

Control Strategy	Pedestrians and Bicyclists	Transit Services	Freight Needs
Signalized Control	The immediate area does not have significant pedestrian and bicyclist activity.	There is no transit services in the vicinity of the intersection	This should improve the safety and operations of freight activities at the intersection.
Roundabout	The immediate area does not have significant pedestrian and bicyclist activity.	There is no transit services in the vicinity of the intersection	This should improve the safety and operations of freight activities at the intersection.
Displaced Left-Turn	The immediate area does not have significant pedestrian and bicyclist activity.	There is no transit services in the vicinity of the intersection	This should improve the safety and operations of freight activities at the intersection.
Quadrant Roadway	The immediate area does not have significant pedestrian and bicyclist activity.	There is no transit services in the vicinity of the intersection	Although there is no safety data, this improvement should improve the safety freight activities.

Environmental, Utility, and Right-of-Way Impacts	
Summarize any issues related to environmental, utility, or right-of-way (including relocation) impacts specific to each control strategy. Be sure to consider the NEPA requirements for each control type.	
Signalized Control	Improvements are within right-of-way and no environmental impacts are anticipated. The overhead transmission lines on the north side of the corridor are not expected to be impacted.
Roundabout	Improvements are within right-of-way and no environmental impacts are anticipated. The overhead transmission lines on the north side of the corridor are not expected to be impacted.
Displaced Left-Turn	Improvements are within right-of-way and no environmental impacts are anticipated. The overhead transmission lines on the north side of the corridor are not expected to be impacted.
Quadrant Roadway	Right of way will be needed to construct the quadrant roadway at the northeast quadrant of the intersection. The quadrant roadway also has potential for impacting above-ground utility such as overhead transmission lines.

Public Input/Feedback (if appropriate)
Summarize any agency or public input regarding the control strategies:
None performed to date.

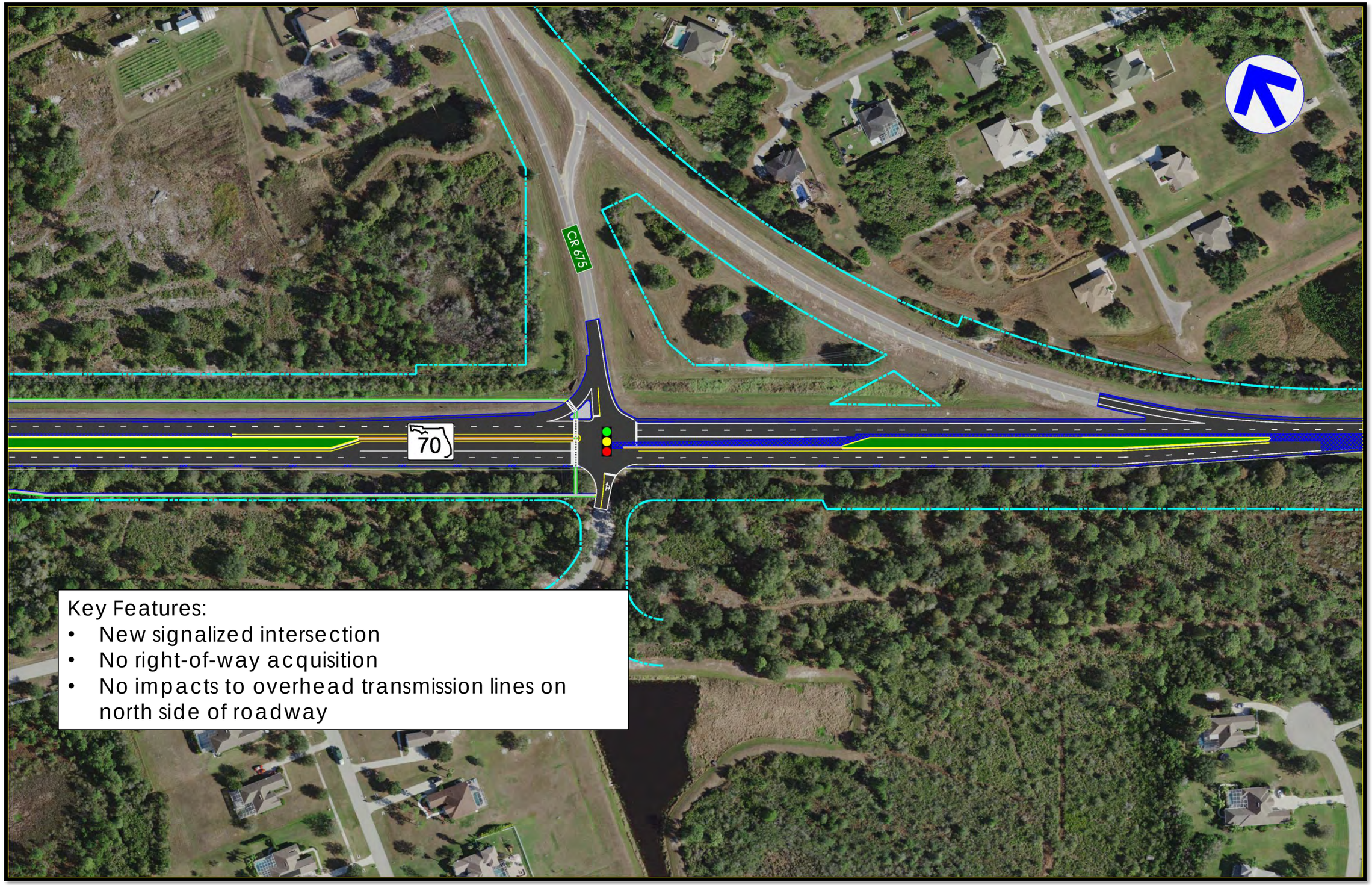
Control Strategy Evaluation		
Provide a brief justification as to why each of the following is either viable or not viable. If a single control strategy is recommended, select it as the only strategy to be advanced.		
Control Strategy	Strategy to be Advanced?	Justification
Signalized Control	No	Although the alternative operates at LOS B, the roundabout is a better option since the benefits are greater and the costs are lower.
Roundabout	Yes	The roundabout is the preferred option because: 1) the benefits are greater than the signalized intersection and the costs are less; 2) best option based on the traffic operations.
Displaced Left-Turn	No	The benefits are less than the signalized control (base condition) and cost is greater than the signalized control.
Quadrant Roadway	No	The benefits are less than the signalized control (base condition) and cost is greater than the signalized control.
	No	
	No	

Resolution					
To be filled out by FDOT District Traffic Operations Engineer and District Design Engineer					
Project Determination					
Comments					
DTOE Name		Signature		Date	
DDE Name		Signature		Date	

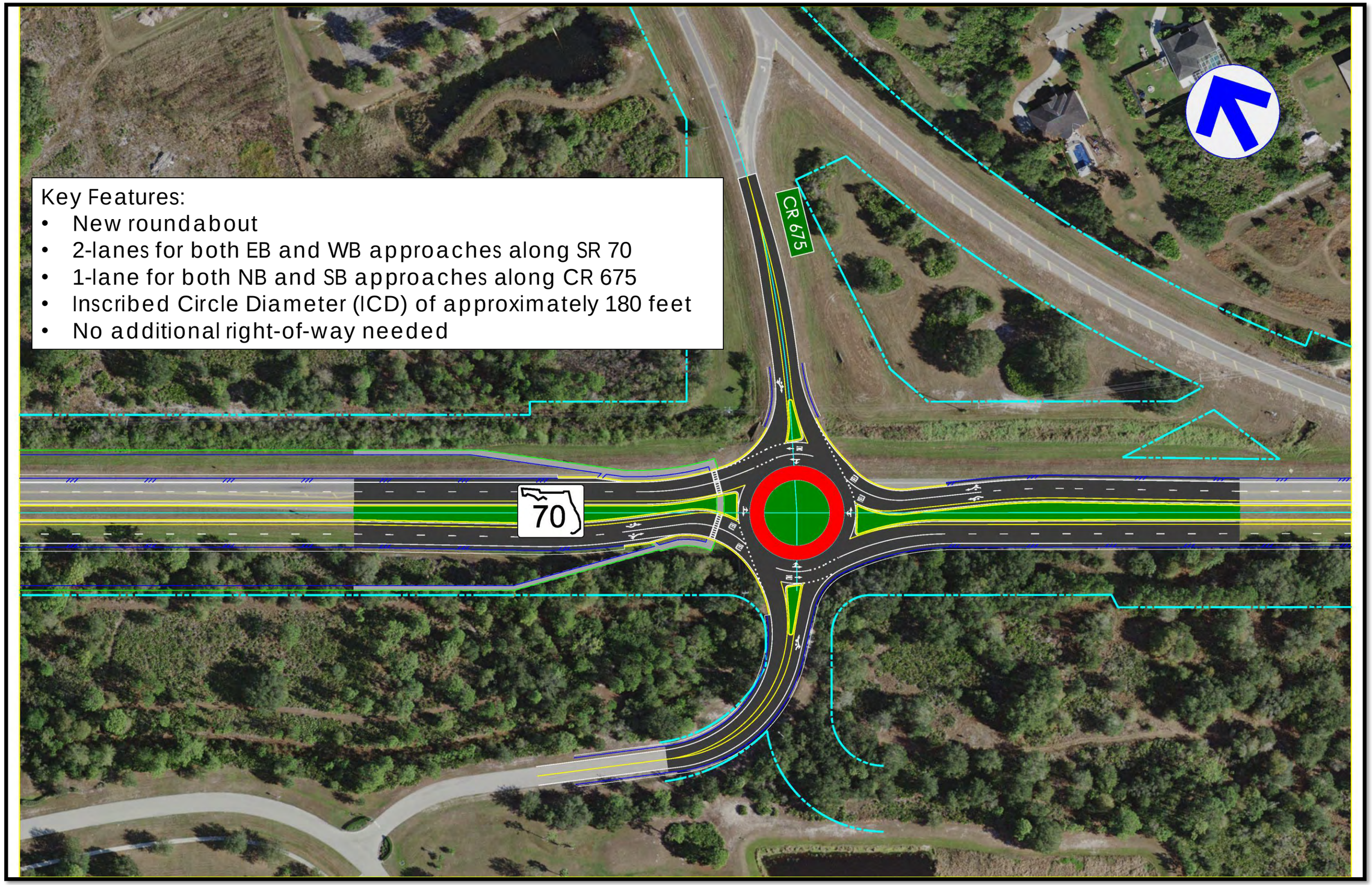
ATTACHMENT B

Conceptual Plans

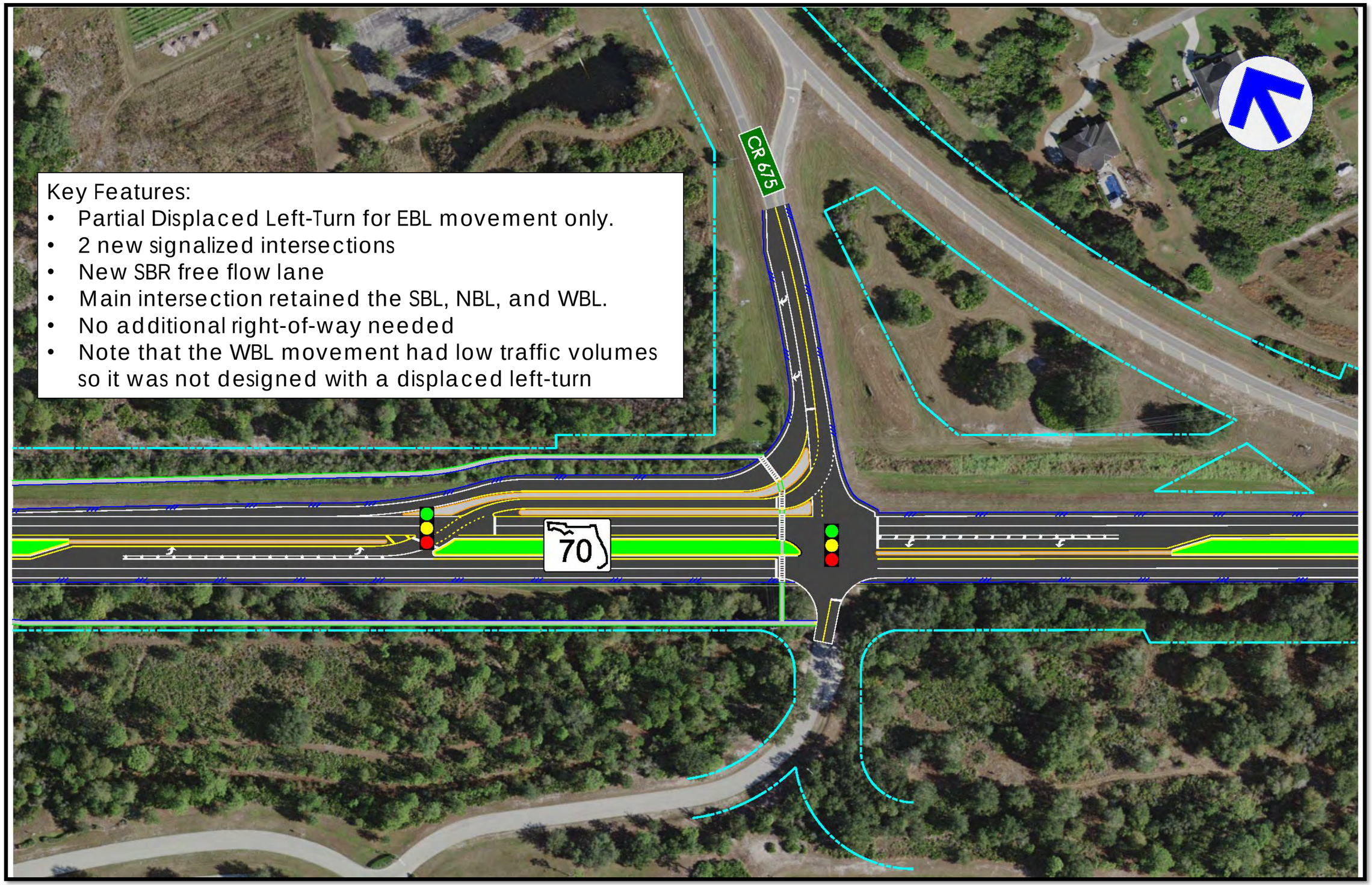
SR 70 and CR 675
Signalized Intersection



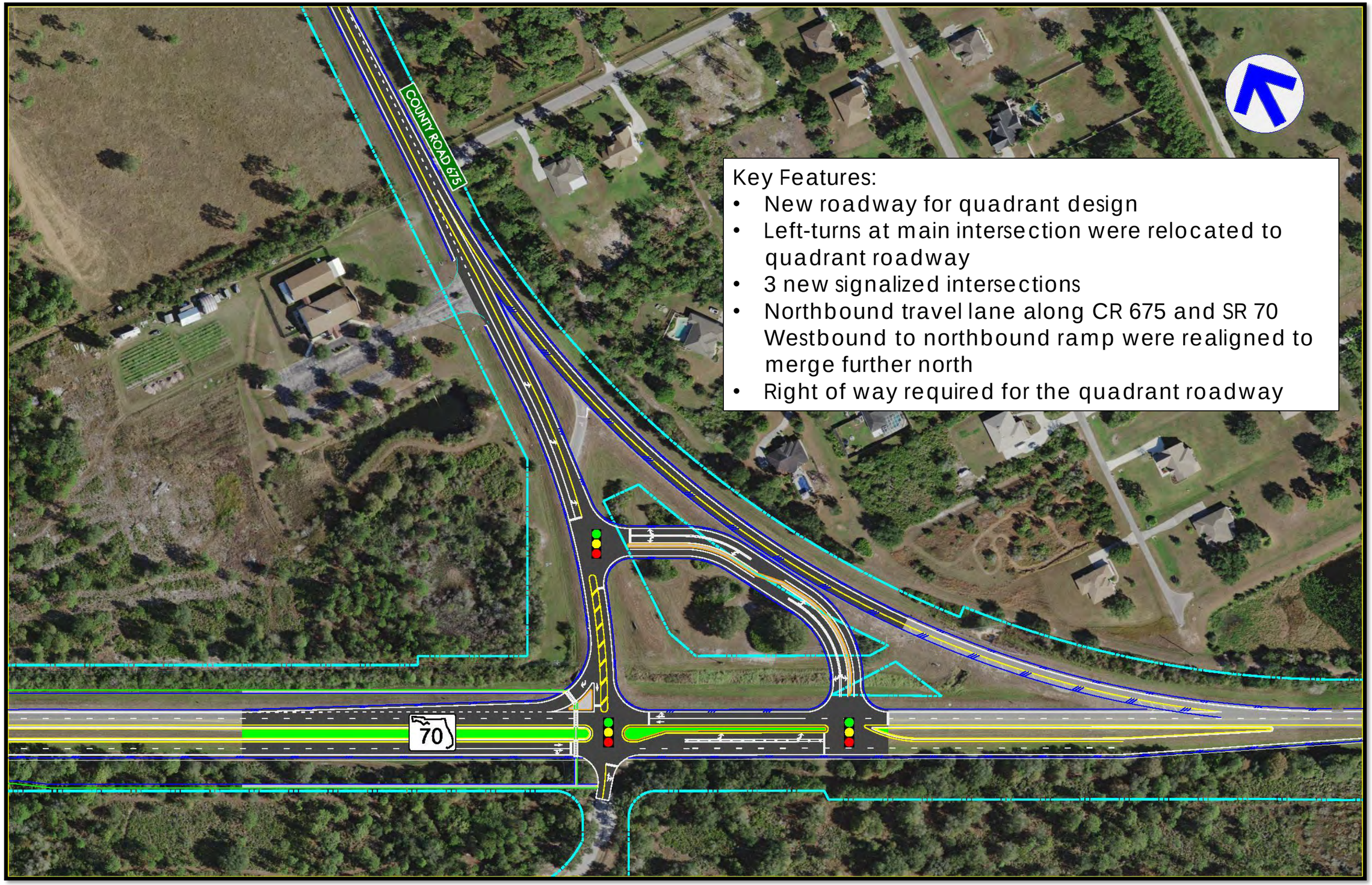
SR 70 and CR 675
Roundabout



SR 70 and CR 675
Partial Displaced Left-Turn



SR 70 and CR 675
Quadrant Roadway



Key Features:

- New roadway for quadrant design
- Left-turns at main intersection were relocated to quadrant roadway
- 3 new signalized intersections
- Northbound travel lane along CR 675 and SR 70 Westbound to northbound ramp were realigned to merge further north
- Right of way required for the quadrant roadway

ATTACHMENT C

Traffic Operational Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	286	10	17	512	61	31	6	14	83	3	133
Future Volume (veh/h)	59	286	10	17	512	61	31	6	14	83	3	133
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	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	1822	1822	1950	1822	1822	1822	1950	1822	1950	1950	1822	1822
Adj Flow Rate, veh/h	62	301	11	18	539	0	33	6	15	87	3	0
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
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, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	757	2105	77	365	1154	516	168	31	39	241	4	132
Arrive On Green	0.28	0.62	0.62	0.02	0.33	0.00	0.09	0.09	0.09	0.09	0.09	0.00
Sat Flow, veh/h	1736	3408	124	1736	3463	1549	838	359	460	1443	50	1549
Grp Volume(v), veh/h	62	153	159	18	539	0	54	0	0	90	0	0
Grp Sat Flow(s),veh/h/ln	1736	1731	1801	1736	1731	1549	1658	0	0	1493	0	1549
Q Serve(g_s), s	0.0	2.2	2.2	0.4	7.4	0.0	0.0	0.0	0.0	1.6	0.0	0.0
Cycle Q Clear(g_c), s	0.0	2.2	2.2	0.4	7.4	0.0	1.7	0.0	0.0	3.4	0.0	0.0
Prop In Lane	1.00		0.07	1.00		1.00	0.61		0.28	0.97		1.00
Lane Grp Cap(c), veh/h	757	1070	1112	365	1154	516	238	0	0	246	0	132
V/C Ratio(X)	0.08	0.14	0.14	0.05	0.47	0.00	0.23	0.00	0.00	0.37	0.00	0.00
Avail Cap(c_a), veh/h	757	1070	1112	472	1154	516	552	0	0	539	0	465
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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.5	4.8	4.8	15.4	15.8	0.0	25.9	0.0	0.0	26.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.1	1.4	0.0	0.5	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	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.1	1.1	0.2	3.7	0.0	0.9	0.0	0.0	1.5	0.0	0.0
LnGrp Delay(d),s/veh	9.5	4.9	4.9	15.4	17.2	0.0	26.4	0.0	0.0	27.4	0.0	0.0
LnGrp LOS	A	A	A	B	B		C			C		
Approach Vol, veh/h		374			557			54			90	
Approach Delay, s/veh		5.6			17.1			26.4			27.4	
Approach LOS		A			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	22.9	26.0		11.1	5.8	43.1		11.1
Change Period (Y+Rc), s	6.0	* 6		6.0	4.5	6.0		6.0
Max Green Setting (Gmax), s	5.5	* 20		18.0	5.0	20.5		18.0
Max Q Clear Time (g_c+I1), s	2.0	9.4		5.4	2.4	4.2		3.7
Green Ext Time (p_c), s	0.0	2.3		0.3	0.0	1.3		0.1

Intersection Summary		
HCM 2010 Ctrl Delay		14.4
HCM 2010 LOS		B

Notes

HCM 2010 Signalized Intersection Summary
3: CR 675 & SR 70

06/19/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	124	494	13	10	289	71	23	4	10	72	4	50
Future Volume (veh/h)	124	494	13	10	289	71	23	4	10	72	4	50
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	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	1822	1822	1950	1822	1822	1822	1950	1822	1950	1950	1822	1822
Adj Flow Rate, veh/h	131	520	14	11	304	0	24	4	11	76	4	0
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
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, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	857	2187	59	282	1096	491	160	28	36	224	6	118
Arrive On Green	0.31	0.63	0.63	0.01	0.32	0.00	0.08	0.08	0.08	0.08	0.08	0.00
Sat Flow, veh/h	1736	3445	93	1736	3463	1549	830	362	468	1406	74	1549
Grp Volume(v), veh/h	131	261	273	11	304	0	39	0	0	80	0	0
Grp Sat Flow(s),veh/h/ln	1736	1731	1806	1736	1731	1549	1660	0	0	1480	0	1549
Q Serve(g_s), s	0.0	3.9	3.9	0.3	3.9	0.0	0.0	0.0	0.0	1.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.9	3.9	0.3	3.9	0.0	1.3	0.0	0.0	3.1	0.0	0.0
Prop In Lane	1.00		0.05	1.00		1.00	0.62		0.28	0.95		1.00
Lane Grp Cap(c), veh/h	857	1099	1147	282	1096	491	223	0	0	230	0	118
V/C Ratio(X)	0.15	0.24	0.24	0.04	0.28	0.00	0.17	0.00	0.00	0.35	0.00	0.00
Avail Cap(c_a), veh/h	857	1099	1147	403	1096	491	550	0	0	539	0	465
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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.5	4.7	4.7	16.2	15.4	0.0	26.2	0.0	0.0	26.9	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.1	0.1	0.1	0.6	0.0	0.4	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	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.8	1.9	0.1	2.0	0.0	0.6	0.0	0.0	1.3	0.0	0.0
LnGrp Delay(d),s/veh	8.6	4.8	4.8	16.2	16.0	0.0	26.6	0.0	0.0	27.8	0.0	0.0
LnGrp LOS	A	A	A	B	B		C			C		
Approach Vol, veh/h		665			315			39			80	
Approach Delay, s/veh		5.6			16.0			26.6			27.8	
Approach LOS		A			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	24.4	25.0		10.6	5.3	44.1		10.6
Change Period (Y+Rc), s	6.0	* 6		6.0	4.5	6.0		6.0
Max Green Setting (Gmax), s	6.5	* 19		18.0	5.0	20.5		18.0
Max Q Clear Time (g_c+I1), s	2.0	5.9		5.1	2.3	5.9		3.3
Green Ext Time (p_c), s	0.1	1.3		0.2	0.0	2.3		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	10.9
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	493	26	51	719	92	45	10	25	121	10	193
Future Volume (veh/h)	107	493	26	51	719	92	45	10	25	121	10	193
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	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	1822	1822	1950	1822	1822	1822	1950	1822	1950	1950	1822	1822
Adj Flow Rate, veh/h	113	519	27	54	757	0	47	11	26	127	11	0
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
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, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	621	1850	96	312	1154	516	184	51	64	285	15	191
Arrive On Green	0.24	0.55	0.55	0.05	0.33	0.00	0.12	0.12	0.12	0.12	0.12	0.00
Sat Flow, veh/h	1736	3349	174	1736	3463	1549	738	415	517	1381	120	1549
Grp Volume(v), veh/h	113	268	278	54	757	0	84	0	0	138	0	0
Grp Sat Flow(s),veh/h/ln	1736	1731	1792	1736	1731	1549	1670	0	0	1501	0	1549
Q Serve(g_s), s	0.0	4.9	4.9	1.4	11.2	0.0	0.0	0.0	0.0	2.4	0.0	0.0
Cycle Q Clear(g_c), s	0.0	4.9	4.9	1.4	11.2	0.0	2.7	0.0	0.0	5.1	0.0	0.0
Prop In Lane	1.00		0.10	1.00		1.00	0.56		0.31	0.92		1.00
Lane Grp Cap(c), veh/h	621	956	990	312	1154	516	299	0	0	300	0	191
V/C Ratio(X)	0.18	0.28	0.28	0.17	0.66	0.00	0.28	0.00	0.00	0.46	0.00	0.00
Avail Cap(c_a), veh/h	621	956	990	371	1154	516	559	0	0	541	0	465
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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.8	7.1	7.1	16.0	17.1	0.0	24.2	0.0	0.0	25.2	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.2	0.2	0.3	2.9	0.0	0.5	0.0	0.0	1.1	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	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	2.3	2.4	0.7	5.7	0.0	1.3	0.0	0.0	2.3	0.0	0.0
LnGrp Delay(d),s/veh	14.9	7.3	7.3	16.2	20.0	0.0	24.7	0.0	0.0	26.3	0.0	0.0
LnGrp LOS	B	A	A	B	B		C			C		
Approach Vol, veh/h		659			811			84			138	
Approach Delay, s/veh		8.6			19.7			24.7			26.3	
Approach LOS		A			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	20.6	26.0		13.4	7.5	39.1		13.4
Change Period (Y+Rc), s	6.0	* 6		6.0	4.5	6.0		6.0
Max Green Setting (Gmax), s	5.5	* 20		18.0	5.0	20.5		18.0
Max Q Clear Time (g_c+I1), s	2.0	13.2		7.1	3.4	6.9		4.7
Green Ext Time (p_c), s	0.1	2.5		0.5	0.0	2.3		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
3: CR 675 & SR 70

06/19/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	181	724	25	20	461	110	40	10	25	110	6	85
Future Volume (veh/h)	181	724	25	20	461	110	40	10	25	110	6	85
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	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	1822	1822	1950	1822	1822	1822	1950	1822	1950	1950	1822	1822
Adj Flow Rate, veh/h	191	762	26	21	485	0	42	11	26	116	6	0
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
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, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	757	2014	69	218	1039	465	170	46	61	275	8	172
Arrive On Green	0.29	0.59	0.59	0.02	0.30	0.00	0.11	0.11	0.11	0.11	0.11	0.00
Sat Flow, veh/h	1736	3417	117	1736	3463	1549	701	418	549	1426	74	1549
Grp Volume(v), veh/h	191	386	402	21	485	0	79	0	0	122	0	0
Grp Sat Flow(s),veh/h/ln	1736	1731	1802	1736	1731	1549	1668	0	0	1500	0	1549
Q Serve(g_s), s	0.0	7.1	7.1	0.5	6.8	0.0	0.0	0.0	0.0	2.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	7.1	7.1	0.5	6.8	0.0	2.5	0.0	0.0	4.5	0.0	0.0
Prop In Lane	1.00		0.06	1.00		1.00	0.53		0.33	0.95		1.00
Lane Grp Cap(c), veh/h	757	1020	1062	218	1039	465	277	0	0	284	0	172
V/C Ratio(X)	0.25	0.38	0.38	0.10	0.47	0.00	0.29	0.00	0.00	0.43	0.00	0.00
Avail Cap(c_a), veh/h	757	1020	1062	320	1039	465	557	0	0	539	0	465
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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.9	6.5	6.5	17.4	17.1	0.0	24.8	0.0	0.0	25.6	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.2	0.2	0.2	1.5	0.0	0.6	0.0	0.0	1.0	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	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	3.4	3.5	0.3	3.5	0.0	1.2	0.0	0.0	2.0	0.0	0.0
LnGrp Delay(d),s/veh	12.1	6.7	6.7	17.6	18.6	0.0	25.4	0.0	0.0	26.6	0.0	0.0
LnGrp LOS	B	A	A	B	B		C			C		
Approach Vol, veh/h		979			506			79			122	
Approach Delay, s/veh		7.8			18.6			25.4			26.6	
Approach LOS		A			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	23.3	24.0		12.7	6.0	41.4		12.7
Change Period (Y+Rc), s	6.0	* 6		6.0	4.5	6.0		6.0
Max Green Setting (Gmax), s	7.5	* 18		18.0	5.0	20.5		18.0
Max Q Clear Time (g_c+I1), s	2.0	8.8		6.5	2.5	9.1		4.5
Green Ext Time (p_c), s	0.2	1.8		0.4	0.0	3.2		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	13.2
HCM 2010 LOS	B

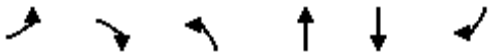
Notes

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	286	10	17	512	31	6	14	83	3
Future Volume (vph)	286	10	17	512	31	6	14	83	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.5	6.0		6.0			6.0
Lane Util. Factor	0.95		1.00	0.95		1.00			1.00
Frt	0.99		1.00	1.00		0.96			1.00
Flt Protected	1.00		0.95	1.00		0.97			0.95
Satd. Flow (prot)	3356		1687	3374		1658			1694
Flt Permitted	1.00		0.50	1.00		0.76			0.69
Satd. Flow (perm)	3356		880	3374		1301			1232
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	301	11	18	539	33	6	15	87	3
RTOR Reduction (vph)	3	0	0	0	0	13	0	0	0
Lane Group Flow (vph)	309	0	18	539	0	41	0	0	90
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	NA		pm+pt	NA	Perm	NA		Perm	NA
Protected Phases	2		1	6		4			8
Permitted Phases			6		4			8	
Actuated Green, G (s)	33.6		39.4	39.4		8.6			8.6
Effective Green, g (s)	33.6		39.4	39.4		8.6			8.6
Actuated g/C Ratio	0.56		0.66	0.66		0.14			0.14
Clearance Time (s)	6.0		4.5	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0	3.0		3.0			3.0
Lane Grp Cap (vph)	1879		595	2215		186			176
v/s Ratio Prot	0.09		0.00	c0.16					
v/s Ratio Perm			0.02			0.03			c0.07
v/c Ratio	0.16		0.03	0.24		0.22			0.51
Uniform Delay, d1	6.4		3.7	4.2		22.7			23.8
Progression Factor	1.00		1.00	1.00		1.00			1.47
Incremental Delay, d2	0.2		0.0	0.1		0.6			2.5
Delay (s)	6.6		3.8	4.3		23.3			37.4
Level of Service	A		A	A		C			D
Approach Delay (s)	6.6			4.3		23.3			37.4
Approach LOS	A			A		C			D

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	31.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	543	0	0	59	0	0	0	0
Future Volume (vph)	0	0	0	0	543	0	0	59	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0			6.0				
Lane Util. Factor					0.95			1.00				
Frt					1.00			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					3374			1776				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					3374			1776				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	572	0	0	62	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	572	0	0	62	0	0	0	0
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type					NA			NA				
Protected Phases					2			4				
Permitted Phases												
Actuated Green, G (s)					33.6			8.6				
Effective Green, g (s)					33.6			8.6				
Actuated g/C Ratio					0.56			0.14				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)					1889			254				
v/s Ratio Prot					c0.17			c0.03				
v/s Ratio Perm												
v/c Ratio					0.30			0.24				
Uniform Delay, d1					7.0			22.8				
Progression Factor					1.04			1.00				
Incremental Delay, d2					0.4			0.5				
Delay (s)					7.7			23.3				
Level of Service					A			C				
Approach Delay (s)		0.0			7.7			23.3			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	59	0	0	6	86	133
Future Volume (vph)	59	0	0	6	86	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	0.95			1.00	1.00	1.00
Satd. Flow (prot)	1687			1776	1776	1509
Flt Permitted	0.95			1.00	1.00	1.00
Satd. Flow (perm)	1687			1776	1776	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	62	0	0	6	91	140
RTOR Reduction (vph)	0	0	0	0	0	48
Lane Group Flow (vph)	62	0	0	6	91	92
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%
Turn Type	Prot			NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases						6
Actuated Green, G (s)	8.6			33.6	39.4	39.4
Effective Green, g (s)	8.6			33.6	39.4	39.4
Actuated g/C Ratio	0.14			0.56	0.66	0.66
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	241			994	1166	990
v/s Ratio Prot	c0.04			0.00	0.05	
v/s Ratio Perm						c0.06
v/c Ratio	0.26			0.01	0.08	0.09
Uniform Delay, d1	22.9			5.8	3.7	3.8
Progression Factor	1.00			2.21	1.00	1.00
Incremental Delay, d2	0.6			0.0	0.0	0.0
Delay (s)	23.4			12.9	3.8	3.8
Level of Service	C			B	A	A
Approach Delay (s)	23.4			12.9	3.8	
Approach LOS	C			B	A	

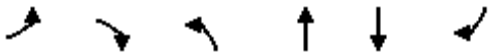
Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.13		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	18.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	494	13	10	289	23	4	10	72	4
Future Volume (vph)	494	13	10	289	23	4	10	72	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.5	6.0		6.0			6.0
Lane Util. Factor	0.95		1.00	0.95		1.00			1.00
Frt	1.00		1.00	1.00		0.96			1.00
Flt Protected	1.00		0.95	1.00		0.97			0.95
Satd. Flow (prot)	3361		1687	3374		1657			1695
Flt Permitted	1.00		0.40	1.00		0.77			0.71
Satd. Flow (perm)	3361		709	3374		1308			1257
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	520	14	11	304	24	4	11	76	4
RTOR Reduction (vph)	2	0	0	0	0	9	0	0	0
Lane Group Flow (vph)	532	0	11	304	0	30	0	0	80
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	NA		pm+pt	NA	Perm	NA		Perm	NA
Protected Phases	2		1	6		4			8
Permitted Phases			6		4			8	
Actuated Green, G (s)	33.4		39.1	39.1		8.9			8.9
Effective Green, g (s)	33.4		39.1	39.1		8.9			8.9
Actuated g/C Ratio	0.56		0.65	0.65		0.15			0.15
Clearance Time (s)	6.0		4.5	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0	3.0		3.0			3.0
Lane Grp Cap (vph)	1870		481	2198		194			186
v/s Ratio Prot	c0.16		0.00	c0.09					
v/s Ratio Perm			0.01			0.02			c0.06
v/c Ratio	0.28		0.02	0.14		0.15			0.43
Uniform Delay, d1	7.0		3.8	4.0		22.3			23.2
Progression Factor	1.00		1.00	1.00		1.00			1.50
Incremental Delay, d2	0.4		0.0	0.0		0.4			1.6
Delay (s)	7.4		3.9	4.0		22.6			36.4
Level of Service	A		A	A		C			D
Approach Delay (s)	7.4			4.0		22.6			36.4
Approach LOS	A			A		C			D

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	30.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	312	0	0	124	0	0	0	0
Future Volume (vph)	0	0	0	0	312	0	0	124	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0			6.0				
Lane Util. Factor					0.95			1.00				
Frt					1.00			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					3374			1776				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					3374			1776				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	328	0	0	131	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	328	0	0	131	0	0	0	0
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type					NA			NA				
Protected Phases					2			4				
Permitted Phases												
Actuated Green, G (s)					33.4			8.9				
Effective Green, g (s)					33.4			8.9				
Actuated g/C Ratio					0.56			0.15				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)					1878			263				
v/s Ratio Prot					c0.10			c0.07				
v/s Ratio Perm												
v/c Ratio					0.17			0.50				
Uniform Delay, d1					6.5			23.5				
Progression Factor					1.05			1.00				
Incremental Delay, d2					0.2			1.5				
Delay (s)					7.1			25.0				
Level of Service					A			C				
Approach Delay (s)		0.0			7.1			25.0			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	124	0	0	4	76	50
Future Volume (vph)	124	0	0	4	76	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	0.95			1.00	1.00	1.00
Satd. Flow (prot)	1687			1776	1776	1509
Flt Permitted	0.95			1.00	1.00	1.00
Satd. Flow (perm)	1687			1776	1776	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	131	0	0	4	80	53
RTOR Reduction (vph)	0	0	0	0	0	18
Lane Group Flow (vph)	131	0	0	4	80	35
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%
Turn Type	Prot			NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases						6
Actuated Green, G (s)	8.9			33.4	39.1	39.1
Effective Green, g (s)	8.9			33.4	39.1	39.1
Actuated g/C Ratio	0.15			0.56	0.65	0.65
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	250			988	1157	983
v/s Ratio Prot	c0.08			0.00	c0.05	
v/s Ratio Perm						0.02
v/c Ratio	0.52			0.00	0.07	0.04
Uniform Delay, d1	23.6			5.9	3.8	3.7
Progression Factor	1.64			2.34	1.00	1.00
Incremental Delay, d2	2.0			0.0	0.0	0.0
Delay (s)	40.7			13.8	3.8	3.7
Level of Service	D			B	A	A
Approach Delay (s)	40.7			13.8	3.8	
Approach LOS	D			B	A	

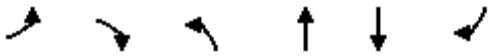
Intersection Summary			
HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.17		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	21.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	493	26	51	719	45	10	25	121	10
Future Volume (vph)	493	26	51	719	45	10	25	121	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.5	6.0		6.0			6.0
Lane Util. Factor	0.95		1.00	0.95		1.00			1.00
Frt	0.99		1.00	1.00		0.96			1.00
Flt Protected	1.00		0.95	1.00		0.97			0.96
Satd. Flow (prot)	3349		1687	3374		1655			1698
Flt Permitted	1.00		0.39	1.00		0.79			0.68
Satd. Flow (perm)	3349		689	3374		1349			1213
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	519	27	54	757	47	11	26	127	11
RTOR Reduction (vph)	5	0	0	0	0	21	0	0	0
Lane Group Flow (vph)	541	0	54	757	0	63	0	0	138
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	NA		pm+pt	NA	Perm	NA		Perm	NA
Protected Phases	2		1	6		4			8
Permitted Phases			6		4			8	
Actuated Green, G (s)	29.1		37.3	37.3		10.7			10.7
Effective Green, g (s)	29.1		37.3	37.3		10.7			10.7
Actuated g/C Ratio	0.49		0.62	0.62		0.18			0.18
Clearance Time (s)	6.0		4.5	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0	3.0		3.0			3.0
Lane Grp Cap (vph)	1624		489	2097		240			216
v/s Ratio Prot	0.16		0.01	c0.22					
v/s Ratio Perm			0.06			0.05			c0.11
v/c Ratio	0.33		0.11	0.36		0.26			0.64
Uniform Delay, d1	9.5		4.6	5.5		21.2			22.9
Progression Factor	1.00		1.00	1.00		1.00			1.54
Incremental Delay, d2	0.6		0.1	0.1		0.6			6.1
Delay (s)	10.0		4.7	5.6		21.8			41.3
Level of Service	B		A	A		C			D
Approach Delay (s)	10.0			5.6		21.8			41.3
Approach LOS	B			A		C			D

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	764	0	0	107	0	0	0	0
Future Volume (vph)	0	0	0	0	764	0	0	107	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0			6.0				
Lane Util. Factor					0.95			1.00				
Frt					1.00			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					3374			1776				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					3374			1776				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	804	0	0	113	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	804	0	0	113	0	0	0	0
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type					NA			NA				
Protected Phases					2			4				
Permitted Phases												
Actuated Green, G (s)					29.1			10.7				
Effective Green, g (s)					29.1			10.7				
Actuated g/C Ratio					0.49			0.18				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)					1636			316				
v/s Ratio Prot					c0.24			c0.06				
v/s Ratio Perm												
v/c Ratio					0.49			0.36				
Uniform Delay, d1					10.4			21.6				
Progression Factor					1.03			1.00				
Incremental Delay, d2					1.1			0.7				
Delay (s)					11.9			22.3				
Level of Service					B			C				
Approach Delay (s)		0.0			11.9			22.3			0.0	
Approach LOS		A			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	36.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	107	0	0	10	131	193
Future Volume (vph)	107	0	0	10	131	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	0.95			1.00	1.00	1.00
Satd. Flow (prot)	1687			1776	1776	1509
Flt Permitted	0.95			1.00	1.00	1.00
Satd. Flow (perm)	1687			1776	1776	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	113	0	0	11	138	203
RTOR Reduction (vph)	0	0	0	0	0	77
Lane Group Flow (vph)	113	0	0	11	138	126
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%
Turn Type	Prot			NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases						6
Actuated Green, G (s)	10.7			29.1	37.3	37.3
Effective Green, g (s)	10.7			29.1	37.3	37.3
Actuated g/C Ratio	0.18			0.49	0.62	0.62
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	300			861	1104	938
v/s Ratio Prot	c0.07			0.01	0.08	
v/s Ratio Perm						c0.08
v/c Ratio	0.38			0.01	0.12	0.13
Uniform Delay, d1	21.7			8.0	4.7	4.7
Progression Factor	1.00			2.00	1.00	1.00
Incremental Delay, d2	0.8			0.0	0.1	0.1
Delay (s)	22.5			16.0	4.7	4.8
Level of Service	C			B	A	A
Approach Delay (s)	22.5			16.0	4.7	
Approach LOS	C			B	A	

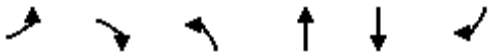
Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	22.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	724	25	20	461	40	10	25	110	6
Future Volume (vph)	724	25	20	461	40	10	25	110	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.5	6.0		6.0			6.0
Lane Util. Factor	0.95		1.00	0.95		1.00			1.00
Frt	1.00		1.00	1.00		0.96			1.00
Flt Protected	1.00		0.95	1.00		0.97			0.95
Satd. Flow (prot)	3357		1687	3374		1653			1695
Flt Permitted	1.00		0.29	1.00		0.80			0.68
Satd. Flow (perm)	3357		515	3374		1360			1206
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	762	26	21	485	42	11	26	116	6
RTOR Reduction (vph)	2	0	0	0	0	21	0	0	0
Lane Group Flow (vph)	786	0	21	485	0	58	0	0	122
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	NA		pm+pt	NA	Perm	NA		pm+pt	NA
Protected Phases	2		1	6		4		3	8
Permitted Phases			6		4			8	
Actuated Green, G (s)	39.0		44.8	44.8		13.2			13.2
Effective Green, g (s)	39.0		44.8	44.8		13.2			13.2
Actuated g/C Ratio	0.56		0.64	0.64		0.19			0.19
Clearance Time (s)	6.0		4.5	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0	3.0		3.0			3.0
Lane Grp Cap (vph)	1870		351	2159		256			227
v/s Ratio Prot	c0.23		0.00	c0.14					
v/s Ratio Perm			0.04			0.04			c0.10
v/c Ratio	0.42		0.06	0.22		0.23			0.54
Uniform Delay, d1	9.0		5.0	5.3		24.1			25.6
Progression Factor	1.00		1.00	1.00		1.00			1.52
Incremental Delay, d2	0.7		0.1	0.2		0.5			2.4
Delay (s)	9.7		5.1	5.5		24.5			41.5
Level of Service	A		A	A		C			D
Approach Delay (s)	9.7			5.5		24.5			41.5
Approach LOS	A			A		C			D

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	501	0	0	181	0	0	0	0
Future Volume (vph)	0	0	0	0	501	0	0	181	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0			6.0				
Lane Util. Factor					0.95			1.00				
Frt					1.00			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					3374			1776				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					3374			1776				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	527	0	0	191	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	527	0	0	191	0	0	0	0
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type					NA			NA				
Protected Phases					6			8				
Permitted Phases												
Actuated Green, G (s)					44.8			13.2				
Effective Green, g (s)					44.8			13.2				
Actuated g/C Ratio					0.64			0.19				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)					2159			334				
v/s Ratio Prot					c0.16			c0.11				
v/s Ratio Perm												
v/c Ratio					0.24			0.57				
Uniform Delay, d1					5.4			25.8				
Progression Factor					1.07			1.00				
Incremental Delay, d2					0.3			2.4				
Delay (s)					6.0			28.2				
Level of Service					A			C				
Approach Delay (s)		0.0			6.0			28.2			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	33.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	181	0	0	10	116	85
Future Volume (vph)	181	0	0	10	116	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	6.0
Lane Util. Factor	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	0.95			1.00	1.00	1.00
Satd. Flow (prot)	1687			1776	1776	1509
Flt Permitted	0.95			1.00	1.00	1.00
Satd. Flow (perm)	1687			1776	1776	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	191	0	0	11	122	89
RTOR Reduction (vph)	0	0	0	0	0	32
Lane Group Flow (vph)	191	0	0	11	122	57
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%
Turn Type	Prot			NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases						6
Actuated Green, G (s)	13.2			39.0	44.8	44.8
Effective Green, g (s)	13.2			39.0	44.8	44.8
Actuated g/C Ratio	0.19			0.56	0.64	0.64
Clearance Time (s)	6.0			6.0	6.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	318			989	1136	965
v/s Ratio Prot	c0.11			0.01	c0.07	
v/s Ratio Perm						0.04
v/c Ratio	0.60			0.01	0.11	0.06
Uniform Delay, d1	26.0			6.9	4.9	4.7
Progression Factor	1.66			2.28	1.00	1.00
Incremental Delay, d2	3.1			0.0	0.2	0.1
Delay (s)	46.3			15.8	5.1	4.8
Level of Service	D			B	A	A
Approach Delay (s)	46.3			15.8	5.0	
Approach LOS	D			B	A	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	26.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	345	10	0	543	0	0	37	14	0	20	133
Future Volume (veh/h)	0	345	10	0	543	0	0	37	14	0	20	133
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	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	0	1822	1950	0	1822	0	0	1822	1950	0	1822	1950
Adj Flow Rate, veh/h	0	363	11	0	572	0	0	39	15	0	21	0
Adj No. of Lanes	0	2	0	0	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, %	0	7	7	0	7	0	0	7	7	0	7	7
Cap, veh/h	0	2813	85	0	2838	0	0	59	23	0	86	0
Arrive On Green	0.00	0.82	0.82	0.00	1.00	0.00	0.00	0.05	0.05	0.00	0.05	0.00
Sat Flow, veh/h	0	3523	104	0	3645	0	0	1255	483	0	1822	0
Grp Volume(v), veh/h	0	183	191	0	572	0	0	0	54	0	21	0
Grp Sat Flow(s),veh/h/ln	0	1731	1804	0	1731	0	0	0	1737	0	1822	0
Q Serve(g_s), s	0.0	1.9	1.9	0.0	0.0	0.0	0.0	0.0	2.8	0.0	1.0	0.0
Cycle Q Clear(g_c), s	0.0	1.9	1.9	0.0	0.0	0.0	0.0	0.0	2.8	0.0	1.0	0.0
Prop In Lane	0.00		0.06	0.00		0.00	0.00		0.28	0.00		0.00
Lane Grp Cap(c), veh/h	0	1419	1479	0	2838	0	0	0	82	0	86	0
V/C Ratio(X)	0.00	0.13	0.13	0.00	0.20	0.00	0.00	0.00	0.66	0.00	0.24	0.00
Avail Cap(c_a), veh/h	0	1419	1479	0	2838	0	0	0	618	0	648	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	0.98	0.00	0.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	1.6	1.6	0.0	0.0	0.0	0.0	0.0	42.2	0.0	41.3	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	8.8	0.0	1.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.9	1.0	0.0	0.1	0.0	0.0	0.0	1.5	0.0	0.5	0.0
LnGrp Delay(d),s/veh	0.0	1.7	1.7	0.0	0.2	0.0	0.0	0.0	50.9	0.0	42.8	0.0
LnGrp LOS		A	A		A				D		D	
Approach Vol, veh/h		374			572			54			21	
Approach Delay, s/veh		1.7			0.2			50.9			42.8	
Approach LOS		A			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		79.8		10.2		79.8		10.2
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		46.0		32.0		46.0		32.0
Max Q Clear Time (g_c+I1), s		2.0		3.0		3.9		4.8
Green Ext Time (p_c), s		4.1		0.1		2.2		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	4.3
HCM 2010 LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	300	512	17	83	31
Future Volume (veh/h)	59	300	512	17	83	31
Number	1	6	2	12	3	18
Initial Q (Qb), 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	1822	1822	1822	1950	1822	1822
Adj Flow Rate, veh/h	62	316	539	18	87	33
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7
Cap, veh/h	609	2755	1292	43	123	654
Arrive On Green	0.35	0.80	0.38	0.38	0.02	0.02
Sat Flow, veh/h	1736	3554	3511	114	1736	1549
Grp Volume(v), veh/h	62	316	273	284	87	33
Grp Sat Flow(s),veh/h/ln	1736	1731	1731	1802	1736	1549
Q Serve(g_s), s	2.2	1.8	10.5	10.5	4.5	0.0
Cycle Q Clear(g_c), s	2.2	1.8	10.5	10.5	4.5	0.0
Prop In Lane	1.00			0.06	1.00	1.00
Lane Grp Cap(c), veh/h	609	2755	654	681	123	654
V/C Ratio(X)	0.10	0.11	0.42	0.42	0.71	0.05
Avail Cap(c_a), veh/h	609	2755	654	681	424	923
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	2.1	20.7	20.7	43.0	16.2
Incr Delay (d2), s/veh	0.1	0.1	2.0	1.9	7.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.9	5.4	5.6	2.4	0.5
LnGrp Delay(d),s/veh	19.7	2.2	22.6	22.6	50.2	16.2
LnGrp LOS	B	A	C	C	D	B
Approach Vol, veh/h		378	557		120	
Approach Delay, s/veh		5.0	22.6		40.8	
Approach LOS		A	C		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	37.6	40.0				77.6		12.4
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0
Max Green Setting (Gmax), s	16.0	34.0				56.0		22.0
Max Q Clear Time (g_c+I1), s	4.2	12.5				3.8		6.5
Green Ext Time (p_c), s	0.1	3.1				2.1		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	18.4
HCM 2010 LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	59	6	31	83	136
Future Volume (veh/h)	17	59	6	31	83	136
Number	1	16	4	14	3	8
Initial Q (Qb), 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	1822	1822	1822	1950	1822	1822
Adj Flow Rate, veh/h	18	62	6	33	87	143
Adj No. of Lanes	1	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7
Cap, veh/h	83	384	135	741	347	1492
Arrive On Green	0.05	0.05	0.55	0.55	0.20	0.82
Sat Flow, veh/h	1736	1549	244	1342	1736	1822
Grp Volume(v), veh/h	18	62	0	39	87	143
Grp Sat Flow(s),veh/h/ln	1736	1549	0	1586	1736	1822
Q Serve(g_s), s	0.9	2.8	0.0	1.0	3.8	1.4
Cycle Q Clear(g_c), s	0.9	2.8	0.0	1.0	3.8	1.4
Prop In Lane	1.00	1.00		0.85	1.00	
Lane Grp Cap(c), veh/h	83	384	0	875	347	1492
V/C Ratio(X)	0.22	0.16	0.00	0.04	0.25	0.10
Avail Cap(c_a), veh/h	328	602	0	875	579	1492
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.00	0.96	1.00	1.00
Uniform Delay (d), s/veh	41.2	26.5	0.0	9.3	30.3	1.6
Incr Delay (d2), s/veh	1.3	0.2	0.0	0.0	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.2	0.0	0.4	1.8	0.7
LnGrp Delay(d),s/veh	42.5	26.7	0.0	9.3	30.7	1.7
LnGrp LOS	D	C		A	C	A
Approach Vol, veh/h	80		39			230
Approach Delay, s/veh	30.2		9.3			12.7
Approach LOS	C		A			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			24.0	55.7		10.3		79.7
Change Period (Y+Rc), s			6.0	6.0		6.0		6.0
Max Green Setting (Gmax), s			30.0	25.0		17.0		61.0
Max Q Clear Time (g_c+I1), s			5.8	3.0		4.8		3.4
Green Ext Time (p_c), s			0.2	0.1		0.1		0.9

Intersection Summary	
HCM 2010 Ctrl Delay	16.3
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	618	13	0	312	0	0	27	10	0	14	50
Future Volume (veh/h)	0	618	13	0	312	0	0	27	10	0	14	50
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	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	0	1822	1950	0	1822	0	0	1822	1950	0	1822	1950
Adj Flow Rate, veh/h	0	651	14	0	328	0	0	28	11	0	15	0
Adj No. of Lanes	0	2	0	0	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, %	0	7	7	0	7	0	0	7	7	0	7	7
Cap, veh/h	0	2861	62	0	2858	0	0	51	20	0	75	0
Arrive On Green	0.00	0.83	0.83	0.00	1.00	0.00	0.00	0.04	0.04	0.00	0.04	0.00
Sat Flow, veh/h	0	3557	75	0	3645	0	0	1246	490	0	1822	0
Grp Volume(v), veh/h	0	325	340	0	328	0	0	0	39	0	15	0
Grp Sat Flow(s),veh/h/ln	0	1731	1809	0	1731	0	0	0	1736	0	1822	0
Q Serve(g_s), s	0.0	3.6	3.6	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.7	0.0
Cycle Q Clear(g_c), s	0.0	3.6	3.6	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.7	0.0
Prop In Lane	0.00		0.04	0.00		0.00	0.00		0.28	0.00		0.00
Lane Grp Cap(c), veh/h	0	1429	1494	0	2858	0	0	0	71	0	75	0
V/C Ratio(X)	0.00	0.23	0.23	0.00	0.11	0.00	0.00	0.00	0.55	0.00	0.20	0.00
Avail Cap(c_a), veh/h	0	1429	1494	0	2858	0	0	0	482	0	506	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	0.99	0.00	0.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	1.7	1.7	0.0	0.0	0.0	0.0	0.0	42.3	0.0	41.7	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	6.3	0.0	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.7	1.8	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.4	0.0
LnGrp Delay(d),s/veh	0.0	1.8	1.8	0.0	0.1	0.0	0.0	0.0	48.7	0.0	43.0	0.0
LnGrp LOS		A	A		A				D		D	
Approach Vol, veh/h		665			328			39			15	
Approach Delay, s/veh		1.8			0.1			48.7			43.0	
Approach LOS		A			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		80.3		9.7		80.3		9.7
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		53.0		25.0		53.0		25.0
Max Q Clear Time (g_c+I1), s		2.0		2.7		5.6		4.0
Green Ext Time (p_c), s		2.2		0.0		4.2		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	3.6
HCM 2010 LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	124	504	289	10	72	23
Future Volume (veh/h)	124	504	289	10	72	23
Number	1	6	2	12	3	18
Initial Q (Qb), 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	1822	1822	1822	1950	1822	1822
Adj Flow Rate, veh/h	131	531	304	11	76	24
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7
Cap, veh/h	760	2785	1023	37	108	775
Arrive On Green	0.44	0.80	0.30	0.30	0.02	0.02
Sat Flow, veh/h	1736	3554	3500	123	1736	1549
Grp Volume(v), veh/h	131	531	154	161	76	24
Grp Sat Flow(s),veh/h/ln	1736	1731	1731	1801	1736	1549
Q Serve(g_s), s	4.1	3.2	6.1	6.2	3.9	0.0
Cycle Q Clear(g_c), s	4.1	3.2	6.1	6.2	3.9	0.0
Prop In Lane	1.00			0.07	1.00	1.00
Lane Grp Cap(c), veh/h	760	2785	519	540	108	775
V/C Ratio(X)	0.17	0.19	0.30	0.30	0.70	0.03
Avail Cap(c_a), veh/h	760	2785	519	540	424	1057
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33
Upstream Filter(I)	0.98	0.98	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.4	2.0	24.2	24.2	43.2	11.9
Incr Delay (d2), s/veh	0.1	0.1	1.5	1.4	8.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	1.5	3.2	3.3	2.1	0.3
LnGrp Delay(d),s/veh	15.5	2.2	25.7	25.6	51.2	12.0
LnGrp LOS	B	A	C	C	D	B
Approach Vol, veh/h		662	315		100	
Approach Delay, s/veh		4.8	25.6		41.8	
Approach LOS		A	C		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	45.4	33.0				78.4		11.6
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0
Max Green Setting (Gmax), s	23.0	27.0				56.0		22.0
Max Q Clear Time (g_c+I1), s	6.1	8.2				5.2		5.9
Green Ext Time (p_c), s	0.3	1.5				3.8		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	14.3
HCM 2010 LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	124	4	23	72	54
Future Volume (veh/h)	10	124	4	23	72	54
Number	1	16	4	14	3	8
Initial Q (Qb), 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	1822	1822	1822	1950	1822	1822
Adj Flow Rate, veh/h	11	131	4	24	76	57
Adj No. of Lanes	1	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7
Cap, veh/h	153	458	114	684	360	1418
Arrive On Green	0.09	0.09	0.50	0.50	0.21	0.78
Sat Flow, veh/h	1736	1549	226	1357	1736	1822
Grp Volume(v), veh/h	11	131	0	28	76	57
Grp Sat Flow(s),veh/h/ln	1736	1549	0	1583	1736	1822
Q Serve(g_s), s	0.5	5.9	0.0	0.8	3.3	0.6
Cycle Q Clear(g_c), s	0.5	5.9	0.0	0.8	3.3	0.6
Prop In Lane	1.00	1.00		0.86	1.00	
Lane Grp Cap(c), veh/h	153	458	0	798	360	1418
V/C Ratio(X)	0.07	0.29	0.00	0.04	0.21	0.04
Avail Cap(c_a), veh/h	424	700	0	798	521	1418
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.97	0.00	0.98	1.00	1.00
Uniform Delay (d), s/veh	37.6	24.4	0.0	11.3	29.6	2.3
Incr Delay (d2), s/veh	0.2	0.3	0.0	0.0	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.5	0.0	0.4	1.6	0.3
LnGrp Delay(d),s/veh	37.8	24.7	0.0	11.3	29.9	2.3
LnGrp LOS	D	C		B	C	A
Approach Vol, veh/h	142		28			133
Approach Delay, s/veh	25.7		11.3			18.1
Approach LOS	C		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			24.7	51.4		14.0		76.0
Change Period (Y+Rc), s			6.0	6.0		6.0		6.0
Max Green Setting (Gmax), s			27.0	23.0		22.0		56.0
Max Q Clear Time (g_c+I1), s			5.3	2.8		7.9		2.6
Green Ext Time (p_c), s			0.2	0.1		0.3		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	21.0
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	600	26	0	764	0	0	55	25	0	61	193
Future Volume (veh/h)	0	600	26	0	764	0	0	55	25	0	61	193
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	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	0	1822	1950	0	1822	0	0	1822	1950	0	1822	1950
Adj Flow Rate, veh/h	0	632	27	0	804	0	0	58	26	0	64	0
Adj No. of Lanes	0	2	0	0	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, %	0	7	7	0	7	0	0	7	7	0	7	7
Cap, veh/h	0	2689	115	0	2752	0	0	86	38	0	131	0
Arrive On Green	0.00	0.79	0.79	0.00	1.00	0.00	0.00	0.07	0.07	0.00	0.02	0.00
Sat Flow, veh/h	0	3475	144	0	3645	0	0	1193	535	0	1822	0
Grp Volume(v), veh/h	0	323	336	0	804	0	0	0	84	0	64	0
Grp Sat Flow(s),veh/h/ln	0	1731	1797	0	1731	0	0	0	1728	0	1822	0
Q Serve(g_s), s	0.0	4.2	4.2	0.0	0.0	0.0	0.0	0.0	4.3	0.0	3.1	0.0
Cycle Q Clear(g_c), s	0.0	4.2	4.2	0.0	0.0	0.0	0.0	0.0	4.3	0.0	3.1	0.0
Prop In Lane	0.00		0.08	0.00		0.00	0.00		0.31	0.00		0.00
Lane Grp Cap(c), veh/h	0	1376	1428	0	2752	0	0	0	124	0	131	0
V/C Ratio(X)	0.00	0.23	0.24	0.00	0.29	0.00	0.00	0.00	0.68	0.00	0.49	0.00
Avail Cap(c_a), veh/h	0	1376	1428	0	2752	0	0	0	614	0	648	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33
Upstream Filter(I)	0.00	1.00	1.00	0.00	0.91	0.00	0.00	0.00	1.00	0.00	0.99	0.00
Uniform Delay (d), s/veh	0.0	2.3	2.3	0.0	0.0	0.0	0.0	0.0	40.7	0.0	42.3	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.0	0.2	0.0	0.0	0.0	6.3	0.0	2.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.0	2.1	0.0	0.1	0.0	0.0	0.0	2.2	0.0	1.7	0.0
LnGrp Delay(d),s/veh	0.0	2.4	2.4	0.0	0.2	0.0	0.0	0.0	47.0	0.0	45.1	0.0
LnGrp LOS		A	A		A				D		D	
Approach Vol, veh/h		659			804			84			64	
Approach Delay, s/veh		2.4			0.2			47.0			45.1	
Approach LOS		A			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		77.5		12.5		77.5		12.5
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		46.0		32.0		46.0		32.0
Max Q Clear Time (g_c+I1), s		2.0		5.1		6.2		6.3
Green Ext Time (p_c), s		6.2		0.3		4.2		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	5.4
HCM 2010 LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	107	518	719	51	121	45
Future Volume (veh/h)	107	518	719	51	121	45
Number	1	6	2	12	3	18
Initial Q (Qb), 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	1822	1822	1822	1950	1822	1822
Adj Flow Rate, veh/h	113	545	757	54	127	47
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7
Cap, veh/h	563	2662	1239	88	170	654
Arrive On Green	0.32	0.77	0.38	0.38	0.03	0.03
Sat Flow, veh/h	1736	3554	3370	234	1736	1549
Grp Volume(v), veh/h	113	545	400	411	127	47
Grp Sat Flow(s),veh/h/ln	1736	1731	1731	1781	1736	1549
Q Serve(g_s), s	4.2	3.9	16.8	16.8	6.5	0.0
Cycle Q Clear(g_c), s	4.2	3.9	16.8	16.8	6.5	0.0
Prop In Lane	1.00			0.13	1.00	1.00
Lane Grp Cap(c), veh/h	563	2662	654	673	170	654
V/C Ratio(X)	0.20	0.20	0.61	0.61	0.75	0.07
Avail Cap(c_a), veh/h	563	2662	654	673	424	881
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33
Upstream Filter(I)	0.97	0.97	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.0	2.9	22.7	22.7	42.5	16.7
Incr Delay (d2), s/veh	0.2	0.2	4.2	4.1	6.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	1.9	8.8	9.0	3.4	0.8
LnGrp Delay(d),s/veh	22.1	3.0	26.9	26.8	48.9	16.7
LnGrp LOS	C	A	C	C	D	B
Approach Vol, veh/h		658	811		174	
Approach Delay, s/veh		6.3	26.8		40.2	
Approach LOS		A	C		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	35.2	40.0				75.2		14.8
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0
Max Green Setting (Gmax), s	16.0	34.0				56.0		22.0
Max Q Clear Time (g_c+I1), s	6.2	18.8				5.9		8.5
Green Ext Time (p_c), s	0.2	4.3				3.9		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	20.0
HCM 2010 LOS	C

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	51	107	10	45	121	203
Future Volume (veh/h)	51	107	10	45	121	203
Number	1	16	4	14	3	8
Initial Q (Qb), 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	1822	1822	1822	1950	1822	1822
Adj Flow Rate, veh/h	54	113	11	47	127	214
Adj No. of Lanes	1	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7
Cap, veh/h	142	425	159	679	335	1431
Arrive On Green	0.08	0.08	0.53	0.53	0.19	0.79
Sat Flow, veh/h	1736	1549	302	1292	1736	1822
Grp Volume(v), veh/h	54	113	0	58	127	214
Grp Sat Flow(s),veh/h/ln	1736	1549	0	1594	1736	1822
Q Serve(g_s), s	2.7	5.1	0.0	1.6	5.7	2.6
Cycle Q Clear(g_c), s	2.7	5.1	0.0	1.6	5.7	2.6
Prop In Lane	1.00	1.00		0.81	1.00	
Lane Grp Cap(c), veh/h	142	425	0	838	335	1431
V/C Ratio(X)	0.38	0.27	0.00	0.07	0.38	0.15
Avail Cap(c_a), veh/h	328	592	0	838	579	1431
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.00	0.96	1.00	1.00
Uniform Delay (d), s/veh	39.2	25.5	0.0	10.5	31.6	2.4
Incr Delay (d2), s/veh	1.5	0.3	0.0	0.0	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	2.2	0.0	0.7	2.8	1.3
LnGrp Delay(d),s/veh	40.7	25.8	0.0	10.6	32.3	2.6
LnGrp LOS	D	C		B	C	A
Approach Vol, veh/h	167		58			341
Approach Delay, s/veh	30.7		10.6			13.7
Approach LOS	C		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			23.4	53.3		13.3		76.7
Change Period (Y+Rc), s			6.0	6.0		6.0		6.0
Max Green Setting (Gmax), s			30.0	25.0		17.0		61.0
Max Q Clear Time (g_c+I1), s			7.7	3.6		7.1		4.6
Green Ext Time (p_c), s			0.3	0.2		0.3		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	18.4
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	905	25	0	501	0	0	50	25	0	27	85
Future Volume (veh/h)	0	905	25	0	501	0	0	50	25	0	27	85
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	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	0	1822	1950	0	1822	0	0	1822	1950	0	1822	1950
Adj Flow Rate, veh/h	0	953	26	0	527	0	0	53	26	0	28	0
Adj No. of Lanes	0	2	0	0	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, %	0	7	7	0	7	0	0	7	7	0	7	7
Cap, veh/h	0	2759	75	0	2774	0	0	76	37	0	119	0
Arrive On Green	0.00	0.80	0.80	0.00	1.00	0.00	0.00	0.07	0.07	0.00	0.07	0.00
Sat Flow, veh/h	0	3534	94	0	3645	0	0	1156	567	0	1822	0
Grp Volume(v), veh/h	0	479	500	0	527	0	0	0	79	0	28	0
Grp Sat Flow(s),veh/h/ln	0	1731	1806	0	1731	0	0	0	1722	0	1822	0
Q Serve(g_s), s	0.0	6.8	6.8	0.0	0.0	0.0	0.0	0.0	4.0	0.0	1.3	0.0
Cycle Q Clear(g_c), s	0.0	6.8	6.8	0.0	0.0	0.0	0.0	0.0	4.0	0.0	1.3	0.0
Prop In Lane	0.00		0.05	0.00		0.00	0.00		0.33	0.00		0.00
Lane Grp Cap(c), veh/h	0	1387	1447	0	2774	0	0	0	113	0	119	0
V/C Ratio(X)	0.00	0.35	0.35	0.00	0.19	0.00	0.00	0.00	0.70	0.00	0.23	0.00
Avail Cap(c_a), veh/h	0	1387	1447	0	2774	0	0	0	478	0	506	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	0.96	0.00	0.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	2.5	2.5	0.0	0.0	0.0	0.0	0.0	41.2	0.0	39.9	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	7.6	0.0	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.3	3.4	0.0	0.1	0.0	0.0	0.0	2.2	0.0	0.7	0.0
LnGrp Delay(d),s/veh	0.0	2.6	2.6	0.0	0.1	0.0	0.0	0.0	48.8	0.0	40.9	0.0
LnGrp LOS		A	A		A				D		D	
Approach Vol, veh/h		979			527			79			28	
Approach Delay, s/veh		2.6			0.1			48.8			40.9	
Approach LOS		A			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		78.1		11.9		78.1		11.9
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		53.0		25.0		53.0		25.0
Max Q Clear Time (g_c+I1), s		2.0		3.3		8.8		6.0
Green Ext Time (p_c), s		3.7		0.1		7.1		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	4.7
HCM 2010 LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	181	749	461	20	110	40
Future Volume (veh/h)	181	749	461	20	110	40
Number	1	6	2	12	3	18
Initial Q (Qb), 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	1822	1822	1822	1950	1822	1822
Adj Flow Rate, veh/h	191	788	485	21	116	42
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7
Cap, veh/h	711	2687	1015	44	157	775
Arrive On Green	0.41	0.78	0.30	0.30	0.03	0.03
Sat Flow, veh/h	1736	3554	3473	146	1736	1549
Grp Volume(v), veh/h	191	788	248	258	116	42
Grp Sat Flow(s),veh/h/ln	1736	1731	1731	1797	1736	1549
Q Serve(g_s), s	6.6	5.9	10.5	10.6	6.0	0.0
Cycle Q Clear(g_c), s	6.6	5.9	10.5	10.6	6.0	0.0
Prop In Lane	1.00			0.08	1.00	1.00
Lane Grp Cap(c), veh/h	711	2687	519	539	157	775
V/C Ratio(X)	0.27	0.29	0.48	0.48	0.74	0.05
Avail Cap(c_a), veh/h	711	2687	519	539	424	1013
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33
Upstream Filter(I)	0.94	0.94	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.6	2.9	25.7	25.7	42.6	12.4
Incr Delay (d2), s/veh	0.2	0.3	3.1	3.0	6.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	2.8	5.5	5.7	3.2	0.6
LnGrp Delay(d),s/veh	17.8	3.2	28.9	28.8	49.2	12.4
LnGrp LOS	B	A	C	C	D	B
Approach Vol, veh/h		979	506		158	
Approach Delay, s/veh		6.0	28.8		39.4	
Approach LOS		A	C		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	42.8	33.0				75.8		14.2
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0
Max Green Setting (Gmax), s	23.0	27.0				56.0		22.0
Max Q Clear Time (g_c+I1), s	8.6	12.6				7.9		8.0
Green Ext Time (p_c), s	0.4	2.4				6.1		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	16.3
HCM 2010 LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	181	10	46	110	91
Future Volume (veh/h)	20	181	10	46	110	91
Number	1	16	4	14	3	8
Initial Q (Qb), 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	1822	1822	1822	1950	1822	1822
Adj Flow Rate, veh/h	21	191	11	48	116	96
Adj No. of Lanes	1	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	7	7	7	7
Cap, veh/h	212	499	142	619	347	1356
Arrive On Green	0.12	0.12	0.48	0.48	0.20	0.74
Sat Flow, veh/h	1736	1549	297	1297	1736	1822
Grp Volume(v), veh/h	21	191	0	59	116	96
Grp Sat Flow(s),veh/h/ln	1736	1549	0	1594	1736	1822
Q Serve(g_s), s	1.0	8.6	0.0	1.8	5.2	1.3
Cycle Q Clear(g_c), s	1.0	8.6	0.0	1.8	5.2	1.3
Prop In Lane	1.00	1.00		0.81	1.00	
Lane Grp Cap(c), veh/h	212	499	0	761	347	1356
V/C Ratio(X)	0.10	0.38	0.00	0.08	0.33	0.07
Avail Cap(c_a), veh/h	424	688	0	761	521	1356
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.00	0.91	1.00	1.00
Uniform Delay (d), s/veh	35.1	23.6	0.0	12.8	30.9	3.1
Incr Delay (d2), s/veh	0.2	0.4	0.0	0.0	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	3.7	0.0	0.8	2.5	0.7
LnGrp Delay(d),s/veh	35.3	24.0	0.0	12.8	31.4	3.2
LnGrp LOS	D	C		B	C	A
Approach Vol, veh/h	212		59			212
Approach Delay, s/veh	25.1		12.8			18.6
Approach LOS	C		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			24.0	49.0		17.0		73.0
Change Period (Y+Rc), s			6.0	6.0		6.0		6.0
Max Green Setting (Gmax), s			27.0	23.0		22.0		56.0
Max Q Clear Time (g_c+I1), s			7.2	3.8		10.6		3.3
Green Ext Time (p_c), s			0.3	0.2		0.5		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	20.8
HCM 2010 LOS	C

SR 70 @ CR 675 ROUNDABOUT ANALYSIS

2025 OPENING YEAR (HCM 6th Edition)

Approach	Delay (s)		Level of Service		v/c Ratio		95th % Queue (ft)	
	AM	PM	AM	PM	AM	PM	AM	PM
Overall	**6.0**	**5.6**	**A**	**A**				
SR 70 EB	4.7	5.9	A	A	0.17	0.29	25	35
SR 70 WB	5.7	5.0	A	A	0.27	0.18	35	25
Meadow Dove Ln NB	4.7	6.0	A	A	0.06	0.06	25	25
CR 675 SB	9.3	5.6	A	A	0.33	0.15	35	25

2025 OPENING YEAR (Sidra Standard)

Approach	Delay (s)		Level of Service		v/c Ratio		95th % Queue (ft)	
	AM	PM	AM	PM	AM	PM	AM	PM
Overall	**5.6**	**5.6**	**A**	**A**				
SR 70 EB	5.1	5.3	A	A	0.14	0.24	25	40
SR 70 WB	4.2	4.5	A	A	0.23	0.15	35	25
Meadow Dove Ln NB	9.2	10.1	A	B	0.06	0.05	25	25
CR 675 SB	9.3	9.2	A	A	0.32	0.16	40	25

2045 DESIGN YEAR (HCM 6th Edition)

Approach	Delay (s)		Level of Service		v/c Ratio		95th % Queue (ft)	
	AM	PM	AM	PM	AM	PM	AM	PM
Overall	**9.6**	**7.9**	**A**	**A**				
SR 70 EB	6.7	8.3	A	A	0.32	0.45	40	65
SR 70 WB	8.0	6.9	A	A	0.43	0.31	60	40
Meadow Dove Ln NB	7.0	9.7	A	A	0.13	0.16	25	25
CR 675 SB	20.2	8.5	C	A	0.63	0.27	105	30

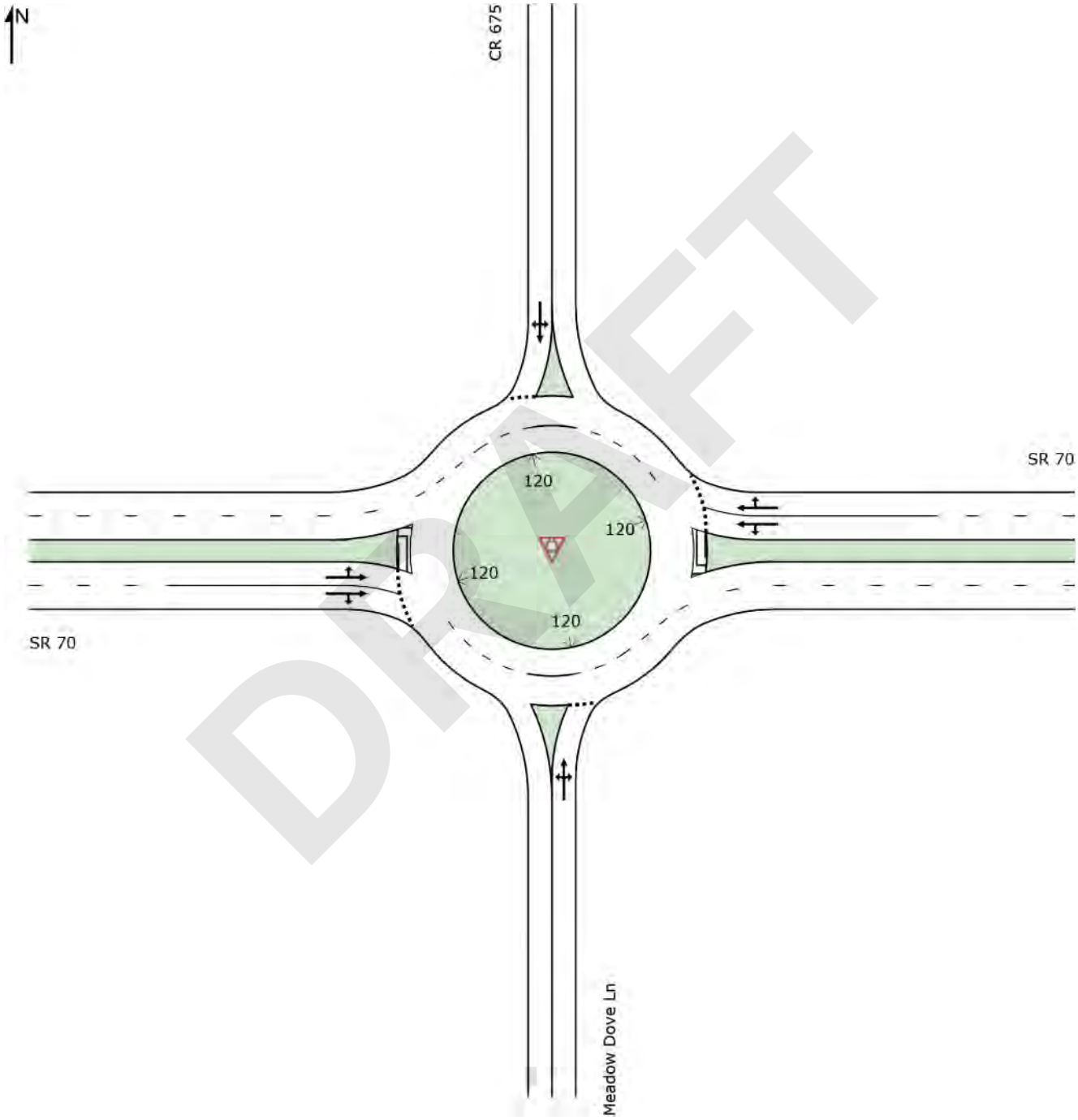
2045 DESIGN YEAR (Sidra Standard)

Approach	Delay (s)		Level of Service		v/c Ratio		95th % Queue (ft)	
	AM	PM	AM	PM	AM	PM	AM	PM
Overall	**6.7**	**6.2**	**A**	**A**				
SR 70 EB	5.7	5.7	A	A	0.27	0.38	45	75
SR 70 WB	4.9	5.1	A	A	0.35	0.26	65	45
Meadow Dove Ln NB	10.0	10.7	B	B	0.12	0.13	25	25
CR 675 SB	12.7	10.3	B	B	0.56	0.30	90	35

SITE LAYOUT

Site: [SR 70 & CR 675]

Site Category: (None)
Roundabout



MOVEMENT SUMMARY

Site: [SR 70 & CR 675]

2025 AM Peak-Hour
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Meadow Dove Ln												
3	L2	33	0.0	0.061	4.7	LOS A	0.2	5.5	0.46	0.37	0.46	34.3
8	T1	6	0.0	0.061	4.7	LOS A	0.2	5.5	0.46	0.37	0.46	34.0
18	R2	15	0.0	0.061	4.7	LOS A	0.2	5.5	0.46	0.37	0.46	33.0
Approach		54	0.0	0.061	4.7	LOS A	0.2	5.5	0.46	0.37	0.46	33.9
East: SR 70												
1	L2	18	7.0	0.272	5.7	LOS A	1.3	33.1	0.27	0.15	0.27	35.3
8	T1	539	7.0	0.272	5.7	LOS A	1.3	33.1	0.27	0.15	0.27	35.3
16	R2	64	7.0	0.272	5.7	LOS A	1.3	33.1	0.27	0.15	0.27	34.0
Approach		621	7.0	0.272	5.7	LOS A	1.3	33.1	0.27	0.15	0.27	35.1
North: CR 675												
7	L2	87	15.0	0.328	9.5	LOS A	1.2	33.4	0.60	0.60	0.61	32.3
4	T1	3	0.0	0.328	8.8	LOS A	1.2	33.4	0.60	0.60	0.61	32.4
14	R2	140	7.0	0.328	9.1	LOS A	1.2	33.4	0.60	0.60	0.61	31.4
Approach		231	9.9	0.328	9.3	LOS A	1.2	33.4	0.60	0.60	0.61	31.8
West: SR 70												
5	L2	62	7.0	0.166	4.7	LOS A	0.7	18.1	0.27	0.14	0.27	34.9
4	T1	301	7.0	0.166	4.7	LOS A	0.7	18.1	0.27	0.14	0.27	35.5
12	R2	11	7.0	0.166	4.7	LOS A	0.7	18.1	0.27	0.14	0.27	34.5
Approach		374	7.0	0.166	4.7	LOS A	0.7	18.1	0.27	0.14	0.27	35.3
All Vehicles		1279	7.2	0.328	6.0	LOS A	1.3	33.4	0.34	0.24	0.34	34.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [SR 70 & CR 675]

2025 AM Peak-Hour
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Meadow Dove Ln												
3	L2	33	0.0	0.061	11.7	LOS B	0.2	5.7	0.45	0.67	0.45	35.7
8	T1	6	0.0	0.061	5.2	LOS A	0.2	5.7	0.45	0.67	0.45	35.4
18	R2	15	0.0	0.061	5.3	LOS A	0.2	5.7	0.45	0.67	0.45	34.3
Approach		54	0.0	0.061	9.2	LOS A	0.2	5.7	0.45	0.67	0.45	35.2
East: SR 70												
1	L2	18	7.0	0.227	10.6	LOS B	1.3	34.6	0.30	0.41	0.30	37.5
8	T1	539	7.0	0.227	4.0	LOS A	1.3	35.0	0.29	0.40	0.29	37.5
16	R2	64	7.0	0.227	4.3	LOS A	1.3	35.0	0.28	0.39	0.28	36.1
Approach		621	7.0	0.227	4.2	LOS A	1.3	35.0	0.29	0.40	0.29	37.3
North: CR 675												
7	L2	87	15.0	0.320	13.7	LOS B	1.4	37.2	0.59	0.81	0.59	35.3
4	T1	3	0.0	0.320	6.1	LOS A	1.4	37.2	0.59	0.81	0.59	35.5
14	R2	140	7.0	0.320	6.7	LOS A	1.4	37.2	0.59	0.81	0.59	34.3
Approach		231	9.9	0.320	9.3	LOS A	1.4	37.2	0.59	0.81	0.59	34.7
West: SR 70												
5	L2	62	7.0	0.140	10.7	LOS B	0.8	21.1	0.32	0.50	0.32	36.5
4	T1	301	7.0	0.140	4.0	LOS A	0.8	21.6	0.31	0.43	0.31	37.1
12	R2	11	7.0	0.140	4.3	LOS A	0.8	21.6	0.30	0.39	0.30	36.0
Approach		374	7.0	0.140	5.1	LOS A	0.8	21.6	0.31	0.44	0.31	37.0
All Vehicles		1279	7.2	0.320	5.6	LOS A	1.4	37.2	0.35	0.50	0.35	36.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [SR 70 & CR 675]

2025 PM Peak-Hour
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Meadow Dove Ln												
3	L2	24	0.0	0.058	6.0	LOS A	0.2	5.0	0.56	0.52	0.56	33.6
8	T1	4	0.0	0.058	6.0	LOS A	0.2	5.0	0.56	0.52	0.56	33.3
18	R2	11	0.0	0.058	6.0	LOS A	0.2	5.0	0.56	0.52	0.56	32.4
Approach		39	0.0	0.058	6.0	LOS A	0.2	5.0	0.56	0.52	0.56	33.2
East: SR 70												
1	L2	11	7.0	0.181	5.0	LOS A	0.7	19.7	0.32	0.20	0.32	35.7
8	T1	304	7.0	0.181	5.0	LOS A	0.7	19.7	0.32	0.20	0.32	35.6
16	R2	75	7.0	0.181	5.0	LOS A	0.7	19.7	0.32	0.20	0.32	34.3
Approach		389	7.0	0.181	5.0	LOS A	0.7	19.7	0.32	0.20	0.32	35.4
North: CR 675												
7	L2	76	15.0	0.151	5.7	LOS A	0.5	14.3	0.42	0.34	0.42	33.5
4	T1	4	0.0	0.151	5.2	LOS A	0.5	14.3	0.42	0.34	0.42	33.7
14	R2	53	7.0	0.151	5.4	LOS A	0.5	14.3	0.42	0.34	0.42	32.6
Approach		133	11.3	0.151	5.6	LOS A	0.5	14.3	0.42	0.34	0.42	33.2
West: SR 70												
5	L2	131	7.0	0.290	5.9	LOS A	1.4	36.1	0.27	0.15	0.27	34.1
4	T1	520	7.0	0.290	5.9	LOS A	1.4	36.1	0.27	0.15	0.27	34.8
12	R2	14	7.0	0.290	5.9	LOS A	1.4	36.1	0.27	0.15	0.27	33.9
Approach		664	7.0	0.290	5.9	LOS A	1.4	36.1	0.27	0.15	0.27	34.6
All Vehicles		1225	7.2	0.290	5.6	LOS A	1.4	36.1	0.31	0.20	0.31	34.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [SR 70 & CR 675]

2025 PM Peak-Hour
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Meadow Dove Ln												
3	L2	24	0.0	0.051	12.5	LOS B	0.2	4.7	0.53	0.73	0.53	35.3
8	T1	4	0.0	0.051	6.0	LOS A	0.2	4.7	0.53	0.73	0.53	35.0
18	R2	11	0.0	0.051	6.1	LOS A	0.2	4.7	0.53	0.73	0.53	34.0
Approach		39	0.0	0.051	10.1	LOS B	0.2	4.7	0.53	0.73	0.53	34.9
East: SR 70												
1	L2	11	7.0	0.150	10.9	LOS B	0.8	21.5	0.36	0.44	0.36	37.2
8	T1	304	7.0	0.150	4.3	LOS A	0.8	21.9	0.35	0.44	0.35	37.3
16	R2	75	7.0	0.150	4.5	LOS A	0.8	21.9	0.34	0.43	0.34	35.9
Approach		389	7.0	0.150	4.5	LOS A	0.8	21.9	0.35	0.44	0.35	37.0
North: CR 675												
7	L2	76	15.0	0.161	12.1	LOS B	0.7	18.0	0.45	0.68	0.45	35.3
4	T1	4	0.0	0.161	4.9	LOS A	0.7	18.0	0.45	0.68	0.45	35.5
14	R2	53	7.0	0.161	5.4	LOS A	0.7	18.0	0.45	0.68	0.45	34.3
Approach		133	11.3	0.161	9.2	LOS A	0.7	18.0	0.45	0.68	0.45	34.9
West: SR 70												
5	L2	131	7.0	0.243	10.6	LOS B	1.5	39.8	0.31	0.51	0.31	36.3
4	T1	520	7.0	0.243	4.0	LOS A	1.5	40.5	0.30	0.43	0.30	37.1
12	R2	14	7.0	0.243	4.3	LOS A	1.5	40.5	0.29	0.38	0.29	36.0
Approach		664	7.0	0.243	5.3	LOS A	1.5	40.5	0.30	0.44	0.30	36.9
All Vehicles		1225	7.2	0.243	5.6	LOS A	1.5	40.5	0.34	0.48	0.34	36.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [SR 70 & CR 675]

2045 AM Peak-Hour
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Meadow Dove Ln												
3	L2	47	0.0	0.130	7.0	LOS A	0.5	11.5	0.59	0.59	0.59	33.2
8	T1	11	0.0	0.130	7.0	LOS A	0.5	11.5	0.59	0.59	0.59	33.0
18	R2	26	0.0	0.130	7.0	LOS A	0.5	11.5	0.59	0.59	0.59	32.0
Approach		84	0.0	0.130	7.0	LOS A	0.5	11.5	0.59	0.59	0.59	32.8
East: SR 70												
1	L2	54	7.0	0.426	8.0	LOS A	2.3	59.7	0.42	0.29	0.42	33.9
8	T1	757	7.0	0.426	8.0	LOS A	2.3	59.7	0.42	0.29	0.42	33.9
16	R2	97	7.0	0.426	8.0	LOS A	2.3	59.7	0.42	0.29	0.42	32.9
Approach		907	7.0	0.426	8.0	LOS A	2.3	59.7	0.42	0.29	0.42	33.8
North: CR 675												
7	L2	127	15.0	0.626	20.5	LOS C	3.9	105.0	0.76	0.99	1.48	28.0
4	T1	11	0.0	0.626	19.6	LOS C	3.9	105.0	0.76	0.99	1.48	28.1
14	R2	203	7.0	0.626	20.0	LOS C	3.9	105.0	0.76	0.99	1.48	27.3
Approach		341	9.8	0.626	20.2	LOS C	3.9	105.0	0.76	0.99	1.48	27.6
West: SR 70												
5	L2	113	7.0	0.320	6.7	LOS A	1.5	39.3	0.41	0.29	0.41	33.8
4	T1	519	7.0	0.320	6.7	LOS A	1.5	39.3	0.41	0.29	0.41	34.3
12	R2	27	7.0	0.320	6.7	LOS A	1.5	39.3	0.41	0.29	0.41	33.5
Approach		659	7.0	0.320	6.7	LOS A	1.5	39.3	0.41	0.29	0.41	34.2
All Vehicles		1992	7.2	0.626	9.6	LOS A	3.9	105.0	0.49	0.42	0.61	32.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [SR 70 & CR 675]

2045 AM Peak-Hour
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Meadow Dove Ln												
3	L2	47	0.0	0.115	12.8	LOS B	0.5	11.6	0.58	0.78	0.58	35.3
8	T1	11	0.0	0.115	6.3	LOS A	0.5	11.6	0.58	0.78	0.58	35.0
18	R2	26	0.0	0.115	6.4	LOS A	0.5	11.6	0.58	0.78	0.58	34.0
Approach		84	0.0	0.115	10.0	LOS A	0.5	11.6	0.58	0.78	0.58	34.9
East: SR 70												
1	L2	54	7.0	0.353	11.2	LOS B	2.3	61.8	0.45	0.49	0.45	36.7
8	T1	757	7.0	0.353	4.5	LOS A	2.4	63.3	0.43	0.47	0.43	36.9
16	R2	97	7.0	0.353	4.7	LOS A	2.4	63.3	0.42	0.45	0.42	35.6
Approach		907	7.0	0.353	4.9	LOS A	2.4	63.3	0.43	0.47	0.43	36.7
North: CR 675												
7	L2	127	15.0	0.564	17.3	LOS B	3.3	89.2	0.76	0.96	0.98	33.6
4	T1	11	0.0	0.564	9.3	LOS A	3.3	89.2	0.76	0.96	0.98	33.7
14	R2	203	7.0	0.564	10.0	LOS B	3.3	89.2	0.76	0.96	0.98	32.6
Approach		341	9.8	0.564	12.7	LOS B	3.3	89.2	0.76	0.96	0.98	33.0
West: SR 70												
5	L2	113	7.0	0.267	11.3	LOS B	1.7	45.0	0.47	0.56	0.47	36.0
4	T1	519	7.0	0.267	4.6	LOS A	1.8	46.6	0.46	0.49	0.46	36.6
12	R2	27	7.0	0.267	4.8	LOS A	1.8	46.6	0.45	0.44	0.45	35.5
Approach		659	7.0	0.267	5.7	LOS A	1.8	46.6	0.46	0.50	0.46	36.4
All Vehicles		1992	7.2	0.564	6.7	LOS A	3.3	89.2	0.50	0.57	0.54	35.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [SR 70 & CR 675]

2045 PM Peak-Hour
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Meadow Dove Ln												
3	L2	42	0.0	0.163	9.7	LOS A	0.6	13.9	0.68	0.68	0.68	32.1
8	T1	11	0.0	0.163	9.7	LOS A	0.6	13.9	0.68	0.68	0.68	31.8
18	R2	26	0.0	0.163	9.7	LOS A	0.6	13.9	0.68	0.68	0.68	31.0
Approach		79	0.0	0.163	9.7	LOS A	0.6	13.9	0.68	0.68	0.68	31.7
East: SR 70												
1	L2	21	7.0	0.314	6.9	LOS A	1.4	37.7	0.44	0.34	0.44	34.6
8	T1	485	7.0	0.314	6.9	LOS A	1.4	37.7	0.44	0.34	0.44	34.6
16	R2	116	7.0	0.314	6.9	LOS A	1.4	37.7	0.44	0.34	0.44	33.3
Approach		622	7.0	0.314	6.9	LOS A	1.4	37.7	0.44	0.34	0.44	34.3
North: CR 675												
7	L2	116	15.0	0.293	8.7	LOS A	1.1	29.0	0.57	0.57	0.57	32.2
4	T1	6	0.0	0.293	8.0	LOS A	1.1	29.0	0.57	0.57	0.57	32.4
14	R2	89	7.0	0.293	8.3	LOS A	1.1	29.0	0.57	0.57	0.57	31.4
Approach		212	11.2	0.293	8.5	LOS A	1.1	29.0	0.57	0.57	0.57	31.8
West: SR 70												
5	L2	191	7.0	0.452	8.3	LOS A	2.5	66.2	0.42	0.28	0.42	32.9
4	T1	762	7.0	0.452	8.3	LOS A	2.5	66.2	0.42	0.28	0.42	33.5
12	R2	26	7.0	0.452	8.3	LOS A	2.5	66.2	0.42	0.28	0.42	32.8
Approach		979	7.0	0.452	8.3	LOS A	2.5	66.2	0.42	0.28	0.42	33.4
All Vehicles		1892	7.2	0.452	7.9	LOS A	2.5	66.2	0.46	0.35	0.46	33.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [SR 70 & CR 675]

2045 PM Peak-Hour
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Meadow Dove Ln												
3	L2	42	0.0	0.126	13.7	LOS B	0.5	12.9	0.65	0.84	0.65	35.0
8	T1	11	0.0	0.126	7.2	LOS A	0.5	12.9	0.65	0.84	0.65	34.7
18	R2	26	0.0	0.126	7.3	LOS A	0.5	12.9	0.65	0.84	0.65	33.6
Approach		79	0.0	0.126	10.7	LOS B	0.5	12.9	0.65	0.84	0.65	34.5
East: SR 70												
1	L2	21	7.0	0.258	11.5	LOS B	1.6	41.2	0.49	0.51	0.49	36.7
8	T1	485	7.0	0.258	4.8	LOS A	1.6	42.7	0.48	0.50	0.48	36.8
16	R2	116	7.0	0.258	5.0	LOS A	1.6	42.7	0.46	0.49	0.46	35.5
Approach		622	7.0	0.258	5.1	LOS A	1.6	42.7	0.47	0.50	0.47	36.5
North: CR 675												
7	L2	116	15.0	0.300	13.4	LOS B	1.3	36.2	0.59	0.81	0.59	34.9
4	T1	6	0.0	0.300	5.9	LOS A	1.3	36.2	0.59	0.81	0.59	35.0
14	R2	89	7.0	0.300	6.5	LOS A	1.3	36.2	0.59	0.81	0.59	33.8
Approach		212	11.2	0.300	10.3	LOS B	1.3	36.2	0.59	0.81	0.59	34.4
West: SR 70												
5	L2	191	7.0	0.379	11.1	LOS B	2.7	71.5	0.46	0.55	0.46	35.9
4	T1	762	7.0	0.379	4.4	LOS A	2.8	73.5	0.44	0.47	0.44	36.6
12	R2	26	7.0	0.379	4.7	LOS A	2.8	73.5	0.43	0.43	0.43	35.5
Approach		979	7.0	0.379	5.7	LOS A	2.8	73.5	0.44	0.49	0.44	36.4
All Vehicles		1892	7.2	0.379	6.2	LOS A	2.8	73.5	0.48	0.54	0.48	36.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

ATTACHMENT D

Safety Performance for Intersection Control Evaluation (SPICE)

Federal Highway Administration (FHWA)

Safety Performance for Intersection Control Evaluation Tool

Results

Summary of crash prediction results for each alternative

Project Information

Project Name:	SR 70 from Lorraine Rd to CR 675	**Intersection Type**	At-Grade Intersections
Intersection:	SR 70 @ CR 675	**Opening Year**	2025
Agency:	D1	**Design Year**	2045
Project Reference:	414506-2-22-01	**Facility Type**	On Urban and Suburban Arterial
City:	Unincorporated Manatee County	**Number of Legs**	4-leg
State:	FL	**1-Way/2-Way**	2-way Intersecting 2-way
Date:	6/14/2019	**# of Major Street Lanes (both directions)**	5 or fewer
Analyst:	Nicole Harris, PE	**Major Street Approach Speed**	Less than 55 mph

Crash Prediction Summary

Control Strategy	Crash Type	Opening Year	Design Year	Total Project Life Cycle	Rank	AADT Within Prediction Range?	Source of Prediction
Traffic Signal	Total	1.91	2.82	49.62	3	Yes	Calibrated SPF w/ EB
	Fatal & Injury	1.05	1.59	27.66			
2-lane Roundabout	Total	5.74	8.33	147.56	2	N/A	Uncalibrated SPF
	Fatal & Injury	0.96	1.45	25.30			
Displaced Left Turn (DLT)	Total	1.68	2.48	43.66	1	N/A	CMF
	Fatal & Injury	0.93	1.40	24.34			

ATTACHMENT E

Cost Estimates

SR 70 and CR 675
Signalized Intersection (Base Condition)
Cost Estimate

Pay Item	Description	Total Quantity	Unit	Weighted Avg. Unit Price	Total Amount	Notes
ROADWAY:Area of influence of intersection is 1130-ft or 0.21 miles along SR 70						
101-1	MOBILIZATION	10.00	%		$ 81,645.16	
102-1	MAINTENANCE OF TRAFFIC	10.00	%		$ 81,645.16	
110-1-1	CLEARING & GRUBBING	2.72	AC	$ 11,000.00	$ 29,962.12	Area to be constructed, including sidestreet returns: (1130 * (30/2+ 24+10+56) half median, lanes & shoulders and border width)
120-1	REGULAR EXCAVATION	2,032.80	CY	$ 5.10	$ 10,367.28	Cost per mile from model @ 0.21 miles
160-4	TYPE B STABILIZATION	5,456.20	SY	$ 3.80	$ 20,733.56	Area to be constructed Use typical section (1130* (2.33+4+24+5+5.33))/9 + 3160 SF/9 for side street - shape
285-709	OPTIONAL BASE,BASE GROUP 09	4,535.88	SY	$ 17.00	$ 77,109.92	Paved area to be constructed:Use typical section (1130* (24+24+5.33))/9 + 3160 SF/9 for side street - shape
327-70-4	MILLING EXIST ASPH PAVT, 3" AVG DEPTH	4,573.11	SY	$ 2.40	$ 10,975.47	Area to be milled and resurfaced: Use typical section (1130* 29)/9 + 8388 SF/9 for side street - shape
334-1-24	SUPERPAVE ASPH CONC, TRAF D, PG76-22,PMA	1,364.49	TN	$ 100.00	$ 136,448.70	Assume Traffic C: Area to be contructed +Area to be millied: (4535.88 *400 + 4573.11*200)/2000
337-7-41	ASPH CONC FC,TRAFFIC B,FC-12.5,PG 76-22	364.36	TN	$ 105.00	$ 38,257.76	Assume Traffic C: (29260 SF*80)/9*2000
430-175-112	PIPE CULV, OPT MATL, ROUND, 12"S/CD	406.56	LF	$ 91.00	$ 36,996.96	Cost per mile from model @ 0.21 miles
520-1-10	CONCRETE CURB & GUTTER, TYPE E	2,217.60	LF	$ 20.00	$ 44,352.00	Cost per mile from model @ 0.21 miles
522-2	CONCRETE SIDEWALK AND DRIVEWAYS, 6"	1,231.86	SY	$ 38.00	$ 46,810.68	Cost per mile from model @ 0.21 miles
570-1-2	PERFORMANCE TURF, SOD	2,741.20	SY	$ 2.60	$ 7,127.12	Cost per mile from model @ 0.21 miles
715-511-140	LIGHT POLE COMP,F&I,SGL ARM SM, AL,40'	7.35	EA	$ 14,600.00	$ 107,310.00	Cost per mile from model @ 0.21 miles
	Signalization	-	PI	$ 250,000.00	$ 250,000.00	One signalized intersection at CR 675 and SR 70
	Partial Total				$ 816,451.57	
	Roadway Total				$ 979,741.88	
999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)	10%			$ 97,974.19	
Intersection Grand Total					$ 1,077,716	

Notes:

PAY ITEM list was created based on FDOT LRE Cost per Mile: MODEL WUUA24-U-19-BB. Contingency covers all other items not shown in Table

Pavement design was assumed to be 4-in for travel lanes and 2-in for shoulders

MOT and MOBILIZATION 10% EACH

No right of way impacts. Potential minor utility impacts to be covered by contingency pay item

SR 70 and CR 675
Roundabout Intersection
Cost Estimate

Pay Item	Description	Total Quantity	Unit	Weighted Avg. Unit Price	Total Amount	Notes
ROADWAY:Area of influence of intersection is 1130-ft or 0.21miles along SR 70						
101-1	MOBILIZATION	10.00	%		$ 78,051.60	
102-1	MAINTENANCE OF TRAFFIC	10.00	%		$ 78,051.60	
110-1-1	CLEARING & GRUBBING	3.45	AC	$ 11,000.00	$ 37,950.00	Area to be constructed, including sidestreet returns: 3.45 AC
120-1	REGULAR EXCAVATION	2,032.80	CY	$ 5.10	$ 10,367.28	Cost per mile from model @ 0.21miles
160-4	TYPE B STABILIZATION	10,994.00	SY	$ 3.80	$ 41,777.20	Area to be constructed, including sidestreet returns: 10994 SY
285-709	OPTIONAL BASE,BASE GROUP 09	10,994.00	SY	$ 17.00	$ 186,898.00	Paved area to be constructed, including sidestreet returns:10994 SY
327-70-4	MILLING EXIST ASPH PAVT, 3" AVG DEPTH	870.00	SY	$ 2.40	$ 2,088.00	Area to be milled and resurfaced, including sidestreet returns: 870 SY
334-1-24	SUPERPAVE ASPH CONC, TRAF D, PG76-22,PMA	2,090.10	TN	$ 100.00	$ 209,010.00	Assume Traffic C: ((9037 SY*400)+ (2827*200))/2000
337-7-41	ASPH CONC FC,TRAFFIC B,FC-12.5,PG 76-22	474.56	TN	$ 105.00	$ 49,828.80	Assume Traffic C: (9037+2827)*80/2000
430-175-112	PIPE CULV, OPT MATL, ROUND, 12"S/CD	406.56	LF	$ 91.00	$ 36,996.96	Cost per mile from model @ 0.21 miles
520-1-10	CONCRETE CURB & GUTTER, TYPE E	2,217.60	LF	$ 20.00	$ 44,352.00	Cost per mile from model @ 0.21 miles
522-2	CONCRETE SIDEWALK AND DRIVEWAYS, 6"	1,231.86	SY	$ 38.00	$ 46,810.68	Cost per mile from model @ 0.21 miles
570-1-2	PERFORMANCE TURF, SOD	2,741.20	SY	$ 2.60	$ 7,127.12	Cost per mile from model @ 0.21 miles
715-511-140	LIGHT POLE COMP,F&I,SGL ARM SM, AL,40'	7.35	EA	$ 14,600.00	$ 107,310.00	Cost per mile from model @ 0.21miles
	Partial Total				$ 780,516.04	
	Roadway Total				$ 936,619.25	
999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)	10%			$ 93,661.92	
Intersection Grand Total					$ 1,030,281	

Notes:

PAY ITEM list was created based on FDOT LRE Cost per Mile: MODEL WUUA24-U-19-BB. Contingency covers all other items not shown in Table

Pavement design was assumed to be 4-in for travel lanes and 2-in for shoulders

MOT and MOBILIZATION 10% EACH

No right of way impacts. Potential minor utility impacts to be covered by contingency pay item

SR 70 and CR 675
Quadrant Intersection
Cost Estimate

Pay Item	Description	Total Quantity	Unit	Weighted Avg. Unit Price	Total Amount	Notes
ROADWAY:Area of influence of intersection is 1180-ft or 0.22 miles along SR 70						
101-1	MOBILIZATION	10.00	%		$ 169,973.56	
102-1	MAINTENANCE OF TRAFFIC	10.00	%		$ 169,973.56	
110-1-1	CLEARING & GRUBBING	2.53	AC	$ 11,000.00	$ 27,830.00	Clearing and Grubbing for areas to be constructed, including sidestreet returns: (1130 * (30/2+ 24+10+56) half median, lanes &
120-1	REGULAR EXCAVATION	2,129.60	CY	$ 5.10	$ 10,860.96	Cost per mile from model @ 0.22 miles
160-4	TYPE B STABILIZATION	15,035.56	SY	$ 3.80	$ 57,135.11	Area to be constructed and stabilized including unpaved shoulders (SR 70, CR 675, new Quadrant road) - Use shapes from DGN
285-709	OPTIONAL BASE,BASE GROUP 09	13,530.00	SY	$ 17.00	$ 230,010.00	Paved area to be constructed: Use stabilization area minus 10 %
327-70-4	MILLING EXIST ASPH PAVT, 3" AVG DEPTH	12,268.89	SY	$ 2.40	$ 29,445.33	Area to be milled and resurfaced: SR 70, WB to NB ramp, and CR 675 - use shape from DGN
334-1-24	SUPERPAVE ASPH CONC, TRAF D, PG76-22,PMA	3,933.00	TN	$ 100.00	$ 393,300.00	Assume Traffic C: Area to be contructed +Area to be millied: (13530*400 + 12270*200)/2000 - Use Optional Base Group Area
337-7-41	ASPH CONC FC,TRAFFIC B,FC-12.5,PG 76-22	1,032.00	TN	$ 105.00	$ 108,360.00	Assume Traffic C: (13530 + 12270 SY*80)/2000
430-175-112	PIPE CULV, OPT MATL, ROUND, 12"S/CD	425.92	LF	$ 91.00	$ 38,758.72	Cost per mile from model @ 0.22 miles
520-70	CONCRETE TRAFFIC SEPARATOR - VARIABLE WIDTH	366.44	SY	$ 105.46	$ 38,645.19	Traffic separator located along quadrant roadway
520-1-10	CONCRETE CURB & GUTTER, TYPE E	2,323.20	LF	$ 20.00	$ 46,464.00	Cost per mile from model @ 0.22 miles
522-2	CONCRETE SIDEWALK AND DRIVEWAYS, 6"	1,290.52	SY	$ 38.00	$ 49,039.76	Cost per mile from model @ 0.22 miles
570-1-2	PERFORMANCE TURF, SOD	2,871.73	SY	$ 2.60	$ 7,466.50	Cost per mile from model @ 0.22 miles
715-511-140	LIGHT POLE COMP,F&I,SGL ARM SM, AL,40'	7.70	EA	$ 14,600.00	$ 112,420.00	Cost per mile from model @ 0.22 miles
	Signalization	3.00	PI	$ 550,000.00	$ 550,000.00	$250,000 for SR 70 @ CR 675 and $150,000 for 2 quadrant road intersections = $550,000
	Partial Total				$ 1,699,735.58	
	Roadway Total				$ 2,039,682.70	
999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)	10%			$ 203,968.27	
-	Right of Way Cost Estimate	-	-	-	$ 10,000.00	Details of the right of way estimate are included in Attachment E.
Intersection Grand Total					$ 2,253,651	

Notes:

PAY ITEM list was created based on FDOT LRE Cost per Mile: MODEL WUUA24-U-19-BB. Contingency covers all other items not shown in

Pavement design was assumed to be 4-in for travel lanes and 2-in for shoulders

MOT and MOBILIZATION 10% EACH

Potential right of way impacts are included for this alternative intersection.

SR 70 and CR 675
Partial Displaced Left-turn Intersection
Cost Estimate

Pay Item	Description	Total Quantity	Unit	Weighted Avg. Unit Price	Total Amount	Notes
ROADWAY: Area of influence of intersection is 1710-ft or 0.32 miles along SR 70						
101-1	MOBILIZATION	10.00	%		$ 166,055.60	
102-1	MAINTENANCE OF TRAFFIC	10.00	%		$ 166,055.60	
110-1-1	CLEARING & GRUBBING	3.34	AC	$ 11,000.00	$ 36,740.00	Clearing and Grubbing for areas to be constructed, including sidestreet returns: Use shapes from DGN
120-1	REGULAR EXCAVATION	3,097.60	CY	$ 5.10	$ 15,797.76	Cost per mile from model @ 0.32 miles
160-4	TYPE B STABILIZATION	12,273.33	SY	$ 3.80	$ 46,638.67	Area to be constructed and stabilized including unpaved shoulders - Use shapes from DGN
285-709	OPTIONAL BASE,BASE GROUP 09	11,046.00	SY	$ 17.00	$ 187,782.00	Paved area to be constructed
327-70-4	MILLING EXIST ASPH PAVT, 3" AVG DEPTH	6,844.44	SY	$ 2.40	$ 16,426.67	Area to be milled and resurfaced - use shape from DGN
334-1-24	SUPERPAVE ASPH CONC, TRAF D, PG76-22,PMA	2,893.60	TN	$ 100.00	$ 289,360.00	Assume Traffic C: Area to be contructed +Area to be millied: (11046*400 + 6844*200)/2000 - Use Optional Base Group Area for new construction
337-7-41	ASPH CONC FC,TRAFFIC B,FC-12.5,PG 76-22	715.60	TN	$ 105.00	$ 75,138.00	Assume Traffic C: (11046 + 6844 SY*80)/2000
430-175-112	PIPE CULV, OPT MATL, ROUND, 12"S/CD	619.52	LF	$ 91.00	$ 56,376.32	Cost per mile from model @ 0.32 miles
520-70	CONCRETE TRAFFIC SEPARATOR - VARIABLE WIDTH	692.22	SY	$ 105.46	$ 73,001.68	Traffic separator located for DLT movement
520-1-10	CONCRETE CURB & GUTTER, TYPE E	3,379.20	LF	$ 20.00	$ 67,584.00	Cost per mile from model @ 0.32 miles
522-2	CONCRETE SIDEWALK AND DRIVEWAYS, 6"	1,877.12	SY	$ 38.00	$ 71,330.56	Cost per mile from model @ 0.32 miles
570-1-2	PERFORMANCE TURF, SOD	4,177.07	SY	$ 2.60	$ 10,860.37	Cost per mile from model @ 0.32 miles
715-511-140	LIGHT POLE COMP,F&I,SGL ARM SM, AL,40'	11.20	EA	$ 14,600.00	$ 163,520.00	Cost per mile from model @ 0.32 miles
	Signalization	3.00	PI	$ 550,000.00	$ 550,000.00	$250,000 for SR 70 @ CR 675 and $150,000 for 2 displaced left intersections (one along SR 70 and one along CR 675) = $550,000
	Partial Total				$ 1,660,556.03	
	Roadway Total				$ 1,992,667.23	
999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)	10%			$ 199,266.72	
Intersection Grand Total					$ 2,191,934	

Notes:

PAY ITEM list was created based on FDOT LRE Cost per Mile: MODEL WUUA24-U-19-BB. Contingency covers all other items not shown in Table

Pavement design was assumed to be 4-in for travel lanes and 2-in for shoulders

MOT and MOBILIZATION 10% EACH

No right of way impacts

No right of way impacts. Potential minor utility impacts to be covered by contingency pay item

SR 70 - ROW Cost Estimates for the Intersection Control Evaluation

Intersection	Configuration	Square footage or ROW Aquisition	ROW Cost Per Square Foot	ROW Cost Estimate
Uihlein at SR 70	Partial Displaced Left-Turn (DLT)	15178	$120	$ 1,820,000
Del Webb at SR 70	Partial Displaced Left-Turn (DLT)	3456	$120	$ 410,000
Bourneside at SR 70	Partial Displaced Left-Turn (DLT)	9921	$120	$ 1,190,000
		9430	$120	$ 1,130,000
	Quadrant roadway	439976	$120	$ 52,800,000
CR 675 at SR 70 (2)	Quadrant roadway	68504	$2,750	$ 10,000

(1) ROW cost estimates are based on the table below

(2) For ROW needs for CR 675, it is assumed that the property will require a full take. The actual property value was used for this estimate.

Property Value Estimates

Folio	Total Just Value as of 2018	Property Size (sq ft.)	Cost Per Sq. Ft.	Inflated cost (factor by 3)	Recommended Cost/Sq Ft to Apply to ROW
586104409	$ 291,876.00	7640.424	$ 38.20	114.6046345	120
586109109	$ 425,015.00	10672.2	$ 39.82	119.4734919	

(1) Property cost estimates were obtained from 2 residential properties near the Lakewood Ranch area. Currently, the Lakewood Ranch residential area is under development and there are no property values from the Manatee County Property Appraiser. The alternative intersection ROW needs are impacting the residential area under development; therefore, there are no property values that could be use for ROW estimates.

(2) These property estimates are used for the intersections of Uihlein, Del Webb, and Bourneside. Since CR 675 is a full take, the property appraised value for that property will be used.

ATTACHMENT F

Delay Calculations

Delay Information

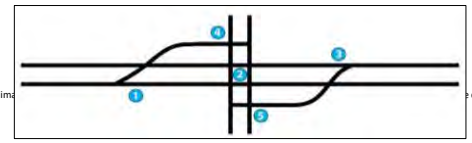
Use this sheet to enter the delay information for each of the included control strategies.

NOTE: Average delay values estimated using specific sheets within this file ("DLT EW", "QR Delay Intstructions") except for the quadrant roadway. A separate file was created for the quadrant design in order to calculate the intersections average delay. The roundabout delay is based on the Sidra output.

				Opening Year			Design Year		
At-Grade Intersections				Average vehicle delay			Average vehicle delay		
Control Strategy		Delay Type	Units	AM peak	PM peak	Weekend peak	AM peak	PM peak	Weekend peak
Traffic Signal	Single Input	Single Input	sec/veh	14.4	10.9		16.2	13.2	
Roundabout	Single Input	Single Input	sec/veh	6.0	5.6		9.6	7.9	
Displaced Left Turn (DLT)	Single Input	Worksheet (Partial E-W)	sec/veh	13.6	17.3		17.2	19.5	
Quadrant Roadway Intersection	Single Input	View Instructions	sec/veh	20.1	18.3		35.3	31.2	

DLT E-W

Use this sheet to enter the delay information for a partial DLT with the displaced lefts on the East-West street. (Requires turning movement count demand inputs)



User must enter value on ! NOTE: Average delay values estima e quadrant roadway. A separate file was created for the quadrant design in order to calculate the intersections avera

Note: Intersections 2, 4, and 5 are a single intersection at an actual DTL.
Modeling in SYNCHRO requires 3 separate intersections

Movement nomenclature refers to equivalent movement at conventional intersection.

Opening Year AM Peak — TEV: 1154

Intersection 1	EB Left	WB Thru*	SB Right
Volume	59	512	133
Delay	23.3	7.7	3.8

Intersection 2	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	NB Left&U	NB Thru	SB Left&U	SB Thru
Volume	59	286	10	17	512	0	31	6	83	3
Delay (Intx 2)		6.6	6.6		4.3	0	23.3	23.3	37.4	37.4
Delay (Intx 4)	23.4								3.8	3.8
Delay (Intx 5)				3.8			0	0		

Intersection 3	EB Thru**	WB Left	NB Right
Volume	286	17	14
Delay	0	0	0

* Delay entered for this movement also applied to NB Left Turn movement
** Delay entered for this movement also applied to SB Left Turn movment

Average delay for DLT: 13.6

Opening Year PM Peak — TEV: 1093

Intersection 1	EB Left	WB Thru*	SB Right
Volume	124	289	50
Delay	25	7.1	3.7

Intersection 2	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	NB Left&U	NB Thru	SB Left&U	SB Thru
Volume	124	494	13	10	289	0	23	4	72	4
Delay (Intx 2)		7.4	7.4		4	0	22.6	22.6	36.4	36.4
Delay (Intx 4)	40.7								3.8	3.8
Delay (Intx 5)				3.9			0	0		

Intersection 3	EB Thru**	WB Left	NB Right
Volume	494	10	10
Delay	0	0	0

* Delay entered for this movement also applied to NB Left Turn movement
** Delay entered for this movement also applied to SB Left Turn movment

Average delay for DLT: 17.3

Design Year AM Peak — TEV: 1800

Intersection 1	EB Left	WB Thru*	SB Right
Volume	107	719	193
Delay	22.3	11.9	4.8

Intersection 2	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	NB Left&U	NB Thru	SB Left&U	SB Thru
Volume	107	493	26	51	719	0	45	10	121	10
Delay (Intx 2)		10	10		5.6	0	21.8	21.8	41.3	41.3
Delay (Intx 4)	22.5								4.7	4.7
Delay (Intx 5)				4.7			0	0		

Intersection 3	EB Thru**	WB Left	NB Right
Volume	493	51	25
Delay	0	0	0

* Delay entered for this movement also applied to NB Left Turn movement
** Delay entered for this movement also applied to SB Left Turn movment

Average delay for DLT: 17.2

Design Year PM Peak — TEV: 1687

Intersection 1	EB Left	WB Thru*	SB Right
Volume	181	461	85
Delay	28.2	6	4.8

Intersection 2	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	NB Left&U	NB Thru	SB Left&U	SB Thru
Volume	181	724	25	20	461	0	40	10	110	6
Delay (Intx 2)		9.7	9.7		5.5	5.5	24.5	24.5	41.5	41.5
Delay (Intx 4)	46.3								5.1	5.1
Delay (Intx 5)				5.1			0	0		

Intersection 3	EB Thru**	WB Left	NB Right
Volume	724	20	25
Delay	0	0	0

* Delay entered for this movement also applied to NB Left Turn movement
** Delay entered for this movement also applied to SB Left Turn movment

Average delay for DLT: 19.5

This worksheet computes a DLT delay value in a manner consistent with the Highway Capacity Manual 6th Edition. This worksheet assumes coordination of certain movements within the DLT and relies in SYNCHRO to capture the delay-related effects of coordination.

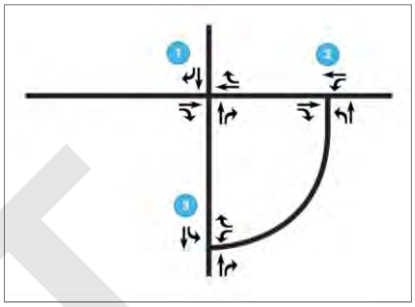
Quadrant Roadway

This sheet provides guidance on how to compute the intersection delay for a Quadrant Roadway. (Requires turning movement count demand inputs)

The Highway Capacity Manual 6th Edition provides a framework for computing delay at alternative intersections where some movements are relocated from the main intersection to outlying intersections, and it provides specific methodologies for some alternative intersection forms that account for both control delay at intersections and extra distance travel time (EDTT) to and from outlying intersections. EDTT can be computed by dividing distance (in feet) by speed (in feet per second). Unlike RCUT, MUT, and DLT intersections, the FDOT ICE Tool does not provide a worksheet for quadrant roadways due to the number of variations possible and the relative ease of computing delay manually on a project-by-project basis. Although the HCM 6th Edition does not provide a quadrant roadway methodology, the overall alternative intersection framework can be used to compute delay as follows:

If a quadrant roadway creates new intersections:

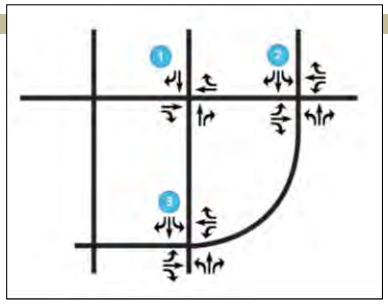
If a quadrant roadway creates two new intersections to redirect some movements away from an existing main intersection, the delay computed for the quadrant roadway should include delay at the main intersection, EDTT for movements redirected away from the main intersection (i.e. the four left turn movements), and delay at the outlying intersections for all movements. Similar to a conventional intersection, delay is computed with a weighted of the individual movement delays, where the "weight" is the volume of each movement.



In the figure below, for example, eastbound through traffic experiences delay at intersection 1 and intersection 2, and the sum of these two delay values is multiplied by the eastbound through volume to compute the average delay for the quadrant roadway intersection. EDTT is computed for the four re-routed left-turn movements and added to the delay associated with those movements to compute the overall quadrant roadway intersection delay. For any given movement, EDTT is defined as the out-of-direction travel time minus the travel time to make a direct movement at the main intersection (if it were permitted). For example, EDTT for a northbound left turn in the figure below would be computed as the travel time from intersection 3 to 2 plus the travel time from intersection two to one minus the travel time from intersection 3 to 1.

If the quadrant roadway redirects traffic through existing intersections:

If a quadrant roadway redirects movements away from an existing main intersection via an existing roadway network and utilizes existing intersections to accommodate these movements, there is delay occurring at outlying intersections not associated with the quadrant roadway itself. In this case, all delay at intersection 1 (including EDTT) is included in the quadrant roadway delay calculation, but not all delay at intersections 2 and 3 is included. At intersections 2 and 3, delay for each movement should be recorded with and without the quadrant roadway. The difference between these values represents delay associated with the quadrant roadway and that difference should be included in the quadrant roadway delay computation.



CR 675 - Quadrant Roadway Intersection Delay Calculation

Delay calculations are based on guidance from the Highway Capacity Manual, Chapter 23.

Intersection 1 CR 675 and SR 70
Intersection 2 SR 70 and Quadrant Roadway
Intersection 3 CR 675 and Quadrant Roadway

DESIGN YEAR (2045)

TEV: 1800

AM Peak Hour (volumes and delay from Synchro output)

Intersection 1	Movements	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Volumes		55	25		61	190		600	26		764	0
	Delay		47	47		45.1	45.1		2.4	2.4		0.2	0.2
Intersection 2	Movements	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Volumes				121		45	107	518			719	51
	Delay				48.9		16.7	22.1	3			26.9	26.8
Intersection 3	Movements	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Volumes		10	45	121	203					51		107
	Delay		0	10.6	32.3	2.6					30.7		25.8

EBTT (Extra Distance Travel Time)

Distance			Speed			EBTT		
Intersection 1	2	3	1	2	3	1	2	3
Intersection 1	440	300		40	30	#DIV/0!	7.5	6.818182
Intersection 2	440		620	40		30	7.5	#DIV/0!	14.09091
Intersection 3	300	620		30	30		6.818182	14.09091	#DIV/0!

Total delay 63629.7

Int. Delay 35.34983

Movement	EBTT	Volume (left-turns at main intersection)
EBL	21.59091	107
WBL	20.90909	51
NBL	28.40909	45
SBL	14.09091	121

PM Peak Hour (volumes and delay from synchro output)

TEV: 1687

Intersectio	Movement	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Volumes		50	25		27	85		905	25		501	0
	Delay		48.8	48.8		40.9	40.9		2.6	2.6		0.1	0.1
Intersectio	Movement	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Volumes				110		40	181	749			461	20
	Delay				49.2		12.4	17.8	3.2			28.9	28.8
Intersectio	Movement	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Volumes		10	46	110	91					20		181
	Delay		12.8	12.8	31.4	3.2					35.3		24

EBTT (Extra Distance Travel Time)

Distance Intersecti			Speed			EBTT		
on 1	2	3	1	2	3	1	2	3
Intersection 1	440	300		40	30	#DIV/0!	7.5	6.818182
Intersectio	440		620	40		30	7.5	#DIV/0!	14.09091
Intersectio	300	620		30	30		6.818182	14.09091	#DIV/0!

Total delay 52658.9

Int. Delay 31.21452

Movement	EBTT	Volume (left-turns at main intersection)
EBL	21.59091	181
WBL	20.90909	20
NBL	28.40909	40
SBL	14.09091	110

OPENING YEAR (2025)

TEV: 1800

AM Peak Hour (volumes and delay from Synchro output)

Intersection 1	Movements	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Volumes		37	14		20	133		345	10		543	0
	Delay		50.9	50.9		42.8	42.8		1.7	1.7		0.2	0.2
Intersection 2	Movements	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Volumes				83		31	59	300			512	17
	Delay				50.2		16.2	19.7	2.2			22.6	22.6
Intersection 3	Movements	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Volumes		6	31	83	136					17		59
	Delay		0	9.3	30.7	1.7					42.5		26.7

EBTT (Extra Distance Travel Time)

Distance			Speed			EBTT		
Intersection 1	2	3	1	2	3	1	2	3
Intersection 1	440	300		40	30	#DIV/0!	7.5	6.818182
Intersection 2	440		620	40		30	7.5	#DIV/0!	14.09091
Intersection 3	300	620		30	30		6.818182	14.09091	#DIV/0!

Total delay 36291.03

Int. Delay 20.16168

Movement	EBTT	Volume (left-turns at main intersection)
EBL	21.59091	59
WBL	20.90909	17
NBL	28.40909	31
SBL	14.09091	8

PM Peak Hour (volumes and delay from synchro output)

TEV: 1687

Intersectio	Movement	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Volumes		27	10		14	50		618	13		312	0
	Delay		48.7	48.7		43	43		1.8	1.8		0.1	0.1
Intersectio	Movement	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Volumes				72		23	124	504			289	10
	Delay				51.2		12	15.5	2.2			25.7	25.6
Intersectio	Movement	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
	Volumes		4	23	72	54					10		124
	Delay		0	11.3	29.9	2.3					37.8		24.7

EBTT (Extra Distance Travel Time)

Distance Intersecti			Speed			EBTT		
on 1	2	3	1	2	3	1	2	3
Intersection 1	440	300		40	30	#DIV/0!	7.5	6.818182
Intersectio	440		620	40		30	7.5	#DIV/0!	14.09091
Intersectio	300	620		30	30		6.818182	14.09091	#DIV/0!

Total delay 30929.42

Int. Delay 18.33398

Movement	EBTT	Volume (left-turns at main intersection)
EBL	21.59091	124
WBL	20.90909	10
NBL	28.40909	23
SBL	14.09091	72

ATTACHMENT G

Benefit / Cost Summary

Outputs

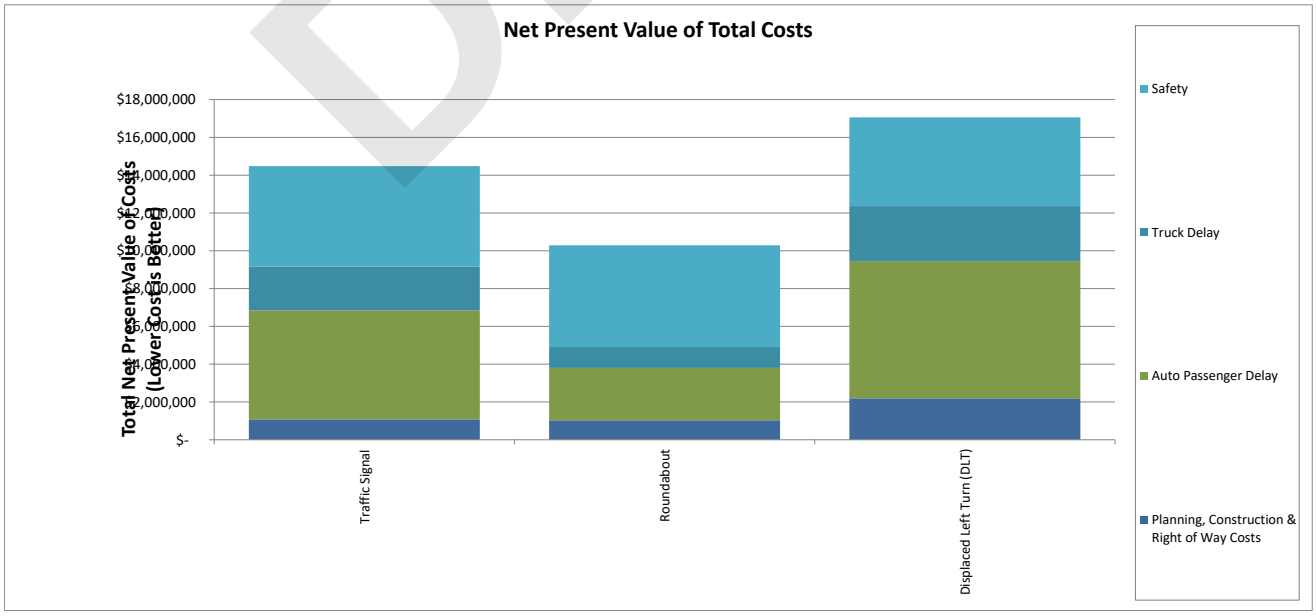
This sheet compiles the data from summary tables in individual alternatives sheets. To populate the output sheet press the "Setup Worksheets" button in the Alternatives_MasterList tab.

Agency:	FDOT District 1
Project Name:	SR 70 from Lorraine Rd to CR 675
Project Reference:	FDOT Project #414506-2-22-01
Intersection:	SR 70 and CR 675
City:	Unincorporated Manatee County
State:	Florida
Performing Department or Organization:	Florida Department of Transportation - District 1
Date:	6/14/2019
Analyst:	CB
Analysis Type	At-Grade Intersection

Analysis Summary

Cost Categories	Net Present Value of Costs			
	Traffic Signal	Roundabout	Displaced Left Turn (DLT)	Quadrant Roadway Intersection
Planning, Construction & Right of Way Costs	$ 1,080,000	$ 1,030,000	$ 2,190,000	$ 2,242,000
Auto Passenger Delay	$ 5,769,340	$ 2,768,886	$ 7,265,081	$ 9,491,999
Truck Delay	$ 2,311,092	$ 1,109,165	$ 2,910,259	$ 3,802,322
Safety	$ 5,318,175	$ 5,377,828	$ 4,696,496	--
Total cost	**$14,576,836**	**$10,358,830**	**$17,300,111**	**$15,831,007**

Select Base Case for Benefit-Cost Comparison: (Choose from list)	Traffic Signal	Two-Way stop control (existing condition)		
Benefit Categories	**Net Present Value of Benefits Relative to Base Case**			
	Traffic Signal	**Roundabout**	**Displaced Left Turn (DLT)**	**Quadrant Roadway Intersection**
Auto Passenger Delay		$ 3,000,454	$ (1,495,741)	$ (3,722,659)
Truck Delay		$ 1,201,927	$ (599,166)	$ (1,491,229)
Safety		$ (59,653)	$ 621,679	
Net Present Value of Benefits		**$ 4,142,729**	**$ (1,473,228)**	**$ (5,213,889)**
Net Present Value of Costs		**$ (75,277)**	**$ 1,250,048**	**$ 1,358,457**
Net Present Value of Improvement		**$ 4,218,006**	**$ (2,723,275)**	**$ (6,572,346)**
Benefit-Cost (B/C) Ratio		**Control strategy preferred. Benefits are greater than base case and cost is less than base case.**	**Control Strategy not preferred. Benefits are less than base case and cost is greater than base case.**	**Control Strategy not preferred. Benefits are less than base case and cost is greater than base case.**
Delay B/C		**Control strategy preferred. Benefits are greater than base case and cost is less than base case.**	**Control Strategy not preferred. Benefits are less than base case and cost is greater than base case.**	**Control Strategy not preferred. Benefits are less than base case and cost is greater than base case.**
Safety B/C		**Benefits are less than base case and cost is less than base case.**	**0.50**	**Due to lack of crash experience nationawide, the safety performance of a QR is not known (see FHWA Publication FHWA-HRT-09-060)**



ATTACHMENT H

FDOT ICE Stage 1 Form, Capacity Analysis for Planning of Junctions (CAP-X), and Stage 1 SPICE

Florida Department of Transportation
Intersection Control Evaluation (ICE) Form
Stage 1: Screening

To fulfill the requirements of Stage 1 (Screening) of FDOT's ICE procedures, complete the following form and append all supporting documentation. Completed forms can be submitted to the District Traffic Operations Engineer (DTOE) and District Design Engineer (DDE) for the project's approval.

Project Name	SR 70 from Lorraine Rd to CR 675	FDOT Project #	414506-2-22-01	Date	06/14/19
Submitted By	Nicole Harris, PE	Agency/Company	Stantec	Email	nicole.harris@stantec.com
FDOT Context Classification	C3R - Suburban Residential	FDOT District	District 1	County	Manatee
Project Locality (*City/Town/Village*)	Unincorporated Manatee County	Project Type	Corridor Improvement Project		
Project Purpose (*What is the catalyst for this project and why is it being undertaken?*)	A PD&E Study is being completed with the purpose of increasing capacity and improving traffic operational conditions along the SR 70 corridor from Lorraine Road to CR 675/Waterbury Road. The Intersection Control Evaluation (ICE) is based on the future build improvements of the project which widen SR 70 to 4-lanes. This ICE will focus on the intersection with CR 675.				
Project Setting Description (*Describe the area surrounding the intersection*)	SR 70 at CR 675 Future Land Use is comprised ofAgricultutal -Commerical. There is a major residential development that is changing the setting from rural to suburban/residential.				
Multimodal Context (*Describe the pedestrian, bicycle, and transit activity in the area and the potential for activity based on surrounding land uses and development patterns*)	SR 70, there are proposed sidewalks and paved shoulders on both sides of the road. CR 675 does not have sidewalks or paved shoulders.				

Major Street Information								
Route #:	SR 70	Route Name(s)				Milepost		
Existing Control Type	Two-way Stop-Control	Existing AADT	9,600	Design Year AADT	16,000			
Design Vehicle	Interstate Semitrailer (WB-62)	Control Vehicle	Interstate Semitrailer (WB-62)					
Primary Functional Classification	Urban Principal Arterial			Design Speed (mph)	55			
Secondary Functional Classification (if app.)				Target Speed (mph) [if app.]				

Approach #1	Direction	Eastbound	Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes	
	Sidewalks along	Both sides of the approach	Left-Turn	1				
	Crosswalk on Approach?	No	Left-Through		Weekday AM Peak		Weekday PM Peak	
	On-Street Bike Facilities?	Yes	Through	1	Left	107	Left	181
	Multi-Use Path?	No	Left-Through-Right		Through	493	Through	724
	Scheduled Bus Service?	No	Through-Right	1	Right	26	Right	25
	Bus Stop on Approach?	No	Right-Turn		Daily Truck %		14.0%	
Approach #2	Direction	Westbound	Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes	
	Sidewalks along:	Both sides of the approach	Left-Turn	1				
	Crosswalk on Approach?	No	Left-Through		Weekday AM Peak		Weekday PM Peak	
	On-Street Bike Facilities?	Yes	Through	1	Left	51	Left	20
	Multi-Use Path?	No	Left-Through-Right		Through	719	Through	461
	Scheduled Bus Service?	No	Through-Right		Right	92	Right	110
	Bus Stop on Approach?	No	Right-Turn	1	Daily Truck %		14.0%	

Minor Street Information											
Route #:	CR 675	Route Name(s)	Waterbury Rd.					Milepost (if app.)			
Existing Control Type	Two-way Stop-Control			Existing AADT	2,600			Design Year AADT	5,400		
Design Vehicle	Interstate Semitrailer (WB-62)			Control Vehicle	Interstate Semitrailer (WB-62)						
Primary Functional Classification	Rural Principal Arterial							Design Speed (mph)			
Secondary Functional Classification (if app.)								Target Speed (mph) [if app.]	45		

Approach #1	Direction	Southbound	Number of Lanes		Study Period #1 Traffic Volumes			Study Period #2 Traffic Volumes			
	Sidewalks along:	Neither side of the approach	Left-Turn								
	Crosswalk on Approach?	No	Left-Through	1	Weekday AM Peak			Weekday PM Peak			
	On-Street Bike Facilities?	No	Through		Left	121		Left	110		
	Multi-Use Path?	No	Left-Through-Right		Through	10		Through	6		
	Scheduled Bus Service?	No	Through-Right		Right	193		Right	85		
	Bus Stop on Approach?	No	Right-Turn	1	Daily Truck %			14.0%			
Approach #2	Direction	Northbound	Number of Lanes		Study Period #1 Traffic Volumes			Study Period #2 Traffic Volumes			
	Sidewalks along:	Neither side of the approach	Left-Turn								
	Crosswalk on Approach?	No	Left-Through		Weekday AM Peak			Weekday PM Peak			
	On-Street Bike Facilities?	No	Through		Left	45		Left	40		
	Multi-Use Path?	No	Left-Through-Right	1	Through	10		Through	10		
	Scheduled Bus Service?	No	Through-Right		Right	25		Right	25		
	Bus Stop on Approach?	No	Right-Turn		Daily Truck %			4.0%			
Approach #3	Direction		Number of Lanes		Study Period #1 Traffic Volumes			Study Period #2 Traffic Volumes			
	Sidewalks along:		Left-Turn								
	Crosswalk on Approach?		Left-Through		Weekday AM Peak			Weekday PM Peak			
	On-Street Bike Facilities?		Through		Left			Left			
	Multi-Use Path?		Left-Through-Right		Through			Through			
	Scheduled Bus Service?		Through-Right		Right			Right			
	Bus Stop on Approach?		Right-Turn		Daily Truck %						

Crash History (Existing Intersections Only)
Append the most recent five-years of crash data for the intersection from the CAR System. If the crash data evidences any issues relating to safety performance, discuss briefly here:
The crash history was not included in the analysis since the future conditions of SR 70 changes significantly from a 2 lane undivided to a 4-lane divided. Instead, a predictive crash model was used for the analysis.

Control Strategy Evaluation						
Provide a brief justification as to why each of the following control strategies should be advanced or not. Justification should consider potential environmental impacts.						
	CAP-X Outputs					
	V/C Ratio					
Control Strategy	Weekday AM Peak	Weekday PM Peak	Multimodal Score	SPICE Ranking	Strategy to Be Advanced?	Justification
Two-Way Stop-Controlled	2.06	2.10	N/A	4	No	Future volumes exceed Peak Hour Volume Thresholds based on FDOT ICE Manual, Figure A1
All-Way Stop-Controlled	1.35	1.28	N/A	N/A	No	Future volumes exceed Peak Hour Volume Thresholds based on FDOT ICE Manual, Figure A1
Signalized Control	0.38	0.34	4.8	8	Yes	Move to Stage 2 based on v/c for am and pm hours
Roundabout	1x2 0.54 2x2 0.42	1x2 0.44 2x2 0.44	5.6	1 & 7	Yes	Roundabout to Stage 2 due to V/C compared to other control types. Note that WBR already has a by-pass lane which may benefit control type
Median U-Turn	0.45	0.41	6.3	3	No	V/C higher than other intersection control types that are being advanced to stage 2.
RCUT (Signalized)	0.45	0.36	6.2	5	No	V/C higher than other intersection control types that are being advanced to stage 2.
RCUT (Unsignalized)	1.12	0.45	4.4	2	No	V/c greater than one
Jughandle				N/A	No	Not included in the analysis.
Displaced Left-Turn	Partial 0.30 DLT 0.29	Partial 0.30 DLT 0.29	4.8	6	Yes	Move DLT to Stage 2
Continuous Green Tee	N/A	N/A	N/A	N/A	No	Not a T-intersection.
Quadrant Roadway	NE 0.37	NE 0.33	4.4		Yes	Move SE Quad to Stage 2
Partial MUT	0.37	0.36	6.3	N/A	No	Other intersection control types which showed more favorable V/C ratios were advanced to stage 2
Other 2 (Type)	N/A	N/A	N/A	N/A	No	No additional alternative intersection configurations were included in this analysis.

Resolution					
To be filled out by FDOT District Traffic Operations Engineer and District Design Engineer					
Project Determination	Multiple Viable Alternatives Identified: Continue to Stage 2				
Comments					
DTOE Name		Signature		Date	
DDE Name		Signature		Date	

Capacity Analysis for Planning of Junctions

Summary Report - Page 1 of 2

Project Name:	SR 70 @ CR 675
Project Number:	0
Location:	Unincorporated Manatee County
Date:	2045 AM
Number of Intersection Legs:	4
Major Street Direction	East-West

Traffic Volume Demand

	Volume (Veh/hr)				Percent (%)	
	U-Turn	**Left**	**Thru**	**Right**	Heavy Vehicles	Volume Growth
Eastbound	0	107	493	26	7.00%	0.00%
Westbound	0	51	719	92	7.00%	0.00%
Southbound	0	121	10	193	7.00%	0.00%
Northbound	0	45	10	25	2.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	**0.80**	**0.95**		**0.85**		

Truck to PCE Factor	**Suggested = 2.00**	2.00
FDOT Context Zone	**C3R-Suburban Residential**	
Critical Lane Volume Threshold — 2-phase signal	**Suggested = 1800**	**1800**
Critical Lane Volume Threshold — 3-phase signal	**Suggested = 1750**	**1750**
Critical Lane Volume Threshold — 4-phase signal	**Suggested = 1700**	**1700**

Capacity Analysis for Planning of Junctions

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Multimodal Score	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
Displaced Left Turn	0.29	1	4.8	Fair	Fair	Good
Partial Displaced Left Turn E-W	0.30	2	4.8	Fair	Fair	Good
Quadrant Roadway N-E	0.37	3	4.4	Fair	Fair	Fair
Partial Median U-Turn E-W	0.37	3	6.3	Good	Good	Fair
Traffic Signal	0.38	5	4.8	Fair	Fair	Good
2 X 2	0.42	6	5.6	Fair	Good	Good
Signalized Restricted Crossing U-Turn E-W	0.45	7	6.3	Good	Good	Fair
Median U-Turn E-W	0.45	7	6.3	Good	Good	Fair
1 X 2	0.54	9	5.6	Fair	Good	Good
1 X 1	0.80	10	6.7	Good	Good	Good

Capacity Analysis for Planning of Junctions

Project Name:	SR 70 @ CR 675
Project Number:	0
Location:	Unincorporated Manatee County
Date:	2045 AM
Number of Intersection Legs:	4
Major Street Direction:	East-West

Traffic Volume Demand

	Volume (Veh/hr)				Percent (%)	
	U-Turn	Left	Thru	Right	Heavy Vehicles	Volume Growth
Eastbound	0	107	493	26	7.00%	0.00%
Westbound	0	51	719	92	7.00%	0.00%
Southbound	0	121	10	193	7.00%	0.00%
Northbound	0	45	10	25	2.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	**0.80**	**0.95**		**0.85**		

Truck to PCE Factor		**Suggested = 2.00**	2.00
FDOT Context Zone		**C3R-Suburban Residential**	
Critical Lane Volume Threshold	2-phase signal	**Suggested = 1800**	**1800**
	3-phase signal	**Suggested = 1750**	**1750**
	4-phase signal	**Suggested = 1700**	**1700**

Capacity Analysis for Planning of Junctions

Number of Lanes for Non-roundabout Intersections																			
TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Traffic Signal	FULL		0	1	0		0	1	1		1	2	0		1	2	1
Two-Way Stop Control	E-W		0	1	0		0	1	1		1	2	0		1	2	1
All-Way Stop Control	FULL		0	1	0		0	1	1		1	2	0		1	2	1
Quadrant Roadway	N-E			0	0		0	0	0		0	0	0		0	0	0
Partial Displaced Left Turn	E-W		0	1	0		0	1	1		1	2	0		1	2	1
Displaced Left Turn	FULL		0	1	0		0	1	1		1	2	0		1	2	1
Signalized Restricted Crossing U-Turn	E-W				1				1	1	1	2	0	1	1	2	1
Unsignalized Restricted Crossing U-Turn	E-W				1				1	1	1	2	0	1	1	2	1
Median U-Turn	E-W			1	0			1	1	1		2	0	1		2	1
Partial Median U-Turn	E-W		0	1	0		0	1	1	1		2	0	1		2	1

Number of Lanes for Interchanges																	
TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R

Capacity Analysis for Planning of Junctions

Results for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Traffic Signal	FULL									645	0.38	0.38	Fair	Fair	Good
Two-Way Stop Control	E-W									--	2.06	2.06	Poor	Fair	Good
All-Way Stop Control	FULL									2021	1.35	1.35	Good	Good	Good
Quadrant Roadway	N-E	255	0.15			640	0.37			651	0.36	0.37	Fair	Fair	Fair
Partial Displaced Left Turn	E-W					399	0.22	528	0.29	525	0.30	0.30	Fair	Fair	Good
Displaced Left Turn	FULL	260	0.14	142	0.08	399	0.22	528	0.29	520	0.29	0.29	Fair	Fair	Good
Signalized Restricted Crossing U-Turn	E-W	816	0.45	425	0.24	531	0.30	510	0.28			0.45	Good	Good	Fair
Unsignalized Restricted Crossing U-Turn	E-W	815	1.12	677	0.21	922	0.10	670	0.19			1.12	Fair	Fair	Fair
Median U-Turn	E-W					661	0.37	565	0.31	807	0.45	0.45	Good	Good	Fair
Partial Median U-Turn	E-W					604	0.34	404	0.22	656	0.37	0.37	Good	Good	Fair

Capacity Analysis for Planning of Junctions

Results for Roundabouts

TYPE OF ROUNDABOUT	Zone 1 (North)			Zone 3 (East)			Zone 2 (South)			Zone 4 (West)			Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3				
50 ICD	1.94			0.78			0.29			1.05			1.94	Good	Good	Good
75 ICD	1.36			0.77			0.23			1.01			1.36	Good	Good	Good
1 X 1	0.62			0.60			0.13			0.80			0.80	Good	Good	Good
1 X 2	0.54			0.29	0.31		0.12			0.40	0.42		0.54	Fair	Good	Good
2 X 2	0.24	0.32		0.40	0.42		0.07	0.05		0.29	0.31		0.42	Fair	Good	Good

Results for Interchanges

TYPE OF INTERCHANGE	Sheet	Zone 1 (Rt Mrg)		Zone 2 (Lt Mrg)		Zone 3 (Ctr. 1)		Zone 4 (Ctr. 2)		Zone 5 (Lt Mrg)		Zone 6 (Rt Mrg)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				

Capacity Analysis for Planning of Junctions

Summary Report - Page 1 of 2

Project Name:	SR 70 @ CR 675
Project Number:	0
Location:	Unincorporated Manatee County
Date:	2045 PM
Number of Intersection Legs:	4
Major Street Direction	East-West

Traffic Volume Demand

	Volume (Veh/hr)				Percent (%)	
	U-Turn	**Left**	**Thru**	**Right**	Heavy Vehicles	Volume Growth
Eastbound	0	181	724	25	7.00%	0.00%
Westbound	0	20	461	110	7.00%	0.00%
Southbound	0	110	6	85	7.00%	0.00%
Northbound	0	40	10	25	2.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	**0.80**	**0.95**		**0.85**		

Truck to PCE Factor	**Suggested = 2.00**	2.00
FDOT Context Zone	**C3R-Suburban Residential**	
Critical Lane Volume Threshold — 2-phase signal	**Suggested = 1800**	**1800**
Critical Lane Volume Threshold — 3-phase signal	**Suggested = 1750**	**1750**
Critical Lane Volume Threshold — 4-phase signal	**Suggested = 1700**	**1700**

Capacity Analysis for Planning of Junctions

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Multimodal Score	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
Displaced Left Turn	0.29	1	4.8	Fair	Fair	Good
Partial Displaced Left Turn E-W	0.30	2	4.8	Fair	Fair	Good
Quadrant Roadway N-E	0.33	3	4.4	Fair	Fair	Fair
Traffic Signal	0.34	4	4.8	Fair	Fair	Good
Signalized Restricted Crossing U-Turn E-W	0.36	5	6.3	Good	Good	Fair
Partial Median U-Turn E-W	0.36	5	6.3	Good	Good	Fair
Median U-Turn E-W	0.41	7	6.3	Good	Good	Fair
1 X 2	0.44	8	5.6	Fair	Good	Good
2 X 2	0.44	8	5.6	Fair	Good	Good
Unsignalized Restricted Crossing U-Turn E-W	0.45	10	4.4	Fair	Fair	Fair

Capacity Analysis for Planning of Junctions

Project Name:	SR 70 @ CR 675
Project Number:	0
Location:	Unincorporated Manatee County
Date:	2045 PM
Number of Intersection Legs:	4
Major Street Direction:	East-West

Traffic Volume Demand

	Volume (Veh/hr)				Percent (%)	
	U-Turn	Left	Thru	Right	Heavy Vehicles	Volume Growth
Eastbound	0	181	724	25	7.00%	0.00%
Westbound	0	20	461	110	7.00%	0.00%
Southbound	0	110	6	85	7.00%	0.00%
Northbound	0	40	10	25	2.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	**0.80**	**0.95**		**0.85**		

Truck to PCE Factor		**Suggested = 2.00**	2.00
FDOT Context Zone		**C3R-Suburban Residential**	
Critical Lane Volume Threshold	2-phase signal	**Suggested = 1800**	**1800**
	3-phase signal	**Suggested = 1750**	**1750**
	4-phase signal	**Suggested = 1700**	**1700**

Capacity Analysis for Planning of Junctions

Number of Lanes for Non-roundabout Intersections																			
TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Traffic Signal	FULL		0	1	0		0	1	1		1	2	0		1	2	1
Two-Way Stop Control	E-W		0	1	0		0	1	1		1	2	0		1	2	1
All-Way Stop Control	FULL		0	1	0		0	1	1		1	2	0		1	2	1
Quadrant Roadway	N-E			0	0		0	0	0		0	0	0		0	0	0
Partial Displaced Left Turn	E-W		0	1	0		0	1	1		1	2	0		1	2	1
Displaced Left Turn	FULL		0	1	0		0	1	1		1	2	0		1	2	1
Signalized Restricted Crossing U-Turn	E-W				1				1	1	1	2	0	1	1	2	1
Unsignalized Restricted Crossing U-Turn	E-W				1				1	1	1	2	0	1	1	2	1
Median U-Turn	E-W			1	0			1	1	1		2	0	1		2	1
Partial Median U-Turn	E-W		0	1	0		0	1	1	1		2	0	1		2	1

Number of Lanes for Interchanges																	
TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R

Capacity Analysis for Planning of Junctions

Results for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Traffic Signal	FULL									575	0.34	0.34	Fair	Fair	Good
Two-Way Stop Control	E-W									--	2.10	2.10	Poor	Fair	Good
All-Way Stop Control	FULL									1920	1.28	1.28	Good	Good	Good
Quadrant Roadway	N-E	393	0.22			575	0.33			592	0.33	0.33	Fair	Fair	Fair
Partial Displaced Left Turn	E-W					482	0.27	471	0.26	525	0.30	0.30	Fair	Fair	Good
Displaced Left Turn	FULL	328	0.18	97	0.05	482	0.27	471	0.26	525	0.29	0.29	Fair	Fair	Good
Signalized Restricted Crossing U-Turn	E-W	520	0.29	537	0.30	380	0.21	653	0.36			0.36	Good	Good	Fair
Unsignalized Restricted Crossing U-Turn	E-W	534	0.45	910	0.28	632	0.07	996	0.23			0.45	Fair	Fair	Fair
Median U-Turn	E-W					610	0.34	672	0.37	744	0.41	0.41	Good	Good	Fair
Partial Median U-Turn	E-W					559	0.31	524	0.29	622	0.36	0.36	Good	Good	Fair

Capacity Analysis for Planning of Junctions

Results for Roundabouts

TYPE OF ROUNDABOUT	Zone 1 (North)			Zone 3 (East)			Zone 2 (South)			Zone 4 (West)			Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3				
50 ICD	0.43			1.08			-3.45			0.79			1.08	Good	Good	Good
75 ICD	0.39			1.08			1.13			0.75			1.13	Good	Good	Good
1 X 1	0.28			0.85			0.17			0.59			0.85	Good	Good	Good
1 X 2	0.26			0.42	0.44		0.14			0.29	0.31		0.44	Fair	Good	Good
2 X 2	0.15	0.12		0.29	0.31		0.09	0.07		0.42	0.44		0.44	Fair	Good	Good

Results for Interchanges

TYPE OF INTERCHANGE	Sheet	Zone 1 (Rt Mrg)		Zone 2 (Lt Mrg)		Zone 3 (Ctr. 1)		Zone 4 (Ctr. 2)		Zone 5 (Lt Mrg)		Zone 6 (Rt Mrg)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				

Federal Highway Administration (FHWA)
Safety Performance for Intersection Control Evaluation Tool

Results

Summary of crash prediction results for each alternative

Project Information

Project Name:	SR 70 from Lorraine Rd to CR 675	**Intersection Type**	At-Grade Intersections
Intersection:	SR 70 @ CR 675	**Opening Year**	2025
Agency:	D1	**Design Year**	2045
Project Reference:	414506-2-22-01	**Facility Type**	On Urban and Suburban Arterial
City:	Unincorporated Manatee County	**Number of Legs**	4-leg
State:	FL	**1-Way/2-Way**	2-way Intersecting 2-way
Date:	6/14/2019	**# of Major Street Lanes (both directions)**	5 or fewer
Analyst:	Nicole Harris, PE	**Major Street Approach Speed**	Less than 55 mph

Crash Prediction Summary

Control Strategy	Crash Type	Opening Year	Design Year	Total Project Life Cycle	Rank	AADT Within Prediction Range?	Source of Prediction
Traffic Signal	Total	4.34	6.47	113.25	8	Yes	Calibrated SPF
	Fatal & Injury	1.43	2.16	37.61			
Minor Road Stop	Total	2.11	2.92	52.80	3	Yes	Calibrated SPF
	Fatal & Injury	0.84	1.20	21.34			
All Way Stop	Total	No SPF	No SPF	No SPF	--	N/A	N/A
	Fatal & Injury	No SPF	No SPF	No SPF			
1-lane Roundabout	Total	1.93	2.45	45.97	1	N/A	Uncalibrated SPF
	Fatal & Injury	0.36	0.48	8.82			
2-lane Roundabout	Total	5.74	8.33	147.56	4	N/A	Uncalibrated SPF
	Fatal & Injury	0.96	1.45	25.30			
Displaced Left Turn (DLT)	Total	3.82	5.69	99.66	7	N/A	CMF
	Fatal & Injury	1.26	1.90	33.09			
Median U-Turn (MUT)	Total	3.69	5.50	96.26	5	N/A	CMF
	Fatal & Injury	1.00	1.51	26.33			
Signalized RCUT	Total	3.69	5.50	96.26	6	N/A	CMF
	Fatal & Injury	1.12	1.69	29.33			
Unsignalized RCUT	Total	1.37	1.90	34.32	2	N/A	CMF
	Fatal & Injury	0.38	0.55	9.82			