WA 2.21 - SR 17/Bloomingdale Rd at I-16 Ramps

Chatham County

Location:

- Intersections Included:
    - SR 17 & I-16 WB Ramps – unsignalized intersection
    - SR 17 & I-16 EB Ramps – unsignalized intersection
- Chatham County, South of Bloomingdale, GA
- GDOT District 5

Existing Conditions:

- This interchange is schedule to be reconfigured by the year 2030, but short-term improvements have been rendered necessary due to the Jimmy DeLoach Parkway extension project that will be complete in 2021. The ramp intersections are expected to experience a significant increase in traffic volumes, resulting in high delay times and queues on the exist ramps, both of which are stop controlled.

Intersection Alternatives:

- Two alternatives were identified for further investigation when evaluating these intersections.
    - **Alternative 1** would include constructing exclusive right turn lanes on each of the I-16 exit ramps as well as the installation of a traffic signal at both intersections to help improve operations. The existing intersections do not provide exclusive left turn lanes on the SR 17 approaches to the I-16 ramps. Adding left turn lanes to each intersection would require shifting tapers. Based on the standards outlined in AASHTO Green Book, neither intersection provides enough space between the end of the bridge and the stop bar to accommodate both a lane shift taper and a full width left turn lane with adequate storage. In fact, the existing intersections only provide approximately 280 feet between the bridge and the approximate location of a stop bar for a traffic signal. Based on the speed limit of 45 mph, a 6-foot shift on both sides of SR 17 would require at least 270 feet just for the lane shift taper. If left turns are not added to the

intersections, then split phasing would need to be installed. The Build analysis for Alternative #1 was performed using split phasing.

- **Alternative 2** would consist of installing roundabouts at each of the I-16 exit ramps. The improvements associated with the Jimmy DeLoach Parkway extension would easily incorporate right turn bypass lanes at the I-16 WB Ramps. The I-16 EB Ramp intersection was examined both with and without bypass lanes.

Build Analysis Delay Results (s/veh) – Alternative #1 (Traffic Signals and Exclusive Right Turn Lanes):

Delay (sec/veh)	SR 17 at I-16 EB Ramps Intersection Delay				SR 17 at I-16 WB Ramps Intersection Delay			
	AM		PM		AM		PM	
	2021	2030	2021	2030	2021	2030	2021	2030
No Build	205.2	2059.7	77.4	1692.0	47.5	124.4	28.8	71.1
Build	124.3	230.0	57.9	83.5	77.8	190.1	51.0	72.8
% Improvement	39%	89%	25%	95%	-64%	-53%	-77%	-2%

Indicates LOS E or worse

(Both No Build and Build analyses were performed in Synchro 9.)

Build Analysis Delay Results (s/veh) – Alternative #2 (Single Lane Roundabouts):

Delay (sec/veh)	SR 17 at I-16 EB Ramps Intersection Delay					SR 17 at I-16 WB Ramps Intersection Delay				
	Approach	AM		PM		Approach	AM		PM	
		2021	2030	2021	2030		2021	2030	2021	2030
No Build	Overall	205.2	2059.7	77.4	1692.0	Overall	47.5	124.4	28.8	71.1
Build (Roundabout)	N	9.7	17.6	6.0	7.8	N*	10.4	24.2	6.3	8.0
	S	54.1	159.7	16.9	37.4	E*	3.6	3.3	2.1	1.7
	W	40.1	480.5	9.7	13.1	S	4.6	6.1	4.9	5.6
	Overall	27.0	146.2	10.8	19.5	Overall	7.1	14.3	4.1	4.7
% Improvement		**87%**	93%	86%	99%		**85%**	89%	**86%**	93%
Build (Roundabout)	N	9.7	17.6	6.0	7.8					
	S*	7.4	14.0	5.5	7.0					
	W*	12.6	127.3	5.6	6.9					
	Overall	9.7	39.2	5.7	7.4					
% Improvement		**95%**	98%	93%	100%					

* - Operational Information takes into account bypass lane

Indicates LOS E or worse

(No Build results were determined using Synchro 9, and Roundabout analysis was performed in SIDRA 7.0)

Benefit-Cost Ratio:

- The Benefit-Cost (B/C) Ratio was analyzed for each alternative (with a 9-year operational design life due to interchange modification being constructed in 2030). The table below outlines the results:

Alternative	SR 17 at I-16 EB Ramps B/C Ratio	SR 17 at I-16 WB Ramps B/C Ratio	Combined B/C Ratio
Alternative #1 (Traffic Signals and Exclusive Right Turn Lanes)	150.64	-1.48	149.16
Alternative #2 (Single Lane Roundabouts)	45.75	3.44	49.19

(B/C Ratio Printouts can be found attached to the back of this report)

Recommended Alternative:

- The operational analysis results indicate that the intersection of SR 17 at I-16 EB Ramps operates better in Alternative #2 (Roundabout with Bypass Lanes). The intersection of SR 17 at I-16 WB Ramps also operates better in Alternative #2 (Roundabout with Bypass Lanes).
- Looking at the B/C Ratio information, it appears to support what the operational results indicate Alternative #1 would be preferred at the I-16 EB Ramps. The higher B/C ratio is likely a reflection of the lower construction cost associated with installing a traffic signal versus constructing a roundabout. As well, the No Build delay is so high, that the traffic signal would provide a considerable reduction in delay but still operate inadequately.
- The recommended alternatives are as follows:
    - SR 17 at I-16 EB Ramps
        - Roundabout with Bypass Lanes
    - SR 17 at I-16 WB Ramps
        - Roundabout with Bypass Lanes

GDOT Benefit-Cost Calculator

Project Information

ID

Description: SR 17 at I-16 EB Ramp
Add Right Turn Lane on ramp & Traffic Signal

Cost Estimate

Date of estimate	3/23/2020
Preliminary Engineering	$ 150,000
Reimbursable Utility	$ -
Right-of-Way	$ -
Construction	$ 350,000
Total	**$ 500,000**

Source of traffic data

Design traffic provided by PE consultant; Analysis in Synchro; split signal phasing in Build

Without project (No-Build)	Open Year 2021				Design Year 2030			
	AM		PM		AM		PM	
	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)
Vehicle Served	1,210	205.2	1,000	77.4	1,530	2,059.7	1,230	1,692.0
Vehicle Denied	0	0.0	0	0.0	0	0.0	0	0.0
Total Delay (hr)	**69.0**		**21.5**		**875.4**		**578.1**	

With project (Build)	Open Year 2021				Design Year 2030			
	AM		PM		AM		PM	
	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)
Vehicle Served	1,391	124.3	1,057	57.9	1,835	230.0	1,294	83.5
Vehicle Denied	0	0.0	0	0.0	0	0.0	0	0.0
Total Delay (hr)	**48.0**		**17.0**		**117.2**		**30.0**	

F: Annual number of collisions involving fatalities during study period
I: Average annual number of collisions involving injured people for the period of the study
P: Average annual number of collisions involving only property damage for the period of the study
R: Reduction of fatal and injury collisions by type (from Table A - Appendix E)
r: Crash modification factor for fatal and injury collisions
Rp: Reduction of property damage only collisions by type (from Table A - Appendix E)
rp: Crash modification factor for property damage only collisions
Pc: Average cost, in thousands of $, per property damage only collision
Q: Weighted cost, in thousands of $, of fatal and injury collisions
Ic: Average cost per injury in thousands of $
Fc: Average cost per fatality in thousands of $
Ek: Capital recovery factor based on countermeasure life (from Table B - Appendix E)
Ci: Estimated initial cost of the countermeasure (cost of the improvement including r/w) in thousands of $
Cm: Estimated annual maintenance and operating cost of the countermeasure in thousands of $

Parameters	Default	Override	Used
Open year	2016	2021	2021
Design year	2036	2030	2030
Discount rate	7%		7%
AM peak period (hr)	2		2
PM peak period (hr)	3		3
Value of auto travel ($/hr)	13.75		13.75
Value of truck travel ($/hr)	72.65		72.65
Percent trucks	12%		12.0%
Fatality Cost (Fc)	$9,100,000		$9,100,000
Injury Cost (Ic)	$955,500		$955,500
Property Damage Cost (Pc)	$27,300		$27,300
Annual Maintenance/Operating Cost (Cm)	$20,000		$20,000
Operational Benefit Factor	100%		100%

===> Operational Design Life = 9 Years

===> Safety Benefit Factor = 0%

Operational Benefits

Costs	**$**	**500,000**
Open Year (2021) Auto Delay Costs		
Nobuild	$	612,381
Build	$	444,846
Auto delay savings	**$**	**167,535**
Open Year (2021) Truck Delay Costs		
Nobuild	$	441,218
Build	$	320,510
Truck delay savings	**$**	**120,708**
Open Year (2021) Benefits	**$**	**288,243**
Design Year (2030) Auto Delay Costs		
Nobuild	$	10,542,261
Build	$	981,652
Auto delay savings	**$**	**9,560,609**
Design Year (2030) Truck Delay Costs		
Nobuild	$	7,595,656
Build	$	707,276
Truck delay savings	**$**	**6,888,379**
Design Year (2030) Benefits	**$**	**16,448,989**
Design Life Benefits	**$**	**75,317,543**
Design Life Benefit-Cost Ratio		**150.64**

Safety Benefits

Recommendation	Ek	R	r	Rp	rp
			1.00		1.00

Description	Symbol	Value
Reduction Factor (F, I)	R	0
Reduction Factor (PDO)	Rp	0
Capital Recovery Factor	Ek	0.000
Initial Improvement Cost	Ci	$ 500,000

Accident Data	Symbol	Value
PDO	P	39
Fatalities	F	0
Injuries	I	12

Weighted cost of fatal and injury collisions
Q = $ 955,500

Annual Benefit: $ -
Annual Cost: $ -
Annual B/C Ratio: **N/A**

Design Life Benefit
B = $ -

Design Life Cost
C = $ -

Design Life Benefit/Cost Ratio
B/C = **N/A**

Total Project Benefit

Design Life Operational Benefit	$75,317,543	**Weight=** 100%
Design Life Safety Benefit	$0	**Weight=** 0%
Total Weighted Benefit	**$75,317,543**	
Design Life Operational Cost	$500,000	**Weight=** 100%
Design Life Safety Cost	$0	**Weight=** 0%
Total Weighted Cost	**$500,000**	
Project Benefit-Cost Ratio	**150.64**	

GDOT Benefit-Cost Calculator

Project Information

ID

Description: SR 17 at I-16 WB Ramp
Add Right Turn Lane on ramp & Traffic Signal

Cost Estimate

Date of estimate	3/23/2020
Preliminary Engineering	$ 150,000
Reimbursable Utility	$ -
Right-of-Way	$ -
Construction	$ 350,000
Total	**$ 500,000**

Source of traffic data

Design traffic provided by PE consultant; Analysis in Synchro, split signal phasing in Build

Without project (No-Build)	Open Year 2021				Design Year 2030			
	AM		PM		AM		PM	
	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)
Vehicle Served	1,555	47.5	1,580	28.8	2,060	124.4	2,100	71.1
Vehicle Denied	0	0.0	0	0.0	0	0.0	0	0.0
Total Delay (hr)	20.5		12.6		71.2		41.5	

With project (Build)	Open Year 2021				Design Year 2030			
	AM		PM		AM		PM	
	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)
Vehicle Served	1,392	77.8	1,057	51.0	1,836	190.1	1,293	72.8
Vehicle Denied	0	0.0	0	0.0	0	0.0	0	0.0
Total Delay (hr)	30.1		15.0		97.0		26.1	

F: Annual number of collisions involving fatalities during study period
I: Average annual number of collisions involving injured people for the period of the study
P: Average annual number of collisions involving only property damage for the period of the study
R: Reduction of fatal and injury collisions by type (from Table A - Appendix E)
r: Crash modification factor for fatal and injury collisions
Rp: Reduction of property damage only collisions by type (from Table A - Appendix E)
rp: Crash modification factor for property damage only collisions
Pc: Average cost, in thousands of $, per property damage only collision
Q: Weighted cost, in thousands of $, of fatal and injury collisions
Ic: Average cost per injury in thousands of $
Fc: Average cost per fatality in thousands of $
Ek: Capital recovery factor based on countermeasure life (from Table B - Appendix E)
Ci: Estimated initial cost of the countermeasure (cost of the improvement including r/w) in thousands of $
Cm: Estimated annual maintenance and operating cost of the countermeasure in thousands of $

Parameters	Default	Override	Used
Open year	2016	2021	2021
Design year	2036	2030	2030
Discount rate	7%		7%
AM peak period (hr)	2		2
PM peak period (hr)	3		3
Value of auto travel ($/hr)	13.75		13.75
Value of truck travel ($/hr)	72.65		72.65
Percent trucks	12%		12.0%
Fatality Cost (Fc)	$9,100,000		$9,100,000
Injury Cost (Ic)	$955,500		$955,500
Property Damage Cost (Pc)	$27,300		$27,300
Annual Maintenance/Operating Cost (Cm)	$20,000		$20,000
Operational Benefit Factor	100%		100%

===> Operational Design Life = 9 Years

===> Safety Benefit Factor = 0%

Operational Benefits

Costs	**$**	**500,000**
Open Year (2021) Auto Delay Costs		
Nobuild	$	238,838
Build	$	317,891
Auto delay savings	**$**	**(79,053)**
Open Year (2021) Truck Delay Costs		
Nobuild	$	172,082
Build	$	229,039
Truck delay savings	**$**	**(56,957)**
Open Year (2021) Benefits	**$**	**(136,010)**
Design Year (2030) Auto Delay Costs		
Nobuild	$	807,052
Build	$	823,841
Auto delay savings	**$**	**(16,789)**
Design Year (2030) Truck Delay Costs		
Nobuild	$	581,477
Build	$	593,574
Truck delay savings	**$**	**(12,096)**
Design Year (2030) Benefits	**$**	**(28,886)**
Design Life Benefits	**$**	**(742,029)**
Design Life Benefit-Cost Ratio		**(1.48)**

Safety Benefits

Recommendation	Ek	R	r	Rp	rp
			1.00		1.00

Description	Symbol	Value
Reduction Factor (F, I)	R	0
Reduction Factor (PDO)	Rp	0
Capital Recovery Factor	Ek	0.000
Initial Improvement Cost	Ci	$ 500,000

Accident Data	Symbol	Value
PDO	P	39
Fatalities	F	0
Injuries	I	12

Weighted cost of fatal and injury collisions
Q = $ 955,500

Annual Benefit: $ -
Annual Cost: $ -
Annual B/C Ratio: **N/A**

Design Life Benefit
B = $ -

Design Life Cost
C = $ -

Design Life Benefit/Cost Ratio
B/C = **N/A**

Total Project Benefit

Design Life Operational Benefit	($742,029)	**Weight=** 100%
Design Life Safety Benefit	$0	**Weight=** 0%
Total Weighted Benefit	**($742,029)**	
Design Life Operational Cost	$500,000	**Weight=** 100%
Design Life Safety Cost	$0	**Weight=** 0%
Total Weighted Cost	**$500,000**	
Project Benefit-Cost Ratio	**-1.48**	

GDOT Benefit-Cost Calculator

Project Information

ID

Description: SR 17 at I-16 EB Ramp
Add Single Lane Roundabout with Bypass lanes on the South and West legs

Cost Estimate

Date of estimate	3/23/2020
Preliminary Engineering	$ 550,000
Reimbursable Utility	$ -
Right-of-Way	$ -
Construction	$1,300,000
Total	**$ 1,850,000**

Source of traffic data

Design traffic provided by PE consultant; No Build Analysis in Synchro; Build Analysis in Sidra 7.0 with bypass lanes

Without project (No-Build)	Open Year 2021				Design Year 2030			
	AM		PM		AM		PM	
	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)
Vehicle Served	1,210	205.2	1,000	77.4	1,530	2,059.7	1,230	1,692.0
Vehicle Denied	0	0.0	0	0.0	0	0.0	0	0.0
Total Delay (hr)	69.0		21.5		875.4		578.1	

With project (Build)	Open Year 2021				Design Year 2030			
	AM		PM		AM		PM	
	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)
Vehicle Served	1,744	9.7	1,386	5.7	2,188	39.2	1,682	7.4
Vehicle Denied	0	0.0	0	0.0	0	0.0	0	0.0
Total Delay (hr)	4.7		2.2		23.8		3.5	

F: Annual number of collisions involving fatalities during study period
I: Average annual number of collisions involving injured people for the period of the study
P: Average annual number of collisions involving only property damage for the period of the study
R: Reduction of fatal and injury collisions by type (from Table A - Appendix E)
r: Crash modification factor for fatal and injury collisions
Rp: Reduction of property damage only collisions by type (from Table A - Appendix E)
rp: Crash modification factor for property damage only collisions
Pc: Average cost, in thousands of $, per property damage only collision
Q: Weighted cost, in thousands of $, of fatal and injury collisions
Ic: Average cost per injury in thousands of $
Fc: Average cost per fatality in thousands of $
Ek: Capital recovery factor based on countermeasure life (from Table B - Appendix E)
Ci: Estimated initial cost of the countermeasure (cost of the improvement including r/w) in thousands of $
Cm: Estimated annual maintenance and operating cost of the countermeasure in thousands of $

Parameters	Default	Override	Used
Open year	2016	2021	2021
Design year	2036	2030	2030
Discount rate	7%		7%
AM peak period (hr)	2		2
PM peak period (hr)	3		3
Value of auto travel ($/hr)	13.75		13.75
Value of truck travel ($/hr)	72.65		72.65
Percent trucks	12%		12.0%
Fatality Cost (Fc)	$9,100,000		$9,100,000
Injury Cost (Ic)	$955,500		$955,500
Property Damage Cost (Pc)	$27,300		$27,300
Annual Maintenance/Operating Cost (Cm)	$20,000		$20,000
Operational Benefit Factor	100%		100%

===> Operational Design Life = 9 Years

===> Safety Benefit Factor = 0%

Operational Benefits

Costs	**$**	**1,850,000**
Open Year (2021) Auto Delay Costs		
Nobuild	$	612,381
Build	$	48,345
Auto delay savings	**$**	**564,036**
Open Year (2021) Truck Delay Costs		
Nobuild	$	441,218
Build	$	34,832
Truck delay savings	**$**	**406,386**
Open Year (2021) Benefits	**$**	**970,422**
Design Year (2030) Auto Delay Costs		
Nobuild	$	10,542,261
Build	$	175,517
Auto delay savings	**$**	**10,366,744**
Design Year (2030) Truck Delay Costs		
Nobuild	$	7,595,656
Build	$	126,459
Truck delay savings	**$**	**7,469,196**
Design Year (2030) Benefits	**$**	**17,835,941**
Design Life Benefits	**$**	**84,628,632**
Design Life Benefit-Cost Ratio		**45.75**

Safety Benefits

Recommendation	Ek	R	r	Rp	rp
			1.00		1.00

Description	Symbol	Value
Reduction Factor (F, I)	R	0
Reduction Factor (PDO)	Rp	0
Capital Recovery Factor	Ek	0.000
Initial Improvement Cost	Ci	$ 1,850,000

Accident Data	Symbol	Value
PDO	P	39
Fatalities	F	0
Injuries	I	12

Weighted cost of fatal and injury collisions
Q = $ 955,500

Annual Benefit: $ -
Annual Cost: $ -
Annual B/C Ratio: **N/A**

Design Life Benefit
B = $ -

Design Life Cost
C = $ -

Design Life Benefit/Cost Ratio
B/C = **N/A**

Total Project Benefit

Design Life Operational Benefit	$84,628,632	**Weight=** 100%
Design Life Safety Benefit	$0	**Weight=** 0%
Total Weighted Benefit	**$84,628,632**	
Design Life Operational Cost	$1,850,000	**Weight=** 100%
Design Life Safety Cost	$0	**Weight=** 0%
Total Weighted Cost	**$1,850,000**	
Project Benefit-Cost Ratio	**45.75**	

GDOT Benefit-Cost Calculator

Project Information

ID

Description: SR 17 at I-16 WB Ramp
Add Single Lane Roundabout with Bypass Lanes on the North and East Legs

Cost Estimate

Date of estimate	3/23/2020
Preliminary Engineering	$ 550,000
Reimbursable Utility	$ -
Right-of-Way	$ -
Construction	$1,300,000
Total	**$ 1,850,000**

Source of traffic data

Design traffic provided by PE consultant; No Build Analysis in Synchro; Build Analysis in Sidra 7.0

Without project (No-Build)	Open Year 2021				Design Year 2030			
	AM		PM		AM		PM	
	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)
Vehicle Served	1,555	47.5	1,580	28.8	2,060	124.4	2,100	71.1
Vehicle Denied	0	0.0	0	0.0	0	0.0	0	0.0
Total Delay (hr)	20.5		12.6		71.2		41.5	

With project (Build)	Open Year 2021				Design Year 2030			
	AM		PM		AM		PM	
	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)	Number of Vehicles	Delay per vehicle (s)
Vehicle Served	1,767	9.2	1,795	5.8	2,341	29.6	2,386	9.0
Vehicle Denied	0	0.0	0	0.0	0	0.0	0	0.0
Total Delay (hr)	4.5		2.9		19.2		6.0	

F: Annual number of collisions involving fatalities during study period
I: Average annual number of collisions involving injured people for the period of the study
P: Average annual number of collisions involving only property damage for the period of the study
R: Reduction of fatal and injury collisions by type (from Table A - Appendix E)
r: Crash modification factor for fatal and injury collisions
Rp: Reduction of property damage only collisions by type (from Table A - Appendix E)
rp: Crash modification factor for property damage only collisions
Pc: Average cost, in thousands of $, per property damage only collision
Q: Weighted cost, in thousands of $, of fatal and injury collisions
Ic: Average cost per injury in thousands of $
Fc: Average cost per fatality in thousands of $
Ek: Capital recovery factor based on countermeasure life (from Table B - Appendix E)
Ci: Estimated initial cost of the countermeasure (cost of the improvement including r/w) in thousands of $
Cm: Estimated annual maintenance and operating cost of the countermeasure in thousands of $

Parameters	Default	Override	Used
Open year	2016	2021	2021
Design year	2036	2030	2030
Discount rate	7%		7%
AM peak period (hr)	2		2
PM peak period (hr)	3		3
Value of auto travel ($/hr)	13.75		13.75
Value of truck travel ($/hr)	72.65		72.65
Percent trucks	12%		12.0%
Fatality Cost (Fc)	$9,100,000		$9,100,000
Injury Cost (Ic)	$955,500		$955,500
Property Damage Cost (Pc)	$27,300		$27,300
Annual Maintenance/Operating Cost (Cm)	$20,000		$20,000
Operational Benefit Factor	100%		100%

===> Operational Design Life = 9 Years

===> Safety Benefit Factor = 0%

Operational Benefits

Costs	**$**	**1,850,000**
Open Year (2021) Auto Delay Costs		
Nobuild	$	238,838
Build	$	53,564
Auto delay savings	**$**	**185,274**
Open Year (2021) Truck Delay Costs		
Nobuild	$	172,082
Build	$	38,593
Truck delay savings	**$**	**133,489**
Open Year (2021) Benefits	**$**	**318,763**
Design Year (2030) Auto Delay Costs		
Nobuild	$	807,052
Build	$	170,584
Auto delay savings	**$**	**636,467**
Design Year (2030) Truck Delay Costs		
Nobuild	$	581,477
Build	$	122,905
Truck delay savings	**$**	**458,572**
Design Year (2030) Benefits	**$**	**1,095,040**
Design Life Benefits	**$**	**6,362,111**
Design Life Benefit-Cost Ratio		**3.44**

Safety Benefits

Recommendation	Ek	R	r	Rp	rp
			1.00		1.00

Description	Symbol	Value
Reduction Factor (F, I)	R	0
Reduction Factor (PDO)	Rp	0
Capital Recovery Factor	Ek	0.000
Initial Improvement Cost	Ci	$ 1,850,000

Accident Data	Symbol	Value
PDO	P	39
Fatalities	F	0
Injuries	I	12

Weighted cost of fatal and injury collisions
Q = $ 955,500

Annual Benefit: $ -
Annual Cost: $ -
Annual B/C Ratio: **N/A**

Design Life Benefit
B = $ -

Design Life Cost
C = $ -

Design Life Benefit/Cost Ratio
B/C = **N/A**

Total Project Benefit

Design Life Operational Benefit	$6,362,111	**Weight=** 100%
Design Life Safety Benefit	$0	**Weight=** 0%
Total Weighted Benefit	**$6,362,111**	
Design Life Operational Cost	$1,850,000	**Weight=** 100%
Design Life Safety Cost	$0	**Weight=** 0%
Total Weighted Cost	**$1,850,000**	
Project Benefit-Cost Ratio	**3.44**	

PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES

BEGIN LIMIT OF ACCESS.....BLA
END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
REQ'D R/W & LIMIT OF ACCESS

THOMAS & HUTTON ENGINEERING Co.
50 PARK OF COMMERCE WAY
P.O. BOX 2727
SAVANNAH, GA 31402
PHONE: (912) 234-5300
FAX: (912) 234-2950
WWW.THOMAS-HUTTON.COM
GEORGIA - SAVANNAH, BRUNSWICK
SOUTH CAROLINA - CHARLESTON, MYRTLE BEACH
NORTH CAROLINA - WILMINGTON

SCALE IN FEET
0 20 40 80

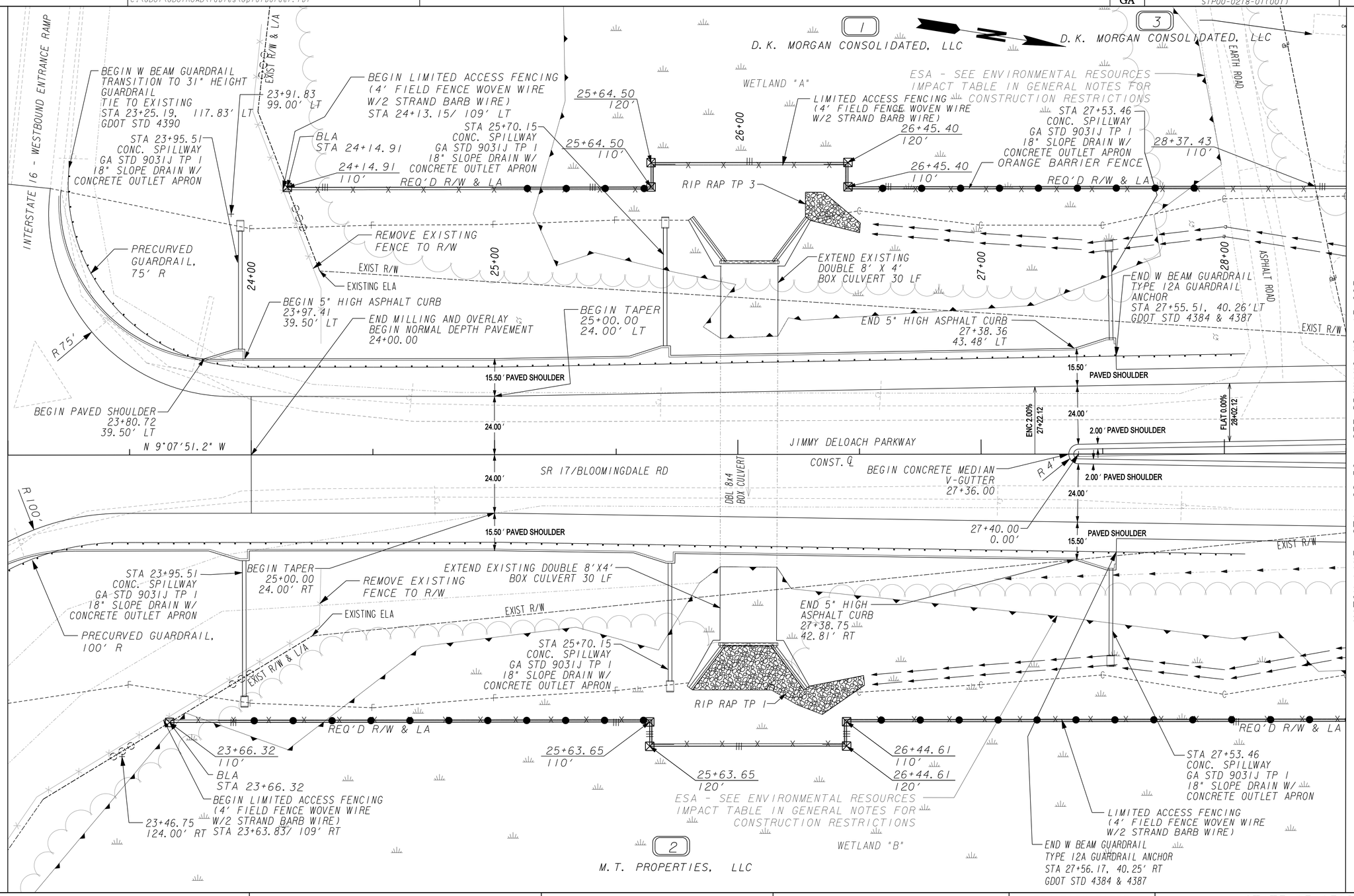
REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: URBAN DESIGN

MAINLINE PLAN

JIMMY DELOACH PKWY PH(2)

DRAWING No. 13-001



PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES

BEGIN LIMIT OF ACCESS.....BLA
END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
REQ'D R/W & LIMIT OF ACCESS

THOMAS & HUTTON ENGINEERING CO.
50 PARK OF COMMERCE WAY
P.O. BOX 2727
SAVANNAH, GA 31402
PHONE: (912) 234-5300
FAX: (912) 234-2950
WWW.THOMAS-HUTTON.COM
GEORGIA - SAVANNAH, BRUNSWICK
SOUTH CAROLINA - CHARLESTON, MYRTLE BEACH
NORTH CAROLINA - WILMINGTON

SCALE IN FEET
0 20 40 80

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: URBAN DESIGN

MAINLINE PLAN

JIMMY DELOACH PKWY PH(2)

DRAWING No. 13-002

3/1/2007 GPLW

Intersection	
Int Delay, s/veh	205.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	270	0	55	0	0	0	0	120	255	495	340	0
Future Vol, veh/h	270	0	55	0	0	0	0	120	255	495	340	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	20	2	20	2	2	2	2	19	7	7	21	2
Mvmt Flow	307	0	63	0	0	0	0	136	290	563	386	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1648	1648	386	-	0	0	136	0	0
Stage 1	1512	1512	-	-	-	-	-	-	-
Stage 2	136	136	-	-	-	-	-	-	-
Critical Hdwy	6.6	6.52	6.4	-	-	-	4.17	-	-
Critical Hdwy Stg 1	5.6	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.6	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.68	4.018	3.48	-	-	-	2.263	-	-
Pot Cap-1 Maneuver	~ 99	99	624	0	-	-	1418	-	0
Stage 1	~ 183	183	-	0	-	-	-	-	0
Stage 2	848	784	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	~ 49	0	624	-	-	-	1418	-	-
Mov Cap-2 Maneuver	~ 49	0	-	-	-	-	-	-	-
Stage 1	~ 183	0	-	-	-	-	-	-	-
Stage 2	419	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 954.9	0	5.5
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	125	1418	-
HCM Lane V/C Ratio	-	-	2.955	0.397	-
HCM Control Delay (s)	-	-	$ 954.9	9.2	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	34.5	1.9	-

Notes

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

Intersection	
Int Delay, s/veh	47.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	255	0	155	35	355	0	0	580	175
Future Vol, veh/h	0	0	0	255	0	155	35	355	0	0	580	175
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	50	-	-	-	-	-	0
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	8	2	8	8	19	2	2	21	8
Mvmt Flow	0	0	0	290	0	176	40	403	0	0	659	199

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1142	1142	-	659	0	-	-	-	0
Stage 1	483	483	-	-	-	-	-	-	-
Stage 2	659	659	-	-	-	-	-	-	-
Critical Hdwy	6.48	6.52	-	4.18	-	-	-	-	-
Critical Hdwy Stg 1	5.48	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.48	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.018	-	2.272	-	-	-	-	-
Pot Cap-1 Maneuver	~ 216	200	0	901	-	0	0	-	-
Stage 1	608	553	0	-	-	0	0	-	-
Stage 2	504	461	0	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	~ 204	0	-	901	-	-	-	-	-
Mov Cap-2 Maneuver	~ 204	0	-	-	-	-	-	-	-
Stage 1	573	0	-	-	-	-	-	-	-
Stage 2	504	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	259.5	0.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	901	-	204	-	-	-
HCM Lane V/C Ratio	0.044	-	1.42	-	-	-
HCM Control Delay (s)	9.2	0	259.5	0	-	-
HCM Lane LOS	A	A	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	17.1	-	-	-

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	0	45	0	0	0	0	225	245	230	300	0
Future Volume (Veh/h)	175	0	45	0	0	0	0	225	245	230	300	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	199	0	51	0	0	0	0	256	278	261	341	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1258	1119	341	1258	1258	395	341			256		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1258	1119	341	1258	1258	395	341			256		
tC, single (s)	7.2	6.5	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	92	100	100	100	100			80		
cM capacity (veh/h)	119	165	679	115	136	654	1218			1297		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	250	534	602
Volume Left	199	0	261
Volume Right	51	278	0
cSH	143	1700	1297
Volume to Capacity	1.75	0.31	0.20
Queue Length 95th (ft)	461	0	19
Control Delay (s)	417.3	0.0	4.9
Lane LOS	F		A
Approach Delay (s)	417.3	0.0	4.9
Approach LOS	F		

Intersection Summary			
Average Delay	77.4		
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	28.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	255	0	450	115	285	0	0	275	200
Future Vol, veh/h	0	0	0	255	0	450	115	285	0	0	275	200
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	50	-	-	-	-	-	0
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	5	2	5	12	15	2	2	20	12
Mvmt Flow	0	0	0	290	0	511	131	324	0	0	313	227

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	899	899	-	313	0	-	-	-	0
Stage 1	586	586	-	-	-	-	-	-	-
Stage 2	313	313	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.52	-	4.22	-	-	-	-	-
Critical Hdwy Stg 1	5.45	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.018	-	2.308	-	-	-	-	-
Pot Cap-1 Maneuver	306	279	0	1193	-	0	0	-	-
Stage 1	550	497	0	-	-	0	0	-	-
Stage 2	735	657	0	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	~ 265	0	-	1193	-	-	-	-	-
Mov Cap-2 Maneuver	~ 265	0	-	-	-	-	-	-	-
Stage 1	476	0	-	-	-	-	-	-	-
Stage 2	735	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	124	2.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	1193	-	265	-	-	-
HCM Lane V/C Ratio	0.11	-	1.093	-	-	-
HCM Control Delay (s)	8.4	0	124	0	-	-
HCM Lane LOS	A	A	F	A	-	-
HCM 95th %tile Q(veh)	0.4	-	12.1	-	-	-

Notes

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

Intersection	
Int Delay, s/veh	2059.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	340	0	55	0	0	0	0	200	255	650	425	0
Future Vol, veh/h	340	0	55	0	0	0	0	200	255	650	425	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	20	2	20	2	2	2	2	19	7	7	21	2
Mvmt Flow	386	0	63	0	0	0	0	227	290	739	483	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	2188	2188	483	-	0	0	227	0	0
Stage 1	1961	1961	-	-	-	-	-	-	-
Stage 2	227	227	-	-	-	-	-	-	-
Critical Hdwy	6.6	6.52	6.4	-	-	-	4.17	-	-
Critical Hdwy Stg 1	5.6	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.6	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.68	4.018	3.48	-	-	-	2.263	-	-
Pot Cap-1 Maneuver	~ 44	46	549	0	-	-	1312	-	0
Stage 1	~ 107	109	-	0	-	-	-	-	0
Stage 2	770	716	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	~ 10	0	549	-	-	-	1312	-	-
Mov Cap-2 Maneuver	~ 10	0	-	-	-	-	-	-	-
Stage 1	~ 107	0	-	-	-	-	-	-	-
Stage 2	~ 177	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 10019.3	0	6.8
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	20	1312	-
HCM Lane V/C Ratio	-	-	22.443	0.563	-
HCM Control Delay (s)	-	-	$ 10019.3	11.2	0
HCM Lane LOS	-	-	F	B	A
HCM 95th %tile Q(veh)	-	-	56.6	3.7	-

Notes

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

Intersection	
Int Delay, s/veh	124.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	255	0	250	35	505	0	0	820	195
Future Vol, veh/h	0	0	0	255	0	250	35	505	0	0	820	195
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	50	-	-	-	-	-	0
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	8	2	8	8	19	2	2	21	8
Mvmt Flow	0	0	0	290	0	284	40	574	0	0	932	222

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1586	1586	-	932	0	-	-	-	0
Stage 1	654	654	-	-	-	-	-	-	-
Stage 2	932	932	-	-	-	-	-	-	-
Critical Hdwy	6.48	6.52	-	4.18	-	-	-	-	-
Critical Hdwy Stg 1	5.48	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.48	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.018	-	2.272	-	-	-	-	-
Pot Cap-1 Maneuver	~ 115	108	0	710	-	0	0	-	-
Stage 1	506	463	0	-	-	0	0	-	-
Stage 2	374	345	0	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	~ 105	0	-	710	-	-	-	-	-
Mov Cap-2 Maneuver	~ 105	0	-	-	-	-	-	-	-
Stage 1	464	0	-	-	-	-	-	-	-
Stage 2	374	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 881.7	0.7	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	710	-	105	-	-	-
HCM Lane V/C Ratio	0.056	-	2.76	-	-	-
HCM Control Delay (s)	10.4	0	$ 881.7	0	-	-
HCM Lane LOS	B	A	F	A	-	-
HCM 95th %tile Q(veh)	0.2	-	27.1	-	-	-

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	0	45	0	0	0	0	295	245	295	395	0
Future Volume (Veh/h)	205	0	45	0	0	0	0	295	245	295	395	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	233	0	51	0	0	0	0	335	278	335	449	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1593	1454	449	1593	1593	474	449			335		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1593	1454	449	1593	1593	474	449			335		
tC, single (s)	7.2	6.5	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	91	100	100	100	100			72		
cM capacity (veh/h)	64	94	590	62	77	590	1111			1213		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	284	613	784
Volume Left	233	0	335
Volume Right	51	278	0
cSH	77	1700	1213
Volume to Capacity	3.71	0.36	0.28
Queue Length 95th (ft)	Err	0	28
Control Delay (s)	Err	0.0	5.8
Lane LOS	F		A
Approach Delay (s)	Err	0.0	5.8
Approach LOS	F		

Intersection Summary			
Average Delay	1692.0		
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	71.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	255	0	660	115	385	0	0	435	250
Future Vol, veh/h	0	0	0	255	0	660	115	385	0	0	435	250
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	50	-	-	-	-	-	0
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	5	2	5	12	15	2	2	20	12
Mvmt Flow	0	0	0	290	0	750	131	438	0	0	494	284

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1194	1194	-	494	0	-	-	-	0
Stage 1	700	700	-	-	-	-	-	-	-
Stage 2	494	494	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.52	-	4.22	-	-	-	-	-
Critical Hdwy Stg 1	5.45	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.018	-	2.308	-	-	-	-	-
Pot Cap-1 Maneuver	~ 203	187	0	1020	-	0	0	-	-
Stage 1	487	441	0	-	-	0	0	-	-
Stage 2	607	546	0	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	~ 168	0	-	1020	-	-	-	-	-
Mov Cap-2 Maneuver	~ 168	0	-	-	-	-	-	-	-
Stage 1	404	0	-	-	-	-	-	-	-
Stage 2	607	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 397.4	2.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	1020	-	168	-	-	-
HCM Lane V/C Ratio	0.128	-	1.725	-	-	-
HCM Control Delay (s)	9	0	$ 397.4	0	-	-
HCM Lane LOS	A	A	F	A	-	-
HCM 95th %tile Q(veh)	0.4	-	20.5	-	-	-

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	0	55	0	0	0	0	120	255	495	340	0
Future Volume (veh/h)	270	0	55	0	0	0	0	120	255	495	340	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1696	1696				0	1767	1900	1900	1719	0
Adj Flow Rate, veh/h	307	0	0				0	136	0	562	386	0
Adj No. of Lanes	0	1	1				0	1	0	0	1	0
Peak Hour Factor	0.88	0.88	0.88				0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	12	2	12				0	15	15	20	20	0
Cap, veh/h	256	0	228				0	383	0	470	323	0
Arrive On Green	0.16	0.00	0.00				0.00	0.22	0.00	0.47	0.47	0.00
Sat Flow, veh/h	1616	0	1442				0	1767	0	990	680	0
Grp Volume(v), veh/h	307	0	0				0	136	0	948	0	0
Grp Sat Flow(s),veh/h/ln	1616	0	1442				0	1767	0	1670	0	0
Q Serve(g_s), s	19.0	0.0	0.0				0.0	7.8	0.0	57.0	0.0	0.0
Cycle Q Clear(g_c), s	19.0	0.0	0.0				0.0	7.8	0.0	57.0	0.0	0.0
Prop In Lane	1.00		1.00				0.00		0.00	0.59		0.00
Lane Grp Cap(c), veh/h	256	0	228				0	383	0	793	0	0
V/C Ratio(X)	1.20	0.00	0.00				0.00	0.36	0.00	1.20	0.00	0.00
Avail Cap(c_a), veh/h	256	0	228				0	383	0	793	0	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	0.00	0.09	0.00	0.00
Uniform Delay (d), s/veh	50.5	0.0	0.0				0.0	39.9	0.0	31.5	0.0	0.0
Incr Delay (d2), s/veh	121.4	0.0	0.0				0.0	2.6	0.0	89.1	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
%ile BackOfQ(95%),veh/ln	30.7	0.0	0.0				0.0	7.4	0.0	79.9	0.0	0.0
LnGrp Delay(d),s/veh	171.9	0.0	0.0				0.0	42.5	0.0	120.6	0.0	0.0
LnGrp LOS	F							D		F		
Approach Vol, veh/h		307						136			948	
Approach Delay, s/veh		171.9						42.5			120.6	
Approach LOS		F						D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		32.0		25.0		63.0		
Change Period (Y+Rc), s		6.0		6.0		6.0		
Max Green Setting (Gmax), s		26.0		19.0		57.0		
Max Q Clear Time (g_c+I1), s		9.8		21.0		59.0		
Green Ext Time (p_c), s		0.5		0.0		0.0		

Intersection Summary	
HCM 2010 Ctrl Delay	124.3
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	255	0	155	35	355	0	0	580	175
Future Volume (veh/h)	0	0	0	255	0	155	35	355	0	0	580	175
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				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
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1810	1810	1900	1656	0	0	1583	1696
Adj Flow Rate, veh/h				290	0	0	40	403	0	0	659	0
Adj No. of Lanes				0	1	1	0	1	0	0	1	1
Peak Hour Factor				0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %				5	2	5	15	15	0	0	20	12
Cap, veh/h				287	0	256	41	412	0	0	647	589
Arrive On Green				0.17	0.00	0.00	0.09	0.09	0.00	0.00	0.41	0.00
Sat Flow, veh/h				1723	0	1538	149	1500	0	0	1583	1442
Grp Volume(v), veh/h				290	0	0	443	0	0	0	659	0
Grp Sat Flow(s),veh/h/ln				1723	0	1538	1649	0	0	0	1583	1442
Q Serve(g_s), s				20.0	0.0	0.0	32.2	0.0	0.0	0.0	49.0	0.0
Cycle Q Clear(g_c), s				20.0	0.0	0.0	32.2	0.0	0.0	0.0	49.0	0.0
Prop In Lane				1.00		1.00	0.09		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				287	0	256	453	0	0	0	647	589
V/C Ratio(X)				1.01	0.00	0.00	0.98	0.00	0.00	0.00	1.02	0.00
Avail Cap(c_a), veh/h				287	0	256	453	0	0	0	647	589
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.09	0.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				50.0	0.0	0.0	54.2	0.0	0.0	0.0	35.5	0.0
Incr Delay (d2), s/veh				55.6	0.0	0.0	8.4	0.0	0.0	0.0	40.3	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
%ile BackOfQ(95%),veh/ln				25.1	0.0	0.0	17.7	0.0	0.0	0.0	51.5	0.0
LnGrp Delay(d),s/veh				105.6	0.0	0.0	62.6	0.0	0.0	0.0	75.8	0.0
LnGrp LOS				F			E				F	
Approach Vol, veh/h					290			443			659	
Approach Delay, s/veh					105.6			62.6			75.8	
Approach LOS					F			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		39.0				55.0		26.0
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		33.0				49.0		20.0
Max Q Clear Time (g_c+I1), s		34.2				51.0		22.0
Green Ext Time (p_c), s		0.0				0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	77.8
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	0	45	0	0	0	0	225	245	230	300	0
Future Volume (veh/h)	175	0	45	0	0	0	0	225	245	230	300	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1696	1696				0	1739	1900	1900	1680	0
Adj Flow Rate, veh/h	199	0	0				0	256	0	261	341	0
Adj No. of Lanes	0	1	1				0	1	0	0	1	0
Peak Hour Factor	0.88	0.88	0.88				0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	12	2	12				0	15	15	20	20	0
Cap, veh/h	226	0	202				0	577	0	260	340	0
Arrive On Green	0.14	0.00	0.00				0.00	0.33	0.00	0.36	0.36	0.00
Sat Flow, veh/h	1616	0	1442				0	1739	0	713	932	0
Grp Volume(v), veh/h	199	0	0				0	256	0	602	0	0
Grp Sat Flow(s),veh/h/ln	1616	0	1442				0	1739	0	1645	0	0
Q Serve(g_s), s	13.3	0.0	0.0				0.0	12.7	0.0	40.1	0.0	0.0
Cycle Q Clear(g_c), s	13.3	0.0	0.0				0.0	12.7	0.0	40.1	0.0	0.0
Prop In Lane	1.00		1.00				0.00		0.00	0.43		0.00
Lane Grp Cap(c), veh/h	226	0	202				0	577	0	600	0	0
V/C Ratio(X)	0.88	0.00	0.00				0.00	0.44	0.00	1.00	0.00	0.00
Avail Cap(c_a), veh/h	244	0	218				0	577	0	600	0	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	0.00	0.58	0.00	0.00
Uniform Delay (d), s/veh	46.4	0.0	0.0				0.0	28.8	0.0	35.0	0.0	0.0
Incr Delay (d2), s/veh	27.6	0.0	0.0				0.0	2.5	0.0	28.9	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
%ile BackOfQ(95%),veh/ln	12.2	0.0	0.0				0.0	10.7	0.0	41.3	0.0	0.0
LnGrp Delay(d),s/veh	74.0	0.0	0.0				0.0	31.2	0.0	63.9	0.0	0.0
LnGrp LOS	E							C		F		
Approach Vol, veh/h		199						256			602	
Approach Delay, s/veh		74.0						31.2			63.9	
Approach LOS		E						C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		42.5		21.4		46.1		
Change Period (Y+Rc), s		6.0		6.0		6.0		
Max Green Setting (Gmax), s		35.3		16.6		40.1		
Max Q Clear Time (g_c+I1), s		14.7		15.3		42.1		
Green Ext Time (p_c), s		1.2		0.1		0.0		

Intersection Summary	
HCM 2010 Ctrl Delay	57.9
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	255	0	450	115	285	0	0	275	200
Future Volume (veh/h)	0	0	0	255	0	450	115	285	0	0	275	200
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				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
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1810	1810	1900	1665	0	0	1583	1696
Adj Flow Rate, veh/h				290	0	0	131	324	0	0	312	0
Adj No. of Lanes				0	1	1	0	1	0	0	1	1
Peak Hour Factor				0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %				5	2	5	15	15	0	0	20	12
Cap, veh/h				324	0	289	182	450	0	0	417	380
Arrive On Green				0.19	0.00	0.00	0.13	0.13	0.00	0.00	0.26	0.00
Sat Flow, veh/h				1723	0	1538	472	1169	0	0	1583	1442
Grp Volume(v), veh/h				290	0	0	455	0	0	0	312	0
Grp Sat Flow(s),veh/h/ln				1723	0	1538	1641	0	0	0	1583	1442
Q Serve(g_s), s				18.1	0.0	0.0	29.3	0.0	0.0	0.0	19.9	0.0
Cycle Q Clear(g_c), s				18.1	0.0	0.0	29.3	0.0	0.0	0.0	19.9	0.0
Prop In Lane				1.00		1.00	0.29		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				324	0	289	632	0	0	0	417	380
V/C Ratio(X)				0.90	0.00	0.00	0.72	0.00	0.00	0.00	0.75	0.00
Avail Cap(c_a), veh/h				376	0	336	632	0	0	0	417	380
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.21	0.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				43.6	0.0	0.0	42.3	0.0	0.0	0.0	37.1	0.0
Incr Delay (d2), s/veh				21.1	0.0	0.0	1.6	0.0	0.0	0.0	11.6	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
%ile BackOfQ(95%),veh/ln				15.8	0.0	0.0	16.4	0.0	0.0	0.0	15.2	0.0
LnGrp Delay(d),s/veh				64.7	0.0	0.0	43.9	0.0	0.0	0.0	48.7	0.0
LnGrp LOS				E			D				D	
Approach Vol, veh/h					290			455			312	
Approach Delay, s/veh					64.7			43.9			48.7	
Approach LOS					E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		48.3				35.0		26.7
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		39.0				29.0		24.0
Max Q Clear Time (g_c+I1), s		31.3				21.9		20.1
Green Ext Time (p_c), s		1.6				0.9		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	51.0
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	340	0	55	0	0	0	0	200	255	650	425	0
Future Volume (veh/h)	340	0	55	0	0	0	0	200	255	650	425	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1696	1696				0	1746	1900	1900	1722	0
Adj Flow Rate, veh/h	386	0	0				0	227	0	739	483	0
Adj No. of Lanes	0	1	1				0	1	0	0	1	0
Peak Hour Factor	0.88	0.88	0.88				0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	12	2	12				0	15	15	20	20	0
Cap, veh/h	287	0	256				0	388	0	505	330	0
Arrive On Green	0.18	0.00	0.00				0.00	0.22	0.00	0.50	0.50	0.00
Sat Flow, veh/h	1616	0	1442				0	1746	0	1011	661	0
Grp Volume(v), veh/h	386	0	0				0	227	0	1222	0	0
Grp Sat Flow(s),veh/h/ln	1616	0	1442				0	1746	0	1672	0	0
Q Serve(g_s), s	32.0	0.0	0.0				0.0	20.9	0.0	90.0	0.0	0.0
Cycle Q Clear(g_c), s	32.0	0.0	0.0				0.0	20.9	0.0	90.0	0.0	0.0
Prop In Lane	1.00		1.00				0.00		0.00	0.60		0.00
Lane Grp Cap(c), veh/h	287	0	256				0	388	0	836	0	0
V/C Ratio(X)	1.34	0.00	0.00				0.00	0.59	0.00	1.46	0.00	0.00
Avail Cap(c_a), veh/h	287	0	256				0	388	0	836	0	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	0.00	0.09	0.00	0.00
Uniform Delay (d), s/veh	74.0	0.0	0.0				0.0	62.6	0.0	45.0	0.0	0.0
Incr Delay (d2), s/veh	176.3	0.0	0.0				0.0	6.3	0.0	208.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	51.0	0.0	0.0				0.0	16.2	0.0	154.1	0.0	0.0
LnGrp Delay(d),s/veh	250.3	0.0	0.0				0.0	68.9	0.0	253.5	0.0	0.0
LnGrp LOS	F							E		F		
Approach Vol, veh/h		386						227			1222	
Approach Delay, s/veh		250.3						68.9			253.5	
Approach LOS		F						E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		46.0		38.0		96.0		
Change Period (Y+Rc), s		6.0		6.0		6.0		
Max Green Setting (Gmax), s		40.0		32.0		90.0		
Max Q Clear Time (g_c+I1), s		22.9		34.0		92.0		
Green Ext Time (p_c), s		1.0		0.0		0.0		

Intersection Summary	
HCM 2010 Ctrl Delay	230.0
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	255	0	250	35	505	0	0	820	195
Future Volume (veh/h)	0	0	0	255	0	250	35	505	0	0	820	195
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				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
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1810	1810	1900	1655	0	0	1583	1696
Adj Flow Rate, veh/h				290	0	0	40	574	0	0	932	0
Adj No. of Lanes				0	1	1	0	1	0	0	1	1
Peak Hour Factor				0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %				5	2	5	15	15	0	0	20	12
Cap, veh/h				249	0	222	32	463	0	0	721	657
Arrive On Green				0.14	0.00	0.00	0.10	0.10	0.00	0.00	0.46	0.00
Sat Flow, veh/h				1723	0	1538	107	1542	0	0	1583	1442
Grp Volume(v), veh/h				290	0	0	614	0	0	0	932	0
Grp Sat Flow(s),veh/h/ln				1723	0	1538	1650	0	0	0	1583	1442
Q Serve(g_s), s				26.0	0.0	0.0	54.0	0.0	0.0	0.0	82.0	0.0
Cycle Q Clear(g_c), s				26.0	0.0	0.0	54.0	0.0	0.0	0.0	82.0	0.0
Prop In Lane				1.00		1.00	0.07		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				249	0	222	495	0	0	0	721	657
V/C Ratio(X)				1.16	0.00	0.00	1.24	0.00	0.00	0.00	1.29	0.00
Avail Cap(c_a), veh/h				249	0	222	495	0	0	0	721	657
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.09	0.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				77.0	0.0	0.0	81.1	0.0	0.0	0.0	49.0	0.0
Incr Delay (d2), s/veh				109.0	0.0	0.0	110.0	0.0	0.0	0.0	141.7	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
%ile BackOfQ(95%),veh/ln				35.8	0.0	0.0	69.4	0.0	0.0	0.0	115.7	0.0
LnGrp Delay(d),s/veh				186.0	0.0	0.0	191.1	0.0	0.0	0.0	190.7	0.0
LnGrp LOS				F			F				F	
Approach Vol, veh/h					290			614			932	
Approach Delay, s/veh					186.0			191.1			190.7	
Approach LOS					F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		60.0				88.0		32.0
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		54.0				82.0		26.0
Max Q Clear Time (g_c+I1), s		56.0				84.0		28.0
Green Ext Time (p_c), s		0.0				0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	190.1
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	0	45	0	0	0	0	295	245	295	395	0
Future Volume (veh/h)	205	0	45	0	0	0	0	295	245	295	395	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1696	1696				0	1727	1900	1900	1679	0
Adj Flow Rate, veh/h	223	0	0				0	321	0	321	429	0
Adj No. of Lanes	0	1	1				0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	12	2	12				0	15	15	20	20	0
Cap, veh/h	208	0	185				0	555	0	297	396	0
Arrive On Green	0.13	0.00	0.00				0.00	0.32	0.00	0.42	0.42	0.00
Sat Flow, veh/h	1616	0	1442				0	1727	0	704	940	0
Grp Volume(v), veh/h	223	0	0				0	321	0	750	0	0
Grp Sat Flow(s),veh/h/ln	1616	0	1442				0	1727	0	1644	0	0
Q Serve(g_s), s	18.0	0.0	0.0				0.0	21.7	0.0	59.0	0.0	0.0
Cycle Q Clear(g_c), s	18.0	0.0	0.0				0.0	21.7	0.0	59.0	0.0	0.0
Prop In Lane	1.00		1.00				0.00		0.00	0.43		0.00
Lane Grp Cap(c), veh/h	208	0	185				0	555	0	693	0	0
V/C Ratio(X)	1.07	0.00	0.00				0.00	0.58	0.00	1.08	0.00	0.00
Avail Cap(c_a), veh/h	208	0	185				0	555	0	693	0	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	0.00	0.15	0.00	0.00
Uniform Delay (d), s/veh	61.0	0.0	0.0				0.0	39.6	0.0	40.5	0.0	0.0
Incr Delay (d2), s/veh	83.3	0.0	0.0				0.0	4.3	0.0	41.8	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
%ile BackOfQ(50%),veh/ln	12.8	0.0	0.0				0.0	11.0	0.0	34.8	0.0	0.0
LnGrp Delay(d),s/veh	144.3	0.0	0.0				0.0	43.9	0.0	82.3	0.0	0.0
LnGrp LOS	F							D		F		
Approach Vol, veh/h		223						321			750	
Approach Delay, s/veh		144.3						43.9			82.3	
Approach LOS		F						D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		51.0		24.0		65.0		
Change Period (Y+Rc), s		6.0		6.0		6.0		
Max Green Setting (Gmax), s		45.0		18.0		59.0		
Max Q Clear Time (g_c+I1), s		23.7		20.0		61.0		
Green Ext Time (p_c), s		1.7		0.0		0.0		

Intersection Summary	
HCM 2010 Ctrl Delay	83.5
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	255	0	660	115	385	0	0	435	250
Future Volume (veh/h)	0	0	0	255	0	660	115	385	0	0	435	250
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				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
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1810	1810	1900	1662	0	0	1583	1696
Adj Flow Rate, veh/h				277	0	0	125	418	0	0	473	0
Adj No. of Lanes				0	1	1	0	1	0	0	1	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				5	2	5	15	15	0	0	20	12
Cap, veh/h				302	0	270	147	492	0	0	486	443
Arrive On Green				0.18	0.00	0.00	0.13	0.13	0.00	0.00	0.31	0.00
Sat Flow, veh/h				1723	0	1538	378	1265	0	0	1583	1442
Grp Volume(v), veh/h				277	0	0	543	0	0	0	473	0
Grp Sat Flow(s),veh/h/ln				1723	0	1538	1643	0	0	0	1583	1442
Q Serve(g_s), s				22.1	0.0	0.0	45.3	0.0	0.0	0.0	41.3	0.0
Cycle Q Clear(g_c), s				22.1	0.0	0.0	45.3	0.0	0.0	0.0	41.3	0.0
Prop In Lane				1.00		1.00	0.23		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				302	0	270	639	0	0	0	486	443
V/C Ratio(X)				0.92	0.00	0.00	0.85	0.00	0.00	0.00	0.97	0.00
Avail Cap(c_a), veh/h				332	0	297	639	0	0	0	486	443
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.09	0.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				56.7	0.0	0.0	57.0	0.0	0.0	0.0	47.9	0.0
Incr Delay (d2), s/veh				27.8	0.0	0.0	1.4	0.0	0.0	0.0	34.6	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
%ile BackOfQ(50%),veh/ln				12.9	0.0	0.0	20.9	0.0	0.0	0.0	22.7	0.0
LnGrp Delay(d),s/veh				84.6	0.0	0.0	58.4	0.0	0.0	0.0	82.5	0.0
LnGrp LOS				F			E				F	
Approach Vol, veh/h					277			543			473	
Approach Delay, s/veh					84.6			58.4			82.5	
Approach LOS					F			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		60.5				49.0		30.5
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		52.0				43.0		27.0
Max Q Clear Time (g_c+I1), s		47.3				43.3		24.1
Green Ext Time (p_c), s		1.4				0.0		0.4

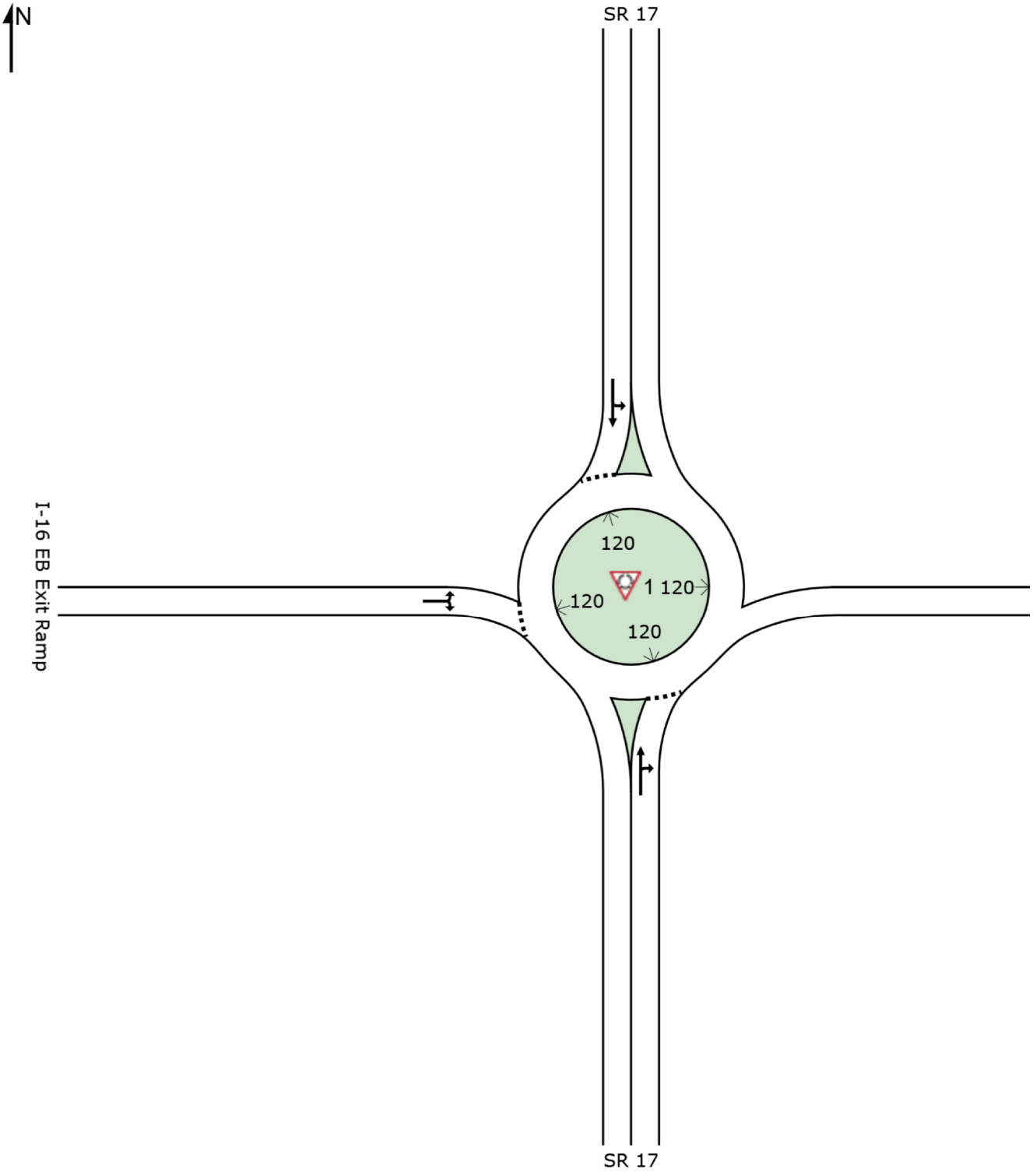
Intersection Summary	
HCM 2010 Ctrl Delay	72.8
HCM 2010 LOS	E

SITE LAYOUT

Site: 1 [SR 17 at I-16 EB Ramps 2021 AM]

SR 17 at I-16 EB Ramps, Chatham County

Roundabout



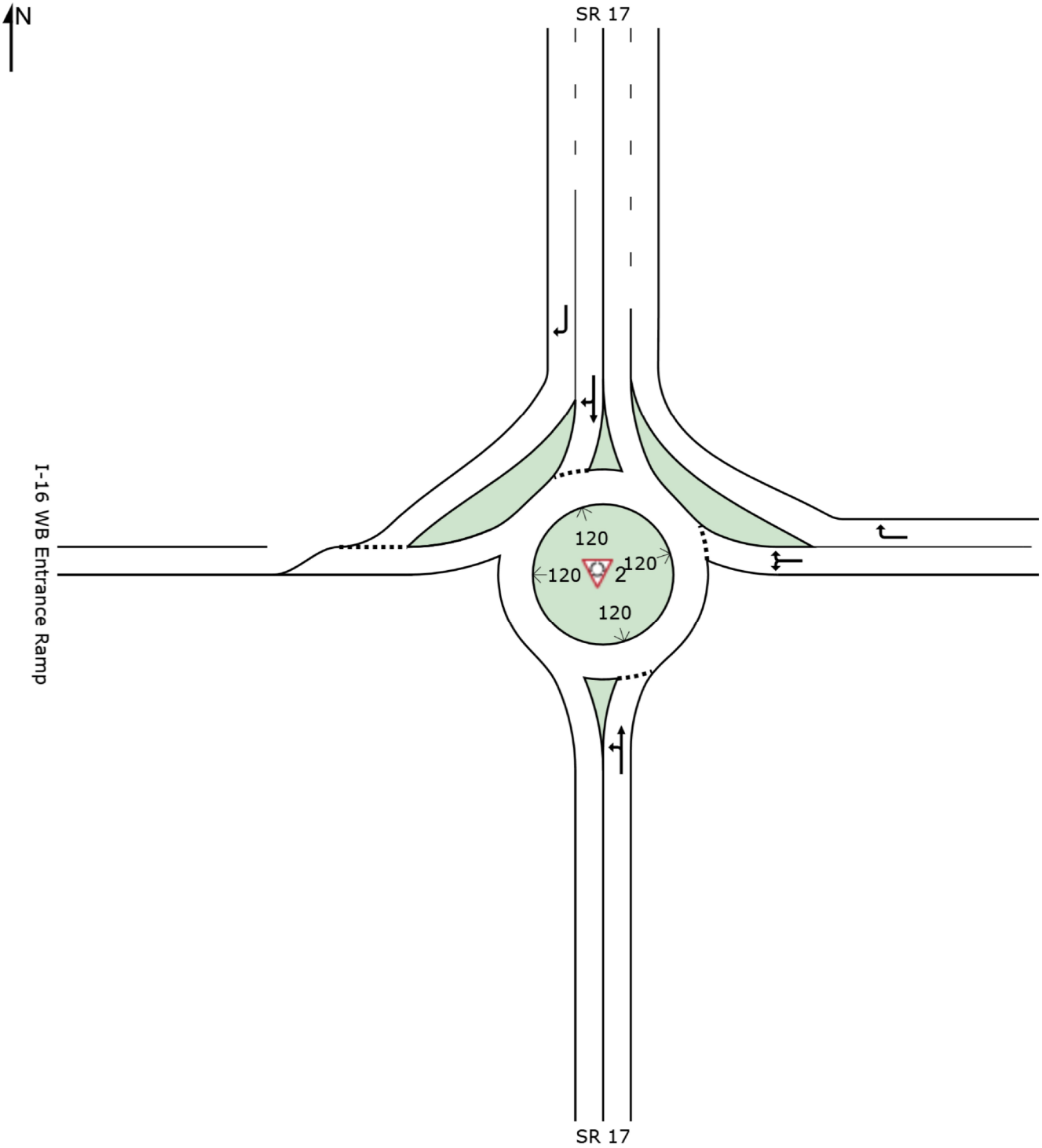
SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: WOLVERTON & ASSOCIATES, INC. | Created: Thursday, March 19, 2020 11:48:15 AM
Project: Z:\All Project Data\Projects\2018\18-TF-902 Op Imp TO2 PI0015936 Synopsis\TF\WA 21 - SR 17 at I-16 Ramps\Roundabout Analysis\Sidra \19-TF-902-WA 21_2021 AM-EB Ramp.sip7

SITE LAYOUT

Site: 2 [SR 17 at I-16 WB Ramps 2021 AM]

SR 17 at I-16 WB Ramps, Chatham County, GA

Roundabout



Project: Z:\All Project Data\Projects\2018\18-TF-902 Op Imp TO2 PI0015936 Synopsis\TF\WA 21 - SR 17 at I-16 Ramps\Roundabout Analysis\Sidra \19-TF-902-WA 21_2021 AM-EB Ramp.sip7

LANE SUMMARY

Site: 1 [SR 17 at I-16 EB Ramps 2021 AM]

SR 17 at I-16 EB Ramps, Chatham County

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 17													
Lane 1[d]	426	11.0	463	0.921	100	54.1	LOS D	17.2	468.6	Full	1600	0.0	0.0
Approach	426	11.0		0.921		54.1	LOS D	17.2	468.6				
North: SR 17													
Lane 1[d]	949	16.5	1495	0.635	100	9.7	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	949	16.5		0.635		9.7	LOS A	0.0	0.0				
West: I-16 EB Exit Ramp													
Lane 1[d]	369	16.5	448	0.825	100	40.1	LOS D	12.2	346.2	Full	1600	0.0	0.0
Approach	369	16.5		0.825		40.1	LOS D	12.2	346.2				
Intersection	1744	15.2		0.921		27.0	LOS C	17.2	468.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com

LANE LEVEL OF SERVICE

Lane Level of Service

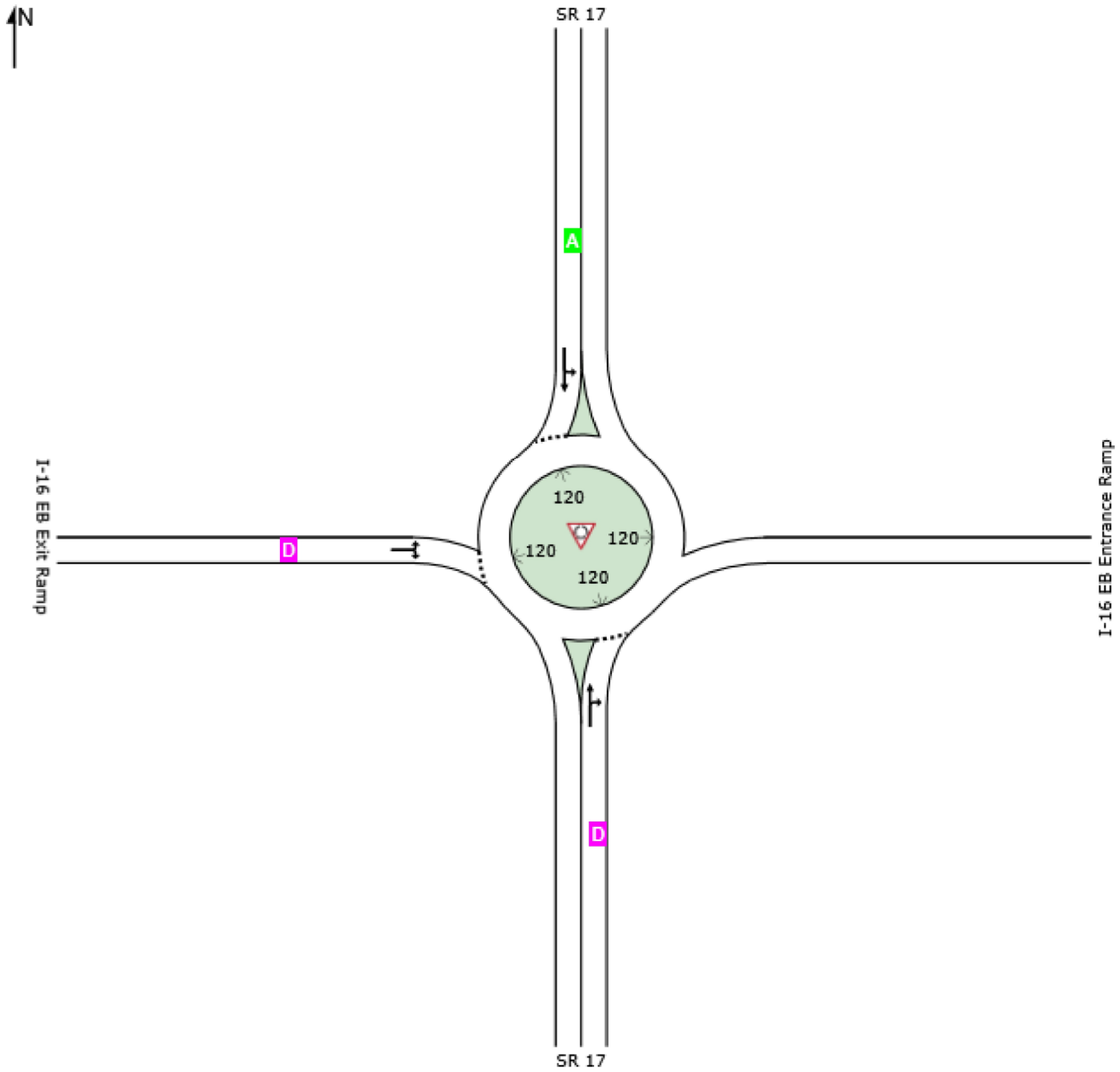
Site: 1 [SR 17 at I-16 EB Ramps 2021 AM]

SR 17 at I-16 EB Ramps, Chatham County

Roundabout

All Movement Classes

	South	North	West	Intersection
LOS	D	A	D	C



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: WOLVERTON & ASSOCIATES, INC. | Processed: Thursday, March 19, 2020 7:24:13 PM
Project: Z:\All Project Data\Projects\2018\18-TF-902 Op Imp TO2 PI0015936 Synopsis\TF\WA 21 - SR 17 at I-16 Ramps\Roundabout Analysis\Sidra \19-TF-902-WA 21_2021 AM-EB Ramp.sip7

LANE SUMMARY

Site: 2 [SR 17 at I-16 WB Ramps 2021 AM]

SR 17 at I-16 WB Ramps, Chatham County, GA

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 17													
Lane 1[d]	443	11.0	1569	0.282	100	4.6	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	443	11.0		0.282		4.6	LOS A	0.0	0.0				
East: I-16 WB Exit Ramp													
Lane 1[d]	290	8.5	1088	0.266	100	5.8	LOS A	1.6	42.0	Full	1600	0.0	0.0
Lane 2	176	8.5	1520	0.116	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	466	8.5		0.266		3.6	LOS A	1.6	42.0				
North: SR 17													
Lane 1[d]	659	16.5	1042	0.633	100	12.4	LOS B	6.4	182.5	Full	1600	0.0	0.0
Lane 2	199	16.5	1416	0.140	100	3.7	LOS A	0.7	20.0	Full	1600	0.0	0.0
Approach	858	16.5		0.633		10.4	LOS B	6.4	182.5				
Intersection	1767	13.0		0.633		7.1	LOS A	6.4	182.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE LEVEL OF SERVICE

Lane Level of Service

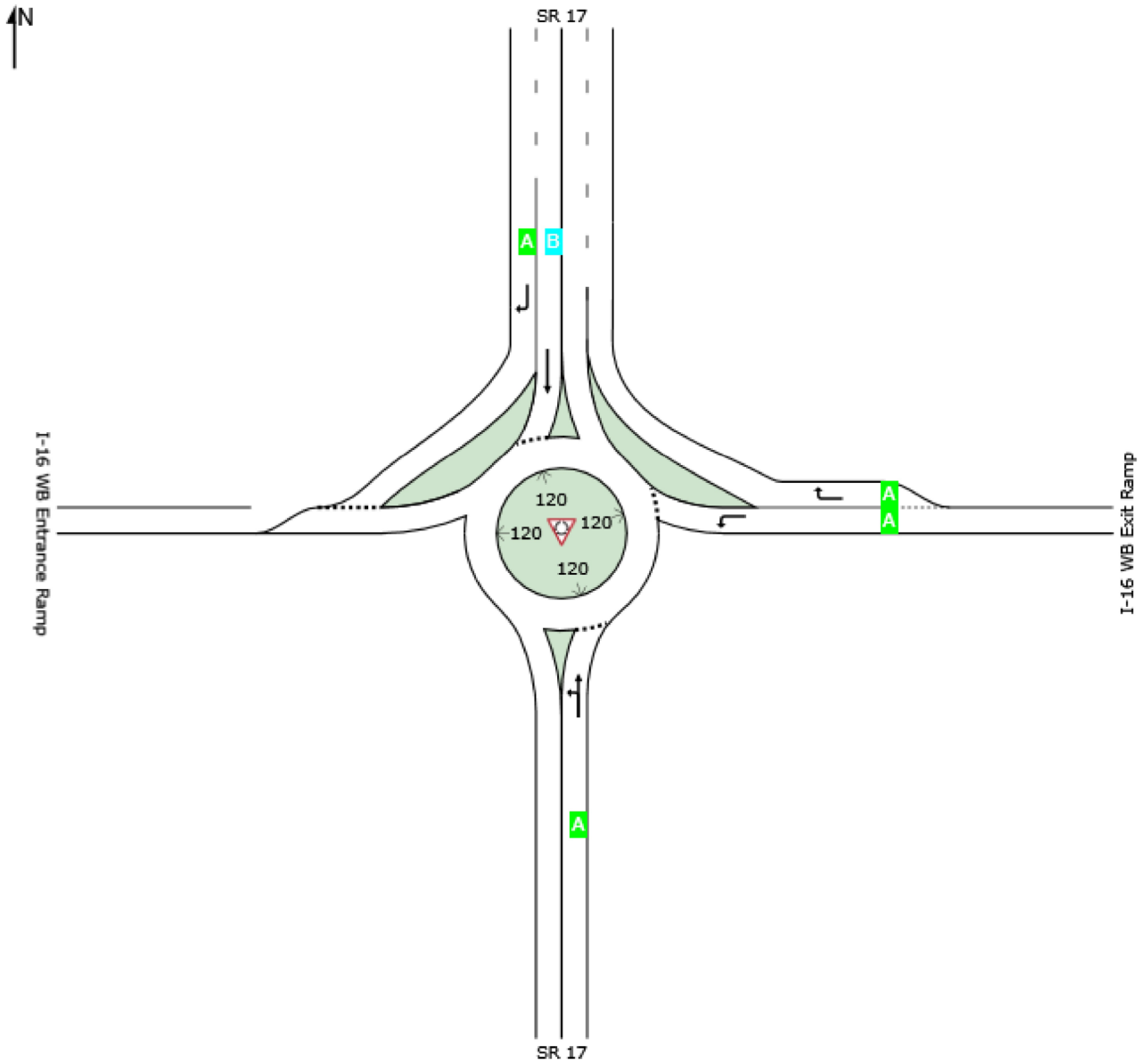
Site: 2 [SR 17 at I-16 WB Ramps 2021 AM]

SR 17 at I-16 WB Ramps, Chatham County, GA

Roundabout

All Movement Classes

	South	East	North	Intersection
LOS	A	A	B	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: WOLVERTON & ASSOCIATES, INC. | Processed: Thursday, March 19, 2020 10:44:24 PM
Project: Z:\All Project Data\Projects\2018\18-TF-902 Op Imp TO2 PI0015936 Synopsis\TF\WA 21 - SR 17 at I-16 Ramps\Roundabout Analysis\Sidra \19-TF-902-WA 21_2021 AM-EB Ramp.sip7

LANE SUMMARY

Site: 1 [SR 17 at I-16 EB Ramps 2021 PM]

SR 17 at I-16 EB Ramps, Chatham County

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 17													
Lane 1[d]	534	9.0	791	0.675	100	16.9	LOS B	7.3	195.6	Full	1600	0.0	0.0
Approach	534	9.0		0.675		16.9	LOS B	7.3	195.6				
North: SR 17													
Lane 1[d]	602	15.5	1508	0.399	100	6.0	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	602	15.5		0.399		6.0	LOS A	0.0	0.0				
West: I-16 EB Exit Ramp													
Lane 1[d]	250	12.0	701	0.356	100	9.7	LOS A	2.1	57.8	Full	1600	0.0	0.0
Approach	250	12.0		0.356		9.7	LOS A	2.1	57.8				
Intersection	1386	12.4		0.675		10.8	LOS B	7.3	195.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com

LANE LEVEL OF SERVICE

Lane Level of Service

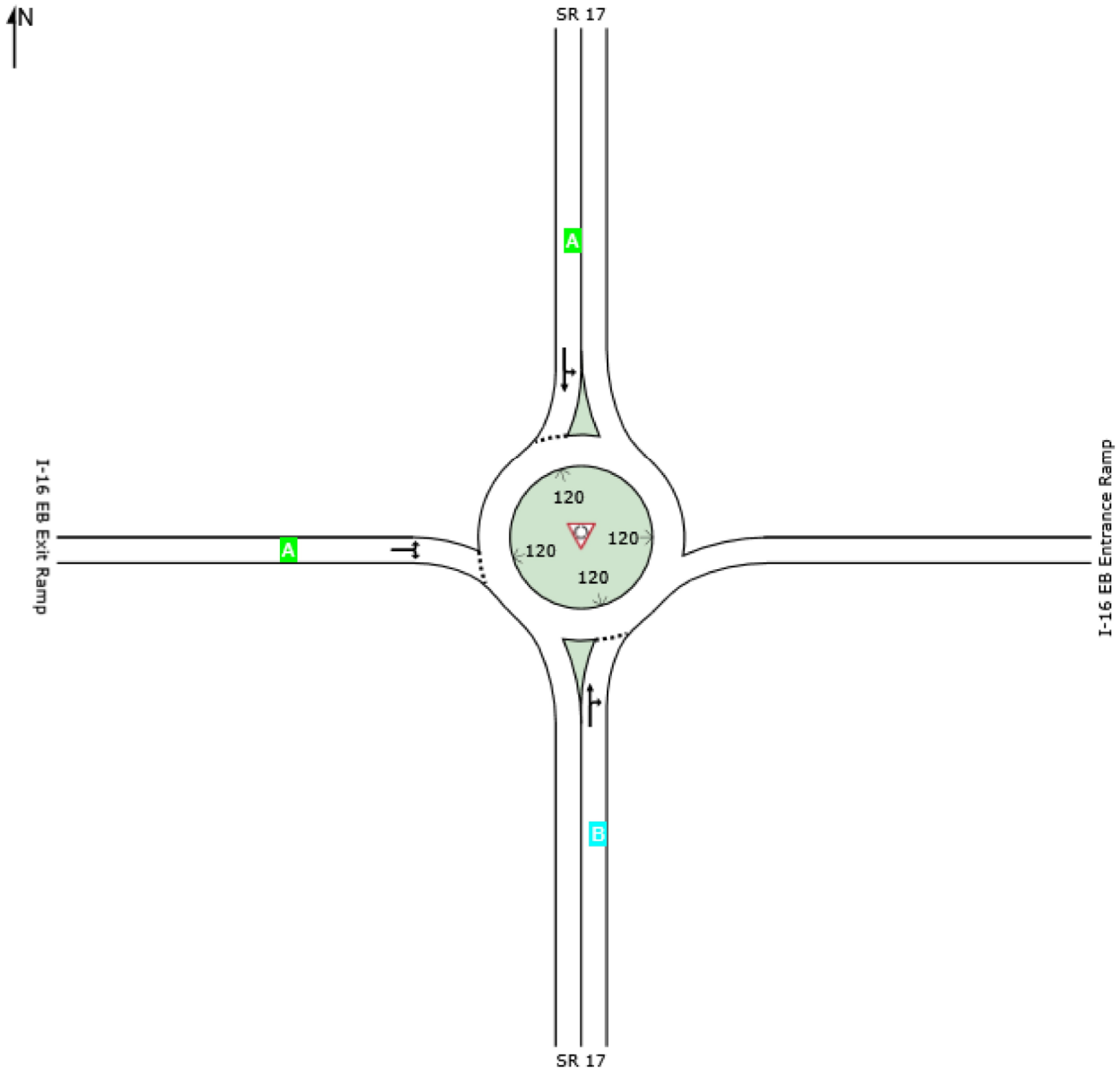
Site: 1 [SR 17 at I-16 EB Ramps 2021 PM]

SR 17 at I-16 EB Ramps, Chatham County

Roundabout

All Movement Classes

	South	North	West	Intersection
LOS	B	A	A	B



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: WOLVERTON & ASSOCIATES, INC. | Processed: Thursday, March 19, 2020 8:14:26 PM
Project: Z:\All Project Data\Projects\2018\18-TF-902 Op Imp TO2 PI0015936 Synopsis\TF\WA 21 - SR 17 at I-16 Ramps\Roundabout Analysis\Sidra \19-TF-902-WA 21_2021 AM-EB Ramp.sip7

LANE SUMMARY

Site: 2 [SR 17 at I-16 WB Ramps 2021 PM]

SR 17 at I-16 WB Ramps, Chatham County, GA

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 17													
Lane 1[d]	455	15.5	1508	0.301	100	4.9	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	455	15.5		0.301		4.9	LOS A	0.0	0.0				
East: I-16 WB Exit Ramp													
Lane 1[d]	290	5.5	1106	0.262	100	5.7	LOS A	1.6	40.9	Full	1600	0.0	0.0
Lane 2	511	5.5	1563	0.327	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	801	5.5		0.327		2.1	LOS A	1.6	40.9				
North: SR 17													
Lane 1[d]	313	20.5	922	0.339	100	7.6	LOS A	2.2	63.8	Full	1600	0.0	0.0
Lane 2	227	20.5	1213	0.187	100	4.6	LOS A	1.0	28.6	Full	1600	0.0	0.0
Approach	540	20.5		0.339		6.3	LOS A	2.2	63.8				
Intersection	1795	12.5		0.339		4.1	LOS A	2.2	63.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE LEVEL OF SERVICE

Lane Level of Service

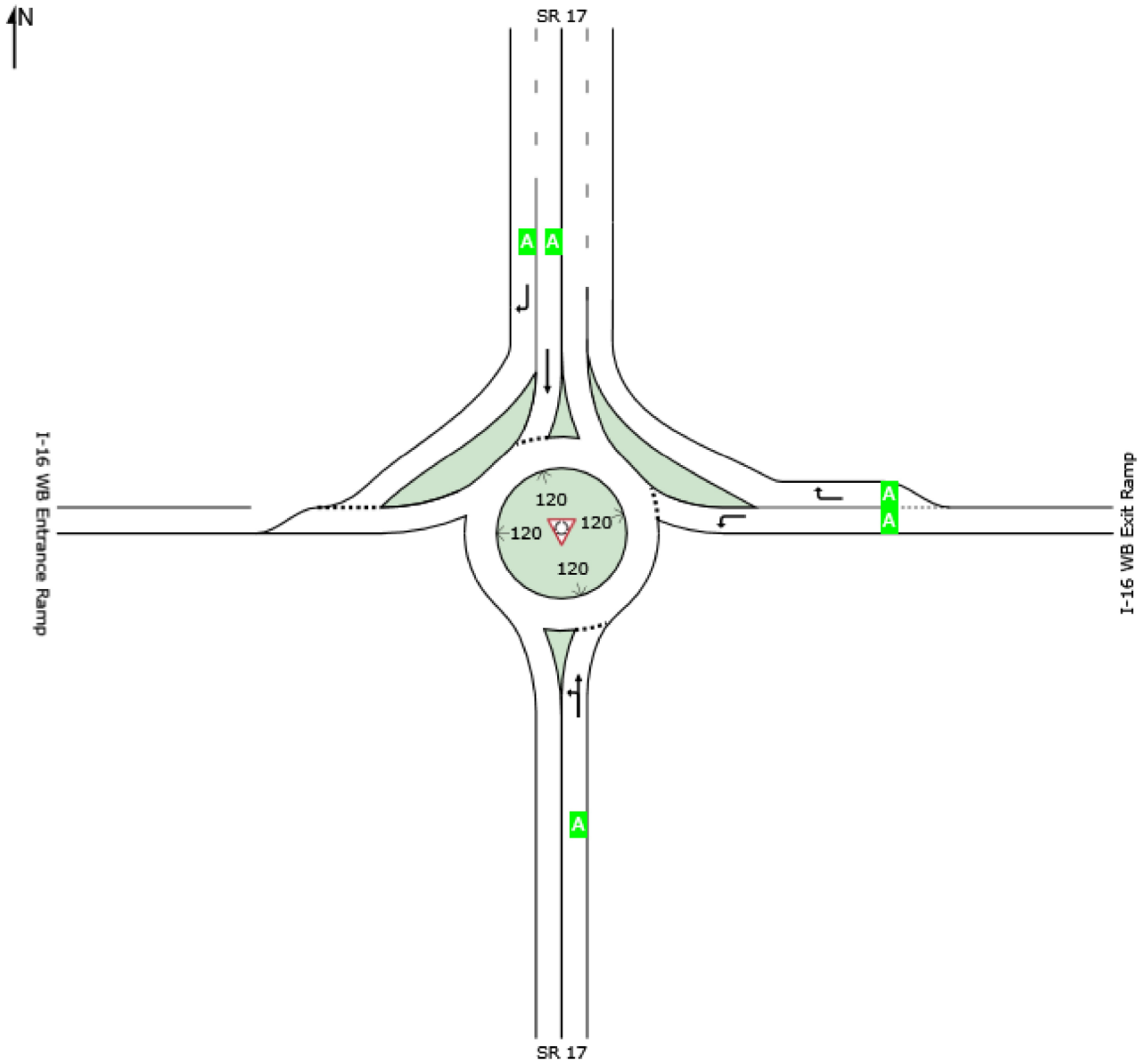
Site: 2 [SR 17 at I-16 WB Ramps 2021 PM]

SR 17 at I-16 WB Ramps, Chatham County, GA

Roundabout

All Movement Classes

	South	East	North	Intersection
LOS	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: WOLVERTON & ASSOCIATES, INC. | Processed: Thursday, March 19, 2020 10:58:17 PM
Project: Z:\All Project Data\Projects\2018\18-TF-902 Op Imp TO2 PI0015936 Synopsis\TF\WA 21 - SR 17 at I-16 Ramps\Roundabout Analysis\Sidra \19-TF-902-WA 21_2021 AM-EB Ramp.sip7

LANE SUMMARY

Site: 1 [SR 17 at I-16 EB Ramps 2030 AM]

SR 17 at I-16 EB Ramps, Chatham County

Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 17													
Lane 1[d]	517	19.0	414	1.250	100	159.7	LOS F	50.7	1459.8	Full	1600	0.0	2.4
Approach	517	19.0		1.250		159.7	LOS F	50.7	1459.8				
North: SR 17													
Lane 1[d]	1222	21.5	1462	0.836	100	17.6	LOS B	0.0	0.0	Full	1600	0.0	0.0
Approach	1222	21.5		0.836		17.6	LOS B	0.0	0.0				
West: I-16 EB Exit Ramp													
Lane 1[d]	449	19.9	230	1.955	100	480.5	LOS F	86.6	2510.2	Full	1600	0.0	20.5
Approach	449	19.9		1.955		480.5	LOS F	86.6	2510.2				
Intersection	2188	20.6		1.955		146.2	LOS F	86.6	2510.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com

LANE LEVEL OF SERVICE

Lane Level of Service

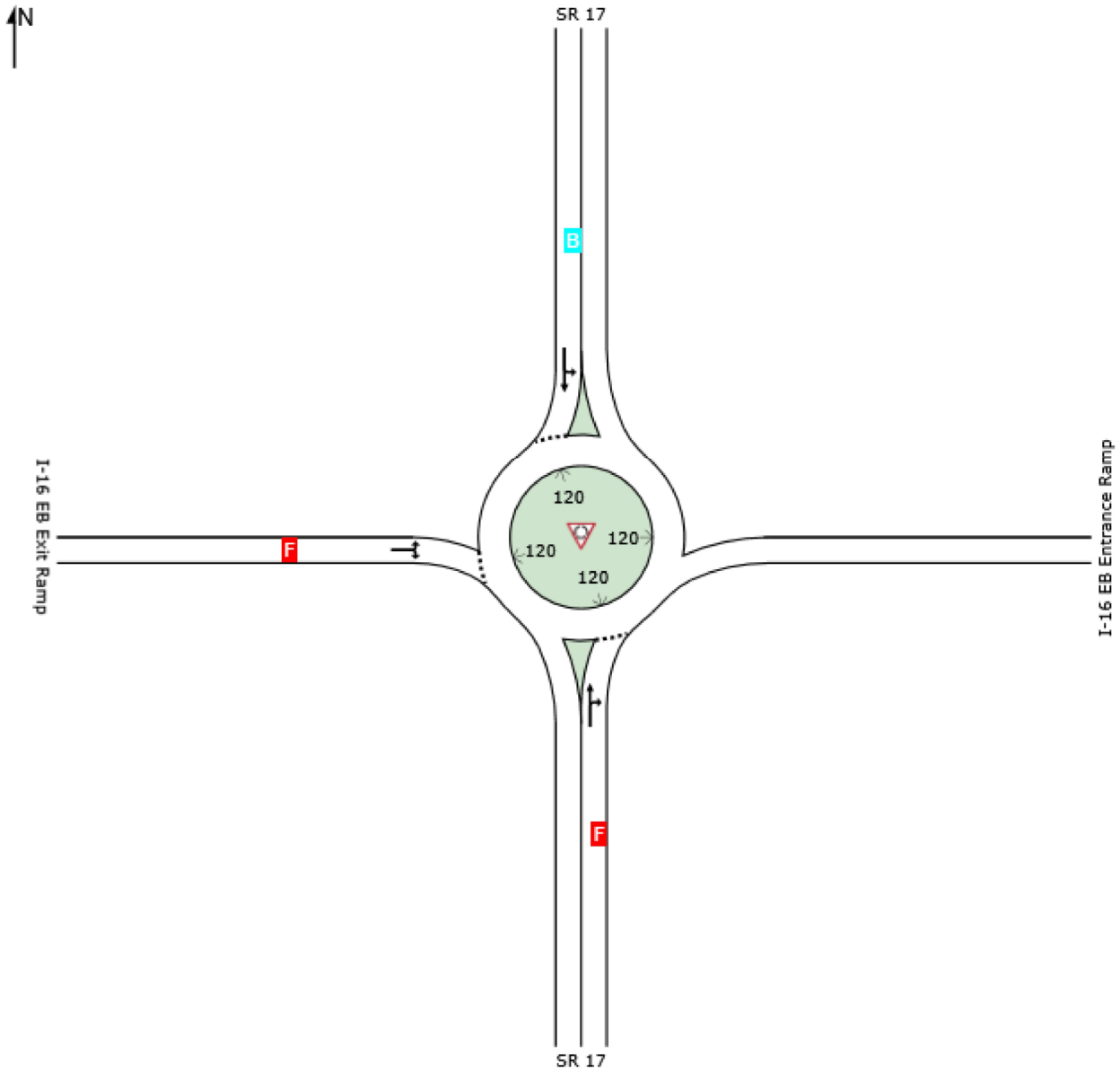
Site: 1 [SR 17 at I-16 EB Ramps 2030 AM]

SR 17 at I-16 EB Ramps, Chatham County

Roundabout

All Movement Classes

	South	North	West	Intersection
LOS	F	B	F	F



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: WOLVERTON & ASSOCIATES, INC. | Processed: Thursday, March 19, 2020 9:58:01 PM
Project: Z:\All Project Data\Projects\2018\18-TF-902 Op Imp TO2 PI0015936 Synopsis\TF\WA 21 - SR 17 at I-16 Ramps\Roundabout Analysis\Sidra \19-TF-902-WA 21_2021 AM-EB Ramp.sip7

LANE SUMMARY

Site: 2 [SR 17 at I-16 WB Ramps 2030 AM]

SR 17 at I-16 WB Ramps, Chatham County, GA

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 17													
Lane 1[d]	614	19.0	1492	0.411	100	6.1	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	614	19.0		0.411		6.1	LOS A	0.0	0.0				
East: I-16 WB Exit Ramp													
Lane 1[d]	290	8.5	1004	0.289	100	6.5	LOS A	1.9	50.1	Full	1600	0.0	0.0
Lane 2	284	8.5	1520	0.187	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	574	8.5		0.289		3.3	LOS A	1.9	50.1				
North: SR 17													
Lane 1[d]	932	21.5	1037	0.899	100	29.1	LOS C	20.2	591.8	Full	1600	0.0	0.0
Lane 2	222	21.5	1407	0.157	100	3.8	LOS A	0.8	23.6	Full	1600	0.0	0.0
Approach	1153	21.5		0.899		24.2	LOS C	20.2	591.8				
Intersection	2341	17.7		0.899		14.3	LOS B	20.2	591.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE LEVEL OF SERVICE

Lane Level of Service

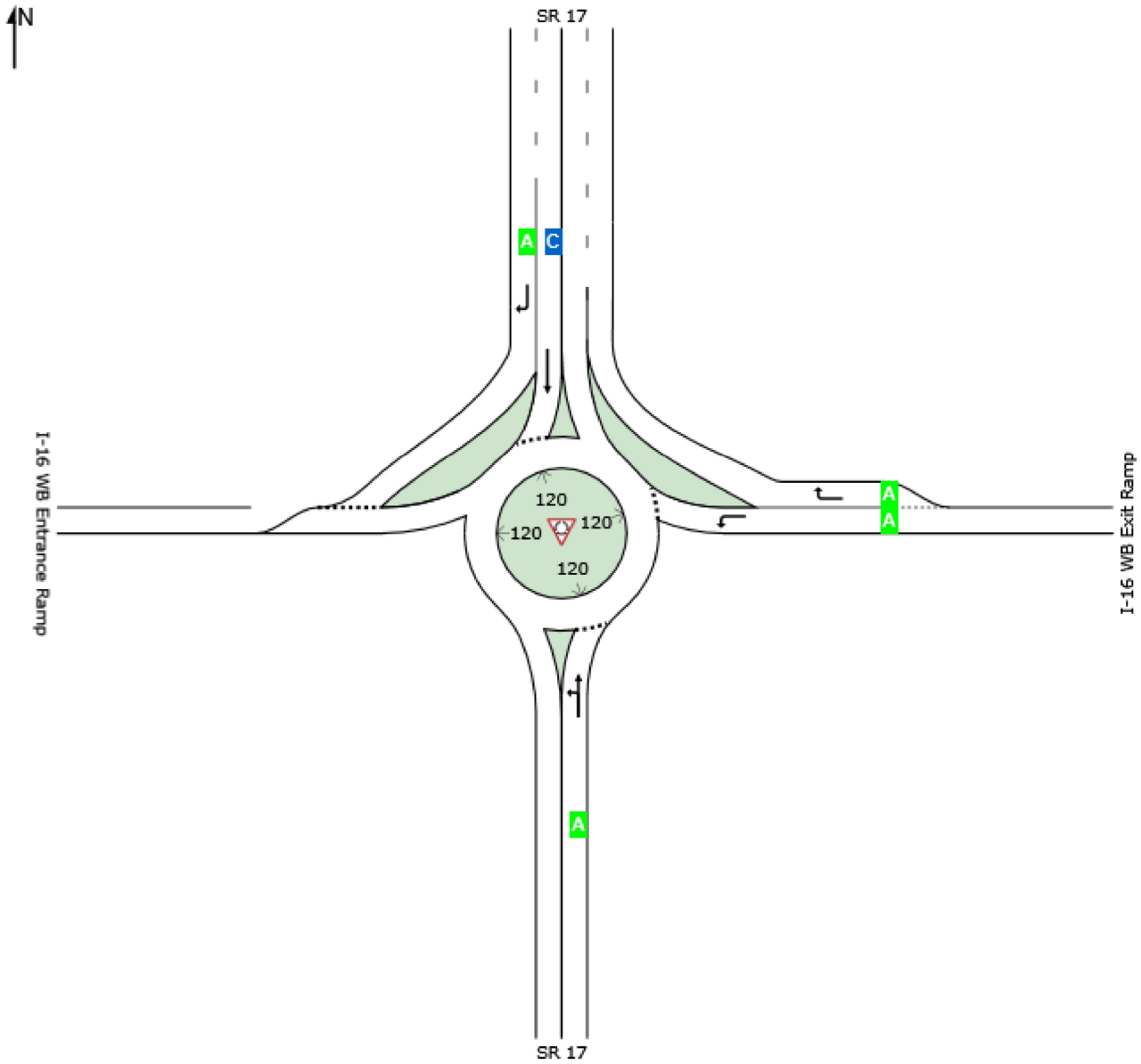
Site: 2 [SR 17 at I-16 WB Ramps 2030 AM]

SR 17 at I-16 WB Ramps, Chatham County, GA

Roundabout

All Movement Classes

	South	East	North	Intersection
LOS	A	A	C	B



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: WOLVERTON & ASSOCIATES, INC. | Processed: Thursday, March 19, 2020 11:44:42 PM
Project: Z:\All Project Data\Projects\2018\18-TF-902 Op Imp TO2 PI0015936 Synopsis\TF\WA 21 - SR 17 at I-16 Ramps\Roundabout Analysis\Sidra \19-TF-902-WA 21_2021 AM-EB Ramp.sip7

LANE SUMMARY

Site: 1 [SR 17 at I-16 EB Ramps 2030 PM]

SR 17 at I-16 EB Ramps, Chatham County

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 17													
Lane 1[d]	614	15.5	688	0.892	100	37.4	LOS D	16.8	473.4	Full	1600	0.0	0.0
Approach	614	15.5		0.892		37.4	LOS D	16.8	473.4				
North: SR 17													
Lane 1[d]	784	20.5	1474	0.532	100	7.8	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	784	20.5		0.532		7.8	LOS A	0.0	0.0				
West: I-16 EB Exit Ramp													
Lane 1[d]	284	12.0	614	0.463	100	13.1	LOS B	3.6	97.4	Full	1600	0.0	0.0
Approach	284	12.0		0.463		13.1	LOS B	3.6	97.4				
Intersection	1682	17.2		0.892		19.5	LOS B	16.8	473.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com

LANE LEVEL OF SERVICE

Lane Level of Service

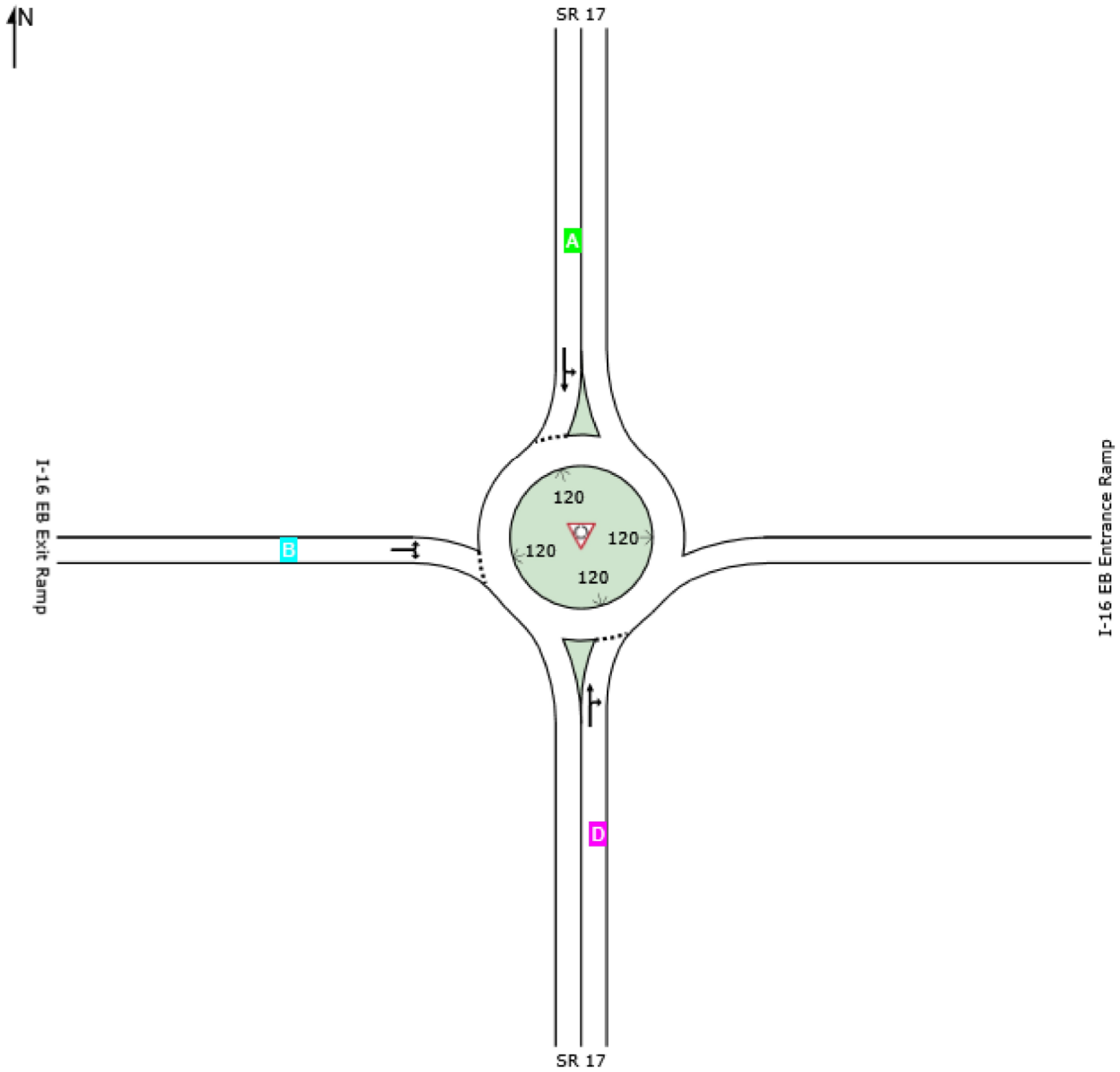
Site: 1 [SR 17 at I-16 EB Ramps 2030 PM]

SR 17 at I-16 EB Ramps, Chatham County

Roundabout

All Movement Classes

	South	North	West	Intersection
LOS	D	A	B	B



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: WOLVERTON & ASSOCIATES, INC. | Processed: Thursday, March 19, 2020 10:09:40 PM
Project: Z:\All Project Data\Projects\2018\18-TF-902 Op Imp TO2 PI0015936 Synopsis\TF\WA 21 - SR 17 at I-16 Ramps\Roundabout Analysis\Sidra \19-TF-902-WA 21_2021 AM-EB Ramp.sip7

LANE SUMMARY

Site: 2 [SR 17 at I-16 WB Ramps 2030 PM]

SR 17 at I-16 WB Ramps, Chatham County, GA

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 17													
Lane 1[d]	568	15.5	1537	0.370	100	5.6	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	568	15.5		0.370		5.6	LOS A	0.0	0.0				
East: I-16 WB Exit Ramp													
Lane 1[d]	290	5.5	1093	0.265	100	5.8	LOS A	1.7	43.9	Full	1600	0.0	0.0
Lane 2	750	5.5	1563	0.480	100	0.1	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	1040	5.5		0.480		1.7	LOS A	1.7	43.9				
North: SR 17													
Lane 1[d]	494	20.5	980	0.504	100	9.9	LOS A	4.0	116.0	Full	1600	0.0	0.0
Lane 2	284	20.5	1282	0.222	100	4.7	LOS A	1.2	35.1	Full	1600	0.0	0.0
Approach	778	20.5		0.504		8.0	LOS A	4.0	116.0				
Intersection	2386	12.8		0.504		4.7	LOS A	4.0	116.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE LEVEL OF SERVICE

Lane Level of Service

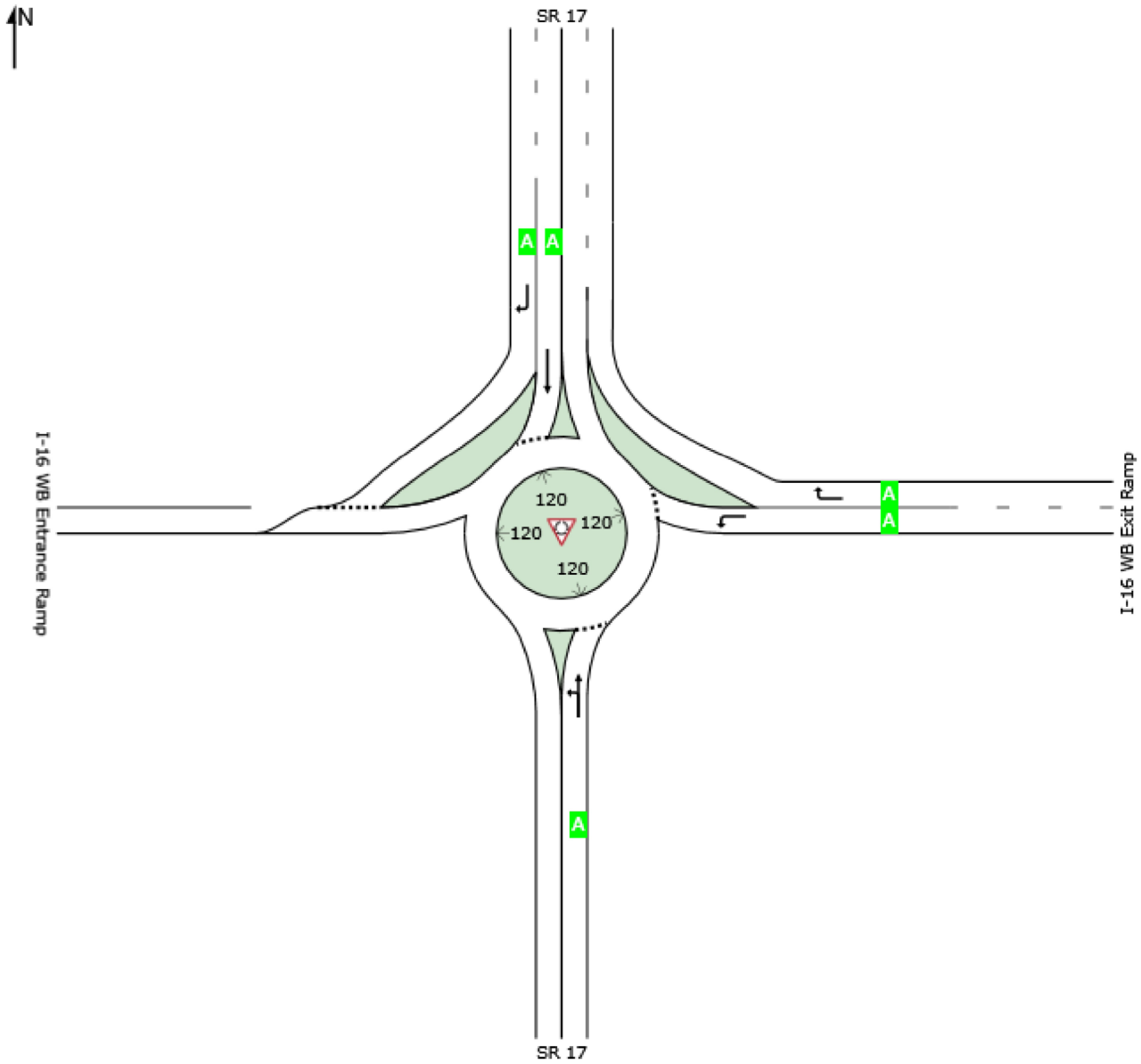
Site: 2 [SR 17 at I-16 WB Ramps 2030 PM]

SR 17 at I-16 WB Ramps, Chatham County, GA

Roundabout

All Movement Classes

	South	East	North	Intersection
LOS	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: WOLVERTON & ASSOCIATES, INC. | Processed: Thursday, March 19, 2020 11:51:53 PM
Project: Z:\All Project Data\Projects\2018\18-TF-902 Op Imp TO2 PI0015936 Synopsis\TF\WA 21 - SR 17 at I-16 Ramps\Roundabout Analysis\Sidra \19-TF-902-WA 21_2021 AM-EB Ramp.sip7

LANE SUMMARY

Site: 1 [SR 17 at I-16 EB Ramps 2021 AM]

SR 17 at I-16 EB Ramps, Chatham County
NB and EB Bypass Lanes

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 17													
Lane 1[d]	136	11.0	626	0.218	100	8.4	LOS A	1.6	42.3	Full	1600	0.0	0.0
Lane 2	290	11.0	952	0.304	100	7.0	LOS A	1.9	51.4	Short	100	0.0	NA
Approach	426	11.0		0.304		7.4	LOS A	1.9	51.4				
North: SR 17													
Lane 1[d]	949	16.5	1495	0.635	100	9.7	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	949	16.5		0.635		9.7	LOS A	0.0	0.0				
West: I-16 EB Exit Ramp													
Lane 1[d]	307	16.5	608	0.505	100	14.3	LOS B	4.6	131.2	Full	1600	0.0	0.0
Lane 2	63	16.5	1017	0.061	100	4.1	LOS A	0.3	8.7	Short	200	0.0	NA
Approach	369	16.5		0.505		12.6	LOS B	4.6	131.2				
Intersection	1744	15.2		0.635		9.7	LOS A	4.6	131.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE LEVEL OF SERVICE

Lane Level of Service

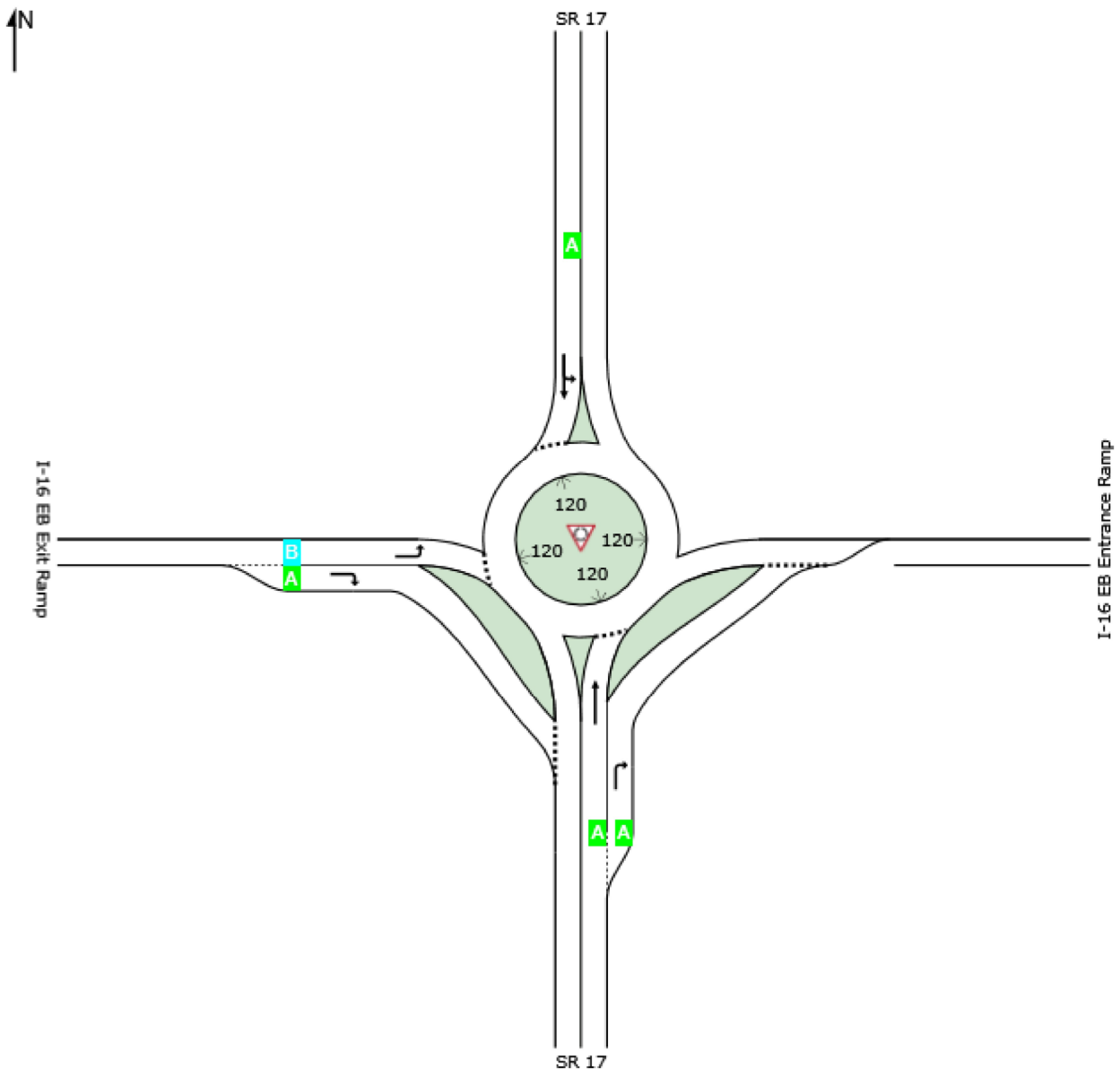
Site: 1 [SR 17 at I-16 EB Ramps 2021 AM]

SR 17 at I-16 EB Ramps, Chatham County
NB and EB Bypass Lanes

Roundabout

All Movement Classes

	South	North	West	Intersection
LOS	A	A	B	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: WOLVERTON & ASSOCIATES, INC. | Processed: Friday, March 20, 2020 12:43:29 AM
Project: Z:\All Project Data\Projects\2018\18-TF-902 Op Imp TO2 PI0015936 Synopsis\TF\WA 21 - SR 17 at I-16 Ramps\Roundabout Analysis\Sidra \19-TF-902-WA 21_SR 17 at I-16 Chatham County.sip7

LANE SUMMARY

Site: 1 [SR 17 at I-16 EB Ramps 2021 PM]

SR 17 at I-16 EB Ramps, Chatham County
NB and EB bypass lanes

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 17													
Lane 1[d]	256	9.0	1016	0.252	100	6.0	LOS A	1.6	42.4	Full	1600	0.0	0.0
Lane 2	278	9.0	1216	0.229	100	5.0	LOS A	1.3	34.2	Short	100	0.0	NA
Approach	534	9.0		0.252		5.5	LOS A	1.6	42.4				
North: SR 17													
Lane 1[d]	602	15.5	1508	0.399	100	6.0	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	602	15.5		0.399		6.0	LOS A	0.0	0.0				
West: I-16 EB Exit Ramp													
Lane 1[d]	199	12.0	915	0.217	100	6.1	LOS A	1.3	35.4	Full	1600	0.0	0.0
Lane 2	51	12.0	1109	0.046	100	3.6	LOS A	0.2	6.2	Short	200	0.0	NA
Approach	250	12.0		0.217		5.6	LOS A	1.3	35.4				
Intersection	1386	12.4		0.399		5.7	LOS A	1.6	42.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE LEVEL OF SERVICE

Lane Level of Service

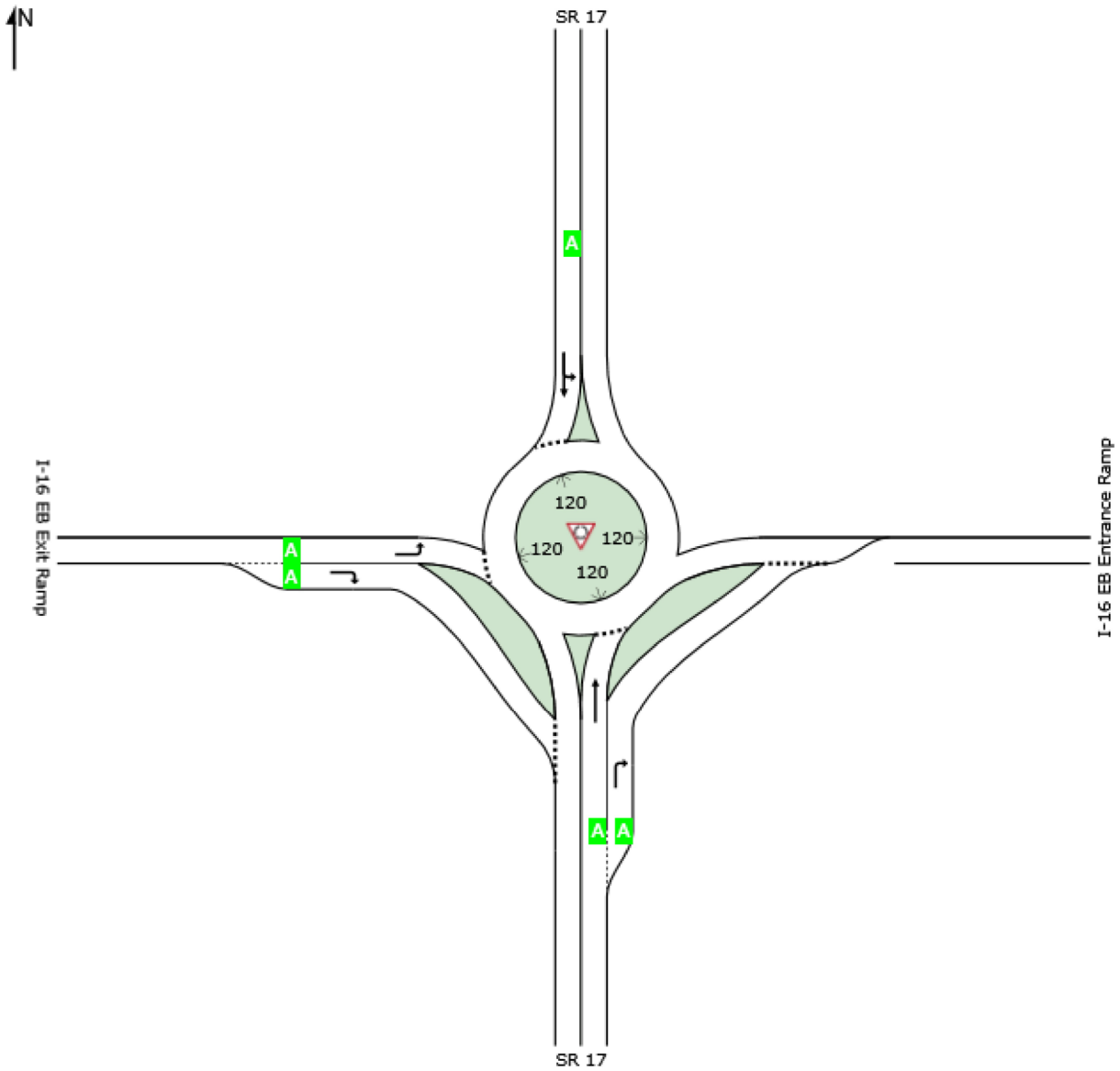
Site: 1 [SR 17 at I-16 EB Ramps 2021 PM]

SR 17 at I-16 EB Ramps, Chatham County
NB and EB bypass lanes

Roundabout

All Movement Classes

	South	North	West	Intersection
LOS	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: WOLVERTON & ASSOCIATES, INC. | Processed: Friday, March 20, 2020 11:21:23 AM
Project: Z:\All Project Data\Projects\2018\18-TF-902 Op Imp TO2 PI0015936 Synopsis\TF\WA 21 - SR 17 at I-16 Ramps\Roundabout Analysis\Sidra \19-TF-902-WA 21_SR 17 at I-16 Chatham County.sip7

LANE SUMMARY

Site: 1 [SR 17 at I-16 EB Ramps 2030 AM]

SR 17 at I-16 EB Ramps, Chatham County
NB and EB Bypass Lanes
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 17													
Lane 1[d]	227	19.0	429	0.530	100	20.1	LOS C	5.4	156.1	Full	1600	0.0	0.0
Lane 2	290	19.0	780	0.371	100	9.2	LOS A	2.5	72.4	Short	100	0.0	NA
Approach	517	19.0		0.530		14.0	LOS B	5.4	156.1				
North: SR 17													
Lane 1[d]	1222	21.5	1462	0.836	100	17.6	LOS B	0.0	0.0	Full	1600	0.0	0.0
Approach	1222	21.5		0.836		17.6	LOS B	0.0	0.0				
West: I-16 EB Exit Ramp													
Lane 1[d]	386	20.5	325	1.191	100	147.2	LOS F	40.2	1168.7	Full	1600	0.0	0.0
Lane 2	63	16.5	1000	0.063	100	4.2	LOS A	0.3	9.4	Full	1600	0.0	0.0
Approach	449	19.9		1.191		127.3	LOS F	40.2	1168.7				
Intersection	2188	20.6		1.191		39.2	LOS D	40.2	1168.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com

LANE LEVEL OF SERVICE

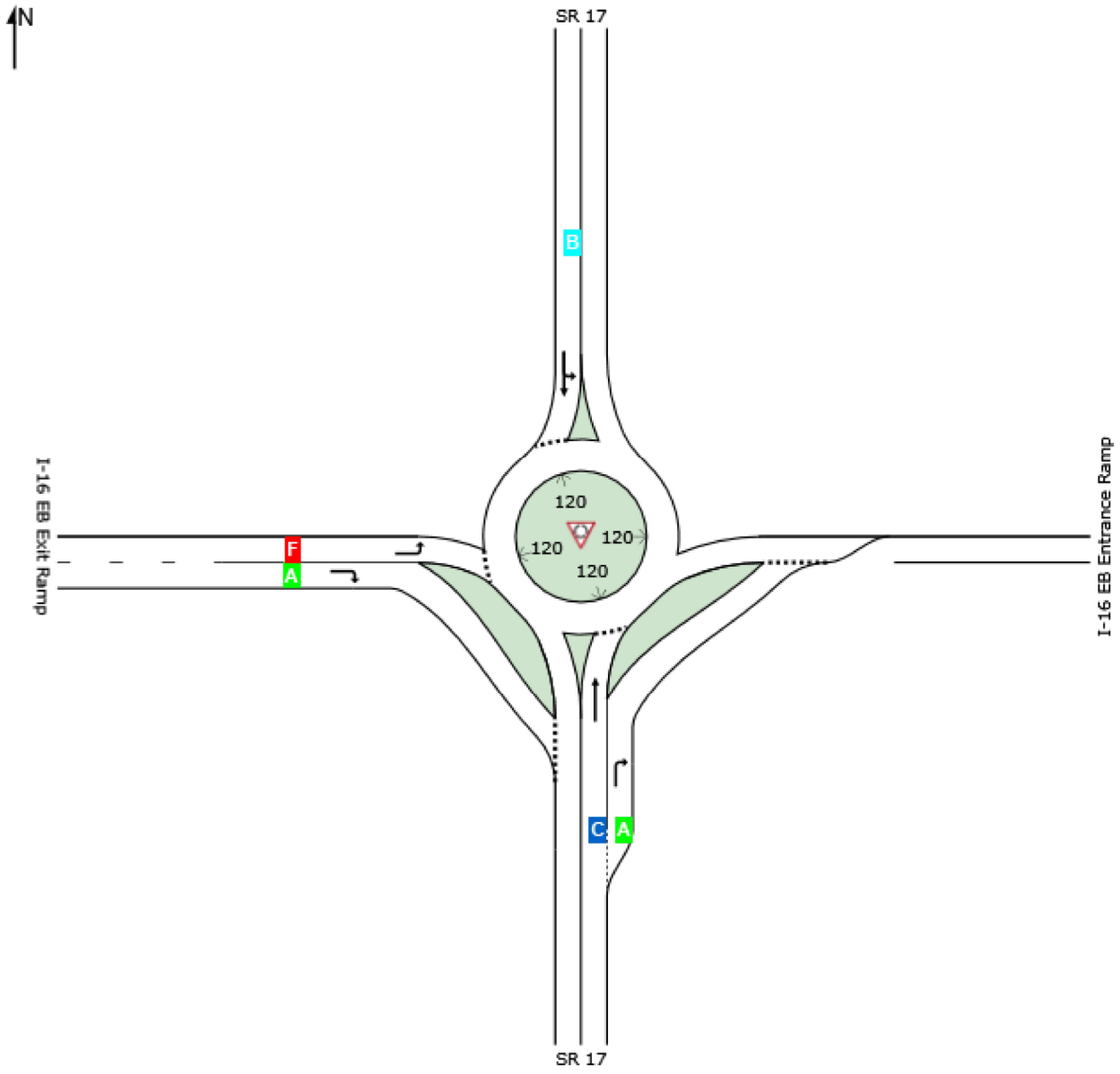
Lane Level of Service

Site: 1 [SR 17 at I-16 EB Ramps 2030 AM]

SR 17 at I-16 EB Ramps, Chatham County
NB and EB Bypass Lanes
Roundabout

All Movement Classes

	South	North	West	Intersection
LOS	B	B	F	D



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: WOLVERTON & ASSOCIATES, INC. | Processed: Friday, March 20, 2020 12:48:45 AM
Project: Z:\All Project Data\Projects\2018\18-TF-902 Op Imp TO2 PI0015936 Synopsis\TF\WA 21 - SR 17 at I-16 Ramps\Roundabout Analysis\Sidra \19-TF-902-WA 21_SR 17 at I-16 Chatham County.sip7

LANE SUMMARY

Site: 1 [SR 17 at I-16 EB Ramps 2030 PM]

SR 17 at I-16 EB Ramps, Chatham County
NB and EB Bypass Lanes
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 17													
Lane 1[d]	335	15.5	898	0.373	100	8.2	LOS A	2.6	73.4	Full	1600	0.0	0.0
Lane 2	278	15.5	1130	0.246	100	5.5	LOS A	1.4	39.6	Short	100	0.0	NA
Approach	614	15.5		0.373		7.0	LOS A	2.6	73.4				
North: SR 17													
Lane 1[d]	784	20.5	1474	0.532	100	7.8	LOS A	0.0	0.0	Full	1600	0.0	0.0
Approach	784	20.5		0.532		7.8	LOS A	0.0	0.0				
West: I-16 EB Exit Ramp													
Lane 1[d]	233	12.0	817	0.285	100	7.6	LOS A	1.9	53.4	Full	1600	0.0	0.0
Lane 2	51	12.0	1083	0.047	100	3.7	LOS A	0.2	6.8	Short	200	0.0	NA
Approach	284	12.0		0.285		6.9	LOS A	1.9	53.4				
Intersection	1682	17.2		0.532		7.4	LOS A	2.6	73.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com

LANE LEVEL OF SERVICE

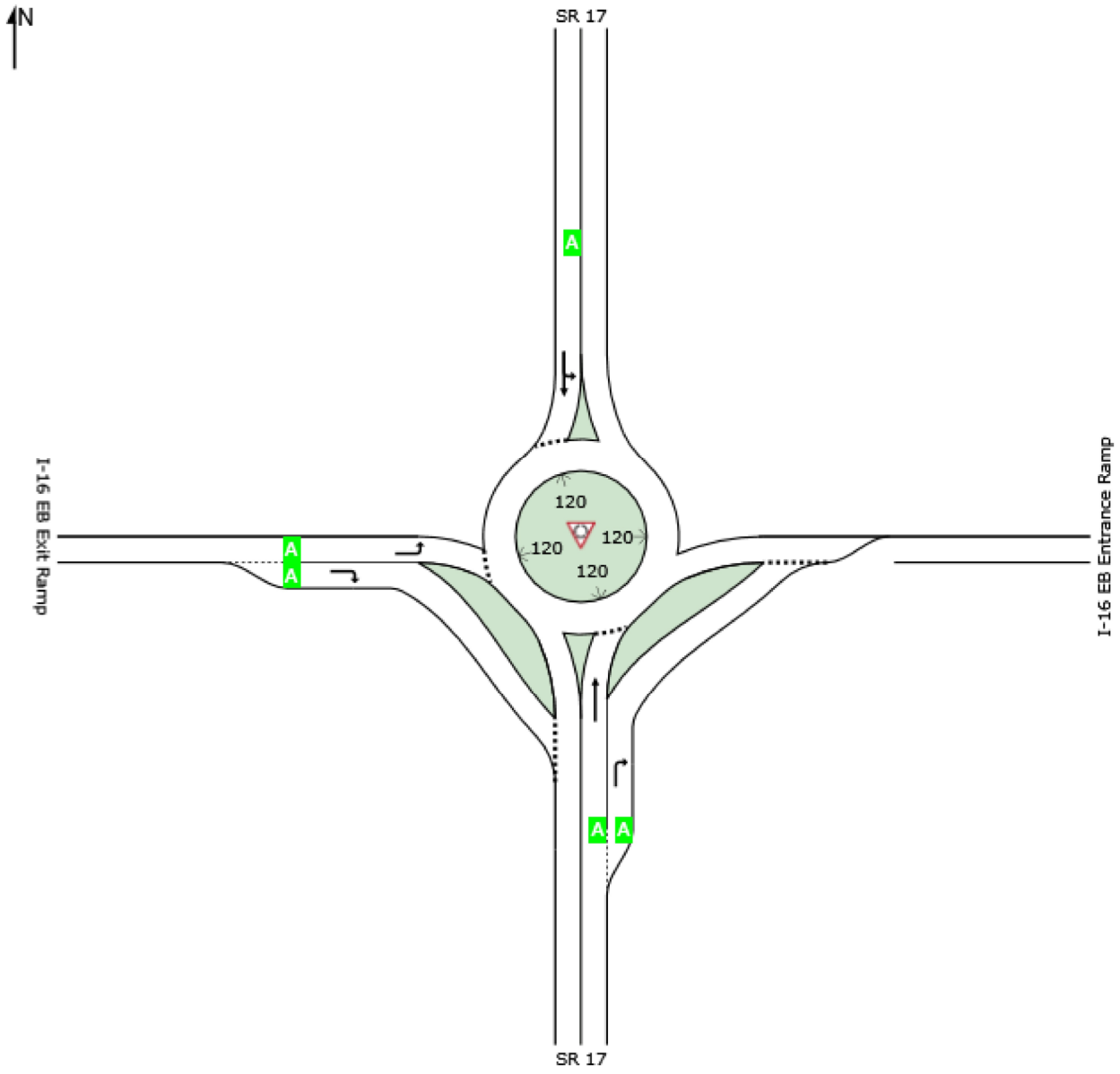
Lane Level of Service

Site: 1 [SR 17 at I-16 EB Ramps 2030 PM]

SR 17 at I-16 EB Ramps, Chatham County
NB and EB Bypass Lanes
Roundabout

All Movement Classes

	South	North	West	Intersection
LOS	A	A	A	A



Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: WOLVERTON & ASSOCIATES, INC. | Processed: Friday, March 20, 2020 11:26:14 AM
Project: Z:\All Project Data\Projects\2018\18-TF-902 Op Imp TO2 PI0015936 Synopsis\TF\WA 21 - SR 17 at I-16 Ramps\Roundabout Analysis\Sidra \19-TF-902-WA 21_SR 17 at I-16 Chatham County.sip7