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January 2nd, 2023

Michael Clark
Planning Director
Town of Zebulon
1003 N. Arendell Avenue
Zebulon, NC 27597
919-823-1808
mclark@townofzebulon.org

RE: Zebulon South Memo

Dear Mr. Clark,

This memorandum is a supplement to the Zebulon South Traffic Impact Analysis (TIA). The TIA was initially scoped with the Town of Zebulon (Town) and NCDOT in March 2022. Originally sealed June 28th, 2022, the NCDOT provided final comments on July 26th, 2022. On November 27th, 2023, WSP provided Town comments to Timmons Group. The TIA was updated and resubmitted (sealed January 2nd, 2023). At the time of scoping, there were no approved area developments that would contribute trips during the Background or Build analyses. In the interim, the Chamblee Lake Planned Development TIA was approved. Due to traffic concerns expressed by Town Council and area citizens, the project team determined that additional analyses should be conducted including the proposed Chamblee Lake Planned Development. This memorandum's purpose is to determine 1) the Zebulon South Development site trip impacts to study area intersections (including the Chamblee Lake Planned Development), and 2) if improvement recommendations are changed from the original TIA.

The following intersections were analyzed:

- NC-97 (Gannon Ave) / SR-2349 (South Wakefield Street);
- NC-97 (Gannon Ave) / NC-96 (Arendell Ave);
- NC-96 (Arendell Ave) / SR-2348 (West Barbee Street);
- NC-96 (Arendell Ave) / Site Access 1*;
- NC-96 (Arendell Ave) / Site Access 2*;
- NC-96 (Arendell Ave) / SR-2347 (Perry Curtis Road); and
- SR-2349 (South Wakefield Street) / Site Access 3*.

* Build conditions only

Upgraded 2026 Background and Build + Improvement AM and PM peak hour capacity analyses were performed including the Chamblee Lake Planned Development site trips. As discussed below, it was determined that with the Chamblee Lake Planned Development site trip addition, all study area intersection approaches are projected to perform acceptably. Therefore, no additional improvement recommendations were necessary.

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2026 Background

Table 1 below summarizes the intersection LOS and delay based on existing intersection geometry (see **Figure A**) and the 2026 Background traffic volumes (see **Figure D**). 2026 Background volumes were calculated by summing 2026 ambient traffic volumes (**Figure B –** Zebulon South TIA **Figure 3-1**) and Chamblee Lake Planned Development traffic volumes (**Figure C**^ and **Appendix B**). The corresponding SYNCHRO outputs are located in **Appendix A**. As shown in **Table 1**, all intersection approaches are projected to operate acceptably during both 2026 Background peak hours. Optimized timings were used for all signalized intersection analyses (adhering to NCDOT minimum cycle length requirements).

^ For purposes of analysis (and to be more conservative), it was assumed that all traffic projected along Horton Street turned right onto NC-96 south of NC-97. Traffic was then split between northbound left and through at NC-97. All traffic wishing to travel west (towards US-264) will likely utilize NC-39.

Table 1: Intersection Approach Level of Service and Delay
2026 Background Traffic Volumes

Intersection	Approach / Overall	AM PEAK HOUR		PM PEAK HOUR		Movement	Turn Lane Storage (ft)	AM PEAK HOUR	PM PEAK HOUR
		Delay [1] (sec/veh)	LOS [1]	Delay [1] (sec/veh)	LOS [1]			*95th Percentile Queue Length	*95th Percentile Queue Length
1: S Wakefield Street & NC-97 (Gannon Avenue)	Eastbound	22.4	C	31.1	C	EB Left	125	10	11
						EB Thru/Right		380	#744
						EB Approach		--	--
	Westbound	13.9	B	11.3	B	WB Left	125	63	72
						WB Thru/Right		265	237
						WB Approach		--	--
	Northbound	31.8	C	46.4	D	NB Left/Thru/Right		199	169
						NB Approach		--	--
	Southbound	23.4	C	31.2	C	SB Left/Thru/Right		35	63
						SB Approach		--	--
	Overall	20.2	C	25.1	C	Overall		--	--
2: NC-96 (Arendell Avenue) & NC-97 (Gannon Avenue)	Eastbound	33.2	C	38.0	D	EB Left	200	46	73
						EB Thru		367	#336
						EB Right	100	69	100
						EB Approach		--	--
	Westbound	23.6	C	28.4	C	WB Left	350	#238	#276
						WB Thru/Right		166	348
						WB Approach		--	--
	Northbound	40.1	D	38.7	D	NB Left	125	124	96
						NB Thru/Right		#352	#462
						NB Approach		--	--
	Southbound	29.7	C	27.8	C	SB Left	250	36	#77
						SB Thru/Right		203	230
						SB Approach		--	--
	Overall	31.5	C	33.2	C	Overall		--	--
3: NC-96 (Arendell Avenue) & Barbee Street	Eastbound	14.9	B	22.1	C	EB Left/Thru/Right		0.5	1.9
						EB Approach		--	--
	Westbound	14.1	B	16.7	C	WB Left/Thru/Right		0.1	0.2
						WB Approach		--	--
	Northbound	1.0	A	1.0	A	NB Left/Thru/Right		0.1	0.1
						NB Approach		--	--
	Southbound	0.2	A	0.1	A	SB Left/Thru/Right		0	0
						SB Approach		--	--
6: NC-96 (Arendell Avenue) & Perry Curtis Road	Westbound	11.1	B	11.1	B	WB Left/Right		0.6	0.4
						WB Approach		--	--
	Northbound	0.0	A	0.0	A	NB Thru/Right		0	0
						NB Approach		--	--
	Southbound	1.8	A	2.6	A	SB Left/Thru		0.1	0.4
						SB Approach		--	--

[1] *Overall intersection LOS and delay not reported for TWSC intersections.*

* - 95th percentile queues for unsignalized intersections reported in number of vehicles.

2026 Build + Improvements

The Zebulon South trip generation and distribution are located in the Zebulon South TIA (see **Section 4** and **Figure 4-2**, respectively). 2026 Build traffic volumes (see **Figure E**) were calculated by summing the 2026 Background traffic volumes (**Figure D**) and projected Zebulon South site trips (**Figure 4-2** – Zebulon South TIA). **Table 2** below summarizes the intersection LOS and delay based on the future lane configuration (see **Figure F**) and 2026 Build traffic volumes (see **Figure E**). The corresponding SYNCHRO outputs are located in **Appendix A**. As shown in **Table 2**, all intersection approaches are projected to operate acceptably during the 2026 Build + Improvements AM and PM peak hours. Optimized timings were used for all signalized intersection analyses (adhering to NCDOT minimum cycle length requirements). Because all approaches are projected to operate acceptably, no additional study area intersection improvements are recommended.

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Table 2: Intersection Approach Level of Service and Delay
2026 Build + Improvements Traffic Volumes

Intersection	Approach / Overall	AM PEAK HOUR		PM PEAK HOUR		Movement	Turn Lane Storage (ft)	AM PEAK HOUR	PM PEAK HOUR
		Delay [1] (sec/veh)	LOS [1]	Delay [1] (sec/veh)	LOS [1]			*95th Percentile Queue Length	*95th Percentile Queue Length
1: S Wakefield Street & NC-97 (Gannon Avenue)	Eastbound	25.1	C	41.0	D	EB Left	125	10	11
						EB Thru/Right		405	#825
						EB Approach		--	--
	Westbound	15.9	B	12.9	B	WB Left	125	68	90
						WB Thru/Right		287	244
						WB Approach		--	--
	Northbound	35.1	D	54.8	D	NB Left/Thru/Right		#273	#232
						NB Approach		--	--
	Southbound	23.0	C	30.9	C	SB Left/Thru/Right		35	63
						SB Approach		--	--
	Overall	23.0	C	31.9	C	Overall		--	--
2: NC-96 (Arendell Avenue) & NC-97 (Gannon Avenue)	Eastbound	38.5	D	47.1	D	EB Left	200	48	77
						EB Thru		#439	#389
						EB Right	100	76	121
						EB Approach		--	--
	Westbound	27.9	C	33.2	C	WB Left	350	#268	#321
						WB Thru/Right		185	385
						WB Approach		--	--
	Northbound	41.6	D	40.2	D	NB Left	125	134	106
						NB Thru/Right		#407	#494
						NB Approach		--	--
	Southbound	27.7	C	28.0	C	SB Left	250	36	#83
						SB Thru/Right		200	243
						SB Approach		--	--
	Overall	34.8	C	37.4	D	Overall		--	--
3: NC-96 (Arendell Avenue) & Barbee Street	Eastbound	17.0	C	30.0	D	EB Left/Thru/Right		0.6	2.8
						EB Approach		--	--
	Westbound	16.1	C	20.2	C	WB Left/Thru/Right		0.1	0.2
						WB Approach		--	--
	Northbound	0.9	A	1.0	A	NB Left/Thru/Right		0.1	0.2
						NB Approach		--	--
	Southbound	0.2	A	0.1	A	SB Left/Thru/Right		0	0
						SB Approach		--	--
4: NC-96 (Arendell Avenue) & Site Access 1	Eastbound	13.1	B	16.0	C	EB Left/Right		0.4	0.3
						EB Approach		--	--
	Northbound	0.1	A	0.3	A	NB Left/Thru		0	0
						NB Approach		--	--
	Southbound	0.0	A	0.0	A	SB Thru		0	0
						SB Right	50	0	0
						SB Approach		--	--
5: NC-96 (Arendell Avenue) & Site Access 2	Eastbound	12.3	B	14.9	B	EB Left/Right		0.4	0.3
						EB Approach		--	--
	Northbound	0.1	A	0.6	A	NB Left/Thru		0	0.1
						NB Approach		--	--
	Southbound	0.0	A	0.0	A	SB Thru		0	0
						SB Right	50	0	0
						SB Approach		--	--
6: NC-96 (Arendell Avenue) & Perry Curtis Road	Westbound	11.3	B	11.3	B	WB Left/Right		0.7	0.5
						WB Approach		--	--
	Northbound	0.0	A	0.0	A	NB Thru/Right		0	0
						NB Approach		--	--
	Southbound	1.9	A	2.6	A	SB Left/Thru		0.1	0.4
						SB Approach		--	--
7: S Wakefield Street & Site Access 3	Westbound	10.1	B	9.9	A	WB Left/Right		0.3	0.2
						WB Approach		--	--
	Northbound	0.0	A	0.0	A	NB Thru/Right		0	0
						NB Approach		--	--
	Southbound	1.1	A	1.8	A	SB Left	50	0	0.1
						SB Thru		0	0
						SB Approach		--	--

[1] *Overall intersection LOS and delay not reported for TWSC intersections.*

* - 95th percentile queues for unsignalized intersections reported in number of vehicles.

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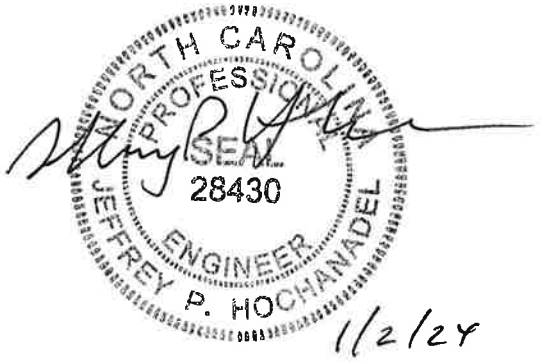
Conclusions

Per the provided analyses, it was determined that inclusion of Chamblee Lake Planned Development site trips does not result in changes to original Zebulon South TIA recommendations.

Should you have any questions regarding this memorandum, please do not hesitate to contact me.

Sincerely,



Jeffrey P. Hochanadel, PE, PTOE
Principal | North Carolina Transportation Group Leader

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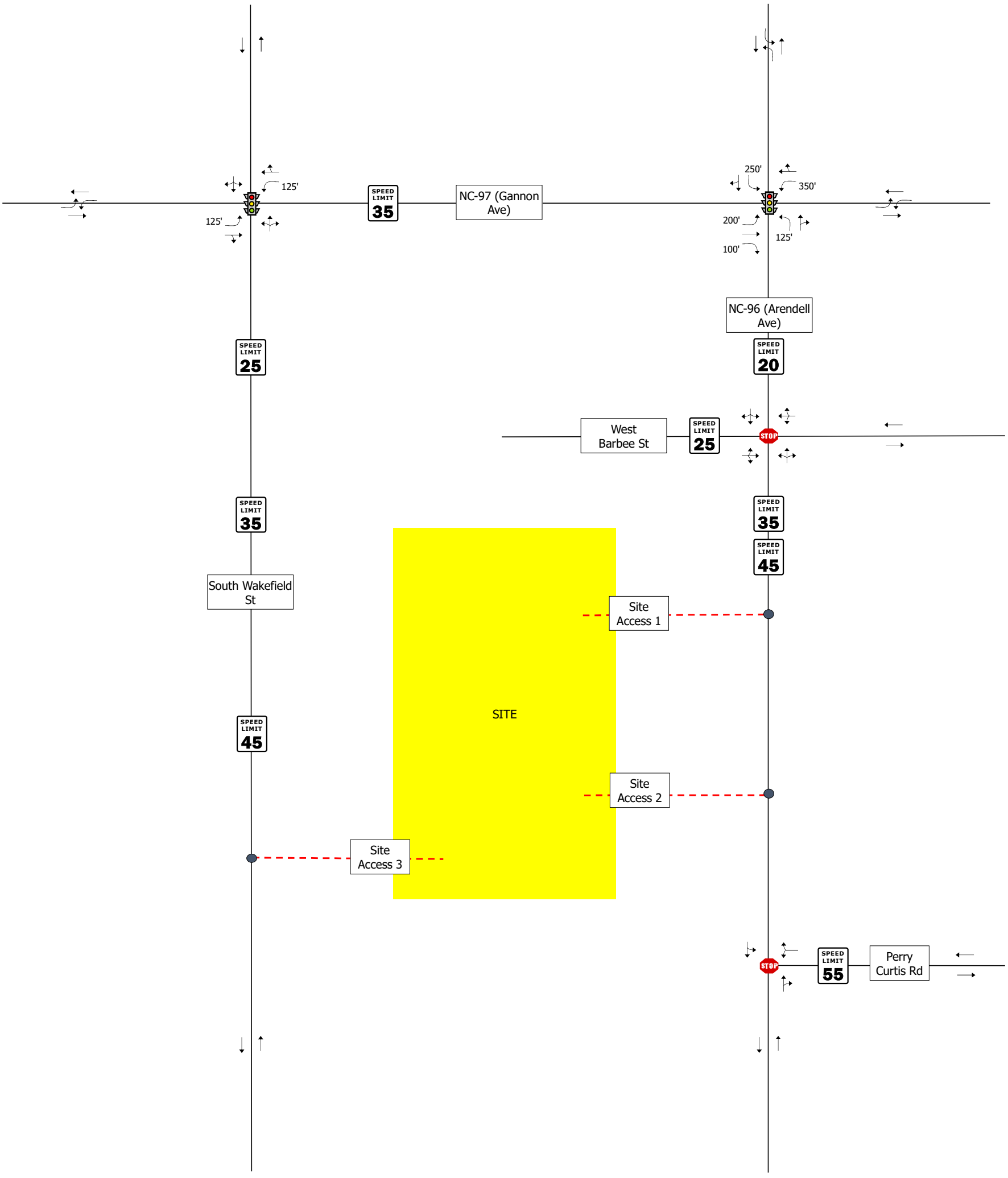
NOT TO SCALE



LEGEND:

- Existing Road
- Proposed Road
- Signalized Intersection
- Unsignalized Intersection
- Existing Lane Configuration

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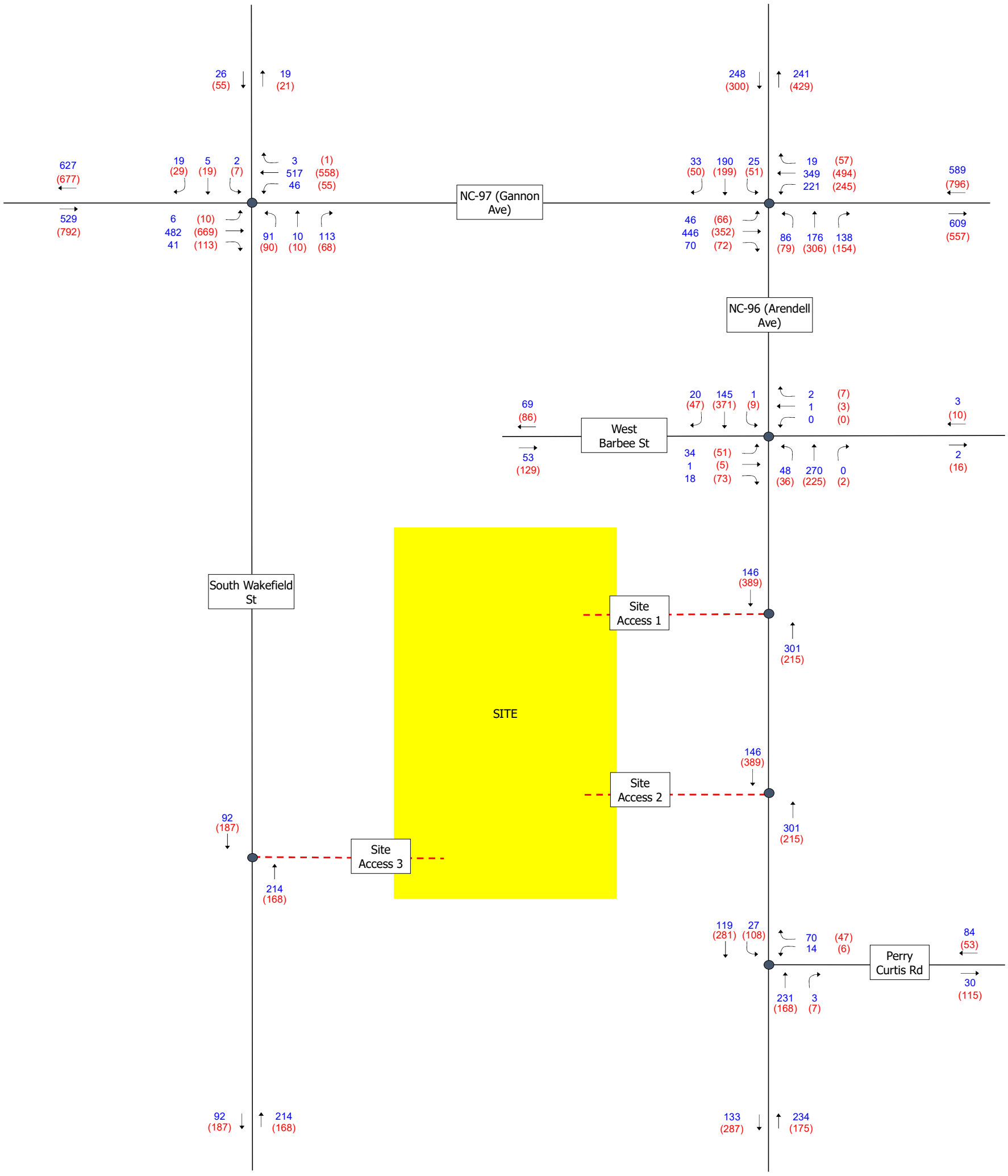
Zebulon South Traffic Impact Analysis

2022 Existing Lane Configuration

Figure A

NOT TO SCALE



LEGEND:

- Existing Road
- Proposed Road
- XX AM Peak Hour Volume (vph)
- (XX) PM Peak Hour Volume (vph)

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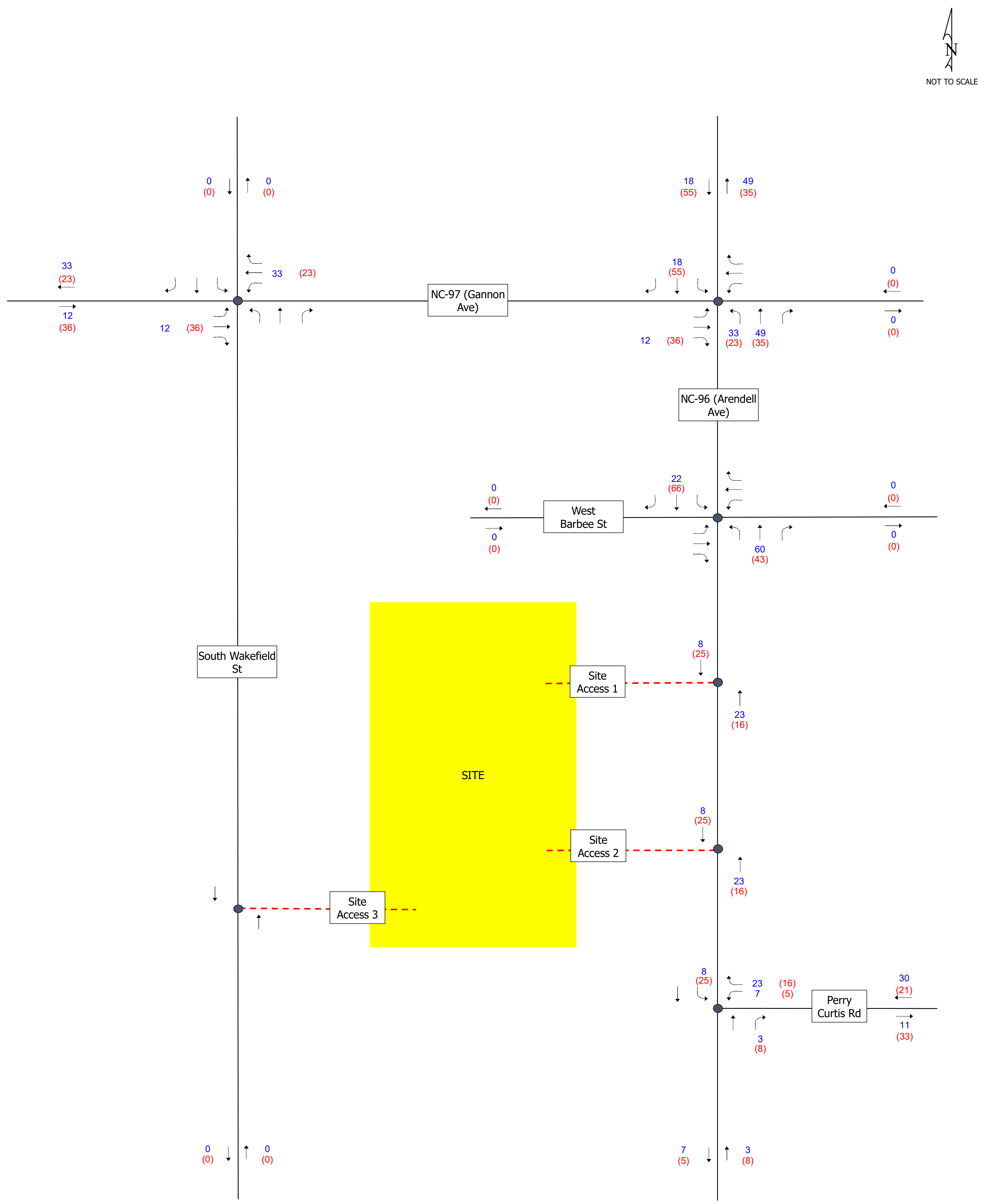
Zebulon South Traffic Impact Analysis

2026 Ambient Traffic Volumes

Figure B



LEGEND:

Existing Road

Proposed Road

XX AM Peak Hour Volume (vph)

(XX) PM Peak Hour Volume (vph)

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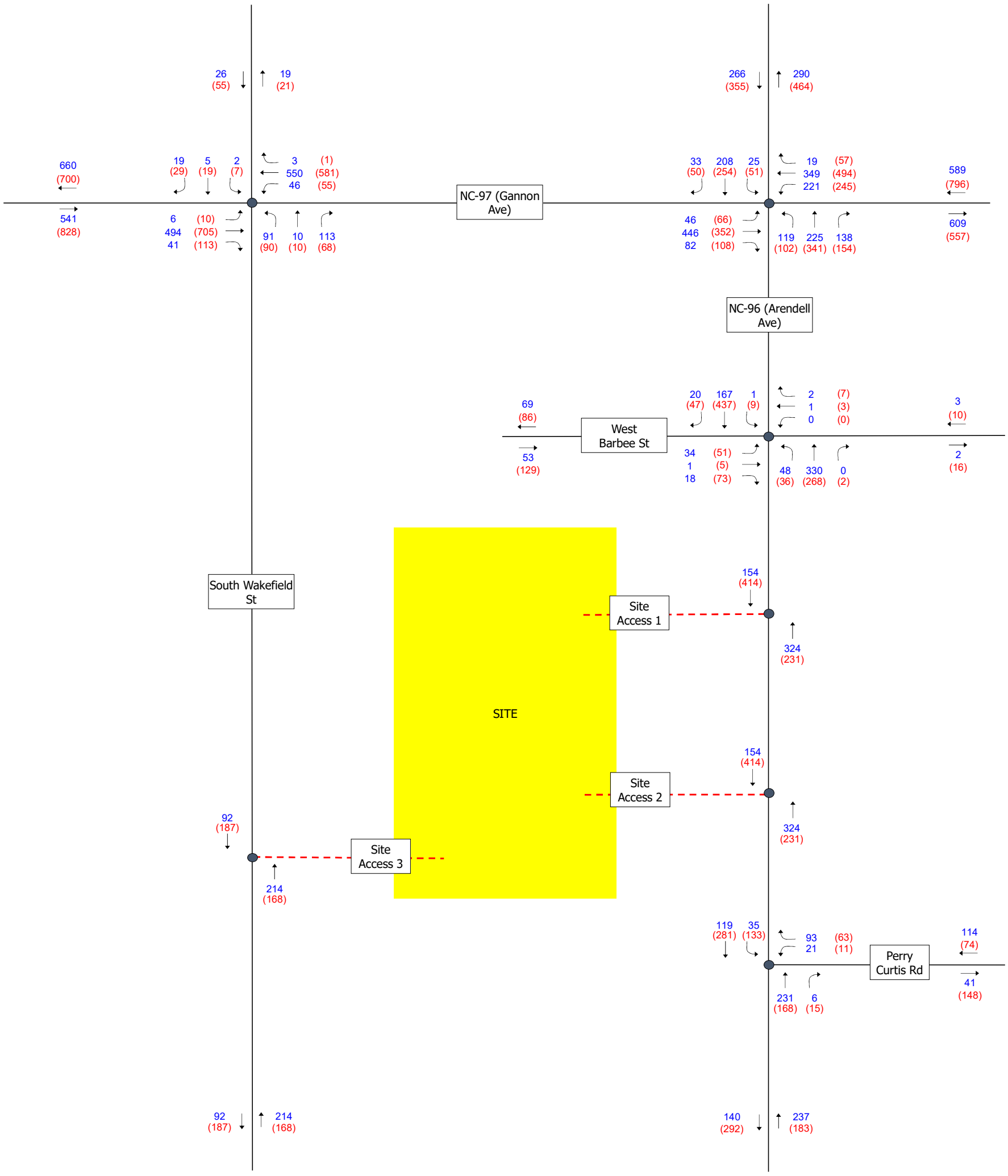
Zebulon South Traffic Impact Analysis
Chamblee Lake Planned Development Traffic Volumes

Figure C

NOT TO SCALE



LEGEND:

- Existing Road
- Proposed Road
- XX AM Peak Hour Volume (vph)
- (XX) PM Peak Hour Volume (vph)

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Zebulon South Traffic Impact Analysis

2026 Background Traffic Volumes

Figure D

NOT TO SCALE

NC-97 (Gannon Ave)

NC-96 (Arendell Ave)

West Barbee St

South Wakefield St

SITE

Site Access 1

Site Access 2

Site Access 3

Perry Curtis Rd

LEGEND:

- Existing Road
- Proposed Road
- XX AM Peak Hour Volume (vph)
- (XX) PM Peak Hour Volume (vph)

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Zebulon South Traffic Impact Analysis

2026 Build Traffic Volumes

Figure E

NOT TO SCALE

NC-97 (Gannon Ave)

SPEED LIMIT 35

125'

125'

250'

350'

200'

100'

125'

NC-96 (Arendell Ave)

SPEED LIMIT 20

SPEED LIMIT 25

West Barbee St

STOP

SPEED LIMIT 25

SPEED LIMIT 35

South Wakefield St

SPEED LIMIT 35

SPEED LIMIT 45

50' Storage

Site Access 1

STOP

SITE

SPEED LIMIT 45

50' Storage

Site Access 2

STOP

50' Storage

Site Access 3

STOP

STOP

SPEED LIMIT 55

Perry Curtis Rd

LEGEND:

- Existing Road
- Proposed Road
- Signalized Intersection
- Unsignalized Intersection
- Existing Lane Configuration
- Proposed Lane Configuration

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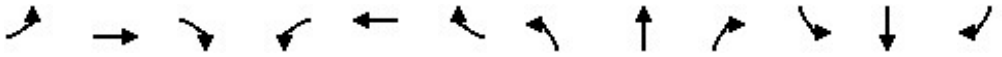
Zebulon South Traffic Impact Analysis

Future Lane Configuration

Figure F

Appendix A – Synchro Output

2026 Background Traffic Volumes



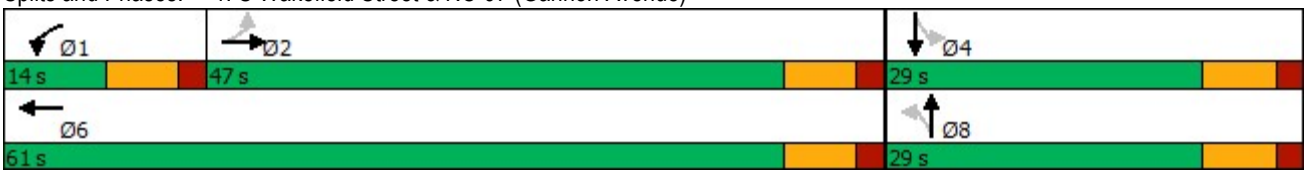
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	494	41	46	550	4	91	10	113	4	5	19
Future Volume (vph)	6	494	41	46	550	4	91	10	113	4	5	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			0%			3%			1%	
Storage Length (ft)	125		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.999			0.929			0.909	
Flt Protected	0.950			0.950				0.979			0.994	
Satd. Flow (prot)	1778	1850	0	1770	1861	0	0	1669	0	0	1675	0
Flt Permitted	0.432			0.950				0.848			0.952	
Satd. Flow (perm)	809	1850	0	1770	1861	0	0	1445	0	0	1604	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		774			1453			1831			462	
Travel Time (s)		15.1			28.3			49.9			12.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	549	46	51	611	4	101	11	126	4	6	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	595	0	51	615	0	0	238	0	0	31	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	1.00	1.00	1.00	1.02	1.02	1.02	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	17.0		14.0	17.0		14.0	14.0		14.0	14.0	
Total Split (s)	47.0	47.0		14.0	61.0		29.0	29.0		29.0	29.0	
Total Split (%)	52.2%	52.2%		15.6%	67.8%		32.2%	32.2%		32.2%	32.2%	
Maximum Green (s)	40.0	40.0		7.0	54.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0			-2.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Act Effct Green (s)	28.8	28.8		10.3	35.5			17.7			17.7	
Actuated g/C Ratio	0.45	0.45		0.16	0.55			0.27			0.27	
v/c Ratio	0.02	0.72		0.18	0.60			0.60			0.07	
Control Delay	13.3	22.6		35.1	12.1			31.8			23.4	

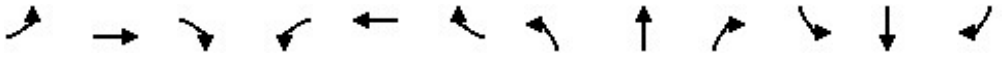
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	13.3	22.6		35.1	12.1			31.8			23.4	
LOS	B	C		D	B			C			C	
Approach Delay		22.4			13.9			31.8			23.4	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	2	221		21	142			94			10	
Queue Length 95th (ft)	10	380		63	265			199			35	
Internal Link Dist (ft)		694			1373			1751			382	
Turn Bay Length (ft)	125			125								
Base Capacity (vph)	575	1317		281	1518			612			680	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.01	0.45		0.18	0.41			0.39			0.05	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 64.6
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 20.2 Intersection LOS: C
Intersection Capacity Utilization 65.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: S Wakefield Street & NC-97 (Gannon Avenue)



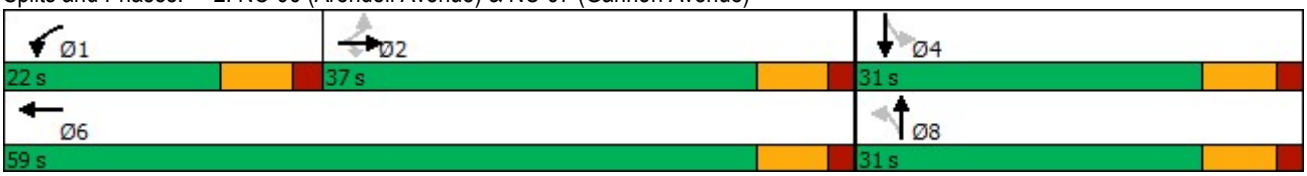


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	446	82	221	349	19	119	225	138	25	208	33
Future Volume (vph)	46	446	82	221	349	19	119	225	138	25	208	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			-2%			2%	
Storage Length (ft)	200		100	350		0	125		0	250		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.992			0.943			0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1844	1567	1787	1866	0	1787	1774	0	1752	1805	0
Flt Permitted	0.522			0.950			0.463			0.259		
Satd. Flow (perm)	963	1844	1567	1787	1866	0	871	1774	0	478	1805	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			20			35	
Link Distance (ft)		1453			677			1822			478	
Travel Time (s)		28.3			13.2			62.1			9.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	51	496	91	246	388	21	132	250	153	28	231	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	496	91	246	409	0	132	403	0	28	268	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes						Yes	
Headway Factor	1.01	1.01	1.01	0.99	0.99	0.99	0.99	0.99	0.99	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm	Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2				8			4		
Detector Phase	2	2	2	1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	24.0	24.0	24.0	14.0	17.0		24.0	24.0		14.0	14.0	
Total Split (s)	37.0	37.0	37.0	22.0	59.0		31.0	31.0		31.0	31.0	
Total Split (%)	41.1%	41.1%	41.1%	24.4%	65.6%		34.4%	34.4%		34.4%	34.4%	
Maximum Green (s)	30.0	30.0	30.0	15.0	52.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min	Min	None	Min		None	None		None	None	
Walk Time (s)	7.0	7.0	7.0				7.0	7.0				
Flash Dont Walk (s)	10.0	10.0	10.0				10.0	10.0				
Pedestrian Calls (#/hr)	0	0	0				0	0				
Act Effct Green (s)	27.0	27.0	27.0	15.5	47.6		22.9	22.9		22.9	22.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.33	0.33	0.33	0.19	0.59		0.28	0.28		0.28	0.28	
v/c Ratio	0.16	0.81	0.17	0.72	0.37		0.53	0.80		0.21	0.52	
Control Delay	21.4	36.7	21.0	45.9	10.1		35.5	41.7		28.7	29.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	21.4	36.7	21.0	45.9	10.1		35.5	41.7		28.7	29.8	
LOS	C	D	C	D	B		D	D		C	C	
Approach Delay		33.2			23.6			40.1			29.7	
Approach LOS		C			C			D			C	
Queue Length 50th (ft)	20	245	35	129	109		61	203		12	123	
Queue Length 95th (ft)	46	367	69	#238	166		124	#352		36	203	
Internal Link Dist (ft)		1373			597			1742			398	
Turn Bay Length (ft)	200		100	350			125			250		
Base Capacity (vph)	391	749	637	385	1311		287	585		158	596	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.13	0.66	0.14	0.64	0.31		0.46	0.69		0.18	0.45	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 80.8			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 31.5		Intersection LOS: C	
Intersection Capacity Utilization 78.5%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 2: NC-96 (Arendell Avenue) & NC-97 (Gannon Avenue)



Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	34	4	18	4	4	4	48	330	4	4	167	20
Future Vol, veh/h	34	4	18	4	4	4	48	330	4	4	167	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	4	20	4	4	4	53	367	4	4	186	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	684	682	197	692	691	369	208	0	0	371	0	0
Stage 1	205	205	-	475	475	-	-	-	-	-	-	-
Stage 2	479	477	-	217	216	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	363	372	844	358	368	677	1363	-	-	1188	-	-
Stage 1	797	732	-	570	557	-	-	-	-	-	-	-
Stage 2	568	556	-	785	724	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	343	352	844	332	348	677	1363	-	-	1188	-	-
Mov Cap-2 Maneuver	343	352	-	332	348	-	-	-	-	-	-	-
Stage 1	758	729	-	542	530	-	-	-	-	-	-	-
Stage 2	532	529	-	759	721	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.9	14.1	1	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1363	-	-	425	407	1188	-	-
HCM Lane V/C Ratio	0.039	-	-	0.146	0.033	0.004	-	-
HCM Control Delay (s)	7.7	0	-	14.9	14.1	8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0.1	0	-	-

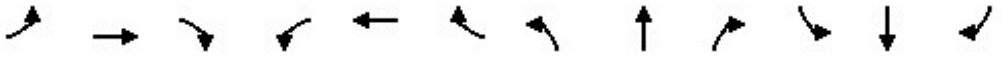
Intersection	
Int Delay, s/veh	3.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	93	231	6	35	119
Future Vol, veh/h	21	93	231	6	35	119
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	103	257	7	39	132

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	471	261	0	0	264	0
Stage 1	261	-	-	-	-	-
Stage 2	210	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	551	778	-	-	1300	-
Stage 1	783	-	-	-	-	-
Stage 2	825	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	533	778	-	-	1300	-
Mov Cap-2 Maneuver	533	-	-	-	-	-
Stage 1	783	-	-	-	-	-
Stage 2	799	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.1	0	1.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	717	1300	-
HCM Lane V/C Ratio	-	-	0.177	0.03	-
HCM Control Delay (s)	-	-	11.1	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-



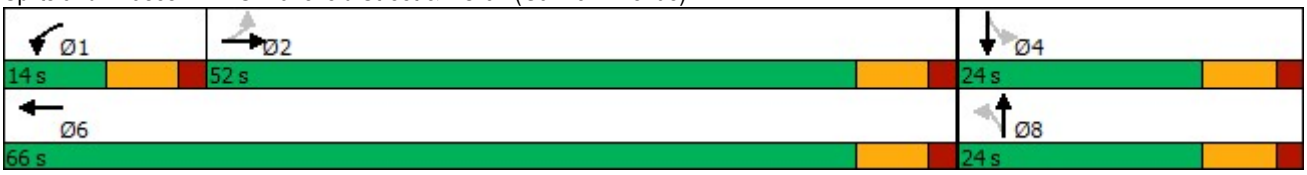
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	705	113	55	581	4	90	10	68	7	19	29
Future Volume (vph)	10	705	113	55	581	4	90	10	68	7	19	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			0%			3%			1%	
Storage Length (ft)	125		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.979			0.999			0.945			0.929	
Flt Protected	0.950			0.950				0.974			0.993	
Satd. Flow (prot)	1778	1833	0	1770	1861	0	0	1689	0	0	1710	0
Flt Permitted	0.418			0.950				0.815			0.956	
Satd. Flow (perm)	783	1833	0	1770	1861	0	0	1413	0	0	1646	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		774			1453			1831			462	
Travel Time (s)		15.1			28.3			49.9			12.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	11	783	126	61	646	4	100	11	76	8	21	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	909	0	61	650	0	0	187	0	0	61	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	1.00	1.00	1.00	1.02	1.02	1.02	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	17.0		14.0	17.0		14.0	14.0		14.0	14.0	
Total Split (s)	52.0	52.0		14.0	66.0		24.0	24.0		24.0	24.0	
Total Split (%)	57.8%	57.8%		15.6%	73.3%		26.7%	26.7%		26.7%	26.7%	
Maximum Green (s)	45.0	45.0		7.0	59.0		17.0	17.0		17.0	17.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0			-2.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Act Effct Green (s)	46.7	46.7		9.2	57.2			16.2			16.2	
Actuated g/C Ratio	0.56	0.56		0.11	0.68			0.19			0.19	
v/c Ratio	0.03	0.89		0.31	0.51			0.68			0.19	
Control Delay	10.7	31.4		42.3	8.4			46.4			31.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	10.7	31.4		42.3	8.4			46.4			31.2	
LOS	B	C		D	A			D			C	
Approach Delay		31.1			11.3			46.4			31.2	
Approach LOS		C			B			D			C	
Queue Length 50th (ft)	3	452		32	153			97			29	
Queue Length 95th (ft)	11	#744		72	237			169			63	
Internal Link Dist (ft)		694			1373			1751			382	
Turn Bay Length (ft)	125			125								
Base Capacity (vph)	448	1051		194	1385			327			381	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.02	0.86		0.31	0.47			0.57			0.16	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 83.6
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 25.1 Intersection LOS: C
Intersection Capacity Utilization 70.4% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: S Wakefield Street & NC-97 (Gannon Avenue)



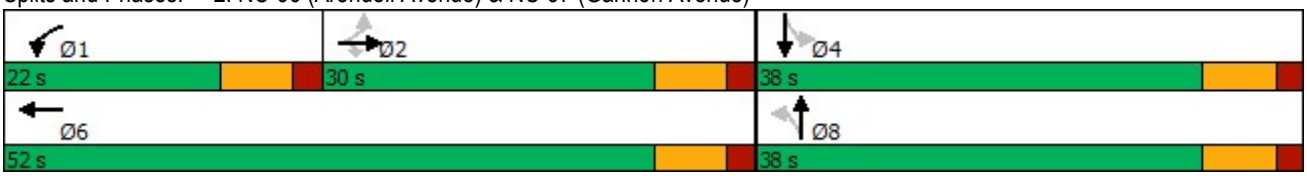
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	352	108	245	494	57	102	341	154	51	254	50
Future Volume (vph)	66	352	108	245	494	57	102	341	154	51	254	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			-2%			2%	
Storage Length (ft)	200		100	350		0	125		0	250		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.985			0.953			0.975	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1844	1567	1787	1853	0	1787	1793	0	1752	1798	0
Flt Permitted	0.433			0.950			0.418			0.170		
Satd. Flow (perm)	799	1844	1567	1787	1853	0	786	1793	0	313	1798	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			20			35	
Link Distance (ft)		1453			677			1822			478	
Travel Time (s)		28.3			13.2			62.1			9.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	73	391	120	272	549	63	113	379	171	57	282	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	391	120	272	612	0	113	550	0	57	338	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes						Yes	
Headway Factor	1.01	1.01	1.01	0.99	0.99	0.99	0.99	0.99	0.99	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm	Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2				8			4		
Detector Phase	2	2	2	1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	24.0	24.0	24.0	14.0	17.0		24.0	24.0		14.0	14.0	
Total Split (s)	30.0	30.0	30.0	22.0	52.0		38.0	38.0		38.0	38.0	
Total Split (%)	33.3%	33.3%	33.3%	24.4%	57.8%		42.2%	42.2%		42.2%	42.2%	
Maximum Green (s)	23.0	23.0	23.0	15.0	45.0		31.0	31.0		31.0	31.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min	Min	None	Min		None	None		None	None	
Walk Time (s)	7.0	7.0	7.0				7.0	7.0				
Flash Dont Walk (s)	10.0	10.0	10.0				10.0	10.0				
Pedestrian Calls (#/hr)	0	0	0				0	0				
Act Effct Green (s)	22.2	22.2	22.2	16.2	43.5		29.5	29.5		29.5	29.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.27	0.27	0.27	0.19	0.52		0.35	0.35		0.35	0.35	
v/c Ratio	0.34	0.79	0.29	0.78	0.63		0.41	0.86		0.52	0.53	
Control Delay	31.3	42.4	27.5	51.2	18.3		26.5	41.3		41.7	25.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	31.3	42.4	27.5	51.2	18.3		26.5	41.3		41.7	25.4	
LOS	C	D	C	D	B		C	D		D	C	
Approach Delay		38.0			28.4			38.7			27.8	
Approach LOS		D			C			D			C	
Queue Length 50th (ft)	33	203	53	149	235		47	281		25	147	
Queue Length 95th (ft)	73	#336	100	#276	348		96	#462		#77	230	
Internal Link Dist (ft)		1373			597			1742			398	
Turn Bay Length (ft)	200		100	350			125			250		
Base Capacity (vph)	244	564	479	371	1065		317	724		126	726	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.30	0.69	0.25	0.73	0.57		0.36	0.76		0.45	0.47	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 83.2	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 33.2	Intersection LOS: C
Intersection Capacity Utilization 87.6%	ICU Level of Service E
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: NC-96 (Arendell Avenue) & NC-97 (Gannon Avenue)



Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	51	5	73	4	4	7	36	268	4	9	437	47
Future Vol, veh/h	51	5	73	4	4	7	36	268	4	9	437	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	57	6	81	4	4	8	40	298	4	10	486	52

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	918	914	512	956	938	300	538	0	0	302	0	0
Stage 1	532	532	-	380	380	-	-	-	-	-	-	-
Stage 2	386	382	-	576	558	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	252	273	562	238	264	740	1030	-	-	1259	-	-
Stage 1	531	526	-	642	614	-	-	-	-	-	-	-
Stage 2	637	613	-	503	512	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	235	257	562	192	249	740	1030	-	-	1259	-	-
Mov Cap-2 Maneuver	235	257	-	192	249	-	-	-	-	-	-	-
Stage 1	506	520	-	612	585	-	-	-	-	-	-	-
Stage 2	596	584	-	421	506	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.1	16.7	1	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1030	-	-	352	324	1259	-	-
HCM Lane V/C Ratio	0.039	-	-	0.407	0.051	0.008	-	-
HCM Control Delay (s)	8.6	0	-	22.1	16.7	7.9	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.9	0.2	0	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	63	168	15	133	281
Future Vol, veh/h	11	63	168	15	133	281
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	70	187	17	148	312

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	804	196	0	0	204	0
Stage 1	196	-	-	-	-	-
Stage 2	608	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	352	845	-	-	1368	-
Stage 1	837	-	-	-	-	-
Stage 2	543	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	306	845	-	-	1368	-
Mov Cap-2 Maneuver	306	-	-	-	-	-
Stage 1	837	-	-	-	-	-
Stage 2	472	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.1	0	2.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	670	1368	-
HCM Lane V/C Ratio	-	-	0.123	0.108	-
HCM Control Delay (s)	-	-	11.1	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.4	-

2026 Build + Improvement Traffic Volumes

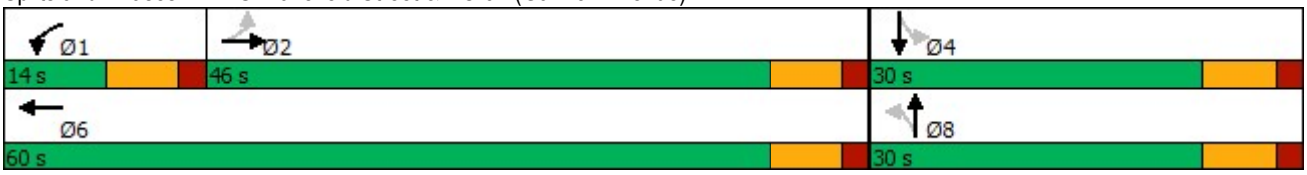
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	499	52	51	567	4	126	10	130	4	5	19
Future Volume (vph)	6	499	52	51	567	4	126	10	130	4	5	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			0%			3%			1%	
Storage Length (ft)	125		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986			0.999			0.934			0.909	
Flt Protected	0.950			0.950				0.977			0.994	
Satd. Flow (prot)	1778	1846	0	1770	1861	0	0	1674	0	0	1675	0
Flt Permitted	0.405			0.950				0.833			0.951	
Satd. Flow (perm)	758	1846	0	1770	1861	0	0	1428	0	0	1602	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		774			1453			1831			462	
Travel Time (s)		15.1			28.3			49.9			12.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	554	58	57	630	4	140	11	144	4	6	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	612	0	57	634	0	0	295	0	0	31	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	1.00	1.00	1.00	1.02	1.02	1.02	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	17.0		14.0	17.0		14.0	14.0		14.0	14.0	
Total Split (s)	46.0	46.0		14.0	60.0		30.0	30.0		30.0	30.0	
Total Split (%)	51.1%	51.1%		15.6%	66.7%		33.3%	33.3%		33.3%	33.3%	
Maximum Green (s)	39.0	39.0		7.0	53.0		23.0	23.0		23.0	23.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0			-2.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Act Effct Green (s)	30.6	30.6		10.1	37.4			21.0			21.0	
Actuated g/C Ratio	0.44	0.44		0.14	0.54			0.30			0.30	
v/c Ratio	0.02	0.76		0.22	0.64			0.68			0.06	
Control Delay	14.0	25.3		37.3	14.0			35.1			23.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	14.0	25.3		37.3	14.0			35.1			23.0	
LOS	B	C		D	B			D			C	
Approach Delay		25.1			15.9			35.1			23.0	
Approach LOS		C			B			D			C	
Queue Length 50th (ft)	2	262		26	182			131			11	
Queue Length 95th (ft)	10	405		68	287			#273			35	
Internal Link Dist (ft)		694			1373			1751			382	
Turn Bay Length (ft)	125			125								
Base Capacity (vph)	483	1177		257	1463			575			646	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.01	0.52		0.22	0.43			0.51			0.05	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 69.7
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 23.0 Intersection LOS: C
Intersection Capacity Utilization 72.9% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: S Wakefield Street & NC-97 (Gannon Avenue)



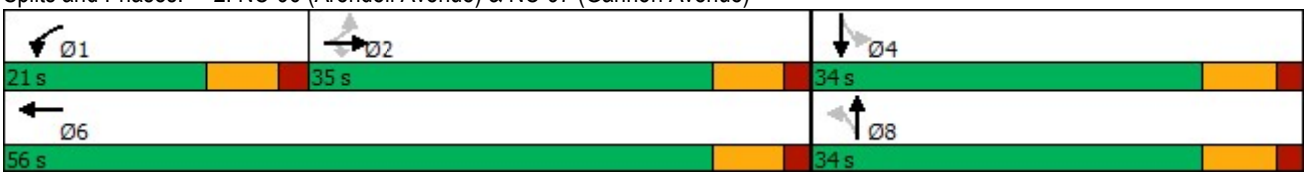
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	463	87	232	354	19	136	250	172	25	216	33
Future Volume (vph)	46	463	87	232	354	19	136	250	172	25	216	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			-2%			2%	
Storage Length (ft)	200		100	350		0	125		0	250		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.992			0.939			0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1844	1567	1787	1866	0	1787	1767	0	1752	1807	0
Flt Permitted	0.520			0.950			0.466			0.205		
Satd. Flow (perm)	959	1844	1567	1787	1866	0	877	1767	0	378	1807	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			20			35	
Link Distance (ft)		1453			677			1822			478	
Travel Time (s)		28.3			13.2			62.1			9.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	51	514	97	258	393	21	151	278	191	28	240	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	514	97	258	414	0	151	469	0	28	277	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes						Yes	
Headway Factor	1.01	1.01	1.01	0.99	0.99	0.99	0.99	0.99	0.99	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm	Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2				8			4		
Detector Phase	2	2	2	1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	24.0	24.0	24.0	14.0	17.0		24.0	24.0		14.0	14.0	
Total Split (s)	35.0	35.0	35.0	21.0	56.0		34.0	34.0		34.0	34.0	
Total Split (%)	38.9%	38.9%	38.9%	23.3%	62.2%		37.8%	37.8%		37.8%	37.8%	
Maximum Green (s)	28.0	28.0	28.0	14.0	49.0		27.0	27.0		27.0	27.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min	Min	None	Min		None	None		None	None	
Walk Time (s)	7.0	7.0	7.0				7.0	7.0				
Flash Dont Walk (s)	10.0	10.0	10.0				10.0	10.0				
Pedestrian Calls (#/hr)	0	0	0				0	0				
Act Effct Green (s)	27.4	27.4	27.4	15.3	47.8		26.3	26.3		26.3	26.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.33	0.33	0.33	0.18	0.57		0.31	0.31		0.31	0.31	
v/c Ratio	0.16	0.86	0.19	0.79	0.39		0.55	0.85		0.24	0.49	
Control Delay	22.9	43.1	22.5	53.8	11.8		33.9	44.1		28.7	27.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	22.9	43.1	22.5	53.8	11.8		33.9	44.1		28.7	27.6	
LOS	C	D	C	D	B		C	D		C	C	
Approach Delay		38.5			27.9			41.6			27.7	
Approach LOS		D			C			D			C	
Queue Length 50th (ft)	20	267	39	142	122		70	244		12	125	
Queue Length 95th (ft)	48	#439	76	#268	185		134	#407		36	200	
Internal Link Dist (ft)		1373			597			1742			398	
Turn Bay Length (ft)	200		100	350			125			250		
Base Capacity (vph)	346	666	566	344	1146		306	617		132	631	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.15	0.77	0.17	0.75	0.36		0.49	0.76		0.21	0.44	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 84.2	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 34.8	Intersection LOS: C
Intersection Capacity Utilization 83.4%	ICU Level of Service E
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: NC-96 (Arendell Avenue) & NC-97 (Gannon Avenue)



Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	34	4	21	4	4	4	56	406	4	4	191	20
Future Vol, veh/h	34	4	21	4	4	4	56	406	4	4	191	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	4	23	4	4	4	62	451	4	4	212	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	812	810	223	822	819	453	234	0	0	455	0	0
Stage 1	231	231	-	577	577	-	-	-	-	-	-	-
Stage 2	581	579	-	245	242	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	298	314	817	293	310	607	1333	-	-	1106	-	-
Stage 1	772	713	-	502	502	-	-	-	-	-	-	-
Stage 2	499	501	-	759	705	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	278	293	817	267	290	607	1333	-	-	1106	-	-
Mov Cap-2 Maneuver	278	293	-	267	290	-	-	-	-	-	-	-
Stage 1	724	710	-	471	471	-	-	-	-	-	-	-
Stage 2	460	470	-	730	702	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17	16.1	0.9	0.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1333	-	-	365	339	1106	-	-
HCM Lane V/C Ratio	0.047	-	-	0.18	0.039	0.004	-	-
HCM Control Delay (s)	7.8	0	-	17	16.1	8.3	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.1	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	42	8	4	366	168	13
Future Vol, veh/h	42	8	4	366	168	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	9	4	407	187	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	602	187	201	0	-	0
Stage 1	187	-	-	-	-	-
Stage 2	415	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	463	855	1371	-	-	-
Stage 1	845	-	-	-	-	-
Stage 2	666	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	461	855	1371	-	-	-
Mov Cap-2 Maneuver	461	-	-	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	666	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1371	-	498	-	-
HCM Lane V/C Ratio	0.003	-	0.112	-	-
HCM Control Delay (s)	7.6	0	13.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	42	17	6	327	162	14
Future Vol, veh/h	42	17	6	327	162	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	19	7	363	180	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	557	180	196	0	-	0
Stage 1	180	-	-	-	-	-
Stage 2	377	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	491	863	1377	-	-	-
Stage 1	851	-	-	-	-	-
Stage 2	694	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	488	863	1377	-	-	-
Mov Cap-2 Maneuver	488	-	-	-	-	-
Stage 1	846	-	-	-	-	-
Stage 2	694	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.3	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1377	-	558	-	-
HCM Lane V/C Ratio	0.005	-	0.117	-	-
HCM Control Delay (s)	7.6	0	12.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	96	237	6	43	136
Future Vol, veh/h	21	96	237	6	43	136
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	107	263	7	48	151

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	514	267	0	0	270	0
Stage 1	267	-	-	-	-	-
Stage 2	247	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	521	772	-	-	1293	-
Stage 1	778	-	-	-	-	-
Stage 2	794	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	500	772	-	-	1293	-
Mov Cap-2 Maneuver	500	-	-	-	-	-
Stage 1	778	-	-	-	-	-
Stage 2	761	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	1.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	703	1293	-
HCM Lane V/C Ratio	-	-	0.185	0.037	-
HCM Control Delay (s)	-	-	11.3	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

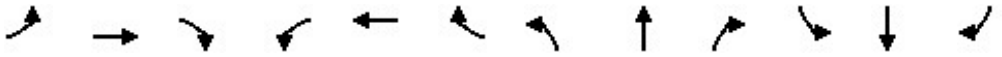
Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	52	214	4	16	92
Future Vol, veh/h	8	52	214	4	16	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	58	238	4	18	102

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	378	240	0	0	242	0
Stage 1	240	-	-	-	-	-
Stage 2	138	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	624	799	-	-	1324	-
Stage 1	800	-	-	-	-	-
Stage 2	889	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	615	799	-	-	1324	-
Mov Cap-2 Maneuver	615	-	-	-	-	-
Stage 1	800	-	-	-	-	-
Stage 2	877	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	768	1324	-
HCM Lane V/C Ratio	-	-	0.087	0.013	-
HCM Control Delay (s)	-	-	10.1	7.8	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	724	150	73	592	4	113	10	79	7	19	29
Future Volume (vph)	10	724	150	73	592	4	113	10	79	7	19	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			0%			3%			1%	
Storage Length (ft)	125		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.974			0.999			0.947			0.929	
Flt Protected	0.950			0.950				0.973			0.993	
Satd. Flow (prot)	1778	1823	0	1770	1861	0	0	1691	0	0	1710	0
Flt Permitted	0.413			0.950				0.812			0.953	
Satd. Flow (perm)	773	1823	0	1770	1861	0	0	1411	0	0	1641	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		774			1453			1831			462	
Travel Time (s)		15.1			28.3			49.9			12.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	11	804	167	81	658	4	126	11	88	8	21	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	971	0	81	662	0	0	225	0	0	61	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	0.99	0.99	0.99	1.00	1.00	1.00	1.02	1.02	1.02	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	17.0		14.0	17.0		14.0	14.0		14.0	14.0	
Total Split (s)	52.0	52.0		14.0	66.0		24.0	24.0		24.0	24.0	
Total Split (%)	57.8%	57.8%		15.6%	73.3%		26.7%	26.7%		26.7%	26.7%	
Maximum Green (s)	45.0	45.0		7.0	59.0		17.0	17.0		17.0	17.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0			-2.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Act Effct Green (s)	48.3	48.3		9.1	59.1			17.5			17.5	
Actuated g/C Ratio	0.56	0.56		0.11	0.68			0.20			0.20	
v/c Ratio	0.03	0.96		0.44	0.52			0.79			0.18	
Control Delay	10.8	41.4		46.3	8.8			54.8			30.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	10.8	41.4		46.3	8.8			54.8			30.9	
LOS	B	D		D	A			D			C	
Approach Delay		41.0			12.9			54.8			30.9	
Approach LOS		D			B			D			C	
Queue Length 50th (ft)	3	~557		44	164			121			29	
Queue Length 95th (ft)	11	#825		90	244			#232			63	
Internal Link Dist (ft)		694			1373			1751			382	
Turn Bay Length (ft)	125			125								
Base Capacity (vph)	430	1016		185	1318			311			362	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.03	0.96		0.44	0.50			0.72			0.17	

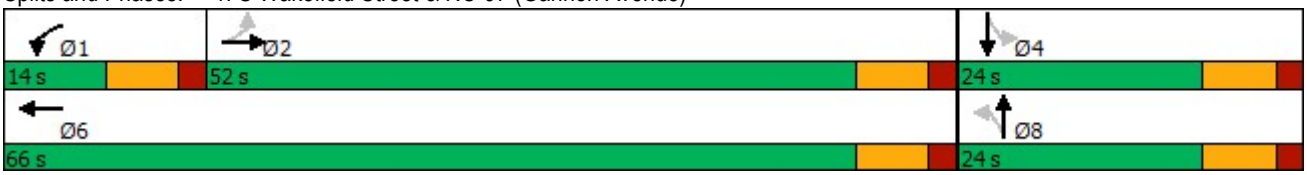
Intersection Summary

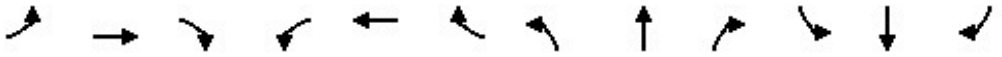
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 86.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 31.9 Intersection LOS: C
Intersection Capacity Utilization 83.8% ICU Level of Service E
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: S Wakefield Street & NC-97 (Gannon Avenue)



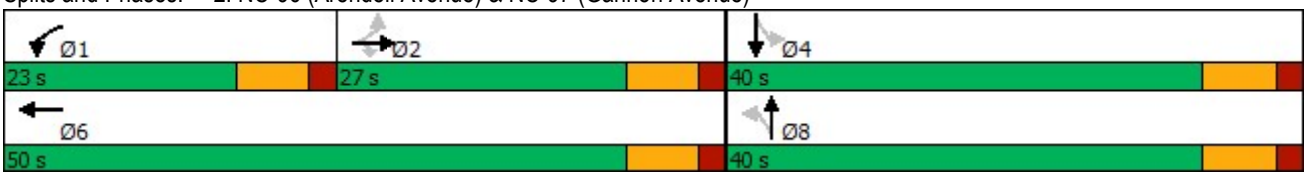


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	363	127	282	512	57	113	357	176	51	282	50
Future Volume (vph)	66	363	127	282	512	57	113	357	176	51	282	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			-2%			2%	
Storage Length (ft)	200		100	350		0	125		0	250		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.985			0.950			0.977	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1844	1567	1787	1853	0	1787	1787	0	1752	1802	0
Flt Permitted	0.425			0.950			0.392			0.146		
Satd. Flow (perm)	784	1844	1567	1787	1853	0	737	1787	0	269	1802	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			20			35	
Link Distance (ft)		1453			677			1822			478	
Travel Time (s)		28.3			13.2			62.1			9.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	73	403	141	313	569	63	126	397	196	57	313	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	403	141	313	632	0	126	593	0	57	369	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes						Yes	
Headway Factor	1.01	1.01	1.01	0.99	0.99	0.99	0.99	0.99	0.99	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm	Prot	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2				8			4		
Detector Phase	2	2	2	1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	24.0	24.0	24.0	14.0	17.0		24.0	24.0		14.0	14.0	
Total Split (s)	27.0	27.0	27.0	23.0	50.0		40.0	40.0		40.0	40.0	
Total Split (%)	30.0%	30.0%	30.0%	25.6%	55.6%		44.4%	44.4%		44.4%	44.4%	
Maximum Green (s)	20.0	20.0	20.0	16.0	43.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min	Min	None	Min		None	None		None	None	
Walk Time (s)	7.0	7.0	7.0				7.0	7.0				
Flash Dont Walk (s)	10.0	10.0	10.0				10.0	10.0				
Pedestrian Calls (#/hr)	0	0	0				0	0				
Act Effct Green (s)	21.3	21.3	21.3	17.5	43.9		32.1	32.1		32.1	32.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.25	0.25	0.25	0.20	0.51		0.37	0.37		0.37	0.37	
v/c Ratio	0.38	0.88	0.36	0.86	0.67		0.46	0.89		0.57	0.55	
Control Delay	35.0	54.9	31.1	58.3	20.7		27.1	43.0		47.6	25.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	35.0	54.9	31.1	58.3	20.7		27.1	43.0		47.6	25.0	
LOS	D	D	C	E	C		C	D		D	C	
Approach Delay		47.1			33.2			40.2			28.0	
Approach LOS		D			C			D			C	
Queue Length 50th (ft)	35	222	67	174	260		52	303		25	158	
Queue Length 95th (ft)	77	#389	121	#321	385		106	#494		#83	243	
Internal Link Dist (ft)		1373			597			1742			398	
Turn Bay Length (ft)	200		100	350			125			250		
Base Capacity (vph)	201	474	403	376	975		301	731		109	737	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.36	0.85	0.35	0.83	0.65		0.42	0.81		0.52	0.50	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 86.1			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 37.4		Intersection LOS: D	
Intersection Capacity Utilization 90.8%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 2: NC-96 (Arendell Avenue) & NC-97 (Gannon Avenue)



Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	51	5	82	4	4	7	41	317	4	9	521	47
Future Vol, veh/h	51	5	82	4	4	7	41	317	4	9	521	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	57	6	91	4	4	8	46	352	4	10	579	52

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1077	1073	605	1120	1097	354	631	0	0	356	0	0
Stage 1	625	625	-	446	446	-	-	-	-	-	-	-
Stage 2	452	448	-	674	651	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	197	220	498	184	213	690	951	-	-	1203	-	-
Stage 1	473	477	-	591	574	-	-	-	-	-	-	-
Stage 2	587	573	-	444	465	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	181	204	498	139	198	690	951	-	-	1203	-	-
Mov Cap-2 Maneuver	181	204	-	139	198	-	-	-	-	-	-	-
Stage 1	445	471	-	556	540	-	-	-	-	-	-	-
Stage 2	541	539	-	354	459	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30	20.2	1	0.1
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	951	-	-	293	254	1203	-	-
HCM Lane V/C Ratio	0.048	-	-	0.523	0.066	0.008	-	-
HCM Control Delay (s)	9	0	-	30	20.2	8	0	-
HCM Lane LOS	A	A	-	D	C	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	2.8	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	27	5	9	258	461	46
Future Vol, veh/h	27	5	9	258	461	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	6	10	287	512	51

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	819	512	563	0	-	0
Stage 1	512	-	-	-	-	-
Stage 2	307	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	345	562	1008	-	-	-
Stage 1	602	-	-	-	-	-
Stage 2	746	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	341	562	1008	-	-	-
Mov Cap-2 Maneuver	341	-	-	-	-	-
Stage 1	595	-	-	-	-	-
Stage 2	746	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1008	-	363	-	-
HCM Lane V/C Ratio	0.01	-	0.098	-	-
HCM Control Delay (s)	8.6	0	16	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	27	11	18	240	419	47
Future Vol, veh/h	27	11	18	240	419	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	12	20	267	466	52

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	773	466	518	0	-	0
Stage 1	466	-	-	-	-	-
Stage 2	307	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	367	597	1048	-	-	-
Stage 1	632	-	-	-	-	-
Stage 2	746	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	359	597	1048	-	-	-
Mov Cap-2 Maneuver	359	-	-	-	-	-
Stage 1	618	-	-	-	-	-
Stage 2	746	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.9	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1048	-	406	-	-
HCM Lane V/C Ratio	0.019	-	0.104	-	-
HCM Control Delay (s)	8.5	0	14.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	72	186	15	138	292
Future Vol, veh/h	11	72	186	15	138	292
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	80	207	17	153	324

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	846	216	0	0	224	0
Stage 1	216	-	-	-	-	-
Stage 2	630	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	333	824	-	-	1345	-
Stage 1	820	-	-	-	-	-
Stage 2	531	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	287	824	-	-	1345	-
Mov Cap-2 Maneuver	287	-	-	-	-	-
Stage 1	820	-	-	-	-	-
Stage 2	457	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	2.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	660	1345	-
HCM Lane V/C Ratio	-	-	0.14	0.114	-
HCM Control Delay (s)	-	-	11.3	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.4	-

Intersection	
Int Delay, s/veh	1.8

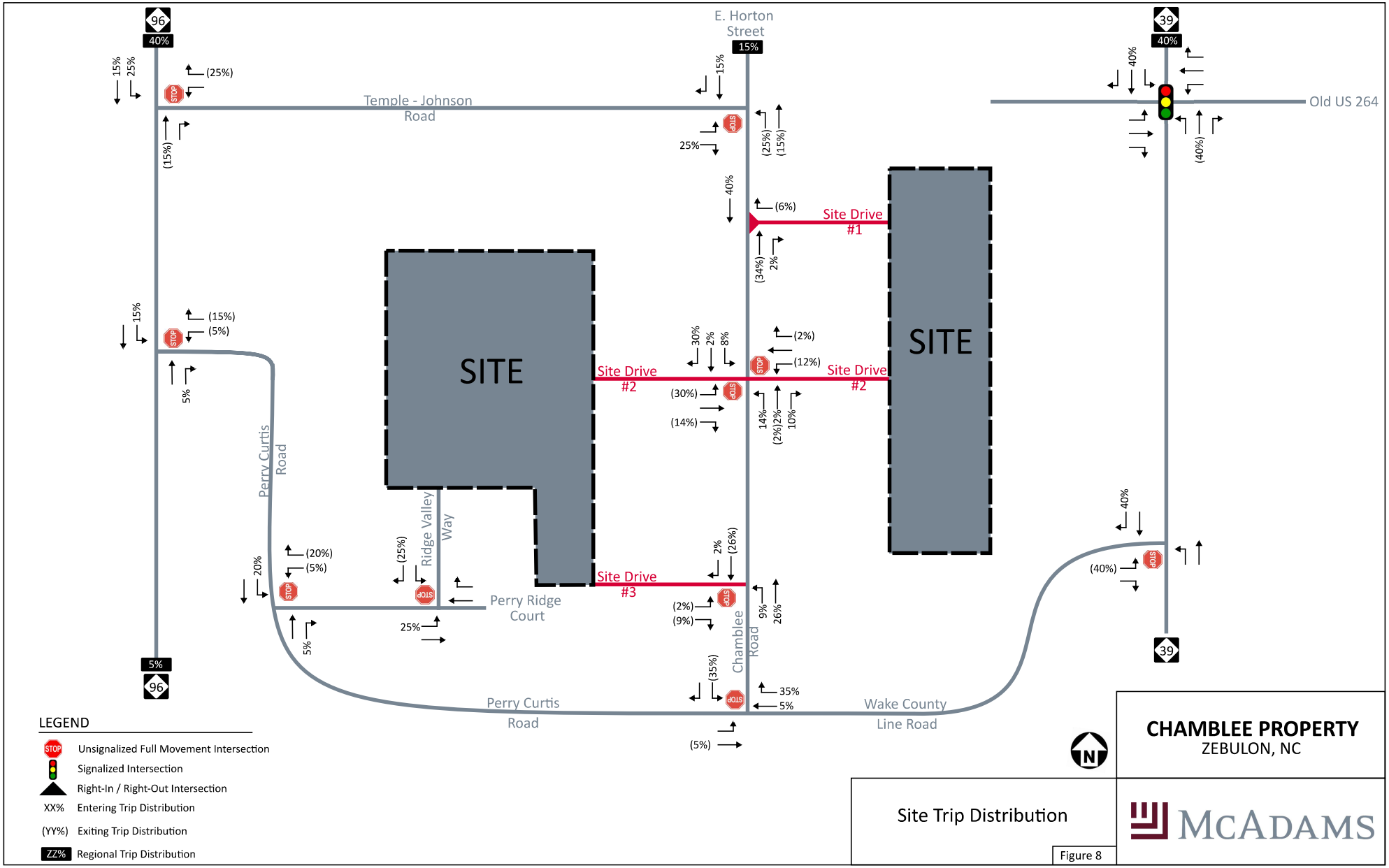
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	34	168	9	55	187
Future Vol, veh/h	5	34	168	9	55	187
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	38	187	10	61	208

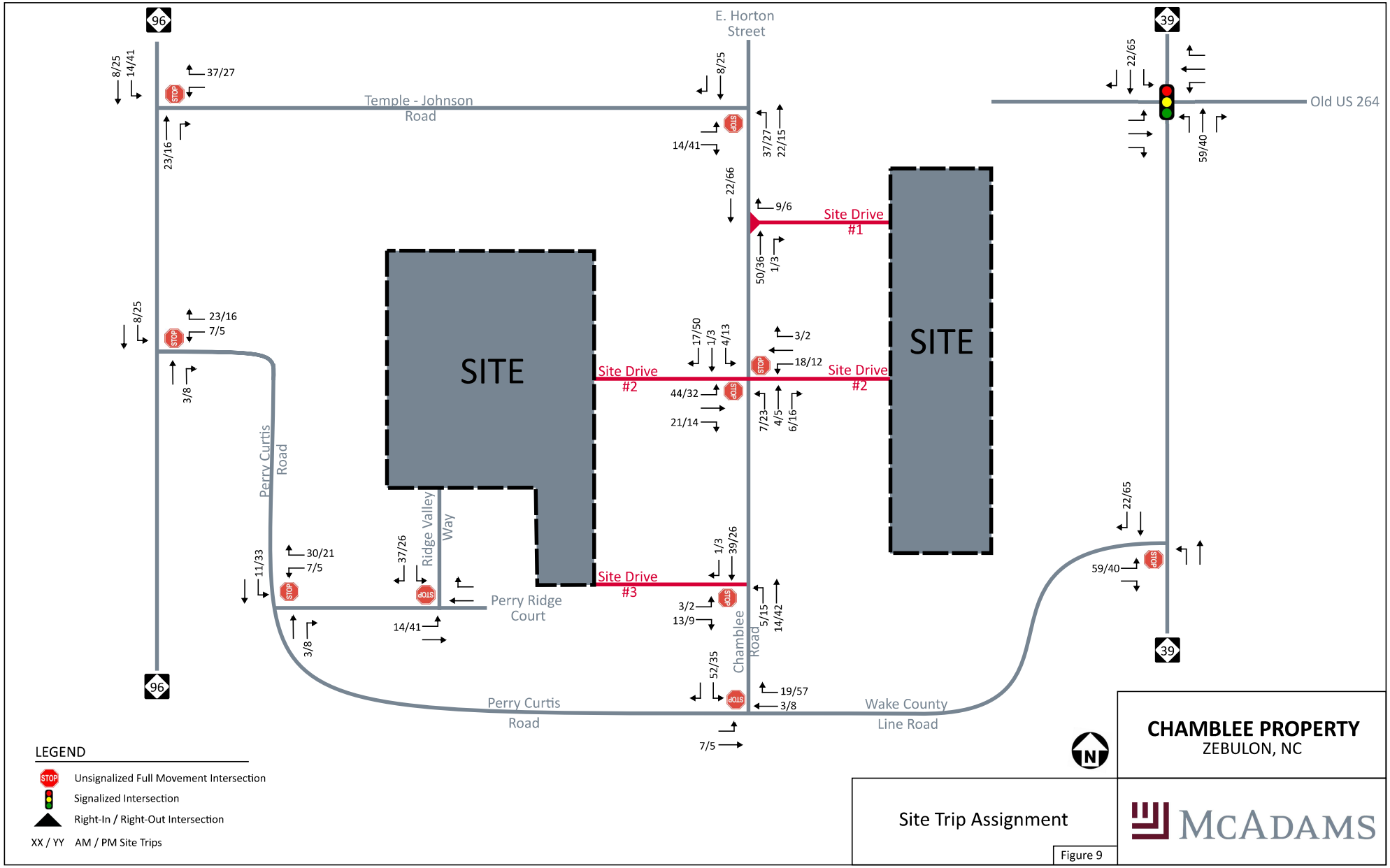
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	522	192	0	0	197	0
Stage 1	192	-	-	-	-	-
Stage 2	330	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	515	850	-	-	1376	-
Stage 1	841	-	-	-	-	-
Stage 2	728	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	492	850	-	-	1376	-
Mov Cap-2 Maneuver	492	-	-	-	-	-
Stage 1	841	-	-	-	-	-
Stage 2	696	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	1.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	777	1376	-
HCM Lane V/C Ratio	-	-	0.056	0.044	-
HCM Control Delay (s)	-	-	9.9	7.7	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Appendix B – Chamblee Lake Planned Development


96
40%
15%
25%
(25%)
Temple - Johnson Road
(15%)
15%
(15%)
(5%)
5%
Perry Curtis Road
20%
(20%)
(5%)
5%
96
Ridge Valley Way
(25%)
25%
Perry Ridge Court
SITE
E. Horton Street
15%
15%
25%
(25%)
(15%)
40%
(6%)
Site Drive #1
(34%)
2%
30%
2%
8%
(2%)
(12%)
Site Drive #2
(30%)
(14%)
14%
(2%)
2%
10%
Site Drive #2
SITE
Site Drive #3
2%
(26%)
(2%)
(9%)
9%
26%
Chamblee Road
(35%)
35%
5%
(5%)
Perry Curtis Road
Wake County Line Road
39
40%
40%
Old US 264
(40%)
40%
(40%)
39
LEGEND
Unsignalized Full Movement Intersection
Signalized Intersection
Right-In / Right-Out Intersection
XX% Entering Trip Distribution
(YY%) Exiting Trip Distribution
ZZ% Regional Trip Distribution
N
CHAMBLEE PROPERTY
ZEBULON, NC
Site Trip Distribution
Figure 8
McADAMS


96
E. Horton Street
39
Temple - Johnson Road
Old US 264
SITE
SITE
Site Drive #1
Site Drive #2
Site Drive #2
Site Drive #3
Perry Curtis Road
Ridge Valley Way
Perry Ridge Court
Chamblee Road
Perry Curtis Road
Wake County Line Road
LEGEND
Unsignalized Full Movement Intersection
Signalized Intersection
Right-In / Right-Out Intersection
XX / YY AM / PM Site Trips
N
CHAMBLEE PROPERTY
ZEBULON, NC
Site Trip Assignment
Figure 9
McADAMS